New York State Department of Environmental Conservation Division of Environmental Remediation

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October 15, 2008

Mr. Joseph Gabriel North Pastoria Environmental Corporation, Inc. 3800 Dewey Avenue #317 Rochester, New York 14616

RE: Sterling Site #3 (No. 4-42-011) Operable Units 1 and 2 Order on Consent Index # A4-0404-9911

Dear Mr. Gabriel:

The New York State Department of Environmental Conservation (the Department) is in receipt of and has reviewed the following correspondence and documents submitted by NPEC, Inc. concerning the above referenced site:

- Biennial Groundwater Sampling Program, June 2008 Sterling Site 3
- Focused Feasibility Study Report Sterling Site 3, OU-02, September 2008

The Department has the following comments and responses based upon it's review of the above documents and prior correspondence:

Operable Units - 01 and 02

Based upon the review of the June 2008, Biennial Groundwater Sampling Program Report and previously submitted monitoring data, the Department is requesting that NPEC perform a round of groundwater sample collection and analysis for both site related VOCs and for specific SVOCs during the next scheduled event. The SVOC analysis should utilize a valid methodology that will both positively identify and quantify the pharmaceutical compounds which have been reported to be tentatively identified compounds (TICs) based upon the SW-846 8270 method. Some of the semi-volatile compounds previously tentatively identified include:

talbutal	lidocaine	hexobarbital	pentazocine		
mephobarbital	phenobarbital	cyclobarbital	mepivacaine		

Samples should be collected from the all monitoring points located within OU-02 (all wells west of Papscanee Creek) and from a select number of points within the landfill source area.

Operable Unit - 01 Landfill Cap

In accordance with the Department's letter of May 12, 2008, NPEC was directed to implement the remedy for OU-01 pursuant to the Record of Decision of March 1992. The ROD calls for source containment by capping of the landfill. Now that the data collection activities to further delineate the fill materials at OU1 have been completed as per the Final Remedial Design Report and CRA Work Plan of 9/8/08, NPEC needs to update the remedial designs for the impermeable cover as appropriate and resubmit them for Department approval. Additionally, the approved schedule for the completion of the impermeable cover system which was presented as Attachment 2 of NPEC's November 30, 2007 letter should be adhered to in the future. The next monthly progress report should specifically address the status of the various tasks, including 1, 2, and 3 of the approved schedule.

Operable Unit - 01 Groundwater Treatment System

The Department feels that a decision to consider permanently discontinuing the ability to extract and treat groundwater cannot be justified at this time based upon the review of the June 2008, Biennial Groundwater Sampling Program report. NPEC should continue to perform the required monitoring and reporting in accordance with the established programs. Future monitoring results will be evaluated in relation to contaminant migration and the need for hydraulic control and groundwater treatment.

Operable Unit - 02

The Department has reviewed the revised Focused Feasibility Study (FFS) for OU-02. The revised document does not adequately address and incorporate the Department's prior comments and thus in it's present revision cannot be approved. Some of the items previously noted by the Department that were not adequately addressed in the document include:

- the specific requirements of the proprietary controls, such as an easement or covenant, made between themselves and the impacted nearby property owners. These controls must include at a minimum the following items:
 - provide for the continued ability to conduct monitoring of the various site media including soil, soil vapor and groundwater;
 - provide for the ability to remediate the property utilizing active remediation if warranted;
 - that in the event of development of the impacted property, then NPEC will provide for the continued evaluation of the potential for vapor intrusion for any buildings developed on the property, including provisions for mitigating any impacts identified; and
 - if groundwater is to be utilized on the developed property for drinking water, then

provide the necessary water quality treatment as determined by NYSDOH for the contaminants of concern or another acceptable water supply alternative.

- the NYSDOH Part 5 Drinking Water UOC standard for ethyl ether of 50 ug/l is not included as an ARAR and a remedial action objective for the site.
- the FFS contradicts itself in a number of places in regards to Alternative G3, Monitored Natural Attenuation. Section 3.2 states that the most important natural attenuation process for the ethyl ether contamination is biodegradation, however Section 3.2.2 states that the most important mechanisms are mechanical and physical.
- the FFS cites MNA as an active groundwater remedial treatment alternative in Section 7.7. The weight of evidence evaluation indicates that without proactive enhancement (chemical supplements, hydraulic controls, ect) the natural attenuation processes will not remediate the contaminant of concern (ethyl ether) at the site within a reasonable time frame. Thus, the Department does not consider MNA as an active remedial action at OU-02.

The Department is not requiring further revision of the FFS. The study will be utilized in it's present form, along with other site documents to develop the Department's Proposed Remedial Action Plan (PRAP) for OU-02.

If you should have any questions or comments please do not hesitate to contact me at the above number.

Sincerely,

andy Randy Hough Project Manager

Project Manager Remedial Bureau B Division of Environmental Remediation

M. Komoroske M. Schuck - NYSDOH J. Crua - NYSDOH R. Call - NPEC

ec:



FOCUSED FEASIBILITY STUDY REPORT STERLING SITE 3 EAST GREENBUSH, NEW YORK

DISCLAIMER: SOME FORMATTING CHANGES MAY HAVE OCCURRED WHEN THE ORIGINAL DOCUMENT WAS PRINTED TO PDF; HOWEVER, THE ORIGINAL CONTENT REMAINS UNCHANGED.

SEPTEMBER 2008 Ref. no. 007830 (71) Prepared by: Conestoga-Rovers & Associates

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1.0 INTRODUCTION

1.1 <u>GENERAL</u>

The Focused Feasibility Study (FFS) presented herein has been prepared to assess various groundwater remedial alternatives for Operable Unit 2 (OU2) at the Sterling Drug Inc. (Sterling) Site 3 (Site) which is located in East Greenbush, Rensselaer County, New York. The Site location is presented on Figure 1.1. The Site is approximately seven acres in size and was used as a disposal area from 1956 to 1977. Waste disposal activities led to contamination of soil and groundwater at the Site. Remedial activities were implemented beginning in 1989 and continue to date. A Site Record of Decision (ROD) dated March 31, 1992 defined two areas of potential concern for the Site known as Operable Unit 1 (OU1) and OU2. OU1 includes the on-Site soils and groundwater managed by the current remedial activities. OU2 includes the off-property portion of the Site groundwater contaminant plume of ethyl ether. The 1992 ROD applies to the on-Site soils and groundwater within OU1.

1.2 ORGANIZATION OF THE FFS

The FFS is organized as follows:

•	Section 1.0:	Introduction
		Presents background information relevant to this FFS and outlines the organization of this FFS.
•	Section 2.0:	Site Characterization
		Presents a brief summary of the nature and extent of the contamination due to the historical operations at the Site.
•	Section 3.0:	Natural Attenuation Evaluation
		Presents a preliminary evaluation of natural attenuation (NA) characteristics in the groundwater beneath the Site.
•	Section 4.0:	Risk Assessment
		Presents a brief summary of the human health risk assessment for the potential future utilization of the off property groundwater (OU2) for a hypothetical residential use scenario.

• Section 5.0:	Identification and Screening of Remedial Technologies
	Identifies remedial action goals and objectives, general remedial response actions and associated remedial technologies; summarizes the initial screening of remedial technologies.
• Section 6.0:	Development and Screening of Remedial Alternatives
	Combines technologies retained after screening of technologies in Section 5.0 into various alternatives; provides an initial screening of the assembled alternatives.
• Section 7.0:	Detailed Analysis of Retained Remedial Alternatives
	Presents a detailed and comparative analysis of the retained remedial alternatives.

• Section 8.0: <u>Preferred Remedial Alternative</u> Identifies the preferred alternatives for the Site.

2.0 SITE CHARACTERIZATION

2.1 <u>SITE DESCRIPTION</u>

The Site is a 7-acre area located on Riverside Avenue, East Greenbush, in Rensselaer County, New York. The Site is located between Papscanee Creek and the Conrail railway tracks. The Site location is shown on Figure 1.1. The Site is vegetated and relatively flat, and the Site is situated within the 100-year flood plain of the Hudson River. The Hudson River is located 500 feet southwest of the Site. Following closure of operations by Sterling in 1977, remedial efforts were undertaken to address soil and groundwater contamination. As defined in the ROD, two distinct areas (OU1 and OU2) were noted as areas of potential concern. OU1 includes the closed landfill, and on-Site soils and groundwater, and OU2 includes the off-property portion of the groundwater contaminant plume of ethyl ether located northwest of the landfill. Land use in the surrounding areas is mainly for agricultural purposes with some residential areas approximately 3/4 of a mile to the northeast of the Site. There is no current use of groundwater as a source of drinking water, and the groundwater is considered non-potable due to elevated levels of naturally occurring inorganics (iron, etc). There are no known water wells downgradient of the Site based upon a search of the Water NYSDEC web site the Well Information on (http://www.dec.state.ny.us/cfmx/extapps/WaterWell/; NYSDEC, 2006).

2.2 <u>GENERAL SITE USE</u>

Between 1956 and 1977, the Site was used by Sterling for the disposal of waste materials. Company records indicated that disposed wastes in OU1 included pharmaceutical intermediates, finished pharmaceutical products, Sterling Winthrop Research Institute waste, filter cakes, solvents, still bottoms, motor and lubricating oils, and wood. In 1977, the Site was covered with sandy clay and gravel and closed, and has remained inactive since that time.

2.3 **PREVIOUS INVESTIGATIONS**

The Site has been the subject of ongoing investigations and remedial activities since 1982. Results from previous investigations identified volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) as the primary contaminants in Site soils and groundwater. Several remedial activities have been implemented at the Site, beginning with the removal of 8,452 buried drums from OU1 between 1989 to 1990. Many of these drums were empty; however, some also contained product. Following the removal of the drums, additional investigations were conducted to determine the extent of remaining contamination on Site. The Vacuum Extraction (VE) System and groundwater pump and treat system were installed in accordance with the Site ROD. The Air Sparging System was installed voluntarily, with the approval and oversight of the NYSDEC, as a further enhancement to source removal prior to capping The VE System commenced full-scale operation in December 1994 to the landfill. address contaminants in the fill/soil within OU1. The Groundwater Treatment System (GWTS) was commissioned in May 1996 to address groundwater immediately downgradient of OU1. The Air Sparging System has been operated since July 2000 to address groundwater within the hot spot areas of OU1. These systems are currently operating and have been effectively reducing the contaminant levels within the landfill. In addition, an impermeable cap, which has been designed, will be placed over the landfill following the evaluation of the completed treatment systems. The OU2 off-property groundwater plume is presently being monitored.

2.4 NATURE AND EXTENT OF CONTAMINATION

Previous Site investigations indicated that the subsurface within OU1 consists of approximately 8 feet of a heterogeneous mixture of silt, sand, and clay fill underlain by 6 feet of lower permeability silt, silty clay, and clayey silt. The upper layer was characterized as being mixed with waste products such as glass vials, flasks, wood, garbage, drainage pipes, needles, and also the drums mentioned previously, which have been excavated from this area during remedial activities between 1989 and 1990. Following drum removal, sampling conducted at the Site indicated the presence of several "hot spots" in OU1 composed of VOCs, which have been, and continue to be, addressed by the VE System. The primary contaminants of concern at OU1 included benzene, toluene, acetone, ethyl ether, 1,2-dichloroethane, trichloroethylene, and chloroform. In addition, a groundwater plume, consisting of ethyl ether has been detected. The Site GWTS intercepted impacted groundwater downgradient of the source area OU1, and the treated effluent from the GWTS was discharged back into the groundwater west of Papscanee Creek and appears to be a contributor to the ethyl ether plume in OU2. The ethyl ether plume extends to the northwest of OU1 and is approximately 2,400 feet long and 750 feet wide. The GWTS was not designed to treat ethyl ether and ceased operations in March 2007 due to mechanical failures. Monitoring of the OU2 groundwater wells is currently being conducted.

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2.5 <u>GROUNDWATER HYDROGEOLOGY</u>

Three water-bearing zones have been identified in the vicinity of the Site. The water-bearing zones from shallowest to deepest are: Upper Unconsolidated Aquifer (at a depth of 10 to 90 feet); Lower Unconsolidated Aquifer (at a depth of 80 to 100 feet); and the Bedrock Aquifer (at a depth of 45 to 120 feet). The Upper Unconsolidated Aquifer has been impacted by the Site. The upper portion of the Upper Unconsolidated Aquifer has higher observed concentrations of ethyl ether than the lower portions of the Upper Unconsolidated Aquifer. The Bedrock Aquifer appears to have not been impacted by ethyl ether. Groundwater flow in the Upper Unconsolidated Aquifer is controlled by a geologic trough and flows towards the Hudson River in a northwest direction. Groundwater in the vicinity of the Site contains naturally elevated iron and manganese concentrations, which discourages its use as a drinking water source.

2.6 <u>GROUNDWATER</u>

Groundwater moves directly toward the Hudson River 500 feet away from the Site and surface water runoff from the Site moves directly toward the Papscanee Creek. Previous investigations have identified benzene, toluene, ethyl ether, methylene chloride, acetone, methyl thiophene, 1,2-dichloroethane, trichloroethylene, and chloroform as the primary chemicals of concern in OU1 groundwater. Concentrations were typically 1 to 2 orders of magnitude higher than the corresponding groundwater remediation goals. However, the groundwater treatment system has been effective in reducing the levels of the majority of these contaminants in OU1. During investigations, a groundwater plume consisting primarily of ethyl ether was identified to migrate from the former landfill area to off-Site agricultural land. This area has been defined as OU2. The OU2 groundwater sampling locations are shown on Figure 2.1. Groundwater in OU2 has been monitored under the Site semi-annual and biennial groundwater sampling program. Groundwater elevations from June 2006 are presented on Figure 2.2.

Investigation of the OU2 groundwater plume between 2001 and 2005 has shown that the levels of the majority of primary chemicals within OU2 are either not detected, or have been reduced to below detection levels, with the exception of ethyl ether, which still remains above the original groundwater cleanup objectives. Ethyl ether is the only organic constituent that is detected on a consistent basis to the west of Papscanee Creek. Detected VOCs and SVOCs from 1997 to 2006 are presented on Figure 2.3.

3.0 NATURAL ATTENUATION EVALUATION

3.1 INTRODUCTION

This section presents the results of a preliminary evaluation of natural attenuation (NA) characteristics in the groundwater beneath the Site. The purpose of this evaluation was to review evidence for increased biological activity in the groundwater at the Site, indicating the occurrence of biodegradation of the Site-related compounds, benzene and ethyl ether.

The NA evaluation involved the collection of groundwater samples from select upgradient, Site source area (OU1), and downgradient (OU2) monitoring wells for the analyses of natural attenuation indicator parameters. A list of the natural attenuation indicator parameters is presented in Section 3.5. The natural attenuation indicator parameters include a suite of geochemical and oxidation-reduction (redox) reaction indicator parameters, along with biodegradation parameters, that were evaluated to assess the occurrence of biodegradation processes in groundwater beneath and downgradient from the Site. The groundwater samples for analysis of the natural attenuation indicator parameters were collected using Snap Sampler[™] sampling techniques to ensure that the groundwater samples were representative of groundwater flowing within the formation. A description of the natural attenuation indicator parameter sampling event is presented in Section 3.4.

The NA evaluation is based on the approach presented in the United States Environmental Protection Agency's (USEPA's) "Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water" (Technical Protocol) (U.S. EPA, 1998) and the Technical Protocol for Implementing Intrinsic Remediation with Long-Term Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Groundwater (AFCEE, 1999). The NA evaluation consisted of evaluating the natural attenuation indicator parameter data, in conjunction with the detected concentrations of VOCs in groundwater, for evidence supporting the occurrence of biodegradation processes. A weight-of-evidence approach was applied where converging lines of evidence are identified to demonstrate the occurrence of natural attenuation processes.

3.2 BACKGROUND ON NATURAL ATTENUATION PROCESSES

Natural attenuation refers to naturally occurring processes in soil and groundwater environments that act without human intervention to reduce the mass, toxicity, mobility, volume or concentration of contaminants in those media. These in situ processes include biodegradation, dispersion, dilution, adsorption, volatilization, and chemical or biological stabilization or destruction of contaminants.

Natural attenuation processes are classified as destructive and non-destructive. Destructive natural attenuation processes result in a reduction in contaminant mass. Destructive natural attenuation processes consist of biological degradation (where, naturally occurring microorganisms indigenous to the subsurface, break down or degrade contaminant compounds into less toxic or nontoxic compounds), and chemical degradation (where contaminants chemically break down, or degrade into less toxic or Non-destructive natural attenuation processes result in a nontoxic compounds). reduction in contaminant concentrations. Non-destructive natural attenuation processes consist of advection (contaminant spreading due to groundwater flow), dispersion (contaminant spreading due to the tortuous flow of groundwater in porous or fractured media), sorption (contaminant sorption from groundwater onto soil particles), diffusion (contaminant spreading due to chemical concentration gradients - including diffusion from groundwater into rock or clay matrix), dilution (mixing with uncontaminated groundwater or surface water), and volatilization (contaminant volatilization to soil gas and/or the atmosphere).

For benzene and ethyl ether, the most important natural attenuation process is biodegradation. Through a series of degradation pathways, microorganisms present in the subsurface can ultimately degrade these contaminants to nontoxic end products such as carbon dioxide, ethane, ethene, and water. The evaluation of natural attenuation processes occurring at a site must include an assessment of the potential production and accumulation of intermediate degradation products.

3.2.1 BACKGROUND ON BIODEGRADATION PROCESSES

Biologically mediated degradation reactions involve electron transfer, where the microorganisms gain energy for growth and reproduction by catalyzing redox reactions, which require an electron donor (referred to as a primary substrate) and an electron acceptor. Sources of primary substrate are naturally occurring organic carbon, or anthropogenic carbon sources, such as petroleum hydrocarbon compounds or landfill leachate rich in organic matter. The preferred degradation pathway for a given VOC is dependent upon the oxidation state of the VOC, groundwater redox conditions, primary substrate availability, and the microbial population present in the subsurface. VOCs may be degraded by serving as an electron donor that becomes oxidized, as an electron acceptor that becomes reduced, or VOCs may be degraded through cometabolism which

is an incidental reaction occurring as a result of microbial activity. These three biodegradation processes are described further below:

- <u>use as an electron donor, or primary substrate</u>: this process involves the transfer of electrons from VOCs, which provides energy for microorganism growth and reproduction;
- <u>use as an electron acceptor</u>: this process involves a transfer of electrons to the VOC. This process is a common biodegradation mechanism for chlorinated VOCs; and
- <u>cometabolism</u>: this process involves the incidental degradation of a VOC catalyzed by an enzyme, or cofactor, that is fortuitously produced by microorganisms for other purposes. The microorganisms indirectly transform the VOC as they use either naturally occurring, or anthropogenic, carbon sources as a primary substrate for energy. The VOC serves neither as an electron acceptor nor a primary substrate and the reaction is of no benefit to the microorganisms.

Evaluating the distribution of naturally occurring electron acceptors can provide evidence of where and how biodegradation is occurring. Naturally occurring electron acceptors available in groundwater, in the order of those that release the greatest energy to those that release the least energy, are as follows: dissolved oxygen, nitrate, manganese, and iron coatings on soil sediments, dissolved sulfate, and carbon dioxide. The sequential reduction of these electron acceptors occurs, as groundwater becomes increasingly more reducing during the biodegradation of organic compounds. With the long-term presence of organic contaminants in groundwater, a sequence of redox zones of increasing redox potential will develop downgradient from a source area (Lyngkilde and Christensen, 1992a; Appelo and Postma, 1993). The sequence of these redox zones, in order of the closest to the farthest away from a source area, can be as follows:

- 1) methanogenic zone (carbon dioxide reduction to methane);
- 2) sulfidogenic zone (sulfate reduction to sulfide);
- 3) ferrogenic zone (Fe³⁺ reduction to Fe²⁺);
- 4) manganogenic zone (Mn^{4+} reduction to Mn^{2+});
- 5) nitrate-reducing zone (nitrate reduction to nitrite); and
- 6) aerobic zone (dissolved oxygen reduction to water).

The extent of each individual redox zone is site-specific, and will depend on substrate migration pathways, kinetics of redox processes, hydraulic retention times, and the availability of various electron acceptors in groundwater. Identifying the redox zones

downgradient of a source area can provide strong evidence of the occurrence of biodegradation.

Reducing conditions in groundwater often are associated with increased dissolved metals concentrations. When the groundwater becomes depleted of dissolved oxygen and nitrate, conditions become anaerobic where the reduction and subsequent dissolution of iron and manganese oxide coatings on soil sediments can occur. These reactions will result in the mobilization of ferrous iron (Fe²⁺) and dissolved manganese (Mn²⁺) in groundwater. In their oxidized state, Fe³⁺ and Mn⁴⁺ are practically insoluble at pH levels of 5 to 7, and dissolved concentrations are considered to represent the reduced species of Fe²⁺ and Mn²⁺ (Lyngkilde and Christensen, 1992a). The mobilization of manganese will begin prior to that of iron because dissolved manganese is more stable over a larger range of redox conditions than ferrous iron (Baedecker and Back, 1979). However, the concentration of dissolved iron in groundwater often is greater than that of manganese because soil sediments typically consist of a greater iron content (Hem, 1985).

3.2.2 CHEMICALS OF CONCERN FOR DEGRADATION EVALUATION

Site contaminants of concern in OU2 groundwater include benzene and ethyl ether. Benzene in aerobic microbial conditions is readily oxidized to carbon dioxide. The biodegradation of benzene anaerobically has been found to occur under iron, nitrate, and sulphate reducing conditions. However, it is highly dependent on microbial species present.

Few published research papers are available at this time that evaluates the reductive biodegradation of ethyl ether in natural aquifers. Studies on other ether compounds such as methyl tert-butyl ether have shown that no appreciable amount of biodegradation occurs in anaerobic environments. Mechanical/physical mechanisms (i.e., dispersion, dilution, and diffusion) may be more significant than the biodegradation mechanism for natural attenuation of ethyl ether.

3.3 <u>SITE HYDROGEOLOGY</u>

Groundwater flow is in a northerly direction on the Site changing to northwesterly, immediately north of the Site, as shown on Figure 2.2. Groundwater flows toward the Hudson River downgradient of the Site. The monitoring wells MW-5B, MW-4B, MW-2S,

MW-3SR, MW-6B, MW-9B, MW-12B, MW-13B, MW-16B, MW-17B, and MW-19B are all screened at the base of the upper aquifer.

The monitoring well MW-5B is upgradient of both the Site and the air sparging area and is representative of upgradient groundwater conditions. Wells MW-4B, PZ-14, PZ-20 represent source area conditions, and MW-2S, MW-6B, MW-9B, MW-12B, MW-13B, MW-16B, MW-17B, and MW-19B represent downgradient conditions.

Active air sparging is ongoing in the southern portion of the Site, and is hydraulically upgradient of most of the Site.

3.4 NATURAL ATTENUATION INDICATOR PARAMETER SAMPLING EVENT

The natural attenuation indicator parameters sampled include the following geochemical and redox reaction indicator parameters (field parameters, general chemistry parameters, and dissolved metals), and compounds of concern:

- temperature;
- pH;
- turbidity;
- conductivity;
- dissolved oxygen (DO) concentrations;
- oxidation-reduction potential (ORP);
- nitrate concentrations;
- dissolved iron concentrations
- dissolved manganese concentrations;
- sulphate concentrations;
- dissolved organic carbon (DOC);
- dissolved methane;
- alkalinity;
- benzene; and
- ethyl ether.

Site-specific indicators of natural attenuation were evaluated based on groundwater quality monitoring data collected in May and June 2006. To effectively characterize background groundwater conditions, groundwater was sampled at MW-5B, which is hydraulically upgradient of the Site. To determine groundwater conditions in the source area, wells sampled in the source area included MW-4B, PZ-14, PZ-20, and hydraulically downgradient of the source area at wells MW-2S, MW-6B, MW-9B, MW-12B, MW-13B, MW-16B, MW-17B, and MW-19B.

The monitoring wells MW-5B, MW-4B, MW-2S, MW-3SR, MW-6B, MW-9B, MW-12B, MW-13B, MW-16B, MW-17B, MW-19B, PZ-14, PZ-20, and RW-1 were sampled during the May and June 2006 monitoring rounds. The piezometers PZ-14, PZ-20, and recovery well RW-1, were also sampled in May and June. During all sampling rounds, the listed wells were sampled for the natural attenuation indicator parameters listed above, with the exception of DOC, which was not measured in the June 2006 round for any of the wells. During the June 2006 monitoring round, the well MW-5B was only sampled for field parameters and benzene and ethyl ether. The 2006 VOC, metals, and general chemistry data are presented in Table 3.1.

3.5 NA EVALUATION – WEIGHT OF EVIDENCE EVALUATION APPROACH

A weight-of-evidence approach is applied to demonstrate the occurrence of natural attenuation processes at the Site. This evaluation includes examining trends in the geochemical and redox indicator parameter data along a common groundwater flow path to evaluate indirectly the type(s) of natural attenuation processes occurring at the Site. The lines of evidence evaluated consist of the following:

- steady-state (stable) or receding plume conditions over distance and time;
- geochemical and redox indicator parameters demonstrating the occurrence of biodegradation processes; and
- the presence of metabolic end products.

These lines of evidence were evaluated using qualitative means as described below.

<u>Concentration Reduction Along Flow Path and Over Time</u>

If biological destruction of VOCs is occurring, quantifiable decreases in VOC concentrations over time should be measured. VOCs of concern should exhibit decreasing concentrations along the flow path downgradient of the source area. A

key indicator of biodegradation is the presence of daughter products at monitoring wells located in and downgradient of source areas. Decreases in parent compounds and the presence of their degradation products (i.e., daughter/end products) provide strong evidence that degradation of parent VOCs by natural attenuation is occurring.

<u>Redox Zone Delineation Including Identification of Electron Donors and Acceptors</u>

An evaluation of redox indicator parameters is conducted to determine whether conditions in the groundwater flow system are conducive to biodegradation of the VOCs present, by demonstrating that groundwater conditions at the Site are conducive to natural biodegradation and that biodegradation is occurring. Using a comparison of upgradient to on-Site and downgradient wells is essential to evaluating changes in aquifer conditions that occur as a result of biological oxidation-reduction reactions.

<u>Characterization of Metabolic Byproducts</u>

Further qualitative natural attenuation evaluation involves analysis of the presence of specific metabolic by-products of in order to determine whether VOCs are undergoing degradation. For instance, an increase in alkalinity is indicative of increased biological activity.

3.5.1 CONCENTRATIONS TRENDS OVER TIME

The concentration trends over time for benzene and ethyl ether were evaluated for 31 wells at the Site. The results of the statistical evaluation are presented in Table 3.2. The results of the statistical analysis indicate that there are decreasing trends for both benzene and ethyl ether in all monitoring wells where significant trends exist. Out of the 31 wells evaluated:

- 1 well (MW-17B), with an ethyl ether concentration above the screening criterion of 1,200 ppb, showed no significant trend over time since 1998 for ethyl ether but appear to be declining since 2005;
- 5 wells showed a decreasing trend for benzene (all within the source area);
- 3 wells showed a decreasing trend for ethyl ether (all downgradient);
- 17 wells showed no significant trend over time for ethyl ether;
- 4 wells showed no significant trend over time for benzene;
- 22 wells had insufficient benzene detections for trend analysis; and
- 11 wells had insufficient ethyl ether detections for trend analysis.

Decreasing concentrations over time is good evidence that natural attenuation is occurring in the groundwater at the Site. However, the decreasing trends for benzene all occurred within the source area, near where the air sparging is taking place. It is possible that the air sparging is contributing to the decrease in benzene over time. Details of the trend evaluation are presented in Appendix B.

Benzene concentrations are essentially non-detect downgradient of OU1, and the concentrations of ethyl ether have decreased in OU2. Future contributions from the source area OU1 are expected to be minimal based upon conservative modeling as presented in the Preliminary Geochemical Evaluation dated November 30, 2007.

3.5.2 **GROUNDWATER REDOX CONDITIONS**

The groundwater samples collected during the natural attenuation indicator parameter sampling events were analyzed for the redox indicator parameters dissolved iron (Fe²⁺), dissolved manganese (Mn²⁺), nitrate, sulfate, sulfide, and methane. The redox indicator parameters pH, temperature, conductivity, DO, and ORP were measured in the field. These redox indicator parameter data are summarized in Table 3.3. Table 3.3 presents the redox indicator parameter data in terms of upgradient monitoring wells, on-Site monitoring wells, off-Site monitoring wells, and downgradient monitoring wells for both May and June 2006 sampling rounds. Due to difficulties encountered in measuring DO, the dissolved oxygen measurements were not considered for this evaluation.

Expected reducing groundwater conditions are represented by:

- decrease in DO;
- decrease in ORP;
- decrease in nitrate concentration;
- increase in dissolved iron concentration;
- increase in dissolved manganese concentration;
- decrease in sulphate concentration; and
- increase in methane concentration.

3.5.2.1 UPGRADIENT (BACKGROUND) CONDITIONS

Background conditions at the Site are defined by the chemistry at monitoring wells MW-4B and MW-5B. In June 2006, general chemistry parameters and SVOCs were not measured in MW-5B. The May 18, 2006 monitoring round is the next most recent sampling event, and will be used for this evaluation.

<u>ORP</u>

The concentration of ORP measurements are indicators of whether conditions are reducing or oxidizing. Typically, there is a positive correlation between DO concentrations and ORP values. It is expected that as DO concentrations increase, the groundwater becomes more oxidizing and the opposite is true for DO concentration decreases.

During the April 2006 monitoring round ORP values in the upgradient monitoring wells (MW-4B and MW-5B) were low (-63 mV to -124 mV). A low (negative) ORP indicates oxygen concentrations are very low and conditions are reducing.

<u>Nitrate</u>

Nitrate concentrations in the upgradient wells were below detection limits (0.05 mg/L), which indicate reducing conditions exist upgradient of the Site.

Dissolved iron and manganese

The concentration of dissolved iron upgradient of the source ranged from 0.572 (MW-4B in June) to 37.1 mg/L (MW-5B in May). The concentration of dissolved manganese in the upgradient monitoring wells ranged from 0.118 mg/L (MW-4B in June) to 3.16 mg/L (MW-5B in May). These values are generally high, which indicates that groundwater conditions are reducing upgradient of the Site.

<u>Sulfate</u>

The concentration of sulfate in the upgradient wells ranged from below the detection limit [ND (4) mg/L in MW-5B] to 22.6 mg/L (MW-5B in June), indicating that the upgradient groundwater conditions are reducing.

<u>Methane</u>

The concentration of methane in the upgradient wells ranged from 0.0028 mg/L (MW4B in May) to 0.78 mg/L (MW-5B in May), which indicates that upgradient groundwater conditions are reducing.

<u>Summary</u>

A low (negative) ORP value, low nitrate, low sulfate, high dissolved iron, and manganese, and the presence of methane, suggest background conditions are reducing. These data suggest groundwater conditions are ferrogenic to methanogenic, because concentrations of dissolved iron and manganese are high and dissolved methane is present.

3.5.2.2 IMPACTED AREA REDOX CONDITIONS

<u>ORP</u>

ORP values ranged from –151 mV (MW-16B) to 256 mV (MW-3SR). In general, values were below zero, indicating reducing conditions exist within the source area and Downgradient well. However, the ORP values were not more negative than the upgradient conditions, and therefore, do not indicate an increase in biological activity within the source area.

<u>Nitrate</u>

The concentrations of nitrate in the monitoring wells at the Site were very low (less than 5 mg/L). This indicates that conditions at the Site are generally reducing at all monitoring wells. Therefore, nitrate cannot be used as an indicator of redox conditions at the Site.

Dissolved iron and manganese

The concentration of dissolved iron in the source area ranged from 2.28 mg/L to 67.8 mg/L (PZ-14 in June and May, respectively). The higher values are above the upgradient values, but there are significant fluctuations between May and June sampling rounds, and there are values in the source area in June that are below the May upgradient values. Historical iron concentrations in the source area are higher than the concentrations measured in the upgradient locations (See Table 3.3). Therefore, the

dissolved iron data indicate that conditions are somewhat more reducing in the source area relative to the upgradient conditions.

<u>Sulfate</u>

The highest sulfate concentrations were measured in the source area at PZ-14 (1,350 mg/L, May 18, 2006). The concentrations are much higher than the upgradient concentration, which means that the source material contains sulfate, and therefore, sulfate cannot be used as an indicator of redox conditions at the Site.

<u>Methane</u>

Methane concentrations in the source area ranged from 0.77 (PZ-14 in May) to 9.6 mg/L (PZ-20 in June). The concentration of methane in the source area was generally higher than in the upgradient samples.

3.5.2.3 <u>REDOX SUMMARY</u>

The redox data indicate that the conditions at the Site are generally reducing. The dissolved methane and dissolved iron data indicate that the conditions in the source area are more reducing than upgradient conditions. The nitrate and ORP data indicate that conditions are reducing both upgradient and in the source are and therefore, cannot be used to determine if an increase in biological activity is occurring in the source area. The sulfate data indicate that sulfate is part of the source material and therefore, cannot be used as an indicator of redox conditions at the Site.

3.5.3 METABOLIC BY-PRODUCTS

An increase in alkalinity in the source area relative to upgradient conditions is indicative of increased biological activity. The alkalinity measure in the upgradient well was 258 mg/L. The alkalinity in the source area ranged from 55 mg/L (PZ-14) to 284 mg/L (PZ-14). The values in the source area were not significantly higher than the upgradient value. This does not support the existence of biodegradation at the Site.

Other parameters such as pH, temperature, and conductivity were within acceptable ranges for biodegradation to occur.

Table 3.4 presents the results of the microbial analyses in the groundwater at the Site. The results indicate the presence of benzene-degrading microorganisms in the groundwater at the Site, including downgradient in OU2 at locations MW-9B, MW-10B, MW-11B, MW-12B, MW-13B, and MW-19B, as indicated by the microbial data in Appendix A. This is good evidence that the biodegradation of benzene is occurring. There is currently no commonly performed test for the existence of microorganisms that can degrade ethyl ether.

3.6 <u>SUMMARY</u>

Multiple lines of evidence for the occurrence of natural attenuation via biodegradation were evaluated at the Site. The evidence supporting the occurrence of significant biodegradation included:

- decreasing concentration trends for benzene were identified in five source area wells and decreasing trends for ethyl ether were identified in three downgradient wells;
- the iron and methane data indicated that conditions in the source area are more reducing than background conditions, which indicates an increase in biological activity within the source area; and
- microorganisms that degrade benzene were detected within the groundwater at the Site.

The other redox parameters did not indicate that the source area was more reducing than upgradient. The expected increase in alkalinity concentrations from upgradient to source area was also not detected. However, because the upgradient conditions are reducing, an increase in biological activity might not be detectable using nitrate and ORP values.

It appears that natural attenuation is occurring within OU2 at the Site, and that there is evidence to suggest that biodegradation of benzene is occurring. It appears that natural attenuation of ethyl ether is also occurring within OU2 but the mechanical/physical mechanisms of dispersion, dilution, and diffusion may be more significant than biodegradation.

4.0 RISK ASSESSMENT

4.1 <u>GENERAL</u>

The only exceedances of USEPA Region 3 Risk-Based Concentrations for top water or Region 9 Preliminary Remediation Goals were for chloroform (5 of 17 locations), ethyl ether (1 of 17 locations), and iron (total and dissolved). Iron (total and dissolved) also exceeded the Region 3 RBCs and Region 9 PRGs for upgradient wells. A Human Health risk Assessment (HHRA) was performed as indicated below.

In accordance with the relevant USEPA guidance and procedures (USEPA, 1989, 1991a, 1991b, 1997, 2001, 2004a), the HHRA includes the following primary elements:

- 1) Site Characterization This includes the incorporation of Site-specific investigation data coupled with the identification of potential site receptors to develop a Conceptual Site Model (CSM) which describes the factors (chemical/parameter source, media of concern, release mechanisms, transport mechanisms, and potential receptor uptake routes) that could produce a complete exposure pathway and lead to human intake of chemicals at the Site; and the selection of the contaminants of potential concern (COPCs), as discussed in Section 4.2.2.
- 2) Exposure Assessment This is the estimation of the magnitude, frequency, duration, and routes of exposure.
- 3) Toxicity Assessment This assessment examines available evidence regarding the potential for a particular chemical to cause adverse effects in exposed individuals and estimates the extent of exposure and possible severity of adverse effects.
- 4) Risk Characterization The objective of the risk characterization is to integrate information developed in the exposure assessment and the toxicity assessment into an evaluation of the potential human health risks associated with exposure to potentially contaminated media at the Site.

Ultimately, this risk assessment considers risk relative to the following principle:

"Where the cumulative carcinogenic site risk to an individual based on reasonable maximum exposure for both current and future land use is less than 10⁻⁴ and the non-carcinogenic hazard quotient is less than 1, action generally is not warranted unless there are adverse environmental impacts." (U.S. EPA, 1991b)

This section presents a summary and the results of the Human Health Risk Assessment. The detailed HHRA, however, is provided in Appendix C.

4.2 <u>SITE CHARACTERIZATION</u>

4.2.1 EXPOSURE PATHWAYS

OU2 includes the off-property portion of Site groundwater contaminant plume of ethyl ether. Although there is no current use of groundwater as a source of drinking water, and the groundwater is considered non-potable, this HHRA was prepared to conservatively evaluate the risk associated with the potential future utilization of the off-property groundwater (OU2) for a hypothetical residential use scenario. This approach was selected because it is the most conservative.

In order to evaluate the significance of the impacted groundwater within OU2 at the Site, the potential pathways by which individuals may come in contact with the groundwater must be determined. The combination of factors (chemical source, media of concern, release mechanisms, and potential receptors) that could produce a complete exposure pathway and lead to human uptake of chemicals are assessed in what is defined as a Conceptual Site Model (CSM). Adjacent, hypothetical residents have been assumed as the potential human receptors for the OU2 groundwater.

OU2 contains groundwater impacted by VOCs and metals. Currently, groundwater from OU2 is not used for potable purposes. There are no known water wells downgradient of the Site based upon a search of the Water Well Information on the NYSDEC web site (http://www.dec.state.ny.us/cfmx/extapps/WaterWell/; NYSDEC, 2006). In addition, the concentrations of total iron range from 3.45 to 47.9 mg/L and dissolved iron range from 0.375 to 43 mg/L in upgradient Site wells based on 2001 to 2005 data for monitoring wells MW-4B and MW-5B. These iron concentrations are above the aesthetic drinking water standard of 0.3 mg/L presented in the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) (NYSDEC, 1998). Even though groundwater use is unlikely in the future, the risk assessment evaluates OU2 groundwater as a potable drinking water source, because this approach is considered the most conservative.

Exposure pathways involving groundwater as a potable drinking water source typically include direct contact to COPCs in water through ingestion and dermal contact while bathing. Indirect exposure pathways for potable groundwater involve potential release

of COPCs from groundwater-to-indoor air from various activities, e.g., showering, laundering, dish washing, etc.

4.2.2 CHEMICALS OF POTENTIAL CONCERN

The identification of COPCs for OU2 groundwater was completed using a screening process, which involved a comparison of the maximum detected concentration of each contaminant in OU2 groundwater to a risk-based concentration associated with target risks and conservative default exposure assumptions. The most up-to-date and the lowest of the risk-based concentrations (RBCs) from the USEPA Region III (R3-RBCs) (USEPA, 2006a), Region IX preliminary remediation goals (R9-PRGs) (USEPA, 2004b), NYSDOH Maximum Contaminant Levels (MCLs) (NYSDOH, 2004), and NYSDEC Ambient Water Quality Standards and Guidance Effluent Limitations, Divisions of Water Technical and Operational Guidance (TOGS) (NYSDEC, 1998) were used to identify COPCs in the groundwater for the HHRA. Chemicals with maximum concentrations less than their respective screening value were not identified as COPCs, and were not retained in the HHRA quantitative process. Additionally, any parameter that had a level of detection frequency (LDF) less than 5 percent was not identified as a COPC for this risk assessment.

Background iron levels (total and dissolved) were detected at maximum concentrations greater than the screening criteria for groundwater. Site groundwater concentrations of ethyl ether, iron (total), and iron (dissolved) were detected at maximum concentrations greater than the screening criteria for groundwater. As a result, background iron, and OU2 ethyl ether and iron (total and dissolved) were identified as COPCs for groundwater.

4.3 EXPOSURE ASSESSMENT

Exposure is defined as the contact of a receptor with a chemical or physical agent. The exposure assessment is the estimation of the magnitude, frequency, duration, and routes of exposure. An exposure assessment provides a systematic analysis of the potential exposure mechanism by which a receptor may be exposed to chemical or physical agents at or originating from a source. The objectives of an exposure assessment are as follows:

- 1) characterization of exposure setting;
- 2) identification of potential exposure pathways; and

3) quantification of exposure.

The exposure assessment is presented in Appendix C - Section 3.0.

Based on the results of the media-specific screening presented in Appendix C - Section 2.6, the following media and potential human exposures (i.e., complete pathways) have been identified for quantitative evaluation, beyond screening, in the HHRA:

- 1) Background Groundwater Hypothetical Future Resident:
 - dermal contact with groundwater by resident (child and adult);
 - ingestion of groundwater by resident (child and adult); and
 - inhalation of vapors from volatile COPCs by resident (child and adult).
- 2) OU2 Groundwater Hypothetical Future Resident:
 - dermal contact with groundwater by resident (child and adult);
 - ingestion of groundwater by resident (child and adult); and
 - inhalation of vapors from volatile COPCs by resident (child and adult).

To quantify exposure, potential exposure scenarios were developed using USEPA guidance documents, as presented in Appendix C - Section 3.3. In instances where USEPA documents did not present necessary factors, or where more appropriate scientific data were not available, professional judgment was applied to develop conservative assumptions that are representative of the Reasonable Maximum Exposure (RME) and Central Tendency (CT) or mean exposure and are protective of human health.

4.4 <u>TOXICITY ASSESSMENT</u>

The toxicity assessment weighs the available data regarding the potential for a particular COPC to cause adverse effects in exposed individuals and estimates the extent of exposure and possible severity of adverse effects. To develop toxicity values, two steps are taken: hazard identification and dose-response assessment. The hazard identification determines the potential adverse effects associated with exposure to a COPC. In the dose-response assessment, numerical toxicity values are determined or selected from the available toxicity data.

In the selection of toxicity values, preference has been given to the most recently developed values because these would incorporate the most recent toxicological information and would provide the best basis upon which to assess potential health hazards/risks. Toxicity values were primarily obtained from the IRIS (Integrated Risk Information System) database (USEPA, 2006b) and the USEPA-National Center for Environmental Assessment (NCEA) provisional values as presented in the USEPA Region IX PRGs (USEPA, 2004b) and USEPA Region III RBCs (USEPA, 2006a).

The toxicity assessment is presented in Appendix C - Section 4.0.

4.5 **<u>RISK CHARACTERIZATION</u>**

The objective of the risk characterization is to integrate information developed in the exposure assessment and the toxicity assessment into an evaluation of the potential human health risks associated with exposure to potentially contaminated media at the Site. The methods used in this risk characterization are based on USEPA guidance for human exposures (USEPA, 1989, 1991a, 1991b, 1997, 2001, 2002, 2004a).

Risk Quantification Summary

The non-cancer hazard calculations and calculated lifetime cancer risks for future potential receptors using background groundwater and OU2 groundwater are presented in Appendix C Section 5.3. and summarized below.

Receptor	Medium	Route	Exposure	Cancer Risk	Risk > 10-6	Risk > 10-4	Non- Cancer Hazard Index	Hazard > 1.0	Appendix C Table Reference
Resident (Hypothetical	Background Groundwater	Ingestion Dermal	СТ	NC	NA	NA	2.4E+00	Yes	C.11
Future)		Inhalation	RME	NC	NA	NA	6.8E+00	Yes	C.12
	OU2 Groundwater	Ingestion Dermal	СТ	NC	NA	NA	3.1E+00	Yes	C.13
e e e e e e e e e e e e e e e e e e e		Inhalation	RME	NC	NA	NA	6.0E+00	Yes	C.14
	OU2 Groundwater	Ingestion Dermal	CT	NC	NA	NA	7.0E-01	No	
		Inhalation	RME	NC	NA	NA	<0.0	No	

Note:

NC = not calculated as COPCs are not considered to be carcinogenic NA = not applicable

The HI attributable to potential site-related impacts on OU2 groundwater, i.e., HI OU2 groundwater less HI background groundwater is less than 1 for both Central Tendency (CT) and Reasonable Maximum Exposure (RME). Therefore, the risk assessment indicates that no significant additional toxic effect attributable to the Site is expected based upon the concentrations in OU2 groundwater. Details are presented in the following section.

Risk and Hazard COPC Contributions

The contribution to total risk and hazard of each COPC for a specific combined exposure scenario varies, depending on the COPC exposure point concentration and relative toxicity. Frequently, most of the risk estimated for an exposure scenario can be attributed to a few COPCs. The following paragraphs present a summary of the COPCs contributing the majority of risk and/or hazard in OU2 groundwater. The results of this analysis are also shown in Appendix C - Section 5.5.

The RME cumulative HI for OU2 groundwater was 6.0, which exceeds the target hazard level of 1.0. For OU2 groundwater, the RME HI of 6.0 primarily results from the potential ingestion exposure to iron in the OU2 groundwater. Ingestion of iron accounts for 96 percent of the cumulative HI. The cumulative HI for the target organs associated with exposure to ethyl ether was below 1.0; therefore, exposure to ethyl ether in groundwater for the hypothetical future resident is within acceptable levels. The RME HI of 6.8 for exposure to iron in the background groundwater is consistent with the RME HI of 5.8 observed due to exposure to iron in OU2 groundwater. From the risk characterization, it is evident that residential ingestion exposure to iron is the main contributor to the hazard index for both background and OU2 groundwater. In addition, the calculated hazard was found to be slightly higher for residential exposure to background iron levels compared to OU2 groundwater iron. Therefore, the calculated hazard associated with iron exposure through hypothetical future residential groundwater ingestion is comparable to the normal background hazard for this area. To further characterize the hazard exceedance due to residential ingestion exposure to iron within the OU2 groundwater, additional analyses were conducted to compare OU2 concentrations of iron to background (upgradient) levels. Details of the statistical analysis are presented in Appendix C (Attachment B). Three statistical tests were selected to compare OU2 data to background data according to applicable guidance (e.g., USEPA, 2002 and NAVFAC, 2004). The results show that there were no statistical differences between OU2 and background iron concentrations, which suggests that former activities and the contamination present on Site have not contributed or elevated the levels of iron in the area. As a result of these findings, the hazard levels are within the acceptable levels.

4.6 <u>CONCLUSIONS</u>

Based on the information presented in the HHRA, the following conclusions are made:

- 1) The calculated RME cumulative hazard indices for ingestion, dermal contact, and inhalation exposure to background and OU2 groundwater were 6.8 and 6.0, respectively. The Site-related contribution has a HI of less than 1.0.
- 2) Exposure to ethyl ether in OU2 groundwater for the hypothetical future resident is within acceptable levels.
- 3) No carcinogens were identified as COPCs, therefore, a cancer risk was not calculated.

4.7 <u>UNCERTAINTY</u>

The objective of the human health risk assessment process is to estimate an upper-bound average, and average risk for potential receptors under potential hypothetical future exposure scenarios. As noted, for the purposes of this assessment, it was assumed that OU2 groundwater could hypothetically be used as a potable source of residential drinking water even though it is not currently used for that purpose, and it is considered non-potable because of elevated background levels of iron that exceed the aesthetic drinking water standard of 0.3 mg/L presented in TOGS 1.1.1 (NYSDEC, 1998). Therefore, actual future risk estimates are likely to be much lower than presented here and are, in fact, likely to be zero. All uncertainty associated with the risk assessment is discussed in Appendix C, Section 5.6.

5.0 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES

5.1 <u>GENERAL</u>

The National Contingency Plan (NCP) requires that a range of alternatives be developed and evaluated as part of a FFS in order to form the basis for a remedy selection. Generally, it is necessary to develop a range of alternatives for each impacted media, ranging from "no action" to those that involve destruction, active treatment, control/isolation, and/or removal of the contaminant source. This FFS focuses on the off-Site groundwater plume (OU2) of ethyl ether. The ethyl ether plume is centered around monitoring well MW-16B. Current groundwater concentrations of ethyl ether, the primary organic COPC within OU2, are consistent with historical concentrations overall, and have decreased at some individual locations. Groundwater concentrations of ethyl ether since 1997 have shown a statistically significant decrease at locations MW-6B, MW-12B, and MW-13B. Other locations within OU2 since 1997 had no statistically trends identified or had a large percentage of non-detect results. There is evidence to indicate that natural attenuation is occurring at the Site. Groundwater in the vicinity of the Site contains elevated iron and manganese concentrations, which precludes its use as a viable drinking water source. Based upon the HHRA (refer to Section 4.0), the calculated hazard index for the OU2 groundwater is considered to be within background exposure levels. The Final Draft Feasibility Study (Dames & Moore, 1992) stated that estimated maximum loadings of ethyl ether concentrations from OU2 groundwater would have minimal potential impact on the Hudson River.

5.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

Applicable or Relevant and Appropriate Requirements (ARARs) are used to develop remedial action objectives and to scope and formulate remedial action technologies and alternatives. ARARs are applicable or relevant and appropriate New York State Standards, Criteria and Guidelines (SCGs) and also include Federal ARARs or standards, if they are more stringent than State standards. ARARs are categorized as:

- 1) chemical-specific requirements that define acceptable exposure levels and may therefore be used in establishing preliminary remediation goals;
- 2) location-specific requirements that may set restrictions on activities within specific locations, such as floodplains or wetlands; and

3) action-specific requirements which may set controls or restrictions for particular treatment and disposal activities related to the management of hazardous wastes.

ARARs that are potentially applicable to the remediation of OU2 at the Site are summarized in Tables 5.1 and 5.2.

5.3 <u>REMEDIAL ACTION GOAL AND OBJECTIVES</u>

5.3.1 <u>REMEDIAL ACTION GOAL</u>

The overall remedial action goal, as stated in the Record of Decision (ROD), is "to reduce the concentrations of contaminants and control the routes of exposure to protect human health and the environment." The remedy selection process will be performed in a manner consistent with the NCP, appropriate USEPA guidance documents, and appropriate State guidance.

5.3.2 <u>REMEDIAL ACTION OBJECTIVES</u>

The USEPA guidance document entitled "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (USEPA, October 1988) states," *medium-specific or operable-unit specific goals for protecting human health and the environment. The objectives should be as specific as possible but not so specific that the range of Alternatives that can be developed is unduly limited.*" Remedial action objectives established for the protection of human health and the environment should specify:

- 1) the contaminants and media of concern;
- 2) the exposure routes and receptors; and
- 3) an acceptable contaminant level or range of levels for each exposure route.

The calculated RME cumulative hazard indices for ingestion, dermal contact, and inhalation exposure for a hypothetical future resident to background and OU2 groundwater were 6.8 and 6.0, respectively. Ingestion of iron accounted for the majority of the cumulative non-cancer hazard index for OU2 groundwater. The hazard levels associated with ingestion of iron in the background and OU2 groundwater are similar. Additional statistical analyses of the iron levels occurring in the OU2 groundwater confirmed that the levels of iron are similar to background levels for the area, and the

associated calculated hazard index from hypothetical ingestion of OU2 groundwater containing iron are not Site-related but represent a background hazard index for the area. Therefore, the calculated hazard index for the OU2 groundwater is considered to be within background exposure levels.

There is no TOGS 1.1.1 criterion for ethyl ether. As stated in a NPEC letter to NYSDEC dated June 8, 2004, the 50 μ g/L (ppb) limit for ethyl ether currently in the OU1 ROD is an arbitrary value, based on the limit for unspecified organic contaminants. The 50 ppb limit is not based on risk assessment methodologies or any Site-specific evaluations. USEPA Region 3 and Region 9 have the screening criterion of 1,200 ppb for ethyl ether as a Risk-Based Concentration (RBC) for residential tap water and as a generic Preliminary Remediation Goal (PRG) for residential tap water.

Based on the results of the RI, FS, subsequent investigations, and HHRA the following remedial action objective (RAOs) for OU2 have been established:

- 1) to prevent, to the extent practicable, exposure of human receptors to ethyl ether in OU2 groundwater;
- 2) to restore, to the extent practicable, contaminated groundwater in OU2 to a risk-based concentration of 1,200 ppb for ethyl ether; and
- 3) to monitor the groundwater in a manner to verify the effectiveness of the remedial actions.

5.4 GENERAL RESPONSE ACTIONS

5.4.1 <u>GENERAL</u>

General response actions are medium-specific remedial approaches, which encompass those actions that will satisfy the RAOs. General response actions may include institutional actions and monitoring, containment, collection, and treatment (in situ or ex situ), or a combination of these, if required, to be effective in meeting all of the RAOs. The general response actions evaluated are described in the following sections.

5.4.2 <u>NO ACTION</u>

The no further action response is primarily used as a basis for comparison with other alternatives. Under the no action response, no measures are taken to alter environmental conditions at the Site; however, in some cases, monitoring may continue

as appropriate. This response does not reduce the volume, mobility, or toxicity of the hazardous constituents of the Site media except to the extent that the constituent concentrations are reduced through natural mechanisms.

5.4.3 INSTITUTIONAL CONTROLS AND MONITORING

Institutional controls and monitoring responses are not intended to reduce the toxicity, mobility or volume of hazardous site constituents but to reduce the potential of human exposure to those constituents. Options may include implementation of a long-term monitoring program to track contaminant migration and transport, and initiation of institutional controls to restrict or limit: access to the Site; the use of the Site; or exposure to contaminated media.

5.4.4 <u>CONTAINMENT TECHNOLOGIES</u>

The containment response does not (on its own) reduce the volume or toxicity of the contaminants in the Site media. The purpose of this response is to isolate contaminants and reduce contaminant mobility, and in doing so, minimize exposure and reduce potential hazards at the Site. Periodic monitoring is necessary following implementation of the containment response to demonstrate its effectiveness and evaluate the need for further action.

Containment technologies considered for groundwater include hydraulic containment and vertical barriers.

5.4.5 <u>COLLECTION TECHNOLOGIES</u>

Collection technologies are used to reduce the mobility and toxicity of Site contaminants by removal and disposition at a secure location. These technologies may be used in conjunction with a disposal and/or treatment option to meet the Site-specific goals and objectives.

Collection technologies available for groundwater are limited to pumping. This action must be combined with some form of treatment (on- or off-Site) to facilitate disposal.

5.4.6 **TREATMENT TECHNOLOGIES**

The purpose of a treatment technology, when used alone or in conjunction with a collection technology, is to reduce the volume, toxicity, and/or mobility of Site contaminants. Treatment technologies may be implemented in situ or ex situ.

For the purposes of this FFS, all ex situ treatment options have been combined with the pumping collection technology. In situ treatment options may be implemented independent of other actions and are therefore assessed relative to the combined collection/ex situ treatment technology.

5.5 IDENTIFICATION AND SCREENING OF REMEDIAL TECHNOLOGIES

Several remedial technologies may be effective in mitigating the presence of ethyl ether in groundwater at OU2. In this section, remedial technologies that are potentially applicable to the impacted media (OU2 groundwater) and contaminants of concern (ethyl ether) are identified and screened based on technical considerations. The primary intent of the screening process is to ensure subsequent detailed evaluations of remedial alternatives focus on technologies that are effective.

Table 5.3 summarizes the technologies potentially applicable to the remediation of groundwater within OU2 at the Site.

The various remedial technologies presented were screened based on technical considerations.

Technical Considerations

Remedial technologies that could not effectively be implemented at depth, do not effectively treat ethyl ether, or are incompatible with OU2 groundwater chemistry were eliminated from further consideration.

5.5.1 TECHNOLOGY IDENTIFICATION SCREENING -GROUNDWATER

Remedial technologies selected and screened for groundwater are summarized in Table 5.3. The No Action, Limited Action, Containment and Treatment technologies

that were considered potentially applicable were screened against the technical considerations in Section 5.0. The rationale for eliminating technologies from further evaluation is presented in Table 5.3. Ex situ treatment requires extraction of the groundwater prior to treatment.

5.5.2 TECHNOLOGY SCREENING SUMMARY

Technologies and process options retained for further evaluation, based on the initial screening described above, include the following:

Media	General Response Action	Technology	Process Option
Groundwater	No Action	No Action	N/A
	Limited Action	Institutional Controls	Access and Deed
			Restrictions
		Monitoring	Long-Term Monitoring
	In Situ Treatment	Biological Treatment	Monitored Natural
			Attenuation
		Chemical/Physical	Chemical Oxidation
		Treatment	
	Ex Situ Treatment	Chemical/Physical	Carbon Adsorption
		Treatment	

6.0 DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

In this Section, the groundwater remedial technologies that were retained from the initial screening in Section 5.0, are combined into groundwater remedial alternatives. Sufficient information is gathered to allow for a more comprehensive screening of the Alternatives based on three primary screening criteria (effectiveness and implementability), as required in the NCP.

The following remedial Alternatives have been assembled for groundwater at the Site:

Alternative G1	No Action
Alternative G2	Institutional Controls
Alternative G3	Monitored Natural Attenuation
Alternative G4	In Situ Chemical Oxidation
Alternative G5	Ex Situ Carbon Adsorption

Routine groundwater monitoring will be a component of any remedy selected with the exception of the "No Action" Alternative.

6.1 <u>ALTERNATIVE G1 - NO ACTION</u>

Under the No Action Alternative, no remedial measures will be implemented following completion of the FFS. Annual Site inspections would be performed to ensure deterioration of current Site conditions has not occurred.

6.1.1 <u>EFFECTIVENESS</u>

With the No Action Alternative, no remedial actions will be performed to actively reduce mobility, toxicity, or volume of the chemicals of concern found in the groundwater. This Alternative relies on natural attenuation and degradation for the reduction of the chemicals of concern in the OU2 groundwater. Natural degradation is the tendency of the chemicals to reduce through physical, chemical, and biological processes in the natural environment. Attenuation is the tendency of a chemical to bind to in situ soil particles or organic matter resulting in a reduction of the chemical's mobility.

The No Action Alternative will not achieve the RAOs established for the Site.

6.1.2 **IMPLEMENTABILITY**

The No Action Alternative is implementable as well as technically and administratively feasible.

6.1.3 <u>SUMMARY</u>

The No Action Alternative will not meet the groundwater RAO in a reasonable time period. In addition, this Alternative will not meet the remedial action goals. This Alternative is, however, technically and administratively feasible and implementable.

The NCP requires that this Alternative be retained and developed during detailed analysis.

6.2 <u>ALTERNATIVE G2 - INSTITUTIONAL CONTROLS</u>

Institutional Controls would limit the exposure pathways to groundwater potentially containing contaminants of concern. Institutional Controls may involve deed restrictions, well permitting requirements, zoning controls and access restrictions, and would mitigate the potential risk to human health by restricting the potential exposure pathways.

Use of the deed restriction involves placing a notation on the property deed that makes the current and any prospective property owner aware of the property's history and restricted land uses. The deed restriction may further place a limitation on future development and/or groundwater use. This would prevent or mitigate the potential of exposure to contaminated groundwater on Site.

Zoning controls restrict land development or groundwater withdrawals by potential groundwater users. Currently, the Site is zoned commercial/industrial. This zoning ordinance precludes residential development and residential use of the Site.

As part of the institutional controls, NPEC could pursue access agreements, easements, or covenants with the other property owners of OU2, if necessary. However, it may be difficult for NPEC to obtain full cooperation of these property owners.

Access restrictions, such as the existing chain link fence surrounding the Site, can be extended to limit human exposure to media at the Site, which potentially contains COPCs. It is anticipated that access restrictions may not be required following implementation of final remedial actions.

Groundwater monitoring at the Site will be a component of this remedial Alternative. Groundwater monitoring would be performed using the existing well network supplemented by a minimum of one new monitoring well. Results of the monitoring program will be used to evaluate the movement of Site-related COPCs in the groundwater. A monitoring plan would be developed to establish the procedures and protocols for groundwater sampling and analysis. The analytical data would be used to evaluate the migration of COPCs from the Site and to monitor background groundwater quality. Although groundwater monitoring would not reduce the present risk levels, it would provide the following:

- 1) an early warning for the migration of COPCs from the Site; and
- 2) a better understanding and evaluation of the natural attenuation mechanisms in effect.

6.2.1 <u>EFFECTIVENESS</u>

Institutional Controls and groundwater monitoring would not reduce the mobility, toxicity, or volume of the contaminants of concern identified in groundwater at the Site. However, zoning restrictions and Site fencing would be effective in reducing future risk to human health by restricting the number of exposure pathways to media potentially containing COPCs, provided the respective controls are maintained. Groundwater monitoring would be effective in preventing public exposure by tracking the migration of any identified COPCs from the Site, as well as documenting reduction due to natural attenuation mechanisms.

This Alternative partially complies with the remedial action goals by being protective of human health; however, the Institutional Controls Alternative may not be fully protective of the environment and does not minimize the volume of untreated COPCs.

6.2.2 <u>IMPLEMENTABILITY</u>

Established procedures and mechanisms already exist to implement Institutional Controls over the short-term, and these means are sustainable over the proposed long-term (e.g., a minimum of 30 years). Institutional Controls (deed notices, restrictive covenants, well permitting, access restrictions and zoning controls) relating to groundwater use are administratively feasible. However, zoning controls and well permitting can only be implemented by governmental authorities. A sufficient well network, with minor modifications, exists at the Site to implement a monitoring program. Standard procedures and protocols for monitoring and testing of Site groundwater are available.

6.2.3 <u>SUMMARY</u>

Institutional Controls are implementable at the Site and are effective in reducing the potential human health risk. A groundwater monitoring program would be effective in identifying potential incremental future risk due to the Site, and effective in documenting the reduction of COPCs due to natural attenuation effects.

The Institutional Controls and Monitoring Alternative alone would not meet all of the remedial action objectives identified for the Site. However, the selected remedial Alternative for the Site will likely include this Alternative as a secondary component to the remedial action. This Alternative will be carried through for detailed analysis in Section 7.0.

6.3 ALTERNATIVE G3 - MONITORED NATURAL ATTENUATION

Monitored Natural Attenuation (MNA) is the monitored use of the natural processes of intrinsic bioremediation, advection, dispersion, and sorption to remove contaminants from groundwater. It requires a structured program of groundwater monitoring of biological and chemical parameters to determine that the transformation processes are taking place at a rate that is protective of human health and the environment, and that the processes will continue at an acceptable rate for an extended period of time. Section 3.0 provides evidence that natural attenuation is occurring at the Site.

Existing site groundwater and soil characterization data must be periodically reviewed to evaluate continued evidence of natural attenuation. These data include contaminant concentrations, electron acceptors (dissolved oxygen, nitrate, manganese, ferric iron, and sulfate), oxidation-reduction potential (ORP), and dissolved gas (methane). Changes in primary ethyl ether concentrations over time can be used to estimate degradation rates or the existence of asymptotic behavior.

Historic groundwater chemistry data for ethyl ether and benzene and bioattenuation parameters suggest that natural attenuation is occurring at the Site. Benzene concentrations are essentially non-detect downgradient of OU1, and the concentrations of ethyl ether have decreased in OU2. Future contributions from the source area OU1 are expected to be minimal based upon conservative modeling as presented in the Preliminary Geochemical Evaluation dated November 30, 2007. A remedial contingency plan would be developed and implemented if concentrations of ethyl ether are above the risk criteria.

6.3.1 **EFFECTIVENESS**

The use of natural attenuation does not rely upon cross-media transfer of contaminants (i.e., sorption), and would be protective of human health and the environment.

Initial screening of natural attenuation parameters at the Site indicates biodegradation of groundwater contaminants is occurring at the Site. However, the rate of attenuation at each monitoring well location varies, with some wells showing groundwater impact from COPCs attenuating to non-detectable levels, while others show groundwater impact.

6.3.2 <u>IMPLEMENTABILITY</u>

The use of Natural Attenuation is not new at environmental sites. As experience and understanding of attenuation processes increase, practical implementation has also increased.

Natural Attenuation is readily implemented, with an adequate monitoring well network existing at the Site. Use of Natural Attenuation would be a long-term application.

The effectiveness of Natural Attenuation can be readily assessed using the Remediation Toolkit Software¹ consisting of the following: the visualization program SEQUENCE; BioTrends, for spatial and temporal evaluations, EPA and AFCEE degradation rate calculations; and BioTracker, a particle tracking program (based on BioRedox and MT3D) for predicting and evaluating attenuation.

¹ Environmental Software Solutions, October 2002, 140 Bathurst Drive, Waterloo, Canada.

6.3.3 <u>SUMMARY</u>

Monitored natural attenuation is implementable at the Site and would be effective in ensuring the potential human health risk continues to remain below the target risk criteria in the future. A groundwater monitoring program would be effective in documenting the reduction of COPCs due to natural attenuation effects.

The Monitored Natural Attenuation Alternative would meet the remedial action objectives identified for the Site. This Alternative will be carried through for detailed analysis in Section 7.0.

6.4 ACTIVE GROUNDWATER REMEDIATION

Active groundwater remediation technologies retained for further evaluation include in situ chemical treatment, and ex situ chemical/physical treatment.

In situ chemical oxidation, ex situ carbon adsorption, and ex situ chemical oxidation alternatives are described below.

6.4.1 <u>ALTERNATIVE G4 - IN SITU CHEMICAL OXIDATION</u>

In situ chemical oxidation involves chemical injection to thoroughly permeating contaminated zones with a chemical oxidant or reductant (e.g., hydrogen peroxide, alkaline oxidant, etc.) to induce oxidation-reduction (redox) reactions resulting in the complete destruction of COPCs. The injectant can be placed as a slurry.

Chemical oxidants directly oxidize organics, producing carbon dioxide as a byproduct. For effective treatment to take place, a sufficient mass of chemical must be injected to react with both the contaminants and background sinks or interferences, and the injectant must reach the majority of the contaminant mass.

6.4.1.1 <u>EFFECTIVENESS</u>

In situ chemical oxidation would be effective at reducing the concentrations of COPCs in groundwater. This technology would provide significant reduction through destruction, rather than through transferring them to other media such as carbon matrices. Therefore, this technology would also be affective at reducing the toxicity of contaminants at the Site. The elevated iron readings at the Site may create a natural oxygen demand that could complicate the use of chemical oxidation.

6.4.1.2 **IMPLEMENTABILITY**

In situ chemical oxidation is readily implemented, and technically has been well established, with equipment readily available. Repeatability of applications is also feasible. Treatability studies would be required during design to determine the optimum chemical(s) to be used, number of injection points, and volume of injectant. The injection points would be located on off-Site property.

6.4.1.3 <u>SUMMARY</u>

In situ chemical oxidation is implementable at the Site and would be effective in ensuring the potential human health risk continues to remain below the target risk criteria in the future. A groundwater monitoring program would be effective in documenting the reduction of COPCs due to in situ chemical oxidation.

The In situ Chemical Oxidation Alternative would meet the remedial action objectives identified for the Site. This Alternative will be carried through for detailed analysis in Section 7.0.

6.4.2 ALTERNATIVE G5 - EX SITU CARBON ADSORPTION

Ex situ carbon adsorption involves extraction of groundwater, transferring the extracted groundwater to a treatment system where the COPCs are concentrated at the surface of an adsorbent to reduce the concentration in the groundwater. The treated groundwater would have to be discharged and the sorbent material requires regeneration or disposal and replacement. Adsorption mechanisms are generally categorized as physical adsorption, chemisorption or electrostatic adsorption. The most common adsorbent is granular activated carbon (GAC). Pretreatment for removal of suspended solids may be required to prevent plugging of the carbon units. A series of GAC units in series may be required in case of breakthrough of the initial GAC unit. Periodic monitoring for treatment efficiency and breakthrough would be required.

6.4.2.1 <u>EFFECTIVENESS</u>

Ex situ carbon adsorption would be effective at reducing the concentrations of COPCs in groundwater. This technology would provide significant reduction through transferring COPCs to other media rather than immediate destruction. Ultimately, the carbon would be regenerated or disposed. Therefore, this technology would also be effective at reducing the toxicity of contaminants at the Site.

6.4.2.2 **IMPLEMENTABILITY**

Ex situ carbon adsorption is readily implemented, and technically has been well established, with equipment readily available. The GAC treatment system would be modeled to determine a satisfactory design to treat the COPCs to the RAOs.

6.4.2.3 <u>SUMMARY</u>

Ex situ carbon adsorption is implementable at the Site and would be effective in ensuring the potential human health risk continues to remain below the target risk criteria in the future. A treatment system and groundwater monitoring program would be effective in documenting the reduction of COPCs due to ex situ carbon adsorption.

The Ex situ Carbon Adsorption Alternative would meet the remedial action objectives identified for the Site. This Alternative will be carried through for detailed analysis in Section 7.0.

7.0 DETAILED ANALYSIS OF RETAINED REMEDIAL ALTERNATIVES

Remedial Alternatives were developed in Section 6.0 for possible application at the Site. These Alternatives were subject to a detailed analysis using seven of the nine evaluation criteria developed by USEPA as presented in the document "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA", EPA/540/G-89/004, OSWER Directive 9355.3-01, October 1988. The nine evaluation criteria are as follows:

- 1) compliance with New York SCGs;
- 2) protection of human health and the environment;
- 3) short-term effectiveness;
- 4) long-term effectiveness and permanence;
- 5) reduction of toxicity, mobility or volume;
- 6) implementability; and
- 7) cost.

The seven evaluation criteria are divided into two primary groups, namely threshold criteria and balancing criteria.

The threshold criteria include overall protection of human health and the environment, and compliance with SCGs. With the exception of the no action Alternative, all remedial Alternatives must meet the threshold criteria to be eligible for further consideration.

The remaining five evaluation criteria are considered the balancing criteria. Each of the remedial Alternatives is assessed and analyzed on a comparative basis using these evaluation criteria. Ultimately, a remedial action plan will be proposed that incorporates the Alternatives that provide the best solution with respect to the balancing criteria.

The results of the detailed analysis are summarized in Table 7.1.

7.1 COMPLIANCE WITH ARARs

Alternatives G1 and G2 do not comply with various ARARs identified for the Site. Alternatives G4 may reduce the time required for the Site to comply with media specific ARARs.

7.2 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The Human Health Risk Assessment presented in Section 4.0 indicated that:

- 1) the calculated hazard index for iron concentrations in the OU2 groundwater is considered to be within background exposure levels;
- 2) exposure to ethyl ether in OU2 groundwater for the hypothetical future resident is within acceptable levels; and
- 3) no carcinogens were identified as COPCs, therefore, a cancer risk was not calculated.

Alternatives G1 - No Action does not change the current or potential future risks to human health or the environment identified in the HHRA. All four other remaining Alternatives provide varying degrees of protection.

Alternatives G2 - Institutional Controls will provide protection for specific, potential future human exposure scenarios not currently identified at the Site. As noted in Section 4.0, groundwater is not currently used as a source of drinking water, and, given the high background iron concentrations that exceed the NYSDEC standard in the groundwater, use of OU2 groundwater, as a potable water source is unlikely in the future.

Alternatives G3, G4, and G5 address current and potential future risks associated with groundwater. These alternatives would ensure that the potential human health risks continues to remain below the target risk criteria in the future

7.3 SHORT-TERM EFFECTIVENESS

None of the Alternatives considered pose any substantive incremental increased risks to the community, the workers or the environment in the short-term during implementation.

Alternative G4, In Situ Chemical Oxidation, has some inherent incremental risks due to the need to handle and inject chemicals into the subsurface. Potential exposure risks are limited and would be further mitigated through proper handling of the chemicals and monitoring during injection.

Alternative G5, Ex Situ Carbon Adsorption, has some inherent incremental risks due to the need to transfer impacted groundwater to a treatment system. Potential exposure risks are limited and would be further mitigated through proper design of the treatment system.

7.4 LONG-TERM EFFECTIVENESS AND PERMANENCE

Alternatives G1 does not provide a permanent remedy or actively reduce long-term risks. Institutional Controls provided in Alternatives G2 will be effective in mitigating specific long-term exposure risks, provided they are enforced. Failure to enforce Institutional Controls may impact the long-term effectiveness and permanence of any Alternative that is chosen. Long-term groundwater monitoring included in Alternatives G2 will evaluate the effectiveness of natural attenuation mechanisms at the Site, if implemented with no other action, or will serve to monitor the long-term effectiveness of any other remedy selected for implementation.

Alternatives G3, G4, and G5 provide the greatest level of permanence and long-term effectiveness through the permanent reduction in contaminant mass in groundwater. Alternative G4 may reduce the overall time to complete the remediation compared to alternatives G3 and G5, but will still require long-term monitoring.

7.5 <u>REDUCTION OF TOXICITY, MOBILITY, OR VOLUME</u>

Alternatives G1 and G2 will not reduce the toxicity, mobility, or volume of impacted groundwater other than what will reduce will be reduced by natural attenuation and degradation processes.

Alternatives G3, G4, and G5 will both reduce contaminant volumes and toxicity. Alternative G3 will reduce the toxicity, mobility, or volume of impacted groundwater by natural attenuation and degradation processes. Alternative G4, In Situ Chemical Oxidation will treat contaminants in groundwater through chemical degradation. Alternative G5 will treat contaminants in groundwater through physical adsorption.

7.6 **IMPLEMENTABILITY**

All five Alternatives can be readily implemented and are based on demonstrated technologies.

7.7 <u>COST</u>

The estimated present worth costs for the remedial alternatives range from approximately \$175,000 (No Action) to \$3,703,000 (In Situ Chemical Oxidation). Costs are presented in Appendix D. Excluding the No Action Alternative and the Institutional Controls Alternative, the least expensive active groundwater treatment alternative is the Monitored Natural Attenuation Alternative at an estimated present worth cost of \$325,000.

8.0 PREFERRED REMEDIAL ALTERNATIVE

Remedial Alternative G1 was omitted from consideration due to its inability to reduce the toxicity, volume, or mobility of Site contaminants.

Remedial Alternatives G2 - Institutional Controls, will be incorporated into the preferred remedy to restrict access to the Site during implementation of remedial action, restrict long-term use of the Site to protect remedial measures and provide long-term inspections and monitoring. Once implemented, the preferred remedy will not rely on access restrictions (fencing) to maintain protection of public health.

Remedial Alternatives G3, G4, and G5 will reduce the contaminant toxicity, mobility, and volume over time, but since the HHRA indicates that OU2 groundwater does not present an additional hazard above background exposure levels and no carcinogens were identified as COPCs, and therefore, a cancer risk was not calculated; the most cost-effective remedial alternative is Alternative G3, Monitored Natural Attenuation.

A detailed description of the elements of the preferred remedial alternative follows. Estimated costs for the preferred remedy are summarized in Table 8.1.

8.1 <u>SITE MONITORING</u>

The Site monitoring program will include routine groundwater monitoring to assess the overall effectiveness of the remedy. A remedial contingency plan would be developed and implemented if concentrations of ethyl ether are above the risk criteria.

Routine monitoring will consist of annual sampling of select monitoring wells for a period of at least 6 years. It is anticipated that the monitoring well network and analyte list will be compressed after 6 years based on the annual sampling results. After 6 years the monitoring frequency may be reduced.

Samples collected for annual monitoring in years 1 through 6 will be analyzed for:

- ethyl ether and benzene;
- alkalinity; and
- field parameters (ORP, pH, DO, conductivity, and turbidity.

Samples collected for biennial monitoring in years 2 through 6 will be analyzed for:

• nitrate, manganese, iron (dissolved), sulfate, methane.

The analyte list for the subsequent events will be developed based on the results of the first 6 years of the annual monitoring program and biennial events performed to support the monitored natural attenuation program.

8.2 INSTITUTIONAL CONTROLS

Institutional Controls proposed and currently in place at the Site include:

- 1) Site fencing to restrict access during implementation of remedial measures; and
- 2) deed restrictions to preclude residential development and the use of groundwater as a potable water source at the Site.

8.3 MONITORED NATURAL ATTENUATION

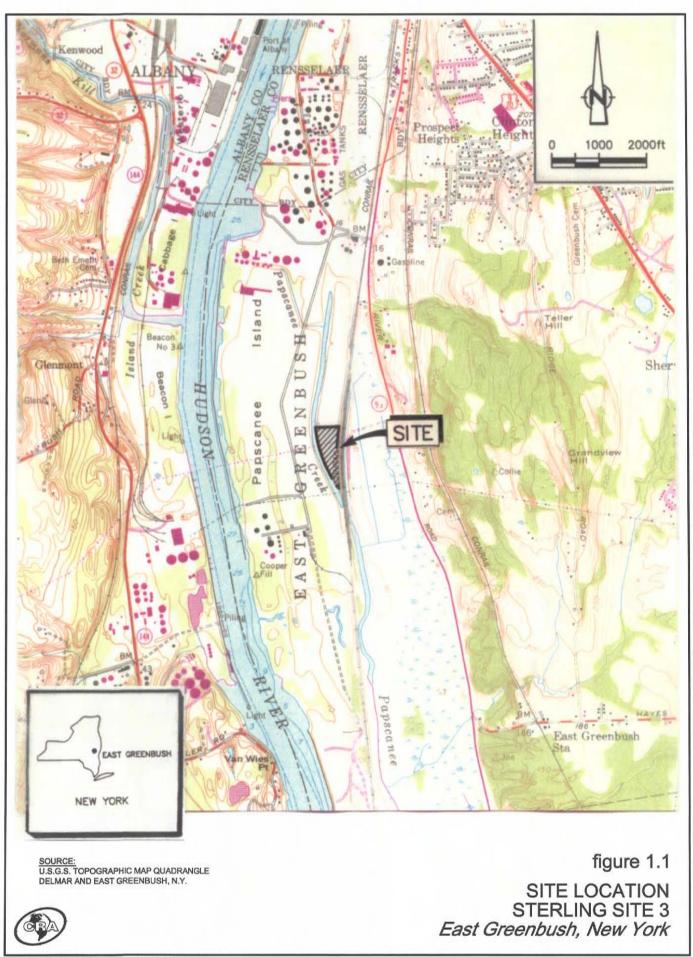
Since the HHRA indicates that OU2 groundwater does not present an additional hazard above background exposure levels, the most cost-effective remedial alternative is Alternative G3, Monitored Natural Attenuation. The non-carcinogenic hazard level associated with the OU2 groundwater is similar to background, based upon the reported groundwater concentrations used in the HHRA presented in Section 4.0. No carcinogens were identified as COPCs, therefore, a cancer risk was not calculated in the HHRA. The groundwater would be monitored on a biennial basis for Site-specific parameters and natural attenuation parameters to ensure that the Site conditions are conducive for natural attenuation and that there is no direct human exposure to ethyl ether above 1,200 ppb within OU2.

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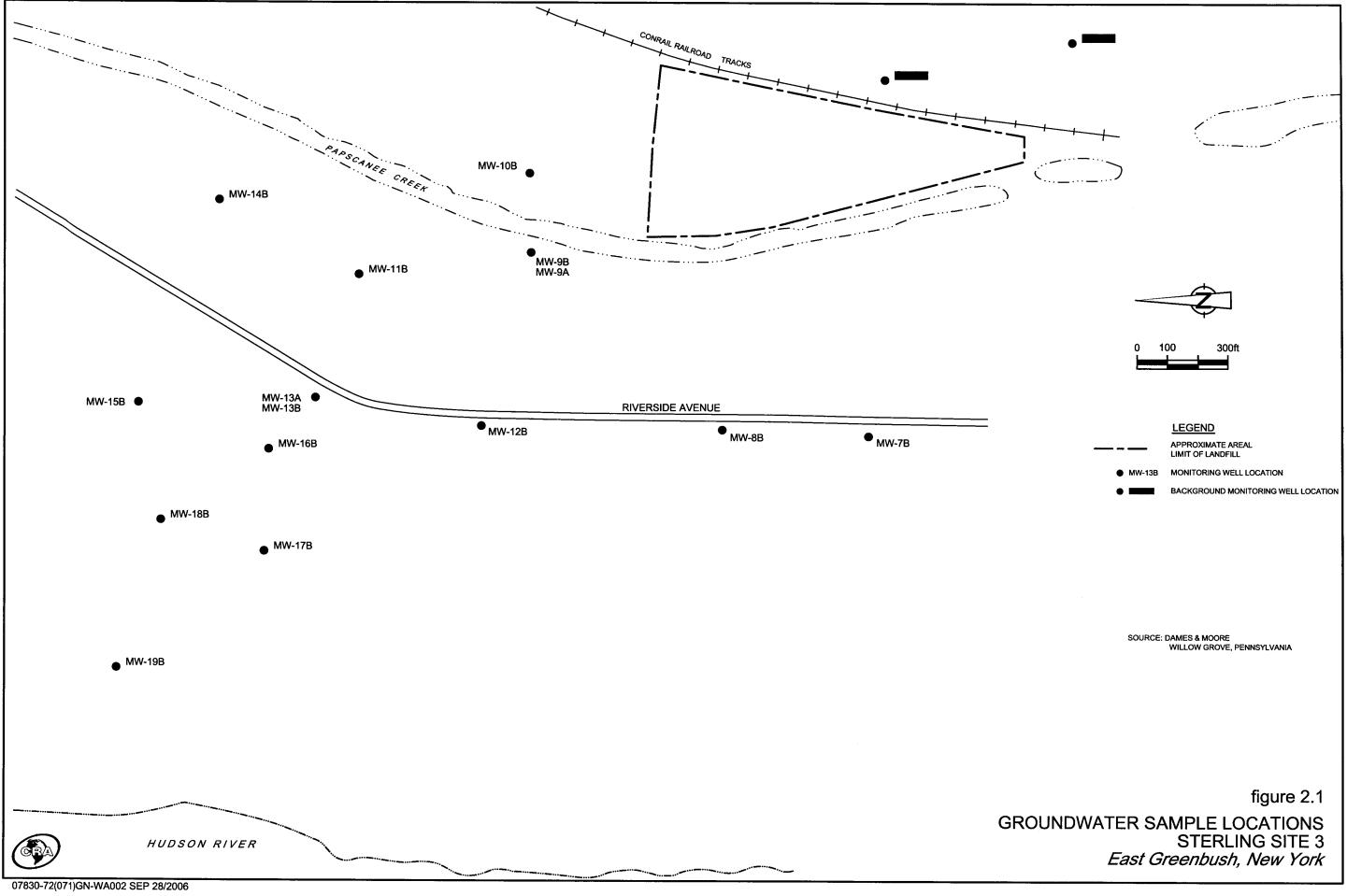
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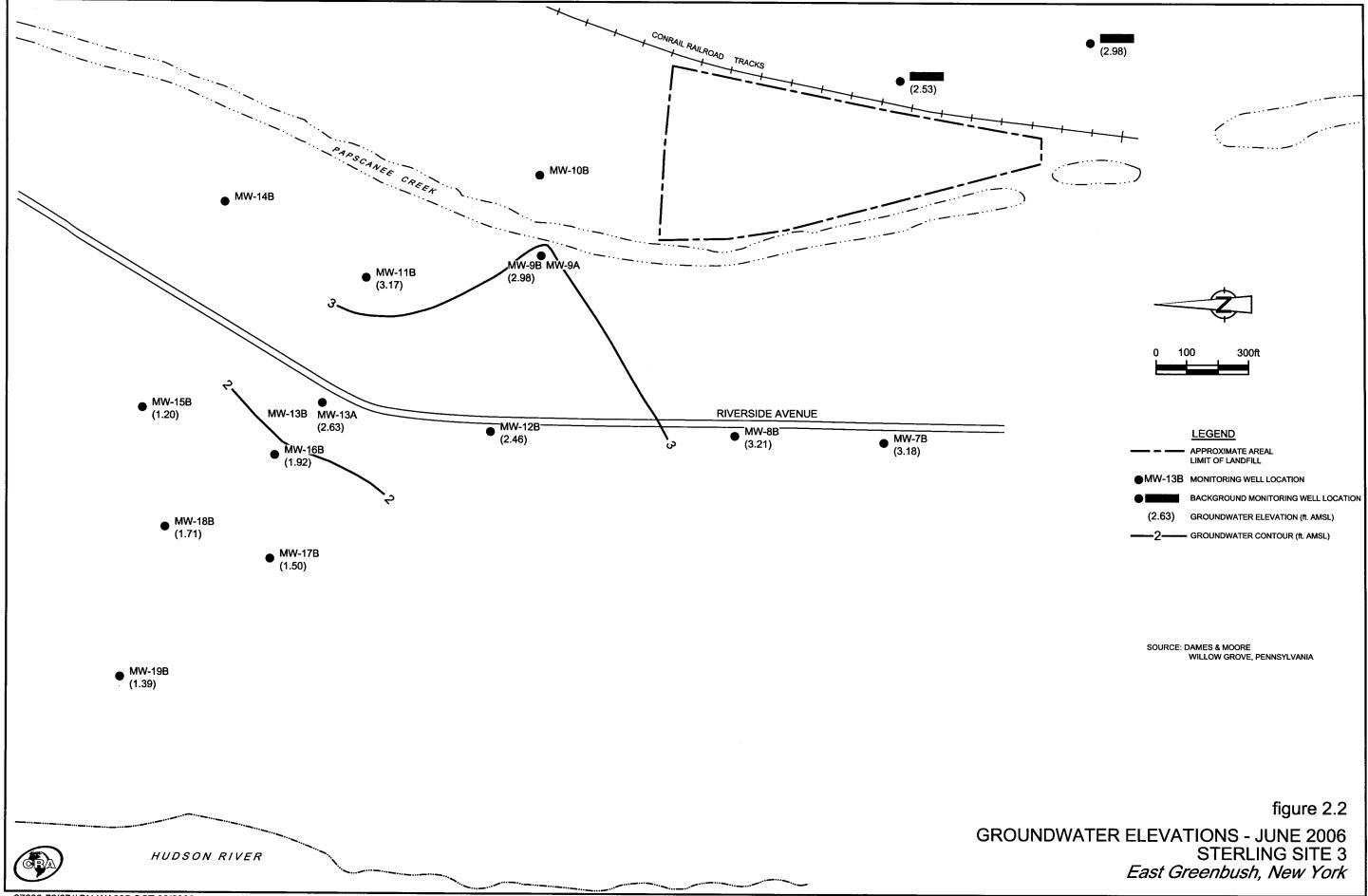
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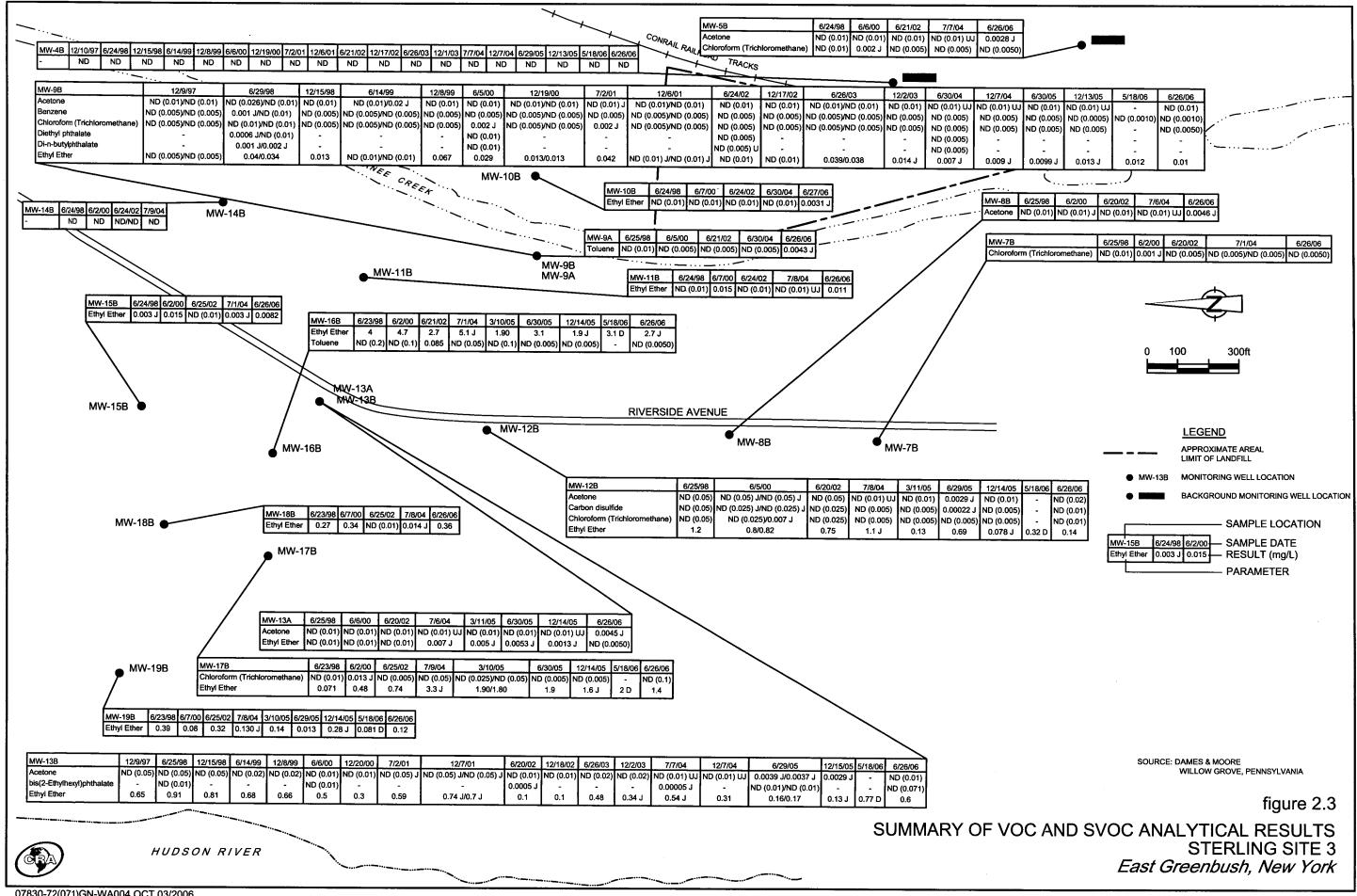


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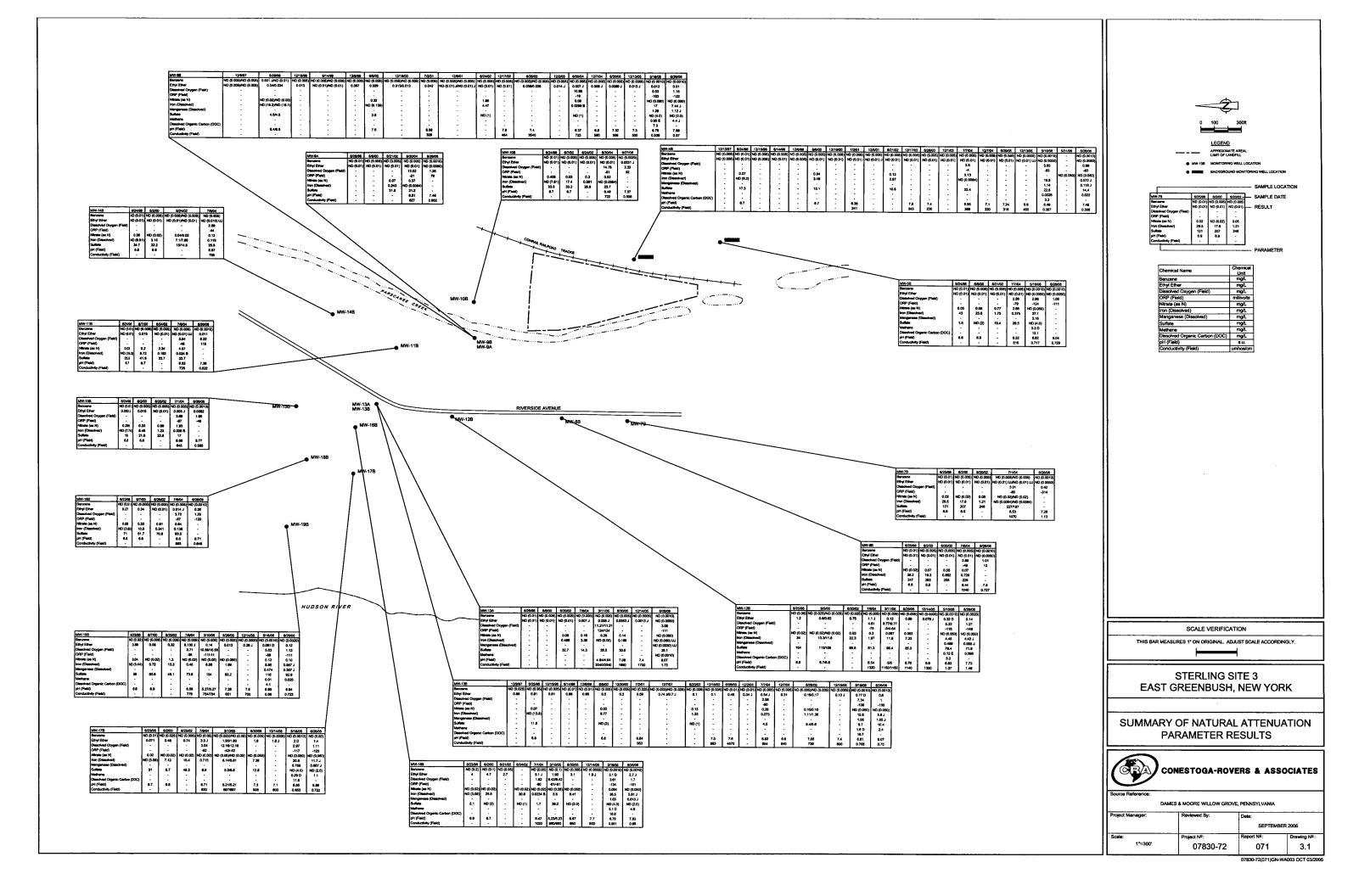




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	MW-35R MM OUI - D/G Upgr 6/27/2006 5/18/	ND (0.0050) ND (0.001) ND (0.001) ND (0.001) ND (0.0010) ND (0.0050) ND (0.005	ND (0.073) (0.073) ND (0.073) ND
	MW-4B MW-4B Upgradient Upgradient 5/18/2006 5/31/2006		
	MTW-4B Upgradient 6/26/2006	ND (0.0000) ND (0.	
	MW-5B Upgradient 5/18/2006		
	MW-5B Upgradient 6/26/2006	ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.0020) ND (0.0020) ND (0.0020) ND (0.0050) ND (0.0050	
	MW-6A OU1 - D/G 6/26/2006	ND (0,000) (0,	

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TABLE 3.1 GROUNDWATER MONITORING DATA - 2006 STERLING SITE 3 EAST GREENBUSH, NEW YORK

mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Sample Location: Location: Sample Date: Parameter 3-Nicroaniline	Units mg/L	MW-1S OU1 - D/G 6/26/2006	MW-25 OU1 - D/G 5/18/2006	MW-2S OUI - D/G 6/27/2006	MW-3SR OU1 - D/G 5/18/2006	MW-35R OUT - D/G 5/31/2006	MTV-35R OU1 - D/G 6/27/2006	MW-4B Upgradient 5/18/2006	MW-4B Upgradient 5/31/2006	MW-4B Upgradient 6/26/2006	MW-5B Upgratient 5/18/2006	MW-5B Upgradient 6/26/2006	MW-6A OUI - D/G 6/26/2006
Markin Markin	4.0-Duntro-2-methylphenol 4-Bromophenyl phenyl ether 4-Chloro-3-methylphenol	mg/L mg/L		1 1				ND (0.36) ND (0.36) ND (0.073)	, , ,			* 1 1		1 1
Marki M	4-Chloroaniline	mg/L		1 1	• •			ND (0.073)	·		ı			
Month Month Month Month Month Month	4-Methylphenol	mg/L mg/I		ı	ł	ı		ND (0.073)	• •			1.1	1 1	
MMA MMA MMA MMA MMA MMA MMA MM	4-Nitroaniline	mg/L				. ,	• •	ND (0.073) ND /0.26)	,		ı	,	ı	ı
market market	A-14110pretroi Acenaphthene	mg/L	ı	•	ļ	Ţ		ND (0.36)				1.1		
Media Tending Tending <thtending< th=""> <thtending< th=""> <thten< td=""><th>Acenaphthylene</th><td>mg/L mg/L</td><td></td><td></td><td></td><td></td><td></td><td>ND (0.073) ND (0.073)</td><td>,</td><td></td><td>,</td><td>Ţ</td><td></td><td></td></thten<></thtending<></thtending<>	Acenaphthylene	mg/L mg/L						ND (0.073) ND (0.073)	,		,	Ţ		
Marti Total Total <th< td=""><th>Auturaceme Benzo(a)anthracene</th><td>mg/L</td><td>ı</td><td></td><td>ı</td><td></td><td>•</td><td>ND (0.073)</td><td></td><td>• •</td><td></td><td></td><td></td><td>, ,</td></th<>	Auturaceme Benzo(a)anthracene	mg/L	ı		ı		•	ND (0.073)		• •				, ,
mmth mmth mmth mmth mmth mmth mmth mm	Benzo(a)pyrene	<i>6</i> /L			. ,		, ,	ND (0.073) ND (0.073)	•		,	ı	ı	
Marti No No No Marti No No No No No No Marti No No No No No No No Marti No No No No No No No Marti No	benzo(b)liuoranthene Benzo(g.h.i)nervlene	mg/L		,			1	(C/070) ON ND (0.073)		1 1				ı
media media media media media media media media media media media media media media media media media media media media media media media media media media media media media media m	Benzo(k)fluoranthene	mg/L mg/L				ı	١	ND (0.073)	ı	ı	Ţ	•	ı	
	Benzoic acid Benzvi Alcohol	mg/L	ı					(5/0.0) UN	1.1			1	ı	
	bis(2-Chloroethoxy)methane	mg/L		١		i	,			,			, ,	• •
	bis(2-Chloroethyl)ether	mg/L		1 1		ı	r	ND (0.073)	•	·	I	ı		ı
	bis(2-Ethylhexyl)phthalate	mg/L	•	ı				ND (0.073) ND (0.073)		1	,	ı	ı	•
	oury neuroprunatate Carbazole	mg/L	•	ı	ı	,		ND (0.073)	ı					1 1
	Chrysene	mg/L me/L		, ,		·	ı	ND (0.073)		I	ı			,
	Dibenz(a,h)anthracene	mg/L	ı		• •			ND (0.073) ND (0.073)	•	ı	ı	Ţ	,	•
	Diethyl phthalate	mg/L	ı	·	ı	ı	·	ND (0.073)						• •
	Dimethyl phthalate	mg/L mg/L					ı	ND (0.073)		ı	ı	ı	ı	
	Di-n-octvl nhthalate Di-n-octvl nhthalate	mg/L	·	ı	1			ND (0.073)	• •			• •	1 1	
	Fluoranthene	mg/L mg/L	. ,				I	ND (0.073)	ı		ı	ı	ı	
	Fluorene Havachtaraharana	mg/L	ı			F I		ND (0.073) ND (0.073)		ı 1		1 1	ı	ı
	Hexachlorobutadiene	mg/L me/L			I	ı	ı	ND (0.073)	ı	,				
	Hexachlorocyclopentadiene	mg/L	1		• •			ND (0.073) ND (0.33)			ŗ	I		ı
	riexactuoroetnane Indeno(1,2,3-cd)pyrene	mg/L	ı	T		i		ND (0.073)				• •		
	Isophorone	mg/L	1 1					ND (0.073)	ì			ı	,	ı
	Naphthalene Nitrobenzone	mg/L	,	ı	ı		. ,	ND (0.073)	• •					1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	N-Nitrosodi-n-propylamine	mg/L	ı		ı			ND (0.073)	•		,	ı	Ţ	· ı
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	N-Nitrosodiphenylamine	mg/L	ı					ND (0.073) ND (0.073)		1	•	ı	ı	ı
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	renactuoropnenoi Phenanthrene	mg/L	I	ı	·	·	,	ND (0.36)	,	I				
$\label{eq:mg/l} mg/l = 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1$	Phenol	mg/L mg/L			1 1	, ,		ND (0.073) ND (0.073)	ı	,	ı		I	ı
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Lyrene	mg/L	I	,	ı		1	ND (0.073)	. 1	• •				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Metals													
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Iron (Dissolved)	mg/L	ŧ				•	,	ì			ļ	ı	
mg/L - 1 E 6.2 0.0075 - 0.27 0.0028 - 0.022 3.3 D - ctu/ml - - - - 0.2 - 0.022 3.3 D - ctu/ml -	Manganese (Dissolved)	m ₆ / L		3.09	1.88 J	0.0147	, , ,	ND (0.050) UJ 0.125 J	19.9 1.14		0.572 J 0.118 I	37.1 3.16		
mg/L - IE 6.2 0.0075 - 0.27 0.0028 - 0.022 3.3 D cfu/mL - - - - - - - - - - cfu/mL - - - - - - - - - - cfu/mL - - - - - - - - - - cfu/mL - - - - - - - - - -	Gases										(212		1
ctu/mL - <th>Methane</th> <th>mg/L</th> <th>·</th> <th>1 E</th> <th>6.2</th> <th>0.0075</th> <th>ı</th> <th>0.27</th> <th>0.0028</th> <th>ı</th> <th>0.022</th> <th>3.3 D</th> <th>•</th> <th></th>	Methane	mg/L	·	1 E	6.2	0.0075	ı	0.27	0.0028	ı	0.022	3.3 D	•	
ctu/mt	<i>Biological</i> Benzene Specific Microbial Population	مۇد، /mI												
сћи/тр	Total Microbial Population	cfu/mL			• •								1 1	
chu/ml	General Chemistry Aerobic Total Miscobial Donalation													
, ekkukTrWcHaunet37TH		ctu/mL	•	ŀ	ı		ŀ	ı		,		ı	ł	1
													g046AL-XT2-WG-	Historical-37-TH

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Sample Location: Location: Sample Date:		MW-1S OUT - D/G 6/26/2006	MW-2S OU1 - D/G 5/18/2006	MW-25 0U1 - D/G 6(27/2006	MW-35R OU1 - D/G 5/18/2006	MW-3SR OU1 - D/G 5/31/2006	MW-35R OU1 - D/G 6/27/2006	MW-4B Upgradient 5118/2006	MW-4B Upgradient 51212000	MW-4B Upgradient	MW-5B Upgradient	MW-5B Upgradient	MW-6A 011 - D/G
Parameter	Units							0007/01/0	0007/1000	9007/97/9	5/18/2006	6/26/2006	6/26/2006
Alkalinity, Total (As CaCO3) Benzene Sreerific Microshial Pomulation	mg/L		170	55	84.4	,	127	011		ļ			
Dissolved Organic Carbon (DOC)	ctu/mL mg/L			ı	' c	I	•				258 ,		•
Nitrate (as N) Orthophosinhate	mg/L	·	ND (0.050)	ND (0.050)	.u.	- 0.25	- 02.0	3.2			12.1	,	,
hd	mg/L	·		•		•	.		(nen:n) rtN	ND (0:020)	ND (0:050)	•	
pH (water)	S.U.	•		,	•	•					•	•	ı
Phosphate, Total	5.U.	ı	•		•	•	,	,	,		•	•	
Sulfate	1/8/1 		• :	,	ı			,		•	•	1	•
Sulfide	uig/L		3.3	29.0	5.9	,	2.4	22.6	,	14.4		I	•
Sulfite	ш <u></u> 8/г те/1		,	ı	ı	,	ı		,	1.11	(n:+) (TN)	•	
Total Dissolved Solids (TDS)	mg/L	•	ł		ı		ı					·	•
Total Kjeldahl Nitrogen (TKN)	mg/∟ ₩a/I			1	1	,	,	,	ı		•	1	
Total Microbial Population	ung/r chi/mì	•	ı	I		T		ı		.)		,	,
Total Organic Carbon (TOC)	me/L						ı	ı	ı				
Total Suspended Solids (TSS)	mg/L	•			ı		,	ı		ı	•	ı	
Field Parameters	9			ı	1	ı		ı	,				ı
Conductivity Field	umhos/cm	0.434	0.621	0.653	0.341								
OVA Reading	mg/L	1.02	4.66	0.24	3.89		0.313 8.22	0.397 5 65	1	0.306	0.717	0.729	0.421
Oxidation reduction potential	ppm millivolts	- 9	· 8	' 8	• ¦	ı	-	, ,	. ,		86.7 -	1.06	4.41
pH Field Turkidite.	S.U.	7.18	6.43	-98 7.15	55 6.6		286	-93	I	ĘŞ	-124	111-	- 1 5
	ntu	ę	78	17	< 666	• •	0.09 2	6.49 2999 >	• •	7.49 17	6.62 5.4	8.04 11	8.21 77
												:	1

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TABLE 3.1	GROUNDWATER MONITORING DATA - 2006	STERLING SITE 3	EAST GREENBUSH, NEW YORK
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ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.01) U ND (0.01) ND (0.01) ND (0.01) U (10.0) CN (1000,01) CN (1000, MW-13A 0U2 6/26/2006 ND (0.01) ND (602) ND (602) ND (6020) ND (6020) ND (602) ND (601) N MW-12B OU2 6/26/2006 ND (0.01) ND (0.01) ND (0.02) ND (0.02) (10.0) CIN ND (0.01) ND (0.01) ND (0.01) 10.0) CIN ND (0.02) MW-12B OU2 5/18/2006 ND (0.0010) . 0.32 D ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.01) U ND (0.01) ND (0.0050) ND (0.0050 ND (10.01) UJ ND (0.01) ND (0.0030) ND (0.0050) ND (0. MW-11B OU2 6/26/2006 ND (0.01) ND (6.02) ND (6.02) ND (6.02) ND (6.01) ND (6. MW-10B 0U2 6/27/2006 ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.02) ND (0.02) ND (0.02) ND (0.02) ND (0.0050) ND (0.01) U] ND (0.01) UJ ND (0.010) ND (0.0050) ND (0. MW-9B 0U2 6/26/2006 ND (0.01) MW-9B 0U2 5/18/2006 ND (0.0010) 0.012 ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.01) UJ ND (0.01) UJ MW-9A 0U2 6/26/2006 ND (0.01) U (0.0050) UN ND (0.0050) U (0.0050) UN (0.0050) UN (0.0050) UN (0.0050) UN (0.0050) UN U (0.00) UN U (0.00) UN U (10,0) GN 0,00061 (10,0050) (10,05 MW-8B 0U2 6/26/2006 ND (0.01) ND (0.0050) ND (0.0050) UN (0.0050) UN (0.0050) ND (0.0050) NN (0.0050) NN (0.0050) NN (0.001) UN (10.01) UN U (10.01) UN U (10, 0) UN (0, 00) UN (0, 0) MW-7B 0U2 6/26/2006 ND (0.01) U (1000) UN (02000) UN UI (0.0) UN ND (0.01) UN (0.0010) UN (0.00 MW-6B OU1 - D/G 6/26/2006 ND (0.01) MW-6B OU1 - D/G 5/18/2006 ND (0.0010) 0.0013 J Units Semi-Volatile Organics 1.2.4.Trichlorobentzene 1.3.2.Dichlorobentzene 1.3.Pichlorobentzene 1.4.Dichlorobentzene 2.2.orybist(-Chlorophanol 2.4.5.Trichlorophanol 2.4.5.Trichlorophanol 2.4.1Dinitrophanol 2.Hexanone 2.Methylthiophene 3.Methylthiophene 4.Methyl-2.Pentanone (Methyl Isobutyl Ketone) 1,2-Dichloropropane 2-Butanone (Methyl Ethyl Ketone) Bromomethane (Methyl Bromide) Chloroform (Trichloromethane) Chloromethane (Methyl Chloride) cis-1,2-Dichloroethene 1,1,1-Trichloroethane 1,1,2,2-Tetrachloroethane 1,1,2-Trichloroethane Toluene Tans-1,2-Dichloroethene Trans-1,2-Dichloropene Trichloroethene Vinyl actetate Vinyl choride Xylene (total) cis-1,3-Dichloropropene Dibromochloromethane Ethyl Ether Bromodichloromethane Carbon disulfide Carbon tetrachloride 1,1-Dichloroethene 1,2-Dichloroethane 2-Methylnaphthalene 2-Methylphenol 2-Nitroaniline 2-Nitrophenol 3,3'-Dichlorobenzidine mårp-Xylene Methylene chloride o-Xylene Sample Location: Location: Sample Date: (,1-Dichloroethane **Volatile Organics** Styrene Tetrachloroethene Chlorobenzene Chloroethane Ethylbenzene Bromoform Parameter Benzene Acetone

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Sample Location: Location: Sample Date:		MW-6B OU1 - D/G 5/18/2006	MW-6B OU1 - D/G 6/26/2006	MW-7B OU2 6/26/2006	MW-8B OU2 6/2006	MW-9A 0U2 6/26/2006	MW-9B OU2 5/18/2006	MW-9B OU2 6/26/2006	MW-10B 0U2 6(27/2006	MW-11B OU2 6/26/2006	MW-12B OU2 5(18/2006	MW-12B OU2 6176/1006	MW-13A OU2 GU2GU2GU2
Parameter	Units												0007 007 00
Alkalinity, Total (As CaCO3)	mg/L	121	147				110						
Denzene Specific Microbial Population	cfu/mL	•		•	,	• •	R '	7.50	1 1	•	160	106	1/2
Nitrate (as N)	mg/L me/l	6.8 NID (0 050)		,	•	ı	7.3			• •	5.2		
Orthophosphate	mg/L		(nen:n) (TN)		•	ı	ND (0:050)	ND (0.050)	•	ì	ND (0:050)	ND (0:050)	ND (0.050)
pH A market and a market	5.U.	ı		ı		•		ı	•	ı		ı	,
pH (water)	S.U.	ı	•	,		•	•	ı	•	•			ı
rnosphate, Iotal	mg/L	ı	•	,	,		•	ı		ı	ı		
Surfate	mg/L	19.2	14.9		,				•		۰.		•
Sunae	mg/L		•	,	,			(N.Z.) CINI	ı	,	79.4	71.9	25.1
	mg/L		,	,				•	ı	•	•	,	•
I otal Dissolved Solids (TDS)	mg/L	,	•	,		•				1	ſ		ı
I otal Kjeldahl Nitrogen (TKN)	mg/L			,		•		·	•	ı		•	T
Total Microbial Population	cfu/mL				•	•			ı			,	,
Total Organic Carbon (TOC)	mg/L		,		•	ı	ı	·		•	•		•
Total Suspended Solids (TSS)	mg/L	•	,						•	,	ı	ı	ı
Field Parameters									ı	,	ı	•	
Conductivity Field	umhos/cm	0.391	0.423	113	707.0	0.050	0010			,			
Dissolved Oxygen OVA Reading	mg/L	4.39	1.26	0.42	1.01	1.25	5.03	1.15	0.506	0.522		1.46 1.21	1.73
Oxidation reduction notantial	udd	• {	• :	•	ı	,	,	1		-		171	00.0
pH Field	STIO VILLEN	47 189	-101	-314	12	62	-103	-122	82	115	-116	-148	-111-
Turbidity	ntu	112	17	9 [,] 666	ú 4	7.40	6.79 8	7.58	7.37	7.36	6.83	7.73	8.07
					•	•	5	D	8	4	19.2	7	169

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TABLE 3.1	GKOUNDWATER MONITORING DATA - 2006	STERLING SITE 3	EAST GREENBUSH, NEW YORK
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89 PZ-2A 001 PZ-2A 001 PZ-2A		(10.0) (10.0)	ND (0.009) ND (0.009)
MW-19B OU2 6/26/2006		ND (0.01) ND (0.02) ND (0.	
MW-19B OU2 5/18/2006		(0000) 100000 1000000	
MW-18B 0U2 6/2006		ND (0.0050) ND (0.	
MW-17B 0U2 6/26/2006		ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.2) ND	
MW-17B OU2 5/18/2006		ND (0.0010) 2 D 2 D 2 D 2 D 2 D 2 D 2 D 2 D 2 D 2 D	
MW-16B OU2 6/26/2006		ND (0.0050) ND (0.	
MW-16B 0U2 5/18/2006		ND (0.0010) 31 D 31 D 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	
MW-15B 0U2 6/26/2006		ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.01) ND (0.0050) ND (0.00	
MW-13B OU2 6/26/2006		ND (0.0000) ND (0.	ND (0.071) ND (0.071)
MW-13B 0U2 5/18/2006		O (0 0010) O (277 D CIN	
	Units	1971年1月 1971年1月 1971年1月 1971年1月 1971年1月 1971年1月 1971年1月 1971年1月 1971年1月 1971年1月 1971年1日 1971年11月 1971年111	人名 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Sample Location: Location: Sample Date:	Parameter	Volatife Organiss Volatife Organiss 11,12-Tichloroethane 11,22-Tichloroethane 11,2-Dichloroethane 11-Dichloroethane 11-Dichloroethane 12-Dichloroethane 2-Methyltispiptene 3-Methyltispiptene 3-Methyl2-Pentanone (Methyl Edyyl Ketone) 3-Methyltispiptene 3-Methyl2-Pentanone (Methyl Isobutyl Ketone) 3-Methyl2-Pentanone (Methyl Isobutyl Ketone) 3-Methyl2-Pentanone 3-Methyl2-Pentanone 3-Methyl2-Pentanone 6-Thoroethane 8-Diconoclic (Methyl Bromide) Carbon disulfide Carbon disulfide Chloroethane Chloroethane Chloroethane Chloroethane Ethyl Beter Ethyl Beter Ethyl Beter Ethyl Beter Ethyl Beter Syytene Syytene (total) Systeme (total) Semi-Volatile Organiss Semi-Volatile Organiss	1.2. Distribution denotes a conservation of the conservation of th

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Sample Location: Location: Sample Date:		MW-13B 0U2 5/18/2006	MW-13B OU2 6/2606	MW-15B OU2 6/26/2006	MW-16B 0U2 5/18/2006	MW-16B OU2 6/2006	MW-17B 0U2 5/18/2006	MW-17B OU2 6/26/2006	MW-18B OU2 6/26/2006	MW-19B 0U2 5118/7006	MW-19B 0U2 67547005	PZ-2A OUI
Parameter	Units										00078778	0007 Kg 74
3-Nitroaniline	1/ vut											
4,6-Dinitro-2-methylphenol	1/9m	•	(00.0) UN	,		ı	ſ	,	,	,	,	ND (0.05)
4-Bromophenyl phenyl ether	- 19 m			•	•		,		,		•	ND (0.05)
4-Chloro-3-methylphenol	me/L		(1700) CIN	•	·			'			•	(600.0) CIN
4-Chloroaniline	me/1.	•	(1700) ON		•	•	,			ı		(0000) CIN
4-Chlorophenyl phenyl ether	me/1.	,	ND/07/1	•	•				•	•	,	0.004 J
4-Methylphenol	-0			•		,		,	,			(0000) ON
4-Nitroaniline	me/1.		NID (0:0/1)	·	t		•	,	'	ı		0.005 J
4-Nitrophenol	me/L		ND (0.36)		•	•		ı	,	,	,	ND (0.05)
Acenaphthene	me/L			•	ı	ı			,			ND (0.05)
Acenaphthylene	mg/L	,	ND (0.071)			r	·		,	1	•	(600:0) CIN
Anthracene	mg/L		ND (0.071)				ı		•		ı	(600:0) CIN
Benzo(a)anthracene	mg/L	,	ND (0.071)	ı			ı				1	ND (0.009)
Benzo(a)pyrene	mg/L	,	ND (0.071)	,	1			ı	•	,	ı	ND (0.009)
Benzo(b)fluoranthene	mg/L		ND (0.071)		,			•	ı	,	•	(600:0) CIN
Denzo(g,n,J)perylene	mg/L	Ţ	ND (0.071)			,				ı	,	(60010) CIN
Detizo(K)fiuorantnene Renzaio anid	mg/L		(120.0) CN		,	ı	,	,	1			(600.0) CIN
Benzyl Alcohol	mg/L	ı		·	,	•	,			ı		
bis()_Chloroethow)motheme	mg/L	ı	•		,	,			,	,		L I
bis(2-Chloroethyl)athar	mg/L	•	ND (0.071)		•		,	,				
bis/2-Ethvlhevvl)nhthalate	mg/L	•	ND (0.071)		,	,		,			ı	1 200 0
Butvi benzvinhthalate	mg/L	•	ND (0.071)			ı	,		ı	,		(0000) CIN
Carbazole	mg/L	•	(1200) ON	•		·	,			ı	,	ND (0.009)
Chrysene	mg/L	,	(L/0.0) CIV	ı				t	,	,		ND (0.009)
Dibenz(a,h)anthracene	mg/ r		(1/070) CIN	1	•	ſ	ı	,	,	t	ı	ND (0.009)
Dibenzofuran	me/L		(1200) CIN			,			ı	ı		ND (0.009)
Diethy! phthalate	mg/L	ı	ND (0.071)					• •	1	ı		(6000) CIN
Dimethyl phthalate	mg/L		ND (0.071)		ı		ı	,				(600.0) CIN
Denerousyptimatate Di-n-octivi nhthalate	mg/L	,	ND (0.071)	•	ı				,	ı		(0000) CIN
Fluoranthene	mg/L	ı	(120:0) CIN	•	ı	•		•		ı		(0000) CIN
Fluorene	me/L		ND (0.71)	• •		t	ı			•	,	(6000) ON
Hexachlorobenzene	mg/L	ı	ND (0.071)									(600.0) CIN
Hexachlorobutadiene	mg/L	,	ND (0.071)	,		ı						(600.0) UNI (00000) UNI
riexacrulorocyclopentadiene Havachlamathana	mg/L	,	ND (0.32)	•	,	ı			•	,	,	ND (0.04)
Indeno(1.2.3-cd) byrene	mg/L	,	(120.0) CIN		•					ŀ		ND (0.009)
Isophorone	mg/L mg/l		(1/0.0) (ND (0.071)	ı				ı	ī			(600:0) QN
Naphthalene	me/L		(1200) ON		•	•		ı				(600:0) CIN
Nitrobenzene	mg/L		ND (0.071)	•			, ,					(600.0) UN
N-Nitrosodi-n-propylamine	mg/L	,	ND (0.071)		ı	,	•					(2007.0) CIVI
IN-INITOSOGIPTIERYJAMINE Pentachloronhenol	ng/L	ı	ND (0.071)	•	,	ı	,			1	,	(0000) CIN
Phenanthrene	mg/L	•	ND (0.36)				Ņ	•	,	•	•	ND (0.05)
Phenol	mg/ r		(1/0/0)/UN	ı	1	,		•		ı	,	(6000) CIN
Pyrene	mg/L	ļ	ND (0.071)					• •		1 1	• •	(6000) CIN
Metals												
Iron	me/L	ı	,									t
Iron (Dissolved)	mg/L	15.8	5.6 J	ı	36.5	5.81]	20.8	11.71		- 8.95	- 0.957 I	0.25
Manganese (Dissolved)	mg/L	1.06	1.05 J	•	1.03	0.813 J	0.759	0.687 J	ı	0.474	0.387]	
Gases												
Methane	mg/L	1.6 D	2.4	ı	5.1 D	4.9	0.29 D	1.1	ı	0.01	0.025	
Biological												
Benzene Specific Microbial Population Total Microbial Population	cfu/mL cfu/mL						1	,	ı	ı	ı	ı
5								ı		ı		1
General Chemistry Aerobic Total Microbial Population	cfu/mL	ı	ı			·				ı	,	36000

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$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Sample Location: Location: Sample Date:		MW-13B OU2 5/18/2006	MW-13B OU2 6/26/2006	MW-15B 0U2 6/26/2006	MW-16B OU2 5/18/2006	MW-16B 0U2 6/26/2006	MW-17B 0U2 5/18/2006	MW-17B 0U2 6/26/2006	MW-18B OU2 6/2006	MW-19B 0U2 5/18/2006	MW-19B 0U2 6/26/2006	PZ-2A OU1 AIG7006
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Parameter	Units											00071012
(iii: Microbial Population and Carbon (DCC) $(i)_{rol}^{(1)}$ ZA 179 Z 276 273 192 190 164 192 and Carbon (DCC) mg/L 167 276 273 192 190 164 192 and Carbon (DCC) mg/L 167 276 273 192 100 113 212 101 113 212 101 1012 1	, Total (As CaCO3)												
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ecific Microbial Population	mg/L	724	179	,	276	273	192	191		124		-
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Dreanic Carbon (DOC)	cru/mL	•	•	,	ı	,				ŧ,	761	202
the marked marked marked by ND (0.05) ND (0.0		mg/L	16.7	,	,	16.8		11.0	•	1		•	20000
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		mg/L	ND (0.050)	ND (0:050)	,	0.064		NID (0.050)			4.1		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	high	mg/L	•		,	-		(nen:n) riki	(09070) AN	•	0.12	0.10	ND (0.050)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		s.u.		,					•				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		6.11			ı	•	•		ı	,			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Total		•	•					,			•	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		mg/L	•		,	,	,				•	٠	
mg/L </td <th></th> <td>mg/L</td> <td>9.7</td> <td>10.4</td> <td>,</td> <td>ND /0 M</td> <td></td> <td></td> <td></td> <td>•</td> <td>,</td> <td>,</td> <td>4.4</td>		mg/L	9.7	10.4	,	ND /0 M				•	,	,	4.4
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		me/L					(NT) (TN)	ND (4.0)	ND (2.0)		116	92.9	588.7
dSolids (TEs) $m_{g/L}^{(1)}$ \cdot </td <th></th> <td>1/am</td> <td></td> <td></td> <td></td> <td>•</td> <td>•</td> <td>•</td> <td>•</td> <td></td> <td></td> <td></td> <td>-</td>		1/am				•	•	•	•				-
Nitrogen (TKi) $\begin{array}{cccccccccccccccccccccccccccccccccccc$	ved Solids (TDS)	- 1/9m	•		ł	•	•	,		,	,	ı	•
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	hl Nitroen (TKN)			,			,	,	•			•	• }
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		mg/L	•	ı	•	,						1	1410
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		cfu/mL	,				I	•	,		•	ì	58.5
ad Solids (TSS) $m_{\tilde{g}}/L$	IC Carbon (IOC)	mg/L				•				•	•		,
The field multiple of	ided Solids (TSS)	me/l.	,		•	•	,	•		,	•		103
The set of		i D		•	•	•		•		,			
ield umhos/cm 0.708 0.75 0.565 0.951 0.96 0.653 0.722 0.848 0.68 0.723 8 0.72 0.848 0.68 0.723 8 0.72 0.72 0.72 0.72 0.72 0.72 0.72 0.72	leters												(ALL) CALL
Ben mmonth 0.70 0.355 0.951 0.96 0.633 0.722 0.846 0.66 0.73 with observation mg/L 7.34 1 1.95 3.61 1.7 2.97 1.11 1.29 5.53 1.13 with observation mg/L - - - 1 1.95 3.61 1.7 2.97 1.11 1.29 5.53 1.13 with observation - 1 </td <th>y Field</th> <td>umhae /am</td> <td>0 700</td> <td>10.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	y Field	umhae /am	0 700	10.0									
mg/L 7.34 1 1.95 3.61 1.7 2.97 1.11 1.29 0.02 0.02 trition potential millivolis -10 -130 -15 -1 -2 5.53 113 action potential millivolis -10 -130 -4 -1 -1 -29 5.53 113 action potential millivolis -109 -130 -46 -134 -151 -117 -123 -120 -68 -611 nu 41.2 14 8.77 6.79 783 6.85 9.98 8.71 6.95 9.94 nu 41.2 14 8 28 14 15 44 7 8.71	tyten		0./10	c/:n	0.585	0.951	0.96	0.653	0 722	0.848	070		
tction potential millivolis 109 1.13 <th1.14< th=""> 1.13 1.14</th1.14<>		mg/L	7.34	-1	1.95	3.61	17	707	11	001	0.0	67/D	
millivolts -109 -130 -46 -134 -151 -117 -123 -120 -68 -111 s.u. 6.81 8.07 8.77 6.79 7.83 6.85 9.98 8.71 6.95 9.94 ntu 41.2 14 8 28 14 15 44 7 8.95 9.94		mdd				•			1.11	67-1	5.53	1.13	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	auction potential	millivolts	-109	051-	46	Ş		1		•	'	1	,
412 14 8 28 14 15 44 7 86 57 594		6.11	6.81	201		51	151-	-117	-123	-120	%	-111	
*1.2 14 8 28 14 15 44 7 7 77 77			10.01	0.0/	8.77	6.79	7.83	6.85	96.6	8.71	6.95	0 04	
			7172	14	×	87	14	15	44	7	8K	5	ı

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TABLE 3.1 GROUNDWATER MONITORING DATA - 2006	STERLING SITE 3	EAST GREENBUSH, NEW YORK
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PZ-16 0U1 6/27/2006	ND (0.025) ND (0.025) ND (0.025) ND (0.025) ND (0.025) ND (0.025) ND (0.025) ND (0.025) ND (0.05) ND (0.025) ND (0.025)	ND (0.073) ND (0.073)
PZ-16 OU1 4/7/2006	ND (0.0050) ND (0.	ND (0.009) ND (0.009)
PZ-15 0UT 6(27/2006	ND (000) (10	ALD (0.076) (210)
PZ-15 OUI 41712006	ND (0.0050) ND (0.	UN (2000) UN (20
PZ-14 OU1 6/27/2006	ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.2) ND (0.1) ND	N N N N N N N N N N N N N N N N N N N
PZ-14 0U1 5/18/2006		
PZ-14 PZ-14 011 41712006	ND (0.023) ND (0.039) ND (0.039) ND (0.023) ND (0.025) ND (0.025)	(200) (20) (2
PZ-2A OU1 6/27/2006	ND (0.12) ND (0.12) ND (0.12) ND (0.12) ND (0.12) ND (0.12) ND (0.12) ND (0.25) ND (0.25) ND (0.25) ND (0.25) ND (0.25) ND (0.25) ND (0.25) ND (0.25) ND (0.12) ND (0.	ND (0.074) ND (0.074)
Units	イン2011年1月11日11日11日11日11日11日11日11日11日11日11日11日11	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2
Sample Location: Location: Sample Date: Parameter	Volatife Organics 1.1.1. Trichloroethane 1.1.2. Trichloroethane 1.1.2. Choloroethane 1.1.2. Choloroethane 1.1.2. Choloroethane 1.1.2. Choloroethane 1.2. Dichloroethane 1.2. Dichloroethane 1.2. Dichloroethane 2. Hexanone 2. Hexanone 2. Hexanone 3. Methylthiophene 3. Methylthiophene 4. Methyl-2. Pertanone (Methyl Isoonide) Carbon disulfde Carbon of isulfde Carbon disulfde Choroethane Choroethane Choroethane Choroethane Choroethane Choroethane Choroethane Choroethane Choroethane Bityl Bherzene Methylene choride 3. Yilene Syrene Trichloroethene Trichloroethene Trichloroethene Trichloroethene Villyl actate Villyl actate Villyl actate Villyl actate Villyl actate	Semi-Volatife Organics 1.2.4.Trichloroberzene 1.3.Dichloroberzene 1.3.Dichloroberzene 1.4.Dichloroberzene 1.4.Dichloroberzene 2.4.Dichlorophenol 2.4.F.Trichlorophenol 2.4.Dinterophenol 2.1000phenol 2.Nitrophenol 2.Nitrophenol 2.Nitrophenol

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TABLE 3.1	STERLING SITE 3
GROUNDWATER MONITORING DATA - 2006	EAST GREENBUSH, NEW YORK

PZ-16 PZ-16 OUL 0U1 4772006 6277206	ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.073) ND (0.009) ND (0.009) ND (0.009) ND (0.009) ND (0.073) ND (ND (1009) ND (10	7 1.23J 6.23J	
PZ-15 P. 011 0 6/27/2006 4/7				ND (0.076) ND (0.076)	- 546 J 100 5.46 J 10 6.17 J	22000
PZ-15 OUT 41712006	(200) ND (0.05) ND (0.05) ND (0.009) ND (0.009) ND (0.009) ND (0.000) ND (0.000)	(2010) CIN (2010) CIN	(600) (00) (00) (00) (00) (00) (00) (00) (ND (0000) (000) (0000)	118 0.17 -	13000
PZ-14 0U1 6/27/2006	ND (0.54) ND (0.54) ND (0.11) ND (0.11) 0.015 J ND (0.11) ND (0.11)	(111) (11) (111) (UL (11) (11) (11) (11) (11) (11) (11) (11)	ND (11) ND (011) ND (01) ND (01) ND (011) ND (011) ND (011) ND (011) ND (011) ND (01	2.28] 3.88] 2.9	
PZ-14 OU1 5/18/2006					- 67.8 4.36 2.6 D	
PZ-14 OU1 4/7/2006	ND (0.05) ND (0.05) ND (0.09) ND (0.009) ND (0.009) ND (0.009) ND (0.009) ND (0.009)	(500) GN (500) GN (500) GN (5000) GN	(0000) 1000 1000 1000 1000 1000 1000 100	ND (0.009) ND (0.009)	664 7.5 -	1100
PZ-2A 0U1 6(27/2006	ND (0.37) ND (0.37) ND (0.37) ND (0.074) 0.014 J ND (0.074) ND (0.074) ND (0.074)	ND (0.37) ND (0.37) ND (0.074) ND (0.074) ND (0.074) ND (0.074) ND (0.074) ND (0.074) ND (0.074)	ND (0.074) ND (0.074) ND (0.074) ND (0.074) ND (0.074) ND (0.074) ND (0.074) ND (0.074) ND (0.074)	ND (0.074) ND (0.074)	- 10.3 J 0.84 J 15	
Units	1/8 1/8 1/8 1/8 1/8 1/8 1/8 1/8 1/8 1/8	1.73m 1.73m 1.73m 1.73m 1.73m 1.73m 1.73m 1.73m 1.73m 1.73m 1.73m 1.73m 1.73m 1.73m 1.73m	1/80 1/80 1/80 1/80 1/80 1/80 1/80	1.1.2mm 1.1.	mg/L mg/L	cfu/mL cfu/mL cfu/mL
	3-Nitroaniline 4-6-Dittro-2-methylphenol 4-Chloro-3-methylphenol 4-Chlorophenyl phenol 4-Chlorophenyl phenyl ether 4-Methylphenol 1-Nitroaniline		bosis/2-Chloroethory)methane bis/2-Chloroethy)lether bis/2-Ethylhevyl)phthalate Butyl benzylphthalate Chrysene Dibenz(a,h)anthracene Dibenzooturan	Dimethyl phthalate Di-n-csyl phthalate Di-n-csyl phthalate Fluorantheme Haxachlorobenzene Haxachlorobutadiene Haxachlorobutadiene Haxachlorobutadiene Haxachlorobutadiene Kerachlorobutadiene Naphthalene Naphthalene Naphthalene Naphthalene Naphthalene Nattrobenzene Pentachlorophenol Phenauthrene Phenauthrene Phenauthrene Metals		Biological Benzene Specific Microbial Population Total Microbial Population General Chemistry Aerobic Total Microbial Population

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PZ-16 0U1 612712006	323 323 10 (0.050) 10 (0.050) 10 (0.050) 10 (0.050) 10 (0.050) 11 (0.050) 11 (0.050) 11 (0.050) 11 (0.050) 11 (0.050) 11 (0.050) 12	
27-16 2001 1002	279 4100 - 100 - 435 435 435 435 435 213 213 213 219 219	
PZ-15 OU1 6(27/2006	218 -	
PZ-15 0UT 417/2006	242 13000 13000 13000 17,6 17,6 227 2,6 2,0 2,0 2,0 2,0 11200 11200	
PZ-14 011 6(27/2006	284 284 	
PZ-14 0U1 5/18/2006	55.6 	
PZ-14 DU1 4/7/2006	188 5800 800 11.8 11.8 11.8 11.8 11.8 11.8 11	
PZ-2A OU1 6(27/2006	6200 -	
Units	mg,/L mg,/L mg,/L mg,/L mg,/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg	
Sample Location: Location: Sample Date: Parameter	Alkalinity, Total (As CaCO3) Berrame Specific Microbial Population Dissolved Organic Carbon (DOC) Orthophosphate pH PH (water) Phosphate, Total Sulfiate Sulfide Sulfide Total Dissolved Solids (TDS) Total Suspended Solids (TDS) Total Suspended Solids (TSS) Total Suspended Solids (TSS) Total Suspended Solids (TSS) Total Suspended Solids (TSS) Teld Parameters Conductivity Field Dissolved Oxygen Oxygen Ov A Reading Oxidation reduction potential PH Field Turbidity	

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TABLE 3.1 GROUNDWATER MONITORING DATA - 2006 STERLING SITE 3 EAST GREENBUSH, NEW YORK

ND (0.8) 5.1 5.1 ND (0.8) UJ 5.1 ND (0.4) UJ 0.18 U 0.18 U 0.18 U 0.18 U 0.19 U 0.10 PZ-20 OU1 6/27/2006 ND (0.4) ND (0.4) ND (0.4) ND (0.4) ND (0.4) ND (0.4) ND (0.3) ND (0.3) -ND (0.074) ND (0.074) PZ-20 OU1 5/18/2006 -0.12 DJ 0.7 D ND (0.013) ND (0.024) ND (0.024) ND (0.012) ND (0.012) ND (0.012) ND (0.012) ND (0.012) ND (0.013) ND (0.013) ND (0.014) ND (0.014) ND (0.016) ND (0.009) PZ-20 OU1 4/6/2006 ND (0.012) ND (0.04) ND (0.04) 1.5 1.5 ND (0.02) ND (0.02) ND (0.02) ND (0.02) ND (0.02) ND (0.02) ND (0.03) ND (0.02) N PZ-18 OU1 6/27/2006 ND (0.02) ND (0.02) ND (0.02) 0.0054 J ND (0.02) ND (0.02) ND (0.04) ND (0.04) ND (0.074) ND (0.077) -ND (0.04) -ND (0.0050) ND (0.0050) 0.0039 ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.012) ND (0.012) ND (0.012) ND (0.012) ND (0.012) ND (0.012) ND (0.0050) ND (0 PZ-18 OU1 4/6/2006 ND (0.09) (0.00) (0.0) (0.00) ND (0.01) ND (0.0050) 0.018 0.018 0.018 0.018 ND (0.0050) ND (0. ND (0.050) ND (0.0050) ND (0.01) ND (0.01) PZ-17 OU1 6/27/2006 ND (0.01) ND (0.074) ND (0.0050) ND (0. PZ-17 OU1 47/2006 ND (0.009) -10.0) CIN -Linits Semi-Volatile Organics 1.2.4-Trichlorobenzene 1.2-Dichlorobenzene 1.3-Dichlorobenzene 1.4-Dichlorobenzene 2.2-oxybiel (Chloropopane) (bis(2.chloroisopropyl) ether) 2.4.5-Trichlorophenol 2.4.5-Trichlorophenol 2.4-Dimethyphenol 2.4-Dimethyphenol 2.4-Dimethyphenol 2-Hexanone 2-Methylthiophene 3-Methylthiophene 4-Methyl-2-Pentanone (Methyl Isobutyl Ketone) Acetone Bromomethane (Methyl Bromide) Carbon disulfide Carbon tetrachloride Chlorobenzene 1,2-Dichloropropane 2-Butanone (Methyl Ethyl Ketone) Chloroethane Chloroform (Trichloromethane) Chloromethane (Methyl Chloride) cis-1,2-Dichloroethene trans-1,2-Dichloroethene trans-1,3-Dichloropropene Trichloroethene Vinyl acetate Vinyl chloride 1,1,2,2-Tetrachioroethane 1,1,2-Trichloroethane Benzene Bromodichloromethane cis-1,3-Dichloropropene Dibromochloromethane Volatile Organics 1,1,1-Trichloroethane 1,1-Dichloroethane 1,1-Dichloroethene 2,4-Dinitrotoluene 2,6-Dinitrotoluene 2-Chloronaphthalene 2-Chlorophenol 2-Methylnaphthalene 2-Methylphenol 2-Nitroaniline 2-Nitrophenol 3,3'-Dichlorobenzidine Ethylbenzene m&p-Xylene Methylene chloride o-Xylene Styrene Tetrachloroethene Toluene Sample Location: Location: Sample Date: ,2-Dichloroethane Xylene (total) ^parameter Bromoform Ethyl Ether

GROUNDWATER MONITORING DATA - 2006 EAST GREENBUSH, NEW YORK STERLING SITE 3 **TABLE 3.1**

ND (0.37) ND (0.37) ND (0.74) ND (0.074) ND ND (0.074) PZ-20 OU1 6/27/2006 3.09 J 6.05 J 9.6 PZ-20 OU1 5/18/2006 25 D -53.2 5.61 (2000) CIN (200) CIN (2000) CIN (ND (0.009) 0.002 J 0.003 J 0.003 J 0.003 J ND (0.009) ND (0. PZ-20 OU1 4/6/2006 53.0 10.2 ND (0.37) ND (0.37) ND (0.73) ND (0.074) ND ND (0.074) PZ-18 OU1 6/27/2006 0.482 J 7.08 J 0.45 (20.0) CN (20.0) ND (0.009) 0.01 PZ-18 OU1 4/6/2006 0.02 ND (0.009) 86.2 0.59 ND (0.37) ND (0.37) ND (0.74) ND (0.074) ND ND (0.074) PZ-17 OUT 6/27/2006 -77.7 J 13.6 J 0.013 ND (0.03) (200) ND (0.003) (200) ND (0.0 ND (0.009) PZ-17 OUT 4/7/2006 1.7 1,2% ng/L ng/L Inits cfu/mL cfu/mL cfu/mL mg/L mg/L ng/L Benzene Specific Microbial Population Total Microbial Population General Chemistry Aerobic Total Microbial Population 4.6-Dinitro-2-methylphenol 4.Bromophenyl phenyl ether 4-Chloro-3-methylphenol 4-Chlorophenyl phenyl ether 4-Chlorophenyl phenyl ether bis(2-Chloroethoxy)methane bis(2-Chloroethy)Jether bis(2-Ethylhexy1)phthalate Buty1 benzy1phthalate Carbazole Hexachlorobenzene Hexachlorotyclopentadiene Hexachlorocyclopentadiene Hexachlorocethane Hexachlorocethane Beophorone Sophorone Sophorone Naphthalene Nitrobenzene N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine Pentachlorophenol Phenanthrene Phenol Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Chrysene Dibenz(a,h)anthracene Dibenzofuran Manganese (Dissolved) Acenaphthylene Anthracene Benzo(a)anthracene Dimethyi phthalate Di-n-butylphthalate Di-n-octyl phthalate Fluoranthene Sample Location: Location: Sample Date: Diethyl phthalate 4-Nitroaniline 4-Nitrophenol Acenaphthene Benzyl Alcohol **3-Nitroaniline** Iron (Dissolved) Benzoic acid ²arameter Biological Fluorene Methane Metals Pyrene Gases ron

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1500

20000

<u>8</u>

Sample Location: Location: Sample Date: Parameter	Units	PZ-17 OU1 4/7/2006	PZ-17 OUT 6/27/2006	PZ-18 OU1 4/6/2006	PZ-18 OUT 6(27/2006	PZ-20 OUT 4/6/2006	PZ-20 0U1 5/18/2006	PZ-20 0U1 6/27/2006
Alkalintity, Total (As CaCO3) Benzene Specific Microbial Population Dissolved Organic Carbon (DOC) Nitrate (as N)	mg/L ctu/mL mg/L mg/L me/I	ND (10) 10000 - ND (0.050)	ND (10) - - ND (0.050)	179 14000 - 0.65	346 ND (0.050)	164 0097 	136 - 94.2 NITA 60600	131 - -
pH pH (water) Phosphate, Total Sulfate Sulfate	1/2 8.u. 18/2 18/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2	- - 6.0 1890	 - 2320 -	- - 57.1 1160	,		(UCUUN) LINI 	ND (0.050) - - 1560
Total Dissolved Solids (TDS) Total Kjeldahl Nitrogen (TKV) Total Microbial Population Total Organic Carbon (TOC) Total Suspended Solids (TSS)	ng/L ng/L ng/L ng/n ng/L ng/L	1870 22.9 27.9 620		- 1620 25.7 48.1 883		2240 33.0 88.5		
Field Parameters Conductivity Field Dissolved Oxygen OV A Reading Oxidation reduction potential pH Field Turbidity	umhos/cm mg/L ppm milivolis s.u.		2.47 2.04 17 0	2 2 2 2 2 2 2 2 2 2 2 2 3 2 2 2 2 3 2 3	- 2.05 1.78 - 132 8.02 52	5. 2	- 2.93 4.94 - 1.1 6.69 35	- 2.33 1.45 -102 8.22 14

q046AI-XT2-WG-Historical-37-TH 10/3/2006

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	Units Bag/L Bag/L Bag/L Bag/L Bag/L Bag/L	(05000) (05000) (05000) (05000) (0 (05000) (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0 (0	 5/18/2006 7/25/2006 - ND ().025 - ND ().025 - ND (0.025) - ND (0.025) - ND (0.025)	0111 4662006 MD (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050)	0111 9012005 ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050)	4/10/2006 0017 4/10/2006 ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050)
1,2-Dichloropropane 2-Butanone (Methyl Ethyl Ketone) 2-Butanone (Methyl Ethyl Ketone) 2-Methylthiophene 3-Methylthiophene 4-Methyl-2-Pentanone (Methyl Isobutyl Ketone) 4-Methyl-2-Pentanone (Methyl Isobutyl Ketone) Benzene Benzene Benzene (Methyl Bronnide) Bronnoferm (Authyl Bronnide) Carbon Ainulicia	- 7.28m - 7.28m	ND (0.0050) ND (0.0050) ND (0.0024) ND (0.024) ND (0.023) ND (0.023) ND (0.025) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.001)	 ND (0.025) ND (0.025) ND (0.025) ND (0.05) ND (0.05) ND (0.05) ND (0.025) ND (0.025) ND (0.021) ND (0.051 U	ND (0.0050) ND (0.	ND (0.0059) ND (0.0059) ND (0.0059) ND (0.012) ND (0.012) ND (0.012) ND (0.012) ND (0.012) ND (0.0059) ND (0.0059) ND (0.0059)	ND (0.0050) ND (0.
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ND (0.0005) ND (0.0005) ND (0.0050) ND (0.	 ND (0.025) ND (0.025)	ND (0.0056) ND (0.0055) ND (0.0055)	ND (0.059) ND (0.0059) ND (0.0059) ND (0.0059) ND (0.0059) ND (0.0059) ND (0.0059) 0.0155 ND (0.0059) ND (0.0059) ND (0.0059) ND (0.0059) ND (0.0059) ND (0.0059) ND (0.0059) ND (0.0059)	ND (0.0050) ND (0.0050)
	л/8ш 1/8ш 1/8ш 1/8ш 1/8ш 1/8ш 1/8ш	ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050)	 ND (0.025) ND (0.025) ND (0.025) ND (0.025) ND (0.025) ND (0.05) ND (-0.05)	ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050)	(1000) (1000) (10000) (10000) (10000) (10000) (10000) (10000) (10	(100) AN (1000) AN (10000) AN (10000) AN (10000) AN (10000) AN (10000) AN (10000) AN (10000) AN (10000) AN (10000) AN
Seni-Volatile Organics 1.2-Firchiorobenzene 1.3-Dichlorobenzene 1.3-Dichlorobenzene 1.3-Dichlorobenzene 2.4-Strichlorophenol 2.4-S Trichlorophenol 2.4-Strichlorophenol 2.4-Dinttrophenol 2.4-Di	1/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m	ND (0.000) (000)	 ND (6.01) ND (6.01) ND (6.01) ND (6.01) ND (6.01) ND (6.04) ND (6.04) ND (6.01) ND (6.	ND (1.009) (2000) (200)	ND (0.05)	

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Sample Location: Location: Sample Date:		RW-1 OUI - D/G - Extract. 4/12/2006	RW-1 RW-1 DUI - DIG - ExtractOUI - DIG - Extract. 5/18/2006 7/25/2006	RW-1 DUI - D/G - Extract. 7/25/2006	RW-2 011 4162006	LFW-1 OU1 4/677006	LFW-3 OUT
Parameter	Units						
3-Nitroaniline							
4.6-Dinitro-2-methylphenol	mg/L	ND (0.05)		ND (0.048)	ND (0.05)	ND (0.2)	1
4-Bromophenyl phenyl ether	mg/L mg/l.			ND (0.048)	ND (0.05)	ND (0.2)	•
4-Chloro-3-methylphenol	mg/L	ND (0.009)		ND (0.01)	ND (0.000) ND (0.000)	ND (0.05) ND (0.05)	•
4-Chloroaniine 4-Chloronhanii ahaarii ahaar	mg/L	ND (0.009)		ND (0.01)	ND (0.009)	ND (0.05)	• •
4-Methylohenol	mg/L	(600:0) CIN		ND (0.01)	(6000) CIN	ND (0.05)	ſ
4-Nitroaniline	mg/L	ND (0.05)		(10:0) CIN	ND (0.009)	ND (0.05)	
4-Nitrophenol	mg/L	ND (0.05)		ND (0.048)	ND (0.05)	(0.2) UN (0.2)	
Accomplition	mg/L	(6000) CIN		ND (0.01)	ND (0.009)	ND (0.05)	
Acenaprunylene Anthracene	mg/L	(6000) ON	•	(10.0) CIN	ND (0.009)	ND (0.05)	
Benzo(a)anthracene	mg/L	(600:0) CIN	•	ND (0.01)	ND (0.009)	ND (0.05)	ı
Benzo(a)pyrene	mg/L me/L	ND (0000) ND (0000)		(10.0) CIN	ND (0.009)	ND (0.05)	
Benzo(b)fluoranthene	mg/L	(0000) ON		ND (0.01)	(600'0) (IN	ND (0.05) ND (0.05)	, ,
Benzo(g.h.i)perylene	mg/L	(600:0) CIN	·	ND (0.01)	(6000) CIN	ND (0.05)	• •
Benzo(k)filuoranthene Benzoio acid	mg/L	ND (0.009)	I	ND (0.01)	(6000) CIN	ND (0.05)	
Benzvi Alcohol	mg/L		ı	ı			
bis(2-Chloroethoxy)methane	me/L		ı		-	-	•
bis(2-Chloroethyl)ether	mg/L	(600:0) CIN		(10.0) CN	ND (0:009)	ND (0.05)	
bis(2-Ethylhexyl)phthalate	mg/L	ND (0.009)		ND (0.01)	0.04	ND (0.05)	
Butyl benzylphthalate	mg/L	(6000) (JN		ND (0.01)	(6000) CIN	ND (0.05)	
Carbazole	mg/L	(6000) CIN	,	(1070) CIN	ND (0.009)	ND (0.05)	,
Curysene Dibenz(a.h)anthracene	mg/L	(6000) CIN	,	(10:0) QN	(6000) ON	ND (0.05)	·
Dibenzofuran	mg/L	(600:0) CIN		(10.0) CIN	(60010) CIN	ND (0.05)	•
Diethyl phthalate	mg/L	(0000) ON		ND (0.01)	(2000)) CIN	ND (0.02) ND (0.05)	
Dimethyl phthalate	mg/L	(6000) CIN		(10.0) CIN	ND (0.009)	ND (0.05)	
Di-n-outytphthalate Di-n-octul nhthalate	mg/L	ND (0.009)		ND (0.01)	ND (0.009)	ND (0.05)	•
Fluoranthene	mg/L me/l	(600.0) CIN	•	(10.0) (IN) ND (0.01)	(600:0) CIN	ND (0.05)	•
Fluorene	mg/L	(6000) CIN		ND (0.01)	ND (0.009)	ND (0.05) ND (0.05)	• •
Hexachlorobenzene	T/Bm	(6000) QN	•	ND (0.01)	ND (0.009)	ND (0.05)	
riexachloroputaciene Hexachlorocyclopentadiene	mg/L mg/l	(600:0) CIN		ND (0.01)	ND (0.009)	ND (0.05)	
Hexachloroethane	mg/L	(5000) GN	• •	ND (0.01)	(m) (0) (D) (D) (D) (D) (D) (D) (D) (D) (D) (D	ND (0.05) ND (0.05)	
Indeno(1,2,3-cd)pyrene	mg/L	ND (0.009)	•	ND (0.01)	ND (0.009)	ND (0.05)	
Isophorone Non-htheland	mg/L	ND (0.009)		ND (0.01)	ND (0.009)	ND (0.05)	
Nitrobenzene	mg/L me/L	ND (000)			(600.0) CIN	NID (0.05) NID (0.05)	
N-Nitrosodi-n-propylamine	mg/L	(0000) ON		ND (0.01)	(600.0) CIN	ND (0.05)	1
N-Nitrosodiphenylamine Pentachloronhenol	mg/L	ND (0.009)	ı	(10.0) CIN	ND (0.009)	ND (0.05)	
Phenanthrene	mg/L me/L	ND (0.009)		(10,001) UN	(GU.U) LIN (000 0/ CIN	(0.2) ND (0.2)	
Phenol	mg/L	(600.0) CIN	ı	0.002 J	0.01	ND (0.05)	
ryrene	mg/L	ND (0.009)	•	ND (0.01)	(600.0) CIN	ND (0.05)	
Metals Iron		L					i
Iron (Dissolved)	mg/L me/L	5.82 1 0	- ⁵	- 1181	47.7 0 50	34.6 0.000	121
Manganese (Dissolved)	mg/L	2 ·	2.03	1.8]	 -	-	
Gases							
Methane	mg/L	ı	0.7 E	1.2			ı
Biological Benzene Specific Microbial Population Total Microbial Population	cfu/mL cfu/mL	• •	1 I ,				
Conoral Chomistru							
Aerobic Total Microbial Population	cfu/mL	2400	ı	ı	14000	3200	20000

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TABLE 3.1 GROUNDWATER MONITORING DATA - 2006 STERLING SITE 3 EAST GREENBUSH, NEW YORK

Sample Location: Location: Sample Date:		RW-1 0U1 - D/G - Extract. 4/12/2006	RW-1 JU1 - D/G - Extrac 5/18/2006	RW-1 RW-1 201 - D/G - Extract 5/18/2006 7/25/2006	RW-2 0111 416/2006	LFW-1 0U1 4/6/2006	LFW-3 OU1 ATTOTOR
Farameter	Units						0007/01/7
	1/ om						
ation	cfu/ml.	467 122	I	295	38.3	573	010
Dissorved Organic Carbon (DOC)	mg/L	, 1	- 753		5000	2000	3100
1	mg/L	ND (0.050)	ND (0 PEO)	NID (0.050)	-	I	
	mg/L	. •	-		(NCU.U) UN	5.3	25.2
vater)	s.u.	ı	,		•		
Total	s.u.	,	•				
	mg/L	3.6	•	ı	•	•	ı
	mg/L	88.8		-	5.6	2.9	27.1
	mg/L			117	1680	847	1050
issolytod Solida (TDC)	mg/L		•		ı	r	•
:	mg/L	562		•	-		
	mg/L	11.5			2000	1600	1470
	cfu/mL	ı			7.4	6.4	11.3
	mg/L	14.9		ı	1		1
(SCI) solids paniadenc mini	mg/L	65.0		•	46.3	31.5	68.9
Field Parameters					0.//	141	811
	umhos/cm	,	2.11				
	mg/L	,	4.11	ı	,		ı
iction notantial	mdd	I		,	•	ı	,
	millivoits		119		•		I
	s.u.	,	6.61	ŗ	ſ	•	i,
	ntu	I	8		ĩ	ı	ı

q046A1-XT2-WG-H1storical-37-TH 10/3/2006

-2 LFW-4 1 OU1 066 4110/2006			050) ND (0.0050)			020) ND (0.0050) 050)				01) ND (0.01) 01) ND (0.01)		l	0.001	IN			020) ND (0.0020) 050)			00000) UN (0.0020) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	4		~	5) ND (0.01) 150) 0.026		N				50) ND (0.0050)			1) ND (0.01)		5) -	5) .													-	
LFW-2 0U1 4/6/2066	Units		mg/L ND (0.0050)		mg/t (0.0050) me/l. Nin (0.0050)			~	(10.0) CIN 1/8m			Z	mg/L 0.17	QN		mg/L ND (0.01)		~	mg/L ND (0.01)		2		mg/L ND (0.0050)	Z	_	mg/L ND (0.0050)				mg/L ND (0.0050) mg/I ND (0.0050)			mg/L ND (0.01) mg/L - ND (0.01)	1 00		Ð	mg/L ND (0.05)	mg/L ND (0.05)				mg/L NU (0.0) mg/L ND (0.2)		mg/L ND (0.05)		mg/L NU (0.05) me/L ND (0.05)			-	
Sample Location: Location: Sample Date:	Parameter	Volatile Organics	1,1,1-Trichloroethane	1.1.2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloroethane	1,2-Dataoore (Methyl Ethyl Ketone)	2-Hexanone	2-Methylthiophene	3-Methylthiophene	Accelone	Benzene	Bromodichloromethane	Bromomethane (Methyl Bromide)	Carbon disulfide	Carbon tetrachloride	Chloroethane	Chloroform (Trichloromethane)	Chloromethane (Methyl Chloride)	cis-1,2-Dichloroethene	cis-1,2-Licruoropropene Dibromochloromethane	Ethyl Ether	Ethylbenzene	m&p-Xylene	Methylene chloride o-Xvlene	Styrene	Tetrachloroethene	Lotuene trane 1 2. Dickloroothara	trans-1,2-Dichloropropene	Trichloroethene	Vinvi acetate Vinvi chlorida	y arys cruotite Xylene (total)	Semi-Volatile Organics	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1.4-Dichlorobenzene	2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	2,4,5-Trichlorophenol	2,4,0-1 riculorophenol 2 4.Dichloromhanol	2,4-Dimethylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	z-Ciuoronapitnalene 2-Chloronhenol	2-Methylnaphthalene	2-Methylphenol	2-Nitroaniline	2-Nitrophenol 3 2-Dichlorohand dina	

LFW-4 OU1 410/2006			I				ı						•		ı	•		ı			• •	•	ı										ł		,			ı		316	2.0	ı	,		, ,		24000
LFW-2 OU1 4/6/2006			(27) (0.2)	(7.7) (1.7) (1.0) (1.0)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.2)	ND (0.05)	ND (0.05)	ND (0.05)	(cn.n) ND (0.05)	ND (0.05)	ND (0.05)	(60:0) (JNI) -		ND (0.05)	ND (0.05)	(en.u) UN) (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	(GU.U) UN	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)		ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.02 J		122	33.2	•	Ţ				6700
	Units	:	mg/L ™≏/I	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L me/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/ L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	л/Яш	mg/L	mg/L	mg/ L	mg/L	I	cfu/mL cfu/mL		cfu/mL
Sample Location: Location: Sample Date:	Parameter	3-Nitroaniline	4,6-Dinitro-2-methylphenol	4-Bromophenyl phenyl ether	4-Chloro-3-methylphenol	4-Culoroanume	4-Methylphenol	4-Nitroaniline	4-Nitrophenol	Acenaphthene	Acenaphinylene Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(6) filuoranthene Benzo(6 h i)mondane	Benzo(k)fluoranthene	Benzoic acid	Benzyl Alcohol	bis(2-Chloroettoxy)methane bis(2-Chloroethotherther	bis(2-Ethylhexyl)phthalate	Butyl benzylphthalate	Carbazole	Curysene Dihenz(a h)anthracona	Dibenzofuran	Diethyl phthalate	Dimethyl phthalate	Di-n-coutyiphthalate Di-n-cotvi sheh-slots	Drutter putting are Fluoranthene	Fluorene	Hexachlorobenzene	rtexactuoroputaquene Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	isophorone Narhthalene	Nitrobenzene	N-Nitrosodi-n-propylamine	IN-INITOSOCIPTIENTIE Pentachlorophenol	Phenanthrene	Phenoi Pyrene	, 1444-1-	iverais Iron	Iron (Dissolved) Manganese (Dissolved)		G <i>ases</i> Methane	Biological	ouvograu Benzene Specific Microbial Population Total Microbial Population	General Chemistry	Aerobic Total Microbial Population

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LFW- 4 OU1 4110/2006	386 14000 ND (0.050) - - - - - - - - - - - - - - - - - - -	
LFW-2 011 462006	82.4 6400 6400 (0.050) - - 1110 11110 34.5 2060 34.5 - - 278 278 278	, 1
Units	mg/L rig/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L m	ntu
Sample Location: Location: Sample Date: Parameter	Alkalinity, Total (As CaCC3) Berzene Specific Microbial Population Dissolved Organic Carbon (DOC) Nitrate (as N) Orthophosphate pH (water) pH (water) pH (water) pH (water) phosphate, Total Sulfiae S	Turbidity

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SUMMARY OF TREND TEST ANALYSIS FOR BENZENE AND ETHYL ETHER IN GROUNDWATER STERLING SITE 3 EAST GREENBUSH, NEW YORK

BENZENE CONCENTRATIONS IN GROUNDWATER

Well	Unit	Number of	Percent	_		Trend Test	
		Samples	Non-Detects	Test	Statistic	Probability	Conclusion
MW-1S	mg/L	5	100%				1000/ NTD
MW-2S	mg/L	18	89%	Logistic			100% ND
MW-3S	mg/L	7	0%	Mann-Kendall	-1		>50% ND
MW-3SR	mg/L	10	20%	Mann-Kendall	-1 -10	1	No trend identified
MW-4B	mg/L	18	100%			0.421	No trend identified
MW-5B	mg/L	5	100%				100% ND
MW-6A	mg/L	6	100%				100% ND
MW-6B	mg/L	18	100%				100% ND
MW-7B	mg/L mg/L	5	100%				100% ND
MW-8B	mg/L mg/L	5	100%				100% ND
MW-9A	-	5					100% ND
MW-9B	mg/L	-	100%				100% ND
	mg/L	18	94%	Logistic			>50% ND
MW-10B	mg/L	5	100%				100% ND
MW-11B	mg/L	5	100%				100% ND
MW-12B	mg/L	8	100%				100% ND
MW-13A	mg/L	8	100%				100% ND
MW-13B	mg/L	18	100%				100% ND
MW-14B	mg/L	4	100%				100% ND
MW-15B	mg/L	5	100%				100% ND
MW-16B	mg/L	8	100%				100% ND
MW-17B	mg/L	8	100%				100% ND
MW-18B	mg/L	5	100%				100% ND
MW-19B	mg/L	8	100%				100% ND
PZ-2A	mg/L	7	0%	Mann-Kendall	-15	0.035	Decreasing Trend
PZ-14	mg/L	7	0%	Mann-Kendall	-11	0.133	No trend identified
PZ-15	mg/L	7	71%	Logistic			>50% ND
PZ-16	mg/L	7	0%	Mann-Kendall	-17	0.016	Decreasing Trend
PZ-17	mg/L	7	0%	Mann-Kendall	-17	0.016	Decreasing Trend
PZ-18	mg/L	12	0%	Mann-Kendall	-40	0.007	Decreasing Trend
PZ-20	mg/L	7	0%	Mann-Kendall	-15	0.035	Decreasing Trend
RW-1	mg/L	7	43%	Mann-Kendall	-6	0.453	No trend identified
	0				Ŭ	0.100	no nena nuentinea

SUMMARY OF TREND TEST ANALYSIS FOR BENZENE AND ETHYL ETHER IN GROUNDWATER STERLING SITE 3 EAST GREENBUSH, NEW YORK

ETHYL ETHER CONCENTRATIONS IN GROUNDWATER

•

Well	Unit	Number of	Percent			Frend Test	
		Samples	Non-Detects	Test	Statistic	Probability	Conclusion
MW-1S	mg/L	5	60%	Logistic			>50% ND
MW-2S	mg/L	18	0%	Mann-Kendall	-44	0.103	No trend identified
MW-3S	mg/L	7	14%	Mann-Kendall	-3	0.764	No trend identified
MW-3SR	mg/L	10	30%	Mann-Kendall	-9	0.474	No trend identified
MW-4B	mg/L	18	100%				
MW-5B	mg/L	5	100%				100% ND
MW-6A	mg/L	6	100%				100% ND
MW-6B	mg/L	18	28%	Mann-Kendall	-59	0.028	100% ND
MW-7B	mg/L	5	100%		-07		Decreasing Trend
MW-8B	mg/L	5	100%				100% ND
MW-9A	mg/L	5	100%				100% ND
MW-9B	mg/L	18	28%	Mann-Kendall	-6		100% ND
MW-10B	mg/L	5	80%	Logistic		0.850	No trend identified
MW-11B	mg/L	5	60%	Logistic			>50% ND
MW-12B	mg/L	8	0%	Mann-Kendall			>50% ND
MW-13A	mg/L	8	50%	Mann-Kendall	-18	0.035	Decreasing Trend
MW-13B	mg/L	18	0%		4	0.711	No trend identified
MW-14B	mg/L	4	100%	Mann-Kendall	-68	0.011	Decreasing Trend
MW-15B	mg/L	5	20%				100% ND
MW-16B	mg/L	8		Mann-Kendall	1	1.000	No trend identified
MW-17B	mg/L	8	0%	Mann-Kendall	-10	0.266	No trend identified
MW-18B	mg/L mg/L	о 5	0%	Mann-Kendall	10	0.266	No trend identified
MW-19B	mg/L mg/L	8	20%	Mann-Kendall	2	0.806	No trend identified
PZ-2A	0	-	0%	Mann-Kendall	-8	0.386	No trend identified
PZ-14	mg/L	5	0%	Mann-Kendall	-2	0.806	No trend identified
PZ-15	mg/L	5	20%	Mann-Kendall	-4	0.462	No trend identified
PZ-15 PZ-16	mg/L	5	80%	Logistic			>50% ND
	mg/L	5	20%	Mann-Kendall	-8	0.086	No trend identified
PZ-17	mg/L	5	0%	Mann-Kendall	-8	0.086	No trend identified
PZ-18	mg/L	12	33%	Mann-Kendall	-26	0.086	No trend identified
PZ-20	mg/L	7		Mann-Kendall	-7	0.368	No trend identified
RW-1	mg/L	7	0%	Mann-Kendall	-13	0.072	No trend identified

MONITORED NATURAL ATTENUATION PARAMETER RESULTS STERLING SITE 3 EAST GREENBUSH, NEW YORK

Well ID Date	:	MW-5B 5/18/06	Upgre MW-5B 6/26/06	Upgradient 5B MW-4B 06 5/18/06	MW-4B 6/26/06	PZ-20 5/18/06	501 PZ-20 6/26/06	Source PZ-14 5/18/06	PZ-14 6/26/06
pH DO	mV s.u. mg/L	-12 4 6.62 2.98	-111 8.04 1.06	-93 6.49 5.65	-63 7.49 0.89	-112 6.69 4.94	-102 8.22 1.45	-123 6.74 4.59	-145 7.96 1 68
Conductivity Turbidity Temperature	NTU °C	0.717 5.4 10.3	0.729 11 1.4	0.397 >999 10.5	0.306 17 10.2	2.930 35 12.4	2.330 14 12	2.420 244 11.4	2.080 9 11.2
Nitrate Manganese Iron Sulfate Methane Alkalinity Ethyl ether Benzene DOC	ng/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L m	ND (0.050) 3.16 37.1 ND (4.0) 0.78 258 ND (0.005) ND (0.001) 12.1		ND (0.050) 1.14 19.9 22.6 0.0028 119 ND (0.005) ND (0.001) 3.2	ND (0.050) 0.118 0.572 14.4 0.022 175 ND (0.005) ND (0.005)	ND (0.050) 5.61 53.2 1.69 1. 0.12 0.12 0.7 94.2	ND (0.050) 6.05 3.09 1.560 9.6 1.31 0.18 5.1	ND (0.050) 4.36 67.8 1350 0.77 55.6 0.12 1.6 49.6	ND (0.050) 3.88 2.28 1380 2.9 2.84 0.1 1.7

Page 1 of 3

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MONITORED NATURAL ATTENUATION PARAMETER RESULTS STERLING SITE 3 EAST GREENBUSH, NEW YORK

Downgradient	MW-3SR RW-1 RW-1 MW-6B MW-6B MW-9B MW-9B 6/26/06 5/18/06 6/26/06 5/18/06 6/26/06	
	MW-2S MW-3SR 6/26/06 5/18/06	 -98 55 7.15 6.60 0.24 3.89 0.653 0.241 17 >999 17 >999 10.0 10.8 10.0 10.8 10.0 10.8 10.0 0.26 11.88 0.0147 2.23 0.0552 29.0 5.9 6.2 0.0075 5.9 6.2 84.4 0.38 ND (0.005) 0.0075 227 84.4 0.38 ND (0.005) 0.0075 20008 ND (0.001) - 10.7
	MW-2S 5/18/06	mV -90 s.u. 6.43 mg/L 6.43 mS 6.43 mS 0.621 NTU 28 °C 10.3 mg/L 3.09 mg/L 3.09 mg/L 3.09 mg/L 170 mg/L 170 mg/L 0.0064 mg/L 2.4
	weii 11) Date	ORP pH DO Conductivity Turbidity Temperature Nitrate Manganese Iron Sulfate Methane Alkalinity Ethyl ether Benzene DOC

Page 2 of 3

MONITORED NATURAL ATTENUATION PARAMETER RESULTS STERLING SITE 3 EAST GREENBUSH, NEW YORK

		3
	MW-19B 6/26/06	-111 9.94 1.13 0.723 0.723 0.723 0.723 71 10.4 0.12 0.387 0.957 92.9 0.957 92.9 0.957 92.9 0.025 192 0.025 192 0.12
	MW-19B 5/18/06	-68 -68 5.53 0.680 86 10.4 10.4 0.053 0.474 8.95 116 0.01 164 0.01 ND (0.001)
	MW-17B 6/26/06	-123 9.98 1.11 0.722 44 10.5 10.5 0.687 11.7 ND (0.050) 0.687 11.7 11.7 ND (2.0) 1.4 1.1 1.1 1.1 1.0 2.0 1.4 ND (0.0007)
	MW-17B 5/18/06	-117 6.85 2.97 0.653 15 10.3 10.3 10.3 0.559 0.759 0.759 0.759 0.759 0.759 0.5 192 2 192 2 ND (0.001)
radient	MW-16B 6/26/06	-151 7.83 1.7 0.960 14 10.8 10.8 0.813 0.813 5.81 ND (0.000 5.81 ND (2.0) 2.7 ND (0.0005)
Downgradient	MW-16B 5/18/06	-134 6.79 3.61 0.951 28 10.8 10.8 1.03 36.5 ND (4.0) 0.92 2.76 3.1 ND (0.001) 16.8
	MW-13B 6/26/06	-130 8.07 1 0.750 14 10.2 10.2 10.2 5.6 10.4 2.4 10.4 2.4 179 0.6 ND (0.0005)
	MW-13B 5/18/06	-109 6.81 7.34 0.708 41.2 10.2 10.2 10.6 1.06 1.06 1.5.8 9.7 0.68 224 0.77 ND (0.001)
	MW-12B 6/26/06	-1.48 7.73 1.21 1.460 7 7 10.2 ND (0.050) 0.585 4.43 71.9 0.585 0.10 106 0.10 106 0.14 ND (0.0007)
	MW-12B 5/18/06	-116 6.83 5.22 1.070 19.2 10.6 0.499 4.45 79.4 0.12 160 0.12 160 0.32 ND (0.001)
•		mV s.u. mS/nmg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L
	Date	ORP PH DO Conductivity Turbidity Temperature Nitrate Manganese Iron Sulfate Methane Alkalinity Ethyl ether Benzene DOC

Page 3 of 3

MICROBIAL POPULATION COUNT RESULTS STERLING SITE 3 EAST GREENBUSH, NEW YORK

PZ-17 Source 2006		
PZ-17 Source 2005		
PZ-16 Source 2006		
PZ-16 Source 2005		C
PZ-15 Source 2006		4
PZ-15 Source 2005		7 7 7 3 3
PZ-14 Source 2006		1 1.103
PZ-14 Source 2005		0 0.10 ³
PZ-2A Source 2006		3 6v10 ⁴
PZ-2A Source 2005		2 6×10 ⁴
Location PZ-2A Relative Site Location Source Year 2005	Sample/ Parameter Units	Total Aerobic (CFUs/mL) $2 6 \times 10^4$ $3 6$
		[

Microbial Population Counts (CFUs/mL) 2.6x10 ⁴	2.6x10 ⁴	3.6x10 ⁴	8.8x10 ³	1.1x10 ³	2.5×10^{3}	1.3×10^{4}	1.7×10^{2}	2.7×10 ⁴	2.3x10 ³	4.6x10 ³
Benzene Specific (CFUs/ mL) 4.6x10 ³ Microbial Population Counts	4.6x10 ³	2.0x10 ⁴	4.5x10 ³	5.8x10 ³	9.8x10 ²	1.3x10 ⁴	2.0x10 ¹	4.1x10 ³	1.5x10 ³	1.0x10 ⁴
Benzene (ma/m1) 0.12	010	0.0051	t v							
	71.0	1cnn'n	0.0 D	11 D	ND (0.00050)	0.0013	0.13	0.054	0.047	0600.0

Page 1 of 3

MICROBIAL POPULATION COUNT RESULTS STERLING SITE 3 EAST GREENBUSH, NEW DOAR

LFW-3 Source 2006			2.0x10 ⁴	3.1x10 ³
LFW-3 Source 2005			9.6x10 ³	7.0×10 ²
LFW-2 Source 2006			6.7x10 ³	6.4x10 ³
LFW-2 Source 2005			1.4×10^{4}	2.4x10 ³
LFW-1 Source 2006			3.2x10 ³	2.0x10 ³
LFW-1 Source 2005			1.7x10 ⁴	4.5×10 ¹
PZ-20 Source 2006			4.5x10 ³	7.9x10 ³
PZ-20 Source 2005			2.2×10 ⁴	4.9x10 ³
PZ-18 Source 2006			2.0x10 ⁴	1.4x10 ⁴
PZ-18 Source 2005			6.3x10 ³	4.8x10 ³
Location Relative Site Location Year	Sample/ Parameter Units	Total Acarchia	Microbial Population Counts (CFUs/mL) 6.3x10 ³	Denzene Specific (CFUs/ mL) 4.8x10 ³ Microbial Population Counts

0.027

0.017

0.17

0.35

0.039

ND (0.0035)

5.4 D

13 D

0.44

0.94

Benzene (mg/mL)

Page 2 of 3

MICROBIAL POPULATION COUNT RESULTS STERLING SITE 3 EAST GREENBUSH, NEW YORK

RW-1 Doungradient 2006	
RW-1 Downgradient 2005	
RW-2 Source 2006	
RW-2 Source 2005	
LFW- 4 Source 2006	
LFW- 4 Source 2005	
Location ite Location Year	Units
Relative Si	ample/ Parameter

n
imeter
Para
ımple/
S

	3.2x10 ³	No growth
	1.4x10 ⁴	5.0x10 ³
	1.0×10 ⁴	4.3x10 ²
	2.4x10 ⁴	1.4×10 ⁴
	2.2×10 ⁴	5.7x10 ³
-	(CFUs/mL)	$(CFUs/mL) 5.7\times 10^3$
Total Acardia	Microbial Population Counts	Denzene ppecific (Microbial Population Counts

Note: CFUs = Colony Forming Units.

ND (0.0035)

0.0064

0.079

<u>C.0</u>

0.063

1.4

Benzene (mg/mL)

 2.4×10^{3}

 2.7×10^{2}

Values are averages of duplicates

Microbial Counts - Method 9215B Adapted from Standard Methods for the Examination of Water and Wastewater 17th ed.

SUMMARY OF POTENTIAL FEDERAL ARARs STERLING SITE 3 EAST GREENBUSH, NEW YORK

Contaminant-Specific	Type	Rationale
40 CFR Subparts 411.11 - 411.18 - Safe Drinking Water Act (SDWA) Maximum Contaminants Levels (MCLs)	ARAR	Sets acceptable concentrations of chemicals in drinking water. Application to derivation of Soil Cleanup Objectives for the protection of groundwater from leaching of contaminants from soil.
Clean Water Act (CWA) Water Quality Criteria	ARAR	Regulates ambient concentrations of contaminants in surface water for human and aquatic exposure scenarios. Also establishes NPDES permit system, under which discharges to surface water are regulated based on use of water, and POTW pretreatment standards.
Clean Air Act	ARAR	Regulates ambient concentrations and release of chemicals to air.
Location-Specific	Туре	Rationale
23 CEP Date 220 Biyon or 111 1		
33 CFR Part 329 - Rivers and Harbors Act	ARAR	Corp of Engineers regulations for wetlands and navigable waters of U.S.
Executive Order 11990 - Protection of Wetlands	ARAR	Requires consideration during remedial actions to minimize destruction, loss, or degradation of wetlands.
Executive Order 11988 - Floodplain Management	ARAR	Requires consideration if remedial actions affect or may potentially affect floodplains.
33 USC 466 Section 404 – Clean Water Act	ARAR	Controls disturbances in wetlands.
40 CFR Subpart 264.18 - RCRA Location Standards	ARAR	Requires that units located in a 100-year floodplain be designed and operated to avoid a washout.
Fish and Wildlife Coordination Act (16 USC 661): -1978 Improvement Act (16 USC 742) -1980 Coordination Act (16 USC 2901)	ARAR	Regulates remedial actions that affect bodies of water or pose potential harm to fish or wildlife. Mitigates impacts to wetlands.
40 CFR Part 280 – Guidelines for Specifications of Disposal Sites for Dredged or Fill Material	TBC	Guidelines for the restoration of wetlands.
40 CFR Part 6, Appendix A – Wetlands Construction and Management Procedures	ARAR	Provides procedures for the management of wetlands that may potentially be impacted by a remedial action.
16 USC 470 – National Historic Preservation Act	ARAR	Determines if Site has significant scientific, prehistorical, historical, archaeological, or cultural resources that may be impacted by remedial action.

Action-Specific	Type	Rationale
49 CFR Parts 107, 171.1-171.500 DOT Rules for Hazardous Materials Transport	ARAR	Regulates remedial measures involving transportation of hazardous materials such as treatment residuals.
29 CFR 1910 OSHA - Health and Safety Standards	ARAR	Provides safety standards for on-Site workers at hazardous waste sites.
29 CFR 1904 OSHA - Recordkeeping, Reporting, and Related Regulations	ARAR	OSHA regulations for recordkeeping and reporting of compliance with safety conditions during management of hazardous waste.
40 CFR Parts 260-270 Resource Conservation and Recovery Act (RCRA), Subtitle C	ARAR	RCRA standards for management of hazardous waste.
40 CFR Parts 264.90-264.101 RCRA - Subpart F Standards for Owner and Operators of Permitted Hazardous Waste Facilities	ARAR	General requirements for groundwater monitoring.
40 CFR Parts 264.70-264.77 RCRA - Manifesting, Recordkeeping and Reporting	ARAR	Requirements for hazardous waste management.
40 CFR 268, Subpart D RCRA – Land Disposal Restrictions	ARAR	Regulates land disposal of RCRA hazardous wastes.
40 CFR Parts 170 to179, 262 and 263 RCRA Standards Applicable to Generators and Transporters of Hazardous Waste - RCRA Section 3003	ARAR	Regulates off-Site transport and management of hazardous waste.
40 CFR Parts 124 and 270 RCRA Hazardous Waste Permit Program RCRA Section 30-35	ARAR	Specifies permit requirements for RCRA hazardous waste management activities.
40 CFR Subpart Part 122.44 – Establishing Limitations, Standards, and Other Permit Conditions (under the National Pollutant Discharge Elimination Program)	ARAR	Establishes discharge criteria for treatment system effluent to waters of the U.S.
40 CFR Subpart 60.52 Clean Air Act - Prevention of Significant Deterioration (PSD) and New Source Performance Standards (NSPS)	ARAR	Requires that treatment, storage, and disposal comply with primary and secondary ambient air quality standards

Note:

ARAR - Applicable or Relevant and Appropriate Requirements TBC - To be considered

SUMMARY OF POTENTIAL STATE ARARs STERLING SITE 3 EAST GREENBUSH, NEW YORK

Contaminant-Specific	Type	Rationale
6 NYCRR Part 700-703 - New York State Water Quality Regulation	ARAR	Pertains to surface water and groundwater quality, classification, and usage.
TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values, June 1998	TBC	Establishes groundwater quality criteria upon which Soil Cleanup Levels for the protection of groundwater are based.
New York State Air Guide-1 Guidelines for the Control of Toxic Ambient Air contaminants	ТВС	Sets ambient concentration for toxic air pollutants used as a possible screening mechanism to determine whether permits should be issued.
6 NYCRR Parts 202, 212 and 219 - New York Air Pollution Control Regulations	ARAR	Regulates emissions from treatment processes such as land farming, vacuum extraction and air stripping.
6 NYCRR Part 375 - New York Ambient Air Quality Standards	ARAR	Establishes treatment process emission standards for treatments such as land farming, vacuum extraction, air stripping, etc.
New York Effluent Standards and Limitations for Class GA Aquifers	ARAR	Regulates direct or indirect injection of treatment effluents into the groundwater aquifer.
TAGM HWR-92-4046 Determination of Soil Cleanup Objectives and Cleanup Levels, 1/24/1994	ТВС	Establishes Soil Cleanup Goals for COCs.
Location-Specific	Туре	Rationale
New York Wetlands Laws, New York Environmental Conservation Law, Title 7, Freshwater Wetland Regulations (Article 24)	ARAR	Regulates impacts of remedial actions adjacent to wetlands.

Regulations (Article 24)		
6 NYCRR Part 664 – New York Freshwater Wetlands Maps and Classifications	ARAR	Establishes the classification system for various types of wetlands.
6 NYCRR Part 663 – New York Freshwater Wetlands Permit Requirements	ARAR	Provides procedural requirements for various activities in wetlands and adjacent areas and standards for permit issuance.
6 NYCRR Part 500 – New York State Floodplain Management Act and Regulations	ARAR	Provides requirements for activities on floodplains or areas that may impact floodplains.
6 NYCRR Part 361 - New York Citing of Hazardous Waste Facilities	ARAR	Regulates siting of certain industrial hazardous waste facilities.
6 NYCRR Chapter 375 - New York Rules for Inactive Hazardous Waste Disposal Sites	ARAR	Dictates involvement of federal, state, local governments, etc.
6 NYCRR Part 608 - New York State Water Pollution Control Regulations Use and Protection of Waters	ARAR	Provides for the protection of certain classified streams, and permits for impoundments, structures, dredge and fill.
New York State Flood Hazard Area Construction Standards	ARAR	Evaluation of remedial alternatives with respect to floodplains.

SUMMARY OF POTENTIAL STATE ARARs STERLING SITE 3 EAST GREENBUSH, NEW YORK

Action-Specific	Type	Rationale
6 NYCRR Part 212 – General Process Emission Sources	ARAR	Prohibits emissions which are injurious to human, plant, or animal life; or causes a nuisance.
6 NYCRR Part 370 - New York General Hazardous Waste Management Systems Regulations	ARAR	General regulations for hazardous waste management.
6 NYCRR Part 371 - New York Identification and Listing of Hazardous Waste	ARAR	Identifies hazardous waste.
6 NYCRR Part 372 - New York Hazardous Waste Manifest System Requirements	ARAR	Regulates transportation of hazardous waste.
6 NYCRR Subpart 373-1 - New York Hazardous Waste Treatment, Storage and Disposal Facility Permitting Requirements	ARAR	Regulates permitting for hazardous waste storage and disposal.
6 NYCRR Subpart 373–2 - New York Final Status Standards for Owners & Operators of Hazardous Waste Treatment, Storage and Disposal Facilities	ARAR	Regulates hazardous waste treatment, storage
TAGM HWR-92-4030 Selection of Remedial Actions at Inactive Hazardous Waste Sites, 5/15/1990	ТВС	General guidance for remedy selection, criteria, and evaluation.
TAGM HWR-89-4031 Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites, 10/27/1989	TBC	Guidance for dust suppression during remedial action.

Note:

ARAR - Applicable or Relevant and Appropriate Requirements TBC - To be considered

COMPARATIVE ANALYSIS OF ALTERNATIVES STERLING SITE 3 EAST GREENBUSH, NEW YORK

Evaluation Criteria	Alternative G1 No Action	Alternative G2 Institutional Controls	Alternative G3 Monitored Natural Attenuation	Alternative G4 In Situ Chemical Oxidation	Alternative G5 Ex Situ Carbon Adsorption
Compliance with SCGs					
Chemical-Specific SCGs	No	Yes (Long-term)	Yes (Long-term)	Yes	Yes
Action-Specific SCGs	N/A	Yes	Yes	Yes	Yes
				Yes	Yes
Location-Specific SCGs	Yes	Yes	Yes	(Special Permits and	(Special Permits and
		1	3	construction methods may be	construction methods may be
				required)	required)

Overall Protection of Human Health and the Environment

Protection Over Time [1] None	None	Short-term	Long-Term	Short-Term	Long-Term	C ²
Reduction of Risk and Hazard [1]	None	Risk Reduction through	Risk Reduction through	Risk Reduction through	Risk Reduction through	
				רובדוורמו ווכמוחובווו	pitysical treatment	
Contamination addressed	Not eliminated, reduced or	Controlled through enforcement of institutional	Reduced through natural	Eliminated through chemical	Reduced through physical	
	controlled	controls	attentuation	destruction	treatment	

Short-Term Effectiveness

Protection/Controls required Protection/Controls required during injection during construction	Protection/Controls required during injection	N/A	N/A	N/A	Worker Protection
<5 years	<5 years	15 to 30 years	N/A	N/A	I ime until remedial response objectives achieved
Medium adverse impact (Access for forcemain construction and release of untreated groundwater or adsorbent)	Medium adverse impact (potential for release of oxidant)	Low adverse impact (Access for well installation)		N/A	Environmental Impacts
Low risk to Community		Very low risk to Community	No risk to Community	N/A	Community Protection During Remedial Actions

Long-Term Effectiveness and Permanence [1]

Permanence of the remedial alternative	Does not reduce risk	Requires enforcemnt	Permanently reduces risk	Permanently eliminates risk Permanently eliminates risk	Permanently eliminates risk
Maonitude of Remaining Risk [1]	No Diel Poduction	Reduces risk if	Monitors risk and risk	D	1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 - 1919 -
		Site use restricted	reduced in long term	remanently ennuates risk remanently ennuates risk	rermanently eliminates risk
		Contaminants remain on Site			
Ademiacy of Controls	Not adominated	but exposure potential	Contaminants remain on Site	Contaminants remain on Site Contaminants in groundwater	Contaminants in groundwater
	1401 auchuate	reduced if institutional	under monitored conditions	destroyed	transferred to another media
		controls enforced.			and/or destroyed
Reliability of Controls	Not roliable	Requires inspection and	Dominor	D	
	INOU LETIADIE	monitoring	kequires monitoring	kequires monitoring	kequires monitoring

TABLE 7.1

COMPARATIVE ANALYSIS OF ALTERNATIVES STERLING SITE 3 EAST GREENBUSH, NEW YORK

Evaluation Criteria	Alternative G1 No Action	Alternative G2 Institutional Controls	Alternative G3 Monitored Natural Attenuation	Alternative G4 In Situ Chemical Oxidation	Alternative G5 Ex Situ Carbon Adsorption
Reduction of Toxicity, Mobility and Volume	ume				
Quantify of Chemicals Treated or Destroyed	None	None	Minimum 80 % reduction in concentration (natural attenuation)	Approx. 100% (chemical treatment)	Approx. 100% (physical treatment)
Degree of expected reduction in toxicity, mobility or volume	None	None	Concentrations reduced further below an acceptable	Approx. 100% reduction	Approx. 100% reduction
Degree to which treatment is irreversible	N/A	N/A	Not reversible	Not reversible	Not easily reversible
Type and quantity of treatment residuals	N/A	N/A	N/A	N/A	Carbon (250 tons) regenerated or disposed off-Site

<u>Implementability</u>					
1 echnical Feasibility - construction and operation	N/A	N/A	High	Average	Average
lectrucal reasibility - reliability of technology	N/A	High	Average	Average	Average
l echnical Feasibility - ease of undertaking additional remedial action	High	High	High	High	High
Technical Feasibility - monitoring considerations	N/A	High	Average	Average	Average
Administrative Feasibility	N/A	High	High	Average	Average
Avaulabulity of Services and Materials - availability of adequate off-Site treatment, storage capacity, and disposal services	N/A	N/A	N/A	N/A	High
Availability of Services and Materials - availability of necessary equipment, specialists and skilled operators	N/A	N/A	High	High	High
Availability of Services and Materials - availability of services and materials	N/A	N/A	High	High	High

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COMPARATIVE ANALYSIS OF ALTERNATIVES STERLING SITE 3 EAST GREENBUSH, NEW YORK

Alternative G5 Ex Situ Carbon Adsorption		\$293 500	\$1,149,700	
Alternative G4 In Situ Chemical Oxidation		\$283.500	\$3,419,100	\$3,703,000
Alternative G3 Monitored Natural Attenuation		\$36,000	\$289,100	\$325,000
Alternative G2 Institutional Controls		\$14,400	\$412,000	\$ <u>426,000</u>
Alternative G1 No Action		0\$	\$175,000	\$175,000
Evaluation Criteria	Cost	Capital Costs	IMALITEDANCE	

Recommendation

Not recommended
Not recommended
Include in Final Remedy
Include in Final Remedy
Not recommended

Notes:

No carcinogenic risk and non-carcinogenic hazard within background exposure levels for OU2
 Rounded to nearest \$1,000
 N/A Not Applicable

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ABLE	
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PREFERRED REMEDY COST SUMMARY

STERLING SITE 3

Alternative It	ttive Item	Unit	Estimated Quantity	Unit Cost	ŭ	Unit Cost	Unit Co
Ж	<u>Monitored Natural Attenuation</u>						
ы. Ч	Capital Costs A. Deed restrictions B. Monitoring Well Installation	l.s. L.s.	11	11	6 69	10,000 15,000 assumes two new wells will be installed	
	Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal Project Management (approx. 10%) Technical Support (approx. 15%) Subtotal				64 64 64 64 64 64 64 64 64 64	25,000 3,800 28,800 2,900 4,300 36,000	
ರೆ ಕ ಹ ರ ದ ್ಷ	Peration Insport Report Semi II. III. Revis Revis Subt	Ls. L.S. L.S. L.S.	11111			 5,000 2,000 2,000 3,000 assumes semi-annual reporting 1,500 assumes monitoring of 10 wells for Site-specific pa 700 assumes monitoring of 10 wells for extended Site-specific pa 2,000 assumed that a review will be conducted every 5 y 16,200 18,600 	fic pa Site-s ry 5 y
	r roject management (approx. 10%) Technical Support (approx. 15%) Subtotal Present Worth O&M Costs (30 years at 7%)			1	\$ 1,900 \$ 2,800 \$ 23,300 \$ 23,300 \$ 289,100	1,900 23,800 23,300 189,100	

- Re
- Site-specific parameter list is assumed to include ethyl ether, benzene,
 Extended Site-specific parameter list is assumed to includes nitrate, manganese, dissolved iron, sulfate, and methane.
 Period of analysis is 30 years for long-term monitoring and maintenance
 Scope and bid contingencies are 5% and 10% of costs, respectively

- Bid contingency is 15 percent of costs
 Project management is 10 percent of costs
 Remedial design is 20 percent of costs
 Technical support is 15 percent of costs
 Technical support is 15 percent of costs
 Line item costs are rounded to the nearest \$1,000

			EAST G	REENBU	EAST GREENBUSH, NEW YORK
Alternative Item	Unit	Estimated Quantity	Unit Cost	Cost	Unit Cost Notes st
3. Monitored Natural Attenuation					
Capital Costs A. Deed restrictions B. Monitoring Well Installation	l.s. I.s.	11	4 1	÷ ↔	10,000 15,000 assumes two new wells will be installed
Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal				69 69 6	25,000 28,000 28 000
Project Management (approx. 10%) Technical Support (approx. 15%) Subtotal					25,000 2,900 36,000
Operation and Maintenance Costs A. Inspections B. Renortino ^c	Ls.	1	ł		5,000
Site	LS. LS.	11	11	69 69	2,000 2,000
i. Reporting ii. Annual Groundwater Monitoring iii. Biennial Groundwater Monitoring	l.s. l.s.	11	11		 3,000 assumes semi-annual reporting 1,500 assumes monitoring of 10 wells for Site-specific parameter list annually 700 assumes monitoring of 10 wells for extended Site-specific parameter list biennially concurrent with
E. Review of Remedy	l.s.	I	I	\$	every second annual round 2,000 assumed that a review will be conducted every 5 years using biennial monitoring data
Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal Project Management (approx. 10%) Technical Support (approx. 15%) Subtotal				8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	16.200 18,600 1,900 2,800 23,300
Present Worth O&M Costs (30 years at 7%) Total Present Worth O&M Costs				\$ 289 \$ 289	289,100 289,100
Total Present Worth Cost (Capital O&M Costs)				\$ 325	325,000
Notes: • Real discount rate of 7% • Site-superific narameter list is assumed to include other character					

APPENDIX A

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SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - OU2

					TABLE A.1	1				Dame 1 and
			OU2 - STE	G ANA RLING SIT	GROUNDWATER ANALYTICAL RESULTS SITE 3, EAST GREENBU	ATER ESULTS REENBUSH,	GROUNDWATER ANALYTICAL RESULTS - STERLING SITE 3, EAST GREENBUSH, NEW YORK			1 486 1 01
Sample Location: Location: Sample ID: Sample Date:		MW-4B Upgradient MW-AK-08 12/10/1997	MW-4B Upgradient GW-AK-10 6/24/1998	MW-4B Upgradient GW-AK-02 12/15/1998	MW-4B Upgradient MW-JR-08 6/14/1999	MW-4B Upgradient MW-JR-06 12/8/1900	MW-4B Upgradient GW-BKP-024 ElELYDOOD	MW-4B Upgradient GW-BP-002	MW-4B MYV-4B Upgradient GW-7830-001-BKP-001	MW-4B Upgradient GW-7830-1201-BKP-006
Parameter	Units				00012210	CCT 10171	0007/0/0	0007/61/71	//2/2001	12/6/2001
Volatile Organics 1,1,1-Trichloroethane 1,1,2,2-Tetrachloroethane	mg/L	ND (0.005)	(100) (IN	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	(100 0) (IN	
1,1,2-Trichloroethane 1,1,1,2-Trichloroethane	mg/L mg/L me/I.	ND (0.005) ND (0.005) ND (0.005)	(10.0) UN (10.0) UN (10.0) UN	ND (0.005) ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005) ND (0.005)
1,1-Dichloroethene 1,2-Dichloroethane	ng/L mg/L	ND (0.005) ND (0.005)	(1000) CIN (1000) CIN	ND (0.005) ND (0.005)	ND (0.005) ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)
1,2-Dichloropropane 2-Butanone (Methyl Ethyl Ketone)	mg/L mg/L	ND (0.005)	(1070) CIN	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)
2-Hexanone 2-Methylthiophene	mg/L mg/L	(100) QN	(1070) QN	ND (0.01)	(100) CN (100) CN	ND (0.01) ND (0.01)	(1070) CIN (1070) CIN	ND (0.01) ND (0.01)	ND (0.01) J ND (0.01)	[(100) CIN [(100) CIN
3-Methylthiophene 4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	− ² /F mg/L	ND (0.005) ND (0.01)	(100) CN	ND (0.005)	(1010) CN (1010) CN (1010) CN	ND (0.005)	(1070) CIN	(10.0) CIN ND (0.01)	(10.0) CIN (10.0) CIN	ND (0.01) ND (0.01)
Acetone Benzene	mg/L	(10.0) UN (10.01)	(1010) ON ND (0.01)	ND (0.01)	(10.0) ON	(10.0) UN ND (0.01)	(100) CIN (100) CIN	ND (0.01) ND (0.01)	(10.0) CIN I (10.0) CIN	ND (0.01) ND (0.01)
Bromodichloromethane Bromoform	mg/L mg/L	ND (0.005)	ND (0.01) ND (0.01)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)
Bromomethane (Methyl Bromide)	mg/L mg/L	ND (0.005) ND (0.01)	ND (0.01) ND (0.01)	ND (0.005) ND (0.01)	ND (0.005) ND (0.011)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Carbon disulfide Carbon tetrachloride	ng/L mg/L	ND (0.005) ND (0.005)	(10.0) CIN	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005) J	(10.005) UND (0.005)	ND (0.005) ND (0.005)	ND (0.01) ND (0.005)
Chlorobenzene Chloroethane	l/gm 1/2m	ND (0.005)	(10.0) UN (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)
Chloroform (Trichloromethane)	mg/L mg/L	ND (0.005) ND (0.005)	ND (0.01) ND (0.01)	ND (0.01) ND (0.005)	ND (0.01) ND (0.005)	ND (0.01) ND (0.005)	ND (0.01) ND (0.005)	ND (0.01) ND (0.005)	ND (0.01) ND (0.005) I	ND (0.01)
Citorometriane (Methyl Chloride) cis-1,2-Dichloroethene	mg/L mg/L	ND (0.01) ND (0.005)	ND (0.01) ND (0.01)	ND (0.01) ND (0.05)	ND (0.01) ND (0.015)	ND (0.01)	ND (0.01)	ND (0.01)	(1000) UN (0.01)	(100) ON
cis-1,3-Dichloropropene Dibromochloromethane	mg/L me/L	ND (0.005) ND (0.005)	(10.0) UN	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)
Ethyl Ether Ethylbenzene	ng/L	ND (0.005)	ND (0.01)	ND (0.005)	ND (0.01)	ND (0.005)	ND (0.01) ND (0.01)	ND (0.005) ND (0.01)	ND (0.005) ND (0.01)	ND (0.005) ND (0.01)]
m&p-Xylene Mathitiana chlorida	mg/L		- -		ND (0.005) ND (0.005)	ND (0.005) -	ND (0.005) -	ND (0.005) -	ND (0.005) -	NID (0.005) NID (0.005)
o-Xylene	mg/L mg/L	(10:0) CIN -	ND (0.01) -	ND (0.005) -	ND (0.005) ND (0.005)	ND (0.005) -	ND (0.005) -	ND (0.005) -	ND (0.005)	ND (0.005)
Styrene Tetrachloroethene	mg/L mg/L	ND (0.005) ND (0.005)	ND (0.01) (100) CIN	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	(cm/n) UN ND (0.005)
Toluene trans-1.2-Dichloroethene		ND (0.005)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005) ND	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)
trans-1,3-Dichloropropene Trichloroptopene	mg/L	ND (0.005)	(1070) QN	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)
Viny cathories Viny chloride	mg/L mg/L	(10.0) UN (10.0) UN	(1070) CIN	ND (0.005) ND (0.01)	ND (0.005) ND (0.01)	ND (0.005) ND (0.01)	ND (0.005) ND (0.01)	ND (0.005) -	ND (0.005) -	NID (0.005)
Xylene (total)	mg/L mg/L	ND (0.005) ND (0.005)	(10.0) UN ND (0.01)	ND (0.01) ND (0.005)	ND (0.01) -	ND (0.01) ND (0.005)	ND (0.01) ND (0.005)	ND (0.01) ND (0.005)	ND (0.01) ND (0.005)	ND (0.01) -
TIC Volatile Organics 1,2-Dichlorotetrafluoroethane (CFC 114) A	mg/L	,				ï	ı	ï		,
Benzene A Carbon dioxide A	mg/L	•		I	,	ŀ	ı	I		
Chlorodifluoromethane A Dichlorodifluoromethane (CEC-12), A	1/2m					• 1			1 1	1 1
Dichloroftuoromethane A	mg/L							1 1		
Disconstructure A Discopyletter A Dinhenul ether A	mg/L mg/L			• •		• •		• •	1 1	
Ether A	mg/L mg/L	• •						• •		, ,
Ethoxymethyl benzene A Hexane A	mg/L mg/L		• •	• •	• •		• •	1 1		
Silanol, trimethyl- A Sulfur dioxides A	mg/L me/L							•		ı
Trichlorofluoromethane A Unknown A	mg/L	• •				• •		1 1		
CIDNICALI SIMILE V	mg/ L	•		ı	•	ı		١	ı	1
Semi-Volatile Organics 1,2,4-Trichlorobenzene	mg/L						·	ı	,	
										oth6A1-XT2-WG-Hitstorical-37-1

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906AI-XT2-WG-Historical-37-TH 10/3/2006

AW 48 Stadient V-AK-08 					TABLE AI ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEI MW-48 Liggradient Liggradient Liggradient Liggradient Ungeratient Ungeratient Curv. Act 20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-5/4.20 CW-4/4.20	TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING STTE 3, EAST CREENBUSH, NEW YORK Ww4s Mw4s Mw4s Ww4s Mw4s Mw4s Ww4s Mw4s Mw4s Storation Uspatient Uspatient Uspatient Storation Uspatient Uspatient <			1.3 Dicklostocherzene 1.3 Dicklostocherzene 1.4 Dicklostocherzene 2.45-Treklostocherzene 2.45-Treklostocherzene 2.45 Treklostocherzene 2.45 Treklostocherzene 2.45 Dicklostocherzene 2.45 Dicklostocherzene 2.45 Dicklostocherzene 2.4 Dicklostoch
	OU2 - STE MW-4B Upgradient GW-AK-10 GW-AK-10 GW-AK-10 GW-AK-10	ANA ANA OU2 - STERLING SIT MW-4B MW-4B MW-4B Lipgradient Upgradient GW-AK-02 GW-AK-0	TABLE A GROUNDW/ ANALYTICAL R ANALYTICAL R ANALYTICAL R ANALYTICAL R ANA-4B MW-4B MM-4B MW-4B MM-	TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2-STERLING SITE 3, EAST GREENBUSH WW-4B MW-4B MW-4B WW-4B MW-4B MW-4B Upperation Upperation Upperation CWASC MW-4B MW-4B WW-4B MW-4B MW-4B WW-4B MW-4B MW-4B Upperation Upperation Upperation Upperation Upperation Upperation <thupperation< th=""> Upperatio</thupperation<>	TABLE A.1 TABLE A.1 GROUNDWATER MW-4B MW-4B MW-4B MW-4B MW-4B MW-4B MW-4B Upgradient Upgradient	TABLE A.1 TABLE A.1 GROUNDWATER MALTICAL RESULTS ANALYTICAL RESULTS MM-B University MM-B University MM-B University MM-B University MM-B University MM-B University University University University </td <td></td> <td>MW-4B Upgradient MW-AK-08 12/10/1997</td> <td></td>		MW-4B Upgradient MW-AK-08 12/10/1997	
	MW-4B Upgradient. GW-3P-002 12/19/2000 	MW-4B Upgradient. GW-192-002 12/19/2000 12/19/2000	MW-4B Upgradient. GW-2P-002 12/19/2000 12/19/2000	MW-4B Upgradient. GWBP-002 12/19/2000 12/19/2000	MW-4B Utggradient GW-7830-0701-BKP-001 7/12/2001 		Page 2 of 68	MW 4B MY 4B Upgradient GW-7830-1201-18RP-006 1216/2001	

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Page 3 of 68	MW-4B MW-4B MW-4B Upgradient GW-7830-000-18KP-006 T/2/2001 GW-7830-1201-28KP-006						•••										• •					1.1						11				q046ALXT2-WC-Haortel-37-TH 10/3-2006
¥	MW-4B Upgradient GW-BP-002 12/19/2000			,	1 1 1		11				1 1						1 1		1 1			9 1 3							۰ ۱			
er Ults Eenbush, new Yor	MW-4B MW-4B Upgradient Upgradient MW-JR-06 GW-BKP-024 12/8/1999 6/6/2000						•••		•••						1 1 1 1						•••							• •	• •		, ,	
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS - STERLING SITE 3, EAST GREENBUSH, NEW YORK	MW-4B MW-4B Upgradient Upgradient GW-AK-02 MNV-R-08 12/15/1998 6/14/1999							••						, ,			•••	• •							•••	•••	•••	•••				
OU2 - STERLI	MW-4B Upgradient GW-AK-10 6/24/1998							1 1		.	1 1 1			1.1					, ,			1.1						3 1	1 1	1 1		
	MW-4B Upgradient MW-AK-08 12/10/1997	Units	mg/L - mg/L -				mg/L		mg/L mg/L				mg/L -																		mg/L -	
	Sample Location: Location: Sample Date: Sample Date:	Parameter	Phenol Pyrene	TIC Semi-Volatile Organics 1 (2H)-Naphthalenone, 3.4-dih A 1 1 Ext-1-1 00000	1.1-Polpteriy(1×L) A 1-Phenyl-1-cyclopropanecarbo 2.46(11,31,51+)-Pyrimidinetr A 2.40 mercol 2.4.5.11,2.11	Priperidine Carboxylic Acid A 7,9-Difertidine Carboxylic Acid A 7,9-Difert-butyl-1-oxaspito(4,5)deca-6,9-diene-2,8-dione A	9-Octagecenoic Acid (2)-(9C) A Aminopyrine A Aniliae (A.CN) Acro A	Annue (ALIV) (OLI) A Benzenamie, 22-Dimethyl A Benzenamine 2.4-dimethyl- A	Benzenamine.2.5-dimethyl-A Benzenamine.2.6-dimethyl-A	Benzene, 1,1-Oxybis (9CI) A Benzene,(Ethoxymethyl)-(9C) A	Benzenemethanamine, N.Ndimethyl A Benzenemethanamine, Nmethyl A	Benzoic Acid, 4-Chloro-(9Cl) A Biphenyl A	Butyl ester octadecanoic acid A Butyl seter, heradecanoic acid A Cobocatio Acid A	controcytic Actu A Chloromethylbenzene isomers A Chloromethylbenzene isomers R		cyclopropane Caronitrile, 2 A Cyclopropane Caronitrile, 2 A Diethyltoluamide A	Diphenyl ether A Dodecanoic acid A	Ethane, 1,2-Bis(2-Chloroetho) A Ethane, 1,2-Bis(2-Chloroetho) A Ethavymethyl Benzene A	Hexobarital A Lidocaine A	Mephobarbitol A Mepivacaine A	Mepivacaine hydrochloride A Methyl Thiophene A	Noramidopyrine A O-Hydroxybiphenyl A	o-Toluidine A Pentazocine A	rhenobarbital A Phenobarbital Di-methyl Derivative A	Finemol, (1,1-Dumethylethyl A Phenol, 24-Bis(1,1-Dimethyl) A Phenol, 24-Bis(1,1-Dimethyl) A	Frenol, 24-Distdimethyl A Phenol, 4-(1,1,3,3-Tetrameth	Phenol, 4-(2,2,3,-Tetrameth) A Phenol, 4,4-Butylidenebis(2) A	Sultur A Sultur mold. (S8) A Sultur Mal. (S8) A	Talbutal A	Letramentyburypnenoi A Unknown A Unknown B	Unknown C	CRA 7830 (71) Appendix A

Page 4 of 68	MW-4B UIpgradient GW-7830-1201-BKP-006 12/6/2001			, , ,	·			- - - - - - - - - - - - - - - - - - -
	MW-4B Upgradient GW-7830-J701-BKP-001 712/2001							241 - - 6.38
	MW-4B Upgradient GW-BP-002 12/19/2000				ı	1 7 1		
NEW YORK	MW-4B Upgradient GW-BKP-024 6(6/2000			9.25 3.49 -	ı	1 1 1	145 	
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS - STERLING SITE 3, EAST GREENBUSH, NEW YORK	MW-4B Upgradient MW-JR-06 12/8/1999				ı			
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS SITE 3, EAST GREENBU	MW-4B Upgradient MW-JR-08 6/14/1999			• • •				
AN, ERLING SIT	MW-4B Upgradient GW-AK-02 12/15/1998							
OU2 - ST	MW-4B Upgradient GW-AK-10 6/24/1998			ND (16.6) ND (9.2) -	ı		155 155 0.07 0.21 0.21 6.7 6.7 6.7 17.3 17.3 17.3 17.3 17.3 17.3 117.3 210 ND (1.68) ND (1.9) 30	
	MW-4B Upgradient MW-AK-08 12/10/1997			,				
		Units	インSEE 12/2011 1/2011	mg/L mg/L	mg/L	cfu/mL cfu/mL cfu/mL		umhos/cm mg/L ppm millivolis s.u. nfu
	Sample Location: Location: Sample ID: Sample Date:	Parameter	Unknown E Unknown E Unknown F Unknown H Unknown I Unknown I Unknown J Unknown L Unknown Alkame A Unknown Anade A Unknown Aromatic A Unknown Carboylic Acid B Unknown Carboylic Acid B Unknown Carboylic Acid B Unknown Substituted Thiophene A Unknown Substituted Thiophene A	Metals Iron Iron (Dissolved) Manganese (Dissolved)	Gases Methane	Biological Aerobic Total Microbial Population Benzene Specific Microbial Population Total Microbial Population	General Chemistry Alkalinity, Total (As CaCO3) Dissolved Organic Carbon (DOC) Nitrate (as N) Orthophosphate PH (water) Phosphate, Total Sufface Suffac	Field Parameters Conductivity Field Dissolved Oxygen OVA Reading Ovidation reduction potential pH Field Turbidity CRA 7838 (71) Appendix A

TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

;

MW-4B MW-4B Upgradient Upgradient MW4S MW4A 51812006 53312006				
MW-4B M Upgradient Upg A5E26910 M 12/13/2005 5/11	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005)		ND (0.005) ND (0.005)	
MW-4B at Upgradient 002 A5680607 k 6/29/2005			ND (0.005) ND (0.01)	Z(100'0
B MW-4B ent Upgradient 04120730-002 4 12/7/2004	<u>Z</u>		ND (2005) ND (2005)	
4B MW-4B itient Upgradient 9-003 04077051-001 003 71712004	2	_	(1000) (1	Nifi 600
MW-4B MW-4B MW-4B Upgradient Upgradient 0362209-003 6626/2003 12/11/2003			(1000) (1	
MW-4B MV Upgradient Upgr 021217AE-06 039622 12/17/2002 6/26			(0.005) (0.005	· · · · · · · · · · · · · · · · · · ·
MW-4B Upgradient U 026621AR-01 021 6/21/2002 12	ND (0.002) ND (0.005) ND (0.005)			
Units	Ц 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			七 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Sample Location: Location: Sample ID: Sample Date: Parameter	Volatile Organics 11,1.1-Trichloroethane 11,1.2.2-Teitrachloroethane 11,2.2.Trichloroethane 11,2.Dichloroethane 11-Dichloroethane 11-Dichloroethane 2.2.Butanone (Methyl Ethyl Ketone) 2.2.Hexanone	3. Methylthiophene 3. Methylthiophene 4. Methylt.2. Pentanone (Methyl Isobutyl Ketone) Acetone Bromodichloromethane Bromodithoromethane Bromonorthane (Methyl Bromide) Bromonorthane (Methyl Bromide) Carbon tetrachloride Carbon tetrachloride Choromethane (Methyl Chloride) Choromethane (Methyl Chloride) Choromethane (Methyl Chloride) Chloromethane Chloromethane Eliyl Ether Eliyl Ether Eliyl Ether	m&p-Xylene o-Xylene Gyrene Styrene Tetrachloroethene Trans-1.3-Dichloropropene trans-1.3-Dichloropropene trans-1.3-Dichloropropene Vinyl acetate Vinyl caretate Vinyl caretate (vinyl caretate (vinyl caretate (totat)	<i>Tr Volatile Organies</i> 1.2-Dichlorotetrafluoroethane (CFC 114) A Berzene A Earben dioxide A Chlorodifluoromethane A Dichlorofultuoromethane (CFC-12) A Dichlorofultuoromethane (CFC-12) A Dichlorofultuoromethane (CFC-12) A Dichlorofultuoromethane A Dichlorofultuoromethane A Bihner A Bihner A Bihner A Sulfur dioxides A Trichlorofluoromethane A Unknown silane A Unknown silane A

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q046AI-XT2-WG-Historical-37-TH 10/3/2006

OU2 - STERLING	MW-4B MW-4B Upgradient Upgradient 020621AR-01 021217AE-06 6/21/2002 12117/2002	Table Data 12.150000 1000000000000000000000000000000000000	CRA 7830 (71) Appendix A
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS - STERLING SITE 3, EAST GREENBUSH, NEW YORK	MW-4B MW-4B Upgradient Upgradient 030627014-001 03120209-003 6/26/2003 12/1/2003		
SH, NEW YORK	MW 4B Upgradient 0407061-001 71712004		
	MW-4B MW-4B Upgradient Upgradient 042207030-002 A5680607 12772004 6/29/2005		
	-4B MW-4B dient Upgradient 0607 A5E26910 2005 12/13/2005	•••••••••••••••••••••••••••••••••••••••	
<u>ц</u>	MW-4B Upgratient MW4S 5/18/2006		фИбАІ-XT
Page 6 of 68	MW-4B Upgradient MW4A 5/31/2006		9046ALXT2-WC-Historical-37-TH 10/3/2006

Upgradient Upgradient Upgradient U	Tender Tender<	Sample Location:		MW-4B	MW-4B	MW-4B	MW-4B	Arw AR			ļ		
All Main	Alter Alter <th< th=""><th>Sample ID: Sample Date:</th><th></th><th>Upgradient 020621AR-01 6/21/2002</th><th>Upgradient 021217AE-06 12/17/2002</th><th>Upgradient 03062701<u>4</u>-001 6/26/2003</th><th>Upgradient 03120209-003 12/1/2003</th><th>Upgradient 040707061-001 71712004</th><th>Upgradient 041207030-002 121712004</th><th>Upgradient A5680607 Clourone</th><th>MW 45 Upgradient A5E26910</th><th>MW-4B Upgradient MW4S</th><th></th></th<>	Sample ID: Sample Date:		Upgradient 020621AR-01 6/21/2002	Upgradient 021217AE-06 12/17/2002	Upgradient 03062701 <u>4</u> -001 6/26/2003	Upgradient 03120209-003 12/1/2003	Upgradient 040707061-001 71712004	Upgradient 041207030-002 121712004	Upgradient A5680607 Clourone	MW 45 Upgradient A5E26910	MW-4B Upgradient MW4S	
All Mail	Image: Section of the sectio	Parameter	Units							C0071C7 10	C007/C1/71	9/18/2009	
		Phenol Pyrene	mg/L mg/L			,		·	ı	,		ı	
minit minit minit	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	TIC Semi-Volatile Oroanics	à			•		ł		I	,		
affor mg/l a	attack mg/l attack	1 (2H)-Naphthalenone, 3,4-dih A	mg/L	ı									
A mg/l A mg/l A mg/l A mg/l A mg/l A mg/l B mg/l A mg/l B mg/l B <t< td=""><td>Method (1) mg/l (2) mg/l (2)</td><th>1,1 -biphenyi (9CI) A 1-Phenyi-1-cyclonronanaca-ho</th><td>mg/L</td><td>ı</td><td>•</td><td></td><td></td><td></td><td></td><td></td><td>ı</td><td></td><td></td></t<>	Method (1) mg/l (2)	1,1 -biphenyi (9CI) A 1-Phenyi-1-cyclonronanaca-ho	mg/L	ı	•						ı		
All mg/l	Alia Weill A	2,4,6(1H,3H,5H)-Pvrimidinetr A	mg/L	ı	•	ı			. ,			•	
All A mg/r mg/r mg/r mg/r mg/r mg/r mg/r mg/r	All	3H-Pyrazol-3-one, 1,2-dihydr A	mg/L me/L			ı		1		,			
OKA Model OKA Model <t< td=""><td>$\begin{array}{ccccccc} \label{constraints} const$</td><th>4-Piperidine Carboxylic Acid A</th><td>me/L</td><td></td><td>•</td><td>ı</td><td></td><td>ı</td><td></td><td>,</td><td></td><td></td><td></td></t<>	$ \begin{array}{ccccccc} \label{constraints} const$	4-Piperidine Carboxylic Acid A	me/L		•	ı		ı		,			
A mg/l B mg/l	A mg/l A mg/l A mg/l A mg/l A mg/l B mg/l B <t< td=""><th>7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A</th><td>mg/L</td><td></td><td></td><td></td><td>•</td><td>I</td><td>•</td><td>·</td><td>•</td><td></td><td></td></t<>	7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A	mg/L				•	I	•	·	•		
$ \begin{array}{c} 1 \\ 1 \\ 1 \\ 2 \\ 2 \\ 3 \\ 3 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ 4$	1 1	9-Octadecenoic Acid (Z)-(9C) A	mg/L				•	١	·		•	ı	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Amiliar / A Charles A	mg/L							ı	•	t	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Burzensmine, 2 & Dimetrial A	mg/L				• •		1		,	,	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	A mg/L A mg/L Addacentry A mg/L Bit A mg/L <th></th> <td>mg/L</td> <td></td> <td>•</td> <td>,</td> <td></td> <td>•</td> <td></td> <td>•</td> <td></td> <td></td> <td></td>		mg/L		•	,		•		•			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Benzenamine 2 5-dimethyl- A	mg/L	,	,	,		,		•	ı		
$ \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Penzenamine 2 6. dimethat A	mg/L	,		,	,	,		ı	•	,	
A math math math math math math math math	$ \begin{array}{c} \left(\right) \right) \right) \right) \right) \\ \left(\left(\left(\begin{array}{c} \left(\right) \right) \right) \\ \left(\left(\begin{array}{c} \left(\right) \right) \right) \\ \left(\left(\begin{array}{c} \left(\right) \right) \\ \left(\left(\left(\right) \right) \\ \left(\left(\right) \right) \\ \left(\left(\left(\right) \right) \\ \left(\left(\right) \right) \\ \left(\left(\right) \right) \\ \left(\left(\left(\right) \right) \\ \left(\left(\left(\right) \right) \\ \left(\left(\right) \right) \\ \left(\left(\left(\right) \right) \right) \\ \left(\left(\left(\right) \right) \\ \left(\left(\left(\right) \right) \\ \left(\left(\left(\right) \right) \right) \\ \left(\left(\left(\left(\right) \right) \right) \\ \left(\left(\left(\left(\left(\right) \right) \right) \right) \\ \left($	Penzena 11'-Ovidia (OCD A	mg/L		,			,		ı		•	
Kdiatenyi A mg/L	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Benzene (Fthoxymethyl), (OC) A	mg/L		ı			,				•	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Benzenemethanamine NIN-dimethad	mg/L	ı				,	,	•	,	•	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	10.100,100 mg/L 1 10.100,100 mg/L 1 10.100 mg/L 1 1000 mg/L 1 <th>Benzenemethanamine N. mach A</th> <td>mg/L</td> <td></td> <td>,</td> <td>•</td> <td>,</td> <td>,</td> <td>•</td> <td></td> <td>•</td> <td>ı</td> <td></td>	Benzenemethanamine N. mach A	mg/L		,	•	,	,	•		•	ı	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Benzoic Acid. 4-Chloro-(9CI) A	mg/L			I	·	•	,				
$ \begin{array}{c} \mathrm{d} \wedge & \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{d} \wedge & \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{ters} \ \mathrm{b} \\ \mathrm{ters} \ \mathrm{b} \\ \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{ters} \ \mathrm{b} \\ \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{d} \wedge \\ \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{d} \wedge \\ \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{d} \wedge \\ \mathrm{mgr}_{\mathrm{d}} \\ \mathrm{mgr}_{d$	$ \begin{array}{c} \mathrm{d} A & \mathrm{mgr}_{A} \\ \mathrm{d} A & \mathrm{mgr}_{A} \\ \mathrm{tress B} \\ \mathrm{tress B} & \mathrm{mgr}_{A} \\ \mathrm{tress B} \\ \mathrm{tress B} \\ \mathrm{mgr}_{A} & \mathrm{mgr}_{A} \\ \mathrm{mgr}_{A} \\ \mathrm{tress B} \\ \mathrm{mgr}_{A} & \mathrm{mgr}_{A} \\ \mathrm{tress B} \\ tre$	Biphenvl A	mg/L			ı				,			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Butvl ester octadecanoic acid A	mg/L	,	ı			ı		,			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Butyl ester, hexadecanoic acid A	mg/L			ı		,	,		,		
ters A might be migh	ters A $m_{mg/L}^{mg/L}$ A $m_{mg/L}^{mg/L}$	Carboxylic Acid A	mg/L	•	ı	ı		ı	•	ı	,	,	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ters B mg/L Λ mg/L	Chloromethylbenzene isomers A	- 1/9m	•					,			,	
ethyl- A $m_{0,1}^{(k)}$, m	ethyl A mg/L A	Chloromethylbenzene isomers B	ng/L me/I		•	•		ı		,	ı		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Cyclobarbitol A	mg/L		•	÷	ı	ı		,	T		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Cyclopentasiloxane, decamethyl- A	1/Sm									,	
0 A mg/L -	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Cyclopropane Carbonitrile, 2 A	mg/ L			•	ŀ		1	ı	,	ı	
0) A mg/L mg/L	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Diethyltoluamide A	me/L	. ,			•			ı	ı	ī	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Diphenyl ether A	me/1.		•	•	•		•	•	•	'	
$ \begin{array}{c} \left(\right) \right) \right) \right) \\ \left(\left(\left(\left(\begin{array}{c} \left(\right) \right) \right) \right) \\ \left(\left(\left(\left(\left(\left(\right) \right) \right) \right) \right) \\ \left(\left(\left(\left(\left(\left(\right) \right) \right) \right) \right) \\ \left(\left(\left(\left(\left(\right) \right) \right) \right) \\ \left(\left(\left(\left(\left(\right) \right) \right) \right) \\ \left($	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Dodecanoic acid A	-1/9m	r		•				•	•		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	A magh h	Ethane, 1,2-Bis(2-Chloroetho) A	1/9m			•		•		ı			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Ethoxymethyl Benzene A	me/1	•			•			ı		1	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Hexobarital A	me/I	•				•	,	·		,	
A mg/L \cdot	A magle $nagle f$ $nagle $	Lidocaine A	- 19m		•	·	•	ı		,	,	•	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	A mg/L \cdot	Mephobarbitol A	- 19m			•		•		ı	,		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Mepivacaine A	me/1.			•	,			,	ı	,	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Mepivacaine hydrochloride A	- 1/em	•			•		ı	,		ı	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Methyl Thiophene A	me/I.				ı	,				ı	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Noramidopyrine A	me/L				•	1		•		•	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	O-Hydroxybiphenyl A	mg/L	•	,		•	•			,	,	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	o-Foluidine A	mg/L	,				t	•	•		ı	
The first interval is a second secon	The first interval is	Fentazocine A	mg/L		,	,			•	•			
Trivative A mg/L	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		mg/L	1				,		ı	•	ı	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	A Mg/L 1, 2, 1,	rnenoparpital Li-methyl Derivative A	mg/L			,	•		1	•	•	1	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Frenol, (1,1-Dimethylethyl A	mg/L								,	ı	
Ngm	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	rileituu, 4,4-bis(i,1-Dimethyi) A	mg/L	•	•			4	ŗ	I	•		
mg/l mg/l - </td <td>Mg/L -</td> <th>Frienol, 2,4-bis(I-dimethyl, A</th> <td>mg/L</td> <td></td> <td>•</td> <td></td> <td>,</td> <td></td> <td>•</td> <td></td> <td>·</td> <td>•</td> <td></td>	Mg/L -	Frienol, 2,4-bis(I-dimethyl, A	mg/L		•		,		•		·	•	
A contract of the second secon	A () 1/gm 1/gm 1/gm 1/gm 1/gm 1/gm 1/gm 1/gm 1/gm 1/gm 1/gm 1/gm		mg/L	,		ı	,		•	,			
A (Light of the second	A (),2m 1,		mg/L		,	,			•	•		ı	
1/8ш 1/8ш 1/8ш 1/8ш 1/8ш 1/8ш	1/8ш 1/8ш 1/8ш 1/8ш 1/8ш 1/8ш 1/8ш 1/8ш	Phenol, 4,4 - Butylidenebis(2) A	mg/L	·			,			•	•		
1/8ш 1/8ш 1/8ш 1/8ш 1/8ш 1/8ш	1/8ш 1/8ш 1/8ш 1/8ш 1/8ш	Sulfur A	mg/L		•	,						ı	
1/8ш 1/8ш 1/8ш 1/8ш	1/ชิ่ม 1/ชิ่ม 1/ชิ้ม 1/ชิ้ม 1/ชิ้ม	Sulfur, mold. (58) A	mg/L										
mg/L mg/L mg/L mg/L mg/L	ng/L mg/L mg/L mg/L mg/L mg/L	Sulfur, Mol. (S8) (8CI9CI) A	mg/L	,			•			•			
utylphenol A mg/L mg/L mg/L	utyiphenol A mg/L mg/L mg/L mg/L mg/L	Talbutal A	mg/L					•			•	•	
1/Ցա 1/Ցա	ראש עקר געש	Tetramethylbutylphenol A	mg/L								•	,	
		Unknown A	mg/L			ſ			•	•		I	
		Unknown B	mg/L	ı			,			•	•	•	
		Unknown C	mg/L	,							•	•	

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			OU2 - STERLI	ANALYTIC NG SITE 3, EA	ANALYTICAL RESULTS SITE 3, EAST GREENBUG	ANALYTICAL RESULTS - STERLING SITE 3, EAST GREENBUSH, NEW YORK					
Sample Location: Location: Sample ID: Sample Date: Docements		MW-4B Upgradient 020621AR-01 6/21/2002	MW-4B Upgradient 021217AE-06 12/17/2002	MW-4B Upgradient 030627014-001 6/26/2003	MW- <u>4</u> B Upgradient 03120209-003 12/1/2003	MW-4B Upgradient 040707061-001 71712004	MTV-4B Upgradient 041207030-002 12/7/2004	MW-4B Upgradient A5680607 6/29/2005	MW-4B Upgradient A5E26910 12/13/2005	MW-4B Upgradient MW4S 5/18/2006	MW-4B Upgradient MW4A 5/31/2006
r arameter	Units										
Unknown D Unknown E I Inknown F	mg/L mg/L	• •				ı	ı	ı	ł	ı	
	mg/L mg/L	• •		1 1			1 1			• •	•••
Unknown I Unknown I	mg/L mg/L	.,	, ,			. ,		• •			
Unknown J Unknown K	mg/L me/L		·	Ţ							, ,
Unknown L Unknown Alkane A	mg/L me/l.			•		1.			• •		t i
Unknown Amide A Unknown Aromatic A	mg/L							, ,		•	,
Unknown Aromatic B	mg/L mg/L				1 1	1	ŧ		, ,		
Unknown Aromatic D	mg/L mg/L			1	1						т і
Unknown Aromatic E Unknown Aromatic F	mg/L				1 1	1 1					
Unknown Carboxylic Acid A Unknown Carboxylic Acid B	mg/L					1 1					• •
Unknown Nitrogen Compound 1	mg/L mg/L	, ,					1	•	ŗ		
Unknown Oxygenated Compound A Unknown Oxygenated Compound B Unknown Substituted Thionbases A	mg/L	• •		1 1							
Unknown Sulfur Compound A Unknown Thiophene A Warfarin A	ng/L mg/L mg/L	• • • •			1 1 1						1 1 4 1
Metals					I	ı		ı	1		
iron Iron (Dissolved) Mangarese (Dissolved)	mg/L mg/L	15.5 2.97 -				10.3 ND (0.0084)		1 1		-	
Gases Methane	1/ v.m.						ı	I	I	1.14	•
Diel	mg/ L	I	ı	ı	•	I	I		,	0.0028	ı
<i>Biological</i> Microbial Population Aerobic Total Microbial Population Benzene Specific Microbial Population Total Microbial Population	cfu/mL cfu/mL cfu/mL							1 1 1	141		
General Chemistry Alkalinity, Total (As CaCO3) Dissolved Orosanic Carbon (DOC)	mg/L	130	·	Ţ		115	,	,	•	119	
Nitrate (as N) Orthophosphate	ng/L mg/L	- 0.13				- 0.13				3.2	- ND (0.050)
pH pH (water)	10 S		1 1	1 1	1 1	- 6.8	4 I			•••	
Phosphate, Total Sulfate	m.e T/gm	0.68 J	, ,		1 1	_ 0.23		1 1	¥ 1		, ,
Sulfide Sulfite	mg/L Dg/I	ND (0.1) UJ	1.1			22.4 ND (0.1)			• 1	22.6 _	
Total Kieldah Nitroen (TKN) Total Kieldah Nitroen (TKN)	mg/L mg/L	ND(1)UJ 185			• •	ND (1) 172				· ·	• •
Total Organic Carbon (TOC) Total Suspended Solids (TSS)	mg/L mg/L	ND (1) 2.6 J 38			4 1 1	1.4 1.3 210		1 1 1			,
Field Parameters Conductivity Field Dissolved Oxygen	umhos/cm mø/L		343	230	ı	388	330	316	400	0.397	ı
OVA Reading Oxidation reduction potential PH Field Turbidity	ppm millivolts s.u. ntu		6			5.5 4 6.55 67.8		- - - - -	· ·	5.65 -93 6.49	
CRA 7830 (71) Appendix A						2				-	906AL-XT2-WG-Historical-37-TH 10/3/2006

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS

TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample Location: Location: Sample ID: Sample Date:	Parameter	Volatile Organics 1,1,1-Trichtoroethane 1,1,2,2-Tetrachloroethane	1,1,2-Trichloreethane 1,1-Dichloroethane	1,1-Dichloroethene	1,2-Dichloropethane 1,2-Dichloropropane	2-Butanone (Methyl Ethyl Ketone)	2-Methylthiophene	3-Methylthiophene 4-Methyl2-Dostrono (Methyl 1-1-1-1-1-2)	Acetone	Bromodichloromethana	Bromoform	Bromomethane (Methyl Bromide)	Carbon tetrachloride	Chlorobenzene Chlorosthand	Chloroform (Trichloromethane)	Chloromethane (Methyl Chloride)	cis-1,2-Dichloropronene cis-1,3-Dichloropronene	Dibromochloromethane	Ethyl Ether Ethylhenzene	m&p-Xylene	Methylene chloride o-Xylene	Styrene	Tetrachloroethene Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene Trichloroethene	Vinyl acetate	v inyl chloride Xylene (total)	TIC Volatile Organics 1.2-Dichloroterraftuoroothane (CEC 114) A	Benzene A	Carbon dioxide A	Dichlorodifluoromethane (CFC-12) A	Dichlorofluoromethane A	Liethoxymethane A Diisopropyl ether A	Diphenyl ether A	etter A Ethoxymethyl benzene A	Hexane A	suanoi, trimetnyi- A Sulfur dioxides A	Trichloroftuoromethane A	ыкиюмп А Unknown silane A	Semi-Volatile Organics 1,2,4-Trichlorobenzene		CKA /830 (/1) Appendix A
	Units	mg/L	mg/L mg/L	mg/L mg/L	mg/L	mg/L mg/L	mg/L	mg/L	mg/L me/L	mg/L	mg/L me/L	mg/L	mg/L mg/I	mg/L	mg/L	mg/L	mg/L	mg/L mg/L	mg/L	mg/L mg/L	mg/L	mg/L mg/L	mg/L	mg/L mg/L	mg/L	mg/L mg/L	mg/L mg/L	ţ	mg/L mø/l.	mg/L	mg/L	mg/L mg/L	mg/L	mg/L	mg/L mg/L	mg/L	mg/L me/I	mg/L	mg/L mg/L	mg/L) D	
MW-4B Upgradient MW4S 6/26/2006		ND (0.0050)	ND (0.0050) UJ ND (0.0050)	ND (0:0050) ND (0:0050)	ND (0.0050)	(00000) CIN (0000) CIN	IN (10:0) AN	11	ND (0.01) UJ ND (0.01)	ND (0.0010)	ND (0.0050) ND (0.0050)	ND (0.01)	ND (0.0050) ND (0.0050)	ND (0.0050)	ND (0.01)	(10:0) ON	ND (0.0050)	ND (0.0050) ND (0.0050)	ND (0.0050)	ND (0.0050) ND (0.0050)	ND (0.0050)	ND (0.0050) ND (0.0050)	ND (0.0050)	ND (0.0050) ND (0.0050)	ND (0.0050)		(10.0) CIN -			е и	ı		I			•	1					
MW-5B Upgradient GW-AK-11 6(24/1998		(10) ON	ND (0.01) ND (0.01)	ND (0.01) ND (0.01)	ND (0.01)	(10.0) UN (10.0) UN	ND (0.01)	(10:0) CN (10:01) CN	ND (0.01)	ND (0.01)	ND (0.01)	(1070) CIN	ND (0.01)	(1070) CN	ND (0.01)	(10.0) UN (10.0) UN	ND (0.01)	ND (0.01) ND (0.01)	ND (0.01)	ND (0.01) -	ND (0.01)	(10 0) CIN	ND (0.01)	(10.0) CIN (10.0) CIN	(100) CIN	(10:0) CIN	ND (0.01) ND (0.01)				ı	, ,		, ,		ı	ı		• •			
MW-5B Upgradient GW-BKP-025 6/6/2000		ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.01)	ND (0.01)	(10.0) CIN (10.0) CIN	(100) CN	ND (0.005)	ND (0.005)	ND (0.005) ND (0.01)	ND (0.005) J	ND (0.005) ND (0.005)	ND (0.01)	0.002J ND (0.01)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.01)	ND (0.005)	ND (0.005)		ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.01)	ND (0.005) ND (0.005)			1 1	ı	1 1	٠		ı			14	• •		·	
MW-5B Upgradient 020621AR-02 6(21/2002		ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) UJ ND (0.011) I II	ND (0.01)	ND (0.01) ND (0.01)	ND (0.01)	ND (0.01) ND (0.005)	ND (0.005)	ND (0.005) ND (0.01)	ND (0.005)	ND (0.005) ND (0.005)	(10.0) CIN	ND (0.005) ND (0.01)	ND (0.005)	ND (0.005) ND (0.005)	(10:0) ON	ND (0.005) ND (0.005)	ND (0.005)	NID (0.005) NID (0.005)	ND (0.005)	NID (0.005) NID (0.005)	ND (0.005)	ND (0.005)	ND (0.01) -		,		·			1 1	ı		I					
MW-5B Upgradient 040707061-002 7772004			ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	(10:0) ON	(10.01) (10.01)	(10:0) QN	ND (0.01) UJ ND (0.005)	ND (0.005)	NID (0.005) NID (0.01)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.01) UJ	ND (0.005) ND (0.01)	ND (0.005)	ND (0.005)	(500.0) UN	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005)	ND (0.010)			0.1 BIN					,	• •	,	, ,	1 1		•	
MW-5B Upgradient MW5B 5/18/2066	000710110			ı	1 1	ļ		ı		- 10100 0/ CIN	-	ı		,		·	, ,	I	ND (0.0050)	-	t 1	ı	1 1	ı	1.	,			,			I	1 1				•	, ,			•	
MW-5B Upgradient MW5B 612612006	00/17 107 10	NID (0 MEO)	(00000) UJ ND (0.0050) UJ ND (0.0050)	ND (0.0050)	ND (0.0050) ND (0.0050)	ND (0.0050)	U (1010) UN U (1010) UN	-	UD (0:01) UJ	0.0028 J	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	(10:0) ON	ND (0.0050)	ND (0.01) UJ ND (0.0050)	ND (0.0050)	ND (0.0050) ND (0.0050)	ND (0.0050)	ND (0.0050) ND (0.0050)	ND (0.0050)	ND (0.0050) ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	, (10.01) 1		,			1	1 1	I		1 1			r .		ı	
MW-7B OU2 GW-AK-14	9661/07/0		(10.0) UN ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01) ND (0.01)	ND (0.01)	(10.0) UN (10.0) UN	ND (001)	(10:0) CN	ND (0.01)	(10.0) UN ND (0.01)	ND (0.01)	(10.0) CIN (10.0) CIN	ND (0.01)	(10.0) CN	ND (0.01)	ND (0.01)	ND (0.01)	- UD (JU) (IN)	-	(100) CIN	ND (0.01)	(10.0) CIN	ND (0.01)	- UD (0.01)	(10:0) (11)			• 1	ı		,							,	
MW-7B OU2 GW-DJT-015	6/2/2000		ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.01)	ND (0.01)	ND (0.01) ND (0.01)	ND (0.01)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.01) ND (0.005) I	ND (0.005)	ND (0.005) ND (0.01)	0.001 J	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	- UD (J 005)	-	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.01) ND (0.01) ND (0.005)		ı	,		·				٠		ı	L		ı	
MW-7B OU2 020620BH-03	6/20/2002		ND (0.005) UJ ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	(1000) CIN	ND (0.01)	ND (0.01) ND (0.01)	ND (0.01)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.01) ND (0.005)	ND (0.005)	ND (0.005) ND (0.01)	ND (0.005)	ND (0.01)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.01)	ı		ı	۰.	•	•••	,	1 1	ŀ			1 1	1		q046AI-XT2-WG-Historical-37. (0/3/2

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

Sample Location:		MW-4B	MW-5B	MW-5B	MW-5B	MW-5B	MW-5B	MW-5B	MW-7B	MW-7B	MW-ZR
southon: Sample ID: Sample Date:		Upgradient MW4S 6/26/2006	Upgradient GW-AK-11 6/24/1998	Upgradient GW-BKP-025 6/6/2000	Upgradient 020621AR-02 6/21/2002	Upgradient 040707061-002 7/7/2004	Upgradient MW5B 5/18/2006	Upgradient MW5B 6/26/2006	OU2 GW-AK-14 6175/1008	OU2 GW-DJT-015	0U2 020620BH-03 617017027
Parameter	Units									0007770	7007/07/0
1,2-Dichlorobenzene	me/L	,		1							
1,3-Dichlorobenzene 14-Dichlorobenzene	mg/L	,	ı	ı					1 1		•
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) effer)	mg/L	1	I	ı		ı	·			1	
2,4,5-Trichlorophenol	mg/L						I	•	I		٠
2,4,0- Lthchlorophenol 2.4-Dichloronhenol	mg/L	ı	t	,		ı				• •	
2,4-Dimethylphenol	mg/L				•	ł	ı		ı	ı	
2,4-Dinitrophenol	mg/L	ı	ı	. ,	• •		1 1				ı
2,4-Duntrotoluene 2,6-Dinitrotoluene	mg/L			I	,		ı	I		1 1	
2-Chloronaphthalene	mg/L me/I	1		ı	ı	•	•	ı	ı		ı
2-Chlorophenol	mg/L				. ,			ı	ł	ı	
2-Methylnaphthalene 2-Methylnaphthalene	mg/L	•	,	,		•					• •
2-Nitroaniline	mg/L mg/I			I	,		ı	١	,	ı	
2-Nitrophenol	mg/L			1 1			ı	ı	ı		
3,3'-Lhchlorobenzidine	mg/L	ı		,		•					
o-runroarume 4.6-Dinitro-2-methvinhend	mg/L	,			r	ı		,	ı		
4-Bromophenyi phenyi ether	me/L		ı	·	ı	ı	·		,	ı	
4-Chloro-3-methylphenol	mg/L					1 1			ı	ı	ı
4-Chloroaniline	mg/L	,	,	ī	,						
4-Cruoropnenyl pnenyl ether 4-Methvinhenol	mg/L	ı	ı		ı	•			ı		
4-Nitroaniline	mg/L me/L			a	•	ı	ı			ı	ı
4-Nitrophenol	mg/L	,					1 1	1			•
Acenaphthene	mg/L	ı	ı	•	•	. 1					
Anthracene	mg/L	•	•	ı	•	•	ı	ı	I		
Benzo(a) anthracene	mg/L mg/L				•••		ı	I	I	ŀ	ı
Benzo(a)pyrene	mg/L	ı	•	ı							
Benzo(a h i)nemiana Benzo(a h i)nemiana	mg/L	•	ı	•	ı	•		ı	ı	ı	,
Benzo(k.)fluoranthene	mg/L	•	·	•	ı	•	ı	I	I	ı	,
Benzoic acid	mg/L		1 1		1 1	• •					
Benzyl Alcohol	mg/L	ı	,		,	,	,	•			
01s(z-t_nloroethoxy)methane his(2-Chlornethvl)ether	mg/L	I		,	·		ı	•		ł	
bis(2-Ethylhexyl)phthalate	mg/L						1	•	•	•	·
Butyl benzylphthalate	mg/L	,		•		ı	. 1			• •	
Carpazote Chrysene	mg/L	ł	ı	•	,		ı	·		ı	Ţ
Dibenz(a,h)anthracene	mg/L										
Dibenzofuran Disetant aktik alata	mg/L	•	ı	ı	•	ı	ı	,	ı		
Dimethyl phthalate	mg/L		•	I	·			•	•	•	
Di-n-butylphthalate	mg/L										1
Di-n-octyl phthalate	mg/L	ı				I					
riuoranmene Fluorene	mg/L	ı	·			•	ı	•	,		
Hexachlorobenzene	mg/L me/l.					•	ı		ı	ŀ	ı
Hexachlorobutadiene	mg/l	•	ı						, ,		
Hexachlorocyclopentadiene Hevachloroothane	mg/L			٠	·		ı		ı	•	•
Indeno(1,2,3-cd)pyrene	mg/L mg/L		τ.		, ,						
Isophorone Namhthalano	mg/L	•	•	·	ı	ı			·		
Nitrobenzene	mg/L me/L	• •	1 1				ı	ı	ı	,	,
N-Nitrosodi-n-propylamine	mg/L	,	·	·	ł		. 1				
N-NITrosociphenylamine Pentachlorophenol	mg/L me/L	1 1	• •		I	,	,	I	ı	•	•
Phenanthrene	mg/L							, 1		• •	

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

Sample Location: Location:		MW-4B Upgradient	MW-5B Upgradient	MW-5B Unoradient	MW-5B Ilmoradiont	MW-5B	MW-5B	MW-5B	MW-7B	87-WM	MW-7B	
sample 111: Sample Date:		MW4S 6/26/2006	GW-AK-11 6/24/1998	GW-BKP-025 6/6/2000	020621AR-02 6/21/2002	040707061-002 7/7/2004	5/18/2006	upgraatent MW5B 6/26/2006	042 GW-AK-14 6(25/1998	0U2 GW-DJT-015 6/2/2000	0U2 020620BH-03 6/20/2002	
Parameter	Units									000717/0	70070710710	
Phenol Pyrene	mg/L mg/L	• •	1.1			·	,	·	,			
TIC Semi-Volatile Organics 1 (2H)-Naphthalenone, 3,4-dih A	mg/L	,					I	ſ	•	•	ı	
1,1'-Biphenyl (9CI) A 1-Phenyl-1-cyclopropanecarbo	mg/L		ı				• 1	• •			, ,	
2,4,6(1H,3H,5H)-Pyrinidinetr A	mg/L		1 1	1 1					·	,		
4-Piperidine Carboxylic Acid A	mg/L mg/L				1	ı					1 1	
7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A 9-Octadecenoic Acid (7)-(9C) A	mg/L	ı	,			1 1	• •	• •	• •		, ,	
Aminopyrine A	mg/L mg/L			4 I		• •			ı	. 1		
Auuure (ALN) (8LI) A Benzenamine, 2,6-Dimethyl A	mg/L	ı		ı					1 1	• •	• •	
Benzenamine 2,4-dimethyl- A	mg/L			• •			ı	ı	ı	·	Ţ	
penzenamine,2,5-dimethyl- A Benzenamine,2,6-dimethyl- A	mg/L	·	ı	ı	ı	•				11		
Benzene, 1,1'-Oxybis (9CI) A	mg/L mg/L					•	ı	,	ı	·		
Benzene (Ethoxymethyl)-(9C) A Benzenemethanamine N N-dimotrul A	mg/L	ł	ı				• •					
Benzenemethanamine, N-methyl A	mg/L mg/L			• •	ı		ı	ı	,			
Benzoic Acid, 4-Chloro-(9CI) A Binhenvi A	mg/L	ı	·					1 1		·	ł	
Butyl ester octadecanoic acid A	mg/L	·	ı	•	1		ı	ı	. 1			
Butyl ester, hexadecanoic acid A	mg/L mg/L			11	1 1		ı		ı	ı		
Chloromethylhenzene icomous A	mg/L	•	ı	ı	•	,	• •				• •	
Chloromethylbenzene isomers B	mg/L me/L			ı	,	·	ı	·	ı			
Cyclobarbitol A	mg/L				, ,			ı	•	,	1	
Cyclopentasiloxane, decamethyl- A Cyclopropane Carhonitrile 2 A	mg/L	ı	ı					1 1		, ,	1 1	
Diethyltoluamide A	mg/L mg/L	1-1	1 1			ı		ı	•	ŗ		
Diphenyl ether A Dodecanoic acid A	mg/L	ı	,					1 1	1 1	, 1		
Ethane, 1,2-Bis(2-Chloroetho) A	mg/L mg/l				•	ı	ī					
Ethoxymethyl Benzene A	mg/L				1 1				1 -	١	ł	
Hexobarital A Lidocaine A	mg/L	·		•	ı				1 1		ŧ ı	
Mephobarbitol A	mg/L	1 1						ı	ı	I		
Mepivacaine A Menivacaine hudrochlorida A	mg/L		ı	ı	,	ı	- 1	, i			1 1	
Methyl Thiophene A	mg/L me/L				·	ı		•		ı	1	
Noramidopyrine A	mg/L	ı	,			• •	, ,	1 1	1 1	11		
o-Toluidine A	mg/L	·	,	ı		·		ı	ı		ı	
Pentazocine A	mg/L						•	١	ı		•	
Phenobarbital A	mg/L	•		•	,							
r iteritotatuitat Lit-methyl Lenvative A Phenol. (1.1-Dimethylefhyl A	mg/L	ł	·	•	•	·	t		,	,		
Phenol, 2,4-Bis(1,1-Dimethyl) A	mg/L me/L	1 1		a 1	•	ı	·	ı	ı		ı	
Phenol, 2,4-bis(1-dimethyl A	mg/L						1	·	•	ı		
Phenol, 4-(1,1,3,3-Tetrameth Phenol, 4-(2,3,3,2,Tetrameth) A	mg/L		ļ	,					1 1			
Phenol, 4,4'-Butylidenebis(2) A	mg/L mg/L	, ,				1		ı	ı			
Sulfur A Sulfur modd (S8) A	mg/L	ı	,	•							• •	
Sulfur, Mol. (S8) (8CI9CI) A	mg/L mg/L								ı			
Talbutal A Trenomediation to the second	mg/L	ı	ı		ı							
Unknown A	mg/L me/L	• •		1			,	ı	•	ı	·	
Unknown B Unknown C	mg/L	•	ı	ı			, ,	1 1				
	шg/ г		ı		ı		ı	ı	ı	ı	ı	

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

Sample Location: Location: Sample ID: Sample Date:	Parameter	Unknown D Unknown E	Unknown F	Unknown G Unknown H	Unknown I	Unknown J	Unknown L	Unknown Alkane A	Unknown Amide A	Unknown Aromatic A	Unknown Aromatic B Unknown Aromatic C	Unknown Aromatic D	Unknown Aromatic E	Unknown Aromatic F	Unknown Carboxylic Acid A Unknown Carboxulic Acid B	Unknown Nitrogen Compound 1	Unknown Oxygenated Compound A	Unknown Oxygenated Compound B	Unknown Sulfur Compound A	Unknown Thiophene A	Warrarin A	Metals	цон Iron (Dissolved)	Manganese (Dissolved)	Gases	Methane	Biological Aerohic Totel Microchiel Boundation	putation Population		General Chemistry	Alkaunity, Total (As CaCO3) Dissolved Organic Carbon (DOC)		Urtnopnosphate pH	pH (water)	Phosphate, Total Suifate				Total Organic Carbon (TOC)			q		uction potential	pH Field Turbidity		CKA 7830 (71) Appendix A
	Units	mg/L	mg/L	mg/L	mg/L	mg/L mg/L	ng/L	mg/L me/l	me/L	mg/L	mg/L	mg/L	mg/L mø/I	mg/L	mg/L	mg/L	mg/L me/L	mg/L	mg/L	mg/L mg/L	mg/L		mg/L	mg/L		ng/L		cfu/mL cfu/mL	cfu/mL		mg/L			s.u.	mg/L	mg/L mg/I	mg/L mg/L	mg/L	mg/L me/L	ng/L		E	mg/L	ppm millivolts	s.u.	1911	
MW-4B Upgradient MV4S 6/26/2006		•	1 1	ı			ŗ	t	• •	ı		,	,		' .	,		ı	ł	11	ı		- 0 570 1	0.118 J		0.022		I			175	- ND (0.050)	, I	1 1	I	14.4						0.306	0.89	- 63	7.49	11	
MW-5B Upgradient GW-AK-11 6(24/1998		ł		ı	ı			ł	ı				•		,		1	. 1	ı				47.9			ı					320	0.05	0.92			1.5		375	5.88 NID /11)	51 51						I	
MW-5B Upgradient GW-BKP-025 6(6/2000		ı	•		,	1 1	ı			ŧ ۱			1	ı		ı	I	1 1	ı		,		36.3	23.6		I		·	1 1		340								5.88 13			ı	ì	• •			
MW-5B Upgradient 020621AR-02 6/21/2002		ı		Ŧ 1				ı	ı			,	•	,	, ,	ı			,		• •		4.76	1.75 -		,		,			132	- 0	-	,	0.371	19.4	ND (0.1) UJ	468 468	(I) (I)	2.6J 24.5				ı	1 1		
MW-5B Upgradient 0407051-002 71712004		1	•	1	ı	ı	Ļ,		•	•	1				, ,	ı	I			ı			3.45	0.375				ı	, ,		130		- 00 -	6.7	- 0.31	28.5	ND (0.1)	ND (1) 208	6	57 B	60	016	2.86	' 1	-79 6.52	36.5	
MW-5B Upgradient MW5B 5/18/2006		1	ı			·		, ,		,	,			ł	•		ı	ı		ı	• •		ı	37.1 3.16	01.0	3.3 D		ı	ı	ı	258	12.1	(0:0:0) (TN	ı	ŧ	ND (4.0)		·	,	ı			2.98 2.98	1	-124 6.62	5.4	
MW-5B Upgradient MW5B 6/26/2006				ı		,	ı		,	·	ı		,	ı	ı		,	ı							•	,			ı		,			ı			,		• •				0.729	1	-111 8.04	11	
MW-7B 0U2 GW-AK-14 6(25/1998			ı	ı		•	ı	, ,	ı	ı	ı	1		ı	ı			ı			• •		36.5	29.5	·	1		,	ı	,	180	2	0.02	<u>,</u>	6.9	- 121	1 '		ND (3.08)	ND (2.5)	38			I		ı	
MW-7B OU2 GW-DJT-015 627/2006	00071710		• •	ı	1	14	·		1		ı			,	,			ŀ			ı	ı	29.8	17.6	I				ı	•	105	-							528 1.68				1	1 1	I		
MW-7B 0U2 020620BH-03 62701200	7007/07/0		, ,	ı			'			ı			1	. 1		•		ſ	¢		,	•	21.4	1.21	ı		t	1			010		0.05		•	0.19 J 246	ND (0.1) UT	(I) (I)	785 ND (1)	2.6]	64					1 1	o046AFXT2-WG-Historical-37-1

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		Ū	OU2 - STERLIN	TAF GROUN ANALYTIC AG SITE 3, EA	TABLE A.1 GROUNDWATER ANALYTICAL RESULTS SITE 3, EAST GREENBU	TABLE A.1 GROUNDWATER ANALYTICAL RESULTS U2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK	ORK				Page 13 of 68
Sample Location: Location: Sample ID: Sample Date: Parameter	Units	MW-7B 012 040702001-005 7/1/2004	MW-7B OU2 040702001-006 711/2004 Duplicate	MW-7B 0U2 MW7 6/26/2006	MW-8B 0U2 GW-AK-17 6(25/1998	MW-8B 0U2 GW-DJT-014 6/2/2000	MtW-8B OU2 020620BH-04 6/20/2002	MW-8B 0U2 042 76/2004	MW-8B 0U2 MW8 6/26/2006	MW-9A 0U2 GW-AK-20 6/25/1998	MW-9A 0U2 GW-BKP-021 65/2000
Volatife Organics 1.1.1.2.2. Tetrachloroethane 1.1.2.2. Tetrachloroethane 1.1.2. Tetrachloroethane 1.1.2. Dickloroethane 1.1.2. Dickloroethane 1.1.2. Dickloroethane 1.2. Dickloroethane 1.2. Dickloroethane 1.2. Dickloroptophene 2. Hexanone 2. Hexanone 2. Hexanone 3. Methyl Ethyl Etholne 8. Exanone 8. Exanone 9. Exanone 1.3. Dicklorophene 1.3.	1、2011年1月11日1日1日1日1日1日1日1日1日1日1日1日1日1日1日1日1日	ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.005) ND (0.05	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.005) ND (0.005)	(10,0) UN (0200.0)	U C C C C C C C C C C C C C C C C C C C	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.005) ND (0.005)	ND (0.005) U ND (0.005) U ND (0.005) U ND (0.005) ND (0.005) U ND (0.005) U ND (0.007) U ND (0.007) U ND (0.005) U ND (0.0	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.005) ND (ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.01) U (0.0050) ND (0.01) U (0.0050) ND (0.01) U (0.0050) ND (0.0050) ND	ND (100) (10	ND (0.00) ND (0.
1.2-Dichlotoretrafluoroethane (CFC 114) A Benzene A Carbon dioxide A Carbon dioxide A Chorodifluoromethane (CFC-12) A Dichlorodifluoromethane (CFC-12) A Dichlorodiluoromethane A Dichlorophyl ether A Diphenyl ether A Diphenyl ether A Bilanol, trimethyl A Ether A Bilanol, trimethyl A Silanol, trimethyl A Silanol, trimethyl A Silanol, trimethyl A Silanol, trimethyl A Silanol, trimethyl A Dibnown A Trichlorobluoromethane A Dibnown Bilane A Dibnown Bilane A Dibnown Bilane A Dibnown Bilane A Dibnown Bilane A	」 1 1 1 1 1 1 1 1 1 1 1 1 1	0.1 BJN	0.04 JN 					NI81.0			

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		0	GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK	GROUN ANALYTIC 5 SITE 3, EA	GROUNDWATER ANALYTICAL RESULTS SITE 3, EAST GREENBU	S BUSH, NEW Y	ORK			-	
Sample Location: Location: Sample ID: Sample Date:		MW-7B OU2 040702001-005 7/1/2004	MW-7B 0U2 040702001-006 7/1/2004	MW-7B 0U2 MW7 6(26/2006	MW-8B 0U2 GW-AK-17 6/25/1998	MW-8B OU2 GW-DJT-014 6777001	MW-8B 0U2 020620BH-04 020620BH-04	MW-8B 0U2 0407001-006	MW-8B OU2 MW8	MW-9A 0U2 GW-AK-20	MW-9A OU2 GW-BKP-021
Parameter	Units		Duplicate			00071700	7007/07/0	//6/2004	6/26/2006	6/25/1998	6/5/2000
1,2-Dichlorobenzene 1,3-Dichlorobenzene	mg/L me/L		,			ı	ı		,		
1,4-Dichlorobenzene 2.2'-oxvhis(1-Chloronronae) Ais// -ktoi: // // // //	mg/L			• •	• •	• •	1 1	·	ı		• •
2.4.5-Trichlorophenol 2.4.5-Trichlorophenol 2.4.5-Trichlorophenol	mg/L mg/L		• •			I	1				• •
2,4-Dichlorophenol 2,4-Dichlorophenol	mg/L	·	ł			• •		1 1		• •	
2,4-Dimethylphenol 2,4-Dimitrophenol	mg/L mg/L	1 1					·	·			
2.4-Dinitrotoluene	mg/L mg/L			ı	•	•					1.1
2,6-Dunitrotoluene 2-Chloronaphthalene	mg/L	1	J		, ,		• •		• •		۰.
2-Chlorophenol 2-Methylnanshthalana	mg/L				1 1			·	ı	ı	·
2-Methylphenol	mg/L mg/L					ı	• •	, ,			
2-Nitroaniline 2-Nitrophenol	mg/L	ı		1 1	۰,		, ,			,	ı
3,3-Dichlorobenzidine	mg/L mg/L						ı	ı			
3-Nitroaruine 4,6-Dinitro-2-methylphenol	mg/L		ı			, 1					1
4-Bromophenyl phenyl ether	mg/L mg/L				• •		,	ı	ı		1)
4-Chloroaniline	mg/L	ı		,	·				1.1	ı,	• •
4-Chlorophenyl phenyl ether	mg/L	, ,	1 1	• •		1	•	ı	ı	ı	
4-MetnyIphenol 4-Nitroaniline	mg/L			,		1 1	+ 1	••	1 1	· 1	
4-Nitrophenol	шg/L mg/L			, ,	• •	1 1	1	·	ı		
Acenaphthone Acenaphthylene	mg/L	ı		ı	ı			• •	1 1	• •	
Anthracene Benzolalanthroom	mg/L	1 1		1 1	1 1			1 1		,	I
Benzo(a)anuracene Benzo(a)pyrene	mg/L me/L				I	·			1 1	••	
Benzo(b)fluoranthene Benzolo h itrastiane	mg/L		, ,		1 1	t í					ı
Benzo(k)fluoranthene	mg/L mg/L	• •			ı	•	ı	т.	• •		• •
Benzoic acid Benzyl Alcohol	mg/L		ł								
bis(2-Chloroethoxy)methane	mg/L		• •		, ,				ı	ı	ı
bis(2-Ethylhexyl)phthalate	mg/L me/L	, ,	1	·		I	·		, ,		• •
Butyl benzylphthalate Carbazole	mg/L	1		• •	11			1 1			
Chrysene Diboordo kharth	mg/L			l r				1			•
Dibenzofuran	me/L	i 1	·	t	ı	,			• •		• 1
Diethyl phthalate Dimotyci actuals	mg/L				• •				ı	,	
Di-n-butylphthalate	mg/L me/L		ı			·		,		н т	
Di-n-octyl phthalate Elstreamhana	mg/L	•							•	ı	
r tot allucene	mg/L mg/L			ī	ı		ı			۲ I	1 1
Hexachlorobenzene Hevachlorobinitacione	mg/L		• •			• •	1 1		1	I	·
A resolution of the second s	mg/L mg/L					ı					, 1 1
Hexachloroethane Indeno(1,2,3-cd)ovrene	mg/L	·	ļ		1 1						
Isophorone Namhthalane	mg/L								• •	1	
Nitrobenzene	mg/L mg/L						,	ı			
N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine	mg/L mg/L					a	1 4		• •		1.1
Pentachlorophenol Phenanthrene	mg/L mg/L		• •		•••				1.1	t ı	· •
CRA 7830 (71) Appendix A							I	,	•		ı

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TABLE A.1 GROUNDWATI

CRA 7830 (71) Appendix A

q046AI-XT2-WC-Historical-37-TH 10/3/2006

Sample Location: Location: Sample Date: Sample Date: Parameter Phenol Pyrene	Units mg/L mg/L	MW-7B OU2 040702001-005 7/1/2004	MW-7B 012 040702001-006 7/112004 Duplicate	MW-7B OU2 MW7 6/26/2006	MW-8B 0U2 GW-AK-17 6/25/1998	MW-8B OU2 GW-DJT-014 6122000	MW-8B OU2 020620BH-04 6/20/2002	MW-8B OU2 040707001-006 716/2004	MW-8B 0U2 MW8 6/26/2006	MW-9A 0U2 GW-AK-20 6/25/1998	MW-9A 012 645/2000 645/2000
III Semi-Volatile Organics III Shorth Collatile Organics III Phonyl-1-Sycloproparcentho 2,46(11,311;31;P)-Pyrindiater A 31:1-Bipteryl (CA) A 31:Pyreridine Carboxylic Acid A 31:Pyreridine Carboxylic Acid A 31:Pyreridine Carboxylic Acid A Aminopyrine A Berzenemethanamine, Nh-dimethyl A Berzenemethylenyl A Coloparital A Coloparital A Cyclobarbitol A A Bertol 2,24Biylidenee A Methyl Dilamide A Methyl Dilamide A Methyl Dilamide A Methyl Dilamide A Methyl Dilamide A Methyl Di	1.2.8m 1.2.8m										

q046A4-XT2-WG-FB4 orice1-37-TH 10/3/2006

Page 16 of 68	MW-9A 0U2 GW-BKP-021 6/5/2000					- - - - - - - - - - - - - - - - - - -
	MW-9A 0U2 GW-AK-20 6/25/1998			1 1 1 1		
	MW-8B OU2 MW8 6/26/2006					0.727 1.01 - 7.5 4
	MW-8B 0112 040707001-006 7/6/2004		14.6 0.729		130 130 130 130 137 130 130 130 130 130 130 130 130 130 130	1040 2.89 - 4 6.44 45.3
YORK	MW-8B 0U2 020620BH-0 4 6/20/2002		7.54 0.662		140 140 0.55 0.55 0.55 0.17 1 205 0.01 0.01 0.01 1.12 1.12 1.12 2.23 18.5	
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS - STERLING SITE 3, EAST GREENBUSH, NEW YORK	MW-8B 0U2 GW-DJT-014 6/2/2000		31 19.3 -		105 0.07 0.28] 0.28] 0.28 0.28 5.308 6.3 8.58 6.1 41	
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS SITE 3, EAST GREENBU	MW-8B 0U2 GW-AK-17 6/25/1998		40.7 38.2 -		140 - 140 - 0.02 - 0.28 247 - 247 - 247 - 247 - 247 - 247 - 31 - 31	
TA GROU ANALYTI G SITE 3, E	MW-7B OU2 MW7 6/26/2006		1 7 1 1			1.13 - 314 7.28 999 >
OU2 - STERLIN	MW-7B 0U2 040702001-006 7/1/2004 Duplicate		58.8 ND (0.0084) -		220 - 20 - 70 J - 70 J - 197 - 118 - 22 - 22 - 22 - 240 - 11	
	MW-7B 012 040702001-005 7/1/2004		233 ND (0.0084) -		210 ND (0.02) - 70J - 7.0 2.7 2.7 2.7 2.7 2.7 2.7 2.7 6.48 MD (1) (1) 11 1256	1070 3.01 - 80 6.53 60.7
	Units	イン 2 2 2 2 2 2 2 2 2 2 2 2 2	ng/L mg/L mg/L mg/L	cfu/mL cfu/mL cfu/mL	า/ชิน 1/ชิน	umhos/cm ppg/L ppgr mullivols s.u. ntu
	Sample Location: Location: Sample ID: Sample Date: Parameter	Unknown D Unknown E Unknown F Unknown H Unknown I Unknown I Unknown J Unknown A Unknown Aromatic A Unknown Aromatic B Unknown Aromatic B Unknown Aromatic B Unknown Aromatic B Unknown Aromatic E Unknown Aromatic E Unknown Aromatic E Unknown Aromatic E Unknown Aromatic E Unknown Aromatic A Unknown Aromatic E Unknown Aromatic A Unknown Aromatic A Unknown Aromatic A Unknown Aromatic A Unknown Sulfur Compound A	Metals Iron (Dissolved) Manganese (Dissolved) Gases Methane	<i>Biological</i> Aerobic Total Microbial Population Benzene Specific Microbial Population Total Microbial Population	General Chemistry Alkalinity, Total (As CaCCO3) Bissolved Organic Carbon (DOC) Nitrate (as N) Orthophosphate pH PH (water) Phosphate, Total Suffice Suffice Suffice Suffice Suffice Cotal Dissolved Solids (TDS) Total Organic Carbon (TOC) Total Suspended Solids (TSS)	Field Parameters Conductivity Field Dissolved Oxygen Ovd Reading PH Field Turbidity CRA 7830 (71) Appendix A

Turn bit	Sample Location:		MTW_9A	OU2 - STERLIN	ANALYTICAL RESULTS STERLING SITE 3, EAST GREENBUSH, NEW YORK	ANALYTICAL RESULTS SITE 3, EAST GREENBU	TS BUSH, NEW	YORK					
	Location Sample D: Sample Date:		MW-9A OU2 020621AR-03 6/21/2002	MW-9A OU2 040701003-002 6/30/2004	MW-9A OU2 MW9A 6(26(2006	MW-9B OU2 MW-AK-02 12/9/1997	MW-9B OU2 MW-AK-03 12/9/1997	MW-9B OU2 GW-AK-31 6/29/1998	MW-9B 0U2 GW-AK-32 6(29(1998	MW-9B 0U2 GW-AK-03 12/15/1998	MW-9B OU2 MW-JR-04 6/14/1999	MW-9B OU2 MW-JR-05 611411999	MW-9B 0U2 MW-JR-04 1218/1000
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Parameter	Units					Duplicate		Duplicate			Duplicate	•
	Volatile Organics 1,1,1-Trichloreethane	mg/L	ND (0.005)	ND (0.005)	(0500 0) CIN								
	1,1,2,2-1 etractioroethane 1,1,2,2 Trichloroethane	mg/L mg/L	NID (0.005) NID (0.005)	ND (0.005) ND (0.005)	ND (0.0050) UJ ND (0.0050)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	(100) CIN	(10:0) CIN (10:0) CIN	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)
(Hota) (Hota)<	1,1-Dichloroethane 1,1-Dichloroethene	mg/L mg/L	ND (0.005) ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.005)	ND (0.005)	(10.0) UN	(10:0) CIN (10:0) CIN	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)
() ()<	1,2-Dichloroethane 1.2-Dichloronronane	1/8u	ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	(10.0) CIN (10.01) VID (0.01)	(10.0) CIN (10.0) CIN	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	
	2-Butanone (Methyl Ethyl Ketone)	mg/L mg/L	ND (0.005) ND (0.01) UI	ND (0.005) ND (0.01) LH	ND (0.0050) ND (0.01) I II	ND (0.005)	ND (0.005)	(100) CN	ND (0.01)	ND (0.005)	ND (0.005)	ND (0:005)	
	2-nexanone 2-Methylthiophene	mg/L me/I	(10.01) (10.01) (10.01)	ND (0.01)	ND (0.01) UJ	ND (0.01)	(1070) ON	(10:0) CIN	(10:0) CN (10:0) CN	(10:0) CIN (10:0) CIN	ND (0.01) ND (0.01)	ND (0.01) ND (0.01)	
	3-Methylthiophene 4-Methyl-2-Pentanone (Methyl Fochuri 1700-20	mg/L	ND (0.01)	ND (0.01)	, ,	ND (0.005)	ND (0.005)	ND (0.01) ND (0.01)	(10:0) CIN (10:0) CIN	- ND // 005)	ND (0.01)	ND (0.01)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Acetone Brances	mg/L	(10.0) UN ND (0.01)	(10.0) CIN UD (0.01) CIN	ND (0.01) UJ ND (0.01)	ND (0.01) ND (0.01)	ND (0.01) ND (0.01)	(10.0) ON ND (0.01)	ND (0.01)	(100) CN	(100) CN	ND (0.01)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Bromodichloromethane	mg/L mg/L	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.0010) ND (0.0050)	ND (0.005) ND (0.005)	ND (0.005)	0.001 J	(10.0) QN	ND (0.005)	ND (0.05)	0.02) ND (0.005)	
	bromororm Bromomethane (Methyl Bromide)	mg/L	ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.005)	ND (0.005)	(10:0) ON ND (0:01)	ND (0.01)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Carbon disulfide	mg/L	ND (0.005)	ND (0.01) ND (0.005)	ND (0.01) ND (0.0050)	ND (0.01) ND (0.005)	ND (0.01) ND (0.005)	(10.0) CIN	(10.0) CIN	ND (0.01)	ND (0.01)	(10.0) CIN	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Carbon tetrachloride Chlorobenzene	mg/L	ND (0.005) ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.005)	ND (0.005)	(10:0) QN	(10:0) GN	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Chloroform (Trickloromothand)	n.ev.r.	ND (0.01)	(cm:n) dN (D (10:0) DN	(0:00) UN ND (0:01)	ND (0.005) ND (0.01)	ND (0.005) ND (0.01)	ND (0.01) ND (0.01)	(10.0) CN (10.0) CN	ND (0.005) ND (0.01)	ND (0.005) ND (0.01)	ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Chloromethane (Methyl Chloride)	mg/L mg/L	ND (0.005) ND (0.01)	ND (0.005) ND (0.01)	ND (0.0050) ND (0.011 I II	ND (0.005) ND (0.01)	ND (0.005)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	cis-1,2-Dichloroethene cis-1,3-Dichloropropene	ng/L	ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.005)	ND (0.005)	(100) ON ND (0.01)	(10.0) CIN (10.0) CIN	ND (0.01) J ND (0.005)	ND (0.01) ND (0.005)	ND (0.01) ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Dibromochloromethane	mg/L mg/L	ND (0.005)	ND (0.005) ND (0.005)	ND (0.0050) ND (0.0050)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.01)	(10.0) UN	ND (0.005)	ND (0.005)	ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ethyi Ether Ethyibenzene	mg/L me/L	ND (0.01) ND (0.005)	ND (0.01)	ND (0.0050)	ND (0.005)	ND (0.005)	0.04	0.034	(c00.0) UN 0.013	ND (0.005) ND (0.01)	ND (0.005) ND (0.01)	
$ \begin{array}{ccccccc} & & & & & & & & & & & & & & & &$	m&p-Xylene Methulene chloride	mg/L	ND (0.005)	ND (0.005)	ND (0.0050)		(500.0) UN	ND (0.01)	ND (0.01)	ND (0.005) -	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	o-Xylene	mg/L mg/L	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.0050) ND (0.0050)	ND (0.005) -	ND (0.014) -	ND (0.012)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	atyrene Tetrachloroethene	mg/L mg/L	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.0050) ND (0.0050)	ND (0.005) ND (0.005)	ND (0.005)	(10.0) CIN	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Toluene trans-1,2-Dichloroethene	l/gui	ND (0.005)	ND (0.005)	0.0043 J	ND (0.005)	ND (0.005)	(10:0) CN (10:0) CN	ND (0.01) ND (0.01)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	trans-1,3-Dichloropropene Trickloroothoro	mg/ r mg/ r	ND (0.005)	ND (0.005) ND (0.005)	ND (0.0050) ND (0.0050)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.01) ND (0.01)	ND (0.01) ND (0.01)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Vinyl acetate	mg/L mg/L	ND (0.005) -	ND (0.005) -	ND (0.0050)	ND (0.005) ND (0.01)	ND (0.005)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	
thate (CFC 114) A $m_{g/1}^{g/1}$, $(1, 2, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,$	Vinyl chloride Xylene (total)	mg/L mg/L	ND (0.01) -		ND (0.01) -	ND (0.01) ND (0.05)	ND (0.01) ND (0.05)	ND (0.01) ND (0.01)	ND (0.01) ND (0.01)	ND (0.01) ND (0.01) ND (0.06)	ND (0.01) ND (0.01)	(10:0) CN (10:0) CN	
$ \begin{array}{cccccc} \label{eq:character} \mbox{mg/L} & \mbox{r} & \mbox{r} & \mbox{mg/L} & \mbox{r} & \mbox{r} & \mbox{mg/L} & \mbox{r} & \m$	TIC Volatile Organics 1 2-Dichlorobern-Burecostherne (CEC 114) A	ł						•					
$ \begin{array}{ccccccc} A & & & & & & & & & & & & & & & & & & $	Benzene Astronomiane (CrC 113) A Benzene Astronomiane (CrC 113) A Carbon discusto A	mg/L mg/L											
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Chlorodifluoromethane A	mg/L me/L		0.2 BJN	ı		,	ı	ı	,	,	·	
$\mathbf{A} = \begin{bmatrix} \mathbf{n} & \mathbf{n} & \mathbf{n} \\ \mathbf{n} & \mathbf{n} \\ \mathbf{n} & \mathbf{n} \\ \mathbf{n} $	Dichlorodifluoromethane (CFC-12) A Dichlorofluoromethane A	mg/L	ı	1		• •	• •	••	, ,		1 1	• •	
A mg/L -	Diethoxymethane A	mg/L mg/L			F I			, ,	11		ŀ		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Ditsopropyl ether A Diphenyl ether A	mg/L	• •						1 1				
A mg/L	Ether A Ethoxymethyl benzene A	mg/L		ı	I				• •	• •		1 1	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Hexane A	mg/L						• •		• •	1 1	ı	
A mg/L · · · · · · · · · · · · · · · · · · ·	Sulfur dioxides A	mg/L me/L	• •			,	ı		ı	t			
mg/L	Trichlorofluoromethane A	mg/L	,			• 1	11		• •) 1	۰ ،	
mg/L ND(0.01) ND(0.01)	Unknown silane A	mg/L mg/L		1 1	• •		• •			4 1		• •	
	Semi-Volatile Organics 1,2,4-Trichlorobenzene	mg/L	,		,								
	(RA 783) (21) Annordiy A	ò								ī	ı		

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TABLE A.1 GROUNDWATER

Sample Location: Location: Sample ID: Sample Date:		MW-9A 0U2 020621AR-03 6/21/2002	MW-9A OU2 040701003-002 6/30/2004	MW-9A OU2 MW9A 6/26/2006	MW-9B 0U2 MW-AK-02 12/9/1997	MW-9B OU2 MW-AK-03 12/9/1997	MW-9B 0U2 GW-AK-31 6/29/1998	MW-9B OU2 GW-AK-32 6(29/1998	MW-9B 0U2 GW-AK-03 12/15/1998	MW-9B OU2 MW-JR-04 6/14/1999	MW-9B 0U2 MW-JR-05 6(14/1999	MW-9B 0U2 MW-JR-04 12/8/1999
Parameter	Units					Duplicate		Duplicate			Duplicate	
1,2-Dichlorobenzene 1,3-Dichlorobenzene	mg/L mg/L			• •		1 1	(10/0) CIN	(10.0) (IN (10.0) (IN	ı			•
2.2-oxtuoronetuzene 2.2-oxybis[-Chloropropane] (bis(2-chloroisopropyl) ether) 2.4.Frichloron-band	∏/gm		г а	, ,			ND (0.01)	(100) CIN			11	
2,4,6 Trichlorophenol	mg/L mg/L				•		ND (0.025)	ND (0.025)				, ,
2,4-Dichlorophenol 2,4-Dimethylphenol	me/L	4 1	ı	ı	• •		(10.0) UN (10.0) UN	(10.0) UN ND (0.01)			•••	
2,4-Dinitrophenol	mg/L	I I			• •	• •	ND (0.01) ND (0.025)	ND (0.01) ND (0.025)		1 1		
2,6-Dinitrotoluene	mg/L mø/L		I		•	·	(10.0) CIN	ND (0.01)		1 1		• •
2-Chloronaphthalene	mg/L	, ,	, ,	• •		• •	(10.0) CIN	ND (0.01) ND (0.01)	I I	'n	ı	
z-Cutoroprienoi 2-Methylnaphthalene	mg/L me/l.		ı		ı	I	ND (0.01)	ND (0.01)	1 1	, ,	1 1	, ,
2-Methylphenol 2-Nitroaniline	mg/L	ı					(10.0) UN ND (0.01)	ND (0.01) ND (0.01)	1 1	• •		
2-Nitrophenol	mg/L mg/L		1 1	1 1		1	ND (0.025) ND (0.03)	ND (0.025)	ı	·	ı	'
3,3'-Dichlorobenzidine 3-Nitroaniline	mg/L		ı	ı	, ,	1 1	(10:0) ON ND (0:01)	(10.0) UN (10.0) UN	• •		1 1	1 1
4,6-Dinitro-2-methylphenol	mg/L mg/L			11			ND (0.025) ND (0.025)	ND (0.025) ND (0.025)	,		·	ı
4-bromophenyt phenyt ether 4-Chloro-3-methylphenol	mg/L me/L		1	•	ı	,	ND (0.01)	ND (0.01)			• •	
4-Chloroaniline	mg/L		1 1	1 1			ND (0.01) ND (0.01)	(10:0) CIN (10:0) CIN		• •	1 1	ī
4-Cuuoropnenyi pnenyi emer 4-Methyiphenol	mg/L me/I		ŀ	,		ı	ND (0.01)	ND (0.01)				1 1
4-Nitroaniline	mg/L						ND (0.01) ND (0.025)	ND (0.01) ND (0.025)		, ,		
4-INITOPRENOI Acenaphthene	mg/L me/I			'n	·	ı	ND (0.025)	ND (0.025)			1 1	1 1
Acenaphthylene	mg/L				• •		(10.0) UN (10.01)	(10.0) CIN (10.0) CIN	1 1	, ,	1 1	
Auturacente Benzo(a)anthracene	mg/L me/l.			ı	ı		ND (0.01)	(10.0) CIN	Ţ	,	,	
Benzo(a)pyrene	mg/L			•			(10.0) UN (10.0) UN	(10.0) UN (10.0) UN				• •
Benzo(g,h,i)perylene	mg/L me/I.	+ 1	•	,			ND (0.01)	ND (0.01)	ı		·	ŀ
Benzo(k)fluoranthene	mg/L	,	• •			1 1	(10:0) CN (10:0) CN	(10.0) UN (10.0) UN	11			
Benzyl Alcohol	mg/L me/L				1	I	. 1	, '	ļ	ı	ı	ı
bis(2-Chloroethoxy)methane	mg/L	ı				, ,	(10.0) UN	ND (0.01)		• •		1 1
bis(2-Ethylhexyl)phthalate	mg/L mg/L		ı.	• •	. ,	, ,	ND (0.01)	ND (0.01)	1	ı	,	•
Butyl benzylphthalate Carbazole	mg/L		·	ļ	,	ı	ND (0.01)	ND (0.01)		1 1		
Chrysene	mg/L	1 1					(10.0) CN ND (0.01)	ND (0.01) ND (0.01)				
Dubenzofuran Dibenzofuran	mg/L me/L			1	ı		(10.0) UN	ND (0.01)	ı	ı	I	ı
Diethyl phthalate Dimethyl nhthalate	mg/L						(10:0) CINI	(10.0) UN (10.0) UN				1 1
Di-n-butylphthalate	mg/L mg/L		1 1	, ,	• •		ND (0.01)	ND (0.01)	,	1	ı	ı
Di-n-octyl phthalate Fluoranthene	mg/L		·	ı	,	,	ND (0.01)	ND (0.01)			• 1	
Fluorene	mg/L mg/L						ND (0.01) ND (0.01)	ND (0.01) ND (0.01)				
Hexachlorobenzene Hexachlorobutadiene	mg/L	•	•	ı	ı	Ţ	(10.0) CIN	ND (0.01)	•			
Hexachlorocyclopentadiene	mg/L				• •	()	ND (0.01) ND (0.01)	ND (0.01) ND (0.01)				
rtexachloroethane Indeno(1,2,3-cd)pyrene	mg/L mg/L					, ,		(10.0) CIN			ı	
Isophorone Naphthalene	mg/L		I	·	,	1		ND (0.01)				• •
Nitrobenzene	mg/L		1 1	• •		• •		(10.0) CIN (10.0) CIN			• •	
N-1410.5001-11-propylamine N-Nitrosodiphenylamine	mg/L mg/L		1 1		1 1		ND (0.01) ND (0.01)	ND (0.01) ND (0.01)				
rentactuorophenol Phenanthrene	mg/L mg/L	, ,	1 1					ND (0.025) ND (0.01)		• •		
	I							()				

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				TAI GROUD ANALYTIG	TABLE A.1 GROUNDWATER ANALYTICAL RESULTES	ģ					Page	Page 19 of 68
		J	OU2 - STERLIN	STERLING SITE 3, EAST GREENBUSH, NEW YORK	IST GREEN	BUSH, NEW	YORK					
Sample Location: Location: Sample ID: Sample Date: Parameter	Ilmite	MW-9A 0U2 020621AR-03 6/21/2002	MW-9A OU2 040701003-002 6/30/2004	MW-9A OU2 MW9A 6/26/2006	MW-9B OU2 MW-AK-02 12/9/1997	MW-9B OU2 MW-AK-03 12/9/1997 Duplicate	MW-9B OU2 GW-AK-31 6/29/1998	MW-9B OU2 GW-AK-32 6/29/1998 Duvlicate	MW-9B 0U2 GW-AK-03 12/15/1998	MW-9B OU2 MW-JR-04 6/14/1999	MW-9B OUZ MW-JR-05 6/14/1999	MW-9B 0U2 MW-JR-04 1218/1999
Phenol Pyrene	mg/L mg/L			ı			(10.0) CIN	(10.0) CIN		ı	-	
<i>TTC Semi-Volatile Organics</i> 1 (21)-Naphthalenone. 3 4-dib. A	,			1	•	ı	ND (0:01)	(10:0) QN	ı.		ı	•
1,1'-Biphenyi (9C1) A 1-Phenyi-1-cyclopropanecarbo	mg/L mg/L			÷ .	T I	1.4				,	ı	ï
24,6(1H,3H,5H)-Pyrimidinetr A 3H-Pyrazol-3-one, 1,2-dihydr A	mg/L	• •				• •		•				, ,
4-Piperidine Carboxylic Acid A 7,9-Di-fert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A	mg/L mº/l.				1 1					•••		
9-Octadecenoic Acid (Z)-(9C) A Aminopyrine A	mg/L				• •	· ·			ı			
Aruline (ACN) (8CI) A Benzenamine 2 6.05mode.i A	mg/L						•					
Benzenamine, 2,4-dimethyl-A Benzenamine, 2,4-dimethyl-A	mg/L mg/L		i i				• •		· ·	· •	• •	
benzenamme,2,5-dimethyl- A Benzenamine,2,6-dimethyl- A	ng/l		ı		1 1		1.1				ı	ı
Benzene, 1,1'-Oxybis (9CI) A Benzene (Ethoxymethyl).40c) A	mg/L	, ,	• •				·	•			•••	• •
Benzenemethanamine, N,N-dimethyl A	mg/L mg/L	, ,							. ,	1 1		
Benzenemethanamine, N-methyl A Benzoic Acid, 4-Chloro-(9CI) A	mg/L me/L			× 1		• •	• •					
Biphenyl A Butyl ester octadecanoic acid A	ng/L								•	,		• •
	mg/L mg/L	1 1					1				• •	
Chloromethylbenzene isomers A	mg/L mg/L				,							
Chloromethylbenzene isomers B Cyclobarbitol A	mg/L	•							. ,			·
Cyclopentasiloxane, decamethyl- A Cyclopropane Carbonitrile. 2 A	mg/L	, ,		• •		• •			• •			
Diethyltoluamide A Dinhendlether A	mg/L mg/L	•••	1 1	• •	, ,			•	1			
	mg/L mg/L			• •	• •		ı					
Ethoxymethyl Benzene A	mg/L mg/L			·			1 I				• •	
Hexobarital A Lidocaine A	mg/L	·	1	¢ ,				• •			• •	• •
Mephobarbitol A Mepivacaine A	mg/L		• •	• •			• •	• •			, ,	
Mepivacaine hydrochloride A Methyl Thiomhand A	mg/L mg/L								I			
Noramidopyrine A	mg/L mg/L		1 1	· ·			•					
O-Hydroxybiphenyl A o-Toluidine A	ng/L	·	ı		, .		· .		1 1		• •	• •
Pentazocine A Dhenoharthifel A	mg/L	1 1	, ,		• •					ı	,	•
Phenobarbital Di-methyl Derivative A	mg/L mg/L				ı	•	ı	ı	1	1 1	1 1	• 1
Phenol, (1,1-Dimethylethyl A Phenol, 2,4-Bis(1,1-Dimethyl) A	ng/L	ı			11			, ,			1	ı
Phenol, 2,4-bis(1-dimetury), A Phenol, 2,4-bis(1-dimetury) A	mg/L mg/L			• •				0.002 JN				
rnerrol, 4-(1,1,5,5-Tetrameth Phenol, 4-(2,2,3,-Tetrameth) A	mg/L mg/L				ŗ					1 1		
Phenol, 4.4'-Butylidenebis(2) A Sulfur A	mg/L		ı				- 0.006 JN	- 0.006 JN		ŧ 1		
Sulfur, mold. (S8) A Sulfur, Mol. (S8) (8CI9CI) A	mg/L mg/L			• •		1 1					1 1	
Talbutal A Tetramethylbutylohenol A	mg/L	1	• •						• •			
Unknown A Unknown B Unknown B	mg/L mg/L mg/L			, , ,			- 0.004 J 0.004 J	0.002 J 0.002 J		1 1 1		
CRA 7830 (71) Amendity A	шg/ L			ı	I	ļ	0.00 4 J	0.004 J	·	ŗ	ı	

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$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Sample Location:												
Line Defauit Defauit <thdefauit< th=""> <thdefauit< th=""> <thdefa< th=""><th>Location: Location: Sample D: Sample Date:</th><th></th><th>MW-9A OU2 020621AR-03 6/21/2002</th><th>MW-9A OU2 040701003-002 6/30/2004</th><th>MW-9A 0U2 MW9A 6/26/2006</th><th>MW-9B 0U2 MW-AK-02 12/9/1997</th><th>MW-9B OU2 MW-AK-03 12/9/1997</th><th>MW-9B OU2 GW-AK-31 6/29/1998</th><th>MW-9B OU2 GW-AK-32 6(29(1998</th><th>MW-9B OU2 GW-AK-03 12/15/1008</th><th>MW-9B OU2 MW-JR-04</th><th>io MW</th><th>-9B 12 18-05</th></thdefa<></thdefauit<></thdefauit<>	Location: Location: Sample D: Sample Date:		MW-9A OU2 020621AR-03 6/21/2002	MW-9A OU2 040701003-002 6/30/2004	MW-9A 0U2 MW9A 6/26/2006	MW-9B 0U2 MW-AK-02 12/9/1997	MW-9B OU2 MW-AK-03 12/9/1997	MW-9B OU2 GW-AK-31 6/29/1998	MW-9B OU2 GW-AK-32 6(29(1998	MW-9B OU2 GW-AK-03 12/15/1008	MW-9B OU2 MW-JR-04	io MW	-9B 12 18-05
	Parameter	Units					Duplicate		Duplicate	0661161171	6667 I&T 10	Duplice	6 H
	Unknown D Unknown E	mg/L			,	•		1 500 0					
	Unknown F I Inknown C	mg/L mg/L				•	• •	[10:0	0.003 J	, ,	• •	• •	
	Unknown H	mg/L mg/L			ı		• •		0.02 J 0.01 J			• •	
	Unknown 1 Unknown J	mg/L me/I	ı	r r							• •	ı	
	Unknown K Unknown I	1/8m			•••			ı		ı			
1 media 1 med	Unknown Alkane A	mg/L me/L		ı	•	ı				, ,	• •	, ,	
Marking Marking	Unknown Amide A Unknown Aromatic A	mg/L	,				• •		ı	ı	ļ	ı	
mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Unknown Aromatic B	mg/L mg/L			ı	ı	ļ	1		1 1	• 1		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Unknown Aromatic C Unknown Aromatic D	mg/L	ı				i i			ı	,	'	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Unknown Aromatic E	mg/L mg/L	÷ 1	• •		ı	•	ı	ı				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Unknown Aromatic F Unknown Carboxylic Acid A	mg/L		·	. 1	• •	, ,				1 1	I	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Unknown Carboxylic Acid B	mg/L mg/L	1 1			1	,		0.003 J			1 1	
Addition mmontum state 00001 00001 Market 00001 00001	Unknown Nitrogen Compound 1 Unknown Oxygenated Compound A	mg/L	,	ı	•	T 1		۰.	0.003 J	1 1			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Unknown Oxygenated Compound B	mg/L			• •			0.006 J	0.003 J	I	ı	1	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Unknown Substituted Inophene A Unknown Sulfur Compound A	mg/L me/L		F	ı	1				1.1			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Unknown Thiophene A Warfarin A	l l gui	1 1								1	•	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Models	uig/ c	ı	1		•				ı		• •	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Iron (Theorem 2)	mg/L	37.4	24.6	,	ı	,	(9 <i>22)</i> CIN					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Manganese (Dissolved)	mg/L mg/L	0.243 -	ND (0.0084) -				ND (18.2)	(1.8.1) UN (18.1)		•••		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	G <i>ases</i> Methane	mg/L	ı	,		1						ı	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Biological	1				I	ı	•	ı	I		ı	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Aerobic Total Microbial Population Benzene Specific Microbial Population Total Microbial Population	cfu/mL cfu/mL cfu/mL	• • •					- 7200 76000					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	General Chemistry						ı	00007	1	•	ı	ı	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Atkalinity, Total (As CaCO3) Dissolved Organic Carbon (DOC)	mg/L mg/L	460	430			ı	190	195	,	ı	I	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Nitrate (as N) Orthophosphate	ng/L mg/L	0.07 -	0.37			• • •	, ND (0.02)	ND (0.03)		• •	i i	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	pH (water) PH (water)	s.u. s.u.		6.7 J -				00-7 - 7	±C:0			t i	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Prosphate, Lotal Sulfate	mg/L mg/L	1.4 J 31.8	0.75 21.2			•••	1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1	0.0 - 1 R			t i	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Sulfite	mg/L	ND (0.1) UJ	UD (1.0) UN	I	ı		C:+	C +	1 +	• 1		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Total Dissolved Solids (TDS) Total Kieldahl Nitmoen (TKN)	mg/L mg/L	282 282	ND (1) UJ 450			, ,	- 255	- 262		1.1		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Total Organic Carbon (TOC) Total Suspended Solids (TSS)	mg/L mg/L	ND(I) 6.2] 118	5.5 80	• •			4.48 J 6.8	1.96J 7.5	· .			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Field Parameters	i Î	1	2	1	1		18	14.5	•	ı	ł	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Conductivity Field Dissolved Oxygen	umhos/cm ma/1	,	827	0.952	,	ı	ŗ		•	ı	ı	
The second secon	OVA Reading Oxidation reduction notential	uidd 1/8m		12.02	<u>د</u> ا ، ا	• •			۰.	Ч. т.		.,	
	PH Field Turbidity	s.u.	4 1 1	-21 6.51	79 7.46 7			1 1	• •		1 1		
		2		0.10		ı	•	Į	1		,		

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS

NU-38 MW-98 M	ALTAL ALLING SITE 3, EA ALLING	MW-38 0012 012 012 012 012 012 012 01	WW-98 MW-98 MW 98 MW 98 <th< th=""></th<>
ARV-383-00115 ARV-382 ARV-383-0012 CVV-383-0012 CVV-383-0012 CVV-383-0012 CVV-383-0012 CVV-383-0012 CVV-383-001 CVV-383-0005 CVV-383-005 CVV-383-005 CVV-383-005 CVV-3	Mix-98 Mix-98<	MW.9B MW.9B 012 012 012 012 01005 0005 0005 0005 0005 0005 0005 00	WW-9B MW-9B MW-9B 0.02 202 -201 -201 1.201-BK7-003 CW-7880-1201-BK7-004 0.02 0.02 Daplicate 0.02 0.03 Daplicate 0.03 0.005 ND (0.065) ND (0.065) 0.01011 Daplicate 216/2001 0.0005 ND (0.005) ND (0.005) 0.01011 ND (0.005) ND (0.005) 0.01011 ND (0.011) ND (0.011) 0.01011 ND (0.005) ND (0.005) 0.0005 ND (0.005) ND (0.005) 0.0005 ND (0.005)
	WY YORK MW-9B MW-9B 012 CW-7839-1201-BKP-003 1216/2001 T216/2005 T216/2001 T216/	MW.9B MW.9B 012 012 012 012 01005 0005 0005 0005 0005 0005 0005 00	WW-9B WW-9B WW-9B WW-9B 0.02 1.201-BK7-003 CW-7830-1201-BK7-004 26/2001 26/2001 DU2 26/2001 DU2 CW-7830-1201-BK7-004 26/2001 DU005 CW-7830-1201-BK7-004 26/2001 DU005 CW-7830-1201-BK7-004 26/2001 DU005 CW-7830-1201-BK7-004 26/005 CW-7830-1201-BK7-004 DU005 26/005 CW-7830-1201 DU005 26/001 CW-7830-120 DU0005

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS STERLING SITE 3, EAST GREENBUSH, NEW YO

Sample Location: Location: Sample ID: Sample Date:		MW-9B OU2 GW-BKP-016	MW-9B OU2 GW-BP-004	MW-9B 012 GW-BP-005	MW-91. OU2 GW-7830-0701-BKP-006		98 2 ?-BKC-003	MW-9B 0U2 830-1201-BKP-004	MW-9B 0U2 0226674AG-07	MW-9B OU2 071717AF-05
Parameter	Units		0007/67/71	12/19/2000 Duplicate	7/2/2001	(0 m)	-	12/6/2001 Duplicate	6/24/2002	12/17/2002
1,2-Dichlorobenzene 1,3-Dichlorobenzene	mg/L	ND (0.01)		ı						
14-Dichlorobenzene 2.2-orvhiel1.Chloromonomy Att.// -11	mg/L mg/L	ND (0.01) ND (0.01)						1 1	ND (0.005) ND (0.005)	• 1
2.4.5 Trichlorophenol	mg/L mg/L	ND (0.01) ND (0.05)			ı			, .	ND (0.005) ND (0.005)	• •
24-Dichlorophenol	mg/L mg/L	ND (0.01) ND (0.01)	•	1		ı			ND (0.005) ND (0.005)	1 1
2,4-Dimethylphenol 2,4-Dinitrophenol	mg/L	ND (0.01)			• •	• •			ND (0.005)	ı
2,4-Dinitrotoluene 2.6-Dinitrotoluene	mg/L mg/L	ND (0.05) ND (0.01)				ı		1 1	(c00.0) UN ND (0.025) UJ	• •
2-Chloronaphthalene	mg/L	ND (0.01) ND (0.01)	ı	ı					ND (0.005) ND (0.005)	1 1
2-Chlorophenol 2-Methylnaphthalene	mg/L	ND (0.01)			1 1				ND (0.005)	•
2-Methylphenol	mg/L me/L	(10.0) ON (10.0) ON						4 1	ND (0.005) ND (0.005)	• •
2-Nitronhenol 2-Nitronhenol	mg/L	ND (0.05)				• •			ND (0.005)	ı
3,3'-Dichlorobenzidine	mg/L me/L	(10:0) CIN 1 (20 0) CIN	1 1	•	·				ND (0.025) UJ ND (0.005)	
3-Nitroaniline 4.6-Dinitro-2-methylohemol	mg/L	ND (0.05)	• •	• •		1			ND (0.010) UJ	,
4-Bromophenyl phenyl ether	mg/L me/L	ND (0.05)		·	·				ND (0.025) UJ ND (0.025)	
4-Chloro-3-methylphenol	mg/L	(10.0) UN ND (0.01)		1 1		•		•	ND (0.005)	
4-Chlorophenyl phenyl ether	mg/L	(10.0) UN	,	,					ND (0.005) ND /0 005) 1 II	
4-Methylphenol	mg/L me/L	(TO:0) CIN	•	,		·		·	ND (0.005)	, ,
4-Nitroaniline 4-Nitronhenol	mg/L	ND (0.05)						ı	ND (0.005)	ŀ
Acenaphthene	mg/L	ND (0.05)	ı	1	•	,			ND (0.025) UI	• •
Acenaphthylene	mg/L	ND (0.01)			•				ND (0.005)	
Anturacene Benzo(a)anthracene	mg/L	ND (0.01)	ı						ND (0.005) ND (0.005)	·
Benzo(a)pyrene	mg/L me/L	ND (0.01)	•	,	•	'		ł	ND (0.005)	
Benzo(b)fluoranthene	mg/L	(100) QN							ND (0.005)	•
Benzo(k)fluoranthene	mg/L	ND (0.01) J	ı	,	ı				ND (0.005) UJ ND (0.005)	
Benzoic acid	mg/L					ı			ND (0.005)	ı
benzyl Alcohol his/2-Chloroethowelpane	mg/L	1	ı			• •		1 1		
bis(2-Chloroethyl)ether	mg/L	(10.0) UN (10.00) UN	,	,		•		1	ND (0.005)	
bis(2-Ethylhexyl)phthalate	mg/L	ND (0.01)				•		ł	ND (0.005)	·
ouryt berizytphrmatate Carbazole	mg/L	ND (0.01)	ł	ı		·			ND (0.005)	
Chrysene	mg/L	(10:0) CIN		1 1	, ,	. :			ND (0.005)	
Lubenz(a,n)anthracene Dibenzofuran	mg/L	ND (0.01)	•						ND (0.005)	
Diethyl phthalate	mg/L	(10.0) ON				•		,	ND (0.005)	
Di-n-butylphthalate	mg/L	ND (0.01)		,					ND (0.005)	• •
Di-n-octyl phthalate	mg/L	ND (0.01)		1 1		ı			ND (0.005) U	ı
Fluoranthene Fluorene	mg/L	ND (0.01)	ı						ND (0.005) ND (0.005)	••
Hexachlorobenzene	mg/L me/L	(10.0) UN (10.01 UN			ı	ı		ı	ND (0.005)	
Hexachlorobutadiene	mg/L	ND (0.01)				1 1		• •	ND (0.005) ND (0.005)	
riexactuorocyctopentacuene Hexachloroethane	mg/L	(10.0) CN (10.0) CN	I		٠	ı			ND (0.005) UJ	
Indeno(1,2,3-cd)pyrene Isonhorone	mg/L	ND (0.01)						1 1	ND (0.005) ND (0.005)	
Naphthalene	mg/L mg/L	(10.0) UN ND (0.01)	. ,						ND (0.005) ND (0.005)	
Nitrobenzene N-Nitrosodi-n-pronylamine	mg/L	ND (0.01)	,	ı					ND (0.005)	1 1
N-Nitrosodiphenylamine Pentachlorophenol	mg/L mg/I	ND (0.01) ND (0.01)		1 1	, ,			1 1	ND (0.005) ND (0.005) UJ	1 1
Phenanthrene	mg/L	(10.0) UN	••					1 1	ND (0.025) ND (0.005)	

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Anticipation </th <th>on: ile Organics</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	on: ile Organics									
National Nation Natio			MW-9B 0U2 GW-BKP-016 6/5/2000	MW-9B OU2 GW-BP-004 12/19/2000	MW-9B OU2 GW-BP-005 12/19/2000	MW-9B 0U2 GW-7830-0701-BKP-006 7/222001	MW-9B OU2 GW-7830-1201-BKP-003 17/6/2001	MW-9B OU2 GW-7830-1201-BKP-004	MW-9B 0U2 020624AG-02	MW-9B OU2 021217AE-05
Media NS001 Media <th></th> <th>Units</th> <th></th> <th></th> <th>Duplicate</th> <th></th> <th>TAA7 10 /7 T</th> <th>12/0/2001 Duplicate</th> <th>6/24/2002</th> <th>17</th>		Units			Duplicate		TAA7 10 /7 T	12/0/2001 Duplicate	6/24/2002	17
		mg/L mg/L	(10.0) CIN (10.0) CIN	• •		• •	ı	,	ND (0.005)	
								•	ND (0.005)	
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		mg/L me/L		ı		1	ı			
		mg/L	ı		• •		·		•	
		mg/L	,	•	•	1		I	•	
		mg/L				,		1 -	ı	
		mg/L		•		Ţ				
		mg/L me/l				ı	ı	•		
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		mg/L	,			•	,	·		
		mg/L	ı		4)		ı			
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Normal desamption mg/L n Inclusion decamption mg/L n Inclusion mg/L n Inc		ng/L		, ,		ł	ŀ	•	•	
$ \begin{array}{ccccc} construction (A & mg/l & construct$		mg/L				1 1		•		
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$\operatorname{cd}(A)$ $\operatorname{mag}(A)$ $\operatorname{mag}(A)$ $\operatorname{Rechonenton}(A)$ $\operatorname{mag}(A)$ $\operatorname{Rechonenton}(A)$ $\operatorname{mag}(A)$ $\operatorname{Rechonenton}(A)$ $\operatorname{mag}(A)$ $\operatorname{Rechonenton}(A)$ $\operatorname{mag}(A)$ $\operatorname{Rechonenton}(A)$ $\operatorname{Rechonenton}(A)$ <th></th> <th>ng/L</th> <th></th> <th>•</th> <th></th> <th>•</th> <th>ı</th> <th>1</th> <th>ı</th> <th></th>		ng/L		•		•	ı	1	ı	
$ \begin{array}{ccccccc} \label{eq:control} (A & mg(t & \cdot & $		ng/L				ı		ı	'	
Notice Mag/L Notice A Mg/L Notice Model Notice Notice M		ng/L	•				1 1	·	,	
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$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		ng/L	•		ı					
$ \begin{array}{cccccc} \label{eq:constraint} & \begin{tabular}{c} & tabular$	Α	ng/L	'	•	ı	•	ı		,	
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mg/L c <thc>////////////////////////////////////</thc>		Jg/L			,	ı	r	1 1		
33-Tetrameth $m_{g/1}^{(1)}$ $ -$ <t< td=""><th></th><td>ng/L</td><td></td><td>•</td><td>ı</td><td>-</td><td>·</td><td></td><td></td><td></td></t<>		ng/L		•	ı	-	·			
3.3.Tetrameth) A m_g/L - - <th></th> <td>lg/L</td> <td></td> <td>. ,</td> <td></td> <td>•</td> <td>ı</td> <td></td> <td></td> <td></td>		lg/L		. ,		•	ı			
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$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	4 - Duryngeneois(2) A	ug∕L	•	ı	ı	ı	ı	1 1		
is) (8C19C1) A mg/L -		18/L			۱	•	T		,	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		1/8/1- 1-				·	,	ı		
utylphenol A mg/L		e/L					•		·	
ng/L	utyiphenol A	1/5	I			1 1	•	ı	ı	
ng/langer in the second s		g/L		ı		ı	1 1	1 1	- 0000	
		1/g/L		•	ı	I	-	. 1	0.005 BI	
		ß/г	I	ı	•		ı	ı	0.001 J	

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TABLE A.1 GROUNDWATER

TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK	
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Sample Location: Location: Sample ID: Sample Date:		MW-9B OU2 GW-BKP-016 6/5/2000	MW-9B 0U2 GW-BP-004 12119/2000	MW-9B OU2 GW-BP-005 12/19/2000	MW-9B 012 GW-7830-0701-BKP-006 7722001	MW-9B OU2 GW-7830-1201-BKP-003	MW-9B OU2 GW-7890-1201-3KP-004	MW-9B OU2 020624AG-02	MW-9B 0U2 021217AE-05
Parameter	Units			Duplicate		1007/0/71	12/0/2001 Duplicate	6/24/2002	12/17/2002
Unknown D Unknown E	mg/L			ı		,	,	0.007	1
Unknown F Tinknown C	mg/L mg/L	• •	• •	1 1	+ 1			0.003 J	1 1
Unknown H Tistrand	mg/L mg/L							• •	
Unknown J Tinknown J	mg/L mg/L							3 1	
Unknown L	mg/L mg/L		1,	1	ı				
Unknown Alkane A Unknown Amide A	mg/L	ı	ı		t 1				1 1
Unknown Aromatic A	mg/L mg/L							·	,
Unknown Aromatic B Unknown Aromatic C	mg/L me/l.		1	ı	ı				
Urknown Aromatic D Unknown Aromatic E	mg/L	I		1 1	1 1			1 1	1 1
Unknown Aromatic F	mg/L mg/L			1	ı				
Unknown Carboxylic Acid A Unknown Carboxylic Acid B	mg/L	ŀ	ļ						
Unknown Nitrogen Compound 1	mg/L								ı
Unknown Oxygenated Compound A Unknown Oxygenated Compound B	mg/L me/l		ı	ı	•			- 0.001 BJ	••
Unknown Substituted Thiophene A Linknown Sulfur Commund A	mg/L		+ 1						ŧ ۱
Unknown Thiophene A	mg/L mg/L	• •						·	ı
Wartarin A	mg/L		·	•		E 1	• •		
Metals Iron	me/L	6.23						!	
Iron (Dissolved) Manganese (Dissolved)	mg/L mg/L	ND (0.139)					1 1 1	8.45 4.47 ,	
G <i>ases</i> Methane	mg/L	ı	,		·				
Biological	b				ı	I	•	,	T
Aerobic Total Microbial Population Benzene Specific Microbial Population	cfu/mĽ cfu/mĽ	, 006		, ,			1 1	-	
Total Microbial Population	cfu/mL	11500	•	ı				5800	
General Chemistry Alkalinity, Total (As CaCO3)	mg/L	170	ı					101	
Dissolved Organic Carbon (DOC) Nitrate (as N)	mg/L	- 0	ļ	,		5 1		- cgi	1 1
Orthophosphate	mg/L	0.46	1 1	F I				1.85 -	1 1
pH (water)	s.u.	7.0	1 1	, ,				1	ı
Phosphate, Total Sulfate	mg/L	י קר	,					0.41	
Sulfide .	mg/L] •					• •	(I) ON (I) ON	
Total Dissolved Solids (TDS)	mg/L mg/L	- 222						ND (1) 252	
I otal Cyclotati Nitrogen (IKN) Total Organic Carbon (TOC)	mg/L mg/L	2.24 9.3	1 1					1.12 8.2	
Total Suspended Solids (TSS)	mg/L	52		ı	,		•	20	
Field Parameters Conductivity Field Discoluted Oursease	umhos/cm				329			,	464
OVA Reading	mg/L	• •	1 1			, ,			
Oxidation reduction potential pH field Turbidier	millivolts s.u.	1 1		1 1	- 6.58			•_•	- 7.8
	זווח	•	•		ı	•	ı	·	,
CRA 7830 (71) Appendix A								q046A1-XT2-M	q046ALXT2-WG-Historical-37-TH 10/3/2006

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TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample Location: Location: Sample ID: Sample Date: Parameter	Volatite Organisa 1.1.1-Tricholoroethane 1.1.2.2.Pictanoloroethane 1.1.2.2.Pichloroethane 1.1.2.2.Pichloroethane 1.1.2.Dichloroethane 1.2.Dichloroethane 1.2.Dichloroethane 1.2.Dichloroethane 1.2.Dichloroethane 1.2.Dichloroethane 1.2.Dichloroethane 1.2.Dichloroethane 2.4.exanore 2.4.frictoronoethane 2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoronoethane 2.2.4.frictoron	
Units	したが、1000円である「1000円である」である「1000円である」」」である「1000円である」」である「1000円である」」である「1000円である」」である「1000円である」」である「1000円である」」である「1000円である」」である「1000円である」」」である「1000円である」」	
MW-9B 012 030627014-004 6/26/2003	ND (0.005) ND (0.05) N	
MW-9B OU2 030627014-005 6/26/2003 Duplicate	ND (0.005) ND (0.05) ND (0.05) ND	
MW-9B 0U2 031202032-003 12/2/2003	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001) ND (0.001) ND (0.005) ND (0.001) ND (0.005) ND (0.05) N	
MW-9B OU2 040701003-001 6/30/2004	ND (0.005) ND (0.005) ND (0.007) ND (0.001) ND (0.001)	
MW-9B OU2 041207030-003 1217/2004	ND (0.001) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.005) ND (0.005)	
MW-9B 0U2 A5687305 6/30/2005	(100) CNN (100)	
MW-9B OU2 A5E26912 12/13/2005	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.005) ND (0.005)	
МW-9В ОЦ2 МW9В 5/18/2006	طلام 1	
MW-9B OU2 MW9B (6/26/2006	ND (0.0050) U ND (0.0050) U ND (0.0050) U ND (0.0050) U ND (0.0050) ND (0.01 ND (0.0050) ND (0.01 ND (0.0050) ND (0.01 ND (0.01) U ND (0.01) U ND (0.01) U ND (0.01) ND (0.01 ND (0.010) ND (0.01 ND (0.010) ND (0.01 ND (0.010) ND (0.01 ND (0.010) ND (0.01 ND (0.0050) ND (0.01 ND (0.01) ND (0.01 ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01)	
MW-10B OU2 GW-AK-09* 6/24/1998	U (100) U (10/3/2006

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

Sample Location: Location: Sample D2: Sample Date:		MW-9B 0U2 03062701 4-004 6/56/2003	MW-9B 0U2 030627014-005 67612003	MW-9B 012 0312022-003	MW-9B OU2 040701003-001	MW-9B OU2 041207030-003	MW-9B 0U2 A5687305	MW-9B OU2 A5E26912	МW-9В ОИ2 МW9В	МW-9В ОИ2 МW9В	MW-10B 0U2 GW-AK-09*
Parameter	Units		Duplicate		6/30/2004	12/7/2004	6/30/2005	12/13/2005	5/18/2006	6/26/2006	6/24/1998
1,2-Dichlorobenzene	mg/L		ı		ND (0.005)						
1,4-Dichlorobenzene	mg/L mg/L		1 1		ND (0.005)						• •
2,40xybi8(1-Chloropropane) (bis(2-chloroisopropyl) ether) 2,4,5-Trichlorophenol	mg/L	ı	,	1)	(c)) UN (0.005) UI	• •			I		·
2,4,6-Trichlorophenol 2,4,Drichlorophenol	mg/L mg/L			1 1	ND (0.005) ND (0.005)						•
2,4-Dimethylphenol	mg/L mg/I		۲	,	ND (0.005)			• •	1 1		
2,4-Dinitrophenol 2.4-Dinitrotelucaro	mg/L		• •		ND (0.005) ND (0.025) 11		,	ı	I	١	,
2,6-Dinitrotoluene	mg/L me/I	,		•	ND (0.005)				1 1	• •	
2-Chloronaphthalene	mg/L				ND (0.005) ND (0.005)	·	ı		1		
2-Chlorophenol 2-Methvlnaohthalene	mg/L	ı	ı		ND (0.005)		1 1	• •		1	ŀ
2-Methylphenol	mg/L mg/L	1 1	1.1	ı	ND (0.005)	•	ı		, ,	1 1	4 1
2-Nitroaniline	mg/L				ND (0.005) [1] ND (0.025) [1]					ı	ı
3.3'-Dichlorobenzidine	mg/L				ND (0.005)						
3-Nitroaniline	mg/L				ND (0.010) UJ	ı		·		ı	ı
4,0-Dinitro-2-methylphenol 4-Bromonhenvi ether	mg/L	ı		I	ND (0.025) UJ						I
4-Chloro-3-methylphenol	mg/L me/l.		ı	ı	ND (0.005)	ı					
4-Chloroaniline	mg/L	1	r ı		ND (0.005) ND (0.005) I II		·	ı	,	·	·
4-Cuorophenyl phenyl ether 4-Methylphenol	mg/L		ı		ND (0.005)				1 1	1 1	
4-Nitroaniline	mg/L me/L			•	ND (0.005)	·	ı	ı	3	ı	l i
4-Nitrophenol	mg/L	ı			ND (0.025) UJ ND (0.025) UT				·	ł	
Acenaphthylene	mg/L			ı	ND (0.005)	1					
Anthracene	mg/L me/l.		•	ı	ND (0.005)		ı	ł	ī		,
Benzo(a)anthracene	mg/L	I			ND (0.005) ND (0.005)		1 1	• •	I	ı	ı
Denzo(a)pyrene Benzo(b)fluoranthene	mg/L	,	ł		NID (0.005)						
Benzo(g,h,i)perylene	mg/L mg/L	, ,			ND (0.005) ND (0.005)	,	ı		ı	ı	ı
Benzo(k)fluoranthene Bonzois zaid	mg/L	•	ŗ		(0.005) UN (0.005)		4 8		, ,		
Benzyl Alcohol	mg/L	3	ı	•		I	ı		i i		
bis(2-Chloroethoxy)methane	mg/L			• •	- NID (0.005)	·	ī	ŀ		ı	ı
	mg/L				ND (0.005)				1 1		
Butyl benzylphthalate	mg/L		ı		ND (0.005) UJ	ı		ı		ı	I
	mg/L				ND (0.005) ND (0.005)		·	ı	ı	ı	•
Chrysene Dihenz(a h)anthracene	mg/L	•	I	ı	ND (0.005)	1		1 1		, ,	
	mg/L mg/L				ND (0.005) ND (0.005)	ı	ī			•	•
	mg/L	ı			ND (0.005)	• •			• •	1 1	
Di-n-butyiphthalate	mg/L	ı		•	ND (0.005)	,				,	,
	mg/L				ND (0:005) ND (0:005) 1 II	•	ı	ı		·	
lene	mg/L				ND (0:005) UI						
Huorene	∏/gm	ı			ND (0.005)	·					
U.S.	mg/L mg/I				ND (0.005)	•	I	Ţ	Ņ		
adiene	mg/L				ND (0.005) ND (0.005)		1	ı	•	ı	ı
Hexachloroethane Indeno(1 2 3-cd)nvrene	mg/L			·	ND (0.005)			1 1	1 7		
	mg/L me/l.			1	ND (0.005) UJ		ı		•	ı	,
	mg/L			ı	ND (0.005)		, ,	• ,			11
Nitrosodi-n-propylamine	mg/L		ı		ND (0.005)	·	•	1	ı	I	
	mg/L mg/L			1 1	ND (0.005) UJ ND (0.005)				1	1	I
Pentachlorophenol Phenanthrene	mg/L	ı		٠	ND (0.025)						
	ч /Ял		•		(cnn:n) (IN	I	1	1	,		

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CRA 7830 (71) Appendix A

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Classification of the second s	And and a constraint of the co		ţ			TABLE A.1 GROUNDWATER	A.1 VATER					Pa	Page 27 of 68
Math Math <th< th=""><th>Mark Mark <th< th=""><th></th><th></th><th>J</th><th>DU2 - STERLINC</th><th>ANALYIICAL 5 SITE 3, EAST</th><th>RESULTS GREENBUSH, N</th><th>JEW YORK</th><th></th><th></th><th></th><th></th><th></th></th<></th></th<>	Mark Mark <th< th=""><th></th><th></th><th>J</th><th>DU2 - STERLINC</th><th>ANALYIICAL 5 SITE 3, EAST</th><th>RESULTS GREENBUSH, N</th><th>JEW YORK</th><th></th><th></th><th></th><th></th><th></th></th<>			J	DU2 - STERLINC	ANALYIICAL 5 SITE 3, EAST	RESULTS GREENBUSH, N	JEW YORK					
Michol Michol	Mile Mile Mile Mile	Sample Location: Location: Sample DS: Sample Date: Parameter	Unite	MtW-9B OU2 030627014-004 6/26/2003	MW-9B OU2 030627014-005 6/26/2003 Dupticate	MW-9B OU2 00212.003 12/2/2003	M:	MW-9B OU2 041207030-003 1277/2004	MW-9B OU2 A5687305 6/30/2005	MW-9B OU2 A5E26912 12/13/2005	MW-9B OU2 MW9B 5/18/2006	MW-9B OU2 MW9B 6/26/2006	MW-10 0U2 GW-AK- 6/24/19
Att Rith Montant Montant Montant Montant Att Rith Montant Montant Montant Montant Montant Att Rith Montant	Alter Monta Monta Alter Monta Monta <td< th=""><th>Phenol Pyrene</th><th>mg/L</th><th></th><th>ı</th><th>Ţ</th><th>ND (0.005)</th><th></th><th>ı</th><th></th><th></th><th></th><th></th></td<>	Phenol Pyrene	mg/L		ı	Ţ	ND (0.005)		ı				
Mith mpl math mpl math Mith mpl math mpl math <th>Attick MML MML Market MML MML</th> <th>TIC Semi-Volatile Organics</th> <th>i ò</th> <th>1</th> <th></th> <th></th> <th>ND (0.005)</th> <th>ı</th> <th></th> <th></th> <th></th> <th>• •</th> <th>• •</th>	Attick MML MML Market MML MML	TIC Semi-Volatile Organics	i ò	1			ND (0.005)	ı				• •	• •
Mathematication Mathematication Mathematication Mathematication Mathematication Mathematication	Match M	1 (2H)-Naphthalenone, 3,4-dih A 1,1'-Biphenyl (9CI) A	mg/L	ï	ı		1						
Mitty A mitty A Mitty A mitty B Mitty A mitty B Mitty A mitty B Mitty B <	Matrix Matrix	1-Phenyl-1-cyclopropanecarbo	mg/L mg/L		·		ı			+ 1		•	,
Mixing Mixing	Addition marking in the interval state of the in	2,4,0(111,511,511)-1'yrundinefr A 3H-Pyrazol-3-one, 1,2-dihydr A	mg/L	·		• •			ı	ı	1	- 1	
Rest (A) A manufactor	R00 (Allocator Amplify August Amplify	4-Piperidine Carboxylic Acid A	mg/L me/L	ι.		ı			• •		ı	ł	
Market market		/,۶-Di-tett-butyt-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A 9-Octadecenoic Acid (۲۵-۲۵۰۰) م	mg/L			• •		ı	·		1		• •
NUT THE STATE STAT	Hyty match Hyty match Hyty match Hyty Hyty CSDA match Hyty match	Aminopyrine A	mg/L		•			• •	1	•	ı	•	•
WIA Marking in the second se	NHA Mach NHA Mach <th>Aniline (ACN) (8CI) A</th> <td>mg/L</td> <td>• •</td> <td>•</td> <td>ı</td> <td>ı</td> <td>•</td> <td>ı</td> <td></td> <td></td> <td></td> <td>•</td>	Aniline (ACN) (8CI) A	mg/L	• •	•	ı	ı	•	ı				•
NA MML	NA WML District WML	Benzenamine, 2,6-Dimethyl A	mg/L	·		1		ſ	ŀ	,	,		
No. No. No.	No. No. No.	Benzenamine,2,5-dimethyl- A Benzenamine,2,5-dimethyl- a	mg/L				• •			Ţ	ı		
And Constrainty March Marc	Diameter	Benzenamine,2,6-dimethyl- A	mg/L	ı		ı	,	1 1	, ,		3	I	ı
Michael Wich Wich Wich District	Chiloson Mail Mail Mail Chiloson <td< td=""><th>Benzene, 1,1'-Oxybis (9CI) A</th><td>mg/L mg/L</td><td></td><td></td><td>ı</td><td>·</td><td></td><td>ı</td><td></td><td>()</td><td>• •</td><td></td></td<>	Benzene, 1,1'-Oxybis (9CI) A	mg/L mg/L			ı	·		ı		()	• •	
Constrainty A Texture CGUA Texture CCUA Texture CCUA Texture Texture Texture <	Constrainty A mg/L	Benzenenettenswisse N.N. J.	mg/L		• •		ı		•	ı	ŀ	1	
ODD (A) Multi- autor Control Catal A Multi- autor Multi- autor Multi- autor Lic 2 A Multi- autor Multi- autor Multi- autor Lic 3 A Multi- autor	ODD (Å) MM/L and (Å) MM/L and (Å) cick(Å) MM/L and (Å)	Benzenemethanamine, N-methyl A	mg/L			ı			• •	•	•	ı	•
etcl month month month ctclicit month month month </td <td>act mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l</td> <th>Benzoic Acid, 4-Chloro-(9CI) A</th> <td>mg/L mg/L</td> <td>t i</td> <td></td> <td>ı</td> <td>•</td> <td>,</td> <td></td> <td></td> <td></td> <td>1 1</td> <td></td>	act mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l	Benzoic Acid, 4-Chloro-(9CI) A	mg/L mg/L	t i		ı	•	,				1 1	
Activ Wyl - cell wyl - mone N - mone - -<	Catol A mg/L - Catol B - - Catol B <	Biphenyl A Bittel category	mg/L	,		1.	ı	ı	•	•	,	1	• •
Mill Title month mill month month month month month month month month	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	butyl ester octadecanoic acid A Butyl ester, hexadecanoic acid A	mg/L	,	ı					ı	ı	ı	ı
Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical Mathematical <th>Matrix Matrix Matrix<</th> <th>Carboxylic Acid A</th> <th>mg/L</th> <th>,</th> <th></th> <th>ı</th> <th>,</th> <th>,</th> <th></th> <th>• •</th> <th>• •</th> <th>,</th> <th>ı</th>	Matrix Matrix<	Carboxylic Acid A	mg/L	,		ı	,	,		• •	• •	,	ı
Montes B mig/light mig/light <th< th=""><th>Others B mmont multiply mmont multiply mmont multiply mmont multiply Lib 2 A multiply multiply multiply multiply Lib A multiply multiply multiply multiply Lib A multiply multiply multiply multiply Lib A multiply multiply multiply multiply A multiply multiply multiply multiply</th><th>Chloromethylbenzene isomers A</th><th>mg/L me/L</th><th>•</th><th></th><th>ı</th><th>ı</th><th>•</th><th>,</th><th></th><th></th><th></th><th></th></th<>	Others B mmont multiply mmont multiply mmont multiply mmont multiply Lib 2 A multiply multiply multiply multiply Lib A multiply multiply multiply multiply Lib A multiply multiply multiply multiply Lib A multiply multiply multiply multiply	Chloromethylbenzene isomers A	mg/L me/L	•		ı	ı	•	,				
Matchelic mg/L	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Chloromethylbenzene isomers B	mg/L	. ,	, ,	ı		·	ı		ı		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Cycloberbitol A Cyclobentasilovane decamethul. A	mg/L	,	I					ı		•	ı
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Cyclopropane Carbonitrile. 7 A	mg/L	ı	ŀ	,					١	•	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Diethyltoluamide A	mg/L	•	·	,		ı			1 1	. ,	•
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Diphenyl ether A	mg/L	• •				ļ		ı			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Dodecanoic acid A	mg/L	,	. ,			•	ı	ı		ı	•
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Ethoxymethyl Benzene A	mg/L	,	,						ı	•	•
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Hexobarital A	mg/L mø/L	, ,	·		Ţ	ı	,	ı			
de A mark M mark	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Lidocaine A	ng/L		• 1		ı		ı	,	ı		
de A mg/L	de A mg/L	Mephobarbitol A Menivacaine A	mg/L		,					•	•	ı	,
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Mepivacaine hydrochloride A	mg/L	·	•	ı				,			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Methyl Thiophene A	mg/ L		•	·	ı		ı		ı	ı	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Noramidopyrine A	mg/L				• •	·		ı	·	·	•
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	O-Triyutoxybipnenyi A o-Toluidine A	mg/L	•	,			. ,			ı	•	ŀ
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	triative A magnitude A magnit	Pentazocine A	mg/L		•	•	ı		ı			1 1	
Tratice A mig/L \cdot mig/L \cdot	Tratice A mig/L Λ has mig/L Λ mig/L Λ has mig/L Λ	Phenobarbital A	mg/L			•			I		ı	ı	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\mathbf{v} \mathbf{v} \mathbf{v} \mathbf{v} \mathbf{v} \mathbf{v} \mathbf{v} \mathbf{v} $	Phenobarbital Di-methyl Derivative A	mg/L	,		• •	•	·	ŀ		ı	Ţ	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Fnenol, (1,1-Dimethylethyl A Phenol 24-Rio/11 Dimod. 1	mg/L	·						·		ļ	•
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Phenol. 2.4-bis(1,1-UIIItetnyt) A	mg/L				ı		1 1			•	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	<pre> Multi Mu</pre>	Phenoly 4-(1,1,3,3-Tetrameth	mg/L ™ĉ/I	•	,				ŧ				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Phenol, 4-(2,2,3,3,-Tetrameth) A	mg/L			1	ı	ı		•	,	·	ı
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Agent of the second sec	Phenol, 4,4-Butylidenebis(2) A Sulfur a	mg/L	·		,			• •		,		•
mg/L - - - - - - mg/L - - - - - - ng/L - - - - - -	A marked for the second	Sulfur, mold. (S8) A	mg/L	·					ı				
mg/L - - - - - -	A constraint of the second constraint of the s	Sulfur, Mol. (S8) (8CI9CI) A	mg/L me/L				•		,	ŀ			٠
mg/L	Mg/L	Talbutal A	mg/L			1		ı			ı	ı	
mg/L	mg/L	Tetramethylbutylphenol A	mg/L	•				•			,	,	
mg/L	mg/L	Unknown A	mg/L		ı			• •		ı	ı	,	•
	130 (7) Appendix A	Unknown B Unknown C	mg/L	ı	·	·	ı						• •
		1	лß/ г	ł	•		٠		•	ı	ı	ı	,

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	9-WW
	MW-9B
EW YORK	MW-9B
1 ATER tesults :reenbush, n	Be-WW
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS : SITE 3, EAST GREENBU	MW-9B 017
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK	MW-9B 0117

Sample Location: Location: Sample ID:		MW-9B OU2 030627014-004	MW-9B 0U2 030637014_005	MW-9B OU2	MW-9B OU2	012 MW-9B	МW-9В ОИ2	MW-9B 0U2	MW-9B OU2	MW-9B DU7	MW-10B
oampte Date: Patameter		6/26/2003	6/26/2003 Duplicate	12/2/2003	040/01003-001 6/30/2004	041207030-003 12/7/2004	A5687305 6/30/2005	A5E26912 12/13/2005	MW9B 5/18/2006	MW9B 6/26/2006	GW-AK-09* 6/24/1998
	SILLE										
	ng/L	ı	ı								
	mg/L me/L								·	,	•
Unknown G Unknown H	ng/L	•					ı	ı		• •	• •
	ng/L		,	ı	, ,	• •	•	ı	,	Ţ	ı
	mg/L mg/L			,	·	·	• •		т 1		
Unknown K Unknown I	ng/L	•			ı	•		ı	,		
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	ıg∕L		ı				ı	•		ı	ı
	18/L	ı		·	•	1 1		ι ι	•	ī	
hiophene A	mg/L mg/L			ı							
Wartarın A me	mg/L	,				, ,	ı		•	ı	
Metals							,	•	ı		•
Iron Iron (Discolucid)	g/L	•		ï	15.2						
iolved)	mg/L me/L		·	I	0.0299 B	1 1		• •	-	- 7.44.1	ND (13.8) ND (7.81)
	ı Ö	I	,	ı		,	ı	ı	1.26	1.12]	-
cuess Methane mg	mg/L		,								
	ı b		•	•		ı		ı	0.95 E	4.4 J	·
	cfu/mL	,	·								
Denzene Specific Microbial Population Total Microbial Pomulation	cfu/mL	ı			5700	1 1		(,		-
	ctu/mL	ı	ı	ı	20000	ı					1440 4800
sartic Carbon (DOC)	mg/L me/L	ı		I	180	I	,		130	64.2	155
	-1/2			• •	- 000				7.3	1	-
	r/L	,	•	,			. ,	4 , 1		ND (0:050)	0.408
	: -:				6.8 J			ı			
Priosphate, Total Sulfate	/r	ı	,		- 0.76		1		ı		6.7
Sulfide mg/L mg/L	/r	, ,		,	ND(1)		,			ND (2.0)	33.5
	/Г	,	. ,				•	,			I
2	27		,	ı	260	•				• •	- 253
	1				2.5 7.8	• •	,			,	(I) (I)
1 Otal Suspended Solids (155) mg/	/r	•	ı	·	37		••	11	1.1	4 1	ND (3)
Field Parameters Conductivity Field											2
Dissolved Oxygen mg/L	s/cm /L	3540 -		I	723	580	559	500	0.539	0.57	ı
OVA Reading Oxidation reduction potential	8	ı	ı		- -		1 1	1 1	5.03 -	1.15 	
	, UICS	- 7.4	• •	1 1	-19 6.37	6.8		- 73	-103 6 70	-122 7 50	ł
ntu	5	ı	ı	I	30.8	•	1	} ,	. 00	6	
CRA 7830 (71) Appendix A										9046ALXT2-N	q046AL-XT2-WG-Historical-37-TH In/37/2006

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		-	OU2 - STERLIN	STERLING SITE 3, EAST GREENBUSH, NEW YORK	T GREENBL	JSH, NEW Y	ORK				
Sample Location: Location: Sample ID: Sample Date:		MW-10B OU2 GW-BKP-034 6/7/2000	MW-10B OU2 026624AG-03 6/24/2002	MW-10B 012 040701003-006 6/30/2004	MW-10B 0U2 MW10B 6/77/7006	MW-11B OU2 GW-AK-07 6/7419098	MW-11B OU2 GW-BKP-032	MW-11B OU2 0266244G-07	MW-11B OU2 040709001-001	MW-11B OU2 MW11B	MW-12B 0U2 GW-AK-19**
Parameter	Units					0001 84 8	00071/00	70071770	/18/2004	6/26/2006	6/25/1998
Volatile Organics 1.1.1.Trichloroschane	2										
1,1,2,2-Tetrachloroethane	mg/L mg/L	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	(10.0) CIN ND (0.01)	ND (0.01) (10.01 CIN	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.05)
1,1-Dichloroethane	mg/L mg/L	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0:0050) UJ ND (0:0050)	ND (0.05) ND (0.05)
1,1-Dichloroethene 1,2-Dichloroethane	mg/L	ND (0.005)	ND (0.005)	ND (0.005)	(1070) CIN (1070) CIN	(10:0) CIN ND (0:01)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.0050) ND (0.0050)	ND (0.05) ND (0.05)
1,2-Dichloropropane	mg/L	ND (0.005)	ND (0.005) UI ND (0.005) UI	ND (0.005) ND (0.005)	(10.01) (10.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.05)
2-Butanone (Methyl Ethyl Ketone) 2-Hexanone	mg/L	ND (0.01)	ND (0.01) UJ	ND (0.01) UI	ND (0.02)	(10:0) CIN	(cm:n) CN (10:0) CIN	ND (0.005) UJ ND (0.01) UI	ND (0.005) ND (0.01) Li	ND (0.0050) ND (0.01) 11	ND (0.05) ND (0.05) LT
2-Methylthiophene	mg/L mg/L	(10:0) CN	(10.0) UN ND (0.01)	ND (0.01) ND (0.01)	ND (0.02)	(10.0) CIN	(10.0) UN (10.0) CIN	ND (0.01)	ND (0.01)	ND (0.01) UJ	ND (0.05)
J-weurytruopnene 4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	mg/L	(10.0) UN (0.01)	(100) CN	ND (0.01)	ì	ND (0.01)	(10:0) CIN	(10.0) UN ND (0.01)	(100) CN (100) CN		ND (0.05) ND (0.05)
Acetone	mg/L	(10:0) QN	(10.0) UN ND (0.01)	(10:0) DN ND (0:01) UI	ND (0.02) ND (0.02) UI	(10.0) CIN (10.0) CIN	(10.0) CIN 1 (10.0) CIN	(10.0) CIN	ND (0.01)	ND (0.01) UJ	ND (0.05) UJ
Bromodichloromethane	mg/L me/L	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.0020)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	(10:00) ON ND (0:0010)	ND (0.05)
Bromoform	mg/L	ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	(10:0) CIN TLI (10:0) CIN	(10:0) ON (10:0) ON	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.05)
Dromometriane (Methyl Bromide) Carbon disulfide	mg/L	ND (0.01)	(100) CIN	ND (0.01)	ND (0.02) UJ	ND (0.01)	(100) ON	(con.o) UN (10.0) UN	(900.0) UN (10.0) ON	ND (0:0050) ND (0:01)	ND (0.05) ND (0.05)
Carbon tetrachloride	mg/L	(G000) UN (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.01)	ND (0.01)	ND (0.005) J	ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.05)
Chlorobenzene	mg/L	ND (0.005)	ND (0.005)	ND (0.005)	(10:0) ON (0:01)	(10.0) UN (10.01)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.0050)	ND (0.05)
Chloroform (Trichloromethane)	mg/L	ND (0.01)	ND (0.01)	ND (0.01) UJ	ND (0.02) UJ	ND (0.01)	ND (0.01)	(10.0) UN	(10.0) UN	(10:0) GN	ND (0.05) ND (0.05)
Chloromethane (Methyl Chloride)	mg/L	(1000) CIN	(1000) ON (1000) ON	ND (0.005) ND (0.011)	ND (0.01)	(10.0) CIN	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.05)
cis-1,2-Dichloroethene cis-1,3-Dichloronronene	mg/L	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.01) ND (0.005)	ND (0:0050) ND (0:0050)	ND (0.05) ND (0.05)
Dibromochloromethane	mg/L me/L	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	(10.0) CIV	ND (0.01)	ND (0.005)	NID (0.005)	ND (0.005)	ND (0.0050)	ND (0.05)
Ethyl Ether Ethylhenzene	mg/L	ND (0.01)	ND (0.01)	ND (0.01)	0.0031 J	ND (0.01)	(cmu) UN 0.015	(500.0) UN (10.0) UN	ND (0.005) ND (0.01) UI	ND (0.0050) 0.011	ND (0.05)
m&p-Xylene	mg/L me/L	ND (0.005) -	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.05)
Methylene chloride o-Xvlene	mg/L	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.0050) ND (0.0050)	- ND (0.05)
Styrene	mg/L mg/L	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	(10.0) CIN	-		ND (0.005)	ND (0.005)	ND (0.0050)	
Tetrachloroethene Tolissie	mg/L	ND (0.005)	ND (0.005)	ND (0.005)	(10.0) CIN	(IUU) UN (I0:0) UN	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.0050) ND (0.0050)	ND (0.05) ND (0.05)
trans-1,2-Dichloroethene	mg/L mg/L	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	(10.0) CIN	(10.0) CIN	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.05)
trans-1,3-Dichloropropene Trichlorostheme	mg/L	ND (0.005)	ND (0.005)	ND (0.005)	(10:0) ON	(100) ON	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.0050) ND (0.0050)	ND (0.05) ND (0.05)
Vinyl acetate	mg/L mg/L	ND (0.005) ND (0.01)	ND (0.005)	ND (0.005)	ND (0.01)	(10.0) CIN	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.0050)	ND (0.05)
Vinyl chloride Xylene (total)	mg/L me/L	ND (0.01) ND (0.005)	(10.0) CIN	ND (0.01)	ND (0.02)	ND (0.01)	(1070) CIN	- 10.0) UN	- - - - - -	ND (0.01)	- ND (0.05)
TIC Volatile Organics	i Ď			•			(0.005) UN	I	ı	ı	ND (0.05)
1,2-Dichlorotetrafluoroethane (CFC 114) A	mg/L				ı	ı	,	,			
benzene A Carbon dioxide A	mg/L mº/l.			, 00 BINI	•	r	ı			, ,	11
Chlorodiftuoromethane A Dichlorodiftuoromethane (CEC-12), A	mg/L	ł		-					0.1 BJN		1 (
Dichlorofluoromethane A	mg/L mg/L						1 1	·	I	ſ	ı
Ditisopropyl ether A	mg/L			·	ı			1 1			1 1
Diphenyl ether A	mg/L					1 1				• •	1 1
Ethoxymethyl benzene A	mg/L mg/L		• •				•	·	ı	ı	
Hexane A Silanol trimethyl A	mg/L	ı	,	•	ı	•		1 1			
Sulfur dioxides A	mg/L mg/L			• •		1	ı		ı	ı	ı
Trichlorofluoromethane A Unknown A	mg/L		ı	1							1 1
Unknown silane A	mg/L mg/L		F 1		• •			۰.		1 1	
Semi-Volatile Organics 1,2,4-Trichlorobenzene	me/L	,									
	i İo			•	ı	ı	ı	•	ı	I	ı
CKA 7830 (71) Appendix A										q046AI-XT2-	q046AI-XT2-WG-Historical-37-TH 10/3/2006

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS e lo

Sample Location: Location: Location: Location: Sample Location: Location: Sample Location: Sample Data: Parameter 1-2-Dickhorobencaree 1-3-Dickhorobencaree 1-3-Dickhorobencaree 1-4-Dickhorobencaree 1-4-Dickhorobencal 2-4-Dintrophenol 2-4-Dintro

Page 31 of 68	MW-11B MW-12B 0U2 0U2 0U2 MW1B GW-AK19** 6/26/2006 6/25/1998			g046AI-XT2-WG-Hitsorical-37-TH 10/3/2006
	MW-11B OU2 040709001-001 7/8/2004			
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK	MW-11B 0U2 020624AG-07 6/24/2002	ı		
	MW-11B OU2 GW-BKP-032 67/2000			
	MW-11B OU2 GW-AK-07 6(24/1998	ı		
	MW-10B 0U2 MW10B 6(27/2006	ı		
	MW-10B 0U2 040701003-006 6/30/2004	·		
	MW-10B 012 020624AG-03 6/24/2002			
	MW-10B OU2 GW-BKP-034 6772000			
		Units mg/L mg/L	し、し、し、し、し、し、し、し、し、し、し、し、し、し、し、し、し、し、し、	
	Sample Location: Location: Sample ID: Sample Date: Deconneter	Phenol Pyrene	True True	το στηγοριατία το (α. λ. α.

10B 10C 10C 10C 10C 10C 10C 10C 10C 10C 10C	MW-10B MW-20B 0012 0012 0015 0016 6124/2002 6130/2004 66 6130/2004 06 6130/2004 06 6130/2004 6130/200000000000000000000000000000000000	MW-10B A MU12 C1 MU12 612712006 61 612712006 61 	MW-11B MW-11B MW-11B 0UI2 CWLAC7 CW12 0UI2 0UI2 0UI2 0U12 0U12 0U12 0U12 0U12 0U12 0U12 0U1	65 7	MW-11B 0U2 00209001-001 7/8/2004 - - - - - - - - - - - - - - - - - -
Britis mg/L - mg/L					
mg/L - mg/L - <td< th=""><th></th><th></th><th></th><th></th><th></th></td<>					
mg/l - mg/l - <td< td=""><td></td><td></td><td></td><td></td><td></td></td<>					
mg/l - mg/l - <td< td=""><td></td><td></td><td></td><td></td><td></td></td<>					
mg/L					
mg/1 - - - mg/1 - - - mg/1 - - - - - mg/1 - - - - - - mg/1 - - - - - - - - - - - - - - - -				• • • • • • • • • • • • • • • • • • • •	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$					
mg/L - - - - - - - - - - <td></td> <td></td> <td></td> <td></td> <td></td>					
$\begin{array}{cccccccccccccccccccccccccccccccccccc$					
mg/L					
$\begin{array}{cccccccccccccccccccccccccccccccccccc$					
mg/L					
mg/L - - mg/L 197 5.43 mg/L 17.4 0.561 mg/L 17.4 0.561 mg/L - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -					
mg/L					
mg/L					
mg/L 197 5.43 mg/L 17.4 0.561 mg/L 17.4 0.561 mg/L mg/L 215 610 ctu/mL 8900 6800 mg/L 215 180				, .	
mg/L 19.7 5.43 mg/L 17.4 0.561 mg/L 17.4 0.561 mg/L - - ng/L - - n ctu/mL 335 610 ctu/mL 335 610 mg/L 215 180 mg/L 215 180					
mg/L				3.37	2.51
n n chu/mL tion chu/mL tion chu/mL 335 610 chu/mL 8900 6800 mg/L 215 180 mg/L 215				-	0.024 D
n ctu/mL	•	,			
n chu/mL					
mg/L 215 180 mg/L 215 180 mg/L	- 610 570 6800 2400		- 480 50 1740 240	- 670 6400	360 3500
180 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
ma/1 0.03 0.3			230 145 	180	175
C'O COO 7/500 Moc/j U-12/	0.3 0.53		0.03 0.2	2.34	4.67
- (250, 2,9m) 	- 6.71				
s.u. 6.7 -			6.7 6.7	ı	-
mg/L 33.2 26.8			25.5 41.9	1.8 33.7	0.12
	U (1.0) UN U (1.0) UN			ND (0.1) UJ	ND (0.1)
Xissolved Solids (TDS) mg/L 328 348				ND (1) UJ 325	ND (1) UI
		- NC	ND (1.96) 3.36	(I) ND ND ND	1.7
mg/L 35 23.5				20	29
mutosycut	- /22 - /24	0.506 2.32			3.84
,		- 6		·	1
	- 649	82 7.37	• •		-46 6.53
·		60		ı	48.5

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TABLE A.1

TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

Sample Location: Location: Sample ID: comment D:		MW-12B 0U2 GW-BKP-017	MW-12B OU2 GW-BKP-019	MW-12B OU2 020620BH-05	MW-12B OU2 040709001-002	MW-12B OU2 05031076-002	MW-12B 0U2 4527003	MW-12B 0U2	MW-12B OU2	MW-12B 0U2	MW-12B 0U2
Jampie Date: Parameter	Units	6/5/2000	6/5/2000 Duplicate	6/20/2002	7/8/2004	3/11/2005	3/11/2005	6(29/2005	12/14/2005	MW12B 5/18/2006	MW12B 6/26/2006
1,2-Dichlorobenzene 1,3-Dichlorobenzene	mg/L mg/L	• •	. ,		. ,	1 .	ı	,	,		ı
1,4-Ukthorobenzene 2,2''aybiel(Tchropropane) (bis(2-chloroisopropyl) ether) 2,4.5'Trichlorobenol	mg/L mg/L									• • •	
2,4.6-Trichlorophenol 2,4-Dichlorophenol	mg/L mg/L				• •						
2,4-Dimethylphenol 2,4-Dinitrophenol	mg/L mg/L	• •	•••		1 1	11	н I	• •			, ,
2.4-Dinitrotoluene 2.6-Dinitrotoluene	mg/L										
2-Chloronaphthalene 2-Chloronaphthalene	mg/L mg/L				•••		ιı	1 1		• •	
2-Methylraphthalene	mg/L mg/L	1 1									• •
z-weurytphenol 2-Nitroantiline	mg/L mg/L					- 1			11	• •	• •
2-Nitrophenol 3,3'-Dichlorobenzidine	mg/L mg/L	1 1				, ,		ч т		1 I	
3-Nitroaniline 4.6-Dinitro-2-methylphenol	mg/L	I	,			F I					
4-Phonophenyl phenyl ether	mg/L										
4-Chloroaniline	mg/L mg/L			11		1		,			1 1
4-Chlorophenyi phenyl ether 4-Methylnhenol	mg/L	,	ŗ				1 1				1 1
4-Nitroaniline	mg/L mg/L	1 1	, ,		1 1	1 1					
A-run priction Acenaphthene	mg/L me/L		4 1	ı	ı	•	ı	ı	ı		
Acenaphthylene Anthracene	mg/L	,		1 1		• •		• •			
Benzo(a)anthracene	mg/L mg/L		• •	1 1	1 1		, ,				ı
benzo(a)pyrene Benzo(b)fluoranthene	mg/L me/l.			ı		I					
Benzo(g.h.i)perylene Benzo(k)fluoranthene	mg/L	ı			1 1	1 1					ь (
Benzoic acid	mg/L mg/L			1 1				• •	1	1	ı
Benzyl Alcohol bis(2-Chloroethoxy)methane	mg/L me/L				•	ı	ł				1 1
bis(2-Chloroethyl)ether bis(2-Ethylbevel)ether	mg/L	I									1 1
busy terry mersy primate Butyl benzylphthalate	mg/L mg/L	۱.				, ,		٠	,		
Carbazole Chrysene	mg/L	,	ŧ	ı		,	ι			• •	
Dibenz(a,h)anthracene	mg/L mg/L	ð I			1 1	• •		• •	• •		
Diethyl phthalate	mg/L me/I	, ,	ı	·			ı	·	Ţ	ı	ı
Dimethyl phthalate Di-n-huthylateda	mg/L			1 1							
Di-n-octyl phthalate	mg/L mg/L	1 1	1 1			• •			,	ı	•
Fluorene Fluorene	mg/L	I	ı	1					ι ι		
Hexachlorobenzene	mg/L mg/L		, ,	1 1	, ,	• •			()	ı	ı
Hexachlorobutadiene Hexachlorocyclopentadiene	mg/L	8 1	ı	,	1 1		• •	• •			
Hexachloroethane	mg/L			11			• •				
Indeno(1,2,3-cd)pyrene Isophorone	mg/L mg/L		1 1	• •	1 1						·
Naphthalene Nitrobenzene	mg/L		,		•	ļ					
N-Nitrosodi-n-propylamine	mg/L 	• •	1 1			1 1				• •	
N-141105001prentylariure Pentachlorophenol	mg/L mg/L	1 1	, ,								
<i>P</i> henanthrene	mg/L	ı			•	٠			•	I	ı

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TABLE A.1 GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample ID: Sample Date: Paraneter											07T-44747
Parameter		042 GW-BKP-017 6/5/2000	OU2 GW-BKP-019 6/5/2000	0U2 020620BH-05 6/20/2002	OU2 040709001-002 7/8/2004	OU2 050311026-002 3/11/2005	0U2 A5227001 3/11/2005	0U2 A5680602 6/29/2005	0U2 A5E26902 12/14/2005	OU2 MW12B	OU2 MW12B Erschood
	Units		Duplicate					C0071C710	C007#117T	9007/01/0	9007/97/9
Ptenol Pyrene	mg/L mg/L					, ,	ı	ı			ı
TTC Semi-Volatile Organics 1 (2H)-Naphthalenone, 3.4-dih A	me/1.						1	ı		•	ı
1,1'-Biphenyl (9CI) A	mg/L				1 1	, ,		ı	•	ı	ı
2.4.6(1H,3H,5H)-Pyrimidinetr A	mg/L mg/l.			•	·				, ,		1 1
3H-Pyrazol-3-one, 1,2-dihydr A 4-Pineridine Contourdia A sid A	mg/L	,			1 1	1 4		ı	ı	,	ı
7.1 pertoune Carboxyue Acta A 7,9-Di-tert-butyt-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A	mg/L		·	•	·			11	۶ ı		1 1
9-Octadecenoic Acid (Z)-(9C) A	mg/L	• •		• •		•	1	ı		ı	
Anturopyrine A Aniline (ACN) (8CI) A	mg/L	ı	,	ı					1 1		
Benzenamine, 2,6-Dimethyl A	mg/L		• •			,	·		ı		
Benzenamine 2,4-dimethyl-A Benzenamine 2,5-dimethyl-A	mg/L	ı		. ,			, ,	• •			
Benzenamine,2,6-dimethyl- A	mg/L me/L		,			ı			1 1	• 1	
Benzene, 1,1'-Oxybis (9CI) A Benzone (Feltronne - 44-1), 2005	mg/L							ı	ſ		•
Benzenementanamine, N,N-dimethyl A	mg/L ma/l	I	ı			•	ı				1 1
Benzenemethanamine, N-methyl A Benzeie Aeid 4 Culture Acco	mg/L	1 1			, ,	• •			1	,	ı
	mg/L me/l			ı	ı	,	- 1		• 1		
	mg/L		• •			ı	ı	ı	ı	ı	ı
butyl ester, hexadecanoic acid A Carboxylic Acid A	mg/L	ı	,	·		1 1			1 1		1 1
	mg/L mg/L		• •		ı		·	ī	,	ı	,
	mg/L					1 1	1 1	1 1			
ne, decamethyl- A	mg/L	•	T	•	I		ı	ı			
	mg/L	• 1	• •	1 1		ı	ı		ł	ı	ı
Diethylfoluamide A Diphenvl ether A	mg/L	,	ı	,			1 1				1.1
4	mg/L mg/L		, ,			•	ı		١	ı	ı
	mg/L		ł		, ,					1 1	
	mg/L mø/L		4			ı	ł				1 1
	mg/L					1 1	• •			1	Į į
Meprivacaine A	mg/L	I			ı	ı	1	·	I I		
loride A	mg/L	. 1			F 1				Ţ	,	Ţ
	mg/L	ı	•	ł	ı				• •	4 1	• •
chenyl A	mg/L	• •					ŗ		ı		
o-Toluidine A Pentazorine A	mg/L	ì							11	• •	1 1
	mg/L mº/l.			,	,		·	ı		·	
vative A	mg/L		1 1		• •				ŀ	ı	,
Prnehol, (1,1-Dimethylethyl A Phenol, 2,4-Bis(1,1-Dimethyl) A	mg/L		·	·	,		ı				
	mg/L me/L			•	,	Ţ	1		ı	1	ı
	mg/L				1 4	• •	1 1				
	mg/L	·	ı		ļ	ı				ı	
	mg/L			1 5			• •	I	,	ı	
Sulfur, mold. (S8) A Sulfur. Mol. (S8) (8C19C1) A	mg/L				ı	,					
	mg/L mg/L		1 1		, ,		I	,			
Tetramethylbutylphenol A I Inknown A	mg/L	ı	ı				1 1				
	mg/L me/L	• •	, ,		1	ı	ı			,	I
Unknown C	mg/L			ı	ı		1 1				

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

Sample Location: Location: Sample D: Sample Date: Parameter	Unknown D Unknown F Unknown H Unknown H Unknown I Unknown I Unknown K Unknown Atame A Unknown Atame A Unknown Atametic B Unknown Atomatic B Unknown Atomatic B Unknown Atomatic B Unknown Atomatic B Unknown Atomatic C Unknown Atomatic C Unknown Atomatic C Unknown Atomatic A Unknown Carboxylic Acid A Unknown Carboxylic Acid A Unknown Oxgenated Compound 1 Unknown Substituted Thiophene A Unknown Substituted Thiophene A	Iron Iron (Dissolved) Manganese (Dissolved)	Gases Mettane Biological Aeroic Total Microbial Population Berraene Specific Microbial Population Total Microbial Population	General Chemistry Alkalinity. Total (As CaCO3) Dissolved Organic Catbon (DOC) Nitrate (as N) Orthophosphate PH PH PH (water) Phosphate, Total Sulfide Sulfide Sulfide Sulfide Total Siesolved Solids (TDS) Total Stepended Solids (TDS) Total Suspended Solids (TDS) Total Suspended Solids (TDS)	Field Parameters Conductivity Field Dissolved Oxygen OVA Reading OXidation reduction potential pH1 Field Turbidity
Units	- 1,28 - 1,28	1/8m 1/8m 1/8m	mg/L cfu/mL cfu/mL cfu/mL	し し し し し し し し し し し し し	umhos/cm mg/L ppm millivolts s.u.
MW-12B OU2 GW-BKP-017 6/5/2000		52 13.3 -	- - 830 12500	235 235 0.74 0.74 0.74 6.7 1.10 1.10 1.64 1.10 1.64 1.10 1.40	
MW-12B 0U2 GW-BKP-019 6/5/2000 Duplicate		52.3 11.8 -	- 910 12000	250 ND (0.02) 1.32 6.8 6.8 1.09 1.00 10.08 1.132	
MW-12B 012 020620BH-05 6/20/2002		53.3 22.3 -	- 520 3000	200 0.03 -	
MW-12B 012 040709001-002 7/8/2004		56.5 1.97 -	- 4500 11000	240 240 3.3 6.5 5.5 81.3 ND (0.1) ND (0.1) 58.8 7 7 242 242	1320 4.61 - 6.54 68.9
MW-12B 012 050311026-002 3/11/2005				• • • • • • • • • • • • • • • • • • • •	1150 9.77 0 5.5 23.2
MW-12B 0U2 A5227001 3/11/2005		33 11.9 -	- - 26000	144 	1150 9.77 0 5.4 5.23.2
MW-12B 0U2 A5680602 6/29/2005		29.4 7.33 -	- 5500 610	187 - 187 - 187 - 1.6 1.0 ND (1.0) ND (2.0) 5.5 5.5 5.5 5.5 6.0 8.4	1140 - 6.76 -
MW-12B OU2 A5E26902 12/14/2005		1 1 1		-	1300 6.9 -
MW-12B 0U2 MW12B 5/18/2006		- 4.45 0.499	0.12 E - -	160 5.2 ND (0.050) 1 - - - - - - -	1.07 5.22 - 116 6.83 19.2
MW-12B OU2 MW12B 6/26/2006		- 4.43 J 0.585 J	960.0 - -	106 - 0.050) 	1.46 1.21 - 148 7.73 7

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK	
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Sample Location: Location: Sample ID: Sammle Date:		MW-13A 0U2 GW-AK-15	MW-13A OU2 GW-BKP-026	MW-13A 0U2 020620BH-02	MW-13A OU2 040207001-005	MW-13A 0U2 012 017	MW-13A OU2	MW-13A 0U2	MW-13A 0U2	MW-13A 0U2	MW-13B OU2
Darmetor		6/25/1998	6/6/2000	6/20/2002	7/6/2004	3/11/2005	3/11/2005	A5687301 6/30/2005	A5E26903 12/14/2005	MW13A 6/26/2006	MW-AK-01 12/9/1997
	Units										
1,2-Dichlorobenzene 1,3-Dichlorobenzene	mg/L			,		ı					
1,4-Dichlorobenzene	mg/L mg/L					ı		, ,			• •
24.5-Trichlorophenol	mg/L me/I	ı	ı	ı			1 1	1 1	, ,	ı	1
2,4,6-Trichlorophenol 2,4-Dichlorophenol	mg/l.	1 1		• •		•	ı	ı	•	1	• 1
24-Dimethylphenol	mg/L mø/L		ı	ı				1.1			
2,4-Dinitrophenol	mg/L			1 1		ŀ	ı	i	ı		
2,6-Dinitrotoluene	mg/L mg/I	ı		ı	,			1 1		ı	
2-Chloronaphthalene	mg/L				•	ł	ı	ı			. ,
2-Methylnaphthalene	mg/L mg/I	ı	•	ı						ı	
2-Methylphenol 2-Niteconstination	mg/L		, ,	1 1	t	,	ı		·		
2-Nitrophenol	mg/L	,	ı	·			1 1		·	•	
3,3'-Dichlorobenzidine	mg/L mg/L			٠	,	ŧ	ł		1 1	• •	1 1
3-Nitroantine 4.6-Dinitro-2-methylnhenol	mg/L	,	I			, ,	į –		•	ı	,
4-Bromophenyl phenyl ether	mg/L		ı	1			÷ 1	• •	1 1		•
4-Chloro-3-methylphenol	mg/L						ı	ı			
4-Chlorophenyl phenyl ether	mg/L		ı			r 1				ı	
4-Methylphenol	mg/L mg/L	.,		•		ı			• •	• •	1 1
4-Nitroaniline 4-Nitronhenol	mg/L			1 1	• •	(1		ı	ı	,	
Acenaphthene	mg/L me/I	•		I	ı	•	• •		1 1	, ,	
Acenaphthylene	mg/L			1 1		ı	•	ı	ı	ſ	
Zuuracene Benzo(a)anthracene	mg/L		1	,		• •	• •			I	ı
Benzo(a)pyrene	mg/L mg/L			ı			•			1 1	
Benzo(b)fluoranthene Benzo(o h i)nem/lene	mg/L					• •		,	,	I	ı
ranthene	mg/L	•	ı		ı	•				1.1	
	mg/L) 1		I	I	ı	ı		
beitzyt Atconol bis/2-Chlomethavv)methana	mg/L	ı	•	ı					ı	ı	
Ľ	mg/L	•	ı		ı			3 1			
bis(2-Ethylhexyl)phthalate Buttel boom-better 1-1-	mg/L	ı					ı		ı	ı	
symmate	mg/L		ı	ı	,	• •		1 1	, ,		ı
	mg/L mg/L	• 1		ı	ı		,	ı			L T
Dibenz(a,h)anthracene Dibenzofireae	mg/L		ı	ŧ 1		• •	1 1	I		•	•
ate	ng/L	ļ	ı	,	,					, ,	
	mg/L		11	, ,		ı	•	I		ı	1
Di-n-butyiphthalate Di-n-octvl phthalate	mg/L	·	ı				÷ 1	1 1	, ,	ı	ı
ene	mg/L mg/L			ı	•	,		,			
	ng/L						1	•	ı	ı	,
Itexactuorobenzene Hexachlorobutadiene	mg/L		,		1			• •			•
ntadiene	ng/L		, ,		1	·	I	ı	,	,	
Intexactuoroethane Indeno(1,2,3-cd)pyrene	mg/L		ī					1 1			
	mg/L mg/L	• •	, ,	1 1	I	ı	·	,			
Naphthalene Nitrobenzene	mg/L					1 1	• 1	1 1			1
-propylamine	mg/L mg/L			• •	•	1	I	ı		1	
	mg/L me/L			ı	1 1	1 1		, ,		• 1	1 4
	18/L			• •	, ,	, ,	• •		ı		•
								1	•		I

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TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample Location: Location: Sample D: Sample D2:		MW-13A 0U2 GW-AK-15	MW-13A OU2 GW-BKP-026	MW-13A OU2 020620BH-02	MW-13A OU2 040707001-005	MW-13A OU2 050311076-001	MW-13A 0U2	MW-13A OU2	MW-13A 0U2	MW-13A 0U2	MW-13B 0U2
Parameter	Ilmite	6/25/1998	6/6/2000	6/20/2002	7/6/2004	3/11/2005	3/11/2005	6/30/2005	12/14/2005	MW13A 6/26/2006	MW-AK-01 12/9/1997
Phenol Purene	mg/L	ı	,	ï							
	mg/L	ı						1 1	• •	Į į	ı
TTC Semi-Volatile Organics 1 (2H)-Naphthalenone, 3,4-dih A	me/L									,	1
1,1'-Biphenyl (9Cl) A 1-Phenyl-1-cvclopronanecarho	mg/L	ı		, ,			• •	,	ı	•	,
2,4,6(1H,3H,5H)-Pyrimidinetr A	mg/L me/l.		ı	ŧ	ı		• •	• •	1.1	1 1	
3H-Pyrazol-3-one, 1,2-dihydr A 4-Pineridine Cadacaria A 213	mg/L		J 1	, ,		,		ł	,	•	I I
7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2.8-dione A	ng/L	ı	•	,	•	1 1					ļ
9-Octadecenoic Acid (Z)-(9C) A	mg/L mg/L	τ.	1 1	ł		·	•				
Aminopyrine A Aniline (ACN) (8CT) A	mg/L	ı				• •	•	I		ı	ı
Benzenamine, 2,6-Dimethyl A	mg/L mø/L		,			ı					
Benzenamine,2,4-dimethyl-A	mg/L		• •	1 1	• •	ı	·	·	ı		
Benzenamine,2,6-dimethyl- A	mg/L	,	•	,	1		1 1	1 1	• •		
Benzene, 1,1'-Oxybis (9CI) A	mg/L				ı	ı	ı	ï	,	,	
Denzene (Ethoxymethyl)-(9C) A Benzenemethanamine. N.Ndimethyl A	mg/L	ł	ı		1 1		1 1		t i	ŀ	,
Benzenemethanamine, N-methyl A	mg/L mg/L	1 1	, ,	1		ł	ł	ı		F 1	
benzoic Acid, 4-Chloro-(9CI) A Biohenvl A	mg/L	,	•			, ,	, ,		·		·
Butyl ester octadecanoic acid A	mg/L	•	I				1				
anoic acid	mg/L		, ,				ı		ł		
Chloromethylbenzene isomers A	ng∕L		ı		ı			, ,		•	ı
Chloromethylbenzene isomers B	mg/L mg/L					,	ı				
Cyclobarbitol A	ng/L	•						ı			
Cyclopentasuoxane, decamethyl- A Cyclopropane Carbonitrile, 2 A	mg/L	1	ı	ı		1 1			1 1	1 1	, ,
Diethyltoluamide A	mg/L			• •	1 1						ı
Dodecanoic acid A	mg/L mg/I				ı	ı	,		1 1		
Ethane, 1,2-Bis(2-Chloroetho) A	mg/L mg/L	1 1				ı	t		ı		ı
Ethoxymethyl Benzene A Hexobarital A	mg/L		,	,			, ,	• •	1 1		
Lidocaine A	mg/L	•••	• 1					,	ı	ı	
Mephobarbitol A Mepivacaine A	mg∕l	•	•		. 1				, ,		
Mepivacaine hydrochloride A	mg/L mg/L	1 1		•		•	ı	ı	,	•	1
Methyl Thiophene A Noramidonyrine A	mg/L	ı		1 1			1 1			• •	ı
O-Hydroxybiphenyl A	mg/L mg/l.			1		,	'	ı			
o-Toluidine A	mg/L	ı						ı	ı	·	
Phenobarbital A	mg/L	ı					I				
Phenobarbital Di-methyl Derivative A	mg/L					ł	ı		ı	,	
Phenol, (1,1-Dimethylethyl A Phenol 24-Bis(11-Dimethyl) A	mg/L	ı				• •	1 1	1 1			ı
Phenol, 2,4-bis(1-dimethyl A	mg/L mø/i	1	ı					ı			
Phenol, 4-(1,1,3,3-Tetrameth	шg/L mg/L			1 1	• •	1			ı	ı	,
rnenol, 4-(2,2,3,3,-1etrameth) A Phenol, 4,4'-Burvlidenehis(2) A	mg/L			,					. 1		• •
Sulfur A	mg/L mg/L		1 1		•	,	ı	ı	ı	,	
Sulfur, mold. (58) A Sulfur. Mol. (58) (8C19C1) A	mg/L	,	,						1 1	. ,	
Talbutal A	mg/L mg/L	• •			,		,	,	ł	1	
Tetramethylbutylphenol A Unknown A	ng/L	ı	·					• •	1 1		
Unknown B	mg/L mg/L		11			1	ı		ı		ı
UNKNOWN C	mg/L	ı	ı	,	١	•					

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q046A1-XT2-WG-Historical-37-TH 10/3/2006

TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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A MW-13B 10-12 11-12 121911997				• •		,							•	. ,		I	1 1	•		١		. [U]		- (0)	, ,		•	ı		'	1 1	1		, ,		, ,					q046AFXT2-WG-Historical-37-TH	. 10/3/2006
MW-13A MW-13A 012 012 012 A5E2603 MW13A 1214/2005 6/26/2006		,	•	• •						•								•				- ND (0.050) UJ	remon) and	- ND (0.0010)	, '		•	- 271	- ND (0.050)			 75.1	-					00 1.73 3.08		4 8.07 169		
MW-13A M1 0U2 (630/2005 12/3		,	ı		,		ı	1		,	, .	,	•				I			I		6.94 0.166			,			198	0.14	,		0.78 30.6	ND (1.0)	ND (2.0) 1410	0.60	35.0				7.4 7.08 - 7.4 		
MW-13A 0U2 A5227002 3/11/2005		,	ı	1)	•	, ,			I	ı								•	• •	ı	a c 7	12.8 ND (0.05)		ı	ı	NO GROW 120	3	211	- 0.26	ı						(0.1) 61.0		2040 11.21	0	4.64 919		
MW-13A 0U2 050311026-001 3/11/2005		,		1	4	1 1	·	• •			•						ı			1				ı				·			ı	• •	·	1 1	ı			2040 11.21	0	4.64 919		
MW-13A 012 040707001-005 7/6/2004			• •	,	,	, ,		, ,	ı		ı	r		ı	•				ı		221	3.39		•	ı	••		230	- 0.16	- 621	- 1	0.79 14.3	ND (0.1)	1300 1300	22	4.0 119		1 1	ı			
MW-13A OU2 020620BH-02 6(20/2002		١.		ı			ı		·		ı								ı	1	30.8	0.486				• •		275	0.08	1 1	• •	32.7	ND (0.1) UJ	800 m	ND(1)	10.9			1 1	,		÷
MW-13A 0U2 GW-BKP-026 6/6/2000		ı				ı	·	1 1	ı				,	,	. ,		ł		1		·	Ŧ . J		•	1	4 I			ı		I		•					1 1				
MW-13A 0U2 GW-AK-15 6(25/1998		•		•					ı		I		ı	ı			• •	I			ı			ı	,	ι.							. ,	•	• •	ı						
	Units	mg/L me/L	mg/L	mg/L	mg/L	mg/L	mg/L me/I.	ng/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L mg/L	mg/L	mg/L me/L	mg/L	mg/L me/L	b	mg/L	mg/L mg/L	:	mg/L	cfu/mL	cfu/mL cfu/mL		mg/L me/L	mg/L	mg/ L S.u.	s.u. me/I	mg/L	mg/L me/I	mg/L	mg/L me/L	mg/L		umhos/cm mg/L	ppm millivol ls	s.u. ntu		
Sample Location: Location: Sample D: Sample Date: Decembers	rameter	Unknown D Unknown E	Unknown F Linknown C	Unknown H	Unknown I	Unknown J Unknown K	Unknown L	Unknown Alkane A Unknown Amide A	Unknown Aromatic A	Unknown Aromatic B	Unknown Aromatic D	Unknown Aromatic E	Unknown Aromatic F Theraum Contractic Action	Unknown Carboxylic Acid B	Unknown Nitrogen Compound 1	Unknown Uxygenated Compound A Unknown Oxvenated Commund B	Unknown Substituted Thiophene A	Unknown Sulfur Compound A	Unurrown 1 nophene A Warfarin A	Metals		Iron (Dissolved) Manganese (Dissolved)	G <i>ases</i> Methane		Biological Aerobic Total Microbial Population Berzene Specific Microbial Population	Total Microbial Population	General Chemistry	Alkalinity, Total (As CaCO3) Dissolved Organic Carbon (DOC)	Nitrate (as N) Orthophosphafe	Hd	pri (water) Phosphate, Total	Sulfate Sulfate	Sulfite	Total Dissolved Solids (TDS)	Total Organic Carbon (TOC)	Total Suspended Solids (TSS)	Field Parameters	Conductority Freid Dissolved Oxygen	OVA Keading Oxidation reduction potential	pH Field Turbidity	CRA 7830 (71) Appendix A	

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

Sample Location: Location: Sample ID: Sample Date:		MW-13B 0U2 GW-AK-16 617511000	MW-13B OU2 GW-AK-01	MW-13B 0U2 MW-JR-06	MW-13B 0U2 MW-JR-07	MW-13B OU2 GW-BKP-027	MW-13B 0U2 GW-BP-007	MW-13B 0U2 GW-7830-0701-BKP-400	MW-13B 012 CW 7920 1141 2000
Parameter	Ilmite	066710710	8661/01/71	6/14/1999	12/8/1999	6/6/2000	12/20/2000	7/2/2001	200-770-700-700-700-700-700-700-700-700-
Volatile Organics									annudara
1,1,1-Trichlosethane	mg/L	ND (0.05)	ND (0.025)	ND/001					
1,1,4,4-1 tetrachioroethane 1,1,2-Trichloroethane	mg/L	ND (0.05)		ND (0.01)	(10:0) ON ND (0:01)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.025) ND (0.025)	ND (0.025)
1,1-Dichloroethane	mg/L	(c0.0) UN ND (0.05)	ND (0.025) ND (0.025)	(10.0) UN (10.0) UN	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.025)	ND (0.025) ND (0.025)
1,1-Dichloroethane	mg/L	ND (0.05)		(10:0) ON	ND (0.01) ND (0.01)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.025)	ND (0.025)
1,2-Dichloropropane	mg/L	ND (0.05)	ND (0.025)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.025) ND (0.025)	ND (0.025)
2-Butanone (Methyl Ethyl Ketone)	mg/L	ND (0.05) ND (0.05)		(10:0) CIN	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.025)	ND (0.025) ND (0.025)
z-nexanone 2-Methylthionhene	mg/L	ND (0.05)	ND (0.05)	ND (0.02)	ND (0.02)	ND (0.01) (100) (10	ND (0.01)	ND (0.05) J	ND (0.05)
3-Methylthiophene	mg/L me/I	ND (0.05)		ND (0.02)	(10.0) CIN	ND (0.01)	ND (0.01)	ND (0.05) ND (0.05)	ND (0.05) J
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	mg/L	ND (0.05)		ND (0.02) ND (0.02)	(10.0) CIN	(10.0) CIN	ND (0.01)	ND (0.05)	(2020) UN ND (0.05)
Benzene	mg/L	ND (0.05)		ND (0.02)	ND (0.02)	(10.0) UN ND (0.01)	(10.0) CIN	ND (0.05)	ND (0.05)
Bromodichloromethane	mg/L me/L	ND (0.05) ND (0.05)		ND (0.01)	(100) CIN	ND (0.005)	ND (0.005)	ND (0.025)	ND (0.05) J ND (0.025)
Bromoterm Bromomethane (Methvl Bromide)	mg/L	ND (0.05)		(10:0) ON	(1070) CN ND (0701)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.025)	ND (0.025)
Carbon disulfide	mg/L	ND (0.05)	ND (0.05)	ND (0.02)	ND (0.02)	ND (0.01)	(cont.n) CIVI	ND (0.025) ND (0.05)	ND (0.025)
Carbon tetrachloride	mg/L	ND (0.05) ND (0.05)		(10.0) ON (10.03) ON	ND (0.01)	ND (0.005) J	ND (0.005)	ND (0.025)	ND (0.05) ND (0.025)
Chloroethane Chloroethane	mg/L	ND (0.05)		(10:0) CIN	(10.0) UN	ND (0.005) ND (0.005)	ND (0.005)	ND (0.025)	ND (0.025)
Chloroform (Trichloromethane)	mg/L	ND (0.05)		ND (0.02)	ND (0.02)	(100) ON	(9000) CIM	ND (0.025) ND (0.05)	ND (0.025)
Chloromethane (Methyl Chloride)	mg/L mg/L	ND (0.05) ND (0.05) 17		ND (0.01)	(10.0) UN	ND (0.005)	ND (0.005)	ND (0.025)	ND (0.05) ND (0.075)
cis-1,2-Dichloroethene cis-1,3-Dichloronana	mg/L	ND (0.05)	ND (0.025)	(1070) ON	(100) CIN	ND (0.01)	ND (0.01)	ND (0.05)	ND (0.05)
Dibromochloromethane	mg/L me/I	NID (0.05) NID (0.05)		ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.025) ND (0.075)	ND (0.025)
Ethyl Ether	mg/L	(cn:n) (TN)	(c20.0) UN 0.81	(10.0) ON	(10.0) QN	ND (0.005)	ND (0.005)	ND (0.025)	ND (0.025) ND (0.025)
Etnyldenzene m&p-Xviene	mg/L	ND (0.05)	ND (0.025)	ND (0.01)	ND (0.01)	0.5 ND (0.005)	0.3 NID (0 ME)	0.59	0.7 J
Methylene chloride	mg/l. mø/l.	- ND (0 05)		ND (0.01)) 	-	(cm.v) ur	(2010) UN	ND (0.025) ND (0.025)
o-Xylene Sturene	mg/L	-	- -	(10:0) CN (10:0) CN	(10:0) CIN	ND (0.005)	ND (0.005)	ND (0.025)	ND (0.025)
Tetrachloroethene	mg/l.	ND (0.05) ND (0.05)	ND (0.025) ND (0.025)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	- ND (0.025)	ND (0.025) ND (0.025)
Toluene	mg/L	ND (0.05)	ND (0.025)	(10:0) CIN	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.025)	ND (0.025)
uatus-1,z-Dichloroethene trans-1,3-Dichloropropene	mg/L	ND (0.05)	ND (0.025)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.025) ND (0.075)	ND (0.025)
Trichloroethene	mg/l.	ND (0.05)	ND (0.025) ND (0.025)	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.025)	ND (0.025) ND (0.025)
v inyl acetate Vinvl chloride	mg/L		ND (0.05)	ND (0.02) J	ND (0.02)	ND (0.005) ND (0.01)	ND (0.005)	ND (0.025)	ND (0.025)
Xylene (total)	mg/L mg/L	ND (0.05) UJ ND (0.05)	ND (0.05) ND (0.025)	ND (0.02) -	ND (0.02) ND (0.01)	(10.0) UN (0.01)	ND (0.01)	ND (0.05)	- ND (0.05) J
TIC Volatile Organics							(000.0) 441	(97070) AN	•
1,2-Dichlorotetrafluoroethane (CFC 114) A	mg/L	ı	,						
Detizene A Carbon dioxide A	mg/L	•	I	•		• 1		, ,	ı
Chlorodifluoromethane A	mg/L me/l	• •	•	,	ı	ı	,	ı	
Dichlorodifluoromethane (CFC-12) A	mg/L	,			11	1 1	1		ı
Diethoxymethane A	mg/L mg/I	ı	ſ	•					
Diisopropyl ether A	mg/L	• •	۰,		•	ı	r		
Lupnenyl ether A Ether A	mg/L	I	,	,	• •				ſ
Ethoxymethyl benzene A	mg/L mg/L	• •	, ,	• •		ı	I		
riexane A Silanol. trimethvl- A	mg/L		• •						
Sulfur dioxides A	mg/L me/L		•	•					1 1
Trichlorofluoromethane A	mg/L		1 1			•		ŧ	I
Unknown silane A	mg/L mg/L	• •	• •		• •		1 1	1 1	
Semi-Volatile Oreanics						a	3	1	•
1,2,4-Trichlorobenzene	mg/L	ND (0.01)		,	,	ND (0.01)		ı	,
CB & 7820 (71) Amountie &						•			I

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

Sample Location: Location: Sample ID: Sample Date:		MW-13B 0U2 GW-AK-16 6/25/1998	MW-13B OU2 GW-AK-01 12/15/1998	MW-13B 0U2 MW-JR-06 6/14/1999	MW-13B 0U2 MW-JR-07 12/8/1999	MW-13B OU2 GW-BKP-027 66612000	MW-13B 0U2 GW-BP-007 1217007000	MW-13B OU2 GW-780-0701-BKP-002	MW-13B 012 GW-7830-1201-BKP-005	
Parameter	Units						0007107171	1007/7//	12/7/2001 Duplicate	
1,2-Dichlorobenzene	mg/L	ND (0.01)		•	ı	(100) CIN	1			
1,4-Dichlorobenzene	mg/L me/I	(10.0) CIN		ł		ND (0.01)			• •	
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether) 2.4 f-Trichtorochend	mg/L	ND (0.01)		1 1	• •	(10:0) ON (10:0) ON			ı	
2,4,6-Trichlorophenol	mg/L me/l.	ND (0.025) ND (0.01)		ı	•	ND (0.05)	ı			
2,4-Dichlorophenol	mg/L	(10.0) ON		1 1		ND (0.01)	•	-	ı	
2,4-Dunetrytpnenol 2,4-Dinitrophenol	mg/L	(10.0) (NN		ı	,	ND (0.01)			1 1	
2,4-Dinitrotoluene	mg/L	(100) ON			•	R MD (0.01)			ı	
2,6-LJunitrotoluene 3-C'hlanoachthalono	mg/L	ND (0.01)	•	ı		(10.0) UN ND (0.01)			I	
2-Chlorophenol	mg/L	ND (0.01)	•	I	ł	ND (0.01)		• •	1 1	
2-Methylnaphthalene	mg/L mg/L	(100) ON ND (0.01)				ND (0.01) ND (0.01)	·		ı	
∠-Methylphenol 2-Nitroaniline	mg/L	ND (0.01)	,		1	(10.0) ON		1 1	I	
2-Nitrophenol	mg/L me/L	ND (0.025) ND (0.01)		ı		ND (0.05)		•	1 1	
3,3'-Dichlorobenzidine	mg/L	ND (0.01)	, ,		, ,	(10:0) CIN 1 (20:0) CIN	•	,	r	
3-Nitroaniine 4.6-Diniiro-2-methylnhenol	mg/L	ND (0.025)		ı	,	ND (0.05)		• •	•	
4-Bromophenyl phenyl ether	mg/L	ND (0.025) ND (0.01)	ı	ı		ND (0.05)	3		1 1	
4-Chloro-3-methylphenol	mg/L	(1070) GN		, ,		ND (0.01)			ı	
4-Chloronhine 4-Chloronhenvi athar	mg/L	ND (0.01)	ı		,	ND (0.01)	1 1		1	
 Curve pricity puerly enter 4-Methylophenol 	mg/L	ND (0.01)			ı	ND (0.01)	ı			
4-Nitroaniline	mg/L mg/L	ND (0.01) ND (0.025)	1.1	• •	• •	ND (0.01)	•	•	ı	
4-Nitrophenol	mg/L	ND (0.025)	•	1		ND (0.05)		τ.	ı	
Acenaphthylene	mg/L	(10.0) QN	ı	ı	I	ND (0.01)	ı			
Anthracene	mg/L mg/L	(10.0) UN ND (0.01)	1 1			(10.0) UN (10.0) UN	ı	,	I	
Benzo(a)anthracene	mg/L	ND (0.01)	• •			(10.0) UN ND (0.01)			ı	
Benzo(a)pyrene Benzo(b)fluoranthene	mg/L	(10.0) CIN	,	·	١	ND (0.01)	ı			
Benzo(g.h.i)perylene	mg/L mg/L	(10:0) CN	• •	1 1	ı .	ND (0.01)	ı	-	ı	
Benzo(k)fluoranthene Bonzois asid	mg/L	(10.0) CIN	1	1		(10:0) ON		•••	1	
benzoic acid Benzvi Alcohol	mg/L	•		•		-	,		1 4	
bis(2-Chloroethoxy)methane	me/L	- 10 0101	•	i	١		ı	,		
bis(2-Chloroethyl)ether	mg/L	(1070) CN	• •	• •		(10.0) ON VID (0.01)	ı	1	·	
bis(2-Ethylhexyl)phthalate Bistrol henzylshthalate	mg/L	ND (0.01)	ı		ı	ND (0.01)				
Carbazole	mg/L me/L	(10:0) CIN	·	ı	,	ND (0.01)	ı	I		
Chrysene Dihoor/a thattane	mg/L	ND (0.01)				(10/0) (IN) (10/0) (IN)	1 1		ų -	
Dibenzofuran Dibenzofuran	mg/L mg/I	ND (0.01)	Ţ			ND (0.01)	ı			
Diethyl phthalate	mg/L	ND (0.01)				ND (0.01)		t		
Dimethyl phthalate Di-n-hutvinkthalate	mg/L	ND (0.01)	1		ı	ND (0.01)		1.1	ı.	
Di-n-octyl phthalate	mg/L me/L	(10.0) CIN		I	ı	(1070) CIN	ı	ł		
Fluoranthene	mg/L	ND (0.01)		1 1		(10.0) CIN	,	ı	•	
Fluorene Urveethaatheetee	mg/L	ND (0.01)	,	ı	,	ND (0.01)				
rexactuoropenzene Hexachlorobutadiene	mg/L	ND (0.01)	,		ı	ND (0.01)				
Hexachlorocyclopentadiene	mg/L	ND (0.01)			1 1	ND (0.01) J	·		-	
Hexactuloroethane Indeno(1-2-3-cd)mmm.c	mg/L	ND (0.01)		ı	•	(10.0) CIN		1 1		
Isophorone	mg/L me/L	ND (0.01)	1		ı	ND (0.01)	ł	ı	T	
Naphthalene	mg/L	(100) QN	, ,			ND (0.01) ND (0.01)				
Nitrobenzene N-Nitrosodi-n-n-nronvjamine	mg/L	ND (0.01)		ı	'	ND (0.01)				
N-Nitrosodiphenylamine	mg/L mg/L	ND (0.01) ND (0.01)		1 1		(10.0) CIN	ı		·	
Pentachiorophenol Phonantheses	mg/L	ND (0.025)	,			ND (0.05)	, ,			
1.1151441111115115	mg/ L	ND (0.01)			ı	ND (0.01)		,	·	

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q046ALXT2-WG-flistorical-37-TH 10/3/2006

TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK	
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Sample Location: Location: Sample ID: Sample Date:		MW-13B 0U2 GW-AK-16 6/25/1998	MW-13B 0U2 GW-AK-01 12/15/1998	MW-13B OU2 MW-JR-06 6(141999	MW-13B OU2 MW-JR-07 12/8/1999	MW-13B OU2 GW-BKP-027 6(6/2000	MW-13B 0U2 GW-BP-007	MW-13B 0U2 GW-789-070-BKP-002	MW-13B 0U2 GW-7830-1201-BKP-005
Patameter	Units					00071010	0007/07/71	E002/2//	12/7/2001 Duplicate
Phenol Pyrene	mg/L mg/L	(10.0) CIN (10.0) CIN				(100) UN ND (0.01)	ı	Ţ	
TIC Semi-Volatile Organics								•	
1 (2H)-Naphthalenone, 3,4-dih A 1,1'-Biphenyl (9CI) A	mg/L	,	ı		·	ı	ı	·	'
1-Phenyi-1-cyclopropanecarbo	mg/L mg/L					,	I	,	
2,4,6(1H,3H,5H)-Pyrimidinetr A 3H-Pyrazol-3-one 1 2-ditade A	mg/L	ı						•	I
4-Piperidine Carboxylic Acid A	mg/L	I	,	ı	ŀ	ı	·		1 1
7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A	mg/L			• •	1	٠	,		ı
9-Octadecenoic Acid (Z)-(9C) A	mg/L	,	•					ı	•
Aniline (ACN) (8CI) A	mg/L	0.004 JN		ı	•	ı		1 1	
Benzenamine, 2,6-Dimethyl A	mg/L me/L		,		•	ı	,	ı	
Benzenamine,2,4-dimethyl- A	mg/L	ı				1 1		ı	I
benzenamine,2,6-dimethyl- A Benzenamine,2,6-dimethyl- A	mg/L	,	ļ	,		ı		1 1	1 1
Benzene, 1,1'-Oxybis (9CI) A	mg/L	ı	•	ı	•		ı	-	- 1
Benzene,(Ethoxymethyl)-(9C) A	mg/L	0.006 IN		, ,	3		ı	-	ı
Benzenemethanamine, N,N-dimethyl A	mg/L	•						•	ı
Benzoic Acid, 4-Chloro-(9Cl) A	mg/L	ı	ľ	I	ī	·	,		
Biphenyl A	mg/L me/L	, ,	• •		ı	,		,	
Butyl ester octadecanoic acid A	mg/L				• •		•	,	
Butyl ester, hexadecanoic acid A Carbovulic Acid A	mg/L			,	. 1			F I	1
ne isomers	mg/Ľ	,		ı		•		1	
Chloromethylbenzene isomers B	mg/L mg/L	1	ı	ı	•	,	ı	ı	
Cyclobarbitol A	mg/L	1 1		•	•	I		ı	ı
Cyclopentasiloxane, decamethyl- A	mg/L	ı				1 1		I	T
Cycuproparte Carbonitrile, 2 A Diethyltoluamide A	mg/L	ı		i	,				1 1
Diphenyl ether A	mg/L me/L			,		ı		ı	
Dodecanoic acid A	mg/L				•	•	·	,	·
Ethane, 1,2-Bis(2-Chloroetho) A	mg/L	ı	ı			, ,		1 1	I
циохушениут венгене А Hexobarital A	mg/L	-	ı	•	ı				1 1
Lidocaine A	mg/t. me/L	NI OUUU		•	•	ı		,	I
Mephobarbitol A	mg/L	,	1					ı	I
iwepiyacame A Meniyacaine hudrochlorido A	mg/L		ı	·	·	1			
Methyl Thiophene A	mg/L	ı	•	•	•	•	ı		ı
Noramidopyrine A	mg/L			• •					
O-Hydroxybiphenyl A	mg/L		,	ı	ı		, ,		I
o-toluiqure A Pentazocine A	mg/L	•	,	ī		ı		1 1	. ,
Phenobarbital A	mg/L mg/I	-		ı	ı		ı	I	,
Phenobarbital Di-methyl Derivative A	mg/L	-		, ,			ı	•	
Phenol, (1,1-Dimethylethyl A Phenol 24-Bis(1 1 Dimeth-1), A	mg/L	•	ł		,			, ,	
Phenol, 2,4-bis(1,-dimethyl, A	mg/L	,	I	ı		ı		•	
Phenol, 4-(1,1,3,3-Tetrameth	mg/L					ı	ı	ŀ	ŧ
Phenol, 4-(2,2,3,3,-Tetrameth) A	mg/L	J						• 1	ı
rnenoi, 4,4 - Butylidenebis(2) A Sulfir A	mg/L			ı	,	ı		1	1 1
Sulfur, mold. (S8) A	mg/L me/I		ı		·	,	·	r	ı
Sulfur, Mol. (S8) (8C19C1) A Talkintel A	mg/L			1 1		۰.		1 1	
Laibutal A Tetramethylbutylohenol A	mg/L	0.02 JN		•	ı			ı	
Unknown A	mg/L mg/L	0.004 [• •		, ,	•		
Unknown B Dinknown C	mg/L	0.002 J	ı	ı					1 1
	n/gur	(10:0	ı	,	I	•		ŧ	

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TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample Location: Location: Sample ID: Sample Date:		MW-13B OU2 GW-AK-16 6/25/1998	MW-13B 0U2 GW-AK-01 12/15/1998	MW-13B 0U2 MW-JR-06 6(14/1999	MW-13B 0U2 MW-JR-07 12/8/1999	MW-13B OU2 GW-BKP-027 64612000	MW-13B 0U2 GW-BP-007 1212012000	MW-13B 0U2 GW-789-0701-BKP-002	MW-13B 012 GW-7830-1201-BKP-005
Parameter	Units						10007/07/77	1007/7//	12/7/2001 Duplicate
Unknown D Unknown F	mg/L	0.004 J	ı		•	,			
Unknown F	mg/L	0.003 J	I	ı	ł	,			
Unknown G Unknown H	mg/L	0.006 J	, ,		• •			ı	ı
Unknown I	mg/L mg/l.	0.01 J	ı		•	ı			
Unknown J Linknown K	mg/L	0.05 J		1 1	• •	• •		ı	·
Unknown L	mg/L me/L	• •	,		ı	ı		e ,	1 1
Unknown Alkane A	mg/L		, ,		1 1		I		I
Unknown Amide A Unknown Aromatic A	ng/L		ı	ŀ	ļ				1
Unknown Aromatic B	mg/L me/L	0.0061	, ,		1		ı		
Unknown Aromatic C Unknown Aromatic D	mg/L	-		. ,					1
Unknown Aromatic E	mg/L	,	ı	٠	ı		,	, ,	1 1
Unknown Aromatic F	mg/L		, ,			•	ı		
Unknown Carboxylic Acid A Unknown Carboxylic Acid R	mg/L	ŗ	·	•					ı
Unknown Nitrogen Compound 1	mg/L mø/L			,	,	ı		·	
Unknown Oxygenated Compound A	mg/L	0.004 J			• •		ı		•
Unknown Oxygenated Compound B Unknown Substituted Thiophene A	mg/L	0.005 J	ı	ı	ı				, ,
Unknown Sulfur Compound A	mg/L mg/L	• •			,	ı	•	ı	
Unknown Thiophene A Warfarin A	ng/L	•	i.						
Metals	7 /9m	•		•	ı	·			ı
iron	me/L	ND (22 3)				ž			
Iron (Dissolved) Manganese (Dissolved)	mg/L	ND (13.8)			, , ,	9.77 2.77		1 1	, ,
Gases						I	I		•
Methane	mg/L	ı			·				
Biological Aerobic Total Microbial Ponulation	1								
Benzene Specific Microbial Population	cfu/mL cfu/mL	800		, ,	, ,	- ' 45	ı		·
Total Microbial Population	cfu/mL	4800	I	ļ	ı	175			1 1
General Chemistry Alkalinity, Total (As CaCO3)	t	-00							
Dissolved Organic Carbon (DOC)	mg/L mg/L	c67	• •) I		325	1		,
Nitrate (as N) Orthophosphate	mg/L	0.07	1	ı		0.03	·		1 1
Hd	s.u.	-				0.63 -			
ри (water) Phosoblate. Total	s.u.	6.8	,	t	,	6.8			1.1
Sulfate	mg/L mg/L	- 11.5	1 1			- ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	•		
Sulfite Sulfite	mg/L	' a	ı	ı		-		1 1	
Total Dissolved Solids (TDS)	mg/L mg/L	- 482			• •	- 402	t		
Total Kjeldahl Nitrogen (TKN) Total Organic Carbon (TCC)	mg/L	9.52	ı	,		8.12	. 1		1 1
Total Suspended Solids (TSS)	mg/L mg/L	14 48	• •	• •	F 1	19 57			
Field Parameters Conductivity Field									
Dissolved Oxygen OV A Dation	umhos/cm mg/L	1.1				1 1	. ,	563	1 1
Oxidation reduction potential	ppm millivolts	, ,			ŀ	ı	ı		Ţ
pH Field Turbidity	8.U.					1 1		- 6.84	1 1
(include)	ntu	,		,		•	I	,	

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Sample Location: MW-13B Location: 012 Sample ID: GW-7830-1201-BKP-007 Sample Date: 1277/2001 Parameter Units	Votatif. Organization Notatif. Organization Notatif. Organization Notatif. Organization Not 0025 11.3.7. Frichborstehane mg/L NO 0025 mg/L NO 0025 11.3.7. Frichborstehane mg/L NO 0025 mg/L NO 0025 11.3.7. Frichborstehane mg/L NO 0025 mg/L NO 0025 12.3.7. Frichborstehane mg/L NO 0025 mg/L NO 0025 12.3.7. Frichborstehane mg/L NO 0025 mg/L NO 0025 13.4. Frichborstehane mg/L NO 0025 mg/L NO 0025 2.4. Frichborstehane mg/L NO 0025 mg/L NO 0025 3.4. Herthylitocheme mg/L NO 0025 mg/L NO 0025 Aretine mg/L NO 0025 mg/L NO 0025 mg/L NO	ne A mg/L mg/L mg/L mg/L	Semi-Volatife Organics 1.2.4 Trichlorobenzene mg/L
MW-13B 0U2 0C2 620/2002 6/20/2002	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.005) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0		ND (0.005)
MW-13B 0U2 021218AC-02 12/18/2002	ND (0.06) ND (0.		ı
MW-13B 012 030627014-007 6(26(2003	$ \begin{array}{c} \begin{array}{c} & \text{UD} (0.01) \\ & \text{UD} (0$		ı
MW-13B OU2 031202032-00 4 12/22003	(10.0) UN (10.0)		
MW-13B 012 040707061-003 71712004	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.011) ND (0.011) ND (0.011) ND (0.011) ND (0.011) ND (0.005) ND (0.005)		ND (0.005)
MW-13B 012 041207030-004 12772004	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.005) ND (0.005)	- - 0.01 J	,
MW-13B 0U2 A5680601 6/29/2005 Duplicate	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001) ND (0.005) ND (0.005)		(10
MW-13B 0U2 A5680603 6(29/2005	ND (0.005) ND (0.005)		ND (0.01)

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

		6-700	OTENLING SITE 3, EAST GREENBUSH, NEW YORK		NDUOR, NEW	IUKN				
Sample Location: Location: Sample Date: Sample Date:		MW-13B 0U2 GW-7830-1201-BKP-007 - 12/7/2001	MW-13B OU2 020620BH-01 6/20/2002	MW-13B 0U2 021218AC-02 12/18/2002	MW-13B OU2 030627014-007 6/26/2003	MW-13B 0U2 031202032-00 4 12/2/203	MW-13B 012 04070561-003 7171904	MW-13B 0U2 041207030-004 1417004	MW-13B OU2 A5680601	MW-13B OU2 A5680603
Parameter	Units								Duplicate	00716770
1,2-Dichlorobenzene	me/1.									
1,3-Dichlorobenzene 1,4-Dichlorohenzene	mg/L		(cm:n) UN ND (0:005)				ND (0.005)	ı	ND (0.01)	ND (0.01
2.2 - oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	mg/L me/L		ND (0.005)	I		• •	(COUC) UND (0.005)		(10.0) CIN (10.0) CIN	ND (0.01)
2.4.5-Trichlorophenol	mg/L		ND (0.005)	1 8	, ,	ı	ND (0.005)	ı	ND (0.01)	ND (0.01)
2,4-Dichlorophenol	mg/L	•	ND (0.005)	ı			ND (0.005) ND (0.005)		(10.0) CIN	ND (0.01)
2,4-Dimethylphenol	mg/L me/L		ND (0.005)		•		ND (0.005)		(10:0) CN (10:01) CN	10:0) CN
2,4-Dinitrophenol	mg/L		ND (0.005) IT		ı	•	ND (0.005)		ND (0.01)	ND (0.01)
2,4-Dinitrotoluene 2,6-Dinitrotoluene	mg/L		ND (0.005)			• 1	ND (0.025) UJ ND (0.005)		ND (0.05)	ND (0.05)
2-Chloronaphthalene	mg/L		ND (0.005)				(2007) UN ND (0.005)		(10.0) CIN	ND (0.01)
2-Chlorophenol	mg/L		ND (0.005)	•			ND (0.005)		(10:0) ON ND (0:01)	(10.0) CIN
2-Methylnaphthalene 2 Methyliae	mg/L		ND (0.005)		ı	•	ND (0.005)		ND (0.01)	ND (0.01)
z-weutypnenoi 2-Nitroaniline	mg/L	ı	ND (0.005)			• •	ND (0.005)		ND (0.01)	ND (0.01)
2-Nitrophenol	mg/L	•	ND (0.025) UJ	,	,		ND (0.005) ND (0.025)	ı	ND (0.01)	ND (0.01)
3,3'-Dichlorobenzidine	mg/L me/I	ı	ND (0.005)	ı	,	r	ND (0.005)		(cn.0) UN (10.0) UN	(cn.0) UN (10.0) UN
3-Nitroaniline	mg/L mg/l.		ND (0:010) UJ				ND (0.010)		ND (0.02)	(10:0) CIN
4,6-Dinitro-2-methylphenol	mg/L	1 1	ND (0.025) UJ	•			ND (0.025)	·	ND (0.05)	ND (0.05)
4-Chlore 3 mothered ether	mg/L		ND (0.005)			,	ND (0.025) UJ		ND (0.05)	ND (0.05)
4-Chloroaniline	mg/L		ND (0.005)		• •		ND (0.005)		ND (0.01)	(10.0) CIN
4-Chlorophenvl phenvl ether	mg/L		ND (0:005) UJ	,			ND (0.005)	• •	(10.0) UN	ND (0.01)
4-Methylphenol	mg/L	ı	ND (0.005)			ı	ND (0.005)	, ,	(10:0) CN (10:0) CN	(10.0) CIN
4-Nitroaniline	mg/r		ND (0.005)		•	ı	ND (0.005)	ı	ND (0.01)	(10:0) ON ND (0:01)
4-Nitrophenol	mg/L	ı	ND (0.075111		•		ND (0.025) UJ	ı	ND (0.05)	ND (0.05)
Acenaphthyloud	mg/L		ND (0.005)				ND (0.025) UJ	I	ND (0.05)	ND (0.05)
Anthracene	mg/L	1	ND (0.005)	,	,		(c00.0) UN (200.0) UN	1	(10.0) CIN	(10.0) ON (10.01) ON
Benzo(a)anthracene	mg/L ma/I	1	ND (0.005)				ND (0.005)		(10:0) ON ND (0:01)	(10.0) CIN
Benzo(a)pyrene	mg/L		ND (0.005) ND (0.005)			ı	ND (0.005)	ı	ND (0.01)	ND (0.01)
Benzo(b)fluoranthene Benzo(z, k.)normatione	mg/L		ND (0.005) UI			1 1	ND (0.005) ND (0.005)	ı	(1070) CIN	ND (0.01)
Benzo(Buty)peryterie Benzo(k)filioranthene	mg∕L		ND (0.005)	ı			ND (0.005)		(10.0) (IN)	(10:0) CIN
Benzoic acid	mg/L	ı	ND (0.005)	·			ND (0.005)		(10:0) CN	(10.0) CIN
Benzyl Alcohol	mg/L				1		. •			-
bis(2-Chioroethoxy)methane	mg/L	. 1	ND (0.005)		ı			•	ı	
Dis(2-Chloroethyl)ether bio/2-Ethelhover)bd.a.2222	mg/L	,	ND (0.005)			•••	ND (0.005) ND (0.005)		ND (0.01)	ND (0.01)
Butyl benzvinhthalate	mg/L	ı	0.0005 J	ı	I	,	0.000051		(10.0) CN	
Carbazole	mg/L	,	ND (0.005)		•	·	ND (0.005)	,	ND (0.01)	(10.0) CIN
Chrysene	mg/L		ND (0.005)	1 1	•	•	ND (0.005)		ND (0.01)	ND (0.01)
Ulbenz(a,h)anthracene Dihenzofirran	mg/L	ı	ND (0.005)	ı		• •	ND (0.005) ND (0.005)		(10.0) UN (10.0) UN	ND (0.01)
Diethyl phthalate	mg/L mg/I	r	ND (0.005)		ı		ND (0.005)		(1070) CIN	(10:0) ON ND (0:01)
Dimethyl phthalate	mg/L	, ,	ND (0.005) ND (0.005)	•		,	ND (0.005)	ı	ND (0.01)	ND (0.01)
Di-n-butylphthalate	mg/L		ND (0.005) U				ND (0.005) ND (0.005)	ı	ND (0.01)	ND (0.01)
	mg/L	-	ND (0.005) UJ	,		,	ND (0.005)		ND (010)	(10.0) CIN
	mg/L me/l		ND (0.005) ND (0.005)		,	•	ND (0.005)	•	ND (0.01)	ND (0.01)
	mg/L		ND (0.005)	•	1	•	ND (0.005)		ND (0.01)	ND (0.01)
	mg/L	ľ	ND (0.005)				ND (0.005) ND (0.005)	ı	ND (0.01)	ND (0.01)
Hexachlorocyctopentadiene Hexachlorochane	mg/L	ı	ND (0.005) UJ		ı		ND (0.005) UT	. ,	ND (0.01)	(10:0) CIN
Tene	mg/L me/I	,	ND (0.005)	ı		ı	ND (0.005)		ND (0.01)	ND (0.01)
	mg/L	• •	ND (0.005) ND (0.005)		,		ND (0.005)		ND (0.01)	ND (0.01)
	mg/L		ND (0.005)		• •	• •	ND (0.005) ND (0.005)	•	ND (0.01)	ND (0.01)
	mg/L	I	ND (0.005)	ŀ	1		ND (0.005)		(1070) CIN	(10.0) CIN
N-Nitrosodiphenylamine	mg/L		ND (0.005)		Ĩ		ND (0.005)		ND (0.01)	ND (0.01)
	mg/L		ND (0.025)		i i		ND (0.005) ND (0.075)		ND (0.01) ND (0.05)	ND (0.01)
ritriantitiene	mg/L	,	ND (0.005)	ŀ	ı	r	ND (0.005)		(10.0) UN ND (0.01)	(co.0) UN (0.01)
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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

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Sample Location: Location: Samme: ID:		MW-13B 0U2	MW-13B OU2	MW-13B OU2	MW-13B 0U2	MW-13B 017	MW-13B OID	MW-13B 0113	MW-13B	MW-13B
Sample Date:		GW-7830-1201-BKP-007 12/7/2001	020620BH-01 6/20/2002	021218AC-02 12/18/2002	03062701 <u>4-0</u> 07 6/26/2003	031202032-004 12/2/2003	040707061-003 71712004	041207030-004	0.02 A5680601	0U2 A5680603
Parameter	Units						20071111		012912005 Duplicate	5007 <i>1671</i> 9
Phenol Pyrene	mg/L mg/L		ND (0.005) ND (0.005)	1 1			ND (0.005)	·	ND (0.01)	ND (0.01)
TIC Semi-Volatile Organics					ı	•	ND (0.005)	ı	ND (0.01)	ND (0.01)
1 (2H)-Naphthalenone, 3,4-dih A	mg/L	•	ı							
1,1 - Phenyl (9CJ) A 1-Phenyl-1-cyclopropanecarbo	mg/L	•	ı	,		* 1	1 1	• •		ı
2,4,6(1H,3H,5H)-Pyrimidinetr A	mg/L		•			,	,	,		
3H-Pyrazol-3-one, 1,2-dihydr A 4-Piroridine Carbourite A 214	mg/L		0.001 JN				ı	•	0.007 JN	0.007 JN
7.9-Di-tert-butv]-1-oxaspiro(4.5)deca-6.9-diana-2.8-diana. A	mg/L		`.			. ,			1	
9-Octadecenoic Acid (Z)-(9C) A	mg/L mg/L		•	ı		ı			0.011 JN	0.006 JN
Aminopyrine A Aniline (ACN) (8C1) A	mg/L						, D DOA TN	•		, 1
Benzenamine, 2,6-Dimethyl A	mg/L mg/I	•		ı	ı		-		۰ ،	• 1
Benzenamine,2,4-dimethyl- A	mg/L				ł	ı	•	•		ı
Benzenamune,2,5-dimethyl- A Benzenamine 2 6 dimethyl- A	mg/L	ı	1				•	,	ı	ı
Benzene, 1,1'-Oxvbis (9Cf) A	mg/L	•			ı					
Benzene,(Ethoxymethyl)-(9C) A	mg/L me/L	• 1	•	,	ı	ı	ı	,	,	
Benzenemethanamine, N,N-dimethyl A	mg/L			• •	• •	•	I	,		·
Derizenementanamine, N-methyl A Benzoic Acid, 4-Chloro-(9Cl) A	mg/L		,		ı			1 1		• •
Biphenyl A	mg/L me/l.	• •	r	ı		,	·	ı	,	
Butyl ester octadecanoic acid A	mg/L	1 1			1	ı	ı		•	,
butyl ester, hexadecanoic acid A Carboxvlic Acid, A	mg/L			·					0.052 JN 0.033 IN	0.005 IN
Chloromethylbenzene isomers A	mg/L me/l		ļ	ı	•	•			-	-
Chloromethylbenzene isomers B	mg/L			• •						ı
Cyclopentasiloxane, decamethyl- A	mg/L		0.006 JN	I			NÍ 600'0		- 0.014 IN	0.014 IN
Cyclopropane Carbonitrile, 2 A	ung/L mg/L		0.001 BJN					ı		-
Diethyttoluamide A Diphenvl ether A	mg/L	,	0.002 J				0.007 IN		- 0 010 U	- 0.010 IN
Dodecanoic acid A	mg/L me/L			I	,	ł	1	ı	•	-
Ethane, 1,2-Bis(2-Chloroetho) A	mg/L	•								,
Hexobarital A	mg/L me/L	•			I	1		ļ		
Lidocaine A	mg/L		NI 600.0				0.005 JN	ı	0.011 JN	0.011 JN
Mepivacaine A	mg/L		0.02 JN		,		0.02 JN		0.046 JN	0.045 JN
Mepivacaine hydrochloride A	mg/L mg/L					ı	1		0.012 JN	0.013 JN
Methyl Thophene A Noramidonvrine A	mg/L		·		ı		, ,			
O-Hydroxybiphenyl A	mg/L mg/L				•		•	ı		0.012 JN
o-Toluídine A Pentazocine A	mg/L	·		. 1	1 1			• •	0.005 JN	0.004 JN
Phenobarbital A	mg/L mg/L		- NI 60 0	ı	ı	•		,	ı	
Phenobarbital Di-methyl Derivative A	mg/L	,	0.002 JN			• 1	0.02 JN 0.003 IN		0.036 JN	NI 660.0
Phenol, 2,4-Bis(1,1-Dimethyl) A	mg/L me/L	1.1	I	·		ı	-			
Phenol, 2,4-bis(1-dimethyl A	mg/L						, ,		Ţ	·
ruenou, 4-(1,1,5,3-1etrameth Phenol, 4-(2,2,3,3,-Tetrameth) A	ng/L me/I	ı		·	·					
Phenol, 4,4'-Butylidenebis(2) A	mg/L		, ,	4 I	• •			1 1	I	τ
Suifur mold (S8) A	ng/L		·		ı		0.005 IN	, ,	• •	, ,
	mg/L mg/L	1 1	1 1					ı	٠	•
Talbutal A Tetramethylbutvlphenol A	mg/L		0.01 JN	ı			0.01 JN		0.024 JN	0.026 IN
Unknown A	mg/L		0.002 J	1 I	1 1	• •	-	,	, 200 v	1 000 0
Unknown B Unknown C	mg/L mg/L	• •	0.003 J	1 1			0.004]		0.021 J	0.025 J
CRA 7830 (71) Amendix A)						0.004 J	•	0.014 J	0.016 J
to primerality of A non-comm									ф046AI-XT2-W	4046AI-XT2-WG-Historical-37-TH 10/3/2006

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3 FACT C PERMINT

Page 48 of 68	MW-13B MW-13B 012 012 A5680601 A5680603 A5680603 6292005 Buplizate	0.016 J 0.004 J 0.004 J 0.000 J 0.0016 J 0.0016 J 0.0010 J 0.0010 J 0.010 J 0.	3.87 5.09 1.36 1.11	- 13000 - 2000	230 228 230 228 0.10 0.10 0.54 0.72 5.8 9.4 ND (1.0) ND (1.0) ND (2.0) ND (2.0) 477 466 6.7 6.4 6.8 9.6 7.0] 18.0 J	- 739 - 7.05
	MW-13B OU2 041207030-004 1277/2004		• • • •			940
	MW-13B OU2 04070761-003 7/7/2004	0.003 J 0.002 J 	11.9 0.273 -	5100 17000	270 270 2.9 2.9 2.5 4.5 ND (0.1) U ND (1.1) 8.4 8.4 14.7 76	954 2.58 - 9 6.82 6.24
ORK	MW-13B 012 031202032-004 12/2/2003			1 1 1		
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS - STERLING SITE 3, EAST GREENBUSH, NEW YORK	MW-13B 0U2 030627014-007 6/26/2003			1 1 1		4870 7.6
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS SITE 3, EAST GREENBU	MW-13B 0U2 021218AC-02 12/18/2002					883
GI ANAI TERLING SITE	MW-13B 0U2 020620BH-01 6/20/2002		6.17 1.33 -	520 3800	265 0.13 0.31 J ND(1) ND(1) ND(1) 10 11 J 19	
OU2 - S	MW-13B OU2 GW-7830-1201-BKP-007 12/7/2001					
	Umits	1.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2	1/Sm J/Sm L/Sm	cfu/mL cfu/mL cfu/mL		umbos/cm ng/L ppm millivolts s.u. ntu
	Sample Location: Location: Sample ID: Sample Date: Parameter	Unknown E Unknown E Unknown H Unknown H Unknown I Unknown I Unknown K Unknown A Unknown Aromatic A Unknown Aromatic A Unknown Aromatic B Unknown Aromatic B Unknown Aromatic E Unknown Substituted Thiophene A Unknown Substituted Thiophene A	Tron Tron (Dissolved) Manganese (Dissolved) Gazes Methane	<i>Biological</i> Aerobic Total Microbial Population Benzene Specific Microbial Population Total Microbial Population	General Chemistry Akalinity, Total (As CaCO3) Nisolued Organic Carbon (DOC) Nitrate (as N) Orthophosphate PH (water) Phosphate, Total Phosphate, Total Sulfide	Field Parameters Dissolved Coygen Oxidation reduction potential Pi Field Turbidity CRA 7380 (71) Appendix A

TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample ID: Sample Date: Parameter Volatile Organics 1,1,1-Trichloroethane 1,1,2-Trichloroethane	 1.1-Dichloroethane 1.1-Dichloroethane 1.2-Dichloroethane 1.2-Dichloroethane 1.2-Dichloroethane 1.2-Dichloroethane 1.2-Dichloroethane 2-Hexanone Methylthiophene 2-Hexanone 4-Methyl-2-Pertanone Chloroberzae Chloroberzae 2-Dichloroethene 2-J.2-Dichloroethene 2-J.2-Dichloroethene<th>Diphenyl ether A Ether A Ether A Ether A Hexane A Silanol, trimethyl- A Sulfunofluoromethane A Unknown A Unknown allane A</th><th>Semi-Volatile Organics 1.2,4-Trichlorobenzene CRA 7830 (71) Appendix A</th>	Diphenyl ether A Ether A Ether A Ether A Hexane A Silanol, trimethyl- A Sulfunofluoromethane A Unknown A Unknown allane A	Semi-Volatile Organics 1.2,4-Trichlorobenzene CRA 7830 (71) Appendix A
Units mg/L mg/L		7.28m 7.28m 7.28m 7.28m 7.28m 7.28m 7.28m 7.28m 7.28m	mg/L
A5F26904 12/15/2005 ND (0.005) ND (0.005) ND (0.005)	ND (0.005) ND (0.005) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.005) ND (0	02 JN	ı
MW73B 5/18/2006	ND (0.0010)		Ţ
MW138 6/26/2006 6/26/2006 ND (0.0050) ND (0.0050) UD (0.0050)	ND (0.0050) (0.0050) ND (0.0050) ND (0.01) U1 (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.01) ND (0.0050) ND (0.005		(120:0) CIN
GW-AK-06 6/24/1998 6/24/1998 ND (0.01) ND (0.01)	$ \begin{pmatrix} 1000 \\ 1000$,
GW-DJT-013 GW-DJT-013 6212000 ND (0.005) ND (0.005)	NN (1000) NN (10		
012 026624AC-05 6/24/2002 6/24/2005 ND (0.005) 0.005)	ND (0.005) ND (0.005)		
0122 020624AG-06 612412002 Duplicate ND (0.005) ND (0.005)	ND (0.005) ND (0.05) N		
0112 040709032-011 7/9/2004 ND (0.005) ND (0.005)	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001) ND (0.005) ND (0.005)		ı
OUZ GW-AK-05 624/1998 624/1998 ND (0.01) ND (0.01)	$ \begin{array}{c} (100) \ \text{CM} \\ (100) $		1 1
012 GW-DJT-011 6/2/2000 ND (0.005) ND (0.005)	ND (0.005) ND (0.005)		- - q046ALXT2-WG-Hateorial-37-17- 1073/200
0112 /-DJT-011 /222000 0 (0.005) 0 (0.005)	2 (0.005) 2 (0.005) 2 (0.005) 2 (0.005) 2 (0.005) 2 (0.011) 2 (0.011) 2 (0.011) 2 (0.011) 2 (0.011) 2 (0.011) 2 (0.005) 2 (0.005)		

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TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample Location: Location: Sample ID: Sample Date:		MW-13B OU2 A5E26904 12115/2005	MW-13B 0U2 MW13B 511817005	MW-13B OU2 MW13B	MW-14B OU2 GW-AK-06	MW-14B 0U2 GW-DJT-013	MW-14B OU2 020624AG-05	MW-14B OU2 020624AG-06	MW-14B OU2 040709032-001	MW-15B OU2 GW-AK-05	MW-15B OU2 GW-DJT-011
Parameter	Units		000710710	9007/07/0	012411998	6/2/2000	6/24/2002	6/24/2002 Duplicate	7/9/2004	6/24/1998	6/2/2000
1,2-Dichlorobenzene 1,3-Dichlorobenzene	mg/L		ı	(120.0) CIN		·			,	ı	,
1,4-Dichlorobenzene 2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) efher)	mg/L mg/L			(170.0) UN (170.0) UN	• •		• •	ŕ i	, ,		
2,4,5 Trichlorophenol	mg/L			(1/0/0) CIN ND (0/071)		, ,			, ,	ı	ı
2,4-Dichlorophenol 2,4-Dichlorophenol	mg/L mg/L	1 1		ND (0.071) ND (0.071)					1		1 1
2,4-Dinitrophenol	mg/L me/L		1	ND (0.071)	،	ı		I I			
2,4-Dinitrotoluene 2.6-Dinitrotoluene	mg/L			(12070) CIN					1 1	ı	ı
2-Chloronaphthalene	mg/L			(1200) CIN	,	ı					
2-Chlorophenol 2-Methylpanhthalene	ng/L			(1/070) CIN					1		ı
2-Methylphenol	mg/L mg/L		I	(I200) CIN				ı	I		
2-Nitroaniline 2-Nitroachanal	mg/L			ND (0.36)		1 1		1	ı	ı	I
2.1 vitro price do 3,3'-Dichlorobenzidine	mg/L me/l		ı	ND (0.071)	٠	ı	ı	• •	, ,	, ,	
3-Nitroaniline	mg/L			ND (0.14) ND (0.36)	1 1		ı	,	ı	١	Ţ
4,0-Dinitro-2-methylphenol 4-Bromophenyl phenyl ether	mg/L	ı	•	ND (0.36)	,		, ,		• •	1 1	
4-Chloro-3-methylphenol	mg/L mg/L	• •		(120.0) CIN (120.0) CIN		,		ı	ı	·	
4-Chloroaniline 4-Chloronhenvl arhoud athou	mg/L	ı		ND (0.071)							ŀ
4-Methylphenol	mg/L		ı	ND (0.071)	·	,	ı	ı			
4-Nitroaniline	mg/L	• •		ND (0.071) ND (0.36)	.,	• 1		Ņ	·	1	ı
4-1vircopnenoi Acenaphthene	mg/L	ı		ND (0.36)		I					
Acenaphthylene	mg/L mg/L			ND (0.071) ND (0.071)		I	,		·	,	
Anthracene Benzole i anthronom	mg/L	,		ND (0.071)				, ,	•••	• •	1
Benzo(a)pyrene	mg/L me/l.			ND (0.071) ND (0.071)		•	ı	ı			
Benzo(b)fluoranthene	mg/L			(1/070) ON	• •	• •	1 1		•	ı	
penzo(g.n.i)perytene Benzo(k)fluoranthene	mg/L me/L		ı	(1200) CIN	ı	ł	ı		, ,		
Benzoic acid	mg/L			(1/0.0) UN				1 1		,	ł
bis(2-Chloroethoxy)methane	mg/L	1	·	-	•	1		ı			
bis(2-Chloroethyl)ether	тg/L mg/L			(1/0.0) (IV (1/0.0) (IV)	• •	1 1		I I	,		
ois(∠-≞thyinexyi)phthalate Butyl benzylphthalate	mg/L	ı	ı	ND (0.071)	ı	ı					
Carbazole	mg/L			(1/070) CIN	11				•	ı	ſ
Curysene Dibenz(a,h)anthracene	mg/L me/I		•	ND (0.071)		,	,				
Dibenzofuran Diseksel akteologi	mg/L			ND (0.071)			1 1	, ,			
Dimethyl phthalate	mg/L me/I		ı	ND (0.071)	•	•	1	'n			• •
Di-n-butylphthalate	mg/L			ND (0.071)			1 1			1	ı
Di-in-octyl phunalate Fluoranthene	mg/L	I	ı	(120 (0.071)	,	ı	•				
Fluorene	mg/L mg/L	1 1		(17010) UN ND (0.071)	, ,	1.1			ı		
Hexachlorobenzene Hevechlorobutedione	mg/L	,	ı	ND (0.071)		ł					
Hexachlorocyclopentadiene	mg/L mg/L		• •	ND (0.071) ND (0.32)		, ,		·		ı	ı
Hexachloroethane Indeno(1.2.3-cd)nvrene	mg/L			ND (0.071)				1 1	ı ı		
Isophorone	mg/L mg/L		1 7	(12070) ON (12070) ON	• •				ı	ı	•
Naphthalene Nitrobenzene	mg/L		,	ND (0.071)		ı	ı				
N-Nitrosodi-n-propylamine	mg/L	• •	· •	(170.0) ON (170.0) ON		1 1					1 1
N-Nutrosodiphenylamine Pentachlorophenol m	mg/L mg/L	а і		ND (0.36) ND (0.36)	• •		ı ı				
Phenanthrene	mg/L	ı		ND (0.071)		•		I	ı	ı	•
CRA 7830 (71) Annondix A											

CRA 7830 (71) Appendix A

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TABLE A.1 CDOMININA TEED	ANDINDWATEK ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample Location: Location Sample ID: Sample Date:		MW-13B OU2 A5E26904 12/15/2005	MW-13B OU2 MW13B 5/18/2006	MW-13B OU2 MW13B 6(2006	MW-14B OU2 GW-AK-06 6(24/1998	MW-14B OU2 GW-DJT-013 6/2/2000	MW-14B OU2 020624AG-05 6/24/2002	MW-14B OU2 020624AG-06 6/24/2002	MW14B OU2 040709032-001 71977004	MW-15B 0U2 GW-AK-05 6/74/1008	MW-15B 0U2 GW-DJT-011 6727000	
Parameter	Units							Duplicate		0001 127 10	00077790	
Phenol Pyrene	mg/L mg/L		•	(170.0) dn (170.0) dn		1 1		1	ľ	ı		
TIC Semi-Volatile Organics 1 (2H)-Naphthalenone, 3,4 dih A	me/L	,						ı	,		•	
1,1'-Biphenyl (9CI) A 1-Phenyl-1-cycloneconsets	mg/L	ı			• •		• •	• •		·	,	
2.4,6(1H,3H,5H)-Pyrimidinetr A	mg/L mg/L			• •		ı	I	,				
3H-Pyrazol-3-one, 1,2-dihydr A 4-Piperidine Carboxvlic Acid A	ng/L	ı				. ,	•••		• •			
7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A	mg/L mg/L	1 1					·	1	ı			
9-Octadecenoic Acid (Z)-(9C) A Aminopyrine A	mg/L	ı	ı	ı			1 1		1 1			
Aniline (ACN) (8CI) A	mg/L mg/L			1 1			1	ı	,		ı	
benzenamine, 2,6-Dimethyl A Benzenamine,2,4-dimethyl- A	mg/L	•	ł		ļ	,		1 1		• •		
Benzenamine,2,5-dimethyl- A	mg/L	11			F I			1 1			ŀ	
benzenantune,2,0-dumethyl- A Benzene, 1,1'-Oxvbis (9Cf) A	mg/L	ı	,	ı	I						• •	
Benzene, (Ethoxymethyl)-(9C) A	mg/L mg/L				1 1			1		ı	ŀ	
benzenemethanamune, N.N-dimethyl A Benzenemethanamine, N-methyl A	mg/L	ı	ı	ı	ı	ı				• •	1 1	
Benzoic Acid, 4-Chloro-(9CI) A	mg/L mg/L				1 1				1	·	ı	
Dipnenyi A Butvi ester octadecannic acid A	mg/L	ı		ı	ı		ı					
Butyl ester, becadecanoic acid A	mg/L mg/L								•	I	I	
Carboxylic Acid A	ng/L				ı	•				1 1		
Chloromethylbenzene isomers B	mg/L me/L			1	ı		•	ı	ı	,		
Cyclobarbitol A	mg/L	I										
Cyclopentasiloxane, decarnethyl- A Cyclopropane Carbonitrile, 2 A	mg/L me/L			·		,		ı				
Diethyltoluamide A Diehend ether A	mg/L	•		• 1				• •				
Dodecanoic acid A	mg/L			·		,	•		•	,	·	
Ethane, 1,2-Bis(2-Chloroetho) A	mg/L		1 1				4 1					
Ethoxymethyl Benzene A Hexobarital A	mg/L	1	ı			ı	ł	ı		- 1		
Lidocaine A	mg/L	. 1	• •				1 1					
Mephobarbitol A Mepivacaine A	mg/L	•	1	•		1						
Mepivacaine hydrochloride A	т <u>8</u> /Г	1 1		, ,	•	ı	I		r		·	
Methyl Thiophene A	mg/L	ı	ı	·	•	1				• •		
O-Hydroxybiphenyl A	mg/L mg/L	• •			• 1		1	ı	•		•	
o-Toluidine A Pentazocine A	mg/L		ı	ı	•		ı	. 1				
Phenobarbital A	mg/L mg/L						1	1	ı	•	١	
Phenobarbital Di-methyl Derivative A	mg/L	ı	,	ı				1 1		()		
Phenol, 2,4-Bis(1,1-Dimethyl) A	mg/L mg/L	1.1			1 1			1 1	ı			
Phenol, 2,4-bis(1-dimethyl A Phenol 4-(1-1-3-3-Treremoth	mg/L	,	ı	ı				• •	1 1			
Phenol, 4-(2,2,3,3,-Tetrameth) A	mg/L mg/L	11					1	I		ı		
Phenol, 4,4'-Butylidenebis(2) A Sulfure a	mg/L	ı		ŀ				11				
Sulfur, mold. (S8) A	mg/L mg/L	, ,		1 1					1	, ,	ı	
Sulfur, Mol. (S8) (8CI9CI) A Talhutal A	mg/L	,		,	ı	1						
Tetramethylbutylphenol A	mg/L							1 1	1 1	• •		
Unknown B Unknown B	mg/L me/I			1 1	1	I			·			
Unknown C	mg/L	,	,	1		1 1	r 1	1 1			1 1	

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TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample Location: Location: Sample ID: Sample Date:	Parameter	Unknown D	Unknown F	Unknown G	Unknown H	Unknown I	Unknown K	Unknown L	Unknown Alkane A	Unknown Amide A	Unknown Aromatic A Unknown Aromatic B	Unknown Aromatic C	Unknown Aromatic D	Unknown Aromatic E	Inknown Aromatic F	Unknown Carboxylic Acid B	Unknown Nitrogen Compound 1	Unknown Oxygenated Compound A	Unknown Oxygenated Compound B	Unknown Sulfur Compound A	Unknown Thiophene A	Wartarin A	Metals	Iron (Discriments)	uon (Dissolved) Manganese (Dissolved)		vases Methane	Biological	Aerobic Total Microbial Population	Benzene Specific Microbial Population		General Chemistry	Aukalinuty, 1 otal (As CaCO3) Dissolved Organic Carbon (DOC)	Nitrate (as N)	Orthophosphate nH	pH (water)	Phosphate, Total	Sulfide	Sulfite	Total Dissolved Solids (TDS) Total Kieldahl Nitroccon (TDS)	Total Organic Carbon (TOC)	Total Suspended Solids (TSS)	Field Parameters	Conductivity Field	Ulssoived Uxygen OVA Reading	Oxidation reduction potential	pH Field Turbidity	former -	CRA 7830 (71) Appendix A
	Units	mg/L	T/gm	mg/L	mg/L	mg/L	mg/L	mg/L me/L	mg/L	mg/L	mg/L	mg/L	mg/L me/l	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	ng/L mg/L	i þ	mg/L		cfu/mL	cfu/mL	cfu/mL		mg/L	mg/L me/L	mg/L	S.U. S.U.	mg/L	mg/L	mg/L	mg/L	ng/L	mg/L		umhos/cm	mg/L	ppm millivolts	S.U.	ntu	
MW-13B OU2 A5E26904 12/15/2005			,			,		• •			,	,			•	,				,		ı		,			ı		,	ı	ļ		ı											800		• •	7.4		
MW-13B 0U2 MW13B 5/18/2006		,	ı			ı	ı	ı		,	•	•	ı		,	•	•			I		•		,	15.8 1.06	00'1	1.6 D		,	ı			224	16.7 MID (0.050)	-			6.7	• •	ı	•			0.708	7.34	-106	6.81	41.2	
MW-13B 0U2 MW13B 6(26/2006		,		ı	. ,	,	,	,			,			1		,	,	ı		ı				ı	5.6J	[cn·1	2.4				•		179		-	ı	4 1	10.4			·	• •		0.75	1	-	0.01- 2013	14	
MW-14B 0U2 GW:AK-06 6/24/1998				ı			,	•	ı			ı		•			·	•		ı	I			ND (12 6)	ND (8.91)	ļ	ı				ı		230		0.26		0.X	34.7	•	- 353	(96.1) CIN	ND (4.1) 16	ł		•	ı		ı	
MW-14B 0U2 GW-DJT-013 6/2/2000				ı	ı			'		•	, ,		ı	ı	• •	1		ı				••		7 67	7.0/ 3.15	ı							240	I	ND (0.02) 0.31	• ;	6.9	32.2	,	341	1.12	5.1 19	1		1	ı		ı	
MW-14B 0U2 02624AG-05 612412002			1 1		,		• •	ı	·	•			I		ı			ı			ı			10 7	6.11 1.7	I					r		215		0.04 -	·		15	ND (0.1) UJ	(I) (I) (I) 330	ND (1)	20	C: C 7			I	• •	·	
MW-14B OU2 020624AG-06 62412002	Duplicate		1 1		,	·			ı	,	•	•							ı				ı		12.1 7.66			T					210	; .	0.02	•	. :	0.44 14.5	ND (0.1) UJ	UD (I) UI	ND (1)	5.3	3			ſ		ı	
MW-14B 040709032-001 7/973044			1							ı	,	•	• •		•			ı		ı			,		9.38 0.119			•		ı	, ,		340		0.12	- 6.2	•	0.26 25.8	ND (0.1)	ND(I)	000 1.1	3.2	C.CC		c0/ 09/2	-	44 6.57	45.3	
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MW-15B 0U2 GW-DJT-011	00071710		ı	ı		,				,	,	ı		,		ł	•					,	ı		18.7 8.48			ı				I	000	- 200	0.33		6.8	- 21 9	Ì '	-	310	6	42		•		1 1		q046AI-XT2-WG-Historical-37-II

q046AI-XT2-WG-Historical-37-TH 10/3/2006

	Sample Location: Location: Sample ID: Sample Date: Parameter Volatile Organics	1,1.1Trichloroethane 1,1.2Trichloroethane 1,1.2.Frichloroethane 1,1.Dichloroethane 1,1.Dichloroethane 1,2.Dichloroethane 1,2.Dichloroethane 1,2.Dichloroethane 2.Alexylithiophene 2.Methylithiophene 2.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 3.Methylithiophene 8.mone (Methyl Bronide) Acton Acton Bronnodianhoromethane Bronnodianhoromethane Methylene (Methyl Bronide) Carbon tetrachloride Carbon tetrachloride Carbon tetrachloride Carbon tetrachloride Chlorobernzene Chlorobernene C	Appendix A
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	MW-15B 012 020625AH-06 62522002	ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001)	
OU2 - STERLIN	MW-15B 012 012 040702001-003 711/2004	ND (0005) ND (0005) ND (0005) ND (0001) ND (00	
GKOUNDWATER ANALYTICAL RESULTS STERLING SITE 3, EAST GREENBUSH, NEW YORK	MW-15B OU2 MW15B 6/26/2006	ND (0.0059) ND (0.0010) ND (0.0010) ND (0.0050) ND (0.	
GKOUNDWATER ANALYTICAL RESULTS SITE 3, EAST GREENBU	MW-16B 0U2 GW-AK-04 6/23/1998	N N N N N N N N N N N N N N N N N N N	
S :USH, NEW Y	MW-16B 012 GW-DJT-012 6/2/2000	$ \begin{array}{c} N \\ N $	
ORK	MW-16B 0U2 020621AR-04 6/21/2002	ND (0.05) ND (0.	
	MW-16B 0U2 020624AG-01 6124/2002		
	MW-16B 0U2 040702001-002 7/1/2004	ND (0.05) ND (0.	
)	MW-16B OU2 050310443-003 3/10/2005	ND (0.1) ND	q046A1-X72-WC-Historical-37-TH
	MW-16B 0U2 A5217201 3/10/2005		fistorical-37-TH 10/3/2006

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS STERLING SITE 3, EAST GREENRIISH NEV

$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Sample Location: Location: Sample Location: Location: Sample Date: Parameter Parameter 13-Dickloroberzene 13-Dickloroberzene 13-Dickloroberzene 13-Dickloroberzene 13-Dickloroberzene 13-Dickloroberzene 24-Diritroluene 25-Diritroluene 25-Diritroluene 25-Diritroluene 25-Diritroluene 26-Diritroluene 26-Diritroluene 20-Di	7 1 1 1 1 1 1 1 1 1 1 1 1 1	MWV-15B 0012 0012 6025AH-06 612512002 612512002 	OU2 - STERLIN MW-158 04072001-003 77112004 77112004 77112004 77112004 77112004 77112004 77112004	TABLE A.1 GROUNDWATER ANALYTICAL RESULTS ANALYTICAL RESULTS MW-16B MW-15B MW-15B MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MW-16B 012 MM-16B 012 MM-16B 012 MM-16B 012 MM-16B 012 MM-16B 012 MM-16B 012 MM-16B 012 MM-16B MM-	(ORK MW-16B 0012 0012 6/21/2002 6/21/2002	MWV:16B OU2 020624AG-01 6(24)2002	MW.168 0U2 0U2 7/1/2004 	Page 3310/22005	Page 54 of 68 3 <i>MW-16B</i> 003 <i>A5217201</i> 5 <i>311012005</i>
	N-Nitrosodi-n-propylamine N-Nitrosodiphenylamine Pentachlorophenol Phenanthrene	ug/r J/gm J/gm J/gm			 	 	• • • • •			

Intel MUSI MUSI <t< th=""><th>Sample Location: Location:</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	Sample Location: Location:											
Attach Attach<	Sample ID: Sample Date:		MW-15B OU2 020625AH-06 6/25/2002	MW-15B OU2 040702001-003 7/1/2004	MW-15B OU2 MW15B 617617006	MW-16B OU2 GW-AK-04	MW-16B OU2 GW-DJT-012	MW-16B 0U2 020621AR-04	MW-16B 0U2 020624AG-01	MW-16B OU2 0 4 0702001-002	MW-16B OU2 050310043-003	MW-16B 0U2 A5217201
Birlie Crypteries mg/l Birlie Crypteries mg/l Static Crypteries mg/l </th <th>Parameter</th> <th>Units</th> <th></th> <th></th> <th></th> <th>00011010</th> <th>00171710</th> <th>700711710</th> <th>6/24/2002</th> <th>7/1/2004</th> <th>3/10/2005</th> <th></th>	Parameter	Units				00011010	00171710	700711710	6/24/2002	7/1/2004	3/10/2005	
lutitie Organiss lutitie Organiss and a log of (SC) a log of lo	Phenol Pyrene	mg/L mg/L		1 1			,	·	ı	•		
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 Sirthy Principatestrono Sirth Principatestrono	1,1'-Biphenyi (9CI) A	mg/L		, ,		1 1	,	ı	ı	•	ı	
3-ore, 12-dity A mg/L and A mg/L A mg/L and A mg/L A	2.4.6(1H,3H,5H)-Pyrimidinetr A	mg/L me/L		•	ı				ļ I	, ,		
utyl-i cospination: Sider -6.9 ditere -2.9 ditore A (2)-(9C) A mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	5H-Pyrazol-3-one, 1,2-dihydr A 4-Piperidine Carboxvlic Acid A	mg/L	ı		1 1		1 1		ı		,	
we conserve (cor)	7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A	mg/L mg/L	• •	1 1				ı			1 1	
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oxyraethyl (x) A mg/L	Benzene. 1,1'-Oxybis (9CI) A	mg/L	•		•		• •		• •	•	ı	
andamure, NN-dimethyl A mg/L andamure, NN-dimethyl A mg/L andamure, NN-dimethyl A mg/L and NN-dimethylethyl thyl A mg/L and NN-dimethylethylethylethylethylethylethylethyl	Benzene,(Ethoxymethyl)-(9C) A	mg/L mg/L	• •	.,		ı	•	ı				
L 4-Chloro-GCD, A mg/L for ang L ang	Derizenemethanamine, N,N-dimethyl A Benzenemethanamine, N-methyl A	mg/L					. ,	ı ı		ļ	,	
tadecanoic acid A mg/L	Benzoic Acid, 4-Chloro-(9CI) A	mg/L mg/L	, ,		1	ł	۲			1 1		
evadecanoic acid A mg/L	bipnenyi A Butyi ester octadecanoic acid A	mg/L	·	•			, ,	• •		ł		
cid A mg/L relations for the mg/L relations and mg/L relations for the mg/L relations for the mg/L relations for the mg/L relation mg/L relation mg/L relations for the mg/L relation mg	Butyl ester, hexadecanoic acid A	mg/L mg/L	1 1		١		•					
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NA mg/L a	Chloromethylbenzene isomers B	mg/L mg/L	, ,		ı	ı	ų		1 1		1 1	
averse versure up - A mg/L	Cyclobarbitol A Cyclopentasilovona Accounted A	mg/L			• •					,		
nide A mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	Cyclopropane Carbonitrile, 2 A	mg/L mø/I.		ı	·	ı	ı				1 1	
redmg/LredAmg/L 1 Amg/L 2 mg/L 1 1 1 1 2 mg/L 1 1 1 1 1 1 2	Diethyltoluamide A Dinhenvliether A	ng/L	1	1 1			1 1			ī	•	
isi2-Ciborotetho) A mg/L mg/L mg/L mg/L mg/L mg/L mg/L mg/L	Dodecanoic acid A	mg/L me/l			ı	•	,		. ,		, ,	
$ \begin{array}{cccccc} mg/L & & & mg/L & & & & \\ \mu/drochoride A & & mg/L & & & & \\ mg/L & & & mg/L & & & & & \\ mg/L & & & & mg/L & & & & & \\ mg/L & & & & & mg/L & & & & & \\ mg/L & & & & & & & & & \\ mg/L & & & & & & & & & & \\ mg/L & & & & & & & & & & \\ mg/L & & & & & & & & & & & \\ mg/L & & & & & & & & & & & & \\ mg/L & & & & & & & & & & & & \\ mg/L & & & & & & & & & & & & & \\ mg/L & & & & & & & & & & & & & & \\ mg/L & & & & & & & & & & & & & & & \\ mg/L & & & & & & & & & & & & & & & & \\ mg/L & & & & & & & & & & & & & & & & & & &$	Ethane, 1,2-Bis(2-Chloroetho) A	mg/L		, ,							,	
al A mg/L a_{1} A mg/L a_{2} a_{3} A mg/L a_{1} a_{2} a_{3} a_{3	Hexobarital A	mg/L mg/L			,	•	1		• •		••	
A mg/L $-$ bydrochloride A mg/L $-$ bydrochloride A mg/L $-$ brene A mg/L $ mg/L$ $ M$ mg/L $ M$ mg/L $ M$ M	Lidocaine A Menhabarhimi a	mg/L			£ 1					I		
bydrochloride A $m_{g,L}^{0,L}$ - $m_{g,L}^{0,L$	Mepivacaine A	me/L		·	ı		ı	,	• 1			
The first of the second magnetic for the second magne	Mepivacaine hydrochloride A Methyl Thionhana A	mg/L		4 1						I	ı	
phenyl A mg/L A mg/L B mg/L A mg/L	Noramidopyrine A	mg/L me/L		1	ı		•	·		• 1	• •	
χ mg/L $ A$ mg/L $ A$ mg/L $ L^{-}$ $ L^{-}$ $ L^{-}$ $ L^{-}$ $ L^{-}$ $ L^{-}$ $ L^{-}$ $ -$	O-Hydroxybiphenyl A o-Toluidine A	mg/L	ı	•	1.1						1	
A mg/L D-methyl Derivative A mg/L Interhylethyl A mg/L $(1,1-Dimethyl) A$ mg/L $(1,1-Dimethyl) A$ mg/L $(1,1-Dimethyl) A$ mg/L $(2,1-Dimethyl) A$ mg/L $(2,1-Dimethyl) A$ mg/L $(2,1-Dimethyl) A$ mg/L $(2,2) A$ mg/L $(2,2) A$ mg/L $(2,2) A$ mg/L $(2,2) A$ mg/L $(3,1-Dimethyl) A$ mg/L $(2,2) A$ mg/L $(2,2) A$ mg/L $(2,2) A$ mg/L $(3,1-Dimethyl) A$ mg/L	Pentazocine A	mg/L mg/L	1 1		•		ı	ı				
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Phenol, 2,4-Bis(1,1-Dimethyl) A Phenol 2,4-his(1,-timethyl) A	mg/L	ı				ŧ 1	1 1	• •		,	
3.3Tetrameth) A mg/L ut/idenebis(2) A mg/L mg/L 38) A mg/L b) (8Cr9Cl) A mg/L ut/phenol A mg/L ut/phenol A mg/L	Phenol, 4-(1,1,3,3-Tetrameth	mg/L me/L		1	I		ı				• 1	
mg/L	Phenol, 4-(2,2,3,3,-Tetrameth) A Phenol 4.4'-Burntistonabisty A	mg/L			• •	, ,		1 1			ı	
(38) A mg/L 8) (8C19C1) A mg/L mg/L mg/L mg/L mg/L	Sulfur A	mg/L me/L	• •		I	,	•	I	,		1 1	
tryphenol A mg/L mg/L mg/L mg/L mg/L mg/L	Sulfur, mold. (S8) A Sulfur: Mol. (S8) (scriger), a	mg/L	,			1 1			• •	1 1	. ,	
tylphenol A mg/L	Talbutal A	mg/L me/L				ı			ı	,		
	Tetramethylbutylphenol A Unknown A	mg/L	·	ı	·		1 1				1 1	
	Unknown B	mg/L		1 1					1 1		ı	
ı		mg/L	I	ł	,	ı	I	ı				
	CRA 7830 (71) Appendix A											

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS - STERLING SITE 3, EAST GREENBUSH, NEV

Sample Location: Location: Sample ID: Sample Date: Parameter Unknown D	<i>Units</i> mg/L	15B 12 1002 1002	OU2 - STERLIN MW-15B 012 012 7112004	TAI GROUJ ANALYTIG G SITE 3, EJ MW-15B MW-15B MW-15B 012 MW-15B 012 012 MW-15B 012 012 012 012 012 012 012 012 012 012	TABLE A.1 GROUNDWATER ANALYTICAL RESULTS SITE 3, EAST GREENBU MW-15B MW-16B 002 002 002 MW15B GW-AC-04 0 6/26/2006 6/23/1998	TABLE A.1 GROUNDWATTER ANALYTICAL RESULTS STERLING SITE 3, EAST GREENBUSH, NEW YORK IW-15B MW-15B MW-16B MW-16B MW-16B MW-15B WW-16B MW-16B MW	ORK MW-16B 012 020621AR-04 6/21/2002	MW-16B MW-16B 012 02062AAG-01 6/24/2002	М.М16В М.М16В 042722001-002 7112004	Page MW:16B 012 050310043-003 3110/2005	Page 56 of 68 B MW-16B 012 03 A5217201 5 3110/2005
Unknown E Unknown F Unknown H Unknown I Unknown I Unknown L Unknown Amide A Unknown Amide A Unknown Aromatic B Unknown Aromatic B Unknown Aromatic B Unknown Aromatic C Unknown Aromatic C Unknown Aromatic C Unknown Aromatic C Unknown Aromatic A Unknown Aromatic A Unknown Carboxylic Acid B Unknown Sulfixed B Unknown Sulfixed Compound A Unknown Sulfixer Compound A Un	1.12mm 1.12mm										
Iron (Dissolved) Manganese (Dissolved) Gases Methane Biological Aerobic Total Microbial Population Benzene Specific Microbial Population Total Microbial Population	mg/L mg/L mg/L mg/L fu/mL cfu/mL cfu/mL	7.19 	10.1 0.028 B 		54.5 ND (3.09) - - -	39 25.5 		33.6 30.8 	35.1 0.0234 B - - -		17.7 5.8 5.8 170 840
General Chemistry Alkainity: Total (As CaCO3) Dissolved Organic Carbon (DOC) Nitrate (as N) Orthophosphate PH PH (water) PH (water) PH (water) Phosphate, Total Sulfide Sulfid	1/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m	205 205 0.99 0.42 	210 -		415 - 100 (0.02) 0.81 - 10.81 - 10.81	470 ND (- 0.02) 0.79 J 6.7 ND (2) 111.2 38 84		370 370 - ND (0.02) ND (1) ND (1) ND (1) ND (1) ND (1) ND (1) 13,7 13,7 28 28 28 28 28 28 28 28 28 28 28 28 28	390 ND (0.02) 0.77 ND (0.1) UJ ND (1) UJ 805 25 75		241 241 - 241 - 392 392 515 515 515 515 515 515 515 515 515 51
Field Parameters Conductivity Field Dissolved Oxygen OVA Reading OVA Reading PH Field Turbidity CRA 7830 (71) Appendix A	umhos/cm mg/L ppm millivolts s.u. ntu		645 3.88 - 87 6.68 17.7	0.585 1.95 - 46 8.77 8					1020 81,9 31,9	960 960 9.42 9.42 9.42 0 0 -01 -61 5.23 5.23 1.1 1.1	960 942 0 5.23 1.1 1.1 1.1

Page 57 of 68	MW-17B 012 050310043-004 3110/2005 Duplicate	ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.05) ND
	MW-17B 012 05031043-001 3/10/2005	ND (0.025) ND (0.025)
	MW-17B 0U2 040709032-002 719/2004	ND (0.05) ND (0.
×	MW-17B 0U2 020625AH-03 6/25/2002	ND (0.005) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS - STERLING SITE 3, EAST GREENBUSH, NEW YORK	MW-17B 012 GW-DJT-010 6(2/2000	ND (0.025) ND (0.025) ND (0.025) ND (0.025) ND (0.025) ND (0.035) ND (0.035)
A.1 /ATER RESULTS GREENBUS	MW-17B 0U2 GW-AK-03 6/23/1998	$ \begin{pmatrix} 0 & 0 \\ 0$
TABLE A.1 GROUNDWATER ANALYTICAL RESULTS SITE 3, EAST GREENBU	MW-16B OU2 MW16B 6/26/2006	ND (1.0050) ND (1.0050) ND (1.0050) ND (1.0050) ND (1.0050) ND (1.0050) ND (1.0050) ND (1.001) ND (1.001) ND (1.001) ND (1.0050) ND (1.005
AN AN ERLING SI	MW-16B 0U2 MW16B 5/18/2006	ND (00010) 3.1 D
OU2 - ST	MW-16B OU2 A5E26905 12/14/2005	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.001) ND (0.005) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0
	MW-16B 0U2 A5687302 6/30/2005	ND (0.005) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.05) ND (0.
	Units	インジョー インジー インジー インジー インジー インジー インジー インジー インジー インジー インジー インジー インジー インジー インジー インジー インジー インジー イン イン イン イン イン イン イン イン イン イン
	Sample Location: Location: Sample D: Sample Date: Parameter Volatile Orvonics	1.1.1.Trichtoroethane 1.1.2.Tretachtoroethane 1.1.2.Tretachtoroethane 1.1.2.Tretachtoroethane 1.1.Dichtoroethane 1.2.Dichtoroethane 1.2.Dichtoroethane 1.2.Dichtoroethane 2.Betranone (Methyl Ethyl Ketone) 2.Betranone (Methyl Biohutyl Ketone) 2.Betranonethane (Methyl Biohutyl Biohutyl Ketone) 2.Betranonethane (Methyl Biohutyl Ketone) 2.Betranonethane (Methyl Biohutyl Biohutyl Ketone) 2.Betranonethane (Methyl Biohutyl Biohutyl Ketone) 2.Bibliononethane (Methyl Biohutyl Biohutyl Ketone) 2.2.Dichloroethane (CT 114) A 2.2.Dichloroethane (CT 114) A 3.2.Biologithus (Dottana (Dott

TABLE A.1 GROUNDWATER ANALYTICAL RESULTS OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK

Sample Location: Location: Sample ID: Sample Date:		MW-16B 0U2 A5687302	MW-16B 0U2 A5E26905	MW-16B 0U2 MW16B	MW-16B 0U2 MW16B	MW-17B 0U2 GW-AK-03	MW-17B OU2 GW-DJT-010	MW-17B OU2 020625AH-03	MW-17B 0U2 0U2	MW-17B OU2 Postanas on	MW-17B OU2 COU2
Parameter	Units	C0/17 / NC/10	12/14/2005	5/18/2006	6/26/2006	6/23/1998	6/2/2000	6/25/2002	7/9/2004	3/10/2005	050510045-004 3/10/2005 Dunlicate
1,2-Dichlorobenzene 1,3-Dichlorobenzene	ng/L	•		,	,		1				
ti Olivar	mg/L mg/L					ı			1 1	• •	
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	mg/L mg/L	• •	г I					• •		• •	
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	mg/L me/L		I	·	,						
2-Chloronaphthalene 2-Chlorophenol	mg/L							,	,		
alene	mg/L mg/L				1 1				• •	• •	
	mg/L me/L			•				•••			t
2-Nitrophenol 3,3'-Dichlorobenzidine	mg/L						• •	I	ı		
	mg/L mg/L	• •	••	1		ı	ı		• •	• •	
ol Der	mg/L					1 1				•	I
	mg/L					1 1		I			• •
phenyl ether	mg/L me/L				ı				1 1		
	mg/L	1 1		÷ I	· 1						
	mg/L mg/L	, ,		ı	I			1 1			
Acenaphthene Acenaphthylene	mg/L	ı		, ,		۰.			·	ı	,
	mg/L mg/L		• •	1	•	•	Ţ			1 1	
benzo(a)anthracene Benzo(a)pvrene	mg/L	ı		11		1 1				ł	ı
	mg/L me/L	• •				·			• •	1 1	
Benzo(g.h.i)perylene Benzo(k)fluoranthene	mg/L	,				11		. ,	ı	·	•
	mg/L mg/L			• •	,	ı	,				• •
Benzyl Alcohol bis(2-Chloroethoxv)methana	mg/L	,				1.1			ı	ı	I
	mg/L mg/L			ı	۰	·		4 1			1 1
DIS(2-Etthylhexyl)phthalate Butyl benzylphthalate	ng/L	I	ı					• •		ı	·
	mg/L mg/L		1 1		3	,	•	,	ı		, ,
thracene	mg/L		•	ı							
	mg/L mg/L							,	ŀ	ı	
	mg/L me/L		1	ı	•	,			• •		۰,
halate halate	mg/L	t	,						· •	i 1	·
ene	mg/L mg/L		+ 1					r	a	1 1	
	mg/L me/I		,	,			۲.1	, ,		1)	
	mg/L	• •	• •	• •	1 1		,				
liene	mg/L		ı		•	1 1	• •	• •	1 1		
rene	mg/L mg/L					• •	ı	ı	ı	·	
	mg/L mø/L				•		1 1				۱.
	mg/L					, ,	1 1	• •		ı	,
oyiamme amine	mg/L me/L			1		•	I				
	ng/L		1	5 B		• •					
	лß/г	•				I	•	,		ŀ	ı
CKA 7830 (71) Appendix A											g046AI-XT2-WG Historical-37-TH 10/3/2006

q046A1-X72-WG-H14corten1-37-TH 10/3/2006

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TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample Location:							,				
Location: Sample ID: Sample Date:		MW-16B OU2 A5687302 6/30/2005	MW-16B OU2 A5E26905 17/14/2005	MW-16B OU2 MW16B	MW-16B OU2 MW16B	MW-17B OU2 GW-AK-03	MW-17B 0U2 GW-DJT-010	MW-17B OU2 020625AH-03	MW-17B OU2 040709032-002	MW-17B OU2 050310043-001	MW-17B 0U2 050310043-004
Parameter	Units		C007 & 177	OUU ZIOTIC	012012000	6/23/1998	6/2/2000	6/25/2002	7/9/2004	3/10/2005	3/10/2005 Duplicate
Phenol Pyrene	ng/L mg/L			1 1			ı	ı		ı	, [,]
TIC Semi-Volatile Organics 1 (2H)-Naphthalenone, 3,4-dih A	mg/L		,		I	ı			ı		·
1,1 - supremy (ACL) A 1-Phenyl-1-cyclopropancearbo 2 4 ATH 3 ut RUN b	mg/L mg/L			• •			• •	1 1			1.1
4.5.00 tra.p.rt.p.rtytumudinetr A 3H-Pyrazol-3-one, 1,2-dithydr A	mg/L mg/L		4 1		, ,	• •	1.1	¥ I	t i		• •
*-riperidine Larboxylic Acid A 7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A	mg/L me/l.		·								
9-Octadecenoic Acid (Z)-(9C) A Aminopyrine A	mg/L	,							ŀ	ı	
Aniline (ACN) (8CI) A Benzenamine 26.Dimodul A	mg/L mg/L						1	ı			
Benzenamine,2,4-dimethyl-A	mg/L me/L		1		ı	ı					
Benzenamine,2,5-dimethyl- A Benzenamine,2,6-dimethyl- A	ng/L					11		1 1		ı	
Benzene, 1,1'-Oxybis (9CI) A	mg/L mg/L					,	ı				
benzene,(⊔thoxymethyl)-(9C) A Benzenemethanamine, N.Ndimethyl A	mg/L	ı	. 1			• •	1 1		1	•	ı
Benzenemethanamine, N-methyl A	mg/L mg/L				•	ı	ı	.,	• •		
Biphenyl A	mg/L	,	J	ı			• •	1 1		,	
Butyl ester octadecanoic acid A	mg/L mg/L		۰ ،		Ι.	ı	ı	r		1 1	
buryı ester, nexadecanoic acid A Carboxylic Acid A	mg/L				a 1		1 1				
Chloromethylbenzene isomers A	mg/L	• •		• •		ı		·			, ,
Cyclobarbitol A	me/l		,	1							, ,
Cyclopentasiloxane, decamethyl- A	mg/L			••		• •				ı	
Diethyltoluamide A	mg/L me/L		• •			I			11		
Urphenyl ether A Dodecanoic acid A	mg/L	ı	ı				1 1				•
Ethane, 1,2-Bis(2-Chloroetho) A	mg/L mg/L				, ,	1 1	ı	Į			• •
butoxymetryt benzene A Hexobarital A	mg/L mg/1		•	·		• •	1 1		, ,		
Lidocaine A Markokaskistal A	mg/L			• •			ı	ı	ı		
Mepivacaine A	mg/L	1	,	ı	•	ı					
Mepivacaine hydrochloride A Methyl Thionhama A	mg/L		11	• •				ı		ļ	
Noramidopyrine A	mg/L me/L	• •	1			ı		1 1			1 1
O-Hydroxybiphenyl A o-Toluidine A	mg/L	•	• •		н 1	• •	¥ 1				ı
Pentazocine A	mg/L mg/L			• •		ı	·	,		4 1	
ruenobarpital A Phenobarbital Di-methyl Derivative A	mg/L mø/L	•		1	,		1 1				
Phenol, (1,1-Dimethylethyl A Phenol 24 Biol 1 Press	mg/L	• •			1 1	۰,		ı	ı	ł	
Phenol, 2,4-bis(1-climethy) A Phenol, 2,4-bis(1-climethy) A	mg/L mg/L	, ,				,		۲ı	• •	• •	,,
Phenol, 4-(1,1,3,3-Tetrameth	mg/L	. 1				1 1	• 1	I			,
ruciuu, 4-(2,2,3,5,-1ettameth) A Phenol, 4,4'-Butylidenebis(2) A	mg/L me/L	• •			ŗ			• •			۰.
Sulfur A Sulfur mold (20) A	mg/L	,					• •	1	ı		ı
Sulfur, Mol. (38) (8Cl9Cl) A	mg/L mg/L						ı				
Tatramethythytychonol A	mg/L	ı	•	ı						ı	
Unknown A	mg/L mg/L			, ,				ı			
Unknown C Unknown C	mg/L mg/L			• •			ı	1 1		1 1	
(RA 283) (71) Amondiy A	•					•	1	•	1	·	
** viewers dide : /* /* *** **************************											q046AJ-XT2-WG-HistoricaJ-37-TH 10/3/2006

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TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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Sample Location: Location: Sample ID:		MW-16B 0U2 45587302	MW-16B OU2	MW-16B 0U2	MW-16B 0U2	MW-17B 0U2	MW-17B 0U2	MW-17B 0U2	МW-17B ОИ2	MW-17B OU2	MW-17B OU2
Sample Date:		6/30/2005	12/14/2005	MW16B 5/18/2006	MW16B 6/26/2006	GW-AK-03 6/23/1998	GW-DJT-010 6/2/2000	020625AH-03 6/25/2002	040709032-002 7/9/2004	050310043-001 3/10/2005	050310043-004 3/10/2005
Parameter	Units										Duplicate
Unknown D	mg/L	ı		,							
Unknown E Unknown F	mg/L	•	ı	ı						• •	ı
Unknown G	mg/L mg/L				i i	ı	·	ı	,		
Unknown H Unknown I	mg/L	ı	ı		1 1		۱.				ŀ
Unknown J	mg/L me/L	1 1		ı	ı	ı	ı	,	•		
Unknown K Hnknown I	mg/L					1 1			I	I	·
Unknown Alkane A	mg/L	ı	·	ı	·	ı		. 1			1 1
Unknown Amide A	mg/L		+ 1	1 1		I		·	ı		
Unknown Aromatic A Unknown Aromatic B	mg/L	·	ı		1					, ,	·
Unknown Aromatic C	mg/L mg/L				I I	•					
Unknown Aromatic D Inknown Aromatic E	mg/L	ı	I	ı			, ,			ı	ı
Unknown Aromatic F	mg/L me/I	·	ł	ı	ı	,					
Unknown Carboxylic Acid A	mg/L				1 1				ı	,	٠
Unknown Carboxylic Acid B Unknown Nitrogen Compound 1	mg/L	ı	ı	ı	ı	ı		()		• •	11
Unknown Oxygenated Compound A	mg/L		• •			ı	ı	ı	ı	,	
Unknown Oxygenated Compound B Unknown Substituted Thisachers A	mg/L	ŀ	·			. ,	1 1	1.1		·	ı
Unknown Sulfur Compound A	mg/L me/L		ı	ı	ı		•	,	L		
Unknown Thiophene A	mg/L					1 1	• •		ı	•	ı
wartarin A	mg/L	•		ı	ı	ı					
Metals Iron	1/2000	2 66									
Iron (Dissolved)	mg/L mg/L	33.b 8.41	• •	- 36.5	- 5.81 [29.8 ND (3.58)	27.7 7 12	25.8 15.4	21.8 0.715	ı	ı
Manganese (Lissolved)	mg/L			1.03	0.813 J	-	-	-	-		
Gases Methane	mg/L	ı	ı	112	4.0						
Biological	b			2	ţ.	8	ł	,	•	•	
Aerobic Total Microbial Population	cfu/mL	,		,	,	,		1			
penzene Spectitc Microbial Population Total Microbial Population	cfu/mL cfu/mL			• •			ı	1		• 1	
General Chemistru				ı	•	1		•	I	4	ı
Alkalinity, Total (As CaCO3) Discolved Organic Cashon (DOC)	mg/L	173			273	230	290	235	315	,	Ţ
Nitrate (as N)	mg/L mg/L	ND (0.050)		16.8	- UD (0 050)	, 00	, co co	-			ı
Orthophosphate nH	mg/L	1			-	0.33	0.44 J	(70.0) / 141	(20.0) UNI -	11	1 1
pH (water)	s.u. s.u.	• •	• •	1 1	1 4	- 67	- X		6.5		١
Phosphate, Total Suifate	mg/L	22	I			} '	2 ·	0.79	- 0.49	1 1	з ,
Sulfide	mg/L mg/L	ND (1.0) ND (1.0)				. 31	6.7	48.3 ND/01111	9.8 (1.0) CIM	1 - 1 -	1
Sultite Total Dissolved Solids (TTDS)	ng/L	ND (2.0)	·			• ['.	(I) (I) ON	ND(I)		
Total Kjeldari Nitrogen (TKN)	mg/L mg/L	7.4	, ,			375 ND (1.96)	455 5.6	402 2.8	420 4.2	1 1	
Total Organic Carbon (LOC) Total Suspended Solids (TSS)	mg/L mg/L	25.2 75.0			1 1	ND (5.2) 60	13 98	13 78	17.9 62.5	1 1	
Field Parameters								1			
Conductivity Field Dissolved Oxygen	umhos/cm mg/L	950 -	906 '	0.951 3.61	0.96 1.7				833 3 04	697 12 16	
OVA Reading Oxidation reduction potential	ppm millivolts	r 1	• •	-134	-151	• •			- ⁶⁴	0 4	
pH Field Turbidity	s.u. ntu	6.97 -	7.7	6.79 28	7.83				6.71 48	5.21 33.1	: 1
				ł	:		1	1	P	1.00	ı

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TABLE A.1	GROUNDWATER	ANALYTICAL RESULTS	OU2 - STERLING SITE 3, EAST GREENBUSH, NEW YORK
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MW-18B 0U2 MW18B 6/26/2006	UL (0.002) (0.	U (100) UN ND (0.01) U ND (0.01) (0.0030) ND (0.0030) ND (0.0030) ND (0.0030) ND (0.0030) ND (0.0030) ND (0.0030) ND (0.0030) ND (0.0030) ND (0.0030)	ND (0.01) ND (0.0050) ND (0.0050)	ND (0.0050) ND (0.0050) ND (0.0050) ND (0.0050) ND (0.01)		taericia J97 HT	10/3/2006
MW-18B OU2 040709001-004 7/8/2004	ND (1005) ND (1005) ND (1005) ND (1005) ND (1005) ND (1001) ND (10	ND (0.01) ND (0.01) ND (0.01) U (0.00) ND (0.00)	ND (0.01) ND (0.05) ND (0.005) ND (0.005) ND (0.005) 0.014 J 0.014 J ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005)	ND (0.005) ND (0.005) ND (0.005) ND (0.010) ND (0.010)	0.1 BJN		
MW-18B 0U2 02625AH-04 6/25/2002	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.001) ND (0.001) ND (0.001)	ND (0.001) ND (0.01) ND (0.01) ND (0.01) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005)	ND (0.01) ND (0.005) ND (0.005) N	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.01)			
MW-18B OUZ GW-BKP-031 6/7/2000	ND (0.005) ND (0.005)	(000) (00) (000) (ND (0.01) ND (0.01) ND (0.05) ND (0.05) ND (0.05) 0.34 ND (0.05) ND (0.05) ND (0.05)	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.01) ND (0.01) ND (0.01)			
MW-18B OU2 GW-AK-01 6(23/1998	U C C C C C C C C C C C C C C C C C C C		U (0.0) U (0.0	(10.0) CIN (10.0) CIN (10.0) CIN (10.0) CIN - - - - (10.0) CIN (10.0) CIN			
MW-17B 0U2 MW17B 6/26/2006	ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.2) UJ ND (0.2) UJ ND (0.2) UJ	ND (0.2) ND (0.2) ND (0.2) ND (0.2) ND (0.1) ND (0.1) ND (0.1) ND (0.1)	U (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (0.1) (1.4	ND (0.1) ND (0.1) ND (0.1) ND (0.1) ND (0.2)			
MW-17B 0U2 MW17B 5/18/2006	4 4 4 4 4 4 4 1 4 1		2 D				
MW-17B 0U2 A5E26906 12/14/2005	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.01) ND (0.01) ND (0.01)	U (10.0) ND (0.01) ND (0.01) ND (0.005) ND (ND (1005) ND (1005)	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.01)			
MW-17B 0U2 A5687303 6/30/2005	ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.005) ND (0.001) ND (0.01)	ND (0.01) ND (0.01) ND (0.01) ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005) ND (0.005) ND (0.01) ,			
MW-17B OU2 A5217202FD 3110/2005 Duplicate							
MW-17B OU2 A5217202 3/10/2005							
Units	1/201 7/201 7/201 7/201 7/201 7/201 7/201 7/201 7/201 7/201 7/201 7/201 7/201	7/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1	1,2 1,2 1,2 1,2 1,2 1,2 1,2 2,2 2	л 2/8ш 1/8ш 1/8ш 1/8ш 1/8ш 1/8ш	1/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m 1/8m	луви 1/8ш 1/8ш 1/8ш 1/8ш	
Sample Location: Location: Sample ID: Sample Date: Parameter	Volatile Organics 1,1,1-Trichlorcethane 1,1,2,2-Trichlorcethane 1,1,2-Trichlorcethane 1,1-Dichlorcethane 1,1-Dichlorcethane 1,2-Dichlorcethane 2-Butanone (Methyl Ethyl Ketone) 2-Hexanone 2-Methylhiophene	3-Methylthiophene 4-Methylt-2-Pentanone (Methyl Isoburyl Ketone) Acetone Benzene Bromodichloromethane Bromodichloromethane Carbon disulfide Carbon disulfide Carbon tetrachloride Chlorobenzene Chlorobenzene	Chloroform (Trichloromethane) Chloromethane (Methyl Chloride) cis-1,3-Dichloroethene cis-1,3-Dichloroepropene Ethyl Encr Ethyl Encr Ethyl Encr Ethyl Encre Methylene chloride o-Xylene Styrene Frenchoroethene Tetrachloroethene	trans-1,2-Dichloroethene Trans-1,3-Dichloropropene Trichloroethene Vinyl catetate Vinyl chloride Xytene (totat)	1.2-Dichlorotetrafiluoroethane (CFC 114) A Benzene A Carbon dioxide A Chorodifluoromethane A Dichlorodifluoromethane A Dichlorofluoromethane A Dichloropyl ether A Dispropyl ether A Biphenyl ether A Ether A Biphenyl benzene A Hexane A	Silanol, trimethyl- A Sulfur dioxidas A Trichlorofluoromethane A Unkrnown A Unkrnown silane A Semi-Volatile Organics 1,2,4-Trichlorobenzene CRA 7830 (71) Appendix A	

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MW-18B OU2 MW18B 6(26006	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
MW-18B 0U2 04079001-004 7/8/2004	4213 4996
MW-18B OU2 020625AH-04 6/25/2002	
MfW-18B OU2 GW-BKP-031 6772000	
MW-18B 0U2 GW-AK-01 6/23/1998	
MW-17B OU2 MW17B 6(26(2006	
MW-17B 0U2 MW17B 5/18/2006	
MW-17B 0U2 A5E26966 12/14/2005	
MW-17B 012 A5687303 613012005	
MW-17B 0U2 35217202FD 3/10/2005 Duplicate	
MW-17B 0U2 A5217202 3/10/2005	
Units	
Sample Location: Location: Sample D: Sample Date: Parameter	1.2. Dichloroberszene 1.3Dichloroberszene 1.4. Exchlorosphenol 2.4.5. Trichlorosphenol 2.4.5. Trichlorosphenol 2.4.5. Trichlorosphenol 2.4.5. Trichlorosphenol 2.4.5. Dinethylphenol 2.4.5. Dinethylphenol 2.4.5. Dinethylphenol 2.4.5. Dinethylphenol 2.4.5. Dinethylaene 2.6. Dinethylaene 2.8. Henyl Diethyl diether 4.6. Dinethylphenol 3.7. Dichlorobernyl phenyl ether 4.6. Dinethylaene 4.6. Dinethylaene 4.6. Dinethylaene 4.6. Dinethylphenol 4.6. Dinethylphenol 4.6. Dinethylaene 4.6. Dinethylphenol 4.6. Dinethylphenol 8.8. Dichloroshilte 8.8. Dichloroshilte 9.8. Dich
	cation: MW-17B MW-17B MW-17B MW-17B MW-17B MW-17B MW-18B MW-18B MW-18B MW-18B MW-18B MW-18B 012 012 012 012 012 012 012 012 012 012

			OU2 - STE	ANALYTICAL RESULTS STERLING SITE 3, EAST GREENBUSH, NEW YORK	ANALYTICAL RESULTS SITE 3, EAST GREENBL	SULTS REENBUSH	, NEW YOR	¥				
Sample Location: Location: Sample ID: Sample Date:		MW-17B OU2 A5217202 3/10/2005	MW-17B 0U2 A5217202FD 3/10/2005	MW-17B 0U2 A5687303 6/30/2005	MW-17B 0U2 A5E26906 12/14/2005	MW-17B OU2 MW17B 5/18/2006	MW-17B OU2 MW17B 6/26/2006	MW-18B 01/2 GW-AK-01 6/23/1998	MW-18B 0U2 GW-BKP-031 6/7/7000	MW-18B 0U2 020625AH-04 6/75/7007	MW-18B 012 04070901-004	MW-18B OU2 MW18B
Parameter	Units		Duplicate						0001100	7007/07/0	/18/2004	6/26/2006
Phenol Pyrene	ng/L mg/L		, ,				·	·	,	ı		·
<i>TIC Semi-Volatile Organics</i> 1 (2H)-Naphthalenone, 3 3 -dih A						ı	,	I	ı	ŀ	ı	ı
1,1'-Biphenyl (9CI) A 1-Phenyl-1-evclonoronaecarho	mg/L mg/L		1 1				1 4		•	ı	ı	ŧ
2,4,6(1H,3H,5H)-Pyrimidinetr A	mg/L mg/L			ı	ı	ı	,			1 1		
3H-Fyrazol-3-one, 1,2-dihydr A 4-Piperidine Carboxylic Acid A	mg/L		ı	()		• •	1 1) 1		ı		ı
7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A	mg/L mg/L						·		I			
7-Octadecenoic Acid (Z)-(9C) A Aminopyrine A	mg/L	ı	ı				• •				·	,
Aniline (ACN) (8CI) A	mg/L mg/L		1 1	4 1		ı	ı	t	ı		• •	
Benzenamune, 2,6-Dimethyl A Benzenamine,2,4-dimethyl	mg/L	ı		. 1		• •	1 1		1		ı	ſ
Benzenamine,2,5-dimethyl- A	mg/L me/L			,	•	i	•	ı ı		, ,		
Benzenamine,2,6-dimethyl- A Benzene 11,-0xyhis (907), a	mg/L				11	1 1		1 1		•	ı	·
Benzene, (Ethoxymethyl)-(9C) A	mg/L mg/I	ŀ		,	ı	,			• •	. ,		
Benzenemethanamine, N,N-dimethyl A	mg/L			, ,			,	•	·	·		
Benzenemethanamine, N-methyl A Benzoic Acid. 4-Chloro-(9Cf) A	mg/L	ı			1 1	• •		1)			·	ı
Biphenyl A	mg/L mg/L				,		1	ı	t		1 1	
Butyl ester octadecanoic acid A Butyl ester hevedecanoic acid A	mg/L	·			1 1		1 1		•	r		ı
Carboxylic Acid A	mg/L me/L	1 1		·		ı	ı			1 1		
Chloromethylbenzene isomers A	ng/L			, ,		, ,		1 1	I		ı	ı
Cultorineury upenzene isomers B Cyclobarbitol A	J/gm	ı	ı	I	ı	ı				• •	ı.	1 1
Cyclopentasiloxane, decamethyl- A	mg/L	• •	. ,	1 1			4 1	1		ı	ı	
Cycropropane Carbonitrile, 2 A Diethyltoluamide A	mg/L	ı	ł	ı	,	•						
Diphenyl ether A	mg/L							1 1	ı	•	·	
Ethane, 1,2-Bis(2-Chloroetho) A	mg/L me/I	, ,	ı	•	١		ı	I		, ,		
Ethoxymethyl Benzene A Hexoharital A	mg/L									1 1	•	
Lidocaine A	mg/L mg/l.			ī	ı		,	ı			• •	
Mephobarbitol A Meniversity A	mg/L			1 1	1 1		• •	()		1 1	·	ı
Mepivacaine hydrochloride A	mg/L mg/l.				•		ı				1 4	1 1
Methyl Thiophene A	mg/L		I I	1 1		••	1 1			•	ı	ı
O-Hydroxybiphenyl A	mg/L me/L		• •	ı	ı	•	, I	,	·	t	1	
o-Toluidine A	mg/L	ı				7 I					·	ı
renazoune A Phenobarbital A	mg/L	,	,	I	ı	ı			1 1			
Phenobarbital Di-methyl Derivative A	mg/L				• •	1 1	• •		ı		,	
Phenol, 2,4-Bis(1,1-Dimethyl) A	mg/L me/I	• •	,	ŀ	,	ı	ı	ı				• •
Phenol, 2,4-bis(1-dimethyl A	mg/L				• •	1 1		ì	ı	·		ļ
Phenol, 4-(1,1,3,3-Tetrameth Phenol, 4-(2,2,3,3Tetrameth) A	ng/L	ŀ	ı	ı		• •	• •				1 1	• •
Phenol, 4,4'-Butylidenebis(2) A	mg/L		, 1	1 1		, ,		1	,	ı	ı	ı
sulfur A Sulfur, mold. (S8) A	mg/L	1	,		ı			1 1			1 1	тт
Sulfur, Mol. (S8) (8CI9CI) A Talkittal A	mg/L	ı			, ,			• •				1 1
Tetramethylbutylphenol A	mg/L me/L			1 1	i			ı	ı	·	ı	
Unknown A Unknown B	mg/L						, ,		• •		I J	
Unknown C	mg/L				• •	14	· •	r 1			1 4	
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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS STERLING SITE 3, EAST GREENBUSH. NEW Y

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MW-17B MW-17B MW-17B MW-17B MW-17B MW-17B MW-17B MW-17B MW-17B MW-17B MW-17B MW-17B MM-17B MM-17B MM-17B MM-17B MM-17B MM-17B MM-17B MM-17B MM-17B MM-17 MM-17B MM-17 MM-18 MM-	MW-178 MW-178 0012 3/10/2005 3/10/2005 1/7 21/7	MW-178 MW-178 0012 3/10/2005 3/10/2005 1/7 2/1/2 2/1/7 2/1/7 2/1/2 2/1/7 2/1/2 2/1/7 2/1/2 2/1/2 2/1/7 2/1/2 2/1/7 2/1/2 2/1/7 2/1/2 2/1/7 2/1/7 2/1/2 2/1/7 2/1/2 2/1/7 2/1/7 2/1/2 2/1/7 2/1/7 2/1/7 2/1/7 2/1/7 2/1/7 2/1/7 2/1/7 2/1/7 2/1/7 2/1/2 2/1/7 2/1/2 2/1/7 2/1/2 2/1/7 2/1/7 2/1/2 2/1/7 2/1/2 2/1/7 2/1/7 2/1/7 2/1/2 2/1/7 2/1/2 2/1/7 2/1/2 2/1/2 2/1/7 2/1/2 2/1/7 2/1/2 2/1/2 2/1/2 2/1/2 2/1/7 2/1/2 2/	MW-178 MW-178 0012 3/10/2005 3/10/2005 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.	MW-178 MW-178 0012 311012005 11.7 21.7 21.7 21.7 21.7 21.7 21.7 21.7	MNATTICAL RESULTS OUL: DULTS MNATTICAL RESULTS OUL: DULTS ATWATS MVATTS MVATS OUL: DULTS ATWATS MVATS MVATS JANDATTICAL RESULTS ATWATS MVATS MVATS JANDATTICAL RESULTS ATTACK MVATS MVATS JANDATTICAL RESULTS ATTACK MVATS MVATS JANDATTICAL RESULTS ATTACK MVATS MVATS JANDATA ATTACK MVATS MVATS JANDATA ATTACK ATTACK MVATS JANDATA ATTACK ATTACK MVATS JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA JANDATA <th>Willing Milling</th> <th>Amatrixial and an analysis of the second sec</th> <th>Willing Milling</th>	Willing Milling	Amatrixial and an analysis of the second sec	Willing Milling
			8 8 8 2	8 8 8	B MMAITICAL RESULTS MMAITE M	B MNLTICAL RESULTS CUL-STERLING STER, SAFT CREENBUGH, NEW YORK MNL-TB	B MNLTICAL RESULTS CUL-STERLING STER, AKTORAL RESULTS MNLTB	Mutual subset manual partial pa
OU2 - STJ MW-178 0012 012 012 012 012 012 012 012 012 01	ANA OU2 - STERLING SITI MW-I7B MW-17B OU2 ANV-17B MW-17B OU2 ASST202ED ASS7303 3110/2005 63012005 Bupficade 63012005 6301205 63012005 63012005 63010	ANALYTICAL RAST GI AWA-ITB MW-ITB MM-ITB MM-ITB MM-ITB <th< td=""><td>MW-ITS AUM.TTR. AUM.TTR ASSTOR Supplicate MW-ITB AUM.TTR ASSTOR ASS</td><td>ANALYTICAL RESULTS ATAIALYTICAL RESULTS AW*/12 AW*/13 AW*/13 AW*/13 AW*/13 AW*/13 AW*/13 AW*/14 AW*/14 AW*/14 AW*/15 AW*/14 AW*/15 AW*/15</td><td>ANALYTICAL RESULTS MW-JPB MW-JPB</td><td>ANALYTICAL RESULTSA ANALYTICAL RESULTSA MW-178 MW-178 MW-188 MM-188 MM-188 MM 188</td><td>ANALYTICAL RESULTSA ANALYTICAL RESULTSA MW-178 MW-178 MW-188 MM-188 MM-188 MM 188</td><td>AMALTICAL RESULTS Merrin colspan="2">Merrin colspan="2">Merrin colspan="2">Merrin colspan="2">Merrin colspan="2">Merrin colspan="2" Merrin colspan="2">Merrin colspan="2" Merrin colspan="2">Colspan="2" Merrin colspan="2" Merrin colspan="2"</td></th<>	MW-ITS AUM.TTR. AUM.TTR ASSTOR Supplicate MW-ITB AUM.TTR ASSTOR ASS	ANALYTICAL RESULTS ATAIALYTICAL RESULTS AW*/12 AW*/13 AW*/13 AW*/13 AW*/13 AW*/13 AW*/13 AW*/14 AW*/14 AW*/14 AW*/15 AW*/14 AW*/15	ANALYTICAL RESULTS MW-JPB	ANALYTICAL RESULTSA ANALYTICAL RESULTSA MW-178 MW-178 MW-188 MM-188 MM-188 MM 188	ANALYTICAL RESULTSA ANALYTICAL RESULTSA MW-178 MW-178 MW-188 MM-188 MM-188 MM 188	AMALTICAL RESULTS Merrin colspan="2">Merrin colspan="2">Merrin colspan="2">Merrin colspan="2">Merrin colspan="2">Merrin colspan="2" Merrin colspan="2">Merrin colspan="2" Merrin colspan="2">Colspan="2" Merrin colspan="2"
	ANA AWA:778 MW-1778 MW-1778 MW-1778 Outz A5667303 6630/2005 6130/2005 6130/2005 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.6	ANALYTICAL R AWW-17B AWW-17B A	ANALYTICAL RESULTS ANALYTICAL RESULTS AWW-I7B MW-17B MW-17B WW-17B MW-17B MW-17B 012 012 012 012 54667303 A5E26966 MW17B 6302005 121442005 51812006 162 012 162 0 162 0 162 0 162 0 162 0 163 0 164 0 ND(0.050) 0 164 0 165 0 177 0 165 0	ANALYTICAL RESULTS MW-I7B MW-17B MW-17B <thm< td=""><td>ANALYTICAL RESULTS AWA-12 MW-12 MW-13 MW-18 MW-18</td><td>MW-1818 MW-1818 MW-181</td><td>MW-1818 MW-1818 MW-181</td><td>MW-18B MW-18B MW-18B MW-18B OUZ <</td></thm<>	ANALYTICAL RESULTS AWA-12 MW-12 MW-13 MW-18	MW-1818 MW-181	MW-1818 MW-181	MW-18B MW-18B MW-18B MW-18B OUZ <

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TABLE A.1 GROUNDWATER ANALYTICAL RESULTS

MW-19B OU2 GW-BKP-030 6772000	ND (0.005) ND (0.005)	(0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.01)	(100) CIN	(100) CN	(10:0) CIN (10:0) CIN	ğğ	ğ F	19 č	88	E 8 3	ND (0.01) ND (0.005)	ND (0.005) ND (0.005)	0.08 ND (0.005)	ND (0.005)	- UD (0 002)	ND (0.005) ND (0.005)	383	ND (0.005) ND (0.005)	ND (0.01) ND (0.01) ND (0.005)									
MW-19B OU2 02625AH-01 6/25/2002		ND (0.005) ND (0.005)	ND (0.005) ND (0.005)		-			ND (0.005) ND (0.005) ND (0.005) ND (0.005)					ND (0.01) ND (0.005)	ND (0.005) ND (0.005)	0.32 ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)			 ND (0.005) ND (0.005) 	- ND (0.01)		 			 	•			
MW-19B A 0U2 040709001-003 0502 7/8/2004 3	ND (0.005) ND (0.005) ND (0.005)	ND (0.005) NI ND (0.005) NI						ND (0.005) NT ND (0.005) NT		_					0.130 J UD (0.05)					ND (0.005) ND ND (0.005) ND	- UD (0.010)		 0.2 BJN -				• •		, ,	ı.
MW-19B MW-19B OU2 OU2 OU2 660310043-002 A5217205 3/10/2005 3/10/2065	ND (0.005) 	ND (0.005) ND (0.005)	D (0.005)	D (0.005)	ND (0.01)	- ND (0.01)	- (10.0) CIN - (10.0) CIN	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.01)	ND (0.01)	ND (0.005) ND (0.005)	- 0.14 0.14	ND (0.005) -	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005) - ND (0.005) -	ND (0.01)		 		•••	 ۱		• •		1
 B MW-19B OU2 3 A5630604 5 6129/2005 	(2000) CIN	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005)	ND (0.01) ND (0.01)	ND (0.01) ND (0.01)	(100) CIN	ND (0.005)	ND (0.005)	ND (0.01) R	ND (0.005) ND (0.005)	ND (0.01) ND (0.005)	(100) UN	ND (0.005)	(cour) UN 0.013	ND (0.005)	(c000) UN ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	- ND (0.01)	I	 	ı	r 1		1 1			1
MW-19B 0U2 0 A5E26907 1 1214/2005	ND (0.005)	ND (0.005) ND (0.005)	ND (0.005)	ND (0.005) ND (0.005)	ND (0.01) ND (0.01)	ND (0.01) UJ ND (0.01) UJ	ND (0.01)	ND (0.005) ND	(c0000) UN ND (0.005) UJ	ND (0.01) UJ ND (0.005)	ND (0.005) ND (0.005)	(10.0) UN (0.01)	ND (0.01) UJ	ND (0.005) ND (0.005)	7	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) ND (0.005)	ND (0.005) UJ ND (0.005)	, (10.0) dN		 	,	0.003 JN	0.28 JN		1		,
MW-19B MW-19B OU2 CUO BOWN AWV19B AMV19B	(1070) CIN -	(10:0) CIN -	(10:0) CIN -	- ND (0.01) - ND (0.01)	- ND (0.02) - ND (0.02)		- ND (0.02)	ND (0.0010) ND (0.020) ND (0.0020)	- ND (0.01) - ND (0.01)	- ND (0.02) - ND (0.01)	- ND (0.01	- ND (0.02)	- ND (0.02) UJ	- ND (0.01) - (0.01)	- ND (0.01) 0.081 D 0.12		- ND (0.01) U 	- ND (0.01) - ND (0.01)	- ND (0.01) 	(1000) CIN	- ND (0.02)	1								

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Sample Location:											
Location: Sample ID: Sample Date:		0U2 0U2 GW-AK-02 6/23/1998	MW-19B 0U2 GW-BKP-030 6/7/2000	MW-19B OU2 020625AH-01 6/25/2002	MW-19B OU2 040709001-003 7/8/2004	MW-19B OU2 050310043-002 24101005	MW-19B 0U2 A5217203	MW-19B 0U2 A5680604	MW-19B 0U2 A5E26907	MW-19B OU2 MW19B	MW-19B 0U2 MW19B
Parameter	Units					CONTINTIC	3/10/2005	6/29/2005	12/14/2005	5/18/2006	6/26/2006
1,2-Dichlorobenzene 1,3-Dichlorobenzene	mg/L		ı	,							
1,4-Dichlorobenzene	mg/L mg/L					ı					• •
2,4.5-Trichlorophenol (bis(2-chloroisopropyl) ether) 2,4.5-Trichlorophenol	mg/L	, ,						• •			1 1
2,4,6-Trichlorophenol 2.4-Dichlorophenol	mg/L	, ,	, ,	• •			I	•	ı		
2,4-Dimethylphenol	mg/L me/l.		·		ı		1.1				. 1
2,4-Dinitrophenol	mg/L				1 1	• •	ı	ı	·	ı	
2,6-Dinitrotoluene	mg/L	ı	·	ı	,			1 1			
2-Chloronaphthalene	mg/L mg/L			ı	ı	F	·	·			
2-Chlorophenol 2-Methylnanhthalone	mg/L	·	ı		, ,			ı	ı	•	ı
2-Methylphenol	mg/L		ı		ı	ı			1 1	1 1	
2-Nitroaniline	mg/L						ı	ī	1	1	
2-Nitrophenol 3.3'-Dichlorobenzidine	mg/L		ı					ı	ī		
3-Nitroaniline	mg/L	•			•	i		11		1 1	
4,6-Dinitro-2-methylphenol	mg/L mg/L			ı	ı	ı	•		1		
4-Bromophenyi phenyi ether	mg/L	,					ı	ı	ł	ì	
4-Chloroaniline	mg/L	·		ı			1 1			ı	ı
4-Chlorophenyl phenyl ether	mg/L mg/I	•		I		,	1				
4-Methylphenol	mg/L		, ,		ı		ı	ı			• •
4-Nitronuline 4-Nitronhenol	mg/L	ı							,	,	
Acenaphthene	mg/L		,	ı	ı		ı				
Acenaphthylene	mg/L mg/L			1 1		ı	ł	ı	ı	,	ı
Anthracene Benzo(a)anthracene	mg/L	ı	ı	ı			• •			ļ	ı
Benzo(a)pyrene	mg/L		ı		ł	·	•				
Benzo(b)fluoranthene	mg/L						•		•	ł	ı
Benzo(g.h.j)perylene Benzo(k)fluoranthene	mg/L	•	ı			()	• •	F 1	1 1		
Benzoic acid	mg/L me/l.		•	•	ı	·	I	ı	·	I	. 1
Benzyl Alcohol	ng/L			, ,			ı	I		,	
Dis(2-Chloroethoxy)methane bis(2-Chlorroethy)hethar	mg/L				1						•
bis(2-Ethylhexyl)phthalate	me/L		•	ŀ		ı		,		,	1
Butyl benzylphthalate	mg/L	ı					•	•	ı		ı
Chrysene	ng∕L				1	1					
Dibenz(a,h)anthracene	mg/L me/L	1 1	3	•	ı		ı	ı			1
Dibenzofuran	mg/L							·	•	,	,
Directly! phthalate	mg/L	ı	•	I		·					11
Di-n-butylphthalate	mg/L				•				•	ı	
Di-m-octyl phthalate	mg/L		,					1		ı	,
Fluorene	mg/L		,		,		1				
Hexachlorobenzene	mg/L me/l.		1		ı	ı	ı	•	,		
Hexachlorobutadiene	mg/L			. ,			1 1		•	I	
riexactuorocyclopentaquene Hexachloroethane	mg/L	1	•				I				
Indeno(1,2,3-cd)pyrene	mg/L mg/L		1 1	, ,			•	t	ı	ı	,
Isophorone Naphthalene	mg/L	·	I	,			• •				
Nitrobenzene	mg/L mg/L		ı r			,		ı	ι	ı	ı
N-Nitrosodi-n-propylamine N-Nitrosodiu-homina-ia-	mg/L	,	ı			. ,		1 1	ŧ 1		
Pentachlorophenol	mg/L mg/L		•••	, ,	. ,		•	1			ŗ
Phenanthrene	mg/L		,				• 1	1 1			

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Sample Location: Location: Sample D: Commenter D:		MW-19B OU2 GW-AK-02	MW-19B 0U2 GW-BKP-030	MW-19B OU2 020625AH-01	MW-19B OU2 040709001_003	MW-19B OU2 DE0210042 000	MW-19B OU2	MW-19B 0U2	MW-19B 0U2	MW-19B OU2	MW-19B OU2
		6(23/1998	6/7/2000	6/25/2002	7/8/2004	3/10/2005	3/10/2005	A5680604 6/29/2005	A5E26907 12/14/2005	MW19B 5/18/2006	MW19B 6/26/2006
Parameter	Units										
Phenol Fyrene	mg/L mg/L			,	ı	,	ı		ı	,	,
TIC Semi-Volatile Organics	ò			ı	I	t	ı	,		ī	
I (ZH)-Naphthalenone, 3,4-dih A 1,1'-Biphenvl (9CD) A	mg/L	I		ı							
1-Phenyl-1-cyclopropanecarbo	mg/L me/L		ļ	·	·	•	. 1				
2/4/6(1H,3H,5H)-Pyrimidinetr A	ng/L			1 1	, ,	ı	ı	ı		ı	
4-Piperidine Carboxylic Acid A	mg/l	ı	•		1			، ۱	•	I	ı
7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione A	mg/L mg/l		•	I	•	·		ı		• •	, ,
9-Octadecenoic Acid (Z)-(9C) A	mg/L	,		1 1	, ,	•	•		,	ı	,
Autuopyrine A Aniline (ACN) (8CI) A		ı	,	ı					ı	ı	
Benzenamine, 2,6-Dimethyl A	mg/L mg/I	·	ł	,	,	ı					
Benzenamine,2,4-dimethyl- A	mg/L	, ,		•	ı		·	ı	,	ı	
Benzenamine,2,5-dimethyl- A Benzenamine 2,6-dimethl	mg/L	1	ı				·	ı		,	ı
Benzene, 1,1'-Oxybis (9CI) A	mg/L	,		·						1	
Benzene, (Ethoxymethyl)-(9C) A	mg/L me/L		·	ı		,	ı	,			
Benzenemethanamine, N,N-dimethyl A	mg/L	ı			•		ı		I	ı	
Benzoic Acid, 4-Chloro-(9CI) A	mg/L	,	·		I					1	ł
Biphenyl A	mg/L me/L	•	,	,	ı			ı			• •
Butyl ester octadecanoic acid A	mg/L			1 1		•	,		·	ı	
buryt ester, hexadecanoic acid A Carboxvlic Acid A	mg/L					• •	1 1		1	I	ı
Chloromethylbenzene isomers A	mg/L me/l	1	ŀ			,		1			
Chloromethylbenzene isomers B	mg/L	• •		1 1		I		ı	ı	ł	•
Cyclobarbitol A Cyclopantasilovana documentul A	mg/L	,		,				ı		,	
Cyclopropane Carbonitrile, 2 A	mg/L			I		•				• •	
Diethyltoluamide A	mg/L mg/L		• •			ſ	·	ı	•		
Diphenyl ether A Dodecanoic acid A	mg/L	ı		ı				1	·	ı	1
Ethane, 1,2-Bis(2-Chloroetho) A	mg/L		ı			ı	·		1 1		
Ethoxymethyl Benzene A	mg/L				• •		ł	ı	ı	ŀ	,
Lidocaine A	mg/L			,						• •	
Mephobarbitol A	mg/L mg/L		, ,	·	ı		1	ı	ı	,	1
Mepivacaine A	mg/L							•	1	ı	
Meprvacatine hydrochloride A Methyl Thiophene A	mg/L		I	·	ı				• •	• •	
Noramidopyrine A	mg/L me/L			·	,		ı	ı			ı
O-Hydroxybiphenyl A	mg/L	,				1 1	•	¢			
o-rotutaine A Pentazocine A	mg/L	•	•	,					• •		
Phenobarbital A	mg/L me/L			·	ı		I	ı		,	
Phenobarbital Di-methyl Derivative A	mg/L				· ·	ı	I	ı	ı	•	ı
Phenol, (1,1-Dimethylethyl A Phenol 2 4-Ris(1 1-Dimethur) A	mg/L	،		,		1 1	11	1 I		•	ı
Phenol, 2.4-bis(1.4-bittetriyl) A Phenol, 2.4-bis(1-dimethyl A	mg/L	Ţ		ļ		ı	t.		• •	, ,	
Phenol, 4-(1,1,3,3-Tetrameth	mg/L mg/L	1 1		•	ı		ı	,	ı	ŀ	ŗ
Phenol, 4-(2,2,3,3,-Tetrameth) A	mg/L								ı	ı	ı
r rectov, 4,4 - Duryndenebis(2) A Sulfur A	mg/L		•	ı			1 1	, ,			• 1
Sulfur, mold. (S8) A	mg/L	1 1	1 1			ı		•		I	ı
Sulfur, Mol. (S8) (8C19C1) A Talbutal A	mg/L	ı	ı	ı		1 1	1 1	• •			
Tetramethylbutylphenol A	mg/L				r	,	ı		,	,	•
Unknown A	mg/L		•		• •		i îi	1 1		•	
Unknown C	mg/L		·	ı	,	ı		ı	,	,	
	1		ı	ł		•	I	ı	1		

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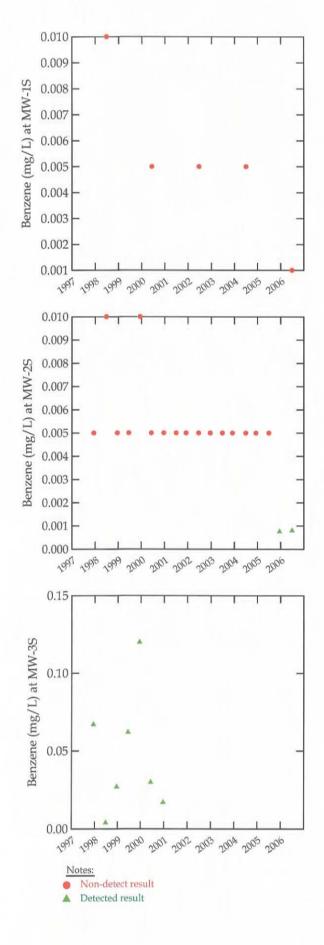
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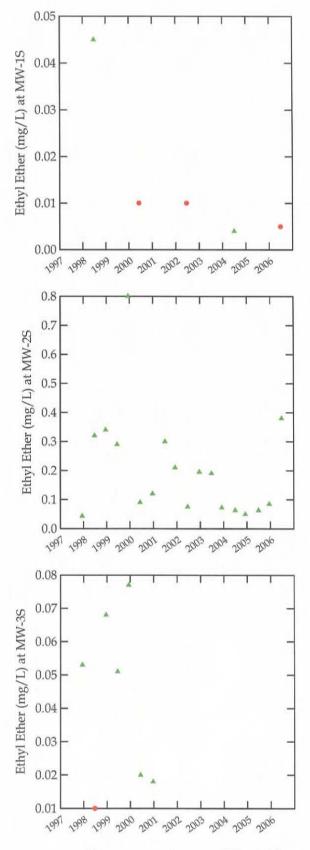
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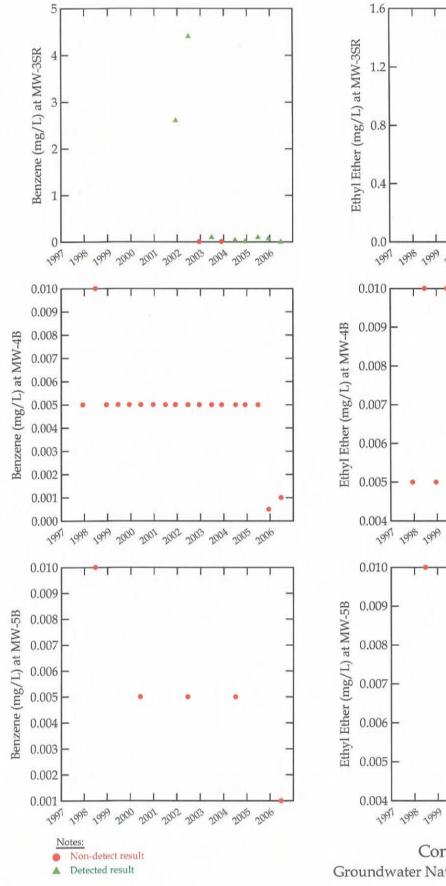
NATURAL ATTENUATION DATA - TREND ANALYSES

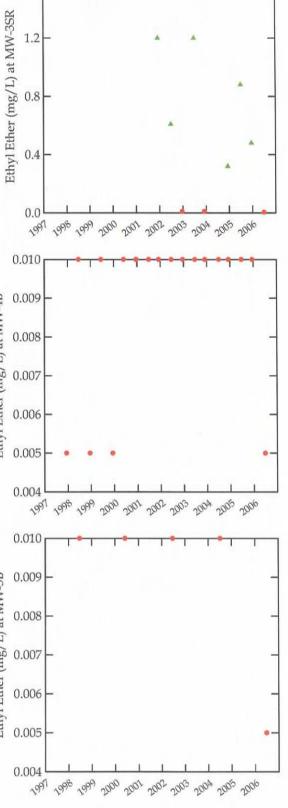
,



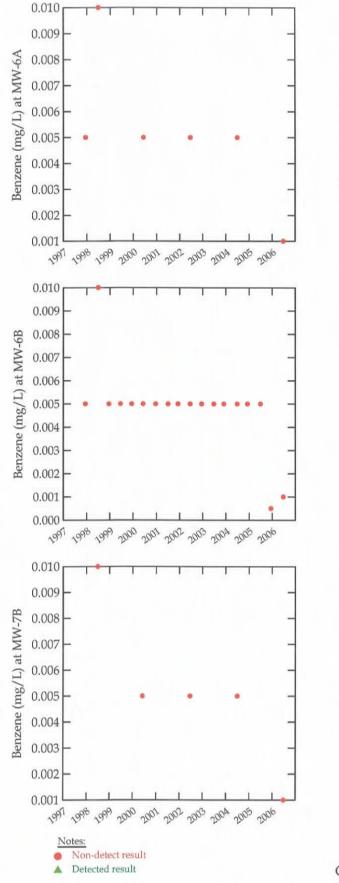


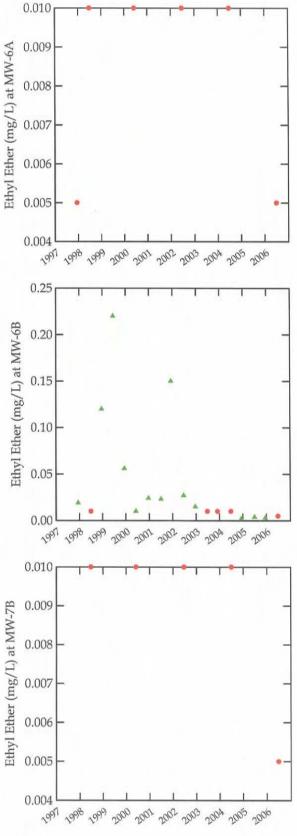
Concentration vs. Time Plots Groundwater Natural Attenuation Monitoring Site 3, New York



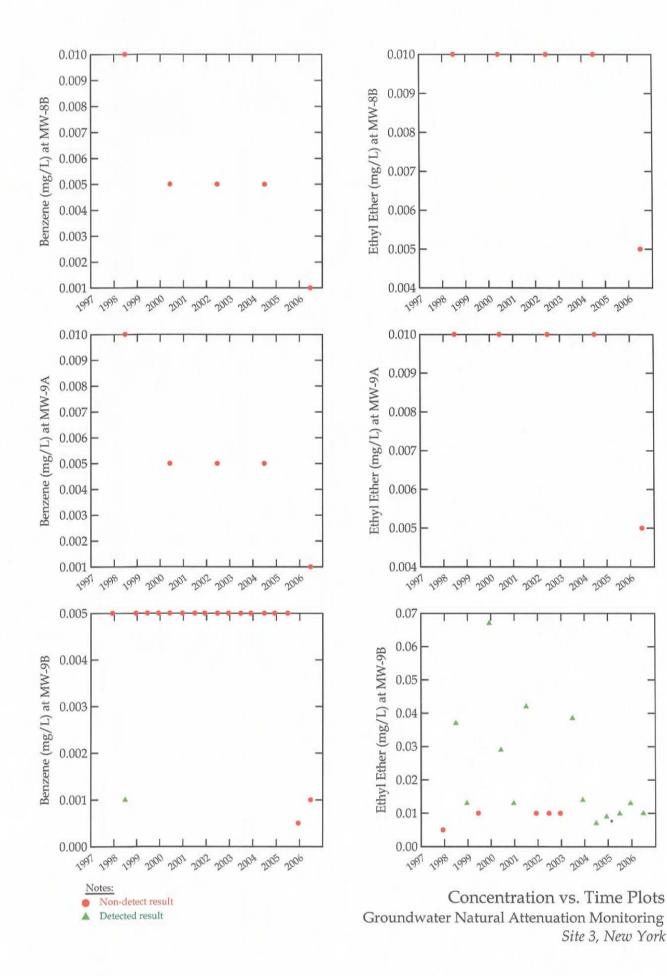


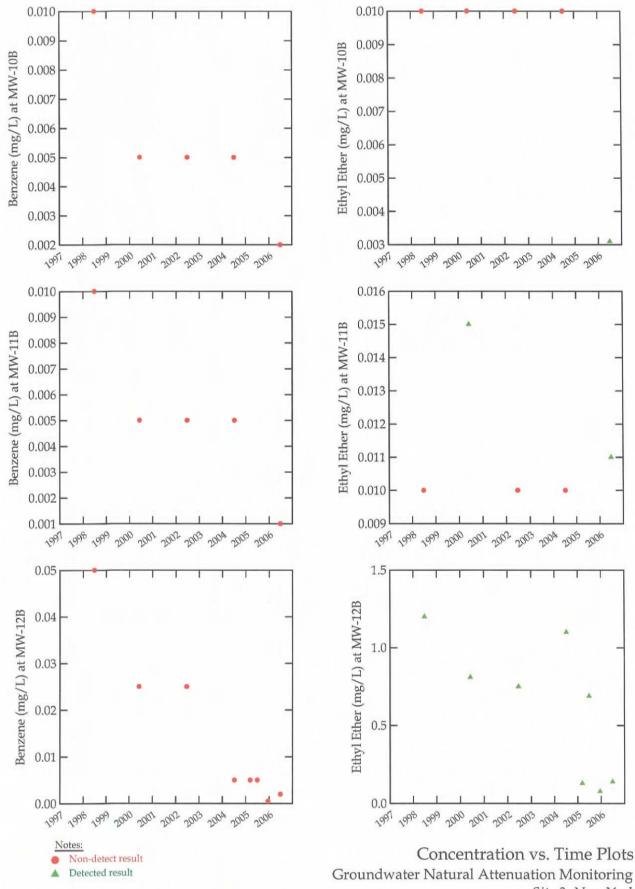
Concentration vs. Time Plots Groundwater Natural Attenuation Monitoring Site 3, New York



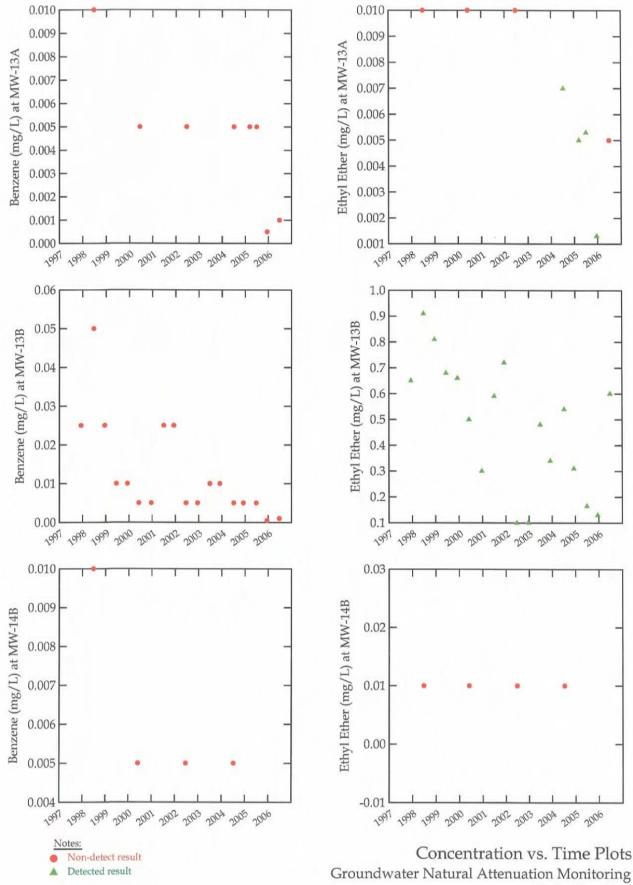


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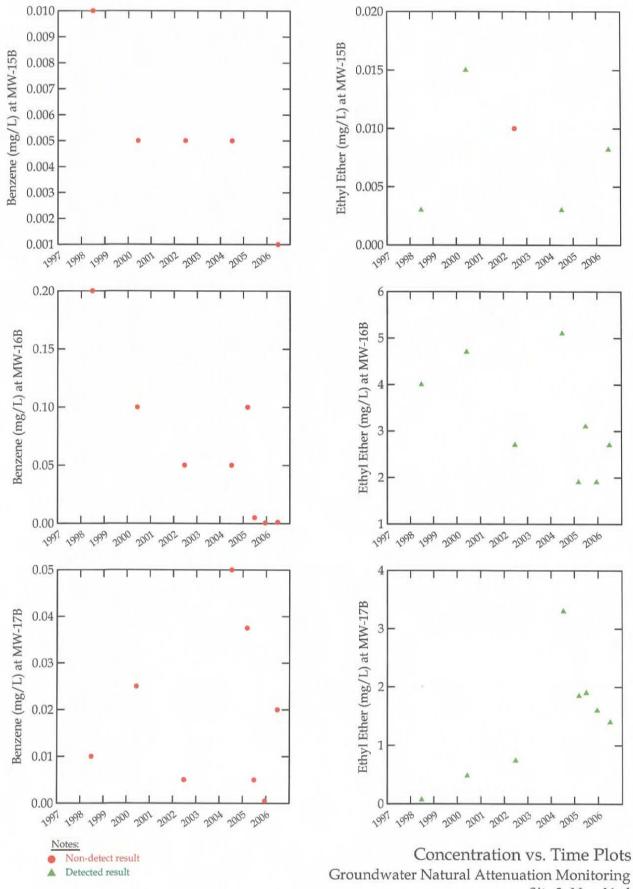




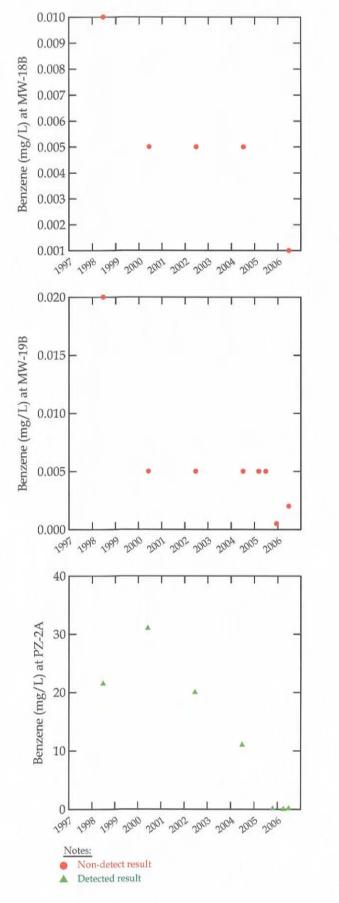
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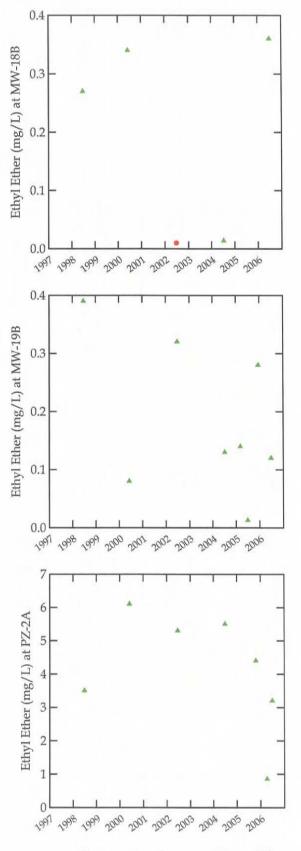


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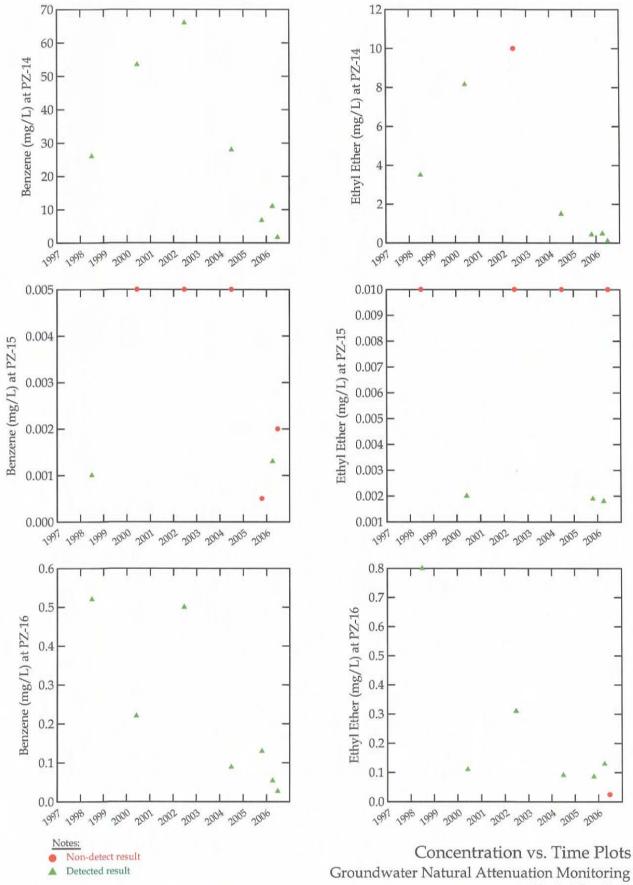


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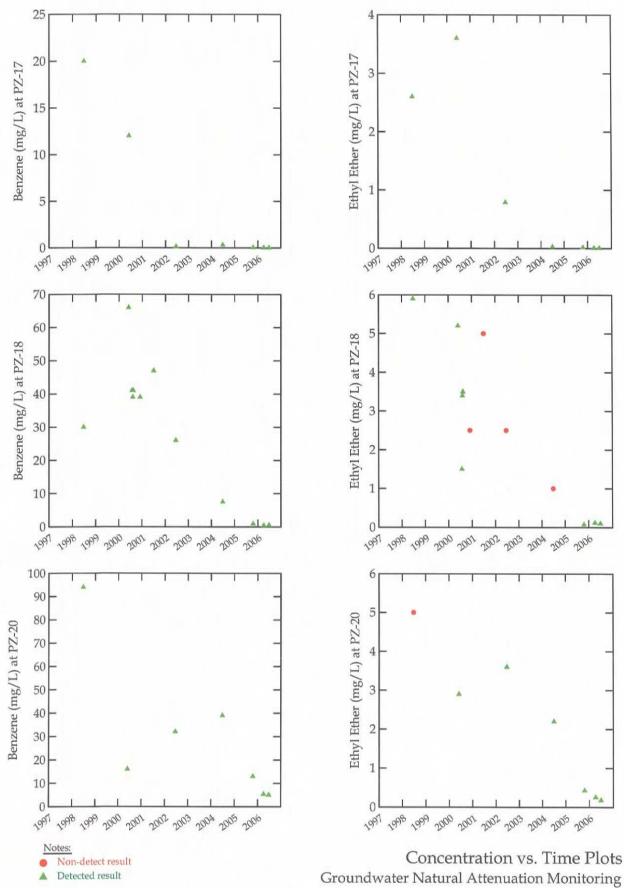




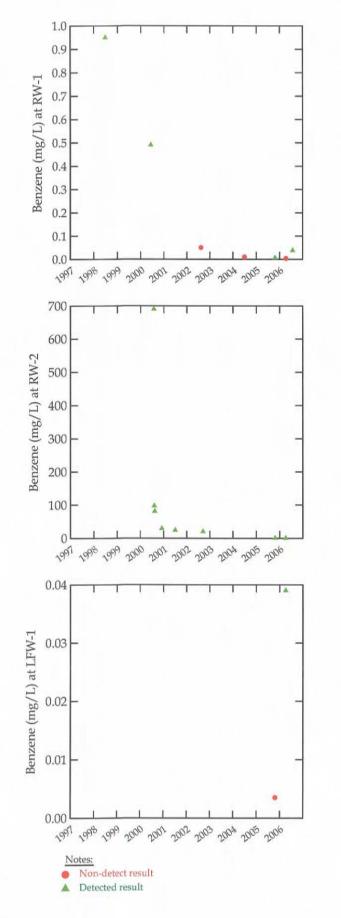
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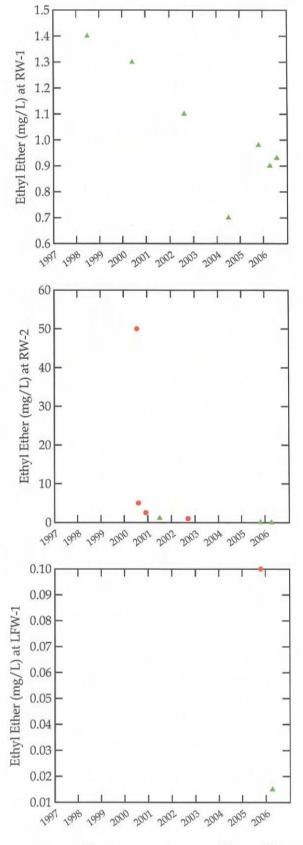


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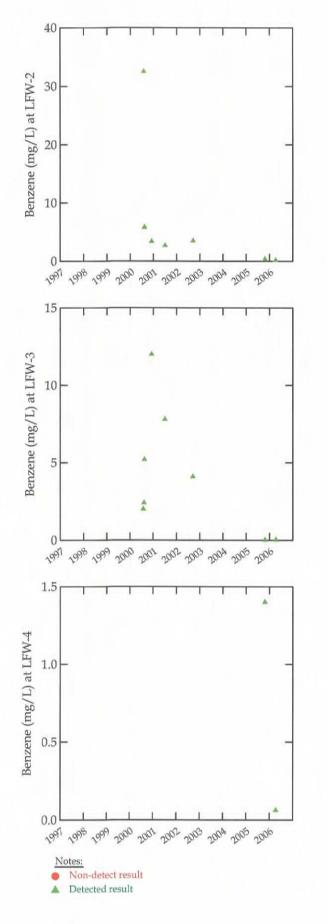


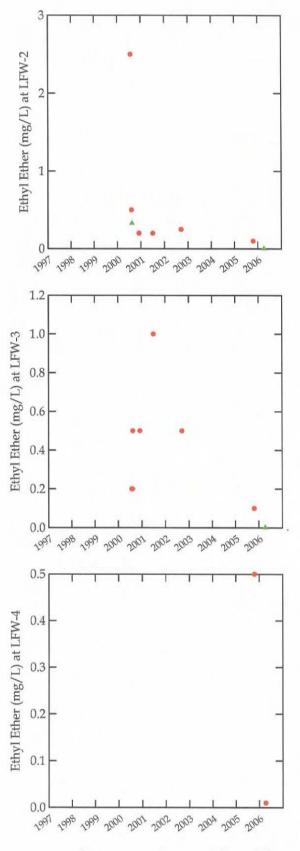
Site 3, New York





Concentration vs. Time Plots Groundwater Natural Attenuation Monitoring Site 3, New York





Concentration vs. Time Plots Groundwater Natural Attenuation Monitoring Site 3, New York

APPENDIX C

.

OU2 GROUNDWATER HUMAN HEALTH RISK ASSESSMENT

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1.0 INTRODUCTION

The Sterling Drug Inc. Site 3 (Site) is located in East Greenbush, Rensselaer County, New York. The Site location is presented on Figure C.1. The Site is approximately seven acres in size and was used as a disposal area for Sterling Drug Inc. (Sterling) from 1956 to 1977. Prior activities (waste disposal) led to contamination of soil and groundwater at the Site. Remedial activities were implemented beginning in 1989 and continue to date. A Site Record of Decision (ROD) dated March 31, 1992 defined two areas of potential concern for the Site known as Operable Unit 1 (OU1) and Operable Unit 2 (OU2). OU1 includes the on-Site soils and groundwater managed by the current remedial activities. OU2 includes the off-property portion of the Site groundwater as a source of drinking water, and the groundwater is considered non-potable, this Human Health Risk Assessment (HHRA) was prepared to evaluate the risk associated with the potential future utilization of the off-property groundwater (OU2) for a hypothetical residential use scenario. This approach was selected because it is the most conservative.

1.1 <u>OBJECTIVE OF THE HHRA</u>

The purpose of the HHRA is to evaluate the potential human health risks posed by Site-related chemicals under hypothetical potential future Site conditions, assuming no additional remedial actions are taken at the Site. The specific goal of the risk assessment is to identify and provide analysis of baseline risks (defined as risks that might exist if no further remediation were applied) based upon OU2 groundwater data from 2001 through 2005.

1.2 ORGANIZATION OF THE HHRA

The HHRA is organized as follows:

• Section 1.0: <u>Introduction</u>

Presents background information relevant to this HHRA, presents the purpose of this HHRA, and outlines the organization of this HHRA.

• Section 2.0: <u>Site Characterization</u>

Presents a brief summary of the nature and extent of the contamination or hazard identification due to the historical operations at the Site, presents the Conceptual Site Model (CSM), and presents the selection of Chemicals of Potential Concern (COPCs).

• Section 3.0: <u>Exposure Assessment</u>

Presents a summary of the exposure settings, identifies the potential exposure pathways, and quantifies exposure based on the exposure assumptions.

• Section 4.0: <u>Toxicity Assessment</u>

Presents a summary of the toxicity data used to calculate the non-carcinogenic hazards and carcinogenic risks.

• Section 5.0: <u>Risk Characterization</u>

Presents an assessment of the potential risks to human health posed by OU2 groundwater and includes the uncertainty analysis.

• Section 6.0: <u>Conclusions</u>

Presents an overview of the COPC identification, human health exposure pathways, and results of the risk characterization.

• Section 7.0: <u>References</u>

Lists references cited in the HHRA.

2.0 SITE CHARACTERIZATION

2.1 <u>SITE DESCRIPTION</u>

Site 3 (Site) is a 7-acre area located on Riverside Avenue, East Greenbush, in Rensselaer County, New York. The Site is located between Papscanee Creek and the Conrail railway tracks. The Site location is shown on Figure C.1. The Site is vegetated and relatively flat, and the Site is situated in the 100-year flood plain of the Hudson River. The Hudson River is located 500 feet southwest of the Site. Following closure of operations by Sterling in 1977, remedial efforts were undertaken to address soil and groundwater contamination. As defined in the ROD, two distinct areas (OU1 and OU2) were noted as areas of potential concern. OU1 includes the closed landfill, and on-Site soils and groundwater, and OU2 includes the off-property portion of the groundwater contaminant plume of ethyl ether located northwest of the landfill. Land use in the surrounding areas is mainly for agricultural purposes with some residential areas approximately 3/4 of a mile to the northeast of the Site.

2.2 <u>GENERAL SITE USE</u>

Between 1956 and 1977, the Site was used by Sterling for the disposal of pharmaceutical waste. Company records indicated that disposed wastes in OU1 included pharmaceutical intermediates, finished pharmaceutical products, Sterling Winthrop Research Institute waste, filter cakes, solvents, still bottoms, motor and lubricating oils, and wood. In 1977, the Site was covered with sandy clay and gravel and closed, and has remained inactive since that time.

2.3 <u>PREVIOUS INVESTIGATIONS</u>

The Site has been the subject of ongoing investigations and remedial activities since 1982. Results from previous investigations identified volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) as the primary contaminants in Site soils and groundwater. Several remedial activities have been implemented at the Site beginning with the removal of 8,452 buried drums from OU1 between 1989 to 1990. Many of these drums were empty, however, some also contained product. Following the removal of the drums, additional investigations were conducted to determine the extent of remaining contamination on Site. The Vacuum Extraction (VE) System and groundwater pump and treat system were installed in accordance with the Site ROD. The Air Sparging System was installed voluntarily, with the approval and

oversight of the NYSDEC, as a further enhancement to source removal prior to capping the landfill. The VE System commenced full-scale operation in December 1994 to address contaminants in the fill/soil within OU1. The Groundwater Pump and Treat System was commissioned in May 1996 to address groundwater immediately downgradient of OU1. The Air Sparging System has been operated since July 2000 to address groundwater within the hot spot areas of OU1. These systems have been effectively reducing the contaminant levels within the landfill. In addition, an impermeable cap, which has been designed, will be placed over the landfill following the evaluation of the completed treatment systems. The OU2 off-property groundwater plume is presently being monitored.

2.4 NATURE AND EXTENT OF CONTAMINATION

Previous Site investigations indicated that the subsurface consists of approximately 8 feet of a heterogeneous mixture of silt, sand, and clay fill underlain by 6 feet of lower permeability silt, silty clay, and clayey silt. The former layer was characterized as being mixed with waste products such as glass vials, flasks, wood, garbage, drainage pipes, needles, and also the drums mentioned previously, which have been excavated from this area during remedial activities between 1989 and 1990. Following drum removal, sampling conducted at the Site indicated the presence of several "hot spots" in OU1 composed of VOCs, which have been, and continue to be, addressed by the VE System. The primary contaminants of concern at OU1 included benzene, toluene, acetone, ethyl ether, dichloroethane, trichloroethane, and chloroform. In addition, a groundwater plume, consisting of ethyl ether has been detected. Monitoring of the OU2 groundwater wells is currently being conducted.

2.4.1 <u>GROUNDWATER</u>

Groundwater moves directly toward the Hudson River 500 feet away from the Site and surface water runoff from the Site moves directly toward the Papscanee Creek. Previous investigations have identified benzene, toluene, ethyl ether, methylene chloride, acetone, methyl thiophene, 1,2-dichloroethane, trichloroethylene, and chloroform as the primary chemicals of concern in OU1 groundwater. Concentrations were typically 1 to 2 orders of magnitude higher than the corresponding groundwater remediation goals. However, the groundwater treatment system has been effective for reducing the levels of the majority of these contaminants in OU1. During investigations, a groundwater plume consisting primarily of ethyl ether was observed to migrate from the former landfill area to off-Site agricultural land. This area has been defined as OU2. The OU2 groundwater

sampling locations are shown on Figure C.2. Investigation of the OU2 groundwater plume between 2001 and 2005 has shown that the levels of the majority of primary chemicals within OU2 are either not detected, or have been reduced to below detection levels, with the exception of ethyl ether, which still remains above the original groundwater objectives.

2.5 <u>CONCEPTUAL SITE MODEL</u>

In order to evaluate the significance of the impacted groundwater within OU2 at the Site, the potential pathways by which individuals may come in contact with the groundwater must be determined. The combination of factors (chemical source, media of concern, release mechanisms, and potential receptors) that could produce a complete exposure pathway and lead to human uptake of chemicals are assessed in what is defined as a Conceptual Site Model (CSM). The adjacent residents have been identified as the potential human receptors for the OU2 groundwater.

OU2 contains groundwater impacted by VOCs and metals. Currently, groundwater from OU2 is not used for potable purposes. There are no known water wells downgradient of the Site based upon a search of the Water Well Information on the NYSDEC web site (http://www.dec.state.ny.us/cfmx/extapps/WaterWell/ index.cfm?view=searchByCounty). In addition, the concentrations of total iron range from 3.45 to 47.9 milligrams per litre (mg/L) and dissolved iron range from 0.375 to 43 mg/L in upgradient Site wells based on 2001 to 2005 data for monitoring wells MW-4B and MW-5B. These iron concentrations are above the aesthetic drinking water standard of 0.3 mg/L presented in the NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) (NYSDEC, 1998). As noted, groundwater is not currently used as a source of drinking water, and, given the high background iron concentrations that exceed the NYSDEC standard in the groundwater, use of OU2 groundwater as a potable water source is unlikely in the future. However, the risk assessment that follows evaluates OU2 groundwater as a potable drinking water source, because this approach is considered the most conservative.

Exposure pathways involving groundwater as a potable drinking water source typically include direct contact to COPCs in water through ingestion and dermal contact while bathing. Indirect exposure pathways for potable groundwater involve potential release of COPCs from groundwater-to-indoor air from various activities, e.g., showering, laundering, dish washing, etc.

Table C.1 presents a summary of the future potentially complete hypothetical pathways and relevant hypothetical receptors to be evaluated in the risk assessment.

2.6 SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPCs)

This section presents the process for establishing chemicals of potential concern (COPCs) for the Site. COPCs are chemicals related to the Site that, pose the greatest potential public health risk. In general, detected chemicals are identified as COPCs based upon their concentrations and known toxicity characteristics.

As part of the identification of COPCs, the selection of COPCs for OU2 groundwater was completed using a screening process. The COPC screening process involved a comparison of the maximum detected concentration of each contaminant in OU2 groundwater to a risk-based concentration associated with target risks and conservative default exposure assumptions. The most up-to-date and the lowest of the risk-based concentrations (RBCs) from the United States Environmental Protection Agency (USEPA) Region III (R3-RBCs) (USEPA, 2006b), Region IX preliminary remediation goals (R9-PRGs) (USEPA, 2004b), NYSDOH Maximum Contaminant Levels (MCLs) (NYSDOH, 2004), and NYSDEC Ambient Water Quality Standards and Guidance Effluent Limitations, Divisions of Water Technical and Operational Guidance (TOGS) (NYSDEC, 1998) were used to identify COPCs in the groundwater for the HHRA.

TOGS (NYSDEC, 1998) presents chemical-specific standards and guidance values for a number of constituents. In addition, TOGS also includes water quality criteria for groups of chemicals such as Principal Organic Contaminant (POC), for which a standard of 5 parts per billion (ppb) applies. NYSDOH (2004) presents chemical-specific MCLs for public drinking water systems that support 25 or more individuals or have five or more connections. An MCL is defined as the maximum permissible level of a contaminant in water, which is delivered to any user of a public water system. As with TOGS, NYSDOH (2004) includes water quality criteria for groups of chemicals such as Principal Organic Contaminants, for which a standard of 5 ppb applies, and Unspecified Organic Contaminants (UOC), for which a standard of 50 ppb applies. For selection of COPCs, POCs and UOCs were used if these concentrations were the lowest available even though they are not risk-based levels.

Chemicals with maximum concentrations less than their respective screening value were not identified as COPCs, and were not retained in the HHRA quantitative process. Essential nutrients such as calcium, magnesium, potassium, and sodium were not identified as being Site-related contaminants and, therefore, were eliminated from further evaluation. Iron is a commonly occurring metallic element that can vary in concentration depending on Site-specific conditions. As a result, additional analysis was conducted to evaluate the concentrations of iron within background groundwater samples (background iron) not impacted by Site-related activities as a method for establishing baseline iron levels for the area. Additionally, any parameter that had a level of detection frequency (LDF) less than 5 percent was not identified as a COPC for this risk assessment.

Analytical data were validated prior to application in the HHRA. Estimated results, usually indicated by a qualifier, were included in the evaluation.

2.6.1 <u>GROUNDWATER</u>

As presented in Table C.2, background iron levels (total and dissolved) were detected at maximum concentrations greater than the screening criteria for groundwater. As presented in Table C.3, Site groundwater concentrations of ethyl ether, iron (total), and iron (dissolved) were detected at maximum concentrations greater than the screening criteria for groundwater. As a result, background iron, and OU2 ethyl ether and iron (total and dissolved) were identified as COPCs for groundwater.

3.0 EXPOSURE ASSESSMENT

Exposure is defined as the contact of a receptor (i.e., person) with a chemical or physical agent. The exposure assessment is the estimation of the magnitude, frequency, duration, and routes of exposure. An exposure assessment provides a systematic analysis of the potential exposure mechanism by which a receptor may be exposed to chemical or physical agents at or originating from a study area. The objectives of an exposure assessment are as follows:

- 1. Characterization of exposure setting;
- 2. Identification of potential exposure pathways; and
- 3. Quantification of exposure.

3.1 <u>CHARACTERIZATION OF EXPOSURE SETTING</u>

As part of the HHRA process, potential exposure pathways are determined through an evaluation of the physical setting of the Site and the potentially exposed populations. A brief description of the physical setting of the Site is presented in Section 2.0. The consideration of Site-specific factors related to land usage is important in the development of realistic exposure scenarios and quantification of risks and hazards. The current and future potential land uses that are reasonably expected for the Site determine what populations may potentially be exposed. The Site land uses are discussed in the following subsections.

3.1.1 <u>CURRENT AND FUTURE LAND USE</u>

The Site has been closed and has remained inactive since 1977. The on-Site area is presently being remediated. Presently, there are no groundwater uses in either OU1 or OU2, however, for the purposes of this assessment, it was assumed that groundwater could hypothetically be used as a potable source of residential drinking water even though it is not currently used for that purpose, and it is considered non-potable because of elevated background levels of iron.

3.2 IDENTIFICATION OF POTENTIAL EXPOSURE PATHWAYS

An exposure pathway describes a mechanism by which humans may come into contact with site-related COPCs. An exposure pathway is complete (i.e., it could result in a receptor contacting a COPC) if the following four elements are present:

- 1. A source or a release from a source (e.g., COPCs released to groundwater due to historical releases during site operations).
- 2. A probable environmental migration route of a site-related COPC (e.g., leaching or partitioning from one medium to another).
- 3. An exposure point where a receptor may come in contact with a site-related COPC (e.g., groundwater).
- 4. A route by which a site-related COPC may enter a potential receptor's body (e.g., ingestion, dermal contact, or inhalation).

If any of these four elements are not present, the exposure pathway is considered incomplete and does not contribute to the total exposure from the Site.

Based on an understanding of the four components of an exposure pathway and the hypothetical future assumed use of the OU2 groundwater, human exposure pathways were identified in the HHRA. The potential human population considered relevant to the HHRA was a future hypothetical resident.

Based on these assumptions and the results of the media-specific screening presented in Section 2.6, the exposure scenarios and pathways quantified in the HHRA are summarized in Table C.1. The following media and potential human exposures (i.e., hypothetically complete pathways) have been identified for quantitative evaluation in the HHRA:

- 1. Background Groundwater Hypothetical Future Resident:
 - dermal contact with groundwater by resident (child and adult);
 - ingestion of groundwater by resident (child and adult); and
 - inhalation of vapors from volatile COPCs by resident (child and adult).
- 2. OU2 Groundwater Hypothetical Future Resident:
 - dermal contact with groundwater by resident (child and adult);
 - ingestion of groundwater by resident (child and adult); and
 - inhalation of vapors from volatile COPCs by resident (child and adult).

The hypothetical extraction and use of OU2 groundwater for irrigation purposes and the uptake of OU2 groundwater by biota (e.g., plants) are also potentially complete exposure pathways. However, as ethyl ether and iron are the only identified COPCs, these pathways are considered incomplete and not further evaluated in the HHRA. Ethyl ether is a VOC and the action of irrigation would result in the loss and dispersion of volatile chemicals, such as ethyl ether, to the atmosphere thereby removing any potential exposure via uptake by biota. Iron is considered an essential plant micronutrient that is required for normal plant growth. As such, plants have evolved methods for the regulation of iron uptake. In most cases, the form of iron present in OU2 groundwater is unavailable for plant uptake, and therefore, non-toxic to plants. Moreover, OU2 groundwater was evaluated in this assessment based on hypothetical future use as a potable source of residential drinking water. This scenario is considered more conservative than agricultural irrigation, and therefore, protective of scenarios involving lower exposure such as agricultural irrigation.

3.3 <u>QUANTIFICATION OF EXPOSURE</u>

To quantify exposure, potential exposure scenarios were developed using guidance presented in the following USEPA documents:

- USEPA Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation Manual (Part A), EPA/540/1-89/002, December 1989 (USEPA, 1989);
- USEPA RAGS Supplemental Guidance, Standard Default Exposure Factors, Interim Final, OSWER Directive 9285.6-03, March 25, 1991 (USEPA, 1991a);
- USEPA Exposure Factors Handbook, EPA/600/P-95/002Fa, August 1997 (USEPA, 1997);
- USEPA RAGS Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments, Interim, Publication 9285.7-O1D, December 2001 (USEPA, 2001); and
- USEPA RAGS Part E, Supplemental Guidance, Dermal Risk Assessment, Final, July 2004 (USEPA, 2004a).

In the absence of USEPA guidance, professional judgment was applied to develop conservative assumptions that are representative of the Reasonable Maximum Exposure (RME) and are protective of human health.

Two exposure paradigms are presented. The Central Tendency (CT) presents the average or mean exposure, and approximates the most probable exposure conditions. The RME presents a conservative exposure scenario that generally utilizes the 90th to 95th percentile assumptions, depending upon available data.

The CT and RME values for the two exposure paradigms were determined based on the observed data distribution, i.e., normal or log-normal and the percentage of censored data points (non-detected results). Duplicate samples were averaged and considered as one sample. The statistical methods used to determine the CT and RME values were consistent with the guidance presented in USEPA (2002b, 2004c, 2006c,d).

The arithmetic mean, maximum, and 95 percent upper confidence limit (UCL) concentrations for the COPCs identified in monitoring wells associated with background groundwater for the years 1998 through 2004 are presented in Table C.4. Due to the limited data set for the background groundwater, all data collected from 1998 to 2004 was used. As the iron concentrations have not significantly changed over time it was appropriate to use all collected data (see Attachment A). The arithmetic mean, maximum, and 95 percent upper confidence limit (UCL) concentrations for the COPCs identified in monitoring wells associated with OU2 for the years 2001 through 2005, are summarized in Table C.5.

3.3.1 GENERIC ESTIMATION OF INTAKE

In the HHRA, exposure estimates reflect chemical concentration, contact rate, exposure time, and body weight in a term called "intake" or "dose". A generic equation for calculating chemical intake (USEPA, 1989) is:

$$CDI = \frac{CS \times IR \times ABS \times CF \times EF \times ED}{BW \times AT}$$

Where:

- CDI = Chronic Daily intake (mg/kg body weight/day)
- CS = Chemical concentration (e.g., mg/kg for soil)
- IR = Ingestion Rate of Soil (e.g., mg soil/day)
- ABS = Absorption Factor (%/100)
- CF = Conversion factors as appropriate (e.g., kg/mg)
- EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged, e.g., days)

Carcinogens

A lifetime average daily dose of the chemical is estimated for carcinogens. This prorates the total cumulative intake over a lifetime. An averaging time (AT) of 70 years is used for carcinogens.

Non-carcinogens

The chemical intake of non-carcinogens is estimated over the appropriate exposure period or averaging time. For non-carcinogens, the averaging time is typically set equal to ED.

3.3.2 EXPOSURE SCENARIO ASSUMPTIONS

Different exposure scenarios were developed for each hypothetical receptor evaluated in the HHRA. Descriptions of each exposure scenario and associated exposure assumptions are presented in the following subsection.

Receptor characteristics had values assigned for CT and RME scenarios. In some cases these values differed between scenarios (e.g., exposure concentration, exposure frequency, etc.) and in other cases these values were the same for both CT and RME scenarios (e.g., body weight, skin surface area, ingestion rate, etc.). The assignment of receptor characteristics by scenarios followed standard practices used by the USEPA and risk assessment professionals. Where default values were used, the value presented by USEPA was selected. The specific values used are presented in the following sections.

Based on the generic screening criteria, COPCs were identified for background and OU2 groundwater.

3.3.2.1 **GROUNDWATER EXPOSURE**

Hypothetical Future Resident Exposure to Potable Groundwater

It was assumed, for purposes of this assessment, that future development of the area defined by OU2 may result in the potential use of groundwater within OU2 as a potable source. Thus, hypothetical resident exposure to groundwater was evaluated in the HHRA. For comparison, residential exposure to background groundwater was evaluated to identify a baseline for groundwater that has not been impacted by Site-related activities. It was assumed that the resident would be exposed to groundwater through ingestion, dermal contact, and inhalation of vapors due to constituents volatizing as a result of normal household activities such as showering, laundering and dish washing, etc. Table C.6 summarizes the conservative and health-protective assumptions used to calculate the residential exposure to groundwater. The exposure assumptions are as follows:

- The exposure point concentration was the mean concentration for the CT (most likely) exposure scenario and the 95 percent UCL or the maximum detected concentration, whichever was lower, for the RME exposure scenario;
- (ii) The ingestion rates for children were 0.7 L/day for CT based on the recommended drinking water intakes for children aged 3 to 5 years (USEPA, 1997; Table 3-30) and 1 L/day for RME (USEPA, 1991a). The ingestion rates for adults were 1.4 L/day for CT based on the recommended drinking water intakes for adults (USEPA, 1997; Table 3-30) and 2 L/day for RME (USEPA, 1991a);
- (iii) The exposed skin surface area for children was 6,600 square centimeters (cm²)
 (CT and RME) and for adults was 18,000 cm² (CT and RME), as per USEPA (2004a);
- (iv) The permeability constants are chemical-specific and were taken from the USEPA (2004a);
- (v) The fractions absorbed are chemical-specific and were taken from the USEPA (2004a);
- (vi) The lag times are chemical-specific and were taken from the USEPA (2004a);
- (vii) The B constants are chemical-specific and were taken from the USEPA (2004a);
- (viii) The inhalation rate for children was 8.3 cubic meters per day (m³/day) for CT and 10 m³/day for RME (USEPA, 1997). The inhalation rate for adults was 15 m³/day for CT and 20 m³/day for RME (USEPA, 1997);
- (ix) The volatilization factor was 0.5 L/m^3 (USEPA, 1991b);

- (x) The exposure frequency for residents was 350 days/year (CT and RME) based on USEPA (1991a);
- (xi) The dermal exposure time for children was 0.33 hr/day for CT and 1 hr/day for RME (USEPA, 2004a). The dermal exposure time for adults was 0.25 hr/day for CT and 0.58 hr/day for RME (USEPA, 2004a);
- (xii) The exposure duration for children was 6 years for both CT and RME and for adults was 3 years for CT and 24 years for RME for a combined total exposure duration of 9 years (CT) and 30 years (RME) (USEPA, 1991a);
- (xiii) The dermal event frequency (EV) was 1 event/day for both CT and RME (USEPA, 2004);
- (xiv) The body weight for the child resident was 16 kilogram (kg) based on USEPA (1991a). The body weight for the adult resident was 70 kg based USEPA (1989);
- (xv) The carcinogenic averaging time was 365 days per year for 70 years (25,550 days); and
- (xvi) The averaging time for non-carcinogens was 365 times the exposure duration (ED).

4.0 <u>TOXICITY ASSESSMENT</u>

The toxicity assessment weighs the available evidence regarding the potential for a particular COPC to cause adverse effects in exposed individuals and estimates the extent of exposure and possible severity of adverse effects. To develop toxicity values, two steps are taken: hazard identification and dose-response assessment. The hazard identification determines the potential adverse effects associated with exposure to a COPC. In the dose-response assessment, numerical toxicity values are determined or selected from the available toxicity data.

In the selection of toxicity values, preference has been given to the most recently developed values because these would incorporate the most recent toxicological information and would provide the best basis upon which to assess potential health hazards/risks. Toxicity values were primarily obtained from the IRIS (Integrated Risk Information System) database (USEPA, 2006a) and the USEPA-National Center for Environmental Assessment (NCEA) provisional values as presented in the USEPA Region IX PRGs (USEPA, 2004b) and USEPA Region III RBCs (USEPA, 2006b).

4.1 <u>NON-CARCINOGENIC HAZARDS</u>

4.1.1 <u>TOXICITY INFORMATION FOR NON-CARCINOGENIC EFFECTS</u>

For substances suspected to cause non-carcinogenic chronic effects, the health criteria are usually expressed as chronic intake levels or reference dose (RfDs) [in units of mg/(kg day⁻¹)] below which, no adverse effects are expected. In other words, there is a level of exposure to a chemical below which no toxic effects are expected. In contrast to the toxicological model used to assess carcinogenic risk, which assumes no concentration threshold, the non-carcinogenic dose-response model postulates a "threshold".

In this risk assessment, chronic RfDs are used as the toxicity values for non-carcinogenic health effects. A chronic RfD is defined as an estimate (with an uncertainty spanning an order of magnitude or greater) of a daily exposure level for the human population, including sensitive sub-populations, which poses no appreciable risk of deleterious effects over a lifetime of exposure. Uncertainty factors are incorporated into the RfDs to account for extrapolations from animal toxicity data, data quality, and to protect sensitive sub-populations. The basis of an RfD is usually the highest dose level administered to laboratory animals that did not cause observable adverse effects after chronic (usually lifetime) exposure. This is called the No-Observed Adverse Effect Level (NOAEL). The NOAEL is then divided by uncertainty (safety) factors, and sometimes an additional modifying factor, to obtain the RfD. In general, an uncertainty factor of 10 is used to account for interspecies variation and another factor of 10 to account for sensitive human populations. Additional factors of 10 are included in the uncertainty factor if the RfD is based on the Lowest-Observed Adverse Effect Level (LOAEL) instead of the NOAEL, or if data inadequacies are present (e.g., the experiment for which the RfD was derived had less than lifetime exposure). The LOAEL is the dose level administered to laboratory animals that causes the lowest adverse effect (e.g., liver toxicity - although this is species and chemical-specific) after chronic exposure.

Table C.7 presents the non-cancer toxicity data (RfDs) used to estimate human health effects for oral and dermal exposure routes. Table C.8 presents RfDs used for the inhalation exposure route.

4.2 <u>CARCINOGENIC RISKS</u>

4.2.1 <u>TOXICITY INFORMATION FOR CARCINOGENIC EFFECTS</u>

Cancer Slope Factors (CSFs) are quantitative risk estimates of carcinogenic potency. Slope factors relate the lifetime probability of excess cancers to the lifetime average exposure dose of a substance. CSFs are estimated using mathematical extrapolation models, most commonly the linearized multistage (LMS) model, and are presented as risk per mg/(kg-day-1) (i.e., mg carcinogen per kg body weight per day). These models assume low dose-response linearity and thus may not be appropriate for some suspect carcinogens, in particular those that function as promoters. As well, the body's natural repair processes and defense mechanisms may decrease cancer risk at low exposure levels. Thus, the risks at lower exposure levels are likely overestimated using the LMS model. When adequate human epidemiology data are available, maximum likelihood estimates (MLEs) of model parameters are used to generate a CSF. When only animal data are available, the CSF is derived from the largest possible linear slope that is consistent with the data (within the upper 95 percent confidence limit). In other words, the true risk to humans, while not identifiable, is not likely to exceed the upper-bound estimate. This is a conservative estimate, and in some cases a linear slope of zero may be as appropriate for the data (i.e., no carcinogenic risk).

Known or suspect human carcinogens have been evaluated and identified by the Carcinogen Assessment Group using the USEPA Weight-of-Evidence approach for carcinogenicity classification (HEAST, 1997). The USEPA classification is based on an

evaluation of the likelihood that the agent is a human carcinogen. The evidence is characterized separately for human and animal studies as follows:

- Group A Known Human Carcinogen (sufficient evidence of carcinogenicity in humans);
- Group B Probable Human Carcinogen (B1 limited evidence of carcinogenicity in humans; B2 sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans);
- Group C Possible Human Carcinogen (limited evidence of carcinogenicity in animals and inadequate or lack of human data);
- Group D Not Classifiable as to Human Carcinogenicity (inadequate or no evidence); and
- Group E Evidence of Noncarcinogenicity for Humans (no evidence of carcinogenicity in animal studies).

The COPCs were classified utilizing the USEPA system. Table C.9 presents the cancer toxicity data (CSFs) used in the HHRA to estimate the risk of cancer for the oral and dermal exposure routes. Table C.10 presents CSFs for the inhalation exposure route.

4.3 <u>POTENTIAL RISK FROM CARCINOGENS</u>

A CSF is applied to estimate the potential risk of cancer from exposure to carcinogenic chemicals. The CSF, when multiplied by the lifetime average daily intake, provides an upper bound estimate of the probability that the intake will cause cancer during the lifetime of the exposed individual. USEPA notes that true risks might, in fact, be zero. This increased cancer risk is expressed, for example, as 1×10^{-6} or 1.0E-06 (1 in 1 million increased cancer risk). This is an upper limit estimate of the risk, based on very conservative health-protective assumptions and conservative statistical evaluations of data from animal experiments or epidemiological studies. To state that a chemical exposure causes a 1E-06 added upper limit risk of cancer means that if 1,000,000 people are exposed to this concentration of the chemical for their lifetimes, a maximum of one additional incident of cancer may occur. This is a very conservative estimate, and, in fact, there may be no additional cases of cancer due to the chemical exposure.

5.0 <u>RISK CHARACTERIZATION</u>

The objective of the risk characterization is to integrate information developed in the exposure assessment (Section 3.0) and the toxicity assessment (Section 4.0) into a complete evaluation of the potential human health risks associated with exposure to iron in the background groundwater and potentially contaminated OU2 groundwater. The methods used in this risk characterization are based on USEPA RA guidance for human exposures (USEPA, 1989, 1991a, 1991b, 1997, 2001, 2004a).

5.1 HAZARD ESTIMATES

The potential for non-cancer health effects from exposure to a COPC is evaluated by comparing an exposure level over a specified time period to a reference dose (RfD) for a similar time period. This ratio, termed the hazard quotient, is calculated according to the following general equation:

$$HQ = \frac{CDI}{RfD}$$

Where:

- HQ = The Hazard Quotient (unitless) is the ratio of the exposure dose of a chemical to a reference dose not expected to cause adverse effects from a lifetime exposure. A hazard quotient equal to or below 1.0 is considered protective of human health;
- CDI = The Chronic Daily Intake is the chemical dose calculated by applying the exposure scenario assumptions and expressed as mg/(kg-day-1). The intake represents the average daily chemical dose over the expected period of exposure; and
- RfD = The Reference Dose is a daily dose believed not to cause an adverse effect from even a lifetime exposure [mg/(kg-day⁻¹)]. The RfD is based on experimental data and/or epidemiological studies.

The Hazard Index (HI) is the sum of Hazard Quotients for individual COPCs for a specific exposure scenario.

The summation of non-carcinogenic effects is only additive if they pertain to similar target organs. The HIs presented in Section 5.3 conservatively sum the non-carcinogenic effects without regard to target organs. HIs summed across similar target organs are

presented in the hazard quotient calculation tables for the background and OU2 groundwater.

5.2 <u>CANCER RISK ESTIMATES</u>

Exposure scenarios may involve potential exposure to more than one carcinogen. To represent the potential carcinogenic effects posed by exposure to multiple carcinogens, it is assumed, in the absence of information on synergistic or antagonistic effects, that these risks are additive. Cancer risks are calculated utilizing the following general equation:

Cancer Risk = $LADD \times CSF$

Where:

- Cancer Risk = Estimated upper bound on additional risk of cancer over a lifetime in an individual exposed to the carcinogen for a specified exposure period (unitless);
- LADD = The Lifetime Average Daily Dose of the chemical calculated using exposure scenario assumptions and expressed in mg/(kg-day-1). The intake represents the total lifetime chemical dose averaged over an individual expected lifetime of 70 years; and
- CSF = The Cancer Slope Factor models the potential carcinogenic response and is expressed as [mg/(kg-day⁻¹)]⁻¹.

For estimating cancer risks from exposure to multiple carcinogens from a single exposure route, the following equation is used:

$$Risk_{T} = \sum_{i=1}^{N} Risk_{i}$$

Where:

Risk _T	=	Total cancer risk from route of exposure;
$Risk_i$	=	Cancer risk for the chemical; and
Ν	=	Number of chemicals.

The cumulative carcinogenic risks are presented and discussed in Section 5.3.

5.3 RISK QUANTIFICATION SUMMARY

The hazard indices and excess lifetime cancer risks for the various exposure scenarios for background and OU2 groundwater are presented below.

5.3.1 CALCULATION OF NON-CANCER HAZARDS AND CALCULATED LIFETIME CANCER RISKS FOR RECEPTORS

The non-cancer hazard calculations and calculated lifetime cancer risks for future potential receptors using background groundwater are presented in Tables C.11 and C.12 and are summarized below. The non-cancer hazard calculations and calculated lifetime cancer risks for future potential receptors using OU2 groundwater are presented in Tables C.13 and C.14 and are summarized below.

Receptor	Medium	Route	Exposure	Cancer Risk	Risk > 10-6	Risk > 10-4	Non- Cancer Hazard Index	Hazard > 1.0	Table Reference
Resident (Hypothetical Future)	Background Groundwater	Ingestion Dermal Inhalation	СТ	NC	NA	NA	2.4E+00	Yes	C.11
ruture)			RME	NC	NA	NA	6.8E+00	Yes	C.12
	OU2 Groundwater	Ingestion Dermal Inhalation	СТ	NC	NA	NA	3.1E+00	Yes	C.13
			RME	NC	NA	NA	6.0E+00	Yes	C.14

Note:

NC = not calculated as COPCs are not considered to be carcinogenic NA = not applicable

The HI attributable to potential site-related impacts on OU2 groundwater, i.e., HI OU2 groundwater less HI background groundwater is <1 for both CT and RME. Details are presented in the following sections.

5.4 SUMMATION OF RISKS

A given human population may be exposed to a chemical by several exposure routes and through more than one medium. The purpose of this section is to identify the risks associated with a population that may be exposed to background and OU2 groundwater COPCs through a combination of exposure pathways.

USEPA (1989) states that risks should be combined across exposure pathways only where the following situation occurs:

- a) reasonable exposure pathway combinations are identified; and
- b) it appears likely that the <u>same</u> individuals would <u>consistently</u> face the "reasonable maximum exposure" (RME) through more than one pathway.

Instead of encouraging the calculation of combined risks from across exposure pathways, USEPA (1989) cautions that each RME estimate includes many conservative assumptions and that combining estimates is not appropriate unless the combination itself is a RME:

"For real world situations in which contaminant concentrations vary over time and space, the same individual may or may not experience the RME for more than one pathway over the same period of time. One individual might face the RME through one pathway, and a different individual face the RME through a different pathway. Only if you can explain why the key RME assumptions for more than one pathway apply to the same individual or sub-population should the RME risks for more than one pathway be combined.

In some situations, it may be appropriate to combine one pathway's RME risks with other pathways' risk estimates that have been derived <u>from more typical</u> <u>exposure</u> parameter values". [Emphasis added].

It is improbable that the same person would experience all potential exposures associated with the study area or even over the periods of years specified in the individual RME scenarios. As a result, it is considered inappropriate to add together the estimated risks and hazards for the different exposure routes and pathways, because this would result in the exaggeration of an appropriate RME for the summed exposures. Therefore, it is unlikely the summation of the RME estimates would result in an underestimation of risk, and this estimate should be evaluated as a conservative estimate of the hypothetical exposure at the Site. However, where appropriate and for completeness, both cumulative CT and RME risks and hazards from separate exposure routes and media were combined to estimate total CT and RME exposures.

The cumulative HIs and lifetime cancer risks across all applicable exposure routes for future receptors exposed to iron in background groundwater are presented in Tables C.15 and C.16 and are summarized below. The cumulative HIs and lifetime cancer risks across all applicable exposure routes for future receptors exposed to OU2 groundwater are presented in Tables C.17 and C.18 and are summarized below.

Receptor	Medium	Route	Exposure	Cancer Risk	Risk > 10-6	Risk > 104	Non- Cancer Hazard Index	Hazard > 1.0	Table Reference
Resident (Hypothetical	Background Groundwater	Ingestion Dermal Inhalation	СТ	NC	NA	NA	2.4E+00	Yes	C.15
Future)			RME	NC	NA	NA	6.8E+00	Yes	C.16
	OU2 Groundwater	Ingestion Dermal Inhalation	СТ	NC	NA	NA	3.1E+00	Yes	C.17
			RME	NC	NA	NA	6.0E+00	Yes	C.18

Note:

NC = not calculated as COPCs are not considered to be carcinogenic

NA = not applicable

The HI attributable to potential site-related impacts on OU2 groundwater, i.e., HI OU2 groundwater less HI background groundwater is less than 1 for both CT and RME. Details are presented in the following sections.

5.5 RISK AND HAZARD COPC CONTRIBUTIONS

The contribution to total risk and hazard of each COPC for a specific combined exposure scenario varies, depending on the COPC exposure point concentration and relative toxicity. Frequently, most of the risk estimated for an exposure scenario can be attributed to a few COPCs. The following paragraphs present a summary of the COPCs contributing the majority of risk and/or hazard in OU2 groundwater.

Hypothetical Future Resident

Table C.19 presents the COPCs contributing the majority of the combined risk and non-cancer hazards for the future resident exposure to OU2 groundwater through ingestion, dermal contact, and inhalation.

The RME cumulative HI for OU2 groundwater was 6.0, which exceeds the target hazard level of 1.0. For OU2 groundwater, the RME HI of 6.0 primarily results from the

potential ingestion exposure to iron in the OU2 groundwater. Ingestion of iron accounts for 96 percent of the cumulative HI. The cumulative HI for the target organs associated with exposure to ethyl ether was below 1.0, therefore there is no significant hazard for the hypothetical future resident associated with ethyl ether exposure in groundwater. As shown in Table C.16 and summarized in Table C.19, the RME HI of 6.8 for exposure to iron in the background groundwater is consistent with the RME HI of 5.8 observed due to exposure to iron in OU2 groundwater. From the risk characterization, it is evident that residential ingestion exposure to iron is the main contributor to the hazard index for both background and OU2 groundwater. In addition, the calculated hazard was found to be slightly higher for residential exposure to background iron levels compared to OU2 groundwater iron. Therefore, the calculated hazard associated with iron exposure through hypothetical future residential groundwater ingestion is comparable to the normal background hazard for this area. To further characterize the hazard exceedance due to residential ingestion exposure to iron within the OU2 groundwater, additional analyses were conducted to compare OU2 concentrations of iron to background (upgradient) levels. Details of the statistical analysis are presented in Attachment A. Three statistical tests were selected to compare OU2 data to background data according to applicable guidance (e.g., USEPA, 2002a and NAVFAC, 2004). The results show that there were no statistical differences between OU2 and background iron concentrations, which suggests that former activities and the contamination present on-Site have not contributed or elevated the levels of iron in the area. As result of these findings, the hazard levels are within the acceptable levels.

5.6 <u>UNCERTAINTY ANALYSIS</u>

The purpose of this section is to provide a summary and discussion regarding the uncertainties associated with the HHRA evaluation. The various uncertainties are discussed below in the following sections.

5.6.1 <u>SAMPLING PROCEDURE BIAS</u>

The sampling strategy is a factor that impacts the health evaluation for chemicals at the Site. Often in the sampling procedures, samples are taken from locations that are visibly contaminated or where contamination would be expected and not from areas of the Site that are potentially uncontaminated. This creates a sampling bias toward worst-case (higher) exposure point concentrations in the media sampled. The utilization of such biased data in the HHRA increases the conservative or health-protective nature of the health risk and hazard assessment.

The data used to estimate CT and RME scenarios for the Site were, primarily, collected in such a biased manner. The groundwater samples were collected from historic areas of known contamination, and should represent the highest COPC concentrations. Sampling rounds usually focussed on additional characterization of the more heavily contaminated areas, thus introducing a high bias in both CT and RME scenarios.

5.6.2 EXPOSURE SCENARIO ASSUMPTIONS

As noted, for the purposes of this assessment, it was assumed that OU2 groundwater could hypothetically be used as a potable source of residential drinking water even though it is not currently used for that purpose, and it is considered non-potable because of elevated background levels of iron that exceed the aesthetic drinking water standard of 0.3 mg/L presented in TOGS (NYSDEC, 1998). Therefore, actual future risk estimates are likely to be much lower than presented here and are, in fact, likely to be zero.

Besides the applicability of the assumed exposure scenario, exposure factors used to evaluate hypothetical exposure tend to be very conservative. This section evaluates the uncertainty associated with the primary exposure scenario assumptions such as land use and frequency of exposure. Because the assumptions used in the scenarios are often not objectively based but rather are subjective estimates based on judgment, conservatism, and experience applied to available data, the tendency is to select conservative, health-protective values to guard against under-estimating exposure (and associated risks). This leads to a general over-estimation of hypothetical exposures. Exposure scenarios are, therefore, conservative in nature, and thereby provide an additional safety factor for protection of human health.

The intent of the HHRA was to develop hypothetical point estimates for both the "average" [Central Tendency (CT) or Mean] and the reasonable maximum exposure (RME) exposure scenarios. In order to accomplish this goal, a series of standardized USEPA exposure assumptions were utilized, where available and applicable. In the absence of available or applicable exposure assumptions, professional judgment was used to establish necessary assumptions protective of human health. The exposure scenarios (CT and RME) were developed to evaluate possible risk for hypothetical future groundwater use.

The major uncertainties regarding the hypothetical exposure scenarios used in the HHRA are summarized as follows:

- i) Because of limited data for most chemicals in the groundwater, the mean values (for CT) and the maximum reported values (for RME) have been used as point concentrations to estimate hypothetical exposures to a hypothetical future resident population. Although the use of maximum values is generally recognized as a conservative screening approach, it should be recognized that this procedure will likely overestimate actual exposure by orders of magnitude. Use of maximum detected COPC concentrations in other exposure scenarios will lead to similar overestimates.
- Long-term exposure point concentrations are inherently uncertain because COPC concentrations are assumed to remain constant over time. The assumptions that the measured concentrations are equivalent during sampling and exposure over the duration of exposure will overestimate the intake and resulting risk.

5.6.3 DOSE RESPONSE

One of the major uncertainties in estimating Site-specific risk is the application of published toxicity information. Factors introducing uncertainty associated with toxicity value application are as follows:

i) Oral RfDs are established using conservative safety factors. As such, actual safe doses in humans are likely to be higher than RfDs.

5.6.4 SYNERGISTIC, ADDITIVE, AND ANTAGONISTIC EFFECTS

Receptor exposure to a mixture of chemicals can in some cases lead to synergistic, additive, or antagonistic health effects. Synergistic effects occur when chemicals interact in the receptor and cause an effect significantly greater than the sum of effects of the individual chemicals. Potential synergistic effects were not evaluated in the HHRA, and thus if these are occurring, then the calculated risks and hazards may be underestimated. Alternatively, chemicals may interact in the receptor in such a way as to cause an overall effect that is less than the sum of effects of the individual chemicals. These potential antagonistic effects were not evaluated in the HHRA, and thus, if they are occurring, the calculated risks and hazards may be overestimated.

It was assumed in the HHRA that non-carcinogenic effects were additive, such that individual chemical non-carcinogenic hazards were added to obtain a total hazard estimate. All compounds were treated as if they all affect the receptor in a similar manner although if each COPC had a different mode of action, then the resulting hazard would presumably be non-additive. For a conservative assessment, the potential non-carcinogenic hazard quotients for each COPC were added to yield a total hazard index. Although the non-carcinogenic hazards for individual chemicals were summed, there is no basis to suspect the toxic effects are additive. This suggests that the total calculated hazard indices for the hypothetical potential Site receptors are over-estimated.

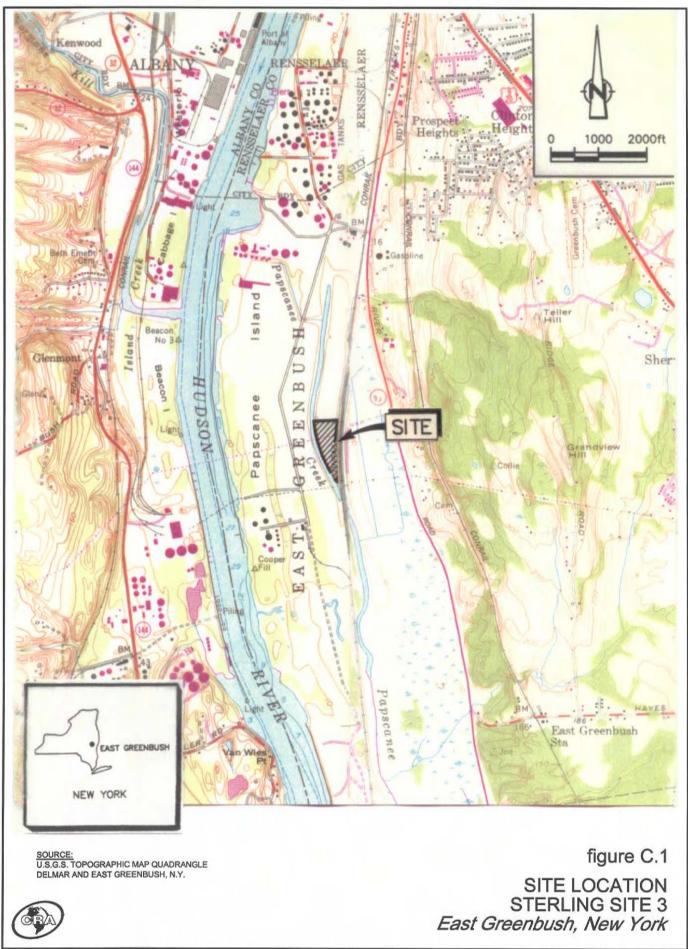
6.0 <u>CONCLUSIONS</u>

This HHRA evaluates the hypothetical risks and hazards to human health associated with the presence of COPCs in background and OU2 groundwater. Following a screening of the groundwater chemical parameters to applicable screening criteria, iron was identified as a COPC for background groundwater, and ethyl ether and iron were identified as COPCs for OU2 groundwater. The potential receptor evaluated in the HHRA was the hypothetical future resident (child/adult). Even though OU2 groundwater is not a current source of potable residential drinking water nor is it expected to be in the future given the elevated background levels of iron, OU2 groundwater was nevertheless assumed to be a potential potable drinking water source for the purposes of this HHRA. Exposure pathways included in the HHRA were ingestion, dermal contact, and inhalation of volatiles during use of the groundwater for potable purposes. The calculated RME cumulative hazard indices for ingestion, dermal contact, and inhalation exposure to background and OU2 groundwater were 6.8 and 6.0, respectively. Ingestion of iron accounted for the majority of the cumulative non-cancer hazard index for OU2 groundwater. The hazard levels associated with ingestion of iron in the background and OU2 groundwater are similar. Following additional statistical analyses of the iron levels occurring in the OU2 groundwater, it was concluded that the levels of iron are similar to background levels for the area, and the associated calculated hazard index from hypothetical ingestion of OU2 groundwater containing iron are not Site related but represent a background hazard index for the area. Therefore, the calculated hazard index for the OU2 groundwater is considered to be within background exposure levels.

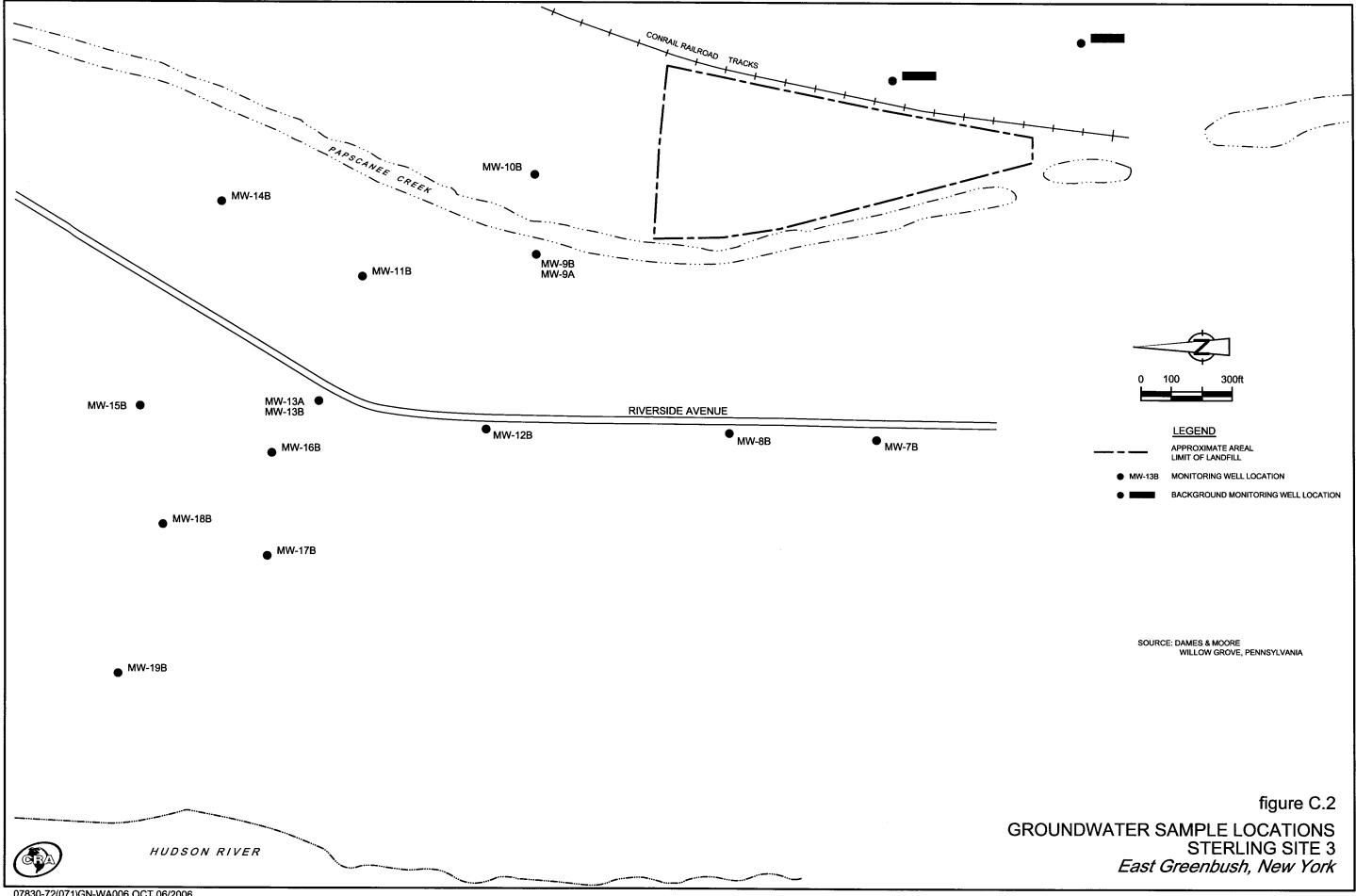
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SELECTION OF EXPOSURE PATHWAY SCENARIOS

OPERABLE UNIT 2

STERLING SITE 3

GREENBUSH, NEW YORK

								44		
Scenario	Medium	Exposure	Exposure	Receptor	Receptor	Exposure	On-Site/ Type of	Type of	Data	Rationale for Selection or Exclusion
Timeframe		Medium	Point	Population	Age	Route	Off-Site Analysis	Analysis	Set	of Exposure Pathway
Current/	_	Groundwater	Groundwater Direct Contact	Recident	Child 2- Adult	Ingestion	c. Cit.		L - F - W - T - 5 - 5	
	Groundwater					Dermal		Man		Cuain Jone where rotentiat exposure to potable groundwater by residents.
		Ambient Air	Ambient Air Direct Contact	Resident	Child & Adult Inhalation	Inhalation	on-Site	Quant	Site Wide	Quant Site Wide Potential exposure to ambient air (volatile emission) by residents when bathing.

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OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPCs) IN BACKGROUND GROUNDWATER

OPERABLE UNIT 2

STERLING SITE 3 GREENBUSH, NEW YORK

	I
Scenario Timeframe: Future	
Medium: Background Groundwater	
Exposure Medium: Groundwater	

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Mitimum (1.2) Mitimum Maximum (1.2) Maximum Units Concentration Qualifier Concentration Qualifier	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening	NYSDOH MCLs	NYSDEC TOGS	R3-RBC R9-PRG Tap Water Tap Water	R9-PRG Tap Water	Surger Star	Potential Potential COPC Rationale for ARAR/TBC ARANTSC Flag Contaminant Value Source Deterion	Potential ARAR/TBC Source	COPC Ra Flag Co De	Potential COPC Rationale for ⁽⁸⁾ ARAN/TBC Flag Conteminant Source Deletion
						ľ		ľ		(i)) E	È	(0)	ŝ			5	or Selection
7439-89-6 Iron	<u>Total Metals</u> Iron	3.45		47.9		mg/L	MW-5B (07/15/98)	2/8	16.6	47.9	0.3	0.3		=	0.3 N	A/N	V/N	×	ASC
7439-89-6	<u>Dissofted Metals</u> Iron	0.375		43		mg/L	MW-5B (07/15/98)	6/8	0.0084 - 9.2	43	0.3	0.3	11	=	0.3 N	N/N	N/A	×	ASC

Notes:

- Minimum/maximum detected concentration.
- Based on data collected from background sampling locations. MW-48, MW-58.
 NYCRR Title 10, Part 5-Drinking Water Supplies, Subpart 5-1 Public Water Systems; Maximum Contaminant Levels (MCLs), NYSDOH, May 26, 2004.
 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. Division of Water Technical and Oxerstional Cividance
- Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Division of Water Technical and Operational Guidance Series (1.1.1), June 1998 and addendums.

- Region III Risk-Based Concentration (R3-BRC) Table, Tap Water, April 11, 2006.
 Region IX Preliminary Remediation Goals (R9-PRG) Table, Tap Water, October 20, 2004.
 Screening criterion is the lower of the NYSDDH MCLs, NYSDEC TOGs, R3-BRC Tap Water, or R9-PRG Tap Water value.
 Rationale Codes
 Rationale Codes Selection Reason: Maximum detected above Screening Criterion (ASC)
 - Deletion Reason: Maximum detected below Screening Criterion (BSC)

C = Carcinogenic Definitions:

- N = Non-Carcinogenic
- ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
 - = Not Available
- N/A = Not Applicable

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPCs) IN OUZ GROUNDWATER

OPERABLE UNIT 2 STERLING SITE 3

GREENBUSH, NEW YORK

Groundwater	posure Medium: Groundwater
Medium:	Exposure
	Medium: Groundwater

CAS	Chemical	Minimum (1,2) Minimum	Minimum	Maximum (1,2) Maximum	Maximum	Units	Location	Detection	Range of	Concentration			-		Screening	Potential	Potential	COPC 1	COPC Rationale for (8)
Number		Concentration Qualifier	Qualifier	Concentration Qualifier	Qualifier		of Maximum	Frequency	Detection	Used for	HODSAN	NYSDEC	R3-RBC	R9-PRG	Toxicity	ARAR/TBC	ARAR/TBC	Flag	Flag Contaminant
							Concentration	3	Limits	Screening	MCLs	TOGS	Tap Water Tap Water	Tap Water	Value	Value	Source		Deletion
									(2)	(2)	(3)	(4)	(2)	(9)	9				or Selection
	<u>Volatiles</u>																		
67-64-1	Acetone	0.0029	ī	0.0039	Ĺ	mg/L	MW-13B (06/29/05)	3/56	0.01 - 0.1	6600.0	0.05	0.05	5.5	5.5	0.05 N	N/A	N/A		BSC; LDF
75-15-0	Carbon disulfide	0.00022	-	0.00022	_	mg/L	MW-12B (06/29/05)	1/55	0.005 - 0.05	0.00022	0.05	I	1.0	1.0		N/A	N/A		BSC; LDF
67-66-3	Chloroform (Trichloromethane)	0.002	1	0.002	-	mg/L	MW-9B (07/02/01)	1/56	0.005 - 0.05	0.002	0.05	0.007	0.00015	0.00017	0.00015 C	N/A	N/A		LDF
60-29-7	Ethyl Ether	0.0013	-	5.1	-	mg/L	MW-16B (07/01/04)	43/61	0.01	5.1	0.05	I	12	1.2	0.05 N	N/A	N/A	×	ASC
108-88-3	Toluene	0.085		0.085		mg/L	MW-16B (06/21/02)	1/56	0.005 - 0.05	0.085	0.005	0.005	2.3	0.72		N/A	N/A		LDF
	-																		
117-81-7	<u>Semi-Volatiles</u> bis(2-Ethylhexyl)phthalate	0.0005		0.005	-	mg/L	MW-13B (06/20/02)	2/5	0.005 - 0.01	0.0005	0.006	0.005	0.0048	0.0048	0.0048	A/N	A V V		JSB
						>												_	
	Total Metals	1																	
/439-89-0	non	2.51		233		mg/L	MW-7B (07/01/04)	41/41	1	233	0.3	0.3	11	11	0.3 N	N/A	N/A	×	ASC
	Dissolved Metals																		
7439-89-6	Iron	0.0234	8	30.8		mg/L	MW-16B (06/24/02)	37/41	0.0084 - 0.05	30.8	0.3	0.3	11	E	0.3 N	N/A	N/A	×	ASC

Notes: Ξ

Minimum/maximum detected concentration. (2)

Based on data collected from sampling locations: MW-7B, MW-8B, MW-9A, MW-9B, MW-10B, MW-11B, MW-12B,

MW-13A, MW-13B, MW-14B, MW-15B, MW-16B, MW-17B, MW-18B, MW-19B.

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Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Division of Water Technical and Operational Guidance Series (1.1.1), NYCRR Title 10, Part 5-Drinking Water Supplies, Subpart 5-1 Public Water Systems; Maximum Contaminant Levels (MCLs), NYSDOH, May 26, 2004. ŧ

June 1998 and addendums.

Region III Risk Based Concentration (R3-RBC) Table, Tap Water, April 11, 2006.
 Region IX Preliminary Remediation Goals (R9-PRC) Table, Tap Water, October 20, 2004.
 Screening criterion is the lower of the NYSDOH MCLs, NYSDEC TOCs, R3-RBC Tap Water, or R9-PRG Tap Water value.
 Rationale Codes Selection Reason: Maximum detected above Screening Criterion (ASC)

Selection Reason: Maximum detected above Screening Criterion (ASC) Deletion Reason: Maximum detected below Screening Criterion (BSC)

Low Detection Frequency; less than 5% (LDF)

Definitions:

C = Carcinogenic

N = Non-Carcinogenic

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered

– = Not Available

N/A = Not Applicable

J = Associated value is estimated
 B = Associated analyte detected in method blank.

Page 1 of 1

EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN BACKGROUND GROUNDWATER

OPERABLE UNIT 2

STERLING SITE 3

GREENBUSH, NEW YORK

Chemical of Determinal	Units	Arithmetic Mean	95% UCL of Normal	Units Arithmetic 95% UCL of Maximum Maximum Mean Normal Detected Qualifier	Maximum Qualifier	EPC Units	Reason	Reasonable Maximum Exposure	Exposure		Central Tendency	cy
Сонсети			Data	Concentration			Medium	Medium	Medium	Medium	Medium	Medium
						<u> </u>	EPC	EPC	EPC	EPC	EPC	EPC
							Value	Statistic	Rationale	Value	Statistic	Rationale
Total Metals												
Iron	mg/L	mg/L 1.70E+01	(1)	4.79E+01		mg/L	3.39E+01	95% UCL-T	W-Test (2)	1.70E+01	Mean-T	W-Test (2)

Notes:

For non-detects, 1/2 laboratory detection limit was used as a proxy concentration.

W-Test : Developed by Shapiro and Wild for data sets with under 50 samples.

Statistics: Maximum Detected Value (Max); 1/2 Maximum Detection Limit (1/2 Max DL); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T);

Non-parametric method used to Determined 95% UCL (95% UCL-NP); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N); Non-parametric Method used to Determine Mean (Mean-NP).

(1) Data set is log-normally distributed.

(2) Shapiro-Wilk W Test was used for data sets where $n \le 50$.

EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN OU2 GROUNDWATER

OPERABLE UNIT 2

STERLING SITE 3

GREENBUSH, NEW YORK

		water
Scenario Timeframe: Future	Medium: Groundwater	Exposure Medium: Groundwater

Chemical of	Units	Arithmetic Mean	95% UCL of Normal	Units Arithmetic 95% UCL of Maximum Mean Normal Detected	Maximum Qualifier	EPC Units	Reason	Reasonable Maximum Exposure	Exposure	-	Central Tendency	*
Potential Concern			Data	Concentration		-	Medium EPC	Medium EPC	Medium EPC	Medium EPC	Medium EPC	Medium EPC
							Value	Statistic	Rationale	Value	Statistic	Rationale
<u>Volatiles</u> Ethyl Ether	mg/L	mg/L 5.16E-01	(1)	5.10E+00	5	mg/L	7.94E-01	95% UCL-NP	W-Test (3)	5.10E-01	Mean-NP	W-Test (3)
<u>Total Metals</u> Iron	mg/L	mg/L 2.19E+01	(2)	2.33E+02		mg/L	2.88E+01	95% UCL-T	W-Test (3)	2.15E+01	Mean-T	W-Test (3)

Notes:

J = Associated value is estimated.

For non-detects, 1/2 laboratory detection limit was used as a proxy concentration.

W-Test : Developed by Shapiro and Wilk for data sets with under 50 samples.

W-Test : Developed by Shapiro and Francia for data sets with over 50 samples but under 100 samples.

Statistics: Maximum Detected Value (Max); 1/2 Maximum Detection Limit (1/2 Max DL); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T);

Non-parametric method used to Determined 95% UCL (95% UCL-NP); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N);

Non-parametric Method used to Determine Mean (Mean-NP).

(1) Data set is neither normally or lognormally distributed.

(2) Data set is log-normally distributed.

(3) Shapiro-Wilk W Test was used for data sets where n<=50. Shapiro-Francia W Test was used for data sets where 50<n>100.

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VALUES USED FOR DAILY INTAKE CALCULATIONS - RESIDENTIAL SCENARIO OPERABLE UNIT 2 STERLING SITE 3 CREENBUSH, NEW YORK

Scenario Tim Medium: Gr Exposure Mo Exposure Mo Receptor Ag Receptor Ag Receptor Ag Receptor Ag Receptor Ag Receptor Ag Receptor Ag Receptor Ag Receptor Ag AT-N (adulu BW - child BW - chi	eframe: Future oundwater edium: Groundwater int. Ingestion, Dermal, and Inhalation utation: Residents e: Child & Adult Parenter Definition Units RME RME	Parameter Definition Unuts KME CT CT CT Value Rationale/ Value Rationale/ Kepternee	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{llllllllllllllllllllllllllllllllllll$
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Notes: (1) For background groundwater concentrations, see Table C.4. For site groundwater concentrations, see Table C.5.

<u>Sources:</u> EPA, 1389. Fisk. Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A OERR, EPA/540-1.89-002. EPA, 1991. Risk. Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03. EPA, 1991. Risk. Assessment Guidance for Superfund Vo. 1: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Gouls), Publication 9285.7-018. EPA, 1997. Exposure Factors Handbook, EPA/600/P-95/002F, Augus 1997. EPA, 2004. RAGs Volume 1, Human Health Evaluation Manual, Guidance for Dermal Risk Assessment, EPA/540/R/99/005, July 2004.

NON-CANCER TOXICITY DATA - ORAL/DERMAL ROUTE OF EXPOSURE

OPERABLE UNIT 2

STERLING SITE 3 GREENBUSH, NEW YORK

Chemical of Potential Concern (COPC)	Chronic/ Subchronic	Chronicl Oral RfD Oral RfD iubchronic Value Units	Oral RyD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of KfD: Target Organ (3) (MMIDD/YY)
<u>Volatiles</u> Ethyl Ether	chronic	2.00E-01 mg/kg-d	mg/kg-d	100%	2.00E-01	mg/kg-d	body weight	3000	IRLS	01/31/06
<u>Metals</u> Iron	chronic	3.00E-01 mg/kg-d	mg/kg-d	100%	3.00E-01	mg/kg-d	1	1	NCEA	10/26/05

Notes:

-- = Not Available

N/A = Not Applicable

(1) USEPA, Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, Part E Supplemental Guidance for Dermal Risk Assessment, EPA/540/R/99/005, July 2004.

(2) Adjusted Dermal RfD = Oral RfD x Oral to Dermal Adjustment Factor

(3) IRIS, Integrated Risk Information System Database, January 31, 2006.

Provisional values supplied by NCEA. Values may be taken from either Region III Risk-Based Concentration Table (04/11/06) or Region IX Preliminary Remediation Goals Table (10/20/04).

TABLE C.8

NON-CANCER TOXICITY DATA - INHALATION ROUTE OF EXPOSURE

OPERABLE UNIT 2

GREENBUSH, NEW YORK STERLING SITE 3

Chemical of Potential Concern (COPC)	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (2) (MM/DD/YY)
<u>Volatiles</u> Ethyl Ether	I	l	I	I	ł	1	ł	I	I
<u>Metals</u> Iron	1	I	I	I	1	-	1	I	1

Notes:

-- = Not Available

(1) (RfC x Inhalation Rate)/Body Weight

(2) IRIS, Integrated Risk Information System Database, January 31, 2006.

Provisional values supplied by NCEA. Values may be taken from either Region III Risk-Based Concentration Table (04/11/06) or Region IX Preliminary Remediation Goals Table (10/20/04).

CANCER TOXICITY DATA -- ORAL/DERMAL ROUTE OF EXPOSURE

OPERABLE UNIT 2 STERLING SITE 3

GREENBUSH, NEW YORK

Chemical of Potential Concern (COPC)	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal Cancer Slope Factor (2)	Units	Weight of Evidencel Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
Volatiles							
Ethyl Ether	l	1	ł	I	ł	ł	I
<u>Metais</u>							
Iron	ł	ł	I	1	I	1	ł

Notes:

– = Not Available

(1) USEPA, Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, Part E Supplemental Guidance for Dermal Risk Assessment, EPA/540/R/99/005, July 2004

(2) Adjusted Dermal CSF = Oral CSF / Oral to Dermal Adjustment Factor

(3) IRIS, Integrated Risk Information System Database, January 31, 2006.

Provisional values supplied by NCEA. Values may be taken from either Region III Risk-Based Concentration Table (04/11/06) or Region IX Preliminary Remediation Goals Table (10/20/04).

EPA Weight of Evidence Classification :

A - Known Human carcinogen

- B1 Probable human carcinogen indicates that limited human data are available
 - B2 Probable human carcinogen indicates sufficient evidence in animals and
 - inadequate or no evidence in humans
 - C Possible human carcinogen
- D Not classifiable as a human carcinogen
 - E Evidence of noncarcinogenicity

CANCER TOXICITY DATA ~ INHALATION ROUTE OF EXPOSURE

OPERABLE UNIT 2

STERLING SITE 3 GREENBUSH, NEW YORK

Chemical of Potential Concern (COPC)	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor (2)	Units	Weight of Evidencel Cancer Guideline Description	Source	Date (3) (MM/DD/YY)
<u>Volatiles</u>								
Bthyl Ether	I	ł	1	1	I	I	I	1
<u>Metals</u>								
Iron	I	I	ł	1	1	ł	1	I

Notes:

-- = Not Available

(1) Adjustment Factor = $70 \text{ kg} \times 1/20 \text{ m}^3/\text{day} \times 1,000 \text{ µg/mg}$

(2) Inhalation CSF = Unit Risk x Adjustment Factor

(3) IRIS, Integrated Risk Information System Database, January 31, 2006.

Provisional values supplied by NCEA. Values may be taken from either Region III Risk-Based Concentration Table (04/11/06) or Region IX Preliminary Remediation Goals Table (10/20/04).

EPA Weight of Evidence Classification :

A - Known Human carcinogen

Probable human carcinogen - indicates that limited human data are available
 Probable human carcinogen - indicates sufficient evidence in animals and

inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen
 E - Evidence of noncarcinogenicity

Page 1 of 1

TABLE C.11

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE RESIDENT EXPOSURE TO BACKGROUND GROUNDWATER CENTRAL TENDENCY OPERABLE UNIT 2 STERLING SITE 3 GREENBUSH, NEW YORK

Scenario Timeframe: Future
Receptor Population: Resident
Porenter Age: Child and Adult

	Adult
	Child and
	Age: 1
	Receptor
1	

Medium	Exposure Medium	Exposure Medium Exposure Point	Exposure Route	Chemical of	EPC	ç		Cancer	Cancer Risk Calculations	tions			Non-Cance	Non-Cancer Hazard Calculations	ilations	
				Potential Concern	Value	Units	Intake/Exposure Concentration	Concentration	CSFIL	CSF/Unit Risk	Cancer Risk	Intake/Exposure	IntakelExposure Concentration	R/D	RfDIRfC	Hazard
							Value	Units	Value	Units		Value	Units	Value	Units	Quotient
Background	Groundwater	0U 2	Ingestion	Iron	1.70E+01	n/g/m	7.50E-02	mg/kg-d		(mg/kg-d)-1	NC	7.12E-01	mg/kg-d	3.00E-01	mg/kg-d	2.37E+00
		_														
			Exp. Koute Total								NC					2.37E+00
		Exposure Point Total	LE .								NC					2.37E+00
	Exposure Medium Total	Fotal									NC					2.37E+00
	Groundwater	0U2	Dermal	lron	1.70E+01	mg/L	2.35E-04	mg/kg-d	1	(mg/kg-d)-1	NC	2.22E-03	mg/kg-d	3.00E-01	mg/kg-đ	7.38E-03
			Exp. Route Total								NC					7.38E-03
		Exposure Point Total	It								NC					7.38E-03
	Exposure Medium Total	Fotał		· · · · · · · · · · · · · · · · · · ·							NC					2.38E+00
	Ambient Air	Vapors from	Inhalation	Iron	NA	mg/L	NC	mg/kg-d	-	(mg/kg-d)-1	NC	NC	mg/kg-d	ı	mg/kg-d	NC
		Household Use														
			Exp. Route Total								NC					NC
		Exposure Point Total	1								NC					NC
	Exposure Medium Total	[otal									NC					2.38E+00
Medium Total											NC					2.38E+00

Notes:

Total of Receptor Hazards Across All Media 2.4E+00

NC

Total of Receptor Risks Across All Media

NC = Not Calculated NA = Not Applicable

TABLE C.12

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE RESIDENT EXPOSURE TO BACKGROUND GROUNDWATER REASONABLE MAXIMUM EXPOSURE

OPERABLE UNIT 2 STERLING SITE 3 GREENBUSH, NEW YORK

Scenario Timeframe: Future	Receptor Population: Resident	Receptor Age: Child and Adult
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Medium	Exposure Medium	Exposure Medium Exposure Point Exposure Route	Exposure Route	Chemical of	EPC	ç,		Cancer	Cancer Risk Calculations	tions			Non-Cance	Non-Cancer Hazard Calculations	lations	
				Potential Concern	Value	Units	Intake/Exposure	Intakel Exposure Concentration	CSFIL	CSF/Umit Risk	Cancer Risk	Intake/Exposure Concentration	Concentration	RfDI	RIDIRJC	Hazard
							Value	Units	Value	Units		Vatue	Units	Value	Units	Quotient
Background Groundwater	Groundwater	0U 2	Ingestion	Iron	3.39E+01	mg/L	4.93E-01	mg/kg-d	1	(mg/kg-d)-1	NC	2.03E+00	mg/kg-d	3.00E-01	mg/kg-d	6.78E+00
			Exp. Route Total								NC					6.78E+00
		Exposure Point Total	al								NC					6.78E+00
	Exposure Medium Total	Fotal									NC				Π	6.78E+00
	Groundwater	OU 2	Dermal	lron	3.39E+01	mg/l_	2.81E-03	mg/kg-d	1	(mg/kg-d)-1	NC	1.34E-02	mg/kg-d	3.00E-01	mg/kg-d	4.47E-02
			Exp. Route Total								NC					4.47E-02
		Exposure Point Total	al								NC				i	4.47E-02
	Exposure Medium Total	Total		Name of the second s							NC					6.82E+00
	Ambient Air	Vapors from	Inhalation	Iron	ΨN	mg/L	NC	mg/kg-d	1	(mg/kg-d)-1	NC	NC	mg/kg-d	I	mg/kg-d	NC
			Exp. Route Total								NC					NC
		Exposure Point Total	'al								NC					SC
	Exposure Medium Total	Total									NC					6.82E+00
Medium Total											NC					6.82E+00
							Total	Total of Receptor Risks Across All Media	tisks Acros	s All Media	NC	Total of	Total of Receptor Hazards Across All Media	cards Across	All Media	6.8E+00

<u>Notes:</u> NC = Not Calculated NA = Not Applicable

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TABLE C.13

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE RESIDENT EXPOSURE TO OUZ GROUNDWATER CENTRAL TENDENCY OFERABLE UNIT 2 STERLING SITE 3 GREENBUSH, NEW YORK

Scenario Timeframe: Future Receptor Population: Resident Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of	EPC			Cancer	Cancer Risk Calculations	ons			Non-Cancer	Non-Cancer Hazard Calculations	lations	
				Potential Concern	Value	Units	Intakel Exposure Concentration	Concentration	CSFIUN	CSF/Unit Risk	Cancer Risk	Intake/Exposure Concentration	Concentration	RIDIRJC	RfC	Hazard
							Value	Units	Value	Units		Value	Units	Value	Umits	Quotient
Groundwater	Groundwater	00.2	Ingestion	Ethyl Ether	5.10E-01	mg/L	2.25E-03	mg/kg-d	ı	(mg/kg-d)-1	У Х	2.14E-02	mg/kg-d	2.00E-01	mg/kg-d	1.07E-01
				Iron	2.15E+01	mg/L	9.52E-02	mg/kg-d	I	(mg/kg-d)-1	NC	9.04E-01	mg/kg-d	3.00E-01	mg/kg-d	3.01E+00
			Exp. Route Total								NC					3.12E+00
		Exposure Point Total	al								NC					3.12E+00
	Exposure Medium Total	Total									NC				Π	3.12E+00
	Groundwater	002	Dermal	Ethyl Ether	5.10E-01	mg/L	5.44E-05	mg/kg-d	ı	(mg/kg-d)-1	N	5.00E-04	mg/kg-d	2.00E-01	mg/kg-d	2.50E-03
				Iron	2.15E+01	mg/L	2.98E-04	mg/kg-d	;	(mg/kg-d)-1	NC	2.81E-03	mg/kg-d	3.00E-01	mg/kg-d	9.38E-03
			Exp. Route Total								NC					1.19E-02
		Exposure Point Total	al								NC					1.19E-02
	Exposure Medium Total	Total									NC					3.13E+00
	Ambient Air	Vapors from	Inhalation	Ethyl Ether	5.10E-01	mg/L	1.31E-02	mg/kg-d	1	(mg/kg-d)-1	NC	1.27E-01	mg/kg-d	1	mg/kg-d	NC
		Household Use		Iron	AN	mg/L	S	mg/kg-d	I	(mg/kg-d)-1	NC	NC	mg/kg-d	1	mg/kg-d	NC
			Exp. Route Total								NC					V
		Exposure Point Total	al	and the second					3		NC					NC
	Exposure Medium Total	Total									NC					3.13E+00
Medium Total											NC					3.13E+00
							Total	Total of Receptor Risks Across All Media	isks Across	All Media	NC	Total of	Total of Receptor Hazards Across All Media	ards Across	All Media	3.1E+00

Notes:

NC = Not Calculated NA = Not Applicable

TABLE C.14

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE RESIDENT EXPOSURE TO OU2 GROUNDWATER REASONABLE MAXIMUM EXPOSURE OPERABLE UNIT 2

STERLING SITE 3 GREENBUSH, NEW YORK

	Scenario Timeframe: Future Receptor Population: Resident	Receptor Age: Child and Adult
--	---	-------------------------------

Medium	Exposure Medium Exposure Point	Exposure Point	Exposure Route	Chemical of	EPC	c C		Cancer	Cancer Risk Calculations	tions			Non-Canc	Non-Cancer Hazard Calculations	ulations	
				Potential Concern	Value	Units	IntakelExposure Concentration	Concentration	CSFI	CSF/Unit Risk	Cancer Risk	Intake/Exposure	IntakelExposure Concentration	RA	RJDIRJC	Hazard
							Value	Units	Value	Units		Value	Units	Value	Units	Quotient
Groundwater	Groundwater	0U 2	Ingestion	Ethyl Ether	7.94E-01	mg/L	1.15E-02	mg/kg-d	:	(mg/kg-d)-1	NC NC	4.76E-02	mg/kg-d	2.00E-01	mg/kg-d	2.38E-01
				Iron	2.88E+01	mg/L	4.18E-01	mg/kg-d	1	(mg/kg-d)-1	NC	1.73E+00	mg/kg-d	3.00E-01	mg/kg-d	5.75E+00
			Exp. Route Total								NC					5.99E+00
		Exposure Point Total	ľ								NC					5.99E+00
	Exposure Medium Total	otal									NC					5.99E+00
	Groundwater	0U 2	Dermal	Ethyl Ether	7.94E-01	mg/L	3.36E-04	p-84/8m	ı	(mg/kg-d)-1	NC	1.35E-03	mg/kg-d	2.00E-01	mg/kg-d	6.77E-03
				Iron	2.88E+01	mg/L	2.39E-03	mg/kg-d	I	(mg/kg-d)-1	NC	1.14E-02	mg/kg-d	3.00E-01	mg/kg-d	3.80E-02
			Exp. Route Total								NC					4.47E-02
		Exposure Point Total									NC					4.47E-02
	Exposure Medium Total	otal									NC					6.04E+00
	Ambient Air	Vapors from	Inhalation	Ethyl Ether	7.94E-01	mg/L	5.77E-02	mg/kg-d	ı	(mg/kg-d)-1	NC	2.38E-01	mg/kg-d	1	mg/kg-d	NC
		Household Use		Iron	NA	mg/L	NC	mg/kg-d	I	(mg/kg-d)-1	NC	NC	mg/kg-d	I	mg/kg-d	NC
			Exp. Route Total								NC					NC
		Exposure Point Total									NC					NC
	Exposure Medium Total	otal									NC					6.04E+00

Medium Total

6.0E+00 6.04E+00

Total of Receptor Hazards Across All Media

NC ğ

Total of Receptor Risks Across All Media

NC = Not Calculated NA = Not Applicable Notes:

TABLE C.15

SUMMARY OF FUTURE RESIDENT RISKS AND HAZARDS FOR COPCs IN BACKGROUND GROUNDWATER CENTRAL TENDENCY OPERABLE UNIT 2

STERLING SITE 3 GREENBUSH, NEW YORK

Medium	Exposure Medium	Exposure Point	Chemical of Potential		3	Carcinogenic Risk	×		Non	1-Carcinogenic	Non-Carcinogenic Hazard Quotient	t .	
			Сопсет	Ingestion	Inhalation	Dermal	External (Radiation)	External Exposure (Radiation) Routes Total	Primary Target Organ(s)	Ingestion	Ingestion Inhalation	Dermal	Exposure Routes Total
Background Groundwater	Groundwater/ Ambient Air	Household Use	Iron	NC	NC	NC	1	NC		2.37E+00	NC	7.38E-03	2.38E+00
			Chemical Total	NC	NC	NC	1	NC		2.37E+00	NC	7.38E-03	2.38E+00
		Exposure Point Total						NC					2.38E+00
	Exposure Medium Total							NC					2.38E+00
Medium Total								NC					2.38E+00
Receptor Total						Receptor Risk Total	iisk Total	NC			Receptor	Receptor HI Total	2.4E+00

<u>Note:</u> NC = Not Calculated

TABLE C.16

SUMMARY OF FUTURE RESIDENT RISKS AND HAZARDS FOR COPCs IN BACKGROUND GROUNDWATER

REASONABLE MAXIMUM EXPOSURE OPERABLE UNIT 2

STERLING SITE 3 GREENBUSH, NEW YORK

Medium	Exposure Medium	Exposure Point	Chemical of Potential		0	Carcinogenic Risk	sk		Nov	1-Carcinogenic	Non-Carcinogenic Hazard Quotient	ŧ	
			Concern	Ingestion	Inhalation	Dermal	External (Radiation)	External Exposure (Radiation) Routes Total	Primary Target Organ(s)	Ingestion	Ingestion Inhalation	Dermal	Exposure Routes Total
Background C Groundwater	Groundwater/ Ambient Air	Household Use	Iron	NC	хс	NC	1	NC	, T	6.78E+00	NC	4.47E-02	6.82E+00
			Chemical Total	NC	NC	NC	1	NC		6.78E+00	NC	4.47E-02	6.82E+00
		Exposure Point Total						NC					6.82E+00
Expo	Exposure Medium Total							NC					6.82E+00
Medium Total								NC					6.82E+00
Receptor Total						Receptor Risk Total	tisk Total	NC			Receptor	Receptor HI Total	6.8E+00

<u>Note:</u> NC = Not Calculated

TABLE C17

SUMMARY OF FUTURE RESIDENT RISKS AND HAZARDS FOR COPCs IN OU2 GROUNDWATER CENTRAL TENDENCY OPERABLE UNIT 2 STERLING SITE 3

GREENBUSH, NEW YORK

Scenario Timeframe: Future Receptor Population: Resident Receptor Age: Child and Adult
--

Medium	Exposure Medium	Exposure Point	Chemical of Potential		0	Carcinogenic Risk	isk		Nor	Non-Carcinogenic Hazard Quotient	Hazard Quotier	nt	
			Сонсет	Ingestion	Inhalation	Dermal	External	Exposure	Primary	Ingestion	Inhalation	Dermal	Exposure
							(Radiation)	(Radiation) Routes Total	Target Organ(s)	_			Routes Total
Groundwater	Groundwater/	Household Use	Ethyl Ether	NC	NC	NC		NC	body weight	1.07E-01	NC	2.50E-03	1.09E-01
	Ambient Air		Iron	NC	NC	NC	I	NC	1	3.01E+00	NC	9.38E-03	3.02E+00
			Chemical Total	NC	NC	NC	-	NC		3.12E+00	NC	1.19E-02	3.13E+00
		Exposure Point Total						NC					3.13E+00
	Exposure Medium Total							NC					3.13E+00
Medium Total								NC					3.13E+00
Receptor Total						Receptor Risk Total	Risk Total	NC			Receptor	Receptor HI Total	3.1E+00
											ĺ		

1.09E-01 Total Body Weight HI Across All Media =

> NC = Not Calculated Note:

TABLE C.18

SUMMARY OF FUTURE RESIDENT RISKS AND HAZARDS FOR COPCs IN OU2 GROUNDWATER REASONABLE MAXIMUM EXPOSURE

ONABLE MAXIMUM EXPOS OPERABLE UNIT 2

STERLING SITE 3 GREENBUSH, NEW YORK

Medium	Exposure Medium	Exposure Point	Chemical of Potential		Ca	Carcinogenic Risk	sk		Non	1-Carcinogenic	Non-Carcinogenic Hazard Quotient	at	
			Concern	Ingestion	Inhalation	Dermal	External	Exposure	Primary	Ingestion	Inhalation	Dermal	Exposure
							(Radiation)	(Radiation) Routes Total	Target Organ(s)				Routes Total
Groundwater	Groundwater/	Household Use Ethyl Ether	Ethyl Ether	NC	NC	NC	1	NC	body weight	2.38E-01	NC	6.77E-03	2.45E-01
	Ambient Air		Iron	NC	NC	NC	1	NC	1	5.75E+00	NC	3.80E-02	5.79E+00
			Chemical Total	NC	NC	NC	-	NC		5.99E+00	NC	4.47E-02	6.04E+00
		Exposure Point Total						NC					6.04E+00
	Exposure Medium Total							NC					6.04E+00
Medium Total								NC					6.04E+00
Receptor Total						Receptor Risk Total	tisk Total	NC			Receptor	Receptor HI Total	6.0E+00

Total Body Weight HI Across All Media = 2.45E-01

<u>Note:</u> NC = Not Calculated

TABLE C.19

RISK ASSESSMENT SUMMARY FOR FUTURE RESIDENT EXPOSURE TO OU2 GROUNDWATER REASONABLE MAXIMUM EXPOSURE OPERABLE UNIT 2

STERLING SITE 3 GREENBUSH, NEW YORK

Scenario Timeframe: Future Receptor Population: Resident Receptor Age: Child and Adult
--

Medium	Exposure Medium	Exposure Point	Chemical Of Potential		2	Carcinogenic Risk	к К		Nor	Non-Carcinogenic Hazard Quotient	Hazard Quotien	t i	
			Concern	Ingestion	Inhalation	Dermal	External	Exposure	Primary Towned Owneded	Ingestion	Inhalation	Dermal	Exposure Routes Total
,							(monumer)	VOLUES TOTAL	14/244 013/44/0/	1 20E 01	U.V	4 77E-03	2 45E-01
Groundwater	Groundwater/	Household Use	Ethyl Ether	z	S	S	I	D Z	body weight	7.38E-UI	ر N	0.712-03	7,405-01
	Ambient Air		Iron	NC	NC	Ŋ	1	NC	I	5.75E+00	NC	3.80E-02	5.79E+00
			Chemical Total	Ŋ	NC	NC	1	NC		5.99E+00	NC	4.47E-02	6.04E+00
		Exposure Point Total						NC					6.04E+00
	Exposure Medium Total							NC					6.04E+00
Medium Total								NC					6.04E+00
Site Receptor Total	otal			OU2 G	OU2 Groundwater Receptor Risk Total	: Receptor I	tisk Total	NC	OU	OU2 Groundwater Receptor HI Total	ter Receptor	HI Total	6.0E+00
Background Receptor Total	ceptor Total		Ba	Background Groundwater Receptor Risk Total	roundwater	: Receptor I	tisk Total	NC	Backgroun	Background Groundwater Receptor HI Total	ter Receptor	HI Total	6.8E+00

2.45E-01 Total Body Weight HI Across All Media =

<u>Note:</u> NC = Not Calculated

ATTACHMENT A

IRON STATISTICAL BACKGROUND COMPARISON

TABLE OF CONTENTS

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1.0	INTRODUCTION	1
2.0	SCOPE OF DATA	2
3.0	RESULTS AND CONCLUSIONS	3
4.0	REFERENCES	4

LIST OF TABLES (Following Text)

TABLE 1 TREND TEST RESULTS FOR BACKGROUND DATA

TABLE 2 BACKGROUND COMPARISONS FOR TOTAL IRON

1.0 **INTRODUCTION**

Background comparisons were performed for total iron. Three tests were selected from applicable guidance documents (e.g., USEPA, 2002 and NAVFAC, 2004) to compare Operable Unit 2 (OU2) data to background data. The first test selected was the two sample t-test (Section 3.3.1.1 of USEPA, 2006), which tests for differences in the means of the OU2 and background concentration populations. This test assumes that both populations are normally distributed, or normal using a suitable transformation (e.g., log transformation). The second test used was the Wilcoxon Rank Sum (WRS) test (Section 3.3.2.1.1 of USEPA, 2006). This is a non-parametric test (i.e., rank-based) and tests for differences between the medians of the OU2 and background populations without making any distributional assumptions. Prior to carrying out the inter-group tests, descriptive statistical analyses were performed in order to determine the appropriate background tests to be used. If the background and OU2 data sets were both found to be normally or lognormally distributed, the *t*-test was used. Otherwise, the WRS test was used. The third test performed was the Quantile test (Section 3.3.2.1.2 of USEPA, 2006), which looks for differences in the tails of OU2 and background distributions. The Quantile test was applied in addition to the *t*-test and WRS test for all comparisons.

The findings of the statistical analyses are presented in Table 2 and are described below.

1

2.0 SCOPE OF DATA

OU2 data consisted of samples collected between 2001 and 2005. During this time period only four data points were available at background sampling locations. This number is low for group-based comparisons, and the background data set was therefore extended back to 1998 in order to include a total of eight background samples. To verify that the background data were consistent over this time period, a statistical trend test (the Mann-Kendall test) was performed. In applying the test, sample location was included as a factor, since data from two background wells (MW-4B and MW-5B) were present. Computational details for this test are provided in Sections 4.3.4.1 and 4.3.4.4 of USEPA, 2006.

3.0 <u>RESULTS AND CONCLUSIONS</u>

Results of the background trend tests are given in Table 1. No statistically significant trend in iron concentrations over time in the background data was observed, and all eight background samples were retained for OU2 vs. background comparisons. This background data set of eight samples included one non-detect (13 percent non-detect), and was found to be log-normally distributed. The OU2 data consisted of 41 observations with no non-detects, and was also log-normally distributed. Therefore, a two sample *t*-test was performed using log-transformed data. The *t*-test found no statistically significant difference (at 95 percent confidence) between means of the two populations (i.e., OU2 and background groundwater quality). The WRS test did not find any statistically significant difference (at 95 percent confidence) between background and OU2 samples. The Quantile test evaluating the tails of the distributions also did not find a statistically significance difference between total iron concentration in groundwater at the OU2 and background in all three quantiles.

Based on the results of the statistical tests performed, no evidence was found that iron concentrations in OU2 exceeded concentrations in background. Therefore, it is concluded that iron concentrations in OU2 are consistent with background.

- NAVFAC, 2004. Guidance for Environmental Background Analysis. Volume III: Groundwater. Naval Facilities Engineering Command. User's Guide UG-2059-ENV. Port Hueneme, California.
- United States Environmental Protection Agency (USEPA), 2002. Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (OSWER 9285.7-41). Office of Emergency and Remedial Response, United States Environmental Protection Agency, Washington, DC. EPA 540-R-01-003. September 2002.
- United States Environmental Protection Agency (USEPA), 2006. Data Quality Assessment: Statistical Methods for Practitioners (EPA QA/G-9S). Office of Environmental Information, United States Environmental Protection Agency, Washington, DC. EPA/240/B-06/003. February 2006.

TABLE 1

TREND TEST RESULTS FOR BACKGROUND DATA STERLING SITE 3 NEW YORK

	Z _{sk} for Overall Test Probability Conclusion		No trend identified
	Probability	5	0.810
lest	Z _{Sk} for Overall Test		-0.240
Mann-Kendall Test	Pooled Standard Deviation (s _k)		4.16
	Overall Test Statistic (S _k)		4
	Test Statistic (S) of by Location	MW-5B	φ
		MW-4B	4
	Well MW-5B ther Percentage of	Non-Detects	%0
d Samples	Well Number	of Samples	4
Background Samples	Well MW-4B Well MW-5B Number Percentage of Number Percentage of	of Samples Non-Detects of Samples Non-Detects	25%
	Wel. Number	of Sample:	4

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TABLE 2

BACKGROUND COMPARISONS FOR TOTAL IRON STERLING SITE 3 NEW YORK

(i) Initial Data Characterization

В	ackground Samples		OU2 Samples				
Number of Samples	Percentage of Non-Detects	Data Distribution	Number of Samples	Percentage of Non-Detects	Data Distribution		
8	13%	Logormal	41	0%	Logormal		

(ii) Comparison of mean values -- t-test using log-transformed data

Background mean (Log units)	OU2 mean (Log units)	Calculated t-statistic	Probability	Conclusion		
2.459	2.747	0.375	0.896	No significant difference		

(iii) Comparison of median values -- Wilcoxon Rank-Sum Test

Background Average Rank-Sum	OU2 Average Rank-Sum	U-Statistic	Probability	Conclusion
25.76	21.13	0.402	195	No significant difference

(iv) Comparisons of tails (upper and lower values) of distributions -- Quantile Test

	0.5 Q	uantile	0.75 Quantile		0.9 Ç	Conclusion	
-	Z-score	Probability	Z-score	Probability	Z-score	Probability	_
	0.84	0.201	-0.48	0.684	-0.86	0.806	No significant difference

Notes:

For descriptions of the tests performed, refer to report text and Chapter 3 of USEPA 2006. All statistical tests were carried out at a 95 percent confidence level.

APPENDIX D

ESTIMATED COSTS FOR POTENTIAL REMEDIAL ALTERNATIVES

TABLE D.1

ESTIMATED COSTS FOR POTENTIAL REMEDIAL ALTERNATIVES STERLING SITE 3 EAST GREENBUSH, NEW YORK

Unit Cost Notes	000 assumed that a review will be conducted every 5 years including limited sampling 000 800 assumes monitoring of 15 wells for extended Site-specific parameter list every 5 years 300 100 100 000 000
Cost	\$ 5,000 \$ 2,000 \$ 2,000 \$ 2,000 \$ 11,300 \$ 11,300 \$ 1,100 \$ 1,75,000 \$ 175,000
Unit Cost	1 1 1 1
Estimated Quantity	4 I I I
Unit	રાં રં.
Alternative Item 1. <u>No Action Altern</u> ative	Operation and Maintenance Costs A. Inspections B. Reporting C. Review of Remedy i. Reporting C. Review of Remedy i. Reporting C. Review of Remedy i. Reporting Subtotal Subtotal Project Management (approx. 10%) Project Management (approx. 10%) Project Management (approx. 10%) Project Management (approx. 10%) Subtotal Present Worth O&M Costs (30 years at 7%) Total Present Worth O&M Costs Total Present Worth Cost (O&M Costs)

ESTIMATED COSTS FOR POTENTIAL REMEDIAL ALTERNATIVES STERLING SITE 3 EAST GREENBUSH, NEW YORK

Unit Cost Notes			5,000 2,000 3,000 3,000 assumes semi-amual reporting 9,000 assumes monitoring of 15 wells for extended Site-specific parameter list semi-amually 2,000 assumed that a review will be conducted every 5 years using semi-amual monitorine data			
Cost	10,000	10,000 1,500 1,500 1,200 1,400	5,000 2,000 2,000 3,000 9,000 2,000	23,000 3,500 26,500 2,700 33,200	412,000 412,000	426,000
5	69		የ ት የት የት የት የት		8 8 4 4	\$
Unit Cost	t					
Estimated Quantity	ł					
Unit	Ls.		Ls. Ls. Ls.			
Alternative ltern 2. <u>Institutional Controls</u>	Capital Costs A. Deed restrictions	Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal Project Management (approx. 10%) Technical Support (approx. 15%) Subtotal	Operation and Maintenance Costs A. Inspections B. Reporting C. Site Maintenance (fencing, monitoring wells) D. Semi-annual Groundwater Monitoring i. Reporting ii. Semi-annual Groundwater Monitoring E. Review of Remedy	Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal Project Management (approx. 15%) Technical Support (approx. 15%) Subtotal	Present Worth O&M Costs (30 years at 7%) Total Present Worth O&M Costs	Total Present Worth Cost (Capital O&M Costs)

\$ 426,000

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ESTIMATED COSTS FOR POTENTIAL REMEDIAL ALTERNATIVES STERLING SITE 3 EAST GREENBUSH, NEW YORK

Unit Cost Notes		10,000 15,000 assumes two new wells will be installed			3,000 assumes semi-annual reporting 1,500 assumes monitoring of 10 wells for Site-specific parameter list annually 700 assumes monitoring of 10 wells for extended Site-specific parameter list biennially concurrent with every second annual round 2,000 assumed that a review will be conducted every 5 was using historical monitoring a second annual round				
Cost				5,000 2,000 2,000	3,000 as: 1,500 as: 700 as: ev 2,000 as:	16,200 2,400 18,600 1,900 2,800 23,300	289,100	289,100	325,000
Unit Cost		به به	မြာ မာ မာ မာ <mark>မာ</mark>	⊌9 ⊌9 ⊌9	99999999999999999999999999999999999999	မ မ မ မ မ မ	(ŝ	ο
Estimated Quantity		11		111	11 1				
ive ltem Unit	Monitored Natural Attenuation	Capital Costs A. Deed restrictions B. Monitoring Well Installation	Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal Project Management (approx. 10%) Technical Support (approx. 15%) Subtotal	in te po tio	i. Reporting Ls. Ii. Annual Groundwater Monitoring Ls. II. Biennial Groundwater Monitoring Review of Remedy Ls.	Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal Project Management (approx. 10%) Technical Support (approx. 15%) Subtotal	Present Worth O&M Costs (30 years at 7%)	Total Present Worth O&M Costs	Total Present Worth Cost (Capital O&M Costs)
Alternative It	3. <u>M</u> o	Ű v mi		Ö Ö d m u d	ці			Tota	Tota

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TABLE D.1

ESTIMATED COSTS FOR POTENTIAL REMEDIAL ALTERNATIVES STERLING SITE 3 EAST GREENBUSH, NEW YORK

Unit Cost Notes	00		5,000 2,000 3,000 assumes semi-amual reporting 3,000 assumes semi-amual reporting	2,000 assumed that a review will be conducted every 5 years using biennial monitoring data 6,900 9,400 1,900 4,200	 300,300 1.200,000 assume that the treatment occurs over first 2 word 		8	2
Cost	\$ 10,000 \$ 160,000				300,300	\$ 1,200,000 \$ 1,200,000 \$ 1,380,000 \$ 1,380,000 \$ 207,000 \$ 1,725,000	\$ 3,118,800	\$ 3,419,100
Unit Cost	1 1	1		¦ പ്രംശ∣ശശശ∣ശ	ග ශ 	မေနာ်မှာ မာနာများ	93	\$
Estimated Quantity	1 1			1	I			
Unit	इ. इ.		LS. LS. LS.	2	s. I			
Alternative Item	 In Situ Chemical Oxidation Capital Costs A. Deed restrictions B. Injection Well Installations 	Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal Project Management (approx. 10%) Remedial Design (approx. 15%) Technical Support (approx. 15%) Subtotal	Operation and Maintenance Costs A. Inspections B. Reporting C. Site Maintenance (fencing, monitoring wells) D. Semi-annual Groundwater Monitoring i. Annual Groundwater Monitoring E. Beriaw of Pornod.	Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal Project Management (approx. 10%) Technical Support (approx. 15%) Subtotal	Present Worth O&M Costs (30 years at 7%) F. Groundwater Injections	Subtotal Scope and bid contingency (approx. 5% plus 10%) Subtotal Project Management (approx. 10%) Technical Support (approx. 15%) Subtotal	Present Worth O&M Costs (2 years at 7%)	Total Present Worth O&M Costs

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\$ 3,703,000

Total Present Worth Cost (Capital O&M Costs)

TABLE D.1

ESTIMATED COSTS FOR POTENTIAL REMEDIAL ALTERNATIVES STERLING SITE 3 EAST GREENBUSH, NEW YORK

\$ 1,443,000

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ESTIMATED COSTS FOR POTENTIAL REMEDIAL ALTERNATIVES

EAST GREENBUSH, NEW YORK STERLING SITE 3

Alternative Item

Cost Unit Cost Estimated Quantity Unit

Unit Cost Notes

Notes:

- Real discount rate of 7%.
 Site-specific parameter list is assumed to include ethyl ether, benzene,
 Extended Site-specific parameter list is assumed to includes nitrate, manganese, dissolved iron, sulfate, and methane.
 Period of analysis is 30 years for long-term monitoring and maintenance
 Scope and bid contingencies are 5% and 10% of costs, respectively
 Bid contingency is 15 percent of costs
 Project management is 10 percent of costs
 Remedial design is 20 percent of costs
 Technical support is 15 percent of costs

•