# **RECORD OF DECISION**



Crown Cleaners of Watertown, Inc. Superfund Site Herrings, Jefferson County, New York



Lithograph of Herring Mill (site first used to manufacture paper bags) circa 1900; Source: Carthage Library

United States Environmental Protection Agency Region II New York, New York March 2012

# DECLARATION FOR THE RECORD OF DECISION

# SITE NAME AND LOCATION

Crown Cleaners of Watertown, Inc. Superfund Site Herrings, Jefferson County, New York

Superfund Site Identification Number: NYD986965333 Operable Unit: 01

#### STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for the Crown Cleaners of Watertown, Inc. Superfund Site (Site), chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. Section 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. This decision document explains the factual and legal basis for selecting a remedy to address the source areas and contaminated groundwater at the Site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the selected remedy is based.

The New York State Department of Environmental Conservation (NYSDEC) was consulted on the proposed remedy in accordance with CERCLA Section 121(f), 42 U.S.C. Section 9621(f), and it concurs with the selected remedy (see Appendix IV).

#### ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

# DESCRIPTION OF THE SELECTED REMEDY

The selected remedy, which addresses contaminant source areas and contaminated groundwater, includes the following components:

- Decontamination and demolition of the main building;
- Excavation of polycyclic aromatic hydrocarbon (PAH)- and arsenic-contaminated soil to a depth of one foot<sup>1</sup> and excavation of tetrachloroethylene (PCE)-

<sup>1</sup> If the land use for the former facility property is changed from commercial to recreational before the design of the remedy is approved, then the PAH- and arsenic-contaminated soils will be excavated to a depth of two feet.

contaminated soils to a depth of four feet<sup>2</sup>;

- Excavation of contaminated soils remaining within the footprint of the building;
- Excavation of PCE-contaminated sediment and soil from the adjacent wetlands to meet the protection of groundwater soil cleanup objective (SCO).
- Transportation for treatment/disposal of the building debris and the PCEcontaminated soils and sediments at an off-Site Resource Conservation and Recovery Act-compliant facility;
- Utilization of the excavated PAH- and arsenic-contaminated soils as backfill to a depth of not less than one foot below ground surface (bgs)<sup>3</sup> in the areas where PCE-contaminated soil will be excavated and in the footprint of the building;
- Backfilling with clean soil those areas where residual PAH- and arseniccontaminated soil will remain after the installation of a readily-visible and permeable subsurface demarcation delineating the interface between the residuallycontaminated native soils and the clean backfill;
- Backfilling the excavated wetland areas with soil that meets the unrestricted SCOs;
- Injection of an oxidizing agent into the contaminated groundwater at the source areas;
- Utilization of monitored natural attenuation (MNA)<sup>4</sup> for the groundwater with lower contaminant concentrations located outside the source areas;
- Utilization of institutional controls in the form of an environmental easement/restrictive covenant in the property records of Jefferson County to, at a minimum, restrict the use of the Site to commercial and industrial uses, unless the use is changed to recreational<sup>5</sup>, restrict intrusive activities in areas where residual contamination remains unless the activities are in accordance with an EPA-approved Site Management Plan (SMP) (see below), and restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the New York State Department of Health or the County Department of Health<sup>6</sup>; and

<sup>4</sup> MNA is the process by which a natural system's ability to attenuate contaminant(s) at a specific site is confirmed, monitored and quantified. <u>See</u> *e.g., DER-10/Technical Guidance for Site Investigation and Remediation* 1.3(b)(31).

<sup>5</sup> If the land use for the former facility property is changed from commercial to recreational before the design of the remedy is approved, then the environmental easement/restrictive covenant will allow recreational, commercial, or industrial use of the property as defined by 6 NYCRR Part 375-1.8(g). The land use will, however, be subject to local requirements.

<sup>6</sup> The property owner will be responsible for implementing and maintaining the controls and NYSDEC will be responsible for enforcing them.

<sup>&</sup>lt;sup>2</sup> Approximately 2,200 cubic yards of PAH and arsenic-contaminated soils and 8,400 cubic yards of PCE-contaminated soils and sediment would be excavated. If the land use for the former facility property is changed to recreational, then the volume of PAH- and arsenic-contaminated soils that would be excavated would increase by 1,650 cubic yards.

<sup>&</sup>lt;sup>3</sup> The excavated PAH- and arsenic-contaminated soils will be utilized as backfill to a depth of not less than two feet bgs if the land use is changed to recreational.

• Development of an SMP that will provide for the proper management of all postconstruction remedy components<sup>7</sup>.

During the design, a Phase 1B Cultural Resources Survey will be performed to document the Site's historic resources.

During the design, the building located in the rear of the former facility property will be assessed to determine whether it contains any hazardous substances. If hazardous substances are present and the building can be safely accessed, then the building will be decontaminated. If the building cannot be safely accessed, then it will be demolished and the debris will be decontaminated, if necessary, and disposed of off-Site.

During the design, samples will be collected to define the limits of the soil and sediment excavation.

Bench- and pilot-scale treatability studies will be performed during the design to optimize the effectiveness of the injection system and to determine optimum oxidant delivery rates and locations for the injection-well points.

Performance and compliance monitoring and testing will be performed during and after the oxidizing agent injections to determine residual contaminant concentrations, assess the need for additional treatment, and monitor the natural attenuation of the contamination at the periphery of the plume.

The environmental benefits of the selected remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy and NYSDEC's Green Remediation Policy<sup>8</sup>. This will include consideration of green remediation technologies and practices.

If in the future, structures are proposed to be built on the former facility property or any existing buildings are reoccupied, as required by the SMP, a soil vapor intrusion evaluation and vapor intrusion mitigation systems may be needed until the cleanup criteria have been achieved.

The selected remedy will address source materials constituting principal threats by

<sup>&</sup>lt;sup>7</sup> The SMP will describe procedures to confirm that the requisite engineering (subsurface demarcation) and a plan for institutional controls (*i.e.*, environmental easement/restrictive covenant) are in place and that nothing has occurred that will impair the ability of said controls to protect public health or the environment. The SMP will also include a soil management plan, an inventory of any use restrictions, the necessary provisions for the implementation of the requirements of the above-noted environmental easement and/or restrictive covenant; a provision for the performance of the operation, maintenance, and monitoring required by the remedy; and a provision that the property owner submit periodic certifications that the institutional and engineering controls are in place.

<sup>&</sup>lt;sup>8</sup> See http://epa.gov/region2/superfund/green\_remediation and http://www.dec.ny.gov/docs/remediation\_hudson\_pdf/der31.pdf.

excavating and treating the PCE-contaminated soil and sediment (if necessary for disposal) and through the in-situ treatment of the source area groundwater contamination, thereby satisfying the preference for treatment.

# DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. Section 9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants, and contaminants which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. In keeping with the statutory preference for treatment that reduces toxicity, mobility, or volume of contaminated media as a principal element of the remedy, the contaminated soil, sediment, and groundwater will be treated by implementing the selected remedy.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

# **ROD DATA CERTIFICATION CHECKLIST**

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

- Contaminants of concern and their respective concentrations (see ROD, pages 4-7 and Appendix II, Tables 1-3);
- Baseline risk represented by the contaminants of concern (see ROD, pages 9-15 and Appendix II, Table 4A);
- Cleanup levels established for contaminants of concern and the basis for these levels (see ROD, Appendix II, Table 5);
- Manner of addressing source materials constituting principal threats (see ROD, pages iii-iv and page 32);
- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see ROD, page 8);
- Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see ROD, page 36-37);
- Estimated capital, annual operation and maintenance, and present-worth costs; discount rate; and the number of years over which the remedy cost estimates are projected (see ROD, pages 31 and Appendix II, Tables 6 and 7); and

Key factors used in selecting the remedy (*i.e.*, how the selected remedy provides • the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)(see ROD, pages 38-39).

AUTHORIZING SIGNATURE

- Je, for

Walter E. Mugdan, Director Emergency and Remedial Response Division

March 29 2012 Date

# RECORD OF DECISION FACT SHEET EPA REGION II

Site	
Site name:	Crown Cleaners of Watertown, Inc. Site
Site location:	Herrings, Jefferson County, New York
HRS score:	49.00
Listed on the NPL:	September 5, 2002
Record of Decision	
Date signed:	March 29, 2012
Selected remedy:	Decontamination and demolition of the main on-Site building, excavation of contaminated wetland sediments and soils located adjacent to the former facility property, excavation of contaminated soil at the source area, off-Site treatment/disposal of the excavated sediments, soils, and building debris, in-situ treatment of the contaminated groundwater near the source using chemical oxidation and downgradient using natural attenuation, development of a Site Management Plan, and an environmental easement.
Capital cost:	\$5.8 million
Annual operation, maintenance, and monitoring cost:	\$505,000 for first year; \$57,000 annually thereafter
Present-worth cost:	\$6.9 million
Lead	EPA
Primary Contact:	Pamela Tames, Remedial Project Manager, (212) 637-4255
Secondary Contact:	Joel Singerman, Chief, Central New York Remediation Section, (212) 637- 4258
<u>Main PRPs</u>	None
Waste	
Waste type:	Volatile organic compounds and polyaromatic hydrocarbons
Waste origin:	On-site waste disposal activities
Contaminated media:	Soil, sediments, and groundwater

# **DECISION SUMMARY**

Crown Cleaners of Watertown, Inc. Superfund Site Herrings, Jefferson County, New York

United States Environmental Protection Agency Region II New York, New York March 2012

# TABLE OF CONTENTS

	<u>PAGE</u>
SITE NAME, LOCATION, AND DESCRIPTION	1
SITE HISTORY AND ENFORCEMENT ACTIVITIES	1
HIGHLIGHTS OF COMMUNITY PARTICIPATION	2
SCOPE AND ROLE OF OPERABLE UNIT	3
SUMMARY OF SITE CHARACTERISTICS	3
CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES	8
SUMMARY OF SITE RISKS	9
REMEDIAL ACTION OBJECTIVES	16
SUMMARY OF REMEDIAL ALTERNATIVES	17
COMPARATIVE ANALYSIS OF ALTERNATIVES	25
PRINCIPAL THREAT WASTE	32
SELECTED REMEDY	33
STATUTORY DETERMINATIONS	38
DOCUMENTATION OF SIGNIFICANT CHANGES	41

ATTACHMENTS

APPENDIX I:	FIGURES
APPENDIX II:	TABLES
APPENDIX III:	ADMINISTRATIVE RECORD INDEX
APPENDIX IV:	STATE LETTER OF CONCURRENCE
APPENDIX V:	RESPONSIVENESS SUMMARY
APPENDIX VI:	STATEMENT OF FINDINGS: FLOODPLAINS AND WETLANDS

# SITE NAME, LOCATION, AND DESCRIPTION

The 9-acre Crown Cleaners of Watertown, Inc. Site<sup>1</sup> (Site) is a former dry cleaning and laundry facility located in the Village of Herrings, Jefferson County on New York State Route 3 (see Figure 1 for a site location map<sup>2</sup>). There are three buildings in poor condition and an occupied mobile home located on the former facility property. Most of the former facility property is surrounded by a chain link fence.

The Site is located approximately 300 feet south of the Village of Herrings' public water supply well and its southern border is adjacent to the Black River. A park is located to the east of the Site and residences are located to the north and west.

A wetland area is located immediately west of the former facility property and another wetland area is located approximately 800 feet southwest of the former facility property. A significant amount of debris, including, paper waste from the former paper factory, old appliances, and several drum carcasses, is located in the wetland to the southwest.

See Figure 2 for a site map.

# SITE HISTORY AND ENFORCEMENT ACTIVITIES

From 1890 until the mid-1960's, the former facility property was used by the St. Regis Paper Co. to produce paper bags. A textile manufacturer subsequently operated on the former facility property for several years. In the late 1970's, the property was purchased by Crown Cleaners of Watertown, Inc. and was operated until 1991 as a dry cleaning and laundry facility. Tetrachloroethene (PCE) and machine oils and greases were used. Wastewater was discharged into basement storage pits, which then discharged through the foundation walls to the ground. Used dry cleaning machine filters were dumped on the former facility property.

The residences in the area use either private wells or a public supply well for potable water supply. In 1991, the New York State Department of Health (NYSDOH) determined that the Village of Herrings' water supply well was contaminated with PCE at concentrations ranging from 25 to 50 micrograms per liter (ug/L). Later that same year, NYSDEC installed a treatment system on the Village of Herrings' water supply system and determined that the source of PCE contamination was from the Site.

Several New York State investigations were conducted at the Site during the 1990's which resulted in the Site being referred to EPA for further evaluation in 2000.

In 2000, EPA sampled the facility's storage pits, oil tanks, on- and off-property soils, and the groundwater. Volatile organic compounds (VOCs), semi-volatile organic compounds

<sup>&</sup>lt;sup>1</sup> The Site's Superfund Site Identification Number is NYD986965333. The U.S. Environmental Protection Agency (EPA) is the lead agency; the New York State Department of Environmental Conservation (NYSDEC) is the support agency.

<sup>&</sup>lt;sup>2</sup> Figures are located in Appendix I, attached hereto.

(SVOCs), polychlorinated biphenyls, copper, iron, mercury, zinc, beryllium, arsenic, and chromium were detected in the soils above NYSDEC's soil cleanup objectives (SCOs). The highest PCE concentration found in the shallow aquifer was 9,800 ug/L. In addition to this investigation, EPA secured the property, removed and disposed of VOC-contaminated sludge and debris, sump pit water, spent dry cleaning filters, removed friable asbestos-containing materials, demolished an unstable portion of the main building and disposed of approximately 5,000 gallons of waste oil. EPA also demolished a large smoke stack from which it is believed the PAHs emanated.

Because of the dilapidated condition of the building located in the rear of the former facility property, it could not be safely assessed.

On September 4, 2002, the Site was listed on EPA's Superfund National Priorities List.

EPA conducted field investigations at the Site from 2004 through 2011, which culminated in the completion of a remedial investigation and feasibility study (RI/FS)<sup>3</sup> report in December 2011.

# HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI/FS report and a Proposed Plan<sup>4</sup> were released to the public for comment on December 12, 2011. These documents were made available to the public at information repositories maintained at the Carthage Free Library located at 412 Budd Street, Carthage, New York and the EPA Region II Office in New York City. A notice of availability for the above-referenced documents was published in the *Watertown Daily Times* on December 12, 2011. The public comment period ran from December 12, 2011 to January 17, 2012. On January 3, 2012, EPA conducted a public meeting at the Village of Herrings Town Hall to inform local officials and interested citizens about the Superfund process, to present the Proposed Plan for the Site, including the preferred remedy and to respond to questions and comments from the approximately 20 attendees. Public comment was related to addressing contamination in the on-Site buildings, addressing contamination behind, and additional sources of contamination. Responses to the questions and comments received at the public meeting and in writing during the public comment period are included in the Responsiveness Summary (see Appendix V).

During the public meeting, several members of the public expressed their views on the

<sup>&</sup>lt;sup>3</sup> An RI determines the nature and extent of the contamination at a site and evaluates the associated human health and ecological risks and an FS identifies and evaluates remedial alternatives to address the contamination.

<sup>&</sup>lt;sup>4</sup> A Proposed Plan describes the remedial alternatives considered for a site and identifies the preferred remedy with the rationale for this preference.

reasonably-anticipated future land use (there is a strong local desire to change the land use from commercial to recreational). Since the area is served by municipal water and the aquifer is already designated as a drinking water source (although it is not likely that the groundwater underlying the former facility property will be used for potable purposes in the foreseeable future), the public's views on potential future beneficial groundwater uses were not solicited.

#### SCOPE AND ROLE OF THE OPERABLE UNIT

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), at 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively addressing Site problems. A discrete portion of a remedial response eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the Site.

This response action applies a comprehensive approach to all Site problems; therefore, only one operable unit is required to remediate the Site. The primary objectives of this action are to remediate the sources of groundwater contamination at the Site, restore downgradient groundwater quality for drinking, and minimize any potential future health and environmental impacts from the contaminated soil, sediment, and groundwater.

# SUMMARY OF SITE CHARACTERISTICS

The RI activities that were conducted at the Site included monitoring well installation, geological and hydrogeological investigations, an ecological assessment, wetlands delineation, a residential vapor intrusion investigation<sup>5</sup>, and collecting samples from the surface soil (top two feet of soil), subsurface soil (below two feet), wetland sediments, surface water and sediment from the Black River, groundwater, residential wells, and the public supply well. Because of the historical significance of the structures on the former facility property, a Phase 1A Cultural Resources survey<sup>6</sup> was also performed.

The results of the RI are summarized below.

3

<sup>&</sup>lt;sup>5</sup> Vapor intrusion is a process by which VOCs move from a source below the ground surface (such as contaminated groundwater) into the indoor air of overlying or nearby buildings.

<sup>&</sup>lt;sup>6</sup> A Phase I cultural resources survey is designed to determine the presence or absence of cultural resources in the project's potential impact area. The Phase I survey is divided into two progressive units of study--Phase IA, a literature search and sensitivity study and, if necessary based upon Phase 1A survey, a Phase IB, field investigation to search for resources.

# Site Hydrology

The Site is located in the Erie-Ontario Lowlands physiographic province, which includes the Black River valley. Local surface water runoff flows toward the Black River, which runs adjacent to the Site along its southern boundary. The Black River in the area where it runs adjacent to the Site is classified by New York State as a "Class C" surface water body. These waters should be suitable for fish propagation and survival, as well as contact recreation (6 NYCRR Part 701.8). The Herrings Station dam is located just east of the Site and a roughly 20-foot surface water elevation difference is maintained across the dam.

Approximately 1.4 acres of the former dry cleaner property are located in the 100-year flood plain of the Black River according to the Federal Emergency Management Agency. The remainder of the Site is located outside the 500-year flood plain.

#### Site Hydrogeology

The hydrogeology is characterized by the existence of four units, Upper Carbonate, Middle Carbonate, Lower Carbonate, and Fractured Granitic Gnéiss Units.

The upper part of the Site hydrogeologic unit, the Upper Carbonate Unit, consists of an unconfined, fractured unit with low permeability that is subject to seasonal variations. The Middle Carbonate Unit is a dense, massive, very low to no permeability unit, which appears to behave as a semi-confining to confining unit. Below this unit is a confined Lower Carbonate unit that provides water resources to the local area. The deepest unit evaluated during the RI investigation was the Fractured Granitic Gneiss unit, which underlies the Lower Carbonate unit. Groundwater in the Upper Carbonate unit primarily flows in a south-southwesterly direction along bedding planes partings, with secondary flow through fractures and joints. In the Lower Carbonate and Granitic Gneiss units, groundwater flow is controlled by secondary porosity through enlarged bedding planes and fractures. Groundwater in both of these units flows in a south-southwesterly direction and eventually discharges to the Black River.

#### Groundwater

EPA and New York State Department of Health have promulgated health-based protective Maximum Contaminant Levels (MCLs), which are enforceable standards for various drinking water contaminants. MCLs, which ensure that drinking water does not pose either a short- or long-term health risk, will be used as the cleanup criteria for the groundwater. The MCL for both PCE and trichloroethylene (TCE) is 5 ug/L.

Four rounds of groundwater sampling were conducted as part of the RI. During the first round in 2004, 24 existing monitoring wells, two piezometric wells and one residential well were sampled. In 2006, a second round of sampling was conducted and included the

4

original 24 wells, 2 piezometric wells, 1 residential well, and eight newly installed monitoring wells. A third sampling round covering 31 monitoring wells, five newly installed multiport wells, and two piezometers was conducted in 2009. A fourth round of groundwater sampling was conducted on these same wells in mid-2011.

Groundwater samples contained PCE in 11 of the 31 monitoring wells. Concentrations in these wells ranged from 6.7 ug/L to 6,500 ug/L. PCE was not detected in the multiport wells. See Table 1 for a summary of the groundwater data<sup>7</sup> and Figure 3 for isoconcentration contours.

The groundwater data indicates that an approximately 350- by 300-foot wide and 145 foot deep contaminant plume radiates from the PCE source area located at the southwest corner of the main building on the former facility property.

The data also suggests that a separate area of PCE contamination is present in the upper unit bedrock aquifer in the wetland area located to the southwest of the former facility property. The dimensions of this plume are 275 by 225 feet wide and 40 feet deep. Isotopic analysis of samples collected from site wells and wells to the southwest of the former facility property indicates that the PCE detected in this area is of a similar origin to the PCE detected in groundwater elsewhere on the Site. Sample results from this area show decreasing PCE concentrations with increasing depth, suggesting a surface source in the vicinity. In addition, the measurement of groundwater levels at various elevations within the bedrock indicates a downward hydraulic gradient. Since the dumping of debris has occurred in this area, the origin of the groundwater impacts southwest of the former facility property is likely the result of the disposal of site-related wastes (*e.g.*, drum(s)) in this area.

Based upon the local groundwater flow direction (generally to the south) and groundwater quality data, contaminants in groundwater originating from the various suspected potential source areas have migrated, and will continue to migrate until dilution and removal mechanisms such as adsorption, degradation, precipitation, and limited volatilization result in their eventual non-detection or until the contaminated groundwater discharges to the potential wetland areas and/or the Black River, particularly if this migration occurs within the upper bedrock fractures. Vertically, groundwater data also shows that Site-related constituents have migrated to and within the lower unit fractured bedrock.

Based upon concentration trends, naturally-occurring processes appear, in general, to be reducing contaminant occurrence within the groundwater plume. The data show a declining trend in PCE levels within the plume. The data also shows the presence of PCE's reductive dechlorination products, known as daughter products, in many of the same wells as PCE, indicating the slow natural breakdown or attenuation of the contaminants. The extent to which any one process (*i.e.*, dilution, advection, dispersion,

<sup>&</sup>lt;sup>7</sup> Tables are located in Appendix II, attached hereto.

etc.) is predominant cannot be determined with the available data.

#### Vapor Intrusion

Subslab, indoor air, and ambient air sampling in and around eight residences in the vicinity of the Site was conducted in March 2009. Only low levels of VOCs were detected in the soil gas and air samples, and no Site-related VOCs were detected in any of those samples. Based upon these data, EPA concluded that no further sampling or analysis of potential vapor intrusion was warranted for the Site.

### Soils

NYSDEC has identified SCOs for the protection of the environment and for various contaminants based upon the assumed future usage of the Site (see Table 5 for the SCOs for the Site)<sup>8</sup>. Based upon the most recent active use of the Site, the Site will be cleaned up to "commercial" standards. The SCO for PCE for the protection of groundwater is 1.3 milligrams per kilogram (mg/kg) and 16 mg/kg for arsenic for commercial use. The commercial SCO for PAHs varies depending on the contaminant<sup>9</sup>.

In 2004, soil samples were collected at 9 locations to a depth of 5 feet. An additional 42 soil locations were sampled in 2011 to a depth of 2 feet. Elevated PCE concentrations were found in five locations, primarily, adjacent to the northern and western corners of the main building in the west-northwestern portion of the Site (the highest concentration detected was 59,000 micrograms per kilogram [ug/kg]). These PCE-contaminated soils (hereinafter, "source area soils") are a source of contamination to the groundwater. In addition, elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) were detected in surface soil at 14 locations. The highest PAH concentration detected was 58.4 mg/kg.

See Table 2 for a summary of the soil data.

<sup>&</sup>lt;sup>8</sup>See 6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6, New York State Department of Environmental Conservation, December 14, 2006.

<sup>&</sup>lt;sup>9</sup> While the land use of the Site has historically been industrial/commercial, local elected officials have expressed a desire to develop a community park on the Site following its remediation. In order for the former facility property to be remediated using soil cleanup objectives that would be protective for a park (*i.e.,* restricted residential), a local governmental entity must acquire the property. The Village Mayor and Town Supervisor are presently pursuing several options to acquire the property and change its use to recreational. If the land use for the property is changed from commercial to recreational before the design of the remedy that is ultimately selected is approved, then restricted residential SCOs will be utilized.

### Sediments

Sediment samples were collected from 15 locations in the wetland areas located immediately west and southwest of the buildings. Eight VOCs were detected in the sediment samples, including PCE as high as 0.17 mg/kg. Samples collected from the wetland area located to the southwest also showed the presence of PAHs, pesticides, and metals. See Table 3 for a summary of the wetland sediment data. Cleanup levels for wetland sediments are outlined in the NYSDEC's Division of Fish, Wildlife, and Marine Resource's 1999 *Technical Guidance for Screening Contaminated Sediments.* 

While attempts were made to obtain sediment samples from the Black River adjacent to the Site, there was insufficient sediment available to get a proper sample.

#### **Contamination Fate and Transport**

Historically, rainwater and snowmelt have percolated through the PCE-contaminated soil, resulting in contaminant releases to the groundwater. Presently, there are four source areas located adjacent to the main building and one in the wetland area located to the southwest of the former facility property that are sources of contamination to the groundwater. Figures 5 and 6 depict the current conceptual Site model<sup>10</sup>.

Once site characterization data have been collected and a conceptual model has been developed, the efficacy of monitored natural attenuation (MNA) as a remedial alternative is evaluated. Site-specific data is used to estimate the rate of attenuation processes and the anticipated time required to achieve the remedial action objectives. A three-tiered evaluation is utilized consistent with OSWER Directive 9200.4-17P. The three "lines of evidence" are historical groundwater and/or soil chemistry data that demonstrate a clear and meaningful trend of decreasing contaminant mass and/or concentration over time at appropriate monitoring or sampling points, hydrogeologic and geochemical data that can be used to demonstrate indirectly the type(s) of natural attenuation processes active at the Site, the rate at which such processes will reduce contaminant concentrations to required levels, and data from field or microcosm studies which directly demonstrate the occurrence of a particular natural attenuation process at the Site and its ability to degrade the contaminants of concern.

The three lines-of-evidence for the Site are as follows:

• Primary Line of Evidence – Qualitative analysis of the trends of concentrations of the select VOCs shows that, generally, PCE is decreasing, TCE is either decreasing or not exhibiting a significant trend, cis-1,2-dichloroethylene (DCE) is not exhibiting significant trends, and vinyl chloride is mainly not detected. Due to the lack of sufficient, appropriately comparative rounds of sampling for the Site wells, it is difficult to ascertain "clear and meaningful trends" of contamination concentrations.

<sup>&</sup>lt;sup>10</sup> A conceptual site model illustrates contaminant sources, release mechanisms, exposure pathways, migration routes, and potential human and ecological receptors.

• Secondary Line of Evidence – PCE daughter products (*e.g.*, TCE, cis-1,2-DCE) were detected within monitoring wells near the source and downgradient of the source/within the plume.

• Tertiary Line of Evidence – The isotopic analysis data follows a Rayleigh distillation model, and trends on a biodegradation kinetic isotope effect enrichment line, which is evidence of natural attenuation occurring via biodegradation.

Based upon preliminary modeling results, it has been estimated that natural attenuation of the contamination at the periphery of the source areas would achieve the cleanup standards in 30 years.

# CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

# Land Use

Although the former facility property was previously used for industrial purposes and the current usage is commercial, the Village intends to develop a community park on the property once it is remediated and available for reuse. The Mayor of Herrings and the Supervisor of the Town of Wilna are currently pursuing several options to acquire the privately-owned property and effect a change to the land use.

The Site is located south of the Village of Herrings' public water supply well and north of the Black River. The Black River where it runs adjacent to the Site is classified by New York State as a "Class C" surface water body. These waters should be suitable for fish propagation and survival, as well contact recreation (6 NYCRR Part 701.8). A park is located to the east of the former facility property and residences are located to the north and west. A wetland area is located immediately west of the former facility property and another wetland area is located approximately 800 feet southwest of the former facility property. A significant amount of debris, including, paper waste from the former paper factory, old appliances, and several drum carcasses, is located in the wetland to the southwest.

#### Groundwater Use

The groundwater underlying the Site is contaminated. Potable water for the former facility property is obtained from a public-supply source. The residences in the area use either private wells or a public supply well for potable water supply.

Although it is not likely that the groundwater underlying the former facility property or downgradient will be used for potable purposes in the foreseeable future, regional groundwater is designated as a drinking water source by NYSDEC.

# **SUMMARY OF SITE RISKS**

A baseline risk assessment is an analysis of the potential adverse human health effects caused by the release of hazardous substances from a site in the absence of any actions to control or mitigate these under current and anticipated future land uses. EPA's baseline risk assessment for this Site, which is part of the RI/FS report, focused on contaminants in the soil, sediments, and groundwater that were likely to pose significant risks to human health and the environment. Potential indoor air vapor intrusion concerns were evaluated and found to not warrant further assessment. The risk assessment for this Site (see *Crown Cleaners of Watertown, Inc. Superfund Site Remedial Investigation Report*, Chapter 6.1 and Appendix O, Tetra Tech, December 2, 2011), is available in the Administrative Record.

#### Human Health Risk Assessment

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

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

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

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

9

*Risk Characterization:* This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a  $10^{-4}$  cancer risk means a one-in-ten-thousand excess cancer risk; or, stated another way, one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime site-related excess cancer risk in the range of  $10^{-4}$  to  $10^{-6}$  (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk) with  $10^{-6}$  being the point of departure. For noncancer health effects, a hazard index (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a noncancer HI is that a threshold level (measured as an HI of less than or equal to 1) exists below which noncancer health effects are not expected to occur.

As was noted above, most of the former facility property is surrounded by a chain link fence. With the exception of an occupied mobile home located on the former facility property outside the fence, the former facility property is not currently being used. Although the former facility property's historical usage was commercial/industrial, it is anticipated that the land use in the future will be recreational<sup>11</sup>. The possibility that the former facility property could be redeveloped for residential use was also considered.

The baseline risk assessment identified the current and potential future receptors that may be affected by contamination at the Site, the pathways by which these receptors may be exposed to site contaminants in various environmental media, and the parameters by which these exposures and risks were quantified. A trespasser was the receptor evaluated under the current scenario. Future scenarios considered a hypothetical future commercial worker, on and off-Site resident (adult and child), construction worker and utility worker.

The risks associated with potential exposures to the contaminated soils, sediment, and groundwater were assessed. Potential indoor air vapor intrusion concerns were evaluated and found to not warrant further assessment. Since the area is served by municipal water, it is not likely that the groundwater underlying the Site will be used for potable purposes in the foreseeable future; however, since regional groundwater is designated as a drinking water source by the State of New York, potential exposure to groundwater was evaluated.

The results of the baseline risk assessment indicate that the contaminated soils on the Site and the contaminated groundwater at the Site pose an unacceptable risk to human health due, primarily, to the presence of VOCs, SVOCs, and metals.

<sup>&</sup>lt;sup>11</sup> Local elected officials have expressed a desire to develop a community park on the former facility property following its remediation

Based on the anticipated future use of the Site, an excess lifetime cancer risk above the EPA reference cancer risk range or HI greater than the EPA threshold value were projected relative to any foreseeable current or future receptor exposed to site-related contaminants of concern (COCs) (PCE and its breakdown products) in soil, with a cancer risk estimated at  $3.2 \times 10^{-4}$  and a noncancer hazard index of 3.4. An excess lifetime cancer risk above the EPA reference cancer risk range is also attributable to the PAH, benzo(a)pyrene, in the soil for on-Site child resident at  $3.2 \times 10^{-4}$ .

All scenarios involving the use of the local groundwater as a drinking water source showed considerably elevated risks, due primarily to the presence of PCE. The greatest risk was estimated for the hypothetical on-Site resident (adult and child) at  $4.3 \times 10^{-2}$ . Concentrations of PCE also exceed the state and federal MCLs for this compound.

#### Ecological Risk Assessment

Potential risks to environmental receptors associated with the Site were identified in the ecological risk assessment (see *Crown Cleaners of Watertown, Inc. Superfund Site Remedial Investigation Report*, Chapter 6.2 and Appendix Q, Tetra Tech, Inc., December 2, 2011). This document is also available in the Administrative Record.

Terrestrial and wetland plants were determined to be at potential risk from toxic effects from copper, lead, and selenium, based upon the comparison to phytotoxic screening benchmarks; these constituents were identified as chemicals of ecological concern (COECs). However, a qualitative survey of vegetation cover-types present did not reveal any areas of stressed vegetation or areas devoid of vegetation. Based upon the exposure assessment, risk characterization, and associated uncertainties, the potential risk to this assessment endpoint was considered to be low.

The exposure assessment and risk characterization for soil and sediment invertebrates revealed potential risks from toxic effects from copper exposure in upland surface soils. Anecdotal evidence of an invertebrate community suggested this exposure is not acute in nature and the associated uncertainties would indicate this potential risk is limited to only one location. In the wetland sediments, the screening assessment, using benthic community benchmarks for community level impairment, identified PAHs, chlordane, antimony, arsenic, cadmium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc as posing a potential risk to benthic community structure and function.

The short-tailed shrew was used as a representative mammalian species that is indigenous to New York and would utilize the available upland habitats present. A mean exposure evaluation employing conservative exposure parameters for upland habitats revealed no observable adverse effects level (NOAEL) hazard quotient (HQs) <1 for all COECs but cadmium and lead. No COECs with lowest observable adverse effects level (LOAEL) HQs >1 were identified. The lack of a LOAEL HQ>1, and the associated

conservative uncertainty associated with the exposure assessment, suggests potential risks to terrestrial mammals should be considered to be low in the upland habitats. The wetland exposure evaluation for the shrew identified seven metals, aluminum, antimony, arsenic, cadmium, lead, selenium, and silver, with NOAEL HQs >1. Aluminum was the only COEC with a LOAEL HQ > 1.0 for this receptor. While exceedance of a LOAEL value may be a basis for the conclusion of significant risk, aluminum is one of the most abundant metals in the crust of the earth and is not typically associated with significant bioaccumulation in tissues. Therefore, the potential risks to mammals associated with these metals are considered to be low in the wetland areas. The American robin was used as a representative avian species that would utilize the available upland habitats present. A mean exposure evaluation employing conservative exposure parameters identified NOAEL HQs to remain <1 for all but cadmium, lead, and selenium. Of these, lead was the only metal with a mean exposure point dosage that exceeded the LOAELbased exposure dosage. Based upon the exceedance of a LOAEL and given that lead is not an essential macronutrient for avian metabolism, lead was identified as a COEC in the upland soils. The mean exposure assessment for the wetland habitats revealed NOAEL HQs < 1 for all COECs except lead and zinc. Of these two metals, the mean lead exposure resulted in exceedance of the LOAEL dosage level for the receptor evaluated. Based upon the exceedance of a LOAEL, and that lead is not an essential macro-nutrient for avian nutrition, a potential significant risk exists for avian receptors from lead exposure in wetland sediments and is identified as a COEC for this environmental media.

No COECs were identified for surface waters of the Black River. PAHs, aluminum, barium, iron, and manganese were identified as being COECs for the surface waters of the Site wetlands. The risks from these COECs are associated with some degree of uncertainty given the lack of applicable background samples for similar wetland environments and the potential for colloidal particles to have been entrained in the surface water sample during collection.

Table 4 summarizes the risk data.

#### **Uncertainties**

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include the following: environmental chemistry sampling and analysis; environmental parameter measurement; fate and transport modeling; exposure parameter estimation; and toxicological data. Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there can be significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources, including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

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

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

For the baseline risk assessment, soil, sediment, and groundwater data collected from various sampling events were evaluated. The most recent sediment data were collected almost 5 years ago (*i.e.*, November 2006) while the most recent surface soil and groundwater data (for VOCs) were collected within the year (*i.e.*, 2011). Potential degradation of VOCs in an exposure medium over time may result in more toxic by-product constituents being formed from less toxic parent compounds (*e.g.*, the breakdown of less toxic chlorinated VOCs to the more toxic vinyl chloride). In such a case, the projected risks could be underestimated for exposure to VOCs in soil. However, this degradation does not appear to have occurred to a great extent in the former facility property soils to date, since the PCE/TCE degradation chain compounds have not been detected in soil at levels associated with threshold toxicity effects.

At the onset of the risk assessment, there was an indication that contamination in the surface soil (especially TCE) might be concentrated in the first 6 inches of the soil such that the soil thickness to be used to define the surface soil for exposure purposes might need to be reduced to be conservative. The concentration distribution of TCE with depth in the soil was evaluated to determine if there was a significant concentration difference between the TCE concentrations in the 0 to 0.5 foot soil samples and the 0.5 to 2 feet soil samples. This analysis revealed no clear difference and the default depth interval of 0 to 2 feet was seen to be appropriate for use as the "surface" soil interval.

Groundwater data collected from the most recent sampling round for each well of interest (*i.e.*, 2011) were selected for use in the baseline risk assessment as the best representation of current Site conditions. Previous investigations indicated at least two distinct groundwater flow systems (an upper and lower) existed in the bedrock beneath the Site. In some cases, the upper wells exhibited somewhat higher concentrations of the Site contaminants than the lower wells, and in other cases the trend was reversed. Since the groundwater units are indicated to be hydrologically connected, the groundwater data from both depth units were pooled for the baseline risk assessment. Due to the potential differences in exposure, the former facility property groundwater was evaluated separately from the wetland area located to the southwest of the former facility property's

groundwater to explicitly examine this variability and allow for a comparison of potential exposures and risks in the two portions of the Site.

The analytical data used in the baseline risk assessment included estimated concentrations ("J" qualified), from a dilution analysis ("D" qualified), or validated as presumptive evidence for the presence of the compound ("N" qualified). All of the data qualified with these codes were used in the calculation of EPCs for the media assessed. The data with these qualifiers do not have a systematic high or low bias relative to the estimation of risk.

A conservative screening was used to select contaminants of potential concern (COPCs) for each exposure medium. Highly conservative screening levels were used to select which COPCs would be carried through the risk assessment. The screening levels used for soil, sediment, and groundwater were criteria developed for a residential soil and drinking water exposure scenario, which is an unlikely land use for this Site in the reasonably foreseeable future.

Background levels were not used to eliminate any chemicals from the quantitative risk assessment. This was, in part, due to the relatively small number of background samples collected for both soil and groundwater. The COPC screening process resulted in the conservative inclusion of a relatively broad set of constituents for assessment and the projection of some amount of risk that may be attributable to local or regional background levels of certain constituents (especially for soil).

A small number of chemicals were retained as COPCs because they did not have screening toxicity values to apply during the COPC screening and selection process. Typically, the risk associated with the intakes of these particular COPCs could not be quantified because of a lack of appropriate carcinogenic or non-carcinogenic health effect endpoint toxicity values. No surrogate values were used to calculate risks for these cases in the baseline risk assessment. The inability to estimate the contribution to risk from these specific COPCs in the baseline risk assessment may represent a small potential to underestimate the risks present.

This risk assessment considered the exposure to child and adult residents during the use of the groundwater for bathing and showering. The dermal absorption of volatile constituents through the skin as well as the inhalation of volatiles flashed out of the water during spraying and splashing could potentially result in exposures. In an actual situation, the same mass of volatile contaminant cannot both be absorbed and inhaled. Consequently, EPA Region 2 typically prefers to evaluate only inhalation exposure to volatiles during this activity, which is how this assessment was performed. By not including the dermal absorption intakes of these compounds, the risks attributable to this activity may be slightly underestimated for these compounds. However, as these exposure pathways were not significant risk drivers for these receptors, the exclusion of the dermal absorption intake does not significantly impact the overall risk estimates or the findings of the risk assessment for these receptors.

Separate assessments of the risks due to exposure to groundwater were performed using the characterized groundwater quality from the former facility property's wells and from the wetland area located to the southwest of the former facility property's wells. While this separation is of potential interest for certain site management considerations and was justified by the significant differences in the concentrations of the risk-driver contaminants (such as PCE and TCE) at the former facility property and within the wetland area located to the southwest of the former facility property, it may over-emphasize the potential difference in exposures that would be likely to occur. The groundwater from both areas is hydrologically connected and the radius of influence of a potential drinking water well in one area is likely to be larger than the areas delineated by the former facility property or wetland area located to the southwest of the former facility property area boundaries. As such, an actual well installed to provide domestic water would likely draw and mix water from both areas.

Considerable uncertainty can be associated with qualitative (hazard assessment) and quantitative (dose-response) evaluations. Hazard assessment characterizes the nature and strength of the evidence of causation or the likelihood a chemical that induces adverse effects in animals will induce adverse effects in humans. Hazard assessment of carcinogenicity is currently evaluated as a weight-of-evidence determination, using EPA (1989) classifications. Positive results in animal cancer tests suggest humans may also manifest a carcinogenic response, but animal data cannot necessarily be used to predict target tissues in humans. In the hazard assessment of noncarcinogenic effects, positive animal test results may suggest the nature of possible human effects (*i.e.*, target tissues and type of effects) (EPA, 1989).

These uncertainties are addressed using the uncertainty and modifying factors and assessment procedures prescribed by EPA in its guidance, and are reflected in the toxicity values recommended by EPA (*i.e.*, EPA's Integrated Risk Information System).

#### Summary of Human Health Risks

The results of the human health risk assessment indicate that the contaminated groundwater presents an unacceptable exposure risk and the ecological risk assessment indicates that the contaminated soils and sediments pose an unacceptable exposure risk.

#### **Basis for Action**

Based upon the quantitative human-health risk assessment and ecological evaluation, EPA has determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the response action selected in this ROD, may present a current or potential threat to human health and the environment.

15

### **REMEDIAL ACTION OBJECTIVES**

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and site-specific risk-based levels.

The following remedial action objectives were established for the Site:

- Reduce or eliminate any direct contact, ingestion, or inhalation threat associated with contaminated soils and sediments;
- Minimize exposure of wildlife to contaminated soils and sediments;
- Protect human health by preventing exposure to contaminated groundwater and soil vapor; and
- Restore groundwater to levels that meet state and federal standards within a reasonable time frame.

Soil cleanup objectives will be those established pursuant to 6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6, effective December 14, 2006. These levels are the more stringent cleanup level between a human-health protection value and a value based on protection of groundwater. All of these levels fall within EPA's acceptable risk range.

Groundwater cleanup goals will be the more stringent of the state or federal promulgated standards.

The cleanup levels for the soil, sediments, and groundwater and their basis are presented in Table 5.

As was noted above, while the land use of the former facility property has historically been industrial/commercial, local elected officials have expressed a desire to develop a community park on the former facility property following its remediation. In order for the former facility property to be remediated using soil cleanup objectives that would be protective for a park (*i.e.*, restricted residential), a local governmental entity must acquire the property. The Village Mayor and Town Supervisor are presently pursuing several options to acquire the property and change its use to recreational. If the land use for the former facility property is changed from commercial to recreational before the design of the remedy that is selected is approved, then restricted residential SCOs will be utilized.

### SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA Section 121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, be cost-effective, comply with ARARs, and utilize permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains federal and state ARARs, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report. The FS report presents four soil/wetland sediment alternatives and five groundwater alternatives. It should be noted that a capping alternative was considered in the FS report, but it was screened out due to questions about its effectiveness in preventing the migration of contaminants to the groundwater in high water table areas and technical difficulties in maintaining such a cap. In addition, in-situ vapor extraction was considered and was screened out due to questions about its effectiveness in high water table areas. To facilitate the presentation and evaluation of the alternatives, the FS report alternatives were reorganized to formulate the remedial alternatives discussed below.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

The remedial alternatives are:

#### **Soil/Wetland Sediment Alternatives**

# Alternative S-1: No Action

Capital Cost:	\$0
Annual Operation and Maintenance (O&M) Cost:	\$0
Present-Worth Cost:	\$0
Construction Time:	0 months

17

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative for soil does not include any physical remedial measures that address the problem of soil and sediment contamination at the Site.

Because this alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils and sediments.

# Alternative S-2: Building Demolition, Limited Excavation of Soils and Sediments, and On-Site Treatment of Soil via Ex-Situ Soil Vapor Extraction

Capital Cost:	\$3,939,000
Annual O&M Cost:	<b>\$</b> 0
Present-Worth Cost:	\$3,939,000
Construction Time:	12 months

This alternative consists of decontaminating and demolishing the main building to obtain access to all of the PCE-contaminated soils underneath, transport for treatment and disposal of the building debris at an off-Site Resource Conservation and Recovery Act (RCRA)-compliant disposal facility, excavation and off-Site disposal of approximately 2,200 cubic yards of PAH and arsenic-contaminated soils located on-Site to meet the commercial/industrial SCOs<sup>12</sup>, and excavation and on-Site treatment with ex-situ soil vapor extraction (ESVE) of approximately 8,400 cubic yards of PCE-contaminated source area soils and PCE-contaminated sediment and soil from the adjacent wetlands to meet the protection of groundwater SCO. Under the ESVE treatment process, a temporary on-Site aboveground fully enclosed system would be constructed to contain the excavated PCE-contaminated soil and sediment. Air would be forced through a series of pipes within the structure to volatilize the PCE. The extracted vapors would be treated by granular activated carbon and/or other appropriate technologies before being vented to the atmosphere.

Following the demolition of the building, contaminated soils remaining within the footprint of the building would be addressed as described above.

<sup>&</sup>lt;sup>12</sup> If the land use for the former facility property is changed from commercial to recreational, then the PAH- and arsenic-contaminated soils would be excavated to a depth of two feet, increasing the volume of excavated soil by 1,650 cubic yards.

Cleared vegetation would be disposed of at a nonhazardous waste landfill or could be mulched and used elsewhere on-Site.

While the actual period of operation of the ESVE system would be based upon sampling results that demonstrate that the affected soil and sediments have been treated to soil cleanup levels, it is estimated that the system would operate for a period of three years.

The excavated source areas would be backfilled with treated and untreated soil and sediment. An estimated 90 cubic yards of excavated soils which would not be suitable for treatment and backfilling would be disposed of at a RCRA-compliant disposal facility. A one-foot deep cover of clean soil would be applied where necessary to meet the commercial SCOs. The wetland areas that would be excavated would be backfilled with soil that meets the unrestricted SCOs.

Areas where residual PAH- and arsenic-contaminated soil would remain would also require the placement of a readily-visible and permeable subsurface demarcation delineating the interface between the residually-contaminated native and/or backfilled soils and the clean soil cover layer. These areas, totaling approximately 3.6 acres, would be seeded with grass to stabilize the soil. The disturbed wetland areas would also be restored.

Under this alternative, institutional controls in the form of an environmental easement and/or restrictive covenant would be used to prohibit future residential development/use of the former facility property and restrict intrusive activities in areas where residual contamination remains unless the activities are in accordance with an EPA-approved Site Management Plan (SMP).

The SMP would provide for the proper management of all post-construction remedy components. Specifically, the SMP would describe procedures to confirm that the requisite engineering (e.g., demarcation layer) and an institutional controls plan are in place and that nothing has occurred that would impair the ability of said controls to protect public health or the environment. The SMP would also include an excavation plan which details the provisions for management of future excavations in areas of remaining contamination; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of the above-noted environmental easement and/or restrictive covenant; a provision for the performance of the operation, maintenance, and monitoring required by the remedy; and a provision that the property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

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

Alternative S-3: Building Demolition, Limited Excavation of Sediments, Excavation of Soil, and Off-Site Treatment/Disposal

Capital Cost:	\$4,000,000
Annual O&M Cost:	\$0
Present-Worth Cost:	\$4,000,000
Construction Time:	9 months

This alternative is similar to Alternative S-2 except instead of treating the excavated soils and sediments on-Site using ESVE and using them for backfill, the excavated PCE-contaminated soil and sediment would be characterized and transported for treatment/disposal at an off-Site RCRA-compliant facility and the excavated PAH- and arsenic-contaminated soil would be used for backfill on-Site<sup>13</sup>.

To meet the commercial SCOs, the excavated areas would be covered with one foot of clean soil and would be seeded with grass to stabilize the soil. Areas where residual PAH- and arsenic-contaminated soil would remain above the commercial SCOs would also require the placement of a readily-visible and permeable subsurface demarcation layer delineating the interface between the residually-contaminated native and/or backfilled soils and the clean soil cover layer. The disturbed wetland areas would also be restored.

Similar to Alternative S-2, institutional controls in the form of an environmental easement and/or restrictive covenant would be used to prohibit future residential development/use of the former facility property and restrict intrusive activities in areas where residual contamination remains unless the activities are in accordance with an EPA-approved SMP.

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

<sup>&</sup>lt;sup>13</sup> The PCE-contaminated soils pose an exposure risk and are a source of groundwater contamination. Since the PAH- and arsenic-contaminated soils only pose an exposure risk (*i.e.*, they are not a source of groundwater contamination), once they are removed from the surface, they can be used as backfill at depth.

#### **Groundwater Alternatives**

Alternative GW-1: No Action

Capital Cost:	\$0
Annual O&M Cost:	\$0
Present-Worth Cost:	\$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative for groundwater would not include any physical remedial measures to address the groundwater contamination at the Site.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

# Alternative GW-2: Source Area Enhanced Bioremediation and Downgradient Monitored Natural Attenuation

Capital Cost:

\$806,700

Annual O&M Cost:

\$686,000 for the first year; \$57,000 annually thereafter

Present-Worth Cost:		\$2,365,000
Construction Time:	•	12 months

Groundwater data for the Site indicate that some level of natural biodegradation is occurring within the aquifer. This alternative would involve injecting reagents into the aquifer to enhance the natural degradation process in the source areas. Lower contaminant concentrations outside the source areas would be addressed through MNA<sup>14</sup>

<sup>&</sup>lt;sup>14</sup> MNA is the process by which a natural system's ability to attenuate contaminant(s) at a specific site is confirmed, monitored, and quantified. Contaminant concentrations may attenuate in natural systems through biodegradation, sorption, volatilization, radioactive decay, chemical or biological stabilization, transformation dispersion, dilution, and/or the destruction of contaminants (source:

For conceptual development of this alternative, it was assumed a supplemental carbon source (*e.g.*, hydrogen releasing compound) would be injected into the most contaminated portions of the groundwater (PCE concentrations greater than 10 times the MCL) at the center of the plume to stimulate bioactivity. For development of this alternative, spacing of injection points was conservatively estimated at 20 feet and the injection rate was estimated at 5 pounds per vertical foot of treatment zone per injection point. However, bench- and pilot-scale testing would be required to determine the nature of reagents necessary to stimulate biodegradation in the aquifer and determine the optimum strategy for introducing these materials.

Performance and compliance monitoring and testing would be performed during and after the injections to determine residual contaminant concentrations, assess the need for additional treatment, and monitor the natural attenuation of the contamination at the periphery of the plume.

The estimated time to implement this alternative, including bench- and pilot-scale testing, bidding, selecting a contractor, and initiating treatment of the high concentration source areas is 1 year. Multiple injections over several years would likely be necessary to sustain the enhanced biodegradation rates. Natural attenuation of the contamination at the periphery of the source areas would likely achieve the cleanup standards in 30 years.

Since the entire groundwater plume would not immediately achieve cleanup levels upon implementation of this alternative, an environmental easement would be required to prevent use of groundwater and would also require that future buildings on the Site either be subject to vapor intrusion study or be built with vapor intrusion mitigation systems in place until the cleanup criteria have been achieved throughout the entire area.

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

# Alternative GW-3: Source Area In-Situ Chemical Oxidation and Downgradient Monitored Natural Attenuation

Capital Cost:

Annual O&M Cost:

\$1,800,000

\$505,000 for first year; \$57,000 annually thereafter

Present-Worth Cost:

\$2,924,000

DER-10/Technical Guidance for Site Investigation and Remediation 1.3(b)(31)).

22

#### Construction Time:

#### 12 months

Under this alternative, an oxidizing agent would be injected into the contaminated groundwater at the source areas to chemically transform the VOCs into less toxic compounds or to carbon dioxide and water. Bench- and pilot-scale treatability studies would be performed to optimize the effectiveness of the injection system and to determine optimum oxidant delivery rates and locations for the injection-well points.

Lower contaminant concentrations outside the source areas would be addressed through MNA, a variety of *in-situ* processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. For this Site, these *in-situ* processes include degradation, dispersion, dilution, and adsorption.

For conceptual development of this alternative, it was assumed the oxidant would be injected into the most contaminated groundwater (PCE concentrations greater than 10 times the MCL) at the center of the plume. For development of this alternative, spacing of injection points was conservatively estimated at 10 feet due to the rapid reaction time of oxidants, and the injection rate was estimated at 10 pounds per vertical foot of treatment zone per injection point. However, actual injection spacing and rates for remediation would need to be determined from pilot-scale treatability studies.

Performance and compliance monitoring and testing would be performed during and after the injections to determine residual contaminant concentrations, assess the need for additional treatment, and monitor the natural attenuation of the contamination at the periphery of the plume.

For this alternative, it is anticipated that treatment of the high concentration source areas by oxidation would achieve cleanup standards in the source area over a very short treatment period (*i.e.*, 1 year). Natural attenuation of the contamination at the periphery of the source areas would likely achieve the cleanup standards in 30 years.

Since the entire groundwater plume would not immediately achieve cleanup levels upon implementation of this alternative, an environmental easement would be required to prevent use of groundwater and would also require that future buildings on the Site either be subject to vapor intrusion studies or be built with vapor intrusion mitigation systems in place until the cleanup criteria have been achieved throughout the entire area.

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

23

Alternative GW-4: Former facility property Source Area Groundwater Extraction and Treatment and Off-Property and Downgradient Monitored Natural Attenuation

Capital Cost:	\$5,404,000
Annual O&M Cost:	\$555,000
Present-Worth Cost:	\$13,987,000
Construction Time:	12 months

Under this alternative, six groundwater extraction wells would be installed to extract contaminated groundwater from the source area located on the former facility property. The source area located in the wetland and lower contaminant concentrations outside the source areas would be addressed through MNA.

The extracted water would be treated at an on-Site facility by air stripping, carbon adsorption, and methods appropriate for the treatment of metals. The treated water, which would meet applicable discharge requirements, would be discharged to surface water.

Air stripping involves pumping untreated groundwater to the top of a "packed" column, which contains a specified amount of inert packing material. The column receives ambient air under pressure in an upward direction from the bottom of the column as the water flows downward, transferring VOCs to the air phase. The air-stripping process would be followed by a groundwater polishing system using granular activated carbon and/or other appropriate technologies. To comply with New York State air guidelines, granular activated carbon treatment of the air stripper's air exhaust streams may be necessary.

Pilot testing, including pump tests, would be required to determine final pumping rates, well spacing, optimum well locations, well design, and treatment options.

In order to evaluate the performance of this alternative, periodic monitoring of the groundwater would be performed. Monitoring of the treatment system performance would also be required. The resulting data would be used to optimize the treatment process and evaluate the effectiveness of this remedial alternative.

It has been estimated that it would take thirty years to remediate the contaminated groundwater to federal and state standards under this alternative.

Since the entire groundwater plume would not immediately achieve cleanup levels upon implementation of this alternative, an environmental easement would be required to prevent use of groundwater and would also require that future buildings on the Site either be subject to vapor intrusion studies or be built with vapor intrusion mitigation systems in place until the cleanup criteria have been achieved throughout the entire area.

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

#### COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance.

The evaluation criteria are described below.

- <u>Overall protection of human health and the environment</u> addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- <u>Compliance with ARARs</u> addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.
- <u>Long-term effectiveness and permanence</u> refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
- <u>Reduction of toxicity, mobility, or volume through treatment</u> is the anticipated performance of the treatment technologies, with respect to these parameters, which a remedy may employ.
- <u>Short-term effectiveness</u> addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

- <u>Implementability</u> is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- <u>Cost</u> includes estimated capital, O&M, and present-worth costs.
- <u>State acceptance</u> indicates if, based on its review of the 2011 FS report and Proposed Plan, the State concurs with the preferred remedy at the present time.
- <u>Community acceptance</u> refers to the public's general response to the alternatives described in the 2011 FS report and Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria noted above follows.

# **Overall Protection of Human Health and the Environment**

Alternative S-1 would not be protective of human health and the environment, since it would not actively address the contaminated soil, which presents unacceptable risks of ecological exposure and is a source of groundwater contamination, which poses a human health risk. Alternatives S-2 and S-3 would be protective of human health and the environment, since both of the alternatives rely upon a remedial strategy or treatment technology capable of eliminating human and ecological exposure and removing the source of groundwater contamination.

Since Alternative GW-1 would rely on natural attenuation (a process which has been demonstrated to be occurring on-Site albeit slowly) to restore groundwater quality to drinking water standards, it would not be as protective as Alternatives GW-2, GW-3, and GW-4, which include active treatment of the groundwater either in-situ or ex-situ. The institutional controls under Alternatives GW-2, GW-3, and GW-4 would provide protection of public health until groundwater standards are met.

Under Alternative GW-1, the restoration of the groundwater would take a significantly longer time (estimated to be at least 100 years) in comparison to the other alternatives. All three of the active groundwater alternatives are estimated to restore groundwater quality significantly faster (approximately thirty years) and, therefore, would be protective of human health and the environment.

#### Compliance with ARARS

There are currently no federal or state promulgated standards for contaminant levels in sediments. There are, however, other federal or state advisories, criteria, or guidance (which are used as TBC criteria). Specifically, NYSDEC's sediment screening values are

a TBC criteria. Soil cleanup objectives were evaluated against NYSDEC's 6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6, effective December 14, 2006.

Since the contaminated soils and sediments would not be addressed under Alternative S-1, this alternative would not achieve the cleanup levels for soils and the sediment cleanup objectives.

Alternatives S-2 and S-3 would attain the cleanup levels for soils and the sediment cleanup objectives.

Both Alternative S-2 and S-3 would be subject to New York State and federal regulations related to the off-Site transportation of wastes.

Since Alternatives S-2 and S-3 would involve the excavation of contaminated soils and sediment, these alternatives would require compliance with fugitive dust and volatile organic compound emission regulations. In addition, this alternative would be subject to New York State and federal regulations related to the transportation and off-Site treatment/disposal of wastes. In the case of Alternatives S-2 and GW-4, compliance with air emission standards would be required for the ESVE and air stripper systems. Specifically, treatment of off-gases would have to meet the substantive requirements of New York State Regulations for Prevention and Control of Air Contamination and Air Pollution (6 NYCRR Part 200, *et seq.*) and comply with the substantive requirements of other state and federal air emission standards.

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10 NYCRR, Chapter 1), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). Although the groundwater at the Site is not presently being utilized as a potable water source, achieving MCLs in the groundwater is an applicable standard, because area groundwater is a source of drinking water.

Alternative GW-1 would not provide for any direct remediation of groundwater and would, therefore, rely upon natural processes to achieve chemical-specific ARARs. Alternatives GW-2, GW-3, and GW-4 would be more effective in reducing groundwater contaminant concentrations below MCLs, since they include active remediation of the contaminated groundwater source areas. Alternative GW-4 would also be subject to surface water discharge ARARs since treated water would be discharged into the Black River.

# Long-Term Effectiveness and Permanence

Alternative S-1 would involve no active remedial measures and, therefore, would not be effective in eliminating the potential exposure to contaminants in soil and would allow the continued migration of contaminants from the soil to the groundwater. Alternatives S-2 and S-3 would both be effective in the long term and would provide permanent remediation by removing the contaminated source area soils and contaminated wetland
sediment and either treat them on-Site or treat/dispose them off-Site.

Under Alternative S-2, pilot-scale treatability testing would be required to identify the configuration and number of vacuum extraction pipes within the treatment unit and to evaluate and characterize the extracted soil vapors and other performance parameters. These data would be used in the system design evaluation, and the system performance would be monitored with extracted vapor measurements and soil samples. Under Alternative S-2, the extracted vapors would be treated by granular activated carbon before being vented to the atmosphere. The granular activated carbon would have to be appropriately handled (off-Site treatment/disposal). Alternatives S-1 and S-3 would not generate such treatment residuals.

Both action alternatives would maintain reliable protection of human health and the environment over time.

Alternative GW-1 would be expected to have minimal long-term effectiveness, since it would rely upon natural attenuation to restore groundwater quality. Alternative GW-4 would generate treatment residues that would have to be appropriately handled; Alternatives GW-2 and GW-3 would not generate such residues.

#### Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative S-1 would provide no reduction in toxicity, mobility or volume. Under Alternative S-2, the toxicity, mobility, and volume of contaminants would be reduced or eliminated through on-Site treatment. Under Alternative S-3, the mobility of the contaminants would be eliminated by removing the VOC-contaminated soil from the former facility property and the toxicity would be reduced through treatment off-Site sediment (if necessary for disposal).

Alternative GW-1 would not effectively reduce the toxicity, mobility, or volume of contaminants in the groundwater, as this alternative involves no active remedial measures. This alternative would rely on natural attenuation to reduce the levels of contaminants, a process that has been slowly occurring at this site. Alternatives GW-2, GW-3, and GW-4, on the other hand, would reduce the toxicity, mobility, and volume of contaminants, thereby satisfying CERCLA's preference for treatment.

## Short-Term Effectiveness

Alternative S-1 does not include any physical construction measures in any areas of contamination and, therefore, would not present any potential adverse impacts to remediation workers or the community as a result of its implementation. Alternatives S-2 and S-3 could present some limited adverse impacts to remediation workers through dermal contact and inhalation related to excavation activities. Noise from the treatment unit and the excavation work associated with Alternatives S-2 and S-3, respectively, could

28

present some limited adverse impacts to remediation workers and nearby residents. In addition, interim and post-remediation soil sampling activities would pose some risk. The risks to remediation workers and nearby residents under all of the alternatives could, however, be mitigated by following appropriate health and safety protocols, by exercising sound engineering practices, and by utilizing proper protective equipment.

Since it is estimated that the on-Site treatment of the excavated soil and sediment with ESVE would require 3 years under Alternative S-2, the excavation would remain open until the soils could be backfilled. Therefore, the excavation would have to be secured to prevent on-Site worker injuries.

Alternative S-3 would require the off-Site transport of contaminated soil (approximately 350 truck loads), which would potentially adversely affect local traffic and may pose the potential for traffic accidents, which in turn could result in releases of hazardous substances.

For Alternatives S-2 and S-3, there is a potential for increased stormwater runoff and erosion during construction and excavation activities that would have to be properly managed to prevent or minimize any adverse impacts. For these alternatives, appropriate measures would have to be taken during excavation activities to prevent transport of fugitive dust and exposure of workers and downgradient receptors to PCE.

Since no actions would be performed under Alternative S-1, there would be no implementation time. It is estimated that Alternative S-2 would require three months to decontaminate and demolish the building, three months to construct the ESVE system, and six months to achieve the soil cleanup objectives. It is estimated that it would take require three months to decontaminate and demolish the building and three months to excavate and transport the contaminated soils to an EPA-approved treatment/disposal facility under Alternative S-3.

Alternative GW-1 would have no short-term impact to workers or the community and would have no adverse environmental impacts, since no actions would be taken. Alternatives GW-2, GW-3 and GW-4 might present some limited risk to remediation workers through dermal contact and inhalation related to groundwater sampling and injection activities. The installation of additional wells for the purpose of monitoring, groundwater extraction, and/or reagent injections would pose an additional risk to on-Site workers, since it would involve the installation of wells through potentially contaminated soils and groundwater. The risks to on-Site workers could, however, be minimized by utilizing proper protective equipment.

The time for implementing Alternative GW-2, including bench- and pilot-scale testing, bidding, selecting a contractor, and initiate treatment of the high concentration source areas, is estimated to be within 1 year of completion of the design. Multiple injections over several years would likely be necessary to sustain the enhanced biodegradation

rates. The overall duration of this remedy to achieve the cleanup criteria throughout the entire groundwater plume is estimated to be 30 years.

For Alternative GW-3, treatment of the high concentration source areas by oxidation may achieve cleanup standards in the source area over a very short treatment period (*i.e.*, 1 year). Natural attenuation of the contamination at the periphery of the source areas would likely achieve the cleanup standards in 30 years.

For Alternative GW-4, the total time for implementing this alternative, including design, testing, bidding, selecting a contractor and the installation of the groundwater extraction and treatment system, is estimated to be 2 years. The overall duration of this remedy to achieve the cleanup criteria throughout the entire groundwater plume is estimated to be 30 years.

#### Implementability

Alternative S-1 would be the easiest soil alternative to implement, as there are no activities to undertake.

Both Alternatives S-2 and S-3 would employ technologies known to be reliable and that can be readily implemented. Equipment, services, and materials needed for Alternatives S-2 and S-3 are readily available, and the actions under these alternatives would be administratively feasible. Sufficient facilities are available for the treatment/disposal of the excavated materials under Alternative S-3.

While soil excavation under Alternatives S-2 and S-3 is technically feasible, there are several site-specific complications related to this remedial approach. Since there would be insufficient room on the Site to create a significant excavation stockpile, it is likely that the excavation and backfilling would need to be performed incrementally. At the same time, post-excavation sampling and rapid turnaround analyses would need to be integrated into the process. There would be a need to monitor for PCE and dust during the excavation, especially since there are nearby homes.

Monitoring the effectiveness of the ESVE system under Alternative S-2 would be easily accomplished through soil and soil-vapor sampling and analysis. Under Alternative S-3, determining the achievement of the soil cleanup objectives could be easily accomplished through post-excavation soil sampling and analysis.

The implementation of institutional controls would be relatively easy to implement under Alternatives S-2 and S-3.

Alternative GW-1 would be the easiest to implement and would require no implementation time since it would not entail the performance of any activities. Alternatives GW-2, GW-3, and GW-4 would each take about 12 months to implement.

30

Equipment, services, and materials needed for all of the groundwater action alternatives are readily available and the actions under these alternatives would be administratively feasible. Groundwater injections and extraction and treatment systems similar to those that would be used under Alternatives GW-2, GW-3 and GW-4 have been implemented successfully at numerous sites to treat contaminated groundwater.

For Alternative GW-2, bench- and pilot-scale testing would be required to determine the nature of reagents necessary to stimulate biodegradation in the aquifer and determine the optimum strategy for introducing these materials. For Alternative GW-3, bench- and pilot-scale treatability studies would need to be performed to optimize the effectiveness of the injection system and to determine optimum oxidant delivery rates and locations for the injection-well points.

The implementation of institutional controls would be relatively easy to implement under Alternatives GW-2, GW-3 and GW-4.

There are considerable uncertainties in the potential radius of influence of injections for Alternatives GW-2 and GW-3. Furthermore, injection of the reagent slurry for Alternative GW-2 may be hindered by bridging across fractures and limited mobility in tight fractures. Alternative GW-3 would not be subject to these limitations. There are also considerable uncertainties in the number and location of extraction wells and the achievable groundwater extraction rate for treatment for Alternative GW-4. In addition, it may be difficult to maintain continuous operations of an active treatment system (Alternative GW-4) during the winter months in this remote location, and Alternative GW-4 would require more maintenance than Alternatives GW-2 or GW-3.

## Cost

The present-worth costs associated with the soil remedies are calculated using a discount rate of seven percent and a five-year time interval. The present-worth costs associated with the groundwater remedies are calculated using a discount rate of seven percent and a thirty-year time interval.

The estimated capital, O&M, and present-worth costs for each of the alternatives are presented below.

Alternative	Capital Cost	Annual O&M Cost	Total Present Worth Cost
S-1	\$0	\$0	\$0
S-2	\$3,939,000	\$0	\$3,939,000
S-3	\$4,000,000	\$0	\$4,000,000
GW-1	\$0	\$0	\$0
GW-2	\$806,700	\$686,000 for the first year and \$57,000 annually thereafter	\$2,365,000
GW-3	\$1,800,000	\$505,000 for the first year and	\$2,924,000

31

,		\$57,000 annually thereafter	
GW-4	\$5,404,000	\$555,000	\$13,987,000

As can be seen by the cost estimates, Alternative S-1 (no action) is the least costly soil/sediment alternative at \$0. Alternative S-3 (building demolition, limited excavation of sediments, excavation of soil, and off-Site treatment/disposal) is the most costly soil alternative at \$4,000,000. If the land use for the former facility property is changed from commercial to recreational before the design of the remedy is approved, then restricted residential SCOs would be utilized, which would allow for recreational use of the former facility property. Accordingly, the PAH- and arsenic-contaminated soils would be excavated to a depth of two feet and backfilled with clean soil. This change would result in the excavation of an additional 1,650 cubic yards of PAH- and arsenic-contaminated soils and would cost an additional \$12,543 for both Alternatives S-2 (building demolition, limited excavation of sediments, and excavation of soils with on-Site treatment via ex-situ soil vapor extraction) and S-3.

The least costly groundwater remedy is Alternative GW-1 (no action) at \$0. Alternative GW-4 (source area groundwater extraction and treatment and downgradient MNA) is the most costly groundwater alternative at an estimated cost of \$13,987,000.

### State Acceptance

NYSDEC concurs with the selected remedy; a letter of concurrence is attached (see Appendix IV).

## Community Acceptance

Comments received during the public comment period indicate that the public generally supports the selected remedy. These comments are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

## PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430 (a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or will present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of

alternatives, using the remedy-selection criteria that are described below. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

Elevated PCE concentrations in soil were found in five locations, primarily, adjacent to the northern and western corners of the main building in the west-northwestern portion of the former facility property (the highest concentration detected was 59,000 ug/kg). These source area soils are sources of contamination to the groundwater. The maximum concentration of PCE in the groundwater was 6,500 ug/L. Since the PCE in the source areas is highly mobile, cannot be reliably contained, and would present a significant risk to human health or the environment should exposure occur, it would constituent a principal threat waste.

Both soil/sediment Alternatives S-2 and S-3 address the PCE-contaminated soil and sediment through treatment and groundwater Alternatives GW-2, GW-3, and GW-4 address the source area groundwater contamination through treatment. Therefore, Alternatives S-2, S-3, GW-2, GW-3, and GW-4 meet the statutory preference for treatment of principal threat waste.

## SELECTED REMEDY

### Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative S-3, building demolition, limited excavation of sediments, excavation of soil, and off-Site treatment/disposal, and Alternative GW-3, source area in-situ chemical oxidation and downgradient MNA, best satisfy the requirements of CERCLA Section 121, 42 U.S.C. §9621, and provides the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, 40 CFR § 300.430(e)(9).

Alternative S-2 and Alternative S-3 would both effectively achieve the soil cleanup levels. While Alternative S-3 is slightly more expensive than Alternative S-2, Alternative S-2 would take substantially longer to achieve the soil cleanup level than Alternative S-3. In addition, since it is estimated that the on-Site treatment of the excavated soil and sediment with ESVE would require 3 years under Alternative S-2, the excavation would remain open until the soils could be backfilled. Therefore, the excavation would have to be secured to prevent on-Site worker injuries. Therefore, EPA believes that Alternative S-3 would effectuate the soil cleanup while providing the best balance of tradeoffs with respect to the evaluating criteria.

There are considerable uncertainties in the number and location of extraction wells and the achievable groundwater extraction rate for treatment for Alternative GW-4. In

addition, it may be difficult to maintain continuous operations of an active treatment system (Alternative GW-4) during the winter months in this remote location, and Alternative GW-4 would require more maintenance than Alternatives GW-2 or GW-3. In addition, Alternative GW-4 is significantly more expensive than the other two action alternatives. There are considerable uncertainties in the potential radius of influence of injections for Alternatives GW-2 and GW-3. Furthermore, injection of the reagent slurry for Alternative GW-2 may be hindered by bridging across fractures, and limited mobility in tight fractures. It is estimated that Alternative GW-3 would achieve groundwater standards in significantly less time than Alternatives GW-2 and GW-4. For these reasons, EPA has selected Alternative GW-3 as its groundwater alternative since it would effectuate the groundwater cleanup while providing the best balance of tradeoffs among the alternatives with respect to the evaluating criteria.

EPA has determined and NYSDEC agrees that the selected remedy (Alternatives S-3 and GW-3) is protective of human health and the environment; provides the greatest long-term effectiveness; is able to achieve ARARs more quickly than other alternatives; and is cost-effective. The selected remedy utilizes permanent solutions, alternative treatment technologies, and resource-recovery technologies to the maximum extent practicable. Furthermore, because air sparging/SVE and, if necessary, in-situ chemical oxidation will be performed, the selected remedy meets the statutory preference for the use of treatment as a principal element.

## Description of the Selected Remedy

The selected remedy to address the source areas and contaminated groundwater includes the following components<sup>15</sup>:

- Decontamination and demolition of the main building;
- Excavation of PAH- and arsenic-contaminated soil to a depth of one foot<sup>16</sup> and excavation of PCE-contaminated soils to a depth of four feet<sup>17</sup>;

<sup>17</sup> Approximately 2,200 cubic yards of PAH and arsenic-contaminated soils and 8,400 cubic yards of PCE-contaminated soils and sediment would be excavated. If the land use for the former facility property is changed from commercial to recreational, then the estimated volume of PAH- and arsenic-contaminated soils that would be excavated would increase by 1,650 cubic yards.

<sup>&</sup>lt;sup>15</sup> See Figures 7 and 8 for illustrations of the selected remedy.

<sup>&</sup>lt;sup>16</sup> If the land use for the former facility property is changed from commercial to recreational before the design of the remedy is approved, then the PAH- and arsenic-contaminated soils will be excavated to a depth of two feet.

- Excavation of contaminated soils remaining within the footprint of the building as described above;
- Excavation of PCE-contaminated sediment and soil from the adjacent wetlands to meet the protection of groundwater SCO.
- Transportation for treatment/disposal of the building debris and the PCEcontaminated soils and sediments at an off-Site Resource Conservation and Recovery Act-compliant facility;
- Utilization of the excavated PAH- and arsenic-contaminated soils as backfill to a depth of not less than 1 foot below ground surface (bgs)<sup>18</sup> in the areas where PCE-contaminated soil will be excavated and in the footprint of the building;
- Backfilling with clean soil those areas where residual PAH- and arseniccontaminated soil will remain after the installation of a readily-visible and permeable subsurface demarcation delineating the interface between the residually-contaminated native soils and the clean backfill;
- Backfilling the excavated wetland areas with soil that meets the unrestricted SCOs;
- Injection of an oxidizing agent into the contaminated groundwater at the source areas;
- Utilization of MNA for the groundwater with lower contaminant concentrations located outside the source areas;
- Utilization of institutional controls in the form of an environmental easement/restrictive covenant in the property records of Jefferson County to, at a minimum, restrict the use of the former facility property to commercial and industrial uses, unless the use is changed to recreational<sup>19</sup>, restrict intrusive activities in areas where residual contamination remains unless the activities are in accordance with an EPA-approved SMP (see below), and restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the New York State Department of Health or the County Department of Health<sup>20</sup>; and
- Development of an SMP that will provide for the proper management of all postconstruction remedy components<sup>21</sup>.

<sup>19</sup> If the land use for the former facility property is changed from commercial to recreational before the design of the remedy is approved, then the environmental easement/restrictive covenant will allow recreational, commercial, or industrial use of the property as defined by 6 NYCRR Part 375-1.8(g). The land use will, however, be subject to local requirements.

<sup>20</sup> The property owner will be responsible for implementing and maintaining the institutional controls and NYSDEC will be responsible for enforcing them.

<sup>21</sup> The SMP will describe procedures to confirm that the requisite engineering (subsurface demarcation) and a plan for institutional controls (*i.e.*, environmental easement/restrictive covenant) are in place and that nothing has occurred that will impair the ability of said controls to protect public health or the environment. The SMP will also include a soil management plan, an

<sup>&</sup>lt;sup>18</sup> The excavated PAH- and arsenic-contaminated soils will be utilized as backfill to a depth of not less than 2 feet bgs if the land use is changed to recreational.

During the design, a Phase 1B Cultural Resources Survey will be performed to document the Site's historic resources.

During the design, samples will be collected to define the limits of the soil and sediment excavation. During the design, the building located in the rear of the former facility property will be assessed to determine whether it contains any hazardous substances. If hazardous substances are present and the building can be safely accessed, then the building will be decontaminated. If the building cannot be safely accessed, then it will be demolished and the debris will be decontaminated, if necessary, and disposed of off-Site.

Bench- and pilot-scale treatability studies will be performed during the design to optimize the effectiveness of the injection system and to determine optimum oxidant delivery rates and locations for the injection-well points.

Performance and compliance monitoring and testing will be performed during and after the oxidizing agent injections to determine residual contaminant concentrations, assess the need for additional treatment, and monitor the natural attenuation of the contamination at the periphery of the plume.

The environmental benefits of the selected remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy and NYSDEC's Green Remediation Policy<sup>22</sup>. This will include consideration of green remediation technologies and practices.

If, in the future, structures are proposed to be built on the former facility property or any existing buildings are reoccupied, as required by the SMP, a soil vapor intrusion evaluation and vapor intrusion mitigation systems may be needed until the cleanup criteria have been achieved.

Because this remedy will result in contaminants remaining on-Site that exceed acceptable health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by the review, additional response actions may be implemented.

### Summary of the Estimated Remedy Costs

inventory of any use restrictions, the necessary provisions for the implementation of the requirements of the above-noted environmental easement and/or restrictive covenant; a provision for the performance of the operation, maintenance, and monitoring required by the remedy; and a provision that the property owner submit periodic certifications that the institutional and engineering controls are in place.

<sup>22</sup> See http://epa.gov/region2/superfund/green\_remediation and http://www.dec.ny.gov/docs/ remediation\_hudson\_pdf/der31.pdf.

The estimated capital, annual O&M, and total present-worth costs (using the federal standard 7% discount rate) for the selected remedy are \$5.8 million, \$57,000, and \$6.9 million, respectively. If the land use for the former facility property is changed from commercial to recreational before the design of the remedy is approved, then restricted residential SCOs would be utilized, which would allow for recreational use of the former facility property. Accordingly, the PAH- and arsenic-contaminated soils would be excavated to a depth of two feet and backfilled with clean soil. This change would result in the excavation of an additional 1,650 cubic yards of PAH- and arsenic-contaminated soils for the cost estimates for Alternatives S-3 and GW-3.

It should be noted that these cost estimates are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual project cost. These cost estimates are based on the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedy.

## **Expected Outcomes of the Selected Remedy**

Land use associated with the former facility property is anticipated to change as a result of the implementation of the selected remedy. Although the former facility property was previously used for industrial purposes and the current usage is commercial, the Village intends to develop a community park on the former facility property once it is remediated and available for reuse. The Mayor of Herrings and the Supervisor of the Town of Wilna are currently pursuing several options to acquire the privately-owned property and effect a change to the land use.

The results of the risk assessment indicates that the PAH, benzo(a)pyrene, poses an excess lifetime cancer risk above the EPA reference cancer risk range. PCE in the soil serves as a source of contamination to the groundwater. All scenarios involving the use of groundwater as a drinking water source showed considerably elevated risks, due primarily to the presence of PCE in the groundwater. Under the selected remedy, the removal of the PAH- and arsenic-contaminated soils will eliminate the excess lifetime cancer risk. The removal of the PCE-contaminated soils, which will eliminate the source of the groundwater contamination, in combination with groundwater treatment in the source areas and natural attenuation in downgradient areas, will result in the restoration of water quality in the aquifer.

Potable water for the former facility property is currently obtained from the public-supply well system. Therefore, it is not anticipated that achieving the cleanup levels will alter groundwater use in the future. The remedial action is expected to restore groundwater quality to allow future uses for drinking, and should reduce the potential for contaminant

releases to lead to vapor intrusion exposures in buildings which exist now, or may in the future.

Under the selected remedy, it is estimated that it will require nine months to achieve soil cleanup levels, 1 year to achieve cleanup standards in the source area, and thirty years to achieve groundwater standards in downgradient areas.

## STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site.

For the reasons discussed below, EPA has determined that the selected remedy meets these statutory requirements.

#### Protection of Human Health and the Environment

The results of the risk assessment indicate that, if no action is taken, the hypothetical future use of the groundwater at the Site will pose an unacceptable increased future cancer risk.

The selected remedy will reduce exposure levels to protective ARAR levels or to within EPA's generally acceptable risk range of 10<sup>-4</sup> to 10<sup>-6</sup> for carcinogenic risk and below the HI of 1 for noncarcinogens in the soils, sediments, and groundwater. The implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts that cannot be mitigated. The selected remedy will be protective of human health and the environment in that the excavation and off-Site treatment/disposal of the PCE-contaminated soil and sediment will eliminate the source of the groundwater contamination and in-situ groundwater treatment, in combination with natural attenuation, will eventually achieve groundwater standards. Combined with institutional controls, the selected remedy will provide protectiveness of human health and the environment over both the short- and long-term.

## Compliance with ARARs and Other Environmental Criteria

A summary of the ARARs and "Other Criteria, Advisories, or Guidance TBCs" that will be complied with during implementation of the selected remedy and the amended 1994-ROD groundwater remedy, is presented below.

- Clean Air Act, National Ambient Air Quality Standards (40 CFR 50)
- Groundwater Quality Regulations (6 NYCRR Parts 700-705)
- National Primary Drinking Water Standards (MCLs and non-zero maximum contaminant level goals) (40 CFR 141)
- National Environmental Policy Act (40 CFR 1500 to 1508)
- National Emissions Standards for Hazardous Air Pollutants (40 CFR Parts 51, 52, 60, and 61)
- New York State Department of Health Drinking Water Standards (10 NYCRR Part 5)
- New York State Regulations for Prevention and Control of Air Contamination and Air Pollution (6 NYCRR Part 200)
- New York State Drinking Water Standards (NYCRR Part 5)
- New York State Air Cleanup Criteria, January 1990
- New York State Department of Environmental Conservation, Environmental Remediation Programs (6 NYCRR Part 375, Subpart 375-6)
- New York State Department of Environmental Conservation Guidelines for the Control of Toxic Ambient Air Contaminants, DAR-1, November 12, 1997
- New York Air Quality Standards (6 NYCRR Part 257)
- New York State Department of Environmental Conservation, Technical and Operational Guidance Series 1.1.1, November 1991
- Safe Drinking Water Act Proposed MCLs and nonzero MCL Goals

### Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP §300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness (discussed above) to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost-effective in that it is the least-cost action alternative and would achieve the remediation goals in the same amount of time in comparison to the more costly alternatives.

Each of the alternatives underwent a detailed cost analysis. In that analysis, capital and annual O&M costs were estimated and used to develop present-worth costs. In the present-worth cost analysis, annual O&M costs were calculated for the estimated life of the groundwater alternatives using a 7% discount rate and a 30-year interval. The estimated capital, annual O&M, and total present-worth costs for the selected remedy are \$5,800,000, \$57,000, and \$6,924,000, respectively. If the land use for the former facility property is changed from commercial to recreational, the capital and present-worth costs would increase by \$12,543.

Both soil/sediment Alternatives S-2 and S-3 would effectively achieve the soil cleanup levels. Although Alternative S-3 is more expensive than Alternative S-2, Alternative S-2 would take considerably longer to achieve the soil cleanup level than Alternative S-3.

While there are uncertainties in the potential radius of influence of injections for Alternatives GW-2 and GW-3, it may be difficult to maintain continuous operations of an active treatment system (Alternative GW-4) during the winter months in this remote location. In addition, Alternative GW-4 is significantly more costly than the other two action alternatives. Although Alternative GW-3 is approximately \$1 million more expensive than Alternative GW-2, it would achieve groundwater standards at the source areas in significantly less time than Alternatives GW-2 and GW-4. For these reasons, EPA believes that the cost of this alternative is proportional to its overall effectiveness.

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

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B), such that it represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Site.

The soil component of the selected remedy will employ off-Site treatment to reduce the toxicity, mobility, and volume of the PCE-contaminated soil and sediment in the source areas. The selected remedy will permanently address this soil contamination.

With regard to the groundwater, the selected remedy will provide a permanent remedy and will employ a treatment technology to reduce the toxicity, mobility, and volume of the contaminants in the groundwater.

### Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied under the selected remedy in that contaminated soils and sediments will be treated at an off-Site facility and in-situ treatment of the contaminated groundwater at the source areas will be used to reduce the toxicity, mobility, and volume of contamination and achieve cleanup levels.

#### Five-Year Review Requirements

The selected remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that will allow for unlimited use and unrestricted exposure. Therefore, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

## **DOCUMENTATION OF SIGNIFICANT CHANGES**

The Proposed Plan, released for public comment on December 12, 2011, identified Alternative S-3, building demolition, limited excavation of sediments, excavation of soil, and off-Site treatment/disposal, as the preferred soil remedy. For the preferred groundwater remedy, it identified Alternative GW-3 source area in-situ chemical oxidation and downgradient MNA. Based upon its review of the written and verbal comments submitted during the public comment period, EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

## CROWN CLEANERS OF WATERTOWN, INC. SUPERFUND SITE RECORD OF DECISION

## APPENDIX I

## **FIGURES**

## SUMMARY OF FIGURES

- Figure 1: Site Location
- Figure 2: Site Map
- Figure 3: Isoconcentration Contour Extent of PCE in Upper Unit Groundwater
- Figure 4: Extent of Soil Contamination
- Figure 5: Site Conceptual Model (West to East)
- Figure 6: Site Conceptual Model (North to South)
- Figure 7: Soil and Sediment Excavation Areas
- Figure 8: Groundwater Remedy





H: \asi\asigy\asimouti\asimouti\ana crown cleaning\post-nirs malmes\ste war malmelons



H: VOIS/OISKEY/OISPROUSI/EPA CROWN CLEANERS/VOI FIGURES/AUGUST 2011/FIGURE 4-7C GW 2011 PCE IN UPPER UNIT CONTOUR OB1011.DWG





N: \GIS\GISKEY\GISPROJ31\EPA CROWN CLEANERS\RI FIGURES\AUGUST 2011\FIGURE 7-1 SCM E-W 012312.DWG



N: \GIS\GISKEY\GISPROJ31\EPA CROWN CLEANERS\RI FIGURES\AUGUST 2011\FIGURE 7-2 SCM N-S 012312.DWG





## CROWN CLEANERS OF WATERTOWN, INC. SUPERFUND SITE RECORD OF DECISION

## APPENDIX II

## TABLES

## SUMMARY OF TABLES

- Table 1:Groundwater Data
- Table 2:Soil Data Tables
- Table 2A: Surface Soil Data
- Table 2B: Subsurface Soil Data
- Table 2C: Off-site Surface Soil Data
- Table 2D: On-site Surface SVOC Soil Data
- Table 2E: On-site Subsurface SVOC Soil Data
- Table 3:Sediment Data
- Table 4: Risk Assessment Tables A-E
- Table 4A:Summary of Chemicals of Concern and Medium-Specific Exposure Point<br/>Concentrations
- Table 4B: Non-Cancer Toxicity Data Summary
- Table 4C:
   Cancer Toxicity Data Summary
- Table 4D:
   Risk Characterization Summary:
   Noncarcinogens
- Table 4E:
   Risk Characterization Summary:
   Carcinogens
- Table 5:
   Cleanup Levels for Chemical of Concern
- Table 6:Capital Costs
- Table 7:Present-Worth Costs

## Table 1 (Sheet 1 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW01S	MW01S	MW01S	MW01S	MW01S	MW01S	MW01S	MW01S	MW01D	MW01D	MW01D	MW01D	MW01D	MW01D	MW01D
DATE	9/1/2004	12/5/2006	9/15/2009	9/15/2009	9/15/2009	7/7/2011	7/7/2011	7/7/2011	9/1/2004	12/5/2006	9/15/2009	9/15/2009	9/15/2009	7/7/2011	7/7/2011
AOUIFER DESIGNATION	UC/MC	UC/MC	UC/MC	UC/MC	UC/MC	UC/MC	UC/MC	UC/MC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC
METHODOLOGY	LF	LF	DB	DB	DB	DB	DB	DB	LF	LF	DB	DB	DB	DB	DB
Volatile Organics (ug/L)		<u> </u>													
1 1 1-Trichloroethane	_						_	- 1		-					
1 1 2-Trichloro-1 2 2-trifluoroethane						NA	NA	NA						NA	NA
1 1-Dichloroethane	-						-								
1 1-Dichloroethene															
1,7-Dichlorobenzene		<u> </u>													
1,2-Dichlorosthane															
7 Butmone						NA	NA NA	 NA						NA	NA
2-Dutatione						NA	NA	NA						NA	NA
A Mathul 2 partemane		<u> </u>			<u> </u>	NA NA	NA NA	NA		<u>_</u>				NA	NA
4-Meury1-2-pentanone		<u> </u>				NA	NA	NA	<u> </u>		61.8		66	NA	NA
Acetone		<u> </u>	10		02	NA		NA				00	<u> </u>		
Benzene															R R
Bromomethane						<u>^</u>		<u>_</u>							<u> </u>
Corbon digulfide		<u> </u>			<u> </u>		<u> </u>				<u> </u>			<u> </u>	<u> </u>
Chloroform		<u> </u>							021						<u> </u>
Chloromethene									0,2 5	<u> </u>		<u> </u>			
circl 2 Dichloroethene															
cis-1,2-Dichloropropene		<u> </u>													
Cyclobezane						NA	NA	NA						NA	NA
Methyl Acetate						NA	NA	NA						NA	NA -
Methyl tert-butyl ether															
Tetrachloroethene		<u> </u>													<u> </u>
Toluene					19							14	14	1.16	1.05
trans-1 2-Dichloroethene							<u> </u>								
Trichloroethene									<u> </u>						<u> </u>
Vinyl chloride															
Semi-Volatile Organics (ug/L)			L		L		L			L	L			L	L
Bis(2-ethylberyl)nhthalate		1 2	NA	NA	NA NA	NA	NA	NA		<u> </u>	NA	NA	NA	NA	NA
Caprolactam		<u> </u>	NA	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA
Isophorone	-		NA	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA
Nanhthalene			NA	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA
Phenol			NA	NA	NA NA	NA	NA	NA	f <u>-</u>		NA	NA	NA	NA	NA NA
Pesticides (ug/I)							L.,			L		·		L	
alpha-Chlordane		1	NA	NA	NA NA	NA	NA	NA			NA	NA	NA NA	NA	NA
beta-BHC			NA	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA
Metals and ('vanide (ug/l.)	·				L • • 2 \$	h				۹ <u>ــــــ</u> ۰	L		L		
Aluminum	_	-	NA	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA
Antimony		1 ~~	NA	NA	NA	NA	NA	NA			NA	NA	I NA	NA	NA
Arsenic	-	<u> </u>	NA	NA	NA	NA	NA	NA		<u> </u>	NA	NA	NA	NA	NA
Barium	-	1 _	NA	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA
Beryllium	_		NA	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA
Cadmium	-	-	NA	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA

## Table 1 (Sheet 2 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW01S	MW01S	MW01S	MW01S	MW01S	MW01S	MW01S	MW01S	MW01D	MW01D	MW01D	MW01D	MW01D	MW01D	MW01D
DATE	9/1/2004	12/5/2006	9/15/2009	9/15/2009	9/15/2009	7/7/2011	7/7/2011	7/7/2011	9/1/2004	12/5/2006	9/15/2009	9/15/2009	9/15/2009	7/7/2011	7/7/2011
AQUIFER DESIGNATION	UC/MC	UC/MC	UC/MC	UC/MC	UC/MC	UC/MC	UC/MC	UC/MC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC
METHODOLOGY	LF	LF	DB	_DB	DB	DB	DB	DB	LF	LF	DB	DB	DB	DB	DB
Calcium	92000	77400	NA	NA	NA	NA	NA	NA	46000	58000	NA	NA	<u>NA</u>	NA	NA
Chromium	-	1.4 J	NA	NA	NA	NA	NA	NA	-	1.9 J	NA	NA ·	NA	NA	NA
Cobalt	-	-	NĀ	NA	NA	NA	NA	NA	1	1	NA	NA	NA	NA	NA
Copper		-	NA	NA	NA	NA	NA	NA		-	NA	NA	NA	NA	NA
Iron		-	NA	NA	NA	ŇA	NA	NA	-	-	NA	NĀ	NA	NĂ	NA
Lead	+	-	NA _	NA	NA	NA	NA	<u>NĀ</u>	-	1	NA	NA	NA	NA	NA
Magnesium	8200	6600	ŇA	NA	NĂ	<u>NĀ</u>	NA	NA	17000	10100	NA	NA	NA	NĂ	NĂ
Manganese			NA	NA	NA	NA	NA	NA			NA	NA	NA	NA	NA
Mercury			NA	NA	NA	NA	NA	NA	-		NA	NA	NA	NA	NA
Nickel			NA	NA	NA	NA	NA	NA	-	-	NA	NA	NA	NĀ	NA
Potassium		<u>5</u> 70 J	NA	NA	NA	NA	NA	NĀ	-	2510 J	NA	NA	NA	NA	NA
Selenium	-		NA	NA	NA	NA	NA	NA		1	NA	NA	NA	NA	NA
Sodium	5900	5070 J	NA	NA	NA	ŇĂ	NA	NĀ	12000	6680	NA	NA	NA	NA	NA
Vanadium		-	NA	NA	NA	NA	NA	NA		-	NA	NĂ	NA	ŇA	NA
Zinc		-	NA	NA	NA	NA	NA	NA		9.7 J	NA	NA	NA	NA	NA
Cyanide	-		NA	NĂ	NA	NA	NA	NA			NA	NA	NA	NA	NA

#### Notes are provided on Page 43.

.

## Table 1 (Sheet 3 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW02S	MW02S	MW02S	MW02S	MW02S	MW02S	MW02S	MW02D	MW02D	MW02D
DATE	9/13/2004	9/13/2004	12/14/2006	12/14/2006	9/15/2009	9/15/2009	7/7/2011	9/14/2004	9/15/2004	12/19/2006
				Duplicate ·						
AOURFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	uc	UC
METHODOLOGY	LF	Bailer	LF	LF	DB	LF	LF	LF	LF	LF
Volatile Organics (ug L)			·····			· · · · · · · · · · · · · · · · · · ·				
1.1.1-Trichloroethane	0.4 J	0.27 J	0.35 J	0.32 J			_	-	NA	
1,1,2-Trichloro-1,2,2-trifluoroethane		-	-	-			NA		NA	
1.1-Dichloroethane		~	-	-			_		NA	
1,1-Dichloroethene	0.1 J						-		NA	
1,2-Dichlorobenzene		-							NA	
1.2-Dichloroethane		-	_	-			-		NA	-
2-Butanone	-			-		-	NA		NA	
2-Hexanone		-	-				NA		NA	
4-Methyl-2-pentanone		-		-			NA		NA	
Acetone		-	-	-	66		NA	2.8 J	NA	
Benzene			-				-		NA	-
Bromoform		-					R		NA	
Bromomethane	-	-				1.7 K			NA	
Carbon disulfide		2.8	-	-					NA	
Chloroform				-					NA	-
Chloromethane		-	-				-	0.15 J	NA	
cis-1,2-Dichloroethene	6.9 J	5.5	3.3	3	3.7	5,5	24.7 J	8,4	NA	2.3
cis-1,3-Dichloropropene	-	-	-	-					NA	
Cyclohexane				-			NA		NA	
Methyl Acetate							NA	R	NA	
Methyl tert-butyl ether	-			-	-		-	0.14 J	NA	-
Tetrachloroethene	1500 DB	1500 DB	1000	1000 D	290 L	550	412 J	69	NA	20
Toluene		-	0.76	-			_		NA	
trans-1,2-Dichloroethene		-	-	_			-	0.27 J	NA	0.11 J
Trichloroethene	9.1	8.8	8.6	8.4	9.3 L	8.2	10.4 J	0.79	NA	0.25 J
Vinyl chloride		-		-			0.72 J		NA	
Semi-Volatile Organics (ug/L)										
Bis(2-ethylhexyl)phthalate		NA		-	NA	NA	NA		NA	
Caprolactam		NA		1	NA	NA	NA		NA	-
Isophorone		NA	-	+	NA	NA	NA	· _	NA	
Naphthalene		NĂ	-		NA	NA	NA	R	NA	
Phenol		NA			NA	NA	NA		NA	
Pesticides (ug/L)										
alpha-Chlordane		NA	-	-	NA	NA	NA NA	NA	0.012 J	
beta-BHC	0.016 JN	NA	-	-	NA	NA	NA	NA	R	
Metals and Cyanide (ug/L)									,	
Aluminum	-	NA	-	-	NA	NA	NA		NA	
Antimony		NA	_	-	NA	NA	NA		NA	
Arsenic		NA		_	NA	NA	NA		NA	
Barium		NA	109 J	108 J	NA	NA	NA		NA	
Beryllium		NA	-		NA	NA	NA	-	NA	
Cadmium	-	NA			NA	NA	NA	_	NA	

•

 

 Table 1
 (Sheet 4 of 43)

 Summary of Detected Constituents in Groundwater

 Crown Cleaners of Watertown, Inc.

 Village of Herrings, Jefferson County, New York

SITE	MW02S	MW02S	MW02S	MW02S	MW02S	MW02S	MW02S	MW02D	MW02D	MW02D
DATE	9/13/2004	9/13/2004	12/14/2006	12/14/2006	9/15/2009	9/15/2009	7/7/2011	9/14/2004	9/15/2004	12/19/2006
				Duplicate						
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	LF	Bailer	LF	LF	DB	LF	LF	LF	LF	LF
Calcium	79000	NA	60100	59900	NA	NA	NA	23000	NA	17100
Chromium	-	NA	1	1	NA	NA	NA	-	NA	\$
Cobalt	-	NA	1	+	NA	NA	NĂ	-	NA	1
Copper		NA	1	+	NA	NA	NA	-	NA	
Iron	-	NA	-	-	NA	NA	NA	-	NA	1
Lead		NA	-	1	NA	NA	NA	-	NA	1
Magnesium	7500	ŇA	6550	6520	NA	NA	NA		NA	160 J
Manganese		NA	1	-	NA	NA	NA	-	NA	1
Mercury		NA	1	-	NA	NA	NA	-	NA	*
Nickel		NA	-	-	NA	NA	NA		NA	1
Potassium		NA	1320 J	1340 J	NA	NA	NA	5700	NA	4160 J
Selenium		NA	1	-	NA	NA	NA	-	NA	-
Sodium	240000	NA	172000	171000	NA	NA	NA	110000	NA	81000
Vanadium		NA	-		NA	NA	NA		NA	1
Zinc		NA	-		NA	NA	NA	-	NA	-
Cyanide	-	ŇA	-	-	NA	NA	NA	NA		

.

Notes are provided on Page 43.

.

# Table 1 (Sheet 5 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

.

SITE	MW03S	MW03S	MW03S	MW03S	MW03S	MW03S	MW03S	MW03D	MW03D	MW03D	MW03D	MW03D	MW03D
DATE	9/2/2004	9/3/2004	12/1/2006	12/11/2006	9/15/2009	9/15/2009	7/6/2011	9/9/2004	12/6/2006	9/15/2009	9/15/2009	7/6/2011	7/6/2011
						Duplicate							1
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	Pump/Bailer	Pump/Bailer	DB	LF	DB	DB	DB	LF	LF	DB	DB	DB	DB
Volatile Organics (ug/L)													
1,1,1-Trichloroethane	-	NA			-				-			-	-
1,1,2-Trichloro-1,2,2-trifluoroethane	-	NA		0.14 J	-		NA		-			NA	NA
1,1-Dichloroethane		NA	-	-			**						-
1,1-Dichloroethene	-	NA		-							<del></del>	-	-
1,2-Dichlorobenzene	-	NA	-								-	-	-
1,2-Dichloroethane	-	NA	-					-		0,88	*-		
2-Butanone	-	NA	-	-	-		NA					NA	NA
2-Hexanone	-	NA	<u>3.7 J</u>	-			NA	-				NA	NA
4-Methyl-2-pentanone		NA	-	-	-		NA					NA	NA
Acetone	-	NA	-	-	60	62	NA			61	68	NA	NA
Benzene	-	NA	-	-	-	-			-				-
Bromoform	1	NA	-	-	-	-	R	-		+	-	R	R
Bromomethane	-	NA	-	-	-		-			-			-
Carbon disulfide	~	NA	1	-	-	-				~		+	-
Chloroform	-	NA	-	-	-							-	-
Chloromethane	-	NA	-	0.12 J	-	-				-		-	
cis-1,2-Dichloroethene	-	NA	-	-	-		-	-	1		-	-	-
cis-1,3-Dichloropropene	-	NA	-	-			-	0 15 J				-	-
Cyclohexane		NA	0.16 J	-			NA			0.58 K		NA	NA
Methyl Acetate		NA	-	-	-		NA				-	NA	NA
Methyl tert-butyl ether	-	NA	-	-								-	-
Tetrachloroethene	-	NA	-	-	-			-		-		-	-
Toluene		NA	-	-			-	-		2.9	0.71		
trans-1,2-Dichloroethene		NA		-								-	
Trichloroethene	<u> </u>	NA	-	-	-		<u> </u>						-
Vinyl chloride		NA	-	-	-						1.7		1.03
Semi-Volatile Organics (ug/L)													
Bis(2-ethylhexyl)phthalate	NA		NA		NA	NA	NA			NA	NA	NA	NA
Caprolactam	NA	-	NA		NA	NA	NA	-		NA	NA	NA	NA
Isophorone	NA		NA	-	NA	NA	NA			NA	NA	NA	NA
Naphthalene	NA	-	NA	-	NA	NA	NA			NA	NA	NA	NA
Phenol	NA	-	NA		NA	NA	NA	-	-	NA	NA	NA	NA
Pesticides (ug/L)													
alpha-Chlordane	NA		NA		NA	NA	NA		-	NA	NA	NA	NA
beta-BHC	NA	-	NA	-	NA	NA	NA		-	NA	NA	NA	NA
Metals and Cyanide (ug/L)													
Aluminum	NA	-	NA	-	NA	NA	NA	-		NA	NA	NA	NA
Antimony	NA	-	NA	-	NA	NA	NA			NA	NA	NA	NA
Arsenic	NA	-	NA	-	NA	NA	NA	-		NA	NA	NA	NA
Barium	NA	410	NĂ	370	NA	NA	NA	370	-	NA	NA	NA	NA
Beryllium	NA	-	NA	-	NA	NA	NA	-		NA	NA	NA	NA
Cadmium	NA		NA		NĂ	NA	NA	-		NA	NA	NA	NA

## Table 1 (Sheet 6 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW03S	MW03S	MW03S	MW03S	MW03S	MW03S	MW03S	MW03D	MW03D	MW03D	MW03D	MW03D	MW03D
DATE	9/2/2004	9/3/2004	12/1/2006	12/11/2006	9/15/2009	9/15/2009	7/6/2011	9/9/2004	12/6/2006	9/15/2009	9/15/2009	7/6/2011	7/6/2011
						Duplicate		1		1	ł		1
AQUIFER DESIGNATION	UC	υc	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	Pump/Bailer	Pump/Bailer	DB	LF	DB	DB	DB	LF	LF	DB	DB	DB _	DB
Calcium	NA	190000	NA	177000	NA	NA	NA	80000	54600	NA	NA	NA	NA
Chromium	NA	-	NĀ	-	NA	NA	NA			NA	NA	NA	NA
Cobalt	NA		NA	-	NA	NA	NA			NA	NA	NA	NA
Copper	NA	_	NA	-	NA	NA	NA		-	NA	NA	NA	NA
Iron	NA	1700	NA	1410	NA	NA	NA			NA	NA	NA	NA
Lead	NA	'	NA	-	NA	NA	NA			NA	NA	NA	NA
Magnesium	NA	26000	NA	22300	NA	NA	NA	14000	9750	NA	NA	NA	NA
Manganese	NA	1000	NA	666	NA	NA	NA			NA	NA	NA	NA
Mercury	NA	-	NA	-	NA	NA	NA		-	NA	NA	NA	NA
Nickel	NA		NA	-	NA	NA	NA	-		NA	NA	NA	NA
Potassium	NA	-	NA	3840 J	NA	NA	NA		1770 J	NA	NA	NA	NA
Selenium	NA	-	NA	-	NA	NA	NA			NA	NA	NA	NA
Sodium	NA	330000	NA	280000	NA	NA	NA	72000	15600	NA	NA	NA	NA
Vanadium	NA		NA	-	NA	NA	NA	-		NA	NA	NA	NA
Zinc	NA	-	NA	9.3 J	NA	NA	NA			NA	NA	NA	NA
Cyanide	NA	-	NA	-	NA	NA	NA		<u>5.7 J</u>	NA	NA	NA	NA

.

Notes are provided on Page 43.

.

## Table 1 (Sheet 7 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

•

.

SITE	MW04S	MW04S	MW04S	MW04S	MW045	MW04S	MW04S	MW04S	MW04S
DATE	9/7/2004	12/1/2006	12/7/2006	9/15/2009	9/15/2009	9/15/2009	7/6/2011	7/6/2011	7/6/2011
AOUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	Pump/Bailer	DB	LE	DB	DB	DB	DB	DB	DB
Volatile Organics (ug/1)	p. Duiter								
1 1 1-Trichloroethane			_					-	
1 1 2-Trichloro-1 2 2-trifluoroethane							NA	NA	NA
1,1,Dichloroethene									
1 1-Dichloroethene									
1.2-Dichlorobenzene	-								
1 2-Dichloroethane	-	_							
2-Butanone							NA	NA	NA
2-Hexanone							NA	NA	NA
4-Methyl-2-pentanone	_						NA	NA	NA
Acetone				62	63	62	NA	NA	NA
Benzene	-		-				<u></u>		
Bromoform							R	R	R
Bromomethane						-		-	-
Carbon disulfide							t		
Chloroform	-								
Chloromethane	_	-							
cis-1 2-Dichloroethene									
cis-1.3-Dichloropropene	0 23 J								
Cyclohexane		0.12 J	-	1.5 K	0.89 K	0.58 K	NA	NA	NA
Methyl Acetate	_		-				NA	NA	NA
Methyl tert-hutyl ether	0111		-				-		
Tetrachloroethene	-		_					-	-
Toluene								-	
trans-1.2-Dichloroethene		-							-
Trichloroethene	-	-				-			-
Vinyl chloride	-				-			_	-
Semi-Volatile Organics (ug/L)	·····	•							
Bis(2-ethylhexyl)phthalate	-	NA		NA	NA	NA	NA	NA	NA
Caprolactam		NA	-	NA	NA	NA	NA	NA	NA
Isophorone	-	NA	-	NA	NA	NA	NA	NA	NA
Naphthalene	-	NA		NA	NA	NA	NA	NA	NA
Phenol	-	NA	-	NA	NA	NA	NA	NA	NA
Pesticides (ug/L)									
alpha-Chlordane		NA		NA	NA	NA	NA	NA	NA
beta-BHC	-	NA		NA	NA	NA	NA	NA	NA
Metals and Cyanide (ug/L)									
Aluminum	210	NA	-	NA	NA	NA	NA	NA	NA
Antimony	-	NA	-	NA	NA	NA	NA	NA	NA
Arsenic		NA	-	NA	NA	NA	NA	NÁ	NA
Barium	-	NA	-	NA	NA	NA	NA	NA	NA
Beryllium	-	NA	-	NA	NA	NA	NA	NA	NA
Cadmium	-	NA	-	NA	NA	NA	NA	NA	NA

## Table 1

#### (Sheet 8 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW04S	MW04S	MW04S	MW04S	MW04S	MW04S	MW04S	MW04S	MW04S
DATE	9/7/2004	12/1/2006	12/7/2006	9/15/2009	9/15/2009	9/15/2009	7/6/2011	7/6/2011	7/6/2011
								· ·	1
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	Pump/Bailer	DB	LF	DB	DB	DB	DB	DB	DB
Calcium	57000	NA	51800	NA	NA	NA	NA	NA	NA
Chromium		NA	1	NA	NA	NĂ	NA	NA	NA_
Cobalt	1	NA	1	NA	NA	NA	NA	NA	NA
Copper	1	NA	1	NA_	NA	NA	NA	NA	NA
Iron	110	NA	33.4 J	NA	NA	NA	NA	NĀ	NA
Lead		NA	1	NA	NA	NA	NA	NA	NA
Magnesium	. 6400	NA	9320	NA	NA	NA	NA	NA	NA
Manganese	-	NĂ		NA	NA	NA	NA	NA	NA
Mercury	-	NA	0.021 J	NA	NA	NA	NA	ŇA	NA
Nickel	-	NA	-	NA	NĂ	NA	NA	NA	NA
Potassium	-	NA	1210 J	NA	NA	NA	NA	NA	NA
Selenium	-	NA	-	NA	NA	NA	NA	NA	NA
Sodium	11000	NĂ	19000	NA	NA	NA	NA	NA	NA
Vanadium		NA	=	NA	NA	NA	NA	NA	NA
Zinc		NA	39.2 J	NA	NA	NA	NA	NA	NA
Cyanide	-	NA	·	NA	NA	NA	NA	NĂ	NA

Notes are provided on Page 43.

# Table 1 (Sheet 9 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW04D	MW04D	MW04D	MW04D	MW04D	MW04D	MW04D	MW04D	MW05S	MW05S	MW05D	MW05D	MW05D
DATE	9/8/2004	9/13/2004	12/1/2006	12/8/2006	9/15/2009	9/15/2009	7/6/2011	7/6/2011	9/2/2004	12/12/2006	9/9/2004	12/1/2006	12/12/2006
	i	1					_				1	1 1	4
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	MC/LC	MC/LC	MC/LC
METHODOLOGY	Pump/Bailer	Pump/Bailer	DB	LF	DB	DB	DB	DB	LF	LF	Pump/Bailer	DB	LF
Volatile Organics (ug/L)	·		<b>.</b>	·	·····			·			· · · · · · · · · · · · · · · · · · ·	·	
1,1,1-Trichloroethane		NA									<u> </u>	/	
1,1,2-Trichloro-1,2,2-trifluoroethane		NA					<u>NA</u>	NA		-			
1,1-Dichloroethane	'									-		·	
1,1-Dichloroethene							-	<u>-</u>		<u> </u>		·	
1,2-Dichlorobenzene		<u>NA</u>	<u>↓</u>	<u> </u>							<u> </u>	·	
1,2-Dichloroethane					ļ					<u> </u>	<u> </u>		
2-Butanone					<u>↓</u>			NA				<sup>-</sup>	
2-Hexanone				<u>↓</u>	<u> </u>		NA	NA			<u> </u>	·'	
4-Methyl-2-pentanone			<u> </u>	<u>↓</u>			NA NA		-			<sup>-</sup>	
Acetone					67	6/	NA	NA	-		4.6 J	<sup>_</sup>	<u> </u>
Benzene			<u>↓</u>		<u> </u>							'	1.2
Bromotorm	<u> </u>			<u> </u>	<u>↓</u>		<u> </u>	ĸ				r'	
Bromomethane			<u> </u>		<u> </u>			<u> </u>		[		j	
Carbon disuitide	<u> </u>												0.113
Chlorotoim	0121	NA NA	<u>↓</u>		<u>+</u>	<u> </u>		<u> </u>			0.17.1	├ <u>──</u> ──	
Chioromemane	0.12 J		<u>↓</u> _	<u> </u>							0.173		<u> </u>
cis 1.2-Dichloropropene		NA NA	<u> </u>	<u> </u>	<del> <u>-</u></del>			<u> </u>		<u> </u>	<u> </u>	r	
Cyclobexane	<u> </u>	NA NA	<u>+</u>	<u> </u>	12K		NA	NA		<u> </u>	<u>                                      </u>	021	<u> </u>
Methyl Acetate		NA	<u> </u>	<u> </u>	<u> </u>		NA NA	NA NA		<u> </u>			
Methyl tert-hutyl ether	<u> </u>	NA	<u>├──</u> ──	<u> </u>	<u> </u>	<u> </u>				<u> </u>	<u> </u>	r	<u> </u>
Tetrachloroethene	<u> </u>	NA	<u>├──</u>	<u>+</u>	<u>↓</u>	<u> </u>		<u> </u>		<u> </u>		i	<u> </u>
Toluene		NA	<u> </u>	0471	0.8	1 1			<u> </u>	<u> </u>			0.75
trans-1 2-Dichloroethene			+	0121		<u>├</u>		<u> </u>				r	
Trichlorgethene	{ <u>-</u>	NA NA	<u> </u>		<u>+</u>	<u> </u>				<u> </u>	<u> </u>	<u> </u>	
Vinvl chloride		NA NA	<u> </u>	<u> </u>	<u>+ _</u>	<u> </u>	<u> </u>	<u> </u>				·	<u> </u>
Semi-Volatile Organics (ug/L)				L				· · · ·				L	L
Bis(2-ethylhexyl)phthalate	NA	4.6.1	NA		NA	NA	NA	NA NA				NA	
Caprolactam	NA	<u> </u>	NA		NA	NA	NA	NA				NA	<u> </u>
Isophorone	NA		NA		NA	NA	NA	NA				NA	
Naphthalene	NA	<u> </u>	NA		NA	NA	NA	NA	_			NA	
Phenol	NA	<u>  </u>	NA		NA	NA	NA	NA	_			NA	
Pesticides (ug/L)		4				l initia							,
alpha-Chlordane	NA	- 1	NĂ	- 1	NA	NA	NA	NA NA	-			NA	
beta-BHC	NA		NA		NA	NA	NA	NA	_		-	NA	
Metals and Cyanide (ug/L)	······	<u></u>	·····	4	.k		•	•		·	· · · · ·	······································	·
Aluminum	1700	NA	NA		NA	I NA	NA	NA	1400		- 1	NA	-
Antimony		NA	NA		NA	NA	NA	NA				NA	
Arsenic		NA	NA		NA	NA	NA	NA				NA	-
Barium		NA	NA		NA	NA	NA	NA			-	NA	412
Beryllium		NA	NA		NA	NA	NA	NA				NA	
Cadmium		NA	NA		NĂ	NA	NÁ	NA				NA	

## Table 1 (Sheet 10 of 43)Summary of Detected Constituents in Groundwater<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	MW04D	MW04D	MW04D	MW04D	MW04D	MW04D	MW04D	MW04D	MW05S	MW05S	MW05D	MW05D	MW05D
DATE	9/8/2004	9/13/2004	12/1/2006	12/8/2006	9/15/2009	9/15/2009	7/6/2011	7/6/2011	9/2/2004	12/12/2006	9/9/2004	12/1/2006	12/12/2006
											1		1
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	MC/LC	MC/LC	MC/LC
METHODOLOGY	Pump/Bailer	Pump/Bailer	DB	LF	DB	DB	DB	DB	LF	LF	Pump/Bailer	DB	LF
Calcium	430000	NA	NA	95700	NA	NA	NA	NA	87000	66300	26000	NA	75900
Chromium	20	NA	NA	1	NA	NA	NA	NA	-	1.5 J		NA	5.8 J
Cobalt	-	NA	NA	1	NA	NA	NA	NA	+	-	-	NA	1
Copper	34	NA	NA	ſ	NA	NA	NA	NA	-		-	NA	-
Iron	2300	NA	NA	112	NA	NA	NA	NA	700	-	-	NA	-
Lead		NA	NA	1	NA	NA	NA	NA		1	-	NA	
Magnesium	160000	NA	NA	30500	NA	NA	NA	NA	9400	-	22000	NA	
Manganese	170	NA	NA	52.5	NA	NA	NA	NA	44	-		NA	-
Mercury		NA	NA	1	NA	NA	NA	NA	-	-		NA	
Nickel	-	NA	NA		NA	NA	NA	NA	-	-		NA	3.5 J
Potassium	31000	NA	NA	7660	NA	NA	NA	NA	-	496 J	15000	NA	11800
Selenium		NA	NA		NA	NA	NA	NA	-	-		NA	-
Sodium	1400000	NA	NA	272000	NA	NA	NA	NA	12000	-	750000	ŇA	584000
Vanadium		NA	NA		NA	NA	NA	NA	-		-	NA	1.5 J
Zinc	94	NA	NA	17.4 J	NA	NA	NA	NA	-	-		NA	
Cyanide	NA		NA		NA	NA	NA	NA			-	NA	

Notes are provided on Page 43.
# Table 1 (Sheet 11 of 43)Summary of Detected Constituents in Groundwater<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

•

.

SITE	MW06S	MW06S	MW06D	MW06D	MW07	MW07	MW07	MW07	MW07	MW07	MW07
DATE	9/3/2004	12/8/2006	9/3/2004	12/8/2006	9/8/2004	12/14/2006	12/14/2006	9/15/2009	9/15/2009	7/6/2011	7/6/2011
							Duplicate				
AOUIFER DESIGNATION	UC	UC	LC	LC	UC	UC	UC	UC	UC	UC	υc
METHODOLOGY	LF	LF	LE	LE	LF	LF	LF	DB	DB	DB	DB
Volatile Organics (ug/L)	=			<u> </u>							
1 1 1-Trichloroethane					0 25 1						
1 1 2-Trichloro-1 2 2-trifluoroethane					-					NA	NA
1 1-Dichloroethane	_										
1 1-Dichloroethene					0.261		0141				
1.2-Dichlorobenzene					0 12 1						
1.2-Dichloroethane					-						
2-Butanone	54					18				NA	NA
2-Hevenone										NA	NA
4-Methyl-2-pentanone										NA	NA
Acetone								65	72	NA	NA NA
Benzene											
Bromoform				_					<u> </u>	R	
Bromomethane										<u> </u>	
Carbon disulfide						0 12 1			-		
Chloroform											
Chloromethane							-				
cis-1 2-Dichloroethene					24	91	10	13	13		3 57 J
cis-1 3-Dichloropropene	0151									_	
Cyclobexane					-				-	NA	NA
Methyl Acetate								-		NA	NA
Methyl tert-butyl ether				_	-			-	_	_	
Tetrachloroethene	++		_		1100 DB	1100 D	1300 D	6500	2800	1500	985
Toluene				0.49.1	-		_				
trans-1 2-Dichloroethene					0.44 J			-	_		
Trichloroethene				-	7.9	9	10	35	29	182	6.2
Vinvl chloride							-		-	-	-
Semi-Volatile Organics (ug/L)				······	•		· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	·
Bis(2-ethylhexyl)phthalate		-	-	-				NA	NA	NA	NA
Caprolactam		-		-	-	-		NA	NA	NA	NA
Isophorone			-	_	-	-		NA	NA	NA	NA
Naphthalene							-	NA	NA	NA	NA
Phenol								NA	NA	NA	NA
Pesticides (ug/L)			·		<b>.</b>		· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·	·····	
alpha-Chlordane		- 1			_			NA	NA	NA	NA
beta-BHC		_	_	_				NA	NA	NA	NA
Metals and Cyanide (ug/L)		•	• • • • • • • • • • • • • • • • • • • •			h		• • • • • • • • • • • • • • • • • • •	<u> </u>	**************************************	·
Aluminum		-	-	-	-		-	NA	NA	NA	NA
Antimony				-			-	NA	NA	NA	NA
Arsenic		-	-		-		-	NA	NA	NA	NA
Barium	-		-	-	-	61.7 J	60.3 J	NA	NA	NA	NA
Beryllium			-		-	-		NA	NA	NA	NA
Cadmium		_		-	-			NA	NA	NA	NA
			· · · · · · · · · · · · · · · · · · ·	·····			·		····		·

· •

 
 Table 1 (Sheet 12 of 43)

 Summary of Detected Constituents in Groundwater
 Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW06S	MW06S	MW06D	MW06D	MW07	MW07	MW07	MW07	MW07	MW07	MW07
DATE	9/3/2004	12/8/2006	9/3/2004	12/8/2006	9/8/2004	12/14/2006	12/14/2006	9/15/2009	9/15/2009	7/6/2011	7/6/2011
						1	Duplicate				
AQUIFER DESIGNATION	UC	UC	LC	LC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	LF	LF	LF	LF	LF	LF	LF	DB	DB	DB	DB
Calcium	59000	63000	5100	7170	73000	62500	62900	NA	ŇĂ	NA	NA
Chromium	+	-	1	-	-	2.6 J	1.3 J	NA	NA	NA	NA
Cobalt		1	+					NA	NA	NA	NA
Copper	-		-	-	-		-	NA	NA	NA	NA
Iron		-	-	_	-	28 2 J		NA	NA	NA	NA
Lead	-	-	-	-			1	NA	NA	NA	NA
Magnesium	-	4900 J	-	1240 J	-	4560 J	4500 J	NA	NA	NA	NA
Manganese		-	-	-	-	1.1 J	-	NA	NA	NA	NA
Mercury		1	-	-		-		NA	NA	NA	NA
Nickel		-	1	-	-		-	NA	NA	NA	NA
Potassium	-	363 J	-	2380 J	-	1020 J	1030 J	NA	NA	NA	NA
Selenium	-	1	1	-	-			NA	ŇĂ	NA	NA
Sodium	-	1	61000	65000	210000	160000	159000	NA	NA	NA	NA
Vanadium	-	-	-	-				NA	NA	NA	NA
Zinc	-	-	-		-		-	NA·	NA	NA	NA
Cyanide		_	-	_	1,13		4.13	NA	NA	NA	NA

.

# Table 1 (Sheet 13 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

.

SITE	MW08	MW08	MW08	MW08	MW08	MW09	MW09	MW09	MW09	MW09	MW10	MW10	MW10	MW10	MW10
DATE	9/7/2004	12/5/2006	9/15/2009	9/15/2009	7/6/2011	9/10/2004	9/10/2004	12/13/2006	9/15/2009	7/6/2011	9/10/2004	12/13/2006	12/14/2006	9/15/2009	7/6/2011
				Duplicate									1		
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC 1	UC	UC
METHODOLOGY	LF	LF	DB	DB	DB	LF	Bailer	LF	DB	DB	LF	LF	LF	DB	DB
Volatile Organics (ug/L)								·	·····						
1.1.1-Trichloroethane	_	-	- 1		-	0.3 J	0.27 J	0.17 J	-		1.3	1	NA		0.53
1.1.2-Trichloro-1.2.2-trifluoroethane					NA	-		-		NA	~		NA		NA
1 1-Dichloroethane			~				-	-			25	19	NA	18	113
1 1-Dichloroethene		-	-					-			0.15.1		NA		
1 2-Dichlorobenzene	_					-							NA		-
1.2-Dichloroethane													NA		
2-Butanone	-	-			NA	-				NA	~		NA		NA
2-Hexanone					NA	-		-		NA			NA		NA
4-Methyl-2-pentanone	-	_	-		NA	-	-	-		NA			NA		NA
Acetone			66	66	NA	-	-	-	63	NA			NĀ	62	NA
Benzene	-	-	-	-	-	-	-	-			~		NA		
Bromoform		-	-	-	R			- 1		R	-		NA		R
Bromomethane	-	-	-								-		NA	1.4 K	-
Carbon disulfide			-	-	-		-	-			~	-	NA		_
Chloroform	-	-	-	-	_	-	-	-	-				NA	-	-
Chloromethane		-	-			-		-	-		~		NA		
cis-1,2-Dichloroethene	-	-	-	-		-					52 D	49 D	NA	64	38.5
cis-1,3-Dichloropropene	0.18 J		-	-	-	-	-						NA		-
Cyclohexane		_	-	-	NA	-	-			NA			NA		NA
Methyl Acetate	-	-	-		NA	-	-	-		NA			NA		NA
Methyl tert-butyl ether					-	-	-						NA		-
Tetrachloroethene	0.49 J	0.12 J	-	0.53	-	8.7	9.3	3.6	2.4	1.25	140 DB	160 D	NA	21	51.6
Toluene						-	-						NA	1.5	
trans-1,2-Dichloroethene	-		-		-	-	-				0.23 J	0.15 J	NA		-
Trichloroethene		-	-	1		0.13 J	-				29 D	25 D	NA	19	25
Vinyl chloride	-	L	-		-	-	-						NA		
Semi-Volatile Organics (ug/L)															
Bis(2-ethylhexyl)phthalate			NA	NA	NA		NA	-	NA	NA			NA	NA	NĀ
Caprolactam			NA	NA	NA	-	NA	-	NA	NA			NA	NA	NA
Isophorone	-		NA	NA	NA		NA		NA	NA			NA	NA	NA
Naphthalene	-		NA	NA	NA	-	NA	<u> </u>	NA	NA	-	0.96 J	NA	NA	NA
Phenol		L	NA	NA	NA		NA		NA	NA			NA	NA	NA
Pesticides (ug/L)															
alpha-Chlordane			NA	NA	NA		NA		NA	NA			NA	NA	NA
beta-BHC			NA	NA	NA	0.0092 J	NA	<u> </u>	NA	NA	0.016 J		NA	NA NA	NA
Metals and Cyanide (ug/L)								·							
Aluminum	220	58.5 J	NA	NA	NA	-	NA		NA	NA		NA		NA	NA
Antimony			NA	NA	NA		NA		NA	NA		NA		NA	NA
Arsenic			**NA	NA	NA	<u> </u>	NA		NA	NA		NA		NA	NA
Barium			NA	NA	NA	-	NA	48.2 J	NA	NA		NA	161 J	NA	NA
Beryllium			NA	NA	NA	-	NA		NA	NA	-	NA		NA	NA
Cadmium		- 1	NA	NA	NA		NA		NA	NA		NA	}	NA	NA

# Table 1 (Sheet 14 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW08	MW08	MW08	MW08	MW08	MW09	MW09	MW09	MW09	MW09	MW10	MW10	MW10	MW10	MW10
DATE	9/7/2004	12/5/2006	9/15/2009	9/15/2009	7/6/2011	9/10/2004	9/10/2004	12/13/2006	9/15/2009	7/6/2011	9/10/2004	12/13/2006	12/14/2006	9/15/2009	7/6/2011
				Duplicate											
AQUIFER DESIGNATION	UC	UC	υc	UC	UC	UC	UC	UC	UC	UC	UC	UC ·	UC	UC	UC
METHODOLOGY	LF	LF	DB	DB	DB	LF	Bailer	LF	DB	DB	LF	LF	LF	DB	DB
Calcium	74000	53300	NA	NA	NA	65000	NA	67700	NA	NA	96000	NA	79900	NA	NA
Chromium	-	2.5 J	NA	NA	NA	ł	NA	1.3 J	NA	NA	-	NA	3.3 J	NA	NA
Cobalt	-	-	NA	NA	NA_	-	NA	1	NA	NA	-	NA	-	NA	NA
Copper	1	-	NA	NA	NA	-	NA	-	NA	NA		NA	-	NA	NA
Iron	210	-	NA	NA	NA	-	NA	+	NA	NA	-	NA	-	NA	NA
Lead	-		NA	NA	NA	-	NA	-	NA	NA		NA	-	NA	NA
Magnesium	5500	4040 J	NA	NA	NA	6400	NA	6590	NA	NA	13000	NA	9310	NA	NA
Manganese	1		NA	NA	NA	-	NA	+	NA	NA	120	NA	93.1	NA	NA
Mercury	1	-	NA	NA	NA		NA		NA	NA	-	NA	+	NA	NĂ
Nickel	-	2 J	NA	NA	NA	-	NA	-	NA	NA	-	NA	3.8 J	NA	NA
Potassium	-	934 J	NA	NA	NA	-	NA	428 J	NA	NA		NA	3060 J	NA	NA
Selenium	-	-	NA	NA	NA		NA		NA	NA		NA	5.2 J	NA	NA
Sodium	210000	191000	NA	NA	NA	26000	NA	12400	NA	NA	250000	NA	176000	NA	NA
Vanadium	1	-	NA	NA	NA		NA	-	NA	NA		NA		NA	NA
Zinc	_	14.5 J	NA	NA_	NA	-	NA	14.5 J	NA	NA	100	NA	<u>11.7 J</u>	NA	NA
Cyanide		-	NA	NĀ	NA	-	NA	-	NĂ	NA		NA	-	NA	NA

٠

Table 1 (Sheet 15 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW11	MWII	MW11	MW11	MWII	MW12S	MW12S	MW12S	MW12S	MW12S	MW12S	MW12S	MW12S
DATE	9/10/2004	12/14/2006	9/15/2009	9/16/2009	7/6/2011	8/30/2004	12/6/2006	9/16/2009	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/7/2011
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	Pump/Bailer	LF	LF	DB	DB	LF	LF	DB	DB	DB	DB	DB	DB
Volatile Organics (ug/L)													
1,1,1-Trichloroethane		~	-	-	-	-	-			-	-		
1,1,2-Trichloro-1,2,2-trifluoroethane	-	-	+	1	NA			1	1	-	NA	NA	NA
1,1-Dichloroethane			-				-	-	-		-	_	-
1,1-Dichloroethene	-	0.Ī J	_	-			-	1				-	+
1,2-Dichlorobenzene	-		-	-			-	-	-		-	1	-
1,2-Dichloroethane	-		0.52	-								-	-
2-Butanone			-		NÁ					-	NA	NA	NA
2-Hexanone	-		-		NA			-			NA	NA	NA
4-Methyl-2-pentanone		~	-		NA	=		-			NA	NA	NA
Acetone			61	59	NA			72	69	61	NA	NA	NA
Benzene	-	-	-						~				
Bromoform		~	-	-	R.						R	R	R
Bromomethane			1.3 K	1.2 K		-							
Carbon disulfide	-	-	-	-							-		-
Chloroform		~					-	-			-		
Chloromethane	-		-	-				-					_
cis-1,2-Dichloroethene		1.4	3.4	-	35.2 J	-			-		-		
cis-1,3-Dichloropropene			-	-									
Cyclohexane		-	0.98	0.54	NA		-		-		NA	NA	NA
Methyl Acetate	-	-	-	-	NA						NA	NA NA	NA
Methyl tert-butyl ether	-	-	-	-		-	-				-		-
Tetrachloroethene	490	270 D	34	-	443	-			-	-	0.61		-
Toluene			0.98		-				-		-	-	-
trans-1,2-Dichloroethene			<u> </u>		0.52 J						-	-	-
Trichloroethene	151	3.8	8.5		223 J								
Vinyl chloride		-								-			
Semi-Volatile Organics (ug/L)													
Bis(2-ethylhexyl)phthalate		2 J	NA	NA	NA			NA	NA	ŇA	NA	NA	NA
Caprolactam			NA	NA	NA			NA	NA	NA	NA	NA	NA
Isophorone			NA	NA	NA			NA	NA	NA	NA	NA	NA
Naphthalene			NA	NA	NA			NA	NA	NA	NA	NA	NA
Phenol	<u> </u>		NA	NA	NA		L	NA	NA	NA	<u>NA</u>	NA	NA
Pesticides (ug/L)							7						
alpha-Chlordane		~	NA	<u>NA</u>	NA		<u> </u>	<u>NA</u>	<u>NA</u>	NA	NA NA	NA	NA
beta-BHC	0.011		NA	NA	NA	<u> </u>		NA	NA	NA	NA	NA	NA
Metals and Cyanide (ug/L)						·							
Aluminum	-	-	NA	NA	NA	330		NA	NA	NA	NA	NA	NA
Antimony	-		NA	NA	NA			NA	NA	NA	NA	NA	NA
Arsenic	-		NA	NA	NA			NA	NA	NA	NA	NA	NA
Barium		123 J	NA	NA	NA			NA	NA	NA	NA	NA NA	NA
Beryllium	-	-	NA	NA	NA			NA	NA	ŇĂ	NA	NA	NA
Cadmium		-	NA	NA	NA			NA	NA	NA	NA	NA	NA

(Sheet 16 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc.

Village of Herrings, Jefferson County, New York

SITE	MW11	MW11	MW11	MW11	MW11	MW12S	MW12S	MW12S	MW12S	MW12S	MW12S	MW12S	MW12S
DATE	9/10/2004	12/14/2006	9/15/2009	9/16/2009	7/6/2011	8/30/2004	12/6/2006	9/16/2009	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/7/2011
					•								
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	Pump/Bailer	LF	LF	DB	DB	LF	LF	DB	DB	DB	DB	DB	DB
Calcium	110000	83400	NA	NA	NA	20000	19400	NA	NA	NA	NA	NA	NA
Chromium	-	-	NA	NA	NA	-	11.1	NA	NA	NĀ	NA	NA	NĀ
Cobalt	-	-	NA	NA	NA	-	+	NA	NA	NA	NĂ	NA	NA
Copper	1	-	NA	NA	NA	-		NA	NA	NA	NA	NA	NA
Iron	110	-	NA	NA	NA	常 1640 4 1	59.2 J	NA	NA	NA	NA	NA	NA
Lead	-		NA	NA	NA	~		NA	NA	NA	NA	NA	NA
Magnesium	17000	12000	NA	NA	NA	6900	6720	NA	NA	NĀ	NA	NA	NA
Manganese	30	10.6 J	NA	NA	NA	~		NA	NA	NA	NA	NA	NA
Mercury	-	1	NA	NA	_NA		-	NA	NA	NA	NA	NA	NA
Nickel	1	-	NA	NA	NĂ	-		NA	NA	NA	NĀ	NA	NA
Potassium	-	2020 J	NA	NA	NA		1420 J	NA	NA	NA	NA	NA	NA
Selenium	1	-	NA	NA	NA	-		NA	NA	NA	NA	NA	NA
Sodium	350000	226000	NA	NA	NA	15000	13800	NA_	NA	NA	NĂ	NA	NA
Vanadium	-	-	NA_	NA	NA			NA	NA	NA	NĂ	NA	NA
Zinc	64	-	NA	NĀ	NA	-		NA_	NA	NA	NA	NA	NA
Cyanide		-	NA	NA	NA	-		NA	NA	NA	NA	NA	NA

### (Sheet 17 of 43) (Sheet 17 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

.

•

SITE	MW12D	MW12D	MW12D	MW12D	MW12D	MW12D	MW12D	MW12D
DATE	8/30/2004	12/6/2006	9/16/2009	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/7/2011
				]				
AQUIFER DESIGNATION	LC	LC	LC	LC	LC	LC	LC	LC
METHODOLOGY	LF	LF	DB	DB	DB	DB	DB	DB
Volatile Organics (ug/L)								
1,1,1-Trichloroethane	1	-		-	-			
1,1,2-Trichloro-1,2,2-trifluoroethane		-	-	-	-	NA	NA	NA
1,1-Dichloroethane	-	-	-		-			
1,1-Dichloroethene	-		-	-	-			
1,2-Dichlorobenzene	-	-	-		-			
1,2-Dichloroethane	1	-	-		-	-	-	
2-Butanone				-	-	NA	NA	NA
2-Hexanone	1		-	-	-	NA	NA	NA
4-Methyl-2-pentanone		-	-	-		NA	NA	NA
Acetone		-	67	62	65	NA	NA	NA
Benzene	-	-	-					
Bromoform	-	-				R	R	<u>R</u>
Bromomethane	-	-	-	1.1 K	-			
Carbon disulfide	-		-	-				
Chloroform	-	-						-
Chloromethane	1		-	-				
cis-1,2-Dichloroethene	-		-	-			-	-
cis-1,3-Dichloropropene					-			-
Cyclohexane	-		0.85	0.7	-	NA	NA	NA
Methyl Acetate		-	-			NA	NA	NA
Methyl tert-butyl ether	-		-	-	-			-
Tetrachloroethene	-		-		-	-		
Toluene	-	-	-	-	-	-		
trans-1,2-Dichloroethene	-	-	-	-				
Trichloroethene	-		-	-	-			
Vinyl chloride					-			
Semi-Volatile Organics (ug/L)						······		
Bis(2-ethylhexyl)phthalate	~	-	NA	NA	NA	NA	NA	NA
Caprolactam	-		NA	NA	NA	NA	NA	NA
Isophorone	_		NA	NA	NA	NA	NA	NA
Naphthalene		-	NA	NA	NA	NA	NA	NA
Phenol	-		NA	NA	NA	NA	NA	NA
Pesticides (ug/L)		• • • • • • • • • • • • • • • • • • •	•				·····	•
alpha-Chlordane		- 1	NA	NA	NA	NA	NA	NA
beta-BHC	-	-	NA	NA	NA	NA	NA	NA
Metals and Cyanide (ug/L)		· · · · · · · · · · · · · · · · · · ·				·		•
Aluminum			NA	NA	NA	NA	NA	NA
Antimony			NA	NA	NA	NA	NA	NA
Arsenic			NA	NA	NA	NA	NA	NA
Barium		-	NA	NA	NA	NA	NA	NA
Bervllium			NA	NA	NA	NA	NA	NA
Cadmium		-	NA	NA	NA	NA	NA	NA

## Table 1 (Sheet 18 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW12D	MW12D	/ MW12D	MW12D	MW12D	MW12D	MW12D	MW12D
DATE	8/30/2004	12/6/2006	9/16/2009	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/7/2011
AQUIFER DESIGNATION	LC	LC	LC	LC	LC	LC	LC	LC
METHODOLOGY	LF	LF	DB	DB	DB	DB	DB	DB
Calcium	9500	10200	NA	NA	NA	NA	NA	NA
Chromium		3.2 J	NA	NA NA	NA	NA	NA	NA
Cobalt		-	NA	NA	NA	NA	NA	NA
Copper	1	-	NA	NA	NA	NA	NA_	NA
Iron	1	-	NA	NA	NA	NA	NA	NA
Lead	-	-	NA	NA	NA	NA	NA	NA
Magnesium	5600	6120	NA	NA	NA	NA	NA	NA
Manganese	1	-	NA	NA	NA	NA	NA	NA
Mercury	1	1	NA	NA	NA	NA	NA	NA
Nickel	1	1.7 J	NA	NA	NA	NA	NA	NA
Potassium	-	2990 J	NA	NA	NA	NA	NA	NA
Selenium	-	-	NA	NA	NA	NA	NA	NA
Sodium	14000	13100	NA	NA	NA	NA	NA	NA
Vanadium	-		NA	NA	NA	NA .	NA	NA
Zinc	-	-	NA	NA	NA	NA	NA	NA
Cyanide	-	4.5 J	NA	NA	NA	NĂ	NA	NA

## Table 1 (Sheet 19 of 43) Summary of Detected Constituents in Groundwater

Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW13S	MW13S	MW13S	MW13S	MW13S	MW13S	MW13S	MW13S
DATE	9/8/2004	12/11/2006	9/15/2009	9/15/2009	9/15/2009	7/7/2011	7/7/2011	7/7/2011
A OTHERD DESIGNATION								TICING
AUTER DESIGNATION				DP				
Volatile Organics (ug/L)								08
1 1 1-Trichloroethane					r			
1.1.2-Trichloro-1.2.2-trifluoroethane		<u> </u>				NA	NA	NA
1 1-Dichloroethane								
1 1-Dichloroethene								
1 2-Dichlorobenzene								
2-Dichloroethane			-		~	~		
2-Butanone			-			NA	NĀ	NA
2-Hexanone	-		-	~		NA	NA	NA
4-Methyl-2-pentanone	-		-			NA	NA	NA
Acetone			68	70	64	NA	NA	NA
Benzene	-		-			-	-	
Bromoform	-	-	-	~		R	R	R
Bromomethane		-	-	-			-	-
Carbon disulfide			-	~	~			
Chloroform	-	_	-				-	
Chloromethane	-	0.16 J	-	-		-		
cis-1,2-Dichloroethene	0.9	0.78	-		7.8	-		6.31
cis-1,3-Dichloropropene	-	_	-			~		
Cyclohexane	-	-	0.53			NA	NA	NA
Methyl Acetate	_	-				NA	NĀ	NA
Methyl tert-butyl ether	-	-		-				
Tetrachloroethene	12	15	1.5	1,7		2.02	2.47	
Toluene	-	-	-			-		
trans-1,2-Dichloroethene			-	-		-	-	-
Trichloroethene	0.85	0.63	0.96	0.79		0.58		
Vinyl chloride		-			0.52			0.73 J
Semi-Volatile Organics (ug/L)						·	·	
Bis(2-ethylhexyl)phthalate		6.6	NA	NA	NA	NA	NA	NA
Caprolactam	<u> </u>		NA	NA	<u>NA</u>	NA	NA	<u>NA</u>
Isophorone			NA	NA	NA	NA	NA	NA NA
Naphthalene			NA	NA NA	NA	NA	NA	
Phenol					NA			<u>NA</u>
Pesticides (ug/L)	·····		·	·			· · · · · · · · · · · · · · · · · · ·	<del>r</del>
alpha-Chlordane			NA		NA NA	NA	NA	
beta-BHC		<u> </u>	NA					
Meiais and Cyanide (ug/L)		·		<u> </u>	1 <del></del>	1	T	1 <del></del>
Aluminum			NA					
Antimony			NA			NA NA		
Arsenic	<u> </u>	f						
Danum	<u> </u>	<u> </u>	NA			NA NA		
Beryillum	<u> </u>	<u> </u>						
Caumum		· ~	I NA	I INA	I NA	I INA	I NA	I NA

## Table 1 (Sheet 20 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

ŠĪTE	MW13S	MW13S	MW13S	MW13S	MW13S	MW13S	MW13S	MW13S
DATE	9/8/2004	12/11/2006	9/15/2009	9/15/2009	9/15/2009	7/7/2011	7/7/2011	7/7/2011
AQUIFER DESIGNATION	UC/MC	UC/MC	UC / MC	UC / MC	UC/MC	UC / MC	UC / MC	UC/MC
METHODOLOGY	LF	LF	DB	DB	DB	DB	DB	DB 🕤
Calcium	29000	25200	NA	NA	NA	NA	NA	NA
Chromium	-		NA_	NA	NA	NA	NA	NĂ
Cobalt	-	-	NA	NA	NA	NA	NA	NA
Copper		-	NA	NA	NA	NA	NA	NA
Iron	170	41.8 J	NA	NA	NA	NA	NA	NA
Lead	-	-	NA	NA	NA	NA	NA	NA
Magnesium	8200	8260	NA	NA	NA	NA	NA	NA
Manganese	18	-	NA	NA	NA	NA	NA	NA
Mercury	-	-	NA	NA	NA	NA	NA	NA
Nickel	-	-	NA	NA	NA	NA	NA	NA
Potassium	-	2430 J	NA	NA	NA	NA_	NA	NA
Selenium	-	- 1	NA	NA	NA	NA	NA	NA
Sodium	32000	29600	NA	NA	NA	NA	NA	NA
Vanadium	-		NA	NA	NA	NA	NA	NA
Zinc	-	10.1 J	NA	NA	NA	NA	NA	NA
Cyanide	-	-	NA_	NA	NA	NA	NA	NA

# Table 1 (Sheet 21 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW13D	MW13D	MW13D	MW13D	MW13D	MW13D	MW13D	MW13D
DATE	9/8/2004	12/11/2006	9/15/2009	9/15/2009	9/15/2009	7/7/2011	7/7/2011	7/7/2011
AQUIFER DESIGNATION	LC	LC	LC	LC	LC	LC	LC	LC
METHODOLOGY	LF	LF	DB	DB	DB	DB	DB	DB
Volatile Organics (ug/L)								
1,1,1-Trichloroethane	-			-	1		-	-
1,1,2-Trichloro-1,2,2-trifluoroethane		-	1	-	ŧ	NA	NA	NA
1,1-Dichloroethane	-	-	-	-	_			
1,1-Dichloroethene	-	-	-	-	_			
1,2-Dichlorobenzene	_	-	-	-	-			-
1,2-Dichloroethane		-	-	~	_	-	-	
2-Butanone	-	-	1	-	-	NA	NA	NA
2-Hexanone		-	-			NA	NA	NA
4-Methyl-2-pentanone	-	-	-			NA	NA	NA
Acetone	-	-	76	76	71	NA	NA	NA
Benzene				-		-		
Bromoform	-	-	1	-	1	R	R	R
Bromomethane	_		-	-	-		-	
Carbon disulfide	-	-	-	-		-		
Chloroform		-	-	-		-	-	
Chloromethane	-	0.12 J	-	-				-
cis-1,2-Dichloroethene	-	-	-		-	-	-	
cis-1,3-Dichloropropene	-		-	-				
Cyclohexane	-		-	-		NA	NA	NA
Methyl Acetate	1.2		-	-		NA	NA	NA
Methyl tert-butyl ether	-	-	-	-				-
Tetrachloroethene			-	-			-	
Toluene	-	-	_	~		-		
trans-1,2-Dichloroethene				-			-	
Trichloroethene	0.67	0.23 J		-	0.88	-		0.77
Vinyl chloride	-	-	-	-				
Semi-Volatile Organics (ug/L)								
Bis(2-ethylhexyl)phthalate		-	NA	NA	NA	NA	NA	NA
Caprolactam	-		NA	<u>NA</u>	NA	NA	NA	NA NA
Isophorone	-	-	NA	NA	NA	NA	NA	NA
Naphthalene	-	-	NA	NA	<u>NA</u>	NA	NA	NA NA
Phenol	1		NÁ	NA	NA	NA	NA	NA
Pesticides (ug/L)								
alpha-Chlordane		-	NA	<u>NA</u>	NA	NA	NA	NA
beta-BHC	-	-	NA	NA	NA	NA	NA	NA
Metals and Cyanide (ug/L)								
Aluminum	-	-	NA	NA	NA	NA	NA	NA
Antimony	-		NA	NA	NA	NA	NA	NA
Arsenic	-		NA	NA	NA	NA	NA	NA
Barium	520	421	NA	NA	NA	NA	NĂ	NA
Beryllium	-		NA	NA	NA	NA	NA	NA
Cadmium			NA	NA	NA	NA	NA	NA

# I ADIE I (Sheet 22 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW13D	MW13D -	MW13D	MW13D	MW13D	MW13D	MW13D	MW13D
DATE	9/8/2004	12/11/2006	9/15/2009	9/15/2009	9/15/2009	7/7/2011	7/7/2011	7/7/2011
AQUIFER DESIGNATION	LC	LC	LC	LC	LC	LC	LC	LC
METHODOLOGY	LF	LF	DB	DB	DB	DB	DB	DB
Calcium	52000	39000	NA	NA	NA	NA	NA	NA
Chromium	1	-	NA	NA	NA	NA	NA	NA
Cobalt	-		NA.	NA	NA_	NA	NA	NA
Copper	-	-	NA	NA	NA	NA	NA	NA
Iron	210	127	NA	NA	NA	NA	NA	NA
Lead	-	-	NA	NA	NA	NA	NA	NA
Magnesium	19000	14300	NA	NA	NA	NA	NA	NA
Manganese	-		NA	NA	NA	NA	NĂ	NA
Mercury	-	-	NA	NA	NA	NA	NA	NA
Nickel	-	-	NA	NA	NA	NA_	NA	NA
Potassium	5400	4040 J	NA	NA	NA	NA	NA	NA
Selenium	-	-	NA	NA	NA NA	NA_	NA	NA
Sodium	140000	111000	NA	NA	NA	NA	NA	NA
Vanadium	-	-	NA	NA	NA	NA_	NA_	NA
Zinc	-	-	NA	NA	NA	NA	NA	NA
Cyanide	-	-	NĀ	NA	NA NA	NA	NA	NĀ

### (Sheet 23 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE DATE	MW14S 8/31/2004	MW14S 12/7/2006	MW14S 9/16/2009	MW145 9/16/2009	MW14S 9/16/2009	MW145 7/7/2011	MW14S 7/7/2011	MW14S 7/7/2011
			1	1	1	l		Duplicate
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC U
METHODOLOGY	<u></u>	LF	LF	DB	DB	DB	DB	DB
Volatile Organics (ug/L)								
1,1,1-Trichloroethane		<u> </u>		<u> </u>	<u> </u>			<u> </u>
1,1,2-Trichloro-1,2,2-trifluoroethane		<u> </u>				NA	NA	NA
1,1-Dichloroethane		<u> </u>					-	<u> </u>
1,1-Dichloroethene	-		-	~				
1,2-Dichlorobenzene		-		-	-		<u> </u>	
1,2-Dichloroethane				~	<u> </u>		-	<u> </u>
2-Butanone						NA	NA	NA
2-Hexanone	-			<u> </u>	<u> </u>	NA	NA	NA
4-Methyl-2-pentanone					<u> </u>	NA	NA	NA
Acetone		T	66	66	70	NA	NA	NA
Benzene	-	-		-	<u> </u>		<u> </u>	
Bromoform			-			R	R	R
Bromomethane	-	-	-	-		<u> </u>	-	
Carbon disulfide		-	_	-				<u> </u>
Chloroform	0.15 J		-		<u> </u>		<u> </u>	Γ
Chloromethane			-		-			1.08
cis-1,2-Dichloroethene	2	1.1	1.5	-	3.7	1.52	1.79	1.93
cis-1,3-Dichloropropene						-	<u> </u>	
Cyclohexane	**					NA	NA	NA
Methyl Acetate	R		-	-		NA '	NA	NA
Methyl tert-butyl ether	0.38 J		-	~				
Tetrachloroethene	30 D	20	0.77		2.8	3.19	3.47	3.44
Toluene			1.1	-				f
trans-1,2-Dichloroethene							<u> </u>	
Trichloroethene	3.5	1	1.3	-	3.1	1.69	1.56	1.58
Vinyl chloride		<u> </u>	<u> </u>					
Semi-Volatile Organics (ug/L)			A		<u> </u>			<u> </u>
Bis(2-ethylhexyl)phthalate		-	NA	NA	NA	NA	NA	NA
Caprolactam	_	-	NA	NA	NA	NA	NA	NA
Isophorone	-		NA	NA	NA	NA	NA	NA
Naphthalene			NA	NA	NA	NA	NA	NA
Phenol			NA	NA	NA	NA	NA	NA
Pesticides (ug/L)		· · · · · · · · · · · · · · · · · · ·						
alpha-Chlordane	-		NA	NA	NA	NA	NA	NA
beta-BHC			NA	NA	NA	NA	NA	NA
Metals and Cyanide (ug/L)				·····				
Aluminum		-	NA	NA	NA	NA	NA	NA
Antimony			NA	NA	NA	NA	NA	NA
Arsenic	-	<u> </u>	NA	NÁ	NA	NA	NA	NA
Barium	220	f	NA	NA	NA	NA	NA	NA
Beryllium	-	<u>├──</u>	NA	NA	NA	NA	NA	NA
Cadmium			NA	NA	NA	NA	NA	NA

### (Sheet 24 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW14S	MW14S	MW14S	MW14S	MW14S	MW14S	MW14S	MW14S
DATE	8/31/2004	12/7/2006	9/16/2009	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/7/2011
								Duplicate
AQUIFER DESIGNATION	UC	UC .	UC	UC	UC	UC	UC	UC
METHODOLOGY	LF	LF	LF	DB	DB	DB	DB	DB
Calcium	140000	95400	NA	NA	· NA	NA	NA	NA
Chromium	-	-	NA	ŇĂ	NA	NA	NA	NA_
Cobalt	-	-	NA	NA	NA	NA	NA	NA
Copper	-		NA	NA	NA	NA	NA	NA
Iron		20.6 J	NA	NA	NA	NA	NA	NA
Lead		-	NA	NA	NA	NA	NA	NA
Magnesium	16000	13200	NA	ŇA	NA	NA	NA	NA
Manganese	-	-	NA	NA	NA	NA	NA	NA
Mercury			NA	NA	NA	NA	NA	NA_
Nickel	_	-	NA	NA	NA	NA	NA	NA
Potassium	-	3510 J	NA	ÑĂ	NA	NA	NA	NA
Selenium			NA	NA	NA	NA	NA	NA
Sodium	290000	111000	NA	ŇA	NA	NA	NA	NA
Vanadium		-	NA	NA	NĀ	NA	NA	NA
Zinc	-	8.9 J	NA	NA	NA	NA	NA	NA
Cyanide		5.7 J	NA	NA	NA	NA	NA	NA

### Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

(Sheet 25 of 43)

SITE	MW14D	MW14D	MW14D	MW14D	MW14D	MW14D	MW14D
DATE	8/31/2004	12/7/2006	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/7/2011
AOUIFER DESIGNATION	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC
METHODOLOGY	LF	LF	DB	DB	DB	DB	DB
Volatile Organics (ug/L)							
1 1 1-Trichlorgethane	_						
1 1 2-Trichloro-1 2 2-trifluoroethane			-		NA	NA	NA
1 1-Dichloroethane							
1 1-Dichloroethene							
1.2-Dichlorobenzene							
1.2-Dichloroethane			<u> </u>				
2-Butanone				_	NA	NA	NA
2-Hexanone					NA	NA	NA
4-Methyl-2-pentanone					NA	NA	NA
Acetone			557758 FEER	PSVIE 64 Skiel	NA	NA	NA
Benzene			-	-			
Bromoform	291				Ř	R	R
Bromomethane							
Carbon disulfide							
Chloroform							
Chloromethane							
cis-1 2-Dichloroethene	-			-			
cis-1 3-Dichloropropene	-			-			
Cyclohexane	-	-	0.81		NA	NA	NA
Methyl Acetate	R				NA	NA	NA
Methyl tert-butyl ether	0.21 J			-			
Tetrachloroethene							_
Toluene			0.62	~			
trans-1 2-Dichloroethene	_						
Trichloroethene	-						
Vinvl chloride	-			-			
Semi-Volatile Organics (ug/L)							
Bis(2-ethylhexyl)phthalate	·	_	NA	NA	NA	NA	NA
Caprolactam	-		. NA	NA	NA	NA	NA
Isophorone	-	_	NA	NA	NA	NA	NA
Naphthalene	-		NA	NA	NA	NA	NA
Phenol	-		NĀ	NA	NA	NA	NA
Pesticides (ug/L)							
alpha-Chlordane	-		NA	NA	NA	NA	NA
beta-BHC	-	·	NA	NĀ	NA	NA	NA
Metals and Cyanide (ug/L)			· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·
Aluminum	-		NA	NA	NA	NA	NA
Antimony			NA	NA	NA	NA	NA
Arsenic	-		NA	NA	NA	NA	NA
Barium			NA	NA	NA	NA	NA
Beryllium	-	-	NA	NA	NA	NA	NA
Cadmium			NA	NA	NA	NA	NÁ

### (Sheet 26 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SĪTE	MW14D	MW14D	MW14D	MW14D	MW14D	MW14D	MW14D
DATE	8/31/2004	12/7/2006	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/7/2011
AQUIFER DESIGNATION	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC
METHODOLOGY	LF	LF	DB	DB	DB	DB	DB
Calcium	7800	9240	NA	NA	NA	NA	NA
Chromium	-	-	NA	NA	NA	NA NA	NĂ
Cobalt	-	-	NA	NA	NA	NA	NA
Соррег	-		NA	NA	NA	NA	NA
Iron	-	37 J	NA	NĂ	NA	NA	NA
Lead	-	-	NA	NA	NA	NA	NA
Magnesium	1	5110 J	NA	NA	NA	NA	NA
Manganese	-	1	NA	NA	NA	NA	NA
Mercury	1		NA	NA	NA	NA	NA
Nickel	-	-	NA	NA	NA	NA	NA
Potassium	1	3240 J	NA	NA	NA	NA	NA
Selenium	-	-	NA	NA	NA	NA	NA
Sodium	22000	21400	NA	NA	NA	NA	NA
Vanadium	-		NA	NA	NA	NA	NA
Zine			NA	NA	NA	NA	NA
Cyanide	-	3.8 J	NA	NA	NA	NA	NA

# Table 1 (Sheet 27 of 43)Summary of Detected Constituents in Groundwater<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

.

.

SITE	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW16	MW16	MW16	MW16	MW16	MW16
DATE	9/1/2004	9/15/2004	12/1/2006	12/14/2006	9/16/2009	9/16/2009	7/7/2011	7/7/2011	9/16/2009	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/7/2011
AOUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC
METHODOLOGY	Pump/Bailer	Pump/Bailer	DB	LF	DB	DB	DB	DB	DB	DB	DB	DB	DB	DB
Volatile Organics (ug/L)		· · · · · · · · · · · · · · · · · · ·	• • • • • • • • • • • • • • • • • • • •									•		
1.1.1-Trichloroethane		NÁ		-		-	-				-			
1.1.2-Trichloro-1.2.2-trifluoroethane		NA			++		NA	NA	-			NA	NA	NA
1.1-Dichloroethane	-	NA				-								
1.1-Dichloroethene		NA		_	-	-								
1,2-Dichlorobenzene		NA						_	i					
1,2-Dichloroethane	_	NA	-			-	-	~			-		-	
2-Butanone	-	NA	~	-	-		NA	NA	-			NA	NA	NA
2-Hexanone	-	NA	~		-	-	NA	NĀ	-		-	NA	NA	NA
4-Methyl-2-pentanone	-	NA		-	-		NA	NA	-			NA	NĂ	NA
Acetone	-	NA		_	56	72	NA	NA	68	63	62	NA	NA	NA
Benzene	-	NA	-	-	-	-	-	~		-			-	
Bromoform		NA	~	-		-	R	Ŕ	-	-		R	R	R
Bromomethane	-	NA		-		1	1			-				
Carbon disulfide		NA	-	-	-	-	1	-			-			
Chloroform		NA			-	-	-	-			-	-	-	
Chloromethane	-	NA	-	-	-	-	-	-						
cis-1,2-Dichloroethene	20	NA	23 D	18	19	19 K	6.61	15.7						
cis-1,3-Dichloropropene	-	NA	-	_	1	-	-					-		
Cyclohexane	-	NA	0.13 J	-	-		NA	NA	-			NA	NA	NA
Methyl Acetate		NA				-	NA	NA	-			NA	NA	NA
Methyl tert-butyl ether		NA	-		-	_	-							
Tetrachloroethene	1.4	NA	-	0.35 J		-	-							
Toluene		NA		-	-	1.1					0.77			
trans-1,2-Dichloroethene		NA	~	0.53	-		-							
Trichloroethene	3.1	NA	0.43 J	0.55		0.5			-	-		-	-	-
Vinyl chloride		NA		-	-	<u> </u>						<u> </u>	<u> </u>	
Semi-Volatile Organics (ug/L)		•		<u> </u>					<b></b>		•			
Bis(2-ethylhexyl)phthalate	NA		NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	<u>NA</u>	5.7 J	NA	-	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	<u>NA</u>
Isophorone	NA		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	
Naphthalene	NA		NA		NA	NA	NA	NA	NA	NA	NA	NA NA	NA	
Phenol	NA	L	<u>NA</u>	<u> </u>		NA	NA		NA		NA	NA		NA
Pesticides (ug/L)		F							1					<del></del>
alpha-Chlordane	NA		NA		NA	NA	NA	NA	NA	NA	NA		NA	<u>NA</u>
beta-BHC	NA	L	<u>NA</u>		NA		NA	NA	NA					
Melais and Cyaniae (ug/L)		<u> </u>	r	T	514	N 14	<u> </u>	<u></u>	214		1 11			T
Aluminum			<u>NA</u>		NA NA	NA	NA	NA	NA	NA	NA	NA NA	NA NA	
America	NA NA	<u> </u>	NA NA	·	NA	NA NA	INA NA	INA NA					NA NA	
Alseine Darium	NA NA		NA NA	74.61	NA NA		NA NA	NA NA	INA NA	NA NA				
				/4.5 J	NA NA		NA NA	NA NA	NA NA		NA NA			
Codmium	NA NA	+		<u> </u>	NA	NA NA			NA NA				NA NA	
Caumium				<u> </u>		NA			NA		NA			

## Table 1 (Sheet 28 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW15	MW16	MW16	MW16	MW16	MW16	MW16
DATE	9/1/2004	9/15/2004	12/1/2006	12/14/2006	9/16/2009	9/16/2009	7/7/2011	7/7/2011	9/16/2009	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/7/2011
														1
AQUIFER DESIGNATION	UC	UC	UC ·	UC	UC	UC	UC	UC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC	MC/LC
METHODOLOGY	Pump/Bailer	Pump/Bailer	DB	LF	DB	DB	DB	DB	DB	DB	DB	DB	DB	DB
Calcium	NA	100000	NA	105000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	-	NA	_	NĀ	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	+	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	-	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	ŇA	260	NA	114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	-	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	52000	NA	52400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	33	NA	26.2	NA	NA	NA	NA	NA	NA	NA	NA	NA_	NA
Mercury	NA		NA		NA	NA	NA	NA	NA	NA	NA	NA	NA_	NA
Nickel	NA	-	NA	39.2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	13000	NA	11400	NA	NA	NA	NĀ	NA	NA	NA	NA	NA	NA
Selenium	NA	-	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	150000	'NA	139000	NA	NA	NA	NA	NA	NA_	NA	NA	NA	NA
Vanadium	NA	-	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zine	NA		NA	15.6 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	NĂ	-	NA		NA	NA	NA	NA	NA	NA_	NA NA	NA	NA	NÁ

Sheet 29 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW17	MW17	MW17	MW18	MW18	MW18	MW18	MW19	MW19	MW19	MW19	MW20	MW20	MW20
DATE	12/19/2006	9/15/2009	7/7/2011	12/20/2006	9/15/2009	7/7/2011	7/7/2011	12/20/2006	9/15/2009	7/7/2011	7/7/2011	12/20/2006	9/16/2009	7/7/2011
DATE	12/19/2000	311372003		12/20/2000	2002		Dunlicate	1220,2000	511512005		Duplicate	12/20/2000	5/10/2005	111/2011
AOUIFER DESIGNATION	110	UC		110			Duplicate			110	Duplicate		110	110
AQUIFER DESIGNATION				15		DD							00	
METHODOLOGY	LF	DB	DB			UB				<u>D</u> B				DB
Volanie Organics (ug/L)							r	r	· · · · · · · · · · · · · · · · · · ·			·		
1,1,1-1richloroethane					-			<del></del>						
1,1,2-Trichloro-1,2,2-trifluoroethane			NA		-	NA	NA			NA	NA			NA
1,1-Dichloroethane			-		-									
1,1-Dichloroethene			-	-		-		-					•*	
1,2-Dichlorobenzene		-			-			-						
1,2-Dichloroethane	-	-	-	-		-	-				-			
2-Butanone	-		NA		+	NA	NA	-	-	NA	NA	-		NA
2-Hexanone	1	-	NA	-	-	NA	NA			NA	NA		1	NA
4-Methyl-2-pentanone		-	NA	-	-	ŇA	NA			NA	NA			NA
Acetone	-	63	NA	-	69 K	NA	NA		67	NA	NA		67	NA
Benzene			_		-	-		-		-			-	
Bromoform	-		R			R	R	-		R	R	-		R
Bromomethane		_							-			-		-
Carbon disulfide		_		-	_			-	-					
Chloroform						-						-	-	
Chloromethane						-								
cis-1 2-Dichloroethene	2.8			0111			t	I				t		
cis-1.3-Dichloropropene							t	<u> </u>						<u> </u>
Cycloberane			NA			NA	NA			NA	NA			NA
Methyl Acetate			NA			NA	NA		<u> </u>	NA	NA			NA
Methyl tert-hutyl ether										101				
Tatashlaroathana		0.61	0.64	<u> </u>		0.66	0.62	f		<u> </u>	[			
Teluere	3.1	0.01	0.04	<u>_</u>	0.57	0.00	0.05	<u>↓</u> ,				4.0		<u>                                     </u>
Toluene				<u>_</u>				ļ	<u> </u>					
trans-1,2-Dichloroethene	0.14 J							ļ						
1 richloroethene	1.2	<u> </u>		0.131				ļ						·
Vinyl chloride	-	L	<u> </u>	<u> </u>			L	L	<u> </u>		<u> </u>			
Semi-Volatile Organics (ug/L)							T	<del></del>		1				
Bis(2-ethylhexyl)phthalate		NA	NA		NA	NA	NA		NA		<u>NA</u>		NA	NA
Caprolactam		NA	NA	=	NA	NA	NA	L		NA	NA		<u>NA</u>	NA
Isophorone		NA	NA		NA	NA	NA		NA	NA	NA	<u> </u>	NA NA	NA
Naphthalene		NA	NA	<b></b>	NA	NA	NA	L	<u>NA</u>	NA	NA	<u> </u>	<u>NA</u>	NA
Phenol		NA	NA	<u> </u>	NA	NA	NA	-	NA	NA	NA		NA	NA
Pesticides (ug/L)														
alpha-Chlordane	-	NA	NA	-	NA	NA	NA	-	NA	NA	NA		NA	NA
beta-BHC	-	NA	NA	-	NA	NA	NA		NA	NA	NA		NA	NA
Metals and Cyanide (ug/L)														
Aluminum	76.6 J	NA	NA	75 J	NA	NA	NA	- 1	NA	NA	NA		NA	NA
Antimony	-	NA	NA		NA	NA	NA		NA	NA	NA	- 1	NA	NA
Arsenic	-	NA	NA		NA	NA	NA	-	NA	NA	NA		NA	NA
Barium	+	NA	NA	-	NA	NA	NA		NA	NA	NA		NA	NA
Beryllium	-	NA	NA		NA	NA	I NA		NA	NA	NA		NA	NA
Cadmium		NA	NA	-	NA	NA	NA		NA	NA	NA		NA	NA

## Table 1 (Sheet 30 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW17	MW17	MW17	MW18	MW18	MW18	MW18	MW19	MW19	MW19	MW19	MW20	MW20	MW20
DATE	12/19/2006	9/15/2009	7/7/2011	12/20/2006	9/15/2009	7/7/2011	7/7/2011	12/20/2006	9/15/2009	7/7/2011	7/7/2011	12/20/2006	9/16/2009	7/7/2011
1							Duplicate				Duplicate			
AQUIFER DESIGNATION	UC	UC		UC	UC			UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	LF	DB	DB	LF	DB	DB	DB	LF	DB	DB	DB	LF	DB	DB
Calcium	52700	NA	NA	63900	NA	NA	NA	94900	NA	NA NA	NA	60300	NA	NA
Chromium	-	NA	NA	26.3	NA	NA	NA		NA	NA	NA	25.4	NA	NA
Cobalt	-	NA	NA	-	NA	NA	NA		NA	NA	NA		NA	NA
Copper	-	NA	NA		NA	NA	NA	-	NA	NA	NA		NA	NA
Iron	-	NA	NA	155	NA	NA	NA	37.5 J	NA	NA	NA	12891414、14	NA	NA
Lead	-	NA	NA	2.4 J	NA	NA	NĀ	-	NĀ	NA	NA		NA	NA
Magnesium	6810	NA	NA	22500	NA	NA	NA	16700	NA	NA	NA	11200	NA_	NA
Manganese	20.2	NA	NA	19.9	NA	NA	NA	22	NA	NA	NA	34.2	NA	NA
Mercury	-	NA	NA		NA	NA	NA	-	NA	NA	NA		NA	NA
Nickel	5.1 J	NA	NA	12.9 J	NA	NA	NA	8.9 J	NA	NA	NA	24.7 J	NA	NA
Potassium	2730 J	NA	NA	8390	NA	NA	NA	3680 J	NA	NA	NA	16200	NA	NA
Selenium	-	NA	NA	-	NA	NA	NA		NA	NA	NA	-	NA	<u>NA</u>
Sodium	97500	NA	NA	57200	NA	NA	NA	53100	NA	NA	NA	221000	NA	NA
Vanadium	-	NA	NA		NA	NA	NA		NA	NA	NA		NA	NA
Zinc	25.1 J	NA	NA	11.7 J	NA	NA	NA	<u>10,8 J</u>	NA	NA	NA	14.6 J	NA	NA
Cyanide	-	NA	NA	-	NA	NA	NĂ	-	NA	NA	NA		NA	NA

Notes are provided on Page 43.

.

# Table 1 (Sheet 31 of 43)Summary of Detected Constituents in Groundwater<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	MW21	MW21	MW21	MW22	MW22	MW22	MW23	MW23	MW23	MW24	MW24	MW24
DATE	12/21/2006	9/16/2009	7/7/2011	12/18/2006	9/16/2009	7/7/2011	12/18/2006	9/16/2009	7/7/2011	12/19/2006	9/16/2009	7/7/2011
		l i										
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	Pump/Bailer	DB	DB	LF	DB	DB	LF	DB	DB	Pump/Bailer	DB	DB
Volatile Organics (ug/L)												
1,1,1-Trichloroethane							-					<del></del>
1,1,2-Trichloro-1,2,2-trifluoroethane			NA			NA			NA			NA
1,1-Dichloroethane				~						-		
1,1-Dichloroethene					-							
1,2-Dichlorobenzene									**			
1,2-Dichloroethane												<u> </u>
2-Butanone			<u>NA</u>			NA			<u>NA</u>			<u>NA</u>
2-Hexanone	<u> </u>					NA			NA			<u>NA</u>
4-Methyl-2-pentanone			<u>NA</u>			NA	<u> </u>		<u>NA</u>			NA
Acetone		66	<u> </u>		68	NA		62 K	<u>NA</u>		00 K	
Benzene		<del>_</del>	—— <u>—</u> —		<u> </u>				<u> </u>		<del></del>	
Bromotorm		<u> </u>	<u> </u>			ĸ	<u> </u>	~	ĸ			ĸ
Bromomethane		ļ	<u> </u>	<u>↓</u>								
Carbon disulfide	<u> </u>	<u> </u>					<u> </u>			·		
Chlorotorm	<u> </u>		<u> </u>	<u> </u>		-	<u> </u>					
Chloromethane		I		<u>_</u>							<u> </u>	
cis-1,2-Dichloroethene					3.3		<u> </u>					
cis-1,3-Dichloropropene				<u> </u>	-		<u> </u>					
			<u>NA</u>	<u> </u>	0.62			- <u> </u>				NA
Methyl Acetate	<u> </u>					NA						INA
Methyl tert-outyl ether	f		<u>↓</u>							<u> </u>		
T etrachioroethene				23 D	18		<u> </u>					
1 oluene	0.51										0.98	
trans-1,2-Dichloroethene				- <u>-</u>							<u> </u>	
1 Inchioroeunene			<u> </u>				ļ	<u> </u>				
Sami Volatila Operation (un/l.)	· · · ·	<u> </u>		L	L		<u> </u>	L			L	
Big(2 athylheavi) athylate	r	1 NIA		r	NA	NA	r	NA.	NA	<u> </u>	NIA	NA -
Cantolactam		NA NA	NA NA	<u> </u>	NA NA	NA NA	<u>}</u>	NA NA	NA NA		NA	NA NA
Isophorope		NA NA	NA NA	<u> </u>		NA	<u> </u>	NA NA	NA NA	f	NA	NA NA
Naphthalene		NA NA			NA NA	NA	<u> </u>	NA NA	NA NA		NA	NA NA
Phenol	f		NA NA	<u> </u>	NA	NA	I	NA	NA			NA
Pesticides (ug/L)	L		<u>1NA</u>	L	<u>NA</u>		1	<u> </u>				
alpha-Chlordane		NA.			NA	NA	<u> </u>	NA	NA		NA	NA
beta-BHC		NA	NA		NA	NA		NA	NA		NA	NA
Metals and Cyanide (up/L)	·	1	1	L	1	1	L	L*```	<u> </u>	k	1	<u> </u>
Aluminum	16200	NA	I NA		NA	NA	202 J	NA	NA	373	NA	NA
Antimony	521		NA	<u></u>	NA	NA		<u>NA</u>	NA		NA	NA
Arsenic	421	NA	NA		NA	NA		NA	NA		NA	NA
Barium	346	NA	NA	t	NA NA	NA	<u> </u>	NA	NA		NA	NA
Bervilium	1 11	NA		t	NA	NA		NA	NA		NA	NA
Cadmium	1.2 J	NA	NA		NA	NA	f	NA	NA	0.47 J	NA	NA

3

Table 1 (Sheet 32 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW21	MW21	MW21	MW22	MW22	MW22	MW23	MW23	MW23	MW24	MW24	MW24
DATE	12/21/2006	9/16/2009	7/7/2011	12/18/2006	9/16/2009	7/7/2011	12/18/2006	9/16/2009	7/7/2011	12/19/2006	9/16/2009	7/7/2011
		i										
AQUIFER DESIGNATION	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC	UC
METHODOLOGY	Pump/Bailer	DB	DB	LF	DB	DB	LF	DB	DB	Pump/Bailer	DB	DB
Calcium	257000	NA	NA	105000	NA_	NA	62800	NA	NA	109000	NA	NA
Chromium	88.1	NA	NA	-	NA	NA	11.5	NA	NA	123	NA	NA
Cobalt	<u>13</u> J	NA	NA	-	NA	NA		NA	NA	-	NA	NA
Copper	51.1	NA	NA	-	NA	NA	-	NA	NA	6.3 J	NA	NA
Iron	31200	NA	NA	-	NA	NA	141	NA	NA	490	NA	NA
Lead	39,3	NA	NA	-	NA	NA	1	NA	NA		NA	NA
Magnesium	48900	NA	NA	8350	NA	NA	17500	NA	NA	21600	NA	NA
Manganese	1130	NA	NA	-	NA	NA	19.1	NA	NA_	71.8	NA	NA
Mercury	0.19 J	NA	NA	-	NA	NA	1	NA	NA		NA	NA
Nickel	57.1	NA	NA	2 J	NA	NA	7.2 J	NA	NA_	9.9 J	NA	NA
Potassium	10100	NA	NA	2670 J	NA	NA	7630	NA	NA	8560	NA	NA
Selenium	_	NA	NA	4.8 J	NA	NA	-	NA	NA	-	NA	NA
Sodium	93200	NA	NA	148000	NA	NA	95800	NA	NA	64500	NA	NA
Vanadium	-	NA	NA	-	NA	NA	-	NA	NA		NA	NA
Zine	106	NA	NA	-	NA	NA	13.1 J	NA	NA	284	NĂ	NA
Cyanide	-	NA	NA	-	NA	NA	-	NA	NĀ	NA	NA	NA

# Table 1 (Sheet 33 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

.

•

SITE	MW25	MW25	MW25	MW26	MW26	MW26	MW27	MW27	MW27	MW27
DATE	4/15/2008	9/15/2009	7/6/2011	9/11/2007	9/15/2009	7/7/2011	9/11/2007	9/11/2007	9/16/2009	7/7/2011
				!				Duplicate		
AOUIFER DESIGNATION	GN	GN	GN	GN	GN	GN	GN	GN	GN	GN
METHODOLOGY	LF	DB	DB	LF	DB	DB	LF	LF	DB	DB
Volatile Organics (ug/L)				•			· · · · · · · · · · · · · · · · · · ·		4,	••••••••
1.1.1-Trichloroethane		-		<u> </u>	-			-		
1,1,2-Trichloro-1,2,2-trifluoroethane	-	_	NA	-	-	NA	-			NA
1,1-Dichloroethane						-	-			
1,1-Dichloroethene		-	_	-	-	~				
1,2-Dichlorobenzene	-	-	-	-	-					
1,2-Dichloroethane		-	-		-					
2-Butanone		-	NA	-	-	NA	-	-		NA
2-Hexanone	-		NA	-	-	NA				NA
4-Methyl-2-pentanone	-	-	NA	-	-	NĀ	-		-	NA
Acetone	~	59	NA	-	65 K	NA	-		67 K	NA
Benzene	-	-		-						
Bromoform	•••	-	R	-	-	R				R
Bromomethane		-	-	-		-				-
Carbon disulfide	~-	-	-	-	-	1	-			
Chloroform	1,2	-	-	-	-	-				
Chloromethane	-	-		-	-		-			
cis-1,2-Dichloroethene	0.14 J	-	-		-	1		-		-
cis-1,3-Dichloropropene	-	-	-	_	-	1				
Cyclohexane		-	NA	-	1	NA				NA
Methyl Acetate	-	-	NA	-	-	NA	-			NA
Methyl tert-butyl ether		-	-	- 1	-	~-	-			
Tetrachloroethene	12	6.7	2.78	-	-	-	7.9	8		
Toluene	1.3	1.9	0.66	0.3 J	-	***				
trans-1,2-Dichloroethene		-	-	-	-		-			
Trichloroethene	2.9	1.2	0.53		-	-	0.51	0.49 J		
Vinyl chloride	~			-	-	-	-	-		
Semi-Volatile Organics (ug/L)										
Bis(2-ethylhexyl)phthalate	-	NA	NA	-	NA	NA	- 1	-	NA	NA
Caprolactam	-	NA	· NA	-	NA	NA		-	NA	NA
Isophorone	0.2 J	NA	NA	-	NA	NA	-		NA	NA
Naphthalene	-	NA	NA	-	NA	NA	-		NA	NA
Phenol	1.8J	NA	NA	-	NA	NA	-		NA	NA
Pesticides (ug/L)										
alpha-Chlordane	-	NA	NA	-	NA	NA	-		NA	NA
beta-BHC	1	NA	NA	-	NA	NA	1		NA	NA
Metals and Cyanide (ug/L)										
Aluminum	200	NA	NA		NA	NA	-	-	NA	NA
Antimony	-	NA	NA	-	NA	NA	-		NA	NA
Arsenic	-	NA	NA	-	NA	NA		2 J	NA	NA
Barium		NA	NA	418	NA	NA	234	235	NA	NA
Beryllium	-	NA	NA	-	NA	NA	-		NA	NA
Cadmium	-	NA	NA	_	NA	NA	-		NA	NA

### Table 1 (Sheet 34 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW25	MW25	MW25	MW26	MW26	MW26	MW27	MW27	MW27	MW27
DATE	4/15/2008	9/15/2009	7/6/2011	9/11/2007	9/15/2009	7/7/2011	9/11/2007	9/11/2007	9/16/2009	7/7/2011
								Duplicate		
AQUIFER DESIGNATION	GN	GN	GN	GN	GN	GN	GN	GN	GN	GN
METHODOLOGY	LF	DB	DB	LF	DB	DB	LF	LF	DB	DB
Calcium	46000	NA	NA	83200	NA	NA	42500	42300	NA	NA
Chromium	17	NA	NA	3.3 J	NA	NA	2.6 J	2.9 J	NA	NA_
Cobalt		NA	NA	0.36 J	NĂ	NA	0.44 J	0.35 J	NA	NA
Copper	1	NA	NA	0.45 J	NĂ	NA			NA	NA
Iron	64	NA	NA	199	NA	NA	74.9 J	81.1 J	NA	NA
Lead		NA	NA		NA	NA	-	-	NA	NA
Magnesium	3000	NA	NA	22100	NA	NA	14600	14600	NA	NA
Manganese	12	NĂ	NA	17.6 J	NA	NA	21.6 J	22.4 J	NA	NA
Mercury	-	NA	NA	-	NA	NA	_	-	NA	NA
Nickel	_	NA	NA	3.5 J	ŇĂ	NA	4.5 J	51	NA	NA
Potassium	27000	NA	NA	5100 J	NA	NA	4570 J	4600 J	NA	NA
Selenium	-	NA	NA	-	• NĀ	NA	-		NA	NA
Sodium	160000	NA	NA	96400	NA	NA	57000	61200	NA	NA
Vanadium	-	NA	NA	-	NA	NA	0.18 J	0.26 J	NA	NA
Zinc	-	NĂ	NA	-	NA	NA	-		NA	NA
Cyanide	-	NA	NA		NA	NĂ	-	-	NĂ	<u>NA</u>

Notes are provided on Page 43.

.

### Sheet 35 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW28	MW28	MW28	MW28	MW28	MW28	MW28	MW28	MW28	MW28
DATE	9/15/2009	9/15/2009	9/15/2009	9/15/2009	9/15/2009	7/6/2011	7/6/2011	7/6/2011	7/6/2011	7/6/2011
AQUIFER DESIGNATION	UC.	UC	MC	LC	LC	UC	UC	MC	LC	LC
METHODOLOGY	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port
Volatile Organics (ug/L)							•			
1,1,1-Trichloroethane				-	-		-			
1,1,2-Trichloro-1,2,2-trifluoroethane	-		_		-	NA	NA	NA	NA	NA
1,1-Dichloroethane	- 1		-	-	-	-			-	
1,1-Dichloroethene	-		-	-		1	-		-	
1,2-Dichlorobenzene	-		-		-	-		-	-	
1,2-Dichloroethane	-	-	-	-	-	-		-	1	
2-Butanone	-		-	<del></del>	5.8	NA	NA	NA	NA	NA
2-Hexanone	1		-		-	NA	NA	NA	NA	NA
4-Methyl-2-pentanone		_	-	-	-	NA	NA	NA	NA	NA
Acetone	_	-	-	-	6.5	NA	NA	NA	NA	NA
Benzene	-	-	-		-	· · · -			÷	
Bromoform	-		-	-		R	R	R	R	R
Bromomethane	1.9		-		-					
Carbon disulfide	-		-	-		-	·		-	
Chloroform		-	1	-		-		· _	1	
Chloromethane	-	-	-	-	-					
cis-1,2-Dichloroethene	-	-	-	-	-	1			-	
cis-1,3-Dichloropropene	-				-	-				
Cyclohexane	-	-	-	-		NA	NA	NA	NA	NA
Methyl Acetate	-	-	-		-	NA	NA	NA	NA	NA
Methyl tert-butyl ether	1	-			-	1				-
Tetrachloroethene	-		-	-	-				-	
Toluene	0.84	0.58	-	-	62	1				1 27
trans-1,2-Dichloroethene	-	-			-	-			-	
Trichloroethene	-		-	-	-	-			-	
Vinyl chloride		-	-							
Semi-Volatile Organics (ug/L)										
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA		NA	NA	NA NA	<u>NA</u>	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides (ug/L)					-					
alpha-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals and Cyanide (ug/L)				•						
Aluminum	NA	NA	NA	NA	NA	NA	ŇA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

### (Sheet 36 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW28									
DATE	9/15/2009	9/15/2009	9/15/2009	9/15/2009	9/15/2009	7/6/2011	7/6/2011	7/6/2011	7/6/2011	7/6/2011
AQUIFER DESIGNATION	UC	UC	MC	LC	LC	UC	UC	MC	LC	LC
METHODOLOGY	Multi-Port									
Calcium	NA									
Chromium	NA									
Cobalt	NA									
Copper	NA									
Iron	NA									
Lead	NA									
Magnesium	NA									
Manganese	NA									
Mercury	NA									
Nickel	NA									
Potassium	NA	NA	NA	NÁ	NA	NA	NA	NA	NA	NA
Selenium	NA									
Sodium	NA									
Vanadium	NA									
Zinc	NA									
Cyanide	NA	NĂ								

### (Sheet 37 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW29	MW29	MW29	MW29	MW29						
DATE	9/16/2009	9/16/2009	9/16/2009	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/6/2011	7/7/2011	7/7/2011	7/7/2011
		]						Duplicate			
AQUIFER DESIGNATION	UC	UC	10	10	10	UC	UC	UC	10	10	
METHODOLOGY	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port						
Volatile Organics (ug/L)							1 1.1014 1 011		- Maria I Oli	Materiat	
1,1,1-Trichloroethane	-	-	_	-				-	-		
1,1,2-Trichloro-1,2,2-trifluoroethane		-				NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	-		-				-			-	-
1,1-Dichloroethene		-	-				-			-	
1,2-Dichlorobenzene	-		-				-	-		-	
1,2-Dichloroethane	1	-	-							-	-
2-Butanone	ł	-	-		-	NA	NÁ	NA	NA	NA	NA
2-Hexanone	1	_	-		-	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	-	-	-			NA	NA	NA	NA	NA	NA
Acetone		-	-	-	6.4	NA	NA	NA	NA	NA	NA
Benzene			-				-				-
Bromoform	-			-		<u>R</u>	R	R	R	R	R
Bromomethane		-		<u> </u>				-			
Carbon disulfide											
Chloroform									<u> </u>		
Chloromethane				-							
cis-1,2-Dichloroethene											
cis-1,3-Dichloropropene			=							<u> </u>	-
Cyclohexane						NA	NA	NA	NA	NA	NA
Methyl Acetate		<u> </u>		<u> </u>		NA	NA	NA	NA	NA	<u>NA</u>
Methyl tert-butyl ether					<u> </u>		-		<u> </u>		
Tetrachloroethene	-	<u> </u>	-				-				
Toluene	34 J	83	29	21	6.7	<u> </u>	6.73	11	8.61	4.8	2.15
trans-1,2-Dichloroethene				-							-
Trichloroethene											-
Vinyl chloride		<u> </u>						-		-	-
Semi-Volatile Organics (ug/L)											
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NÁ	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA						
Isophorone	NA	NA	NA	NA	NA						
Naphthalene	NA	NA	NA	NA	NA						
Phenol	NA	NA	NA	NA	NA						
Pesticides (ug/L)								_			
alpha-Chlordane	NA	NĀ	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	NA	NA	NĂ	NA	NA						
Metals and Cyanide (ug/L)											
Aluminum	NA	NA	NA	NA	NA						
Antimony	NA	NA	NA	NA	NA						
Arsenic	NA	NA	NA	NA	NA						
Barium	NA	NA	NA	NA	NA						
Beryllium	NA	NA	NA	NA	NA						
Cadmium	NA	NA	NA	NA	NA						

### (Sheet 38 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW29										
- DATE	9/16/2009	9/16/2009	9/16/2009	9/16/2009	9/16/2009	7/7/2011	7/7/2011	7/6/2011	7/7/2011	7/7/2011	7/7/2011
[	•							Duplicate		·	
AQUIFER DESIGNATION	UC	UC	LC	LC	LC	UC	UC	UC	LC	LC	LC
METHODOLOGY	Multi-Port										
Calcium	NA	NA	NA	NA	NA	NĀ	NA	NA	NA	NA	NA
Chromium	NA										
Cobalt	NA	NĂ									
Copper	NA	NA	NA	ŇA	NA						
Iron	NA	NA	NA	NA	NA	NĀ	NA	NA	NA	NA	NA
Lead	NA										
Magnesium	NA	· NA	NA	NA							
Manganese	NA										
Mercury	NA	NA .	NA								
Nickel	NA	NA	ŇA	NA	NA	NĂ	NA	NA	NA	NA	NA
Potassium	NA										
Selenium	NA										
Sodium	NA										
Vanadium	NA										
Zinc	NA										
Cyanide	NA	ŇA	NA								

# Table 1 (Sheet 39 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW30	MW30	MW30	MW30	MW31									
DATE	9/16/2009	9/16/2009	7/7/2011	7/7/2011	9/15/2009	9/15/2009	9/15/2009	9/15/2009	9/15/2009	7/6/2011	7/6/2011	7/6/2011	7/6/2011	7/6/2011
AQUIFER DESIGNATION	LC	LC	LC	LC	UC	мс	LC	LC	LC	UC	мс	LC	LC	LC
METHODOLOGY	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port
Volatile Organics (ug/L)		•					•							• • • • • • • • • • • • • • • • • • •
1,1,1-Trichloroethane	-	-	-				- 1			-		-	-	
1,1,2-Trichloro-1,2,2-trifluoroethane			NA	NA	-			~		NA	NA	NA	NA	NA
1,1-Dichloroethane	-	-			**	-	-	-						
1,1-Dichloroethene		-	-		-	-	-	-						-
1,2-Dichlorobenzene	-		-		-	-	-	~						
1,2-Dichloroethane	-	-	-		-		-							
2-Butanone	-	-	NA	NA	140	-	-	-	-	NA	NA	NA	NA	NA
2-Hexanone	_	-	NA	NA	-	-	-	-	-	NA	NA	NA	NA	NA
4-Methyl-2-pentanone			NA	NA	8.8	-	-	-	-	NA	NA	NA	NA	NA
Acetone		-	NA	NA	280	5.1		-	6.5	NA	NA	NA	NA	NA
Benzene			-	-	-		-		-			-		
Bromoform			R	R		-	-	-		R	R	R	R	R
Bromomethane		-						-			-			
Carbon disulfide		-		-			-							
Chloroform	-	-		-	1.1			-					-	
Chloromethane	-	-	-	-		~	-	-	-					
cis-1,2-Dichloroethene	-	-	-	-		-		-	-					
cis-1,3-Dichloropropene	-	-				-	-		-			-		
Cyclohexane	-	-	NA	NA	-		<u> </u>	-		NA	NA	NA	NA	NA
Methyl Acetate	-	-	NA	NA			-			NA	NA	<u>NA</u>	NA	NA NA
Methyl tert-butyl ether					-									
Tetrachioroethene							-	-				-		
Toluene	1.3	19	0.89	18.8	190	140 K	2.8	15	31	32 J	5.26			8.16
trans-1,2-Dichloroethene		-		-	-									
Trichloroethene	0.77		-	-	-	-	<u> </u>	-	-					
Vinyl chloride	i				-		L	<u> </u>		<u> </u>			<u> </u>	
Semi-Volatile Organics (ug/L)			•····	•·····					··			<u></u>		
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA	<u>NA</u>	NA	<u>NA</u>	NA NA	<u>NA</u>
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA NA	NA NA
Naphthalene	NA	NA	NA	NA	NA	NA		NA						
Phenol	NA	NA NA	NA	<u>NA</u>	NA	NA	NA	<u>NA</u>			NA		<u>NA</u>	
Pesticides (ug/L)					<b>.</b>									
alpha-Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA
beta-BHC	NA	NA	NA	NA	NA	NA		NA		NA	<u>NA</u>	<u>NA</u>		<u>NA</u>
Metals and Cyanide (ug/L)								1						
Aluminum	NA	NA	NA		NA	NA.	NA	<u>NA</u>	NA NA					
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA
Arsenic	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	<u>NA</u>	<u>NA</u>	NA	NA	NA	NA	NA	NA NA		<u>NA</u>	NA NA	<u>NA</u>	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA	NA
Cadmium	NA	<u>1 NA</u>	NA	<u>NA</u>	NA	NA	NA	NA	<u>NA</u>	<u>NA</u>	<u>NA</u>	NA NA	<u>NA</u>	<u>NA</u>

.

# Table 1 (Sheet 40 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	MW30	MW30	MW30	MW30	MW31									
DATE	9/16/2009	9/16/2009	7/7/2011	7/7/2011	9/15/2009	9/15/2009	9/15/2009	9/15/2009	9/15/2009	7/6/2011	7/6/2011	7/6/2011	7/6/2011	7/6/2011
1												· · ·		
AQUIFER DESIGNATION	LC	LC	LC	LC	UC	мс	LC	LC	LC	UC	мс	LC	LC	LC
METHODOLOGY	Multi-Port													
Calcium	NA													
Chromium	NA	NĀ	NA	NA	NA									
Cobalt	NA	NA NA	NA	NA	NA									
Copper	NA	NA	NA	NA	NĀ	NA	NĂ	NA						
Iron	NA	NA	NA	NA	NĂ	NA								
Lead	NA													
Magnesium	NA	NA	NA	NA NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NÁ	NA	NA	NA									
Mercury	NA	NĂ	NA	NA	NA	NA	NA	NA						
Nickel	NA	NA	NA	, NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA NA	NA	NA	NA	NA	NA	ŇA	NA						
Selenium	NA													
Sodium	NA													
Vanadium	NA	NA	NA .	NA										
Zinc	NA													
Cyanide	NA	NA	NA	NĀ	ŇA	NA	ŇÁ							

# Table 1<br/>(Sheet 41 of 43)Summary of Detected Constituents in Groundwater<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	MW32	MW32	MW32	MW32	MW32	PETER'S WELL	PETER'S WELL	PETER'S WELL	PETER'S WELL	35552 ROUTE 3	P7.01	PZ01	P7.02	PZ02
DATE	9/17/2009	9/17/2009	9/17/2009	7/7/2011	7/7/2011	9/14/2004	9/14/2004	9/14/2004	12/15/2006	10/2/2008	9/13/2004	12/12/2006	9/14/2004	12/12/2006
		Duplicate					Duplicate						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
AQUIFER DESIGNATION	LC	IC	21			UC/MC/LC	UC/MC/LC	DELMELLE	DC/MC/IC	NA	NA	NA	NA	NA
METHODOLOGY	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	LF	LF	Bailer	IF	IF	IF	IF	IF	LE
Volatile Organics (ug/L)									L		<u></u>			
1 1 1-Trichloroethane			<u> </u>	-	-									
1.1.2-Trichloro-1.2.2-trifluoroethane	-	-	-	NA	NA							<u> </u>		
1.1-Dichloroethane		-				-						<u> </u>		
1.1-Dichloroethene		-				-		t						-
1.2-Dichlorobenzene					-					-				
1.2-Dichloroethane		-			_			-						
2-Butanone		-	-	NA	NA	-				-				
2-Hexanone		-		NA	NA		~						-	_
4-Methyl-2-pentanone				NA	NA									
Acetone		-		NA	NA						5.3		3.2 J	-
Benzene		-	-						-			-		- 1
Bromoform		- 1	-	R	Ř	-			-					
Bromomethane	-		-				-					- 1		-
Carbon disulfide	-	1	-				~	-	-				-	
Chloroform	-	-						-		-	-		-	
Chloromethane	-		-				~		-				-	
cis-1,2-Dichloroethene	-		-		-	0.41 J	0.44 J	0,63	-		22	6.2		0.18 J
cis-1,3-Dichloropropene		-		-	-				-	-				
Cyclohexane		-	-	NA	NA			-	-			-	-	-
Methyl Acetate				NA	NA			-	-	-			R	
Methyl tert-butyl ether		- 1	-	-	-	- 1		-	-	-	-	-	-	-
Tetrachloroethene		-			-	380 D	370 D	490 D	47 D	7.6	4.7	10	-	-
Toluene	0.89	0.85	21 L	-	18.6	-		-	-	-	:	-	-	-
trans-1,2-Dichloroethene		-		-		-	-	-		-	2	0.41 J	0.36 J	
Trichloroethene	-	-		-	-	2	2.1	2.4	1.2	-	3.4	2.6	0.15 J	0.12 J
Vinyl chloride	-			-			~	-	-		61	0.47 J		
Semi-Volatile Organics (ug/L)			· · · · ·										· · · · · · · · · · · · · · · · · · ·	······
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA			NA	-	NA	4.2 J	<u> </u>		
Caprolactam	NA	NA	NA	NA	NA			NA	-	NA		-		-
Isophorone	NA	NA	NA	NA	NA		-	NA	-	NA				
Naphthalene	NA	NA	NA	NA	NA			NA	-	NA			-	-
Phenol	NA	NA	NA	NA	NA		-	NA		NA				
Pesticides (ug/L)														
alpha-Chlordane	NA	NA	NA	NA	NA			NA		NA			-	1
beta-BHC	NA	NA	NA	NĀ	NA		-	NA		NA	-		R	
Metals and Cyanide (ug/L)														
Aluminum	NA	NA	NA	NA	NA		-	NA	-	NA	420	-		-
Antimony	NA	NA	NA	NA	NA			NA	-	NA				-
Arsenic	NA	NA	NA	NA	NA			NA		NA				-
Barium	NA	NA	NA	NA	NA			NA	16.8 J	NA	L -			-
Beryllium	NA	NA	NA	NA	NA		-	NA	-	NA				-
Cadmium	NA	NA	NA	NA	NA			NA	- 1	NA				

# Table 1(Sheet 42 of 43)Summary of Detected Constituents in Groundwater<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	MW32	MW32	MW32	MW32	MW32	PETER'S WELL	PETER'S WELL	PETER'S WELL	PETER'S WELL	35552 ROUTE 3	PZ01	PZ01	PZ02	PZ02
DATE	9/17/2009	9/17/2009	9/17/2009	7/7/2011	7/7/2011	9/14/2004	9/14/2004	9/14/2004	12/15/2006	10/2/2008	9/13/2004	12/12/2006	9/14/2004	12/12/2006
		Duplicate				<b>!</b> .	Duplicate							
AQUIFER DESIGNATION	LC	LC	LC	LC	LC	UC/MC/LC	UC/MC/LC	UC/MC/LC	UC/MC/LC	NA	NA	NA	NA	NA
METHODOLOGY	Multi-Port	Multi-Port	Multi-Port	Multi-Port	Multi-Port	LF	LF	Bailer	LF	LF	LF	LF	LF	LF
Calcium	NA	NA	NA	NA	NA	28000	28000	NA	11400	NA	93000	60000	130000	123000
Chromium	NA_	NA	NA	NA	NA		-	NA	-	NA	**	-	-	-
Cobalt	NA	NA	NA	NA	NA			NA		NA		-		-
Copper	NA	NA_	NA	NA	NA		~	NA	1	NA	-		-	
Iron	NA	NA_	NA	NA	NA	280	270	NA	31 J	NA	3900	1800	16000	7020
Lead	NA	NA	NA	NA	NA			NA		NA	-	2.9 J		-
Magnesium	NA_	NA	NA	NA	NA	8400	8300	NA	4660 J	NA	5700	-	8900	8820
Manganese	NA	NA	NA	NA	NA	L		NA	8 J	NA	240	47.2	540	507
Mercury	NA	NA_	NA	NA	NA			NA		NA			-	1
Nickel	NA	NA	NA	NA	NA			NA	-	NA	**			1
Potassium	NA	NA	NA	NA	NA	-		NA	3020 J	NA		1240 J		981 J
Selenium	NA	NA	NA	NA	NA		~	NA	-	NA	-			6,3 J
Sodium	NA	NA_	NA	NA	NA	69000	68000	NA	26500	NA	210000	142000	350000	295000
Vanadium	NA	NA	NA	NA	NA		-	NA		NA				-
Zinc	NA	NA	NA	NA	NA		· · ·	NA		NA		16.5 J	-	19.5 J
Cyanide	NA	NA	NA	NA	NA	<del>_</del>		NA		NA				-

.

# Table 1 (Sheet 43 of 43) Summary of Detected Constituents in Groundwater Crown Cleaners of Watertown Site Village of Herrings, Jeffereson County, New York

### NOTES:

"--" indicates not detected. "NA" indicates not analyzed or not applicable. "DB" indicates diffusion bag methodology. "LF" indicates low-flow methodology. "Multi-Port" indicates FLUTe system multi-port sampler methodology. "Pump/Bailer" indicates purged using pump, sampled using bailer methodology. "UC" indicates Upper Carbonate Hydrostratigraphic Unit. "MC" indicates Middle Carbonate Hydrostratigraphic Unit. "LC" indicates Lower Carbonate Hydrostratigraphic Unit. "GN" indicates Granitic Gneiss Hydrostratigraphic Unit. "B" qualifier (organics) indicates the constituent was also detected in an associated blank sample. "D" qualifier indicates concentration value from a dilution analysis. "J" qualifier indicates estimated concentration value. "K" qualifier indicates concentration value may be biased high. "L" qualifier indicates concentration value may be biased low. "N" qualifier indicates presumptive evidence exists for the presence of the compound. "R" qualifier indicates rejected (unusable) value.

Shaded values exceed comparison criteria for groundwater (see Table 4-4), as indicated:

Exceeds human health-based values.

Exceeds state values.

Exceeds both of the above values.

## Table 2A<sub>(Sheet 1 of 3)</sub> Summary of Detected Constituents in On-Site Surface Soils Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	SB01	SB02	SB03	SB03	SB04	SB05	SB06	SB07	SB08	SB13
DATE	8/19/2004	8/18/2004	8/18/2004	8/18/2004	8/24/2004	8/24/2004	8/25/2004	8/25/2004	8/24/2004	11/8/2006
		] ]		Duplicate						
START DEPTH (feet)	0	0	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Volatile Organics (mg/kg)										
2-Butanone			0.29 J							
Isopropylbenzene			0.073 J						-	R
m/p-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NĀ	0.0024 J
Methylcyclohexane										0.0045 J
Tetrachloroethene	0.007 J	0.03	8.5	0.54	0.013	0.007 J				R
Semi-Volatile Organics (mg/	(kg)									
2-Methylnaphthalene			0.083 J		0.97 J			0.18 J		0.21 J
4-Methylphenol					0.45 J					
Acenaphthene	<u>0.12 J</u>	0.18 J			2.3	0.13 J	•= 	0.49		
Acenaphthylene	0.088 J	0.18 J	0.22 J	0.17 J	0.39 J	0.34 J	0.14 J	0.16 J		
Anthracene	0.31 J	0.52 J	0.21 J	0.18 J	4	0.45	0.17 J	1.1		
Benzo(a)anthracene	0.93 J	1.6 J	0.88 J	0.76 J	5. 14 D (18)	1.4	0.72	2.5	0.12 J	1.5
Benzo(a)pyrene	0.88 J	/.a.s.J.a.s.	0.95 J	0.80 J	12 D	1.2	0.77	2,3	0.097 J	11
Benzo(b)fluoranthene	1 J	2 J	1 J	0.99 J	12 D	1.1 C	0.84	2.8	0.15 J	2.4
Benzo(g,h,i)perylene	0.38 J	0.86 J	0.36 J	0.43 J	4.6	0.62	0.51	1.2		
Benzo(k)fluoranthene	0.8 J	1.2 J	0.85 J	0.81 J	6.3	1.0	0.72	1.6	0.088 J	1.7 四日
Biphenyl					0.34 J					
Bis(2-ethylhexyl)phthalate			0.082 J				0.12 J	~~		-
Carbazole	<u>0.19 J</u>	0.29 J	0.082 J	0.086 J	3.8	0.15 J		0.66		-
Chrysene	1.0 J	1.9J	12J	0.95 J	15 D	1.5	0.88	2.8	0.19 J	2.0
Dibenz(a,h)anthracene	0.17 J	7 0.36 J	0.28 J	0.17 J	2.4	0.26 J	0.21 J	0.55		0.61 J
Dibenzofuran	0.094 J	0.12 J			2.1			0.42 J		1
Fluoranthene	<u>1.7 J</u>	3.1 J	1.5 J	1.3 J	33 D	2.2	1.1	5.8 D	0.22 J	2.5
Fluorene	0.14 J	0.19 J			2.6	0.095 J	1	0.54		
Indeno(1,2,3-cd)pyrene	0.50 J	-1.0 J	0.70 J Co	0.55 J		0.73	0.63	1.7		13月13月19日
Naphthalene	0.12 J	0.11 J			3.9			0.46		
Phenanthrene	1.3 J	2.1 J	0.60 J	0.62 J	29 D	1.3	0.60	5.6 D	0.19 J	0.71 J
Phenol			-		0.35 J					
Pyrene	1.8 J	2.8 J	1.5 J	1.4 J	28 D	2.3	1.2	5.4 D	0.24 J	1.6

# Table 2A Sheet 2 of 3)Summary of Detected Constituents in On-Site Surface Soils<br/>Crown Cleaners of Watertown, Inc.<br/>Village of Herrings, Jefferson County, New York

•

SITE	SB01	SB02	SB03	SB03	SB04	SB05	SB06	SB07	SB08	SB13
DATE	8/19/2004	8/18/2004	8/18/2004	8/18/2004	8/24/2004	8/24/2004	8/25/2004	8/25/2004	8/24/2004	11/8/2006
				Duplicate						
START DEPTH (feet)	0	0	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Pesticides (mg/kg)										
4,4'-DDD								0.014		
4,4'-DDE		R	R	0.005 J	R	R	0.007 JN	R		
4,4'-DDT			0.01 J		0.04 J			0.017 J		0.021 JN
alpha-Chlordane			-	0.0025 J					0.0014 J	
Dieldrin									0.0049 J	
Endosulfan I								0.0048		
Endosulfan sulfate					0.032 JN					
Endrin aldehyde	*=				R			0.025 JN		
Endrin ketone					0.12 J			0.11		
gamma-Chlordane		0.011 JN		R		`		0.061 JN	0.0041 J	
Heptachlor	0.00084 J									
Methoxychlor	0.02 J	0.013 J		0.011 J	0.12 J	0.024 J	0.014 J	<u>R</u>	0.0087 J	
Aroclor 1260						<u> </u>	••••		<u> </u>	0.11 J
Metals and Cyanide (mg/kg)										
Aluminum	2520	3900	2210	3050	7350	6300	3960	3550	3140	1790 J
Antimony		1.3 J			2.2 J		1.7 J	3.1 J		
Arsenic	7.9	4	6	7.7	28.6	8.6	14.8	15.7	17.8	24.4 J
Barium	33	77.2	42.4	57.3	472	312	93.6	270	60.8	<u>47.</u> 8 J
Beryllium	0.23 J	0.35 J	0.25 J	0.32 J	0.88	0.67	0.49 J	0.47 J	0.49 J	
Cadmium	0.43 J	0.86	0.71	1.2	3.1	0.79	1		0.3 J	0.71
Calcium	49900	37700	92800	68000	21600	<u>19100</u>	15500	6840	40600	63500 J
Chromium	5.1	6.7	5.5	6.5	10.8	7.1	9.8	5.9	4.7	6.3 J
Cobalt	2.5 J	<u>3.5 J</u>	2.8 J	3.6 J	5.8 J	7.9	5.2 J	<u>5</u> J	2.4 J	4.3 J
Copper	12.1	17.2	29.4	32.7	541	24.9	48.2	56.6	33	58.3 J
Iron	6690	11400	7440	10900 mi	26700	18700	17000	31500	7350	22800 J
Lead	49.4	112	237	260	324	56.6	107	241	28.7	103 J
Magnesium	4710 J	5300 J	7100 J	7270	5340	2270	1630	1140	1160	2660 J
Manganese	314 J	356 J	313 J	298	932	2210	270	309	77.4	232 J
Mercury	0.07 J	0.05 J	0.12	0.04 J	R	R	R	0.21	0.05 J	0.092 J

# Table 2A (Sheet 3 of 3)Summary of Detected Constituents in On-Site Surface Soils<br/>Crown Cleaners of Watertown, Inc.<br/>Village of Herrings, Jefferson County, New York

SITE	SB01	SB02	SB03	SB03	SB04	SB05	SB06	SB07	SB08	SB13
DATE	8/19/2004	8/18/2004	8/18/2004	8/18/2004	8/24/2004	8/24/2004	8/25/2004	8/25/2004	8/24/2004	11/8/2006
				Duplicate						
START DEPTH (feet)	0	0	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Nickel	4.2 J	6.6	5.6	7.7	18.9	16.1	12.3	8.6	5.8	8.7
Potassium	451 J	544 J	477 J	758 J	858 J	944 J	481 J	671 J	311 J	316 J
Selenium		-			0.95 J		0.85 J	1.6J	0.55 J	-
Silver		-								0.96 J
Sodium	99 J	97.1 J	122 J	167 J	282 J	88.5 J	78.3 J	65 J	152 J	353 J
Thallium								0.78 J		3.3
Vanadium	6.3	9.9	7.4	10.3 J	13.4 J	15.4 J	14.7 J	- 16.5	14.1 J	12.2 J
Zinc	63.1	124	83.8	98.2	276	63.1	89.8	132 × 1	33.2	68.6
Cyanide		-	0.51 J	0.27 J	0.21 J		0.29 J	0.33 J		

### NOTES:

"---" indicates not detected.

"J" qualifier indicates estimated concentration value.

"D" qualifier indicates concentration value from a dilution analysis.

"R" qualifier indicates rejected (unusable) value.

"N" qualifier indicates presumptive evidence exists for the presence of the compound. Shaded values exceed comparison criteria for surface soil (see Table 4-1), as indicated:

Exceeds human health-based values.

Exceeds ecological-based values.

Exceeds state values.

Exceeds background values.

Exceeds two or more of the above values.
# Table 2B (Sheet 1 of 7)Summary of Detected Constituents in On-Site Subsurface SoilsCrown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	SB01	SB01	SB02	SB02	SB03	SB03	SB04	SB04	SB05	SB05
DATE	8/19/2004	8/19/2004	8/18/2004	8/18/2004	8/18/2004	8/18/2004	8/25/2004	8/25/2004	8/24/2004	8/24/2004
					:					
START DEPTH (feet)	0.5	2	0.5	2	0.5	2	0.5	3	1	2
END DEPTH (feet)	2	2.6	2	3.6	2	3	1.8	3.8	2	3
Volatile Organics (mg/kg)										
2-Hexanone							'			
Acetone						0.027				
cis-1,2-Dichloroethene								0.021		
Ethylbenzene	-									
m/p-Xylene	NA									
Tetrachloroethene	0.024	0.042	0.051	0.15	59	55 D	0.015	0.029	0.006 J	0.005 J
Trichloroethene								0.009 J		
Semi-Volatile Organics (mg/kg)										
2-Methylnaphthalene	0.12 J		0.098 J							
Acenaphthene	0.21 J		0.34 J	0.15 J			0.08 J			
Acenaphthylene	0.46 J								0.088 J	
Anthracene	0.87 J		0.76 J	0.25 J			0.17 J	-	0.14 J	·
Benzaldehyde							-			
Benzo(a)anthracene	2.7 J	0.098 J	1.6 J	0.63 J	0.11 J		0.49		0.50	0.22 J
Benzo(a)pyrene	3.1 J		1.2 J	0.49 J	0.1 J		0.42		0.41 J	0.19 J
Benzo(b)fluoranthene	3.7 JD		1.3 J	0.55 J	0.11 J		0.40		0.45	0.17 J
Benzo(g,h,i)perylene	1.3 J		0.7 J	0.3 J			0.26 J		0.26 J	0.12 J
Benzo(k)fluoranthene	2.1 J		1.2 J	0.48 J	0.1 J		0.42		0.36 J	0.19 J
Bis(2-ethylhexyl)phthalate										
Carbazole	0.53 J		0.51 J	0.2 J			0.11 J			
Chrysene	3.0 JD	0.11 J	1.7 J	0.67 J	0.17 J		0.55		0.55	0.24 J
Dibenz(a,h)anthracene	0.66 J		0.26 J	0.12 J			0.12 J		0.10 J	
Dibenzofuran	0.18 J		0.29 J	0.11 J						
Di-n-octylphthalate					0.11 J					

# Table 2B (Sheet 2 of 7)Summary of Detected Constituents in On-Site Subsurface Soils<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	SB01	SB01	SB02	SB02	SB03	SB03	SB04	SB04	SB05	SB05
DATE	8/19/2004	8/19/2004	8/18/2004	8/18/2004	8/18/2004	8/18/2004	8/25/2004	8/25/2004	8/24/2004	8/24/2004
START DEPTH (feet)	0.5	2	0.5	2	0.5	2	0.5	3	1	2
END DEPTH (feet)	2	2.6	2	3.6	2	3	1.8	3.8	2	3
Fluoranthene	4.2 JD	0.18 J	4.1 JD	1.5 J	0.16 J		0.99		0.83	0.39 J
Fluorene	0.26 J		0.36 J	0.16 J			0.09 J	-		
Indeno(1,2,3-cd)pyrene	1.8 J.		0.81 J	0.35 J	0.094 J		0.33 J		0.28 J	
Naphthalene	0.18 J		0.27 J		-		0.08 J			
Phenanthrene	2.8 J	0.28 J	4.1 JD	1.4 J	0.15 J		0.88		0.51	0.27 J
Phenol										
Pyrene	4.0 JD	0.27 J	3.5 JD	1.3 J	0.2 J		0.89		0.86	0.38 J
Pesticides (mg/kg)										
4,4'-DDE	R			0.00068 J					0.0045	
4,4'-DDT									0.0057	0.0066
Endosulfan II										0.0045 J
Endrin	R		0.0054 J	0.0014 J	0.002 J					~
Endrin aldehyde	0.01 JN					-				
Methoxychlor	0.04 JN						0.0091 J			
Metals and Cyanide (mg/kg)										
Aluminum	5440	9100	8530	11500	3500	11100	2890	16700	2970	3630
Antimony					1.6 J		2.5 J			0.77 J
Arsenic	28.8	4	5.1	3	<b>13.6</b>	2.3	9.3	2.3	6.6	5.9
Barium	39.3	108	学们相关。	20 <b>149</b>	133	102	122	158	56.5	60.3
Beryllium	0.43 J	0.75	0.82	0.79	0.65	0.84	0.55 J	1.4	0.49 J	0.64
Cadmium	0.32 J	0.61 J	0.75	0.57 J	0.52 J	0.55 J	0.5 J	0.68	0.32 J	0.36 J
Calcium	10900	30700	10800	8660	13700	5420	3390	3490	3900	3990
Chromium	4	7.6	7.7	8.9	5.1	10.5	4.8	12.8	5.4	4.4
Cobalt	3.6 J	6.3	9.2	8.8	4.7 J	8.5	5.5 J	9-114	4.4 J	5.2 J
Copper	22.3	8	19.1	9.8	55	8.5	35	14.1	20	21.7

# Table 2B (Sheet 3 of 7)Summary of Detected Constituents in On-Site Subsurface Soils<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	SB01	SB01	SB02	SB02	SB03	SB03	SB04	SB04	SB05	SB05
DATE	8/19/2004	8/19/2004	8/18/2004	8/18/2004	8/18/2004	8/18/2004	8/25/2004	8/25/2004	8/24/2004	8/24/2004
START DEPTH (feet)	0.5	2	0.5	2	0.5	2	0.5	3	1	2
END DEPTH (feet)	2	2.6	2	3.6	2	3	1.8	3.8	2	3
Iron	11800	20100	21600	22300	15100	21100	27600	30000	17400	19400
Lead		9.7	49,2	12.4	123	11.6	57.4	5.6	30.5	29
Magnesium	1530 J	2380 J	2350 J	2390 J	1020 J	2500 J	482 J	4010	652	560 J
Manganese	221 J	1320 J	1530 J	899 J	285 J	704 J	124	1040	180	230
Mercury	0.06 J	0.06 J			0.1 J	0.09 J	0.07 J	0.04 J	0.08 J	0.06 J
Nickel	4.2 J	7.8	9.6	10.5	9	10.5	9.4	13.7	8.1	10.6
Potassium	339 J	640 J	608 J	520 J	368 J	574 J	436 J	1550 J	463 J	428 J
Selenium							1.2 J		1.2 J	0.88 J
Silver										
Sodium	84.7 J	93.8 J	72.6 J	120 J	114 J	178 J	102 J	197 J	74.7 J	82.5 J
Thallium										
Vanadium	9.1	17	17.9	20.2	11.6	18.6	15.9 J	26.3 J	14 J	13.1 J
Zinc	30.6	34.8	71.8	50.3	53	50.4	R	83.2	44.7	36.7
Cyanide					0.78 J		0.35 J			

Notes are provided on Page 7.

# Table 2B<br/>(Sheet 4 of 7)Summary of Detected Constituents in On-Site Subsurface Soils<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

. .

SITE	SB06	SB06	SB07	SB07	SB07	SB08	SB08	SB13	SB13
DATE	8/25/2004	8/25/2004	8/25/2004	8/25/2004	8/25/2004	8/24/2004	8/24/2004	11/9/2006	11/9/2006
				Duplicate					Duplicate
START DEPTH (feet)	1.5	2	1	1	2	1	4	0.5	0.5
END DEPTH (feet)	2	2.9	2	2	2.5	2	5	2	2
Volatile Organics (mg/kg)									
2-Hexanone									0.0071 J
Acetone			-						
cis-1,2-Dichloroethene									
Ethylbenzene									0.0023 J
m/p-Xylene	NA		0.005 J						
Tetrachloroethene		0.003 J		0.003 J	0.006 J			0.0068	0.0056
Trichloroethene									
Semi-Volatile Organics (mg/kg)		·····							
2-Methylnaphthalene			0.095 J					0.23	0.27
Acenaphthene			0.31 J	0.18 J	0.12 J				0.063 J
Acenaphthylene			0.28 J		0.095 J		0.13 J	0.046 J	0.053 J
Anthracene			0.44	0.32 J	-		0.22 J	0.12 J	0.26
Benzaldehyde						~-		0.051 J	0.059 J
Benzo(a)anthracene			1.8	0.8	0.3 J		0.69	0.97	1.6
Benzo(a)pyrene			2.1	0.75	0.39 J		0.37 J	1.1. Set	1.6
Benzo(b)fluoranthene			2.6	0.79	0.47		0.51	1.2	······································
Benzo(g,h,i)perylene			1.2	0.43	0.29 J		0.22 J	0.39	0.45
Benzo(k)fluoranthene			1.5	0.64	0.36 J		0.49	1.0	1.4
Bis(2-ethylhexyl)phthalate								0.16 J	0.13 J
Carbazole			0.72	0.26 J	0.2 J		0.21 J	0.072 J	0.11 J
Chrysene			2.8	0.98	0.55		0.68	1.2	1.8
Dibenz(a,h)anthracene			0.52	0.18 J			0.11 J	0.25	0.40
Dibenzofuran			0.39	0.18 J	0.19 J			0.088 J	0.11 J
Di-n-octylphthalate						~-			

# Table 2B(Sheet 5 of 7)Summary of Detected Constituents in On-Site Subsurface Soils<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	SB06	SB06	SB07	SB07	SB07	SB08	SB08	SB13	SB13
DATE	8/25/2004	8/25/2004	8/25/2004	8/25/2004	8/25/2004	8/24/2004	8/24/2004	11/9/2006	11/9/2006
				Duplicate					Duplicate
START DEPTH (feet)	1.5	2	1	1	2	1	4	0.5	0.5
END DEPTH (feet)	2	2.9	2	2	2.5	2	5	2	2
Fluoranthene			7.1 D	2.2	1.8		1.5	1.7	2.6
Fluorene			0.45	0.23 J	0.14 J		0.15 J		0.075 J
Indeno(1,2,3-cd)pyrene			1.7	0.58	0.32 J		0.3 J	0.84	1.2
Naphthalene			0.30 J	0.22 J	0.16 J			0.15 J	0.17 J
Phenanthrene			7.2 D	2.3	2.3		1.3	0.64	1.1
Phenol									0.042 J
Pyrene			6.2	2.0	1.7		1.2	1.4	2.3
Pesticides (mg/kg)									
4,4'-DDE									
4,4'-DDT		-	0.00091 J					0.011 J	0.011 J
Endosulfan II									
Endrin									
Endrin aldehyde				0.0028 J					
Methoxychlor			0.014 J						
Metals and Cyanide (mg/kg)									
Aluminum	13900	17200	10900	10100	13400	10800	5880	5250 J	4040 J
Antimony				1.6 J					
Arsenic	2.8	5.4	4.1	4.6	3.7	12.6	3.1	12.1 J	15 J
Barium	88.6	102	265	312	185	157	64.3	90.6 J	91.5 J
Beryllium	0.93	1.4	0.9	0.81	1	1.1	0.58		
Cadmium	0.67		0.13 J	0.19 J		0.66	0.29 J	0.61	0.41 J
Calcium	3200	3700	4780	4470	4420	4020	1750	26500 J	30300 J
Chromium	12.3	16.2	9.9	9.4	12.1	11.5	4.8	7.3 J	5.5 J
Cobalt	9.7	12.7	8.6	8.3	10.1	8.8	5.1 J	6.6	4.9 J
Copper	11.6	20	25.7	29	11.2	16.8	9	54.1 J	52 J

# Table 2B(Sheet 6 of 7)Summary of Detected Constituents in On-Site Subsurface Soils<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	SB06	SB06	SB07	SB07	SB07	SB08	SB08	SB13	SB13
DATE	8/25/2004	8/25/2004	8/25/2004	8/25/2004	8/25/2004	8/24/2004	8/24/2004	11/9/2006	11/9/2006
				Duplicate					Duplicate
START DEPTH (feet)	1.5	2	1	1	2	1	4	0.5	0.5
END DEPTH (feet)	2	2.9	2	2	2.5	2	5	2	2
Iron	25500	37700	24200	23900	28800	29000	18900	23800 J	17500 J
Lead	8.6	9	54	73,3	12	38.8	8.7	128 J	91.3 J
Magnesium	3060	3770	2400	2030	2570	2340	1310	2150 J	1650 J
Manganese	1220	2670	1300	1290	2310	1280	602	358 J	339 J
Mercury	0.07 J	. 0.06 J	0.04 J		+		0.04 J	0.12	0.12
Nickel	14.8	21.3	13.1	13.3	13.5	12.1	6.5	11.8	8.4
Potassium	740 J	1340 J	818 J	784 J	849 J	883 J	425 J	597	535 J
Selenium			0.63 J			0.89 J			
Silver					+-			1.2	0.79 J
Sodium	81.8 J		88 J	82.4 J	65.8 J	61.5 J	53.6 J	356 J	341 J
Thallium				~-				3.6	
Vanadium	21.6 J	29.1	19.3	18.6	22.9	24.7 J	13.6 J	13 J	10.2 J
Zinc	72.9	94.7	106	129	61.3	62.1	37.1	61.2	40.9
Cyanide								R	R

Notes are provided on Page 7.

٠

## Table 2B (Sheet 7 of 7)Summary of Detected Constituents in On-Site Subsurface Soils<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

#### NOTES:

"--" indicates not detected.

"J" qualifier indicates estimated concentration value.

"D" qualifier indicates concentration value from a dilution analysis.

"R" qualifier indicates rejected (unusable) value.

"N" qualifier indicates presumptive evidence exists for the presence of the compound. Shaded values exceed comparison criteria for surface soil (see Table 4-2), as indicated:

.

Exceeds human health-based values.

Exceeds state values.

Exceeds background values.

Exceeds two or more of the above values.

### Table 2C (Sheet 1 of 10) Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc.

Village of Herrings, Jefferson County, New York

SITE	ERT-B-01	ERT-B-02	ERT-B-03	ERT-B-04	ERT-B-05	ERT-B-06	ERT-B-07
DATE	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011
				_	-		_
START DEPTH (feet)	0	0	0	0	0	0	0
END DEPTH (feet)	0.167	0.167	0.167	0.167	0.167	0.167	0.25
1 2 3-Trichlorobenzene							
1 2 4-Trichlorobenzene							
2-Butanone	0.0707	0.115		0.133	0.0795	<b>0.137</b> (8)	0.137
2-Hexanone							
Acetone	0.665	0.805		1.07	0.979	1.52 J	1.03
Benzene							
Carbon Disulfide	0.0491	0.049 J	0.00913 J				
cis-1,2-Dichloroethene	0.0133 J						
p-Isopropyltoluene		0.0155 J	0.213				
Tetrachloroethene	0.0389 J	0.037 J	0.0393	0.0215 J	0.0692	0.00778 J	
Toluene	0.0115 J	0.0172 J	0.011 J	0.0339 J		0.0117 J	0.0158 J
trans-1,2-Dichloroethene							
Trichloroethene		-					
Vinyl Chloride							
Semi-Volatile Organics (mg/kg)				· · · · ·			
2-Methylnaphthalene						· · · ·	
4-Methylphenol	0.82 J						
4-Nitroaniline							
Acenaphthene				<u></u>			
Acenaphthylene							
Anthracene	0.996	1.54		<u> </u>			
Benzo(a)anthracene	7.48	, l2.9					
Benzo(a)pyrene	6.48	<u> </u>	0.324 J				
Benzo(b)fluoranthene	1 ···· 6.36	10.2	0.365 J				
Benzo(g,h,i)perylene	3.42	5.06					

### Table 2C (Sheet 2 of 10) Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc.

Village of Herrings, Jefferson County, New York

SITE	ERT-B-01	ERT-B-02	ERT-B-03	ERT-B-04	ERT-B-05	ERT-B-06	ERT-B-07
DATE	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011
START DEPTH (feet)	0	0	0	0	0	0	0
END DEPTH (feet)	0.167	0.167	0.167	0.167	0.167	0.167	0.25
Benzo(k)fluoranthene	5.86	9.18	0.312 J				
Bis-(2-ethylhexyl) phthalate							
Butylbenzylphthalate			<b></b>				
Carbazole							
Chrysene	7.76	12.6	0.408 J				
Dibenzo(a,h)anthracene	1.27	1.99					
Dibenzofuran		-					
Di-n-butylphthalate						0.463 J	
Di-n-octylphthalate							
Fluoranthene	10.4	17.5	0.512 J		0.708 J		
Fluorene							
Indeno(1,2,3-cd)pyrene	3.22	4.99					
Naphthalene							
Phenanthrene	3.52	3.78					
Phenol							
Pyrene	9.92	16.6	0.472 J				
Pesticides and PCBs (mg/kg)							
4,4'-DDD	0.0149 J						
4,4'-DDE	0.0119 J	0.00691 J				0.00381 J	
4,4'-DDT			0.00825 J			0.0102 J	0.0117
delta-BHC			0.00436 J				
Dieldrin							
gamma-BHC							
Heptachlor epoxide							
Methoxychlor							
Arocior-1016			0.197				
Aroclor-1254	0.26	0.271 J	0.261				

# Table 2C Sheet 3 of 10) Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc.

Village of Herrings, Jefferson County, New York

.

SITE	ERT-B-01	ERT-B-02	ERT-B-03	ERT-B-04	ERT-B-05	ERT-B-06	ERT-B-07
DATE	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011
START DEPTH (feet)	0	0	0	0	0	0	0
END DEPTH (feet)	0.167	0.167	0.167	0.167	0.167	0.167	0.25
Melais (mg/kg)	(220)	4640	2170	(540	2120	5240	012
	0320	4040	5170	0340		5240	913
Antimony		Re 48					1.13
Arsenic	9.12					5.68	67.8
Barium	634	453	210	427	396	1260	446
Beryllium	0.816			0.684		0.407	
Cadmium	1.66	2.2	1.06			1.54	8.25
Calcium	24100	81700	30200	32300	32700	32200	14800
Chromium	21.5	21.7	16.7	20.5	9.12	12.9	93.8
Cobalt	8.39	3.78	2.61	2.92	1.5	3.4	18,3
Copper	90.2 J	100 J	30.2 J	37.8 J	<b>277</b> J	31.7 J	105 J
Iron	34000 Ĵ	16400 J	10600 J	11100 J	4760 J	10500 J	241000 J
Lead	90.4 J	144 J	258 J	99 J	49.2 J	146 J	210 J
Magnesium	1550 J	1660 J	2480 J	1420 J	1050 J	1300 J	571 J
Manganese	2130	1030	1050	865	627	3120	. 1410
Mercury	0.347	0.39	0.228	0.289		0.415	0.177
Nickel	26.1 J	26.4 J	6.13 J	13.1 J	7.72 J	10.3 J	78.9 J
Potassium	1560 J	1310 J	957 J	1660 J	947 J	1490 J	284 J
Selenium	6.67	15					
Silver					-		
Sodium	1370	2140		1260	318		
Vanadium	13.5J	- 11 J	8.83 J	12.5 J	5.5 J	- 10.5 J	3.64 J
Zinc	379 J	437 J	559 J	126 J	85.7 J	499 J	646 J

Notes are provided on Page 10.

# Table 2C (Sheet 4 of 10) Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	ERT-B-08	ERT-B-8	ERT-B-09	ERT-B-10	ERT-B-11	ERT-B-12	ERT-B-13
DATE	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011
		Duplicate (B-FD)					
START DEPTH (feet)	0	0	0	0	0	0	0
END DEPTH (feet)	0.167	0.167	0.167	0.25	0.167	0.25	0.5
Volatile Organics (mg/kg)		, <u> </u>			T		
1,2,3-Trichlorobenzene				0.00724 J			
1,2,4-Trichlorobenzene				0.00713 J			~
2-Butanone	0.0683	0.132	0.0346	0.0266 J	0.152	0.198	0.0592
2-Hexanone							
Acetone	0.505 J	1.07 J	0.769 J	1.26 J	1.64 J	2.34 J	0.519
Benzene		·					
Carbon Disulfide							0.0293 J
cis-1,2-Dichloroethene							0.0223 J
p-Isopropyltoluene					0.0127 J		
Tetrachloroethene							0.0253 J
Toluene		0.00302 J	0.00539 J		0.0108 J	0.124	0.0181 J
trans-1,2-Dichloroethene							0.0126 J
Trichloroethene							0.0086 J
Vinyl Chloride							0.0319
Semi-Volatile Organics (mg/kg)							
2-Methylnaphthalene							0.689 J
4-Methylphenol							4.56
4-Nitroaniline							0.528 J
Acenaphthene		-			0.411 J		13.9
Acenaphthylene							1
Anthracene				R	1.05		78.2
Benzo(a)anthracene					3.75	0.814	532
Benzo(a)pyrene					3.84	1.42	387
Benzo(b)fluoranthene					3.95	1.1	408
Benzo(g,h,i)perylene					2.45	1.38	143

# Table 2C (Sheet 5 of 10) Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	ERT-B-08	ERT-B-8	ERT-B-09	ERT-B-10	ERT-B-11	ERT-B-12	ERT-B-13
DATE	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011
		Duplicate (B-FD)					
START DEPTH (feet)	0	0	0	0	0	0	0
END DEPTH (feet)	0.167	0.167	0.167	0.25	0.167	0.25	0.5
Benzo(k)fluoranthene					3.31	0.919	245
Bis-(2-ethylhexyl) phthalate		-			0.926		3.63 J
Butylbenzylphthalate							
Carbazole				R	0.726		36.7
Chrysene					3.85	0.908	504
Dibenzo(a,h)anthracene					0.858	`	66.3
Dibenzofuran			**				4.72
Di-n-butylphthalate				R			
Di-n-octylphthalate					-		
Fluoranthene	0.194 J	0.215 J	0.244 J	R	7.47	1.45	837
Fluorene	***			-	0.515 J		13.5
Indeno(1,2,3-cd)pyrene					2.3	1, <b>16</b> → 1,	147
Naphthalene				0.013 J			0.576 J
Phenanthrene				R	4.82	0.949	216
Phenol	-						• 0.48 J
Pyrene		0.181 J	0.204 J	R	5.89	1.23	736
Pesticides and PCBs (mg/kg)				·····			
4,4'-DDD							
4,4'-DDE					0.0137 J	-	
4,4'-DDT	0.00291 J	-			0.0318 J		
delta-BHC							
Dieldrin							
gamma-BHC		-					0.0106 J
Heptachlor epoxide					0.0195 J		<b>*</b> *
Methoxychlor							0.1146 J
Aroclor-1016							
Aroclor-1254		<u> </u>		0.75	0.761	1.86	

### Table 2C (Sheet 6 of 10)Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011)Crown Cleaners of Watertown, Inc.

Village of Herrings, Jefferson County, New York

SITE	ERT-B-08	ERT-B-8	ERT-B-09	ERT-B-10	ERT-B-11	ERT-B-12	ERT-B-13
DATE	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011
		Duplicate (B-FD)					
START DEPTH (feet)	0	0	0	0	0	0	0
END DEPTH (feet)	0.167	0.167	0.167	0.25	0.167	0.25	0.5
Metals (mg/kg)			14704				
Aluminum	11700	12000	12700	6890	8010	3520	3780
Antimony							4.48
Arsenic	10.7	11.6	14.2		7.08		83.3
Barium	748	738	1170	97.1	151	227	449
Beryllium	0.995	1.01	1.31			-	0.47
Cadmium	11.7	12.7	2.48		0.857	1.16	1.75
Calcium	33300	30900	24300	8960	23000	33500	39600
Chromium	1 <b>9</b>	20,9	25.3	18.2	34.7	15.9	37.3
Cobalt	8.44	8.85	9.63	11.5	2.53	2.96	12.1
Copper	38.6 J	49 J	50.6 J	101 J	113 J	172 J	171 J
Iron	31200 J	37100 J	49800 J	123000 J	19000 J	26300 J	103000 J
Lead	90.4 J	97.7 J	81.2 J	35.9 J	333 J	<b>27</b> 0 J	88 J
Magnesium	2330 J	2230 J	2550 J	702 J	1490 J	1310 J	1420 J
Manganese	3780	3910	6100	372	429	1380	994
Mercury	0.28	0.277	0.334		0.554	0.304	0.282
Nickel	23.1 J	25.9 J	33.2 J	13.2 J	15.9 J	11.3 J	32 J
Potassium	3050 J	2870 J	3530 J	751 J	705 J	1050 J	802 J
Selenium							10.7
Silver			1.22				
Sodium							1550
Vanadium	20.8 J	20.8 J	19.2 J	10.8 J	12.1 J	7.21 J	11.8 J
Zinc	156 J	161 J	341 J	77.8 J	307 J	561 J	500 J

Notes are provided on Page 10.

### Table 2C (Sheet 7 of 10) Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc.

SITE	ERT-B-14	ERT-B-15	ERT-B-16	ERT-B-17	ERT-B-18	ERT-B-19
DATE	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011
START DEPTH (feet)	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5
Volatile Organics (mg/kg)		<u> </u>		T		
1,2,3-Trichlorobenzene			== 	<u> </u>		
1,2,4-Trichlorobenzene			***			
2-Butanone	0.0357	0.0381	0.0641	0.131	0.0894	0.0393
2-Hexanone				0.0144 J		
Acetone	0.399	0.329	0.554 J	0.633	0.657 J	0.4 J
Benzene	0.00747 J					-
Carbon Disulfide			0.00211 J			-
cis-1,2-Dichloroethene						-
p-Isopropyltoluene		0.00233 J		R		-
Tetrachloroethene				R		
Toluene	0.00847 J			R	0.00214 J	
trans-1,2-Dichloroethene					-	
Trichloroethene						
Vinyl Chloride						
Semi-Volatile Organics (mg/kg)						
2-Methylnaphthalene	0.889		***			
4-Methylphenol	0.145 J					
4-Nitroaniline						
Acenaphthene	2.62					
Acenaphthylene	0.799	0.382				
Anthracene	5.56	0.249	-			
Benzo(a)anthracene	18.9	1.26	0.128 J		0.234 J	
Benzo(a)pyrene	17	1.56		2.55 J	0.231 J	
Benzo(b)fluoranthene	16.3	1.28	0.133 J	<b>3.2</b> J	0.259	
Benzo(g,h,i)perylene	10.3	1.71		2.12 J	0.173 J	

Village of Herrings, Jefferson County, New York

### Table 2C (Sheet 8 of 10) Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc.

SITE	ERT-B-14	ERT-B-15	ERT-B-16	ERT-B-17	ERT-B-18	ERT-B-19
DATE	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011
		0	0		0	<u>^</u>
SIARI DEPIH (feet)	0	0	0	0.5	0	0
Benzo(k)fluoranthene	15.3	1.12	0.5	2.07 J	0.186 J	
Bis-(2-ethylhexyl) phthalate		18.5	·			
Butylbenzylphthalate						0.339
Carbazole	4.64					
Chrysene	19.4	1.29	0.168 J	3.22 J	0.265	
Dibenzo(a,h)anthracene	3.82	0.366				
Dibenzofuran	2.14	# <b>-</b>				
Di-n-butylphthalate		0.728	0.118 J			
Di-n-octylphthalate		1.33				
Fluoranthene	40.1	1.65	0.223 J	5.53	0.51	
Fluorene	2.98					
Indeno(1,2,3-cd)pyrene	10.3	1.02			0.15 J	
Naphthalene	1.91			-		
Phenanthrene	33.7	0.439		4.06	0.3	
Phenol						
Pyrene	32	1.66	0.193 J	4.28	0.428	
Pesticides and PCBs (mg/kg)						
4,4'-DDD	0.0332 J		••••	0.0642 J		
4,4'-DDE		0.00127 J		0.0482 J		
4,4'-DDT		0.00588 J		0.229 J		
delta-BHC						
Dieldrin	0.0228 J			0.0398 J		
gamma-BHC		**				
Heptachlor epoxide						
Methoxychlor				0.0827 J		
Aroclor-1016						
Aroclor-1254	1.65 J			1.84 J		

Village of Herrings, Jefferson County, New York

### Table 2C (Sheet 9 of 10) Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc.

SITE	ERT-B-14	ERT-B-15	ERT-B-16	ERT-B-17	ERT-B-18	ERT-B-19
DATE	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011	6/23/2011
START DEPTH (feet)	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5
Metals (mg/kg)	11200	7050	5470	6100	11500	10000
	11200	7950	3470	0190	11500	10000
Antimony	2,27		4	342-37 <b>02</b> (2012)		
Arsenic	17.8	8.11	3 <b>7</b> .7	7.68	7.52	24.5
Barium	472	245	288	598	5280	125
Beryllium	0.715	0.406	0.347		1.07	0.365
Cadmium	4.85	13	3.19	3.53	1.26	0.361
Calcium	36400	5390	7350	17300	9790	5220
Chromium	27.5	16.6	53.1	133	17.	12.6
Cobalt	7.91	5.87	12.8	11.4	6.64	5.17
Copper	117 J	64.4 J	80 J	176 J	15.3 J	16.7 J
Iron	40800 J	59000 J	220000 J	34200 J	17200 J	20400 J
Lead	1340 J	153 J	506 J	3190 J	82 J	<b>49.6 J</b>
Magnesium	4360 J	1010 J	3600 J	2080 J	1510 J	1420 J
Manganese	825	1050	1780	494	4390	1130
Mercury	0,712	0.123	0.7	1.09	0.234	0.0979
Nickel	21.4 J	23.8 J	46.8 J	31.1 J	15.1 J	8.45 J
Potassium	1050 J	1320 J	638 J	739 J	2790 J	979 J
Selenium	2:47					
Silver			0.839			
Sodium	352			422		38.4
Vanadium	29.8 J	10.4 J	19.5 J	103 J	17.7J	173 J
Zinc	1170 J	178 J	994 J	8770 J	92.2 J	157 J

.

.

Village of Herrings, Jefferson County, New York

Notes are provided on Page 10.

## Table 2C Sheet 10 of 10) Summary of Detected Constituents in Off-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

### **NOTES:**

"--" indicates not detected.

"J" qualifier indicates estimated concentration value.

"R" qualifier indicates rejected (unusable) value.

Shaded values exceed comparison criteria for surface soil (see Table 4-1), as indicated:

Exceeds human health-based values.

Exceeds ecological-based values.

Exceeds state values.

Exceeds background values.

Exceeds two or more of the above values.

# Table 2D<br/>(Sheet 1 of 4)Summary of Detected Constituents in On-Site Surface Soils Sampled by the EPA Environmental Response Team (2011)<br/>Crown Cleaners of Watertown, Inc.<br/>Village of Herrings, Jefferson County, New York

SITE	FRT-SB-01	FRT-SB-02	FRT-SB-03	FRT-SR-04	FRT-SB-05	FRT-SB-06	ERT-SB-07	FRT-SB-07	FRT-SB-08	FRT-SB-08
DATE	6/22/2011	6/22/2011	6/21/2011	6/21/2011	6/21/2011	6/21/2011	6/22/2011	6/22/2011	6/22/2011	6/22/2011
DATE	0/22/2011	5/22/2011	0/21/2011	0/21/2011	0/21/2011	0/21/2011	<i>VI 221 20</i> 1 1	Duplicate	<i>U 22 2</i> 011	Duplicate
								(FD-03)		(FD-04)
START DEPTH (feet)	0	0	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.167
Semi-Volatile Organics (mg/kg)										
2-Methylnaphthalene			0.166 J	0.351		0.336	0.136 J	0.173 J	0.406	0.492
Acenaphthene						0.114 J	-	0.112 J	0.97 J	1.53
Acenaphthylene						0.632	0.148 J	0.163 J	0.247	0.298
Anthracene			0.142 J		+	2.41	0.121 J	0.347	2.13	2.97
Benzo(a)anthracene			0.419	0.273	0.136 J	5.08		0.83	5.14	( <sub>441</sub> , 7.08),
Benzo(a)pyrene		0.217 J	0.379	0.243	0.144 J	4.12	0.334	0.466	4.62	3.88
Benzo(b)fluoranthene		0.258 J	0.459	0.28	0.151 J	332	0.405	0.468	4.42	5.58
Benzo(g,h,i)perylene		0.154 J	0.25	0.157 J		1.99	0.242	0.429	3.11	4.04
Benzo(k)fluoranthene		0.217 J	0.34	0.19 J	0.138 J	3.61	0.29	0.839	3,39	5.65
Carbazole			0.113 J			0.312		0.192 J	1.17	1.88
Chrysene		0.282	0.543	0.369	0.164 J	4.42	0.431	0.876	5.08	6.97
Dibenzo(a,h)anthracene			0.104 J			0.816	0.112 J	0.197 J		1.66
Dibenzofuran						0.257		0.141 J	0.676	0.931
Fluoranthene	0.128 J	0.391	0.944	0.471	0.302	10.4	0.683	1.88	10.7	14.9
Fluorene						0.679		0.156 J	0.978	1.35
Indeno(1,2,3-cd)pyrene	·	0.143 J	0.232	0.133 J		2.07	0.222	0.431	- 2.7	4.02
Naphthalene			0.0944 J	0.242		0.286		0.13 J	0.805	1.17
Phenanthrene	0.108 J	0.23 J	0.918	0.438	0.191 J	6.02	0.352	1.5	9.21	13
Pyrene	0.104 J	0.356	0.764	0.4	0.25	6.13	0.591	1.52	9.42 J	13
Lead (mg/kg)										
Lead	- 18.4	91.4	249	121	A 27.2	323	27.1	27.1	776	144

Notes are provided on Page 4.

### Table 2D (Sheet 2 of 4) Summary of Detected Constituents in On-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	ERT-SB-09	ERT-SB-09	ERT-SB-10	ERT-SB-11	ERT-SB-12	ERT-SB-12	ERT-SB-13	ERT-SB-14	ERT-SB-15	ERT-SB-16
DATE	6/22/2011	6/22/2011	6/21/2011	6/21/2011	6/22/2011	6/22/2011	6/22/2011	6/21/2011	6/22/2011	6/21/2011
		Duplicate				Duplicate				
		(FD-05)				(FD-02)				
START DEPTH (feet)	0	0	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.167
Semi-Volatile Organics (mg/kg)										
2-Methylnaphthalene	1.97	0.483	0.636 J		0.525	0.44	0.282	0.281		0.718
Acenaphthene	1.91	0.394					0.672			0.215
Acenaphthylene	0.996	0.849					0.236			0.27
Anthracene	4.62	1.54	1.2				1.4	0.156 J		0.733
Benzo(a)anthracene	8.57	3.95	2.86	0.645 J	0.295		3.62	0.661		2.55
Benzo(a)pyrene	3.91	2,95	2.42	0.73 J	0.262	0.258	3.27	0.65		2.41
Benzo(b)fluoranthene	5.67	3.57	2.63	0.904 J	0.297	0.283	3.04	0.83		2.78
Benzo(g,h,i)perylene	4.86	2.47	1.4		0.174 J	0.179 J	1.89	0.419		1.52
Benzo(k)fluoranthene	5.55	4.18	2	0.614 J	0.233	0.196 J	2.86	0.56		2.43
Carbazole	2.99	0.735	0.634 J				1.03			0.489
Chrysene	9.08	4.68	3.1	0.976 J	0.413	0.37	3.74	0.953		3,51
Dibenzo(a,h)anthracene		1.09		-			0.739	0.164 J		0.643
Dibenzofuran	2.35	0.362			0.167 J	0.137 J	0.622			0.358
Fluoranthene	20.6	8.09	6.08	1.45	0.485	0.454	8.19	1.32	0.309 J	4.55
Fluorene	2.53	0.454					0.74			0.293
Indeno(1,2,3-cd)pyrene	4.37	2,31	1.36		0.148 J	0.158 J	1.86	0.414		1.51
Naphthalene	4.07	0.443			0.212 J	0.184 J	0.331	0.158 J		0.56
Phenanthrene	22.2	5.4	6.0	0.95 J	0.7	0.5	8.3	1.0		3.5
Pyrene	17	7.41	4.89	1.2	0.405	0.408	5,4	1.02	0.27 J	3.68
Lead (mg/kg)										
Lead	622	465	303	110	72.6	84.6	360	114	67.4	121

Notes are provided on Page 4.

# Table 2D (Sheet 3 of 4)Summary of Detected Constituents in On-Site Surface Soils Sampled by the EPA Environmental Response Team (2011)Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

	·							
SITE	ERT-SB-17	ERT-SB-18	ERT-SB-18	ERT-SB-19	ERT-SB-20	ERT-SB-21	ERT-SB-22	ERT-SB-23
DATE	6/21/2011	6/22/2011	6/22/2011	6/21/2011	6/21/2011	6/21/2011	6/21/2011	6/21/2011
			Duplicate					
			(FD-01)					
START DEPTH (feet)	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.167	0.167	0.167	0.167	0.167	0.167	0.167	0.167
Semi-Volatile Organics (mg/kg)						r		
2-Methylnaphthalene	4.73			0.72 J	0.286	0.531		0.116 J
Acenaphthene				2.4	0.222			
Acenaphthylene				1.28	0.131 J			
Anthracene				6.01	0.62	0.164 J		
Benzo(a)anthracene	0.147 J	0.295	0.275	13.5	2.24	0.546	0.192	0.418
Benzo(a)pyrene	0.128 J	0.299	0.274	12.6	2	0.43	0.191	0.442
Benzo(b)fluoranthene	0.204	0.34	0.318	13	1.99	0.652	0.262	0.528
Benzo(g,h,i)perylene	0.104 J	0.208	0.213	8.87	1.24	0.246	0.136 J	0.294
Benzo(k)fluoranthene	0.109 J	0.276	0.234	9.96	1.55	0.376	0.162 J	0.39
Carbazole				3.77	0.273	0.115 J		
Chrysene	0.36	0.356	0.332	13.8	2.45	1	0.283	0.539
Dibenzo(a,h)anthracene				3.04	0.469	0.106 J		
Dibenzofuran	0.193			1.87	0.175 J	0.195		
Fluoranthene	0.311	0.492	0.529	34.4	3.75	1.26	0.427	0.875
Fluorene				3.27	0.223			
Indeno(1,2,3-cd)pyrene		0.196 J	0.191 J	7.47	1.14	0.252	0.125 J	0.287
Naphthalene	1.21			1.53	0.189 J	0.374		
Phenanthrene	0.6	0.3	0.2	26.2	3.1	1.1	0.3	0.5
Pyrene	0.258	0.428	0.452	26	3.53	0.888	0.321	0.697
Lead (mg/kg)	·····		·····				•	
Lead	65.3	113	95,6	144	248	-22.5	21.2	40.5
	the second se							

Notes are provided on Page 4.

## Table 2D (Sheet 4 of 4) Summary of Detected Constituents in On-Site Surface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

### **NOTES:**

: 1

,

"--" indicates not detected.

"J" qualifier indicates estimated concentration value.

Shaded values exceed comparison criteria for surface soil (see Table 4-1), as indicated:

Exceeds human health-based values.

Exceeds ecological-based values.

Exceeds state values.

Exceeds background values.

Exceeds two or more of the above values.

## Table 2E (Sheet 1 of 3) Summary of Detected Constituents in On-Site Subsurface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE ERT-SB-06 ERT-SB-07 ERT-SB-07 ERT-SB-08 ERT-SB-08 ERT-SB-08 ERT-SB-09 ERT-SB-09 ERT-SB-10 6/21/2011 6/22/2011 6/22/2011 DATE 6/22/2011 6/22/2011 6/22/2011 6/22/2011 6/22/2011 6/21/2011 0.5 START DEPTH (feet) 0.5 1 0.5 1 1.5 0.5 1 0.5 END DEPTH (feet) 1.5 1.5 2 1 1 1 1 1.5 1 Semi-Volatile Organics (mg/kg) 2.6 1.73 2-Methylnaphthalene 0.12 J 0.145 J 0.325 0.561 0.708 0.113 J ---Acenaphthene 0.10 J 0.359 1.32 4.1 0.752 5.84 -------1.44 4.27 1.4 0.259 0.134 J 1.1 0.382 0.168 J Acenaphthylene ---0.295 1.42 4.59 16.6 2.94 13.3 0.304 Anthracene 0.15 J ---7.19 Benzo(a)anthracene 0.108 J 0.93 0.606 J 4.34 10.1 J 30.3 J 24.4 J 1.06 6.48 4,21 27.1 20.8 Benzo(a)pyrene 0.104 J 0.858 0.553 9.51 1 1.01 J 7.39 1 0.931 Benzo(b)fluoranthene 0.553 J .4.02 J 9.55 J 25 J 🦿 20.8 J 0.104 J 0.537 2.59 6.22 4.46 0.624 Benzo(g,h,i)perylene 0.352 16.8 13.5 ..... 3.85 7.28 21.3 5.42 15.6 Benzo(k)fluoranthene 0.78 0.484 0.912 ----Carbazole 2.49 J 7.88 J 0.177 J ---0.586 1.41 7.39 J 0.137 J ---1.12 4.53 10.1 J 27.7 J 243 J 💭 0.122 J 0.725 J 1.12 Chrysene 6.86 Dibenzo(a,h)anthracene 0.199 0.136 J 0.982 2.36 1.61 5.62 0.225 --1.1 Dibenzofuran ---0.114 J ---0.298 1.22 5.2 0.7 4.89 ---72.2 Fluoranthene 0.219 1.87 1.21 7.76 21.6 13.7 2 56.5 0.0981 J 1.77 0.914 0.451 9.19 6.51 Fluorene ---------16.6 Indeno(1,2,3-cd)pyrene 0.541 0.342 2.53 6 4.28 12.4 0.589 ---Naphthalene 0.129 J 0.143 J 0.324 1.04 6.57 0.707 ---3.79 --Phenanthrene 0.144 J 1.26 0.733 4.22 17.1 56.9 9.7 58.4 1.3 Pyrene 0.182 J 1.52 0.99 5.81 17.2 50 12 46.5 1.72 Lead (mg/kg) - 107 308 Lead NA NA NA NA NA NA NA

Notes are provided on Page 3.

## Table 2E (Sheet 2 of 3) Summary of Detected Constituents in On-Site Subsurface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

SITE	ERT-SB-10	ERT-SB-11	ERT-SB-13	ERT-SB-13	ERT-SB-16	ERT-SB-19	ERT-SB-19	ERT-SB-19	ERT-SB-20
DATE	6/21/2011	6/21/2011	6/22/2011	6/22/2011	6/21/2011	6/21/2011	6/21/2011	6/21/2011	6/21/2011
START DEPTH (feet)	1	0.5	0.5	1	0.5	0.5	1	1.5	0.5
END DEPTH (feet)	1.5	1	1	1.5	1	1	1.5	2	1
Semi-Volatile Organics (mg/kg)									
2-Methylnaphthalene		0.102 J	0.381	1.4	0.264	0.858	0.761	0.267	0.116 J
Acenaphthene						2.24	0.972		
Acenaphthylene			0.63			0.998	0.118 J		
Anthracene			0.724		0.269	5.35	2.18	0.256	0.152 J
Benzo(a)anthracene		0.127 J	2.77	0.174 J	0.83	15.2	<b>5.71 J</b>	0.87 J	0.547
Benzo(a)pyrene		0.103 J	2.69	0.136 J	0.679	13	4.16	0.777	0.496
Benzo(b)fluoranthene		0.186 J	2.41 J	0.128 J	0.94 J	12.2 J	<b>3:22 J</b>	0.682 J	0.477 J
Benzo(g,h,i)perylene			1.57		0.459	7.47	2.63	0.488	0.312
Benzo(k)fluoranthene			2		0.594	9.63	3.05	0.566	0.388
Carbazole			0.464		0.161 J	2.37	0.544 J		
Chrysene		0.353	2.73	0.268 J	1.53	15.9	5.27 J	0.969 J	0.628
Dibenzo(a,h)anthracene			0.538		0.191	2.76	0.821		0.117 J
Dibenzofuran			0.205	0.338	0.156 J	1.26	0.446	0.103 J	
Fluoranthene	0.184 J	0.221	4.03	0.219	1.84	29.2	9.37	1.47	1.02
Fluorene			0.187 J		0.126 J	2.45	0.922		
Indeno(1,2,3-cd)pyrene			1.52		0.423	6.72	2.22	0.419	0.277
Naphthalene			0.21	0.648	0.218	1.06	0.689	0.141 J	
Phenanthrene	0.121 J	0.4	2.7	0.8	1.8	28.7	10.5	1.3	0.9
Pyrene	0.156 J	0.183 J	3.54	0.199	1.38	29.5	10.6	1.57	0.978
Lead (mg/kg)									
Lead	NA	NA	NA						

Notes are provided on Page 3.

### Table 2E<sub>(Sheet 3 of 3)</sub>

Summary of Detected Constituents in On-Site Subsurface Soils Sampled by the EPA Environmental Response Team (2011) Crown Cleaners of Watertown, Inc. Village of Herrings, Jefferson County, New York

#### **NOTES:**

"--" indicates not detected.

"J" qualifier indicates estimated concentration value.

Shaded values exceed comparison criteria for surface soil (see Table 4-2), as indicated:

Exceeds human health-based values.

Exceeds state values.

Exceeds background values.

Exceeds two or more of the above values.

# Table 3 (Sheet 1 of 7)Summary of Detected Constituents in Sediments<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	SD-SW01	SD-SW02	SD-SW03	SD-SW03	SD-SW04	SD-SW08	SD-SW09	SD-SW10
DATE	8/23/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004	11/10/2006	11/13/2006	11/13/2006
[ [				Duplicate				
START DEPTH (feet)	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Volatile Organics (mg/kg)								
2-Butanone			0.16 J			R	0.15 J	0.071
2-Hexanone						0.44 J	0.12 J	
Acetone	0.51 J	0.51 J	0.41 J	0.40 J	0.26 J	0.15 J	0.21 J	0.21
cis-1,2-Dichloroethylene		0.048 J						
Tetrachloroethene							0.028 J	
trans-1,2-Dichloroethene		0.039 J						
Trichloroethene		0.026 J				-	0.037 J	
Vinyl chloride					0.012 J			
Semi-Volatile Organics (mg/kg)								
2-Methyinaphthalene								
Acenaphthene								
Acetophenone						2.8 J	0.83 J	0.58
Anthracene		2.6 J	0.54 J					
Benzaldehyde						0.75 J	0.28 J	0.37 J
Benzo(a)anthracene		28 JD	1.8 J	1.2 J	1.3 J			
Benzo(a)pyrene		21 JD	1.4 J	1.0 J	1.1 J			0.12 J
Benzo(b)fluoranthene		26 JD	1.3 J	0.91 J	1.1 J			
Benzo(g,h,i)perylene		6.2 J	0.86 J	0.74 J	0.75 J			
Benzo(k)fluoranthene		13 J	1.1 J	0.85 J	0.91 J			
Bis(2-ethylhexyl)phthalate						0.3 J		0.18 J
Carbazole		0.87 J						
Chrysene		28 JD	2.1 J	1.5 J	1.7 J			
Dibenz(a,h)anthracene		3.5 J						
Dibenzofuran								

# Table 3<br/>(Sheet 2 of 7)Summary of Detected Constituents in Sediments<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	SD-SW01	SD-SW02	SD-SW03	SD-SW03	SD-SW04	SD-SW08	SD-SW09	SD-SW10
DATE	8/23/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004	11/10/2006	11/13/2006	11/13/2006
				Duplicate				
START DEPTH (feet)	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Diethylphthalate		-		-				0.36 J
Fluoranthene	-	37 JD	3.5 J	2.0 J	2.4 J		0.15 J	0.26 J
Fluorene		4- <b></b>		-				_ <u>`</u> _`
Indeno(1,2,3-cd)pyrene		9J.	0.82 J	0.63 J 💲	0.68 J	-		
Phenanthrene		8.5 J	2.8 J	13月	1. <b>5 J</b>	-		
Phenol						- 0.99 J		0.23 JB
Pyrene		39 JD	5.0 J	3.0 J	3.6 J	-		0.2 J
Pesticides/PCBs (mg/kg)								
4,4'-DDD							R	0.0052 J
4,4'-DDE	0.0082 J		0.004 J	0.0083 J	0.012 J	-	R	0.0082 J
4,4'-DDT				0.0095 J			R	
alpha-Chlordane							R	
Dieldrin							0.0038 J	
Endrin			0.0048 J				R	
gamma-Chiordane							😴 0.0058 J	0.0024 J
Aroclor-1254					₹. 0.27 J			
Aroclor-1260						-		🕫 0.054 J
Metals and Cyanide (mg/kg)								
Aluminum	11100 J	3190 J	11300 J	8810 J	R	3030 J	6840 J	6410 J
Antimony		3.7 J	6.1 J		R			3.8 J
Arsenic		2 J	7 J	5.4 J	R	18.1 J	18.3.J.	22 <b>.15.6</b> J
Barium	473 J	440 J	214 J	178 J	R	805 J	560 J	504 J
Beryllium	0.98 J	0.51 J	0.89 J	0.74 J	R	6-14		
Cadmium	1.9 J	2.6 J	2.6 J	₹1.9,J	R	1.6 J	0.99 J	2.2.J
Calcium	28500 J	49300 J	22600 J	19100 J	R	102000 J	36800 J	18200 J

# Table 3<br/>(Sheet 3 of 7)Summary of Detected Constituents in Sediments<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	SD-SW01	SD-SW02	SD-SW03	SD-SW03	SD-SW04	SD-SW08	SD-SW09	SD-SW10
DATE	8/23/2004	8/23/2004	8/23/2004	8/23/2004	8/23/2004	11/10/2006	11/13/2006	11/13/2006
				Duplicate				
START DEPTH (feet)	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5 ·	0.5
Chromium	16.2 J	14.5 J	20.3 J	14.8 J	R	8.2 J	15.2 J	19.8 J
Cobalt	5.2 J	6.8 J	8.5 J	7.1 J	R	2.8 J	4.5 J	7.6 J
Copper	61.9 J	133 J	155 J	125 J	R	76.3 J	55.5 J	148 J
Iron	12400 J	19900 J	24300 J	21000 J	R	9970 J	11400 J	14400 J
Lead	128 J	84.4 J	171 J	124 J	R	59.6 J	57.8 J	108 J
Magnesium	3170 J	1600 J	3250 J	2660 J	R	1100 J	1660 J	<u>1480</u> J
Manganese	812 J	2390 J	161 J	132 J	R	1510 J	1930 J	550 J
Mercury	0.35 J	0.4 J	0.38 J		R		~~	0.5 J
Nickel	. 15 J	27.9 J	20.9 J	17.7 J	R	12.9 J	14.3 J	22.1 J
Potassium	933 J	578 J	1020 J	737 J	R	622 J	1080 J	866 J
Selenium	3.9 J	7.2 J	9 J	7.6 J	R	11.1 J	4.1 J	5.3 J
Silver					R			1.2 J
Sodium	1670 J	2200 J	2740 J	2300 J	R	4120 J	2440 J	2140 J
Vanadium	24.3 J	9.3 J	24.2 J	19.3 J	R	11.3 J	12.6 J	12 J
Zinc	326 J	531 J	511 J	469 J	R	396 J	180 J	360 J
Cyanide					R			

Notes provided on Page 7.

# Table 3<br/>(Sheet 4 of 7)Summary of Detected Constituents in Sediments<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

\_

SITE	SD-SW11	SD-SW11	SD-SW12	SD-SW13	SD-SW14	SD-SW15	SD-SW16	SD-SW17	SD-SW18
DATE	11/13/2006	11/13/2006	11/14/2006	11/14/2006	11/14/2006	11/14/2006	11/15/2006	11/15/2006	11/15/2006
		Duplicate							
START DEPTH (feet)	0	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Volatile Organics (mg/kg)									
2-Butanone	0.070 J	0.023 J	0.019	0.10 J	0.45 J	0.12 J	0.39 J		0.22 J
2-Hexanone	0.075 J	0.020 J	0.016	0.11 J	0.37 J	0.14 J	0.21 J	0.022 J	0.081 J
Acetone	0.16 J	0.053		0.056 J	0.40 J	0.11 J	1.0 J	0.026	0.43 J
cis-1,2-Dichloroethylene	0.012 J	0.0064 J					R		
Tetrachloroethene	0.057 J		0.017	0.013 J	0.10 J		0.039 J		
trans-1,2-Dichloroethene							R		
Trichloroethene	0.017 J			0.027	0.066 J	0.024 J	0.040 J		
Vinyl chloride							R		
Semi-Volatile Organics (mg/kg)									
2-Methylnaphthalene							R	-	0.17 J
Acenaphthene	0.96 J	0.96 J					R		0.37 J
Acetophenone			0.14 JB				R		
Anthracene	4.9 J	4.6			0.79 J		R		0.95 J
Benzaldehyde				1.4	2.2 J	2 J	R		<u>1.1 J</u>
Benzo(a)anthracene	🧠 31 J	24 D		0.20 J	2.7 J		R		3.6 J
Benzo(a)pyrene	25 J	19		0.24 J	2.6 J		R		<b>3.8</b> J
Benzo(b)fluoranthene	24 J	19		0.36 J	2.5 J		<u>R</u>		3.5 J
Benzo(g,h,i)perylene	13 J	8.4			1.3 J	<del></del>	R		2.0 J
Benzo(k)fluoranthene	21 J	16			2.0 J		R		-3.3 J
Bis(2-ethylhexyl)phthalate							<u></u>		0.22 J
Carbazole	2.6 J	3.0			0.41 J		R		0.43 J
Chrysene	33 J	25 D		0.42 J	2.8 J		R		3.8 J
Dibenz(a,h)anthracene	7.2 J	4.6			0.77 J		R		1.0 J
Dibenzofuran	<u> </u>	0.41 J	<u> </u>				R		0.1 <b>8</b> J

# Table 3<br/>(Sheet 5 of 7)Summary of Detected Constituents in Sediments<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

SITE	SD-SW11	SD-SW11	SD-SW12	SD-SW13	SD-SW14	SD-SW15	SD-SW16	SD-SW17	SD-SW18
DATE	11/13/2006	11/13/2006	11/14/2006	11/14/2006	11/14/2006	11/14/2006	11/15/2006	11/15/2006	11/15/2006
		Duplicate				1			
START DEPTH (feet)	0	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Diethylphthalate							1.5 J		
Fluoranthene	43 J	42 JD		0.24 J	5.8 J	0.58 J	R	0.14 J	7.1 J
Fluorene	0.85 J	0.95 J					R		0.35 J
Indeno(1,2,3-cd)pyrene	17 J	<b>9.6</b>			1.6 J		R		2.6 J
Phenanthrene	16 J	15		0.14 J	3.3 J	0.30 J	R		3.5 J
Phenol		2.1	1.0	1.5	3.3 J	2.6 J	R		6.3 J
Pyrene	42 J	30 JD		0.22 J	4.3 J	0.43 J	R	0.11 J	5.9 J
Pesticides/PCBs (mg/kg)									
4,4'-DDD	0.054 J				R		R		
4,4'-DDE	0.014 J		0.00082 J		R		R		
4,4'-DDT	0.034 J				R		R		0.032 J
alpha-Chlordane	0.027 J				R		R		
Dieldrin					R		R		
Endrin					R		R		
gamma-Chlordane	0.026 J				R		R		
Aroclor-1254							R		
Aroclor-1260	0.16 J	0.034 J					R		
Metals and Cyanide (mg/kg)									
Aluminum	5640 J	4710 J	2320 J	6530 J	2090 J	7340 J	1770 J	3970 J	12400 J
Antimony	2.5 J	4.9 J					11.2 J		5.9 J
Arsenic	20.9 J	17.4 J	7.3	7.3 J	14 J	31 J	31.4 J	8.1 J	22 J
Barium	1040 J	1030 J	R	R					R
Beryllium									
Cadmium	2.3 J	3.3 J							
Calcium	26700 J	26500 J	62600 J	7440 J	17800 J	49300 J	22700 J	4860 J	11100 J

# Table 3<br/>(Sheet 6 of 7)Summary of Detected Constituents in Sediments<br/>Crown Cleaners of Watertown, Inc.Village of Herrings, Jefferson County, New York

	and the second se								
SITE	SD-SW11	SD-SW11	SD-SW12	SD-SW13	SD-SW14	SD-SW15	SD-SW16	SD-SW17	SD-SW18
DATE	11/13/2006	11/13/2006	11/14/2006	11/14/2006	11/14/2006	11/14/2006	11/15/2006	11/15/2006	11/15/2006
		Duplicate							
START DEPTH (feet)	0	0	0	0	0	0	0	0	0
END DEPTH (feet)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chromium	22.2 J	18.8 J	4.6	8.7 J	5.9 J	11.7 J	4.6 J	5.7 J	18.9 J
Cobalt	13.5 J	12.9 J							·
Copper	88.9 J	108 J	20.6	40.4 J	72.8 J	101 J	70.8 J	😒 27.7 J 🏸	77.9 J
Iron	59500 J	50000 J	12200 J	10600 J	3450 J	18000 J	10000 J	9830 J	44700 J
Lead	76.1 J	82.7 J	17.5 J	1480 J	112 J	195 J	86.9 J	150 J	220 J
Magnesium	1380 J	1270 J	10500 J			1850 J	578 J	833 J	2660 J
Manganese	6250 J	7150 J	303 J	94.4 J	13.7 J	117 J	86.4 J	120 J	395 J
Mercury	0.3 J	0.2 J		0,33 J				0.17 J	
Nickel	39.6 J	41.4 J	4.9 J	9.3 J	28.3 J	16.5 J	10.5 J	5.8 J	20.6 J
Potassium	882 J	795 J							
Selenium	2.5 J	4.9 J		3.1 J	12.3 J	10.6 J	12.4 J		
Silver	2.8 J	2.5 J	13J	3×14J		4.9 J		1.6 J	<b>4.9 J</b>
Sodium	1310 J	1610 J	704 J	2240 J	4440 J	8410 J	5080 J	1680 J	2380 J
Vanadium	14.7 J	15.9 J	R	R	R	R	R	R	R
Zinc	549 J	828 J	81.8	478 J	184 J	1250 J	306 J	256 J	260 J
Cyanide	10.5 J		0.29 J	0.38 J	1.3 J	2.4 J	2.3 J	0.31 J	0.86 J

Notes provided on Page 7.

# Table 3 (Sheet 7 of 7)Summary of Detected Constituents in SedimentsCrown Cleaners of Watertown SiteVillage of Herrings, Jefferson County, New York

### NOTES:

"--" indicates not detected.

"J" qualifier indicates estimated concentration value.

"D" qualifier indicates concentration value from a dilution analysis.

"R" qualifier indicates rejected (unusable) value.

"N" qualifier indicates presumptive evidence exists for the presence of the compound.

Shaded values exceed comparison criteria for sediments (see Tables 4-5A and 4-5B), as indicated:

Exceeds ecological-based values.

Exceeds state values.

Exceeds both of the above values.

### TABLE 4A

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

Scenario Timeframe: Current/Future Medium: Soil

Exposure Medium: On-Site Surface Soil

Exposure Point	Chemical of Concern	of Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	EPC Units	Statistical Measure
		Min	Max			(EPC)		
On-Site Surface Soil	Benzo(a)pyrene	0.097	14	mg/kg	16/18	5.0	mg/kg	95% Chebyshev
	Tetrachloroethene	0.006	59	mg/kg	11/17	39	mg/kg	99% Chebyshev
	Vanadium <sup>1</sup>	6.3	25	mg/kg	18/18	16	mg/kg	Student-t

Scenario Timeframe: Current/Future Medium: Groundwater

Exposure met	num: Grounuwater							
Exposure Point	Chemical of Concern	Chemical of Concentration Concern Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	EPC Units	Statistical Measure
		Min	Max			(EFC)		
Groundwater	Tetrachloroethene	0.57	6500	ug/L	14/23	3487	ug/L	99% Chebyshev
	Manganese <sup>1</sup>	1.1	666	ug/L	8/15	151	ug/L	95% UCL (BCA)

99% Chebyshev: 95% Upper Confidence Limit for Nonparametric Data; Chebyshev

95% Chebyshev: 95% Upper Confidence Limit for Nonparametric Data; Chebyshev

Student-t: 95% Upper Confidence Limit for Normal Distribution

95% UCL (BCA): 95% Upper Confidence Limit for Gamma Distribution

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

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

<sup>1</sup> While these contaminants contribute to the risk, they are not believed to be site related.

### **TABLE 4B**

### Non-Cancer Toxicity Data Summary

### Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD ( Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Benzo(a)pyrene		-					-	-	IRIS	4/9/2010
Tetrachloroethene	Chronic	1.0E-02	mg/kg-day	100%	1.0E-02	mg/kg-day	Liver	1000	IRIS	4/9/2010
Manganese (Water)	Chronic	2.4E-02	mg/kg-day	4%	9.6E-04	mg/kg-day	CNS	1	IRIS	4/9/2010
Vanadium	Chronic	7.0E-05	mg/kg-day	3%	2.6E-05	mg/kg-day	Kidney	3000	PPRTV	9/30/2009

### Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates:
Benzo(a)pyrene	Chronic	NA		NA	NA	1		IRIS	4/9/2010
Tetrachloroethene	Chronic	2.7E-01	mg/m3	NA	NA	Brain		ATSDR	9/1/1997
Manganese (Water)	Chronic	5.0E-05	mg/m3	NA	NA	Brain	1000	IRIS	4/9/2010
Vanadium	Chronic	-		NA	NA		-	IRIS	4/9/2010

Key

NA: No information available; noncarcinogenic toxicity values (RfD and RfC) are not available for benzo(a)pyrene; an RfC is not available for Vanadium.

IRIS: Integrated Risk Information System, U.S. EPA PPRTV: Provisional Peer Review Toxicity Value Database, U.S. EPA

ATSDR: Agency for Toxic Substances and Disease Registry

CNS: Central Nervous System

### **Summary of Toxicity Assessment**

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in soil and groundwater.

### TABLE 4C

### Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units		Adjusted Cancer Slope Factor (for Dermal)		Slope Factor Units		Weight of Evidence/ Cancer Guideline Description	Source	Date	
Benzo(a)pyrene	7.3E+00	(mg/kg/da	y) <sup>-1</sup>	y) <sup>-1</sup> 8.2E+00		(mg/kg/day) <sup>-1</sup>		B2	IRIS	4/9/2010	
Tetrachloroethene	5.4E-01	(mg/kg/da	y) <sup>-1</sup> 5.4E-0		)1	(mg/kg/day) <sup>-1</sup>		B2	CalEPA	4/9/2010	
Manganese						<b></b> `*		D	IRIS	4/9/2010	
Vanadium								NA	IRIS	4/9/2010	
Pathway: Inhalation				•							
Chemical of Concern	Unit Risk	Units	In Sloj	halation pe Factor	Slop	oe Factor Units	Weig Car I	t of Evidence/ ocer Guideline Description	Source	Date	
Benzo(a)pyrene	1.1E+00	(mg/m <sup>3</sup> ) <sup>-1</sup>		NA		NA	B2		CalEPA	4/9/2010	
Tetrachloroethene	5.9E-03	(mg/m <sup>3</sup> ) <sup>-1</sup>	NA			NA		2A	CalEPA	4/9/2010	
Manganese		•=					· D		IRIS	4/9/2010	
Vanadium							NA		IRIS	4/9/2010	

#### Key:

IRIS: Integrated Risk Information System. U.S. EPA NA: No information available

CalEPA: California Environmental Protection Agency

#### **EPA Weight of Evidence:**

A - Human carcinogen

B1 - Probable Human Carcinogen-Indicates that limited human data are available

B2 - Probable Human Carcinogen-Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E- Evidence of noncarcinogenicity

2A - CalEPA: Probably Carcinogenic to Humans

#### **Summary of Toxicity Assessment**

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

			·	** <u></u>			· · ·	
			TA	ABLE 4D				
		Risk C	haracterization	Summai	ry - None	arcinoger	15	
Scenario T Receptor F Receptor A	imeframe: Population: Age:	Future On-Site Child	e Resident					
Medium	Exposure	Exposure	Chemical of	Primary		Non-Ca	rcinogenic l	Risk
<u></u>	Medium	Point	Concern	I argei Organ	Ingestion	Inhalation	Dermal	Exposure Route Total
Soil	Surface Soil	Surface Soil	Benzo(a)pyrene		-			
			Tetrachloroethene	Liver	5.0E-02	1.7E-01	4.2E-03	2.2E-01
			Vanadium	Kidney	3.0E+00		2.2E-01	3.2E+00
					So	il Hazard Ind	ex Total =	3.4E+00
Scenario T Receptor P Receptor A	imeframe: opulation: ge:	Curren Off-Sit Adult	t/Future e Resident					
Medium	Exposure Exposure		Concern Target Non-C		Chemical of Primary Non-Carcinoge		cinogenic R	lisk
1	меонин	Point	Concern	Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground- water	Ground- Water	Ground- Water	Tetrachloroethene	Liver	6.5E-02	2.3E-02	2.5E-02	1.1E-01
			Manganese	CNS	5.8E-01		3.3E-02	6.1E-01
						Hazard Inde	x Total =	7.2E-02
Scenario T Receptor P R <u>eceptor A</u>	imeframe: opulation: .ge:	Curren Off-Sit Child	t/Future e Resident					· ·
Medium	Exposure	Exposure	Chemical of	Primary				
	Medium	Point	Concern	Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground- water	Ground- Water	Ground- Water	Tetrachloroethene	Liver	1.5E-01	8.4E-02	6.6E-02	3.0E-01
			Manganese	CNS	1.4E+00		1.3E-01	1.5E+00
			·	·		Hazard Inde	x Total =	1.8E+00
Scenario Ti Receptor P Receptor A	imeframe: opulation: ge:	Future On-Site Adult	e Resident			······································		
Medium	Exposure	Exposure	Chemical of	Primary		Non-Car	cinogenic Ri	isk
	Mealum	Point	Concern	Organ	Ingestion	Inhalation	Dermal	Exposure Route Total
		- ·	Tatrockloroothono	Liver	0 (5.00	2 48-00	2 70+00	1.75(0)
Ground- water	Ground- Water	Ground- Water	Tell achior oethene	Liver	9.6E+00	5.4ET00	3.7E+00	1.72+01

Scenario Tin Receptor Po Receptor Ag	neframe: pulation: ;e:	Future On-Sit Child	e Resident		· .				
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Primary Non-Carcinogenic Risk Target Organ				
					Ingestion	Inhalation	Dermal	Exposure Routes Total	
Ground- water	Ground- Water	Ground- Water	Tetrachloroethene	Liver	2.2E+01	1.2E+01	1.4E-03	2.8E-01	
			Manganese	CNS	4.0E-01	3.8E-02	4.4E-01	8.8E-01	
			<u></u>			Hazard Ind	ex Total =	1.2E+00	

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse noncancer effects.
r			· · · · · · · · · · · · · · · · · · ·				
			TABL	E 4E	~ .		
		Risk Cha	racterization S	ummary -	Carcinog	gens	
Scenario Tim Receptor Pop Receptor Age	ario Timeframe: Future   ptor Population: On-Site Resident   ptor Age: Child						
Medium	Exposure Medium	Exposure Point	Chemical of Concern		Ca	rcinogenic R	lisk
	0.0.0.1	<b>G G G H</b>		Ingestion		Dermai	Exposure Koutes Total
Soil	Surface Soil	Surface Soil	Benzo(a)pyrene	1.9E-04	1.6E-09	7.7E-05	2.7E-04
			Tetrachloroethene	2.3E-05	2.3E-05	1.9E-06	4.8E-05
			Vanadium	·			•••
			·		<b>T</b>	`otal Risk =	3.2E-04
Scenario Tim Receptor Pop Receptor Age	eframe: ulation: :	Current/Future Off-Site Reside Adult	ent	, ,			·····
Medium	Exposure	Exposure	Chemical of		Ca	rcinogenic R	lisk
	Medium	Point	Concern	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Tetrachloroethene	1.2E-04	1.3E-05	4.7E-05	1.8E-04
			Manganese		·		
					ТТ	otal Risk =	1.8E-04
Scenario Time Receptor Pop Receptor Age	eframe: ulation: :	Current/Future Off-Site Reside Child	ent				
Medium	Exposure	Exposure	Chemical of		Ca	cinogenic R	isk
	Medium	Point	Concern	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Tetrachloroethene	7.0E-05	1.1E-03	3.1E-05	1.1E-04
			Manganese				
		<b>.</b>	· · · · · · · · · · · · · · · · · · ·		Т	otal Risk =	1.1E-04
Scenario Timo Receptor Pop Receptor Age	eframe: ulation:	Future On-Site Reside	nt				· · · · · · · · · · · · · · · · · · ·
Medium	Exposure	Exposure	Chemical of		Car	cinogenic R	isk
	Medium	Point	Concern	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater	Tetrachloroethene	1.8E-02	1.9E-03	6.9E-03	2.6E-02
			Manganese				
	l	L		.I		I	
					Т	otal Risk =	2.6E-02
L							· · · · · · · · · · · · · · · · · · ·
	ь.		,				

Scenario Timeframe:   Future     Receptor Population:   On-Site Resident     Receptor Age:   Child								
Medium Exposure		Exposure	Chemical of Concern	Carcinogenic Risk				
	Medium Point	Ingestion		Inhalation	Dermal	Exposure Routes Total		
Groundwater	Groundwater	Groundwater	Tetrachloroethene	1.0E-02	1.7E-03	4.5E-03	1.7E-02	
			Manganese					
•					Т	otal Risk =	1.7E-02	

# Summary of Risk Characterization - Carcinogens

The table presents cancer risks for each route of exposure and for all routes of exposure combined. As stated in the National Contingency Plan, the acceptable risk range for site-related exposure is  $10^{-6}$  to  $10^{-4}$ , with  $10^{-6}$  as the point of departure.

Table 5 – Cleanup	Levels for Chemical	s of Concern				
Media: Surface and S Site Area: On-Site Available Use: Comn Controls to Ensure F	ubsurface Soils nercial/Industrial <b>Restricted Use</b> : Yes					
Chemical of Concern	Cleanup Level	Basis for Cleanup Level	Risk at Cleanup Level			
Benzo(a)pyrene	1.0 mg/kg	NYSDEC Commercial Soil Clean-up Objectives	Cancer risk = 1 x 10 <sup>-6</sup>			
Tetrachloroethene	1.3 mg/kg	NYSDEC Protection of GW Soil Cleanup Objectives	Cancer risk = 1 x 10 <sup>-6</sup>			
Media: Groundwater Site Area: Available Use: Controls to Ensure F	Restricted Use: Yes	Basis for Cleanun	Risk at Cleanup			
Concern		Level	Level			
Tetrachloroethene	5 μg/l	EPA Drinking Water Regulations	Cancer risk = 1 x 10 <sup>-6</sup>			
Media: Sediment Site Area: Western Wetlands Available Use: Commercial Controls to Ensure Restricted Use: NA						
Chemicals of	Cleanup Level	Basis for Cleanup	Risk at Cleanup			
Tetrachloroethene	0.008 mg/kg	NYSDEC Sediment Criteria				
The purpose of this respor migration of contaminants conditions at the site pose 1.7x10 <sup>-2</sup> from ingestion of concentrations in soil and excess of 1.0 mg/kg and T York State ARARs. Treatr	nse is to control risks posed to to groundwater. The results an excess lifetime cancer ris contaminated groundwater. groundwater. This remedy s etrachloroethene in excess of ment shall be monitored to et	by direct contact with soil and grou of the baseline risk assessment i sk of 3.2 x 10 <sup>-4</sup> from direct contact This risk relates to the benzo(a)p hall address all soils contaminate of 1.3 mg/kg. The action levels we nsure that cleanup levels are achi	undwater and to minimize the ndicate that existing with contaminated soils and yrene and Tetrachloroethene d with benzo(a)pyrene in ere determined through New eved. The site is expected to			

be available for commercial land use as a result of the remedy.

Capital Costs for Remedy Component – Soil     Image: Control of the second sec	Description	Quantity	Unit	Unit Cost (\$)	Cost (\$)
Soil     PLANS/REPORTS     Image: Constraint of the second	Capital Costs for Remedy Component –				
PLANS/REPORTS	Soil				
Project Plans/Reports     1     LS     100,000     100,000       MOBILIZATION/DEMOBILIZATION     1     LS     50,000     50,000       SITE PREPARATION     1     LS     50,000     50,000       SITE PREPARATION     1     LS     50,000     50,000       Clearing and grubbing     15,344     SY     2.0     30,688       Building Demolition     1     LS     500,000     24,000       CROSION & SEDIMENT CONTROL     -     -     -     -       SITE Fence & Installation     4,513     LF     10     45,130       EXCAVATION     10,512     CY     20     210,235       Material Handing     10,512     CY     4     42,047       OFF-SITE TREATMENT & DISPOSAL     -     -     -     -       Reusable soil     2,132     CY     10     21,321     -     -     -       Reusable soil     3,461     CY     40     138,456     -     -     -     -     -     -     -     -<	PLANS/REPORTS				
MOBILIZATION/DEMOBILIZATION     Image: Constraint of the second	Project Plans/Reports	1	:LS	100,000	100,000
Mobilization     1     LS     50,000     50,000       SITE PREPARATION     -	MOBILIZATION/DEMOBILIZATION				
SITE PREPARATION     -       Cleating and grubbing     15,344     SY     2.0     30,688       Building Demolition     1     LS     500,000     500,000       SUPPORT FACILITIES     -     -     -     -       Office Trailers     12     MO     2,000     24,000       EROSION & SEDIMENT CONTROL     -     -     -     -       Sill Fence & Installation     4,513     LF     10     45,130       EXCAVATION     -     -     -     -     -       Soli Excavation (above water table)     10,512     CY     4     42,047       OFF-SITE TREATMENT & DISPOSAL     -     -     -     -       Non-hazardous soil     12,570     Ton     100     1,256,950     -     -       Reusable soil     2,132     CY     25     168,158     -     -       Top Soil     3,461     CY     40     138,456     -     -     -     -     -     -     -     -     -     -	Mobilization	· 1	LS	50,000	50,000
Clearing and grubbing     15,344     SY     2.0     30,688       Building Demolition     1     LS     500,000     500,000       SUPPORT FACILITIES     12     MO     2,000     24,000       CBIOR SIGN & SEDIMENT CONTROL	SITE PREPARATION				
Building Demolition     1     LS     500,000     500,000       SUPPORT FACILITIES     12     MO     2,000     24,000       EROSION & SEDIMENT CONTROL	Clearing and grubbing	15,344	SY	2.0	30.688
SUPPORT FACILITIES     12     MO     2,000     24,000       Office Trailers     12     MO     2,000     24,000       Sill Fence & Installation     4,513     LF     10     45,130       Soll Excavation (above water table)     10,512     CY     20     210,235       Material Handling     10,512     CY     4     42,047       OFF-SITE TREATMENT & DISPOSAL	Building Demolition	1	LS	500,000	500,000
Office Trailers     12     MO     2,000     24,000       EROSION & SEDIMENT CONTROL <td>SUPPORT FACILITIES</td> <td>· · · ·</td> <td></td> <td></td> <td></td>	SUPPORT FACILITIES	· · · ·			
EROSION & SEDIMENT CONTROL	Office Trailers	12	MO	2,000	24,000
Silf Fence & Installation     4,513     LF     10     45,130       EXCAVATION	EROSION & SEDIMENT CONTROL				
EXCAVATION	Silt Fence & Installation	4,513	LF	10	45,130
Soil Excavation (above water table)     10,512     CY     20     210,235       Material Handling     10,512     CY     4     42,047       OPF-SITE TREATMENT & DISPOSAL	EXCAVATION				
Material Handling     10,512     CY     4     42,047       OFF-SITE TREATMENT & DISPOSAL	Soil Excavation (above water table)	10,512	CY	20	210.235
OFF-SITE TREATMENT & DISPOSAL     Image: Constraint of the second secon	Material Handling	10,512	CY	4	42,047
Non-hazardous soil     12,570     Ton     100     1,256,950       SITE RESTORATION	OFF-SITE TREATMENT & DISPOSAL				
SITE RESTORATION     2,132     CY     10     21,321       Reusable soil     2,132     CY     10     21,321       Clean Fill     6,726     CY     25     168,158       Top Soil     3,461     CY     40     138,456       Seeding     3.6     Acres     2,000     7,115       Wetland Restoration     0.7     Acres     5,000     3,668       MISCELLANEOUS	Non-hazardous soil	12,570	Ton	100	1,256,950
Reusable soil     2,132     CY     10     21,321       Clean Fill     6,726     CY     25     168,158       Top Soil     3,461     CY     40     138,456       Seeding     3,6     Acres     2,000     7,115       Wetland Restoration     0.7     Acres     2,000     7,115       Metland Restoration     0.7     Acres     5,000     3,668       MISCELLANEOUS	SITE RESTORATION				· · · · · · · · · · · · · · · · · · ·
Clean Fill     6,726     CY     25     168,158       Top Soil     3,461     CY     40     138,456       Seeding     3.6     Acres     2,000     7,115       Wetland Restoration     0.7     Acres     5,000     3,668       MISCELLANEOUS	Reusable soil	2,132	CY	10	21.321
Top Soil     3,461     CY     40     138,456       Seeding     3.6     Acres     2,000     7,115       Wetland Restoration     0.7     Acres     5,000     3,668       MISCELLANEOUS	Clean Fill	6,726	CY	25	168,158
Seeding     3.6     Acres     2,000     7,115       Wetland Restoration     0.7     Acres     5,000     3,668       MISCELLANEOUS            Pre-Design Investigation     1     LS     75,000     75,000        Wetland Identification/Delineation     1     LS     10,000     10,000      10,000     240,000     240,000     240,000     240,000     240,000     240,000     293,277     Legal & Administrative (5%)     146,638     146,638     146,638     146,638     146,638     146,638     146,638     146,638     146,638     146,638     154,53,959,238*     154,53,959,238*     154,53,959,238*     154,53,959,238*     154,53,959,238*     154,53,959,238*     154,53,959,238*     154,53,959,238,53,959,238*     154,53,959,238,53,959,238,53,53	Top Soil	3.461	CY	40	138,456
Wetland Restoration     0.7     Acres     5,000     3,668       MISCELLANEOUS	Seeding	3.6	Acres	2.000	7.115
MISCELLANEOUS     Image: Constraint of the second	Wetland Restoration	0.7	Acres	5.000	3,668
Pre-Design Investigation     1     LS     75,000     75,000       Wetland Identification/Delineation     1     LS     10,000     10,000       Misc. Disposal     1     LS     10,000     10,000       Health and Safety Oversight     12     MO     20,000     240,000       Health and Safety Oversight     12     MO     20,000     240,000       Contingency (20%)     586,554     2,932,769*     293,277       Legal & Administrative (5%)     146,638     46,638     46,638       Total     3,959,238*     3,959,238*     46,638       Project Plans/Reports     1     LS     100,000     100,000       ADMINISTRATIVE ACTIONS     1     S     100,000     100,000       ADMINISTRATIVE ACTIONS     2     LS     10,000     20,000       Mobilization/Demobilization     1     LS     20,000     20,000       SUPPORT FACILITIES     1     LS     10,000     10,000       IN SITU TREATMENT     1     LS     10,000     10,000       IN SITU	MISCELLANEOUS				
Wetland Identification/Delineation     1     LS     10,000     10,000       Misc. Disposal     1     LS     10,000     10,000       Health and Safety Oversight     12     MO     20,000     240,000       Health and Safety Oversight     12     MO     20,000     240,000       Legal & Subtotal     2,932,769*     2,932,769*     2,932,769*       Contingency (20%)     586,554     Engineering (10%)     293,277       Legal & Administrative (5%)     146,638     146,638       Capital Costs for Remedy Component     Total     3,959,238*       Project Plans/Reports     1     LS     100,000       ADMINISTRATIVE ACTIONS     Institutional Controls     2     LS       Mobilization/DemoBilLIZATION     2     LS     10,000     20,000       SUPPORT FACILITIES     Institutional Controls     1     LS     20,000     20,000       SUPPORT FACILITIES     Incomponent IncomponentI	Pre-Design Investigation	1	LS	75.000	75.000
Misc. Disposal     1     LS     10,000     10,000       Health and Safety Oversight     12     MO     20,000     240,000       Health and Safety Oversight     12     MO     20,000     240,000       Subtotal     2,932,769*           Subtotal     2,932,769*	Wetland Identification/Delineation	1	LS	10.000	10.000
Health and Safety Oversight     12     MO     20,000     240,000       Health and Safety Oversight     12     MO     20,000     240,000       Subtotal     2,932,769*      2,932,769*        Subtotal     2,932,769*      586,554       Engineering (10%)     293,277      Legal & Administrative (5%)     146,638       Image: Capital Costs for Remedy Component Groundwater     Total     3,959,238*       PLANS/REPORTS     1     LS     100,000     100,000       ADMINISTRATIVE ACTIONS     Image: Capital Controls     2     LS     100,000     20,000       MOBILIZATION/DEMOBILIZATION     Image: Capital Controls     2     LS     10,000     20,000       SUPPORT FACILITIES     Image: Capital Controls     2     LS     10,000     20,000       Mobilization/Demobilization     1     LS     20,000     20,000       SUPPORT FACILITIES     Image: Capital Controls     1     Umage: Capital Controls     2     10,000     10,000       Mobilization/Demobilization     1     LS	Misc. Disposal	1	LS	10.000	10.000
Capital Costs for Remedy Component Groundwater     Contingency (20%)     586,554       Image: Costs for Remedy Component Groundwater     Image: Costs for Remedy Cost	Health and Safety Oversight	12	MO	20,000	240.000
Capital Costs for Remedy Component Groundwater     Contingency (20%)     586,554       PLANS/REPORTS     Total     3,959,238*       Project Plans/Reports     1     LS     100,000       ADMINISTRATIVE ACTIONS     -     -     -       Institutional Controls     2     LS     10,000     20,000       MOBILIZATION/DEMOBILIZATION     -     -     -     -       Mobilization/Demobilization     1     LS     20,000     20,000       SUPPORT FACILITIES     -     -     -     -       Institutional Controls     1     LS     10,000     20,000       MOBILIZATION/DEMOBILIZATION     -     -     -     -       IN SITU T REATMENT     -     -     -     -       IN SITU TREATMENT     132     EA     7,500     990,000					,
Capital Costs for Remedy Component Groundwater     Capital Costs for Remedy Component Groundwater     Total     3,959,238*       PLANS/REPORTS     1     LS     100,000     100,000       ADMINISTRATIVE ACTIONS     -     -     -     -       Institutional Controls     2     LS     10,000     20,000       Mobilization/Demobilization     1     LS     20,000     20,000       SUPPORT FACILITIES     -     -     -     -       Office Trailers     1     LS     10,000     20,000       IN SITU TREATMENT     -     -     -     -     -       Institutional controls     1     LS     20,000     20,000     100,000       INSITU TREATMENT     -     -     -     -     -     -       Injection well     132     EA     7,500     990,000     -     -				Subtotal	2,932,769*
Capital Costs for Remedy Component Groundwater     Total     3,959,238*       Project Plans/Reports     1     LS     100,000     100,000       ADMINISTRATIVE ACTIONS     2     LS     10,000     20,000       Mobilization/Demobilization     1     LS     20,000     20,000       SUPPORT FACILITIES     0     0     10,000     10,000       INSITU TREATIMENT     1     LS     10,000     20,000       INSITU TREATMENT     1     LS     10,000     10,000       INSITU TREATMENT     1     LS     10,000     20,000       SIUP ORT FACILITIES     0     0     0     0       IN SITU TREATMENT     1     LS     10,000     10,000					
Capital Costs for Remedy Component Groundwater     Total     3,959,238*       PLANS/REPORTS     -     -     -       Project Plans/Reports     1     LS     100,000     100,000       ADMINISTRATIVE ACTIONS     -     -     -     -     -       Institutional Controls     2     LS     100,000     20,000     20,000       MOBILIZATION/DEMOBILIZATION     -     -     -     -     -     -       Office Trailers     1     LS     10,000     20,000     20,000     10,000     10,000     10,000     10,000     10,000     -				Contingency (20%)	586.554
Legal & Administrative (5%)     146,638       Legal & Administrative (5%)     146,638       Total     3,959,238*       Capital Costs for Remedy Component Groundwater     Total     3,959,238*       PLANS/REPORTS				Engineering (10%)	293,277
Capital Costs for Remedy Component GroundwaterTotal3,959,238*PLANS/REPORTSProject Plans/Reports1LSInstitutional Controls2LSInstitutional Controls2LSMOBILIZATION/DEMOBILIZATION-Mobilization/Demobilization1LSOffice Trailers1LSInstitut TREATMENT-Injection well132EATotal7,500	· · · · · · · · · · · · · · · · · · ·			Legal & Administrative (5%)	146.638
Capital Costs for Remedy Component GroundwaterTotal3,959,238*PLANS/REPORTSProject Plans/Reports1LSInstitutional Controls2LSInstitutional Controls2LSMOBILIZATION/DEMOBILIZATION-Mobilization/Demobilization1LSSUPPORT FACILITIES-Office Trailers1LSInstitu TREATMENT-Injection well132EATotal7,500990,000				Elgard / anniholdario (e/o/	
Capital Costs for Remedy Component Groundwater Groundwater GroundwaterPLANS/REPORTS1LS100,000Project Plans/Reports1LS100,000ADMINISTRATIVE ACTIONSInstitutional Controls2LS10,000MOBILIZATION/DEMOBILIZATIONMobilization/Demobilization1LS20,000SUPPORT FACILITIESOffice Trailers1LS10,000IN SITU TREATMENTInjection well132EA7,500			· · · ·	Total	3.959.238*
Capital Costs for Remedy Component GroundwaterImage: Component GroundwaterImage: Component GroundwaterPLANS/REPORTS1LS100,000Project Plans/Reports1LS100,000ADMINISTRATIVE ACTIONSInstitutional Controls2LS10,000MOBILIZATION/DEMOBILIZATIONMobilization/Demobilization1LS20,000SUPPORT FACILITIESOffice Trailers1LS10,000IN SITU TREATMENTInjection well132EA7,500					0,000,200
Capital Costs for Remedy Component GroundwaterImage: Component GroundwaterImage: Component GroundwaterPLANS/REPORTS1LS100,000Project Plans/Reports1LS100,000ADMINISTRATIVE ACTIONS	·				
GroundwaterImage: Constraint of the second seco	Capital Costs for Remedy Component				
PLANS/REPORTS1LS100,000Project Plans/Reports1LS100,000ADMINISTRATIVE ACTIONSInstitutional Controls2LS10,000MOBILIZATION/DEMOBILIZATIONMobilization/Demobilization1LS20,000SUPPORT FACILITIESOffice Trailers1LS10,000IN SITU TREATMENTInjection well132EA7,500					
Project Plans/Reports1LS100,000100,000ADMINISTRATIVE ACTIONS	PLANS/REPORTS		10	400,000	400.000
ADMINISTRATIVE ACTIONSImage: Control statutional Controls2LS10,00020,000MOBILIZATION/DEMOBILIZATIONImage: Control statutionImage: Control statutionImage: Control statutionImage: Control statutionImage: Control statutionMobilization/DemobilizationImage: Control statutionImage: Control statutionImage: Control statutionImage: Control statutionMobilization/DemobilizationImage: Control statutionImage: Control statutionImage: Control statutionImage: Control statutionSUPPORT FACILITIESImage: Control statutionImage: Control statutionImage: Control statutionImage: Control statutionOffice TrailersImage: Control statutionImage: Control statutionImage: Control statutionImage: Control statutionInjection wellImage: Control statutionImage: Control statutionImage: Control statutionImage: Control statutionInjection wellImage: Control statutionImage: Control s	Project Plans/Reports	1	LS	100,000	100,000
Institutional Controls2LS10,00020,000MOBILIZATION/DEMOBILIZATION </td <td>ADMINISTRATIVE ACTIONS</td> <td></td> <td></td> <td></td> <td></td>	ADMINISTRATIVE ACTIONS				
MOBILIZATION/DEMOBILIZATIONILS20,000Mobilization/Demobilization1LS20,000SUPPORT FACILITIESIIIOffice Trailers1LS10,000IN SITU TREATMENTIIIInjection well132EA7,500	Institutional Controls	2	LS	10,000	20,000
Mobilization/Demobilization     1     LS     20,000     20,000       SUPPORT FACILITIES	MOBILIZATION/DEMOBILIZATION			· · · · · · · · · · · · · · · · · · ·	
SUPPORT FACILITIES     Image: Constraint of the second se	Mobilization/Demobilization	1	LS	20,000	20,000
Office Trailers     1     LS     10,000     10,000       IN SITU TREATMENT     Injection well     132     EA     7,500     990,000	SUPPORT FACILITIES			· · ·	
IN SITU TREATMENT     Injection well     132     EA     7,500     990,000	Office Trailers	1	LS	10,000	10,000
Injection well   132   EA   7,500   990,000	IN SITU TREATMENT	ļ			
	Injection well	132	EA	7,500	990,000

# Table 6 - Cost Estimate Summary for the Selected Remedy

\*If the land use for the property is changed from commercial to recreational, then restricted residential Soil Cleanup Objectives would be utilized, which would allow for recreational use of the property. Accordingly, the PAH-contaminated soils would be excavated to a depth of two feet and backfilled with clean soil. This change would result in the excavation of an additional 1,650 cubic yards of PAH-contaminated soils and would cost an additional \$12,543.

Pre-Design Investigation	1 ^	LS	200,000	200,000
			Subtotal	1,340,000
			Contingency (20%)	268,000
			Engineering (10%)	134,000
Description	Quantity	Unit	Unit Cost (\$)	Cost (\$)
			Legal & Administrative (5%)	67,000
			Total	1,809,000
			GRAND TOTAL	5,768,238*

Description	Quantity	Unit	Unit Cost	Cost
1. Plans/Reports				
2. Mobilization/Demobilization		LS		\$11,925
3. Site Preparation				
Perform Site Survey	3	Day	\$910.00	\$2,730
Install Temporary Construction Fencing	3,000	LF	\$5.65	\$16,950
Remove & Replace Existing Monitoring Wells	11	Well	\$3,500.00	\$38,500
4. Structural Demolition and Disposal				
Building Demolition		LS		\$195,314
Dispose of Drums w/Contaminated Materials	374	Drum	\$136.00	\$50,864
Recycle misc. Items (tires, auto tanks, pipes,				· · · · · ·
etc.)	25	Ton	\$75.00	\$1,875
5. Storage Tank Removal & Reclamation	8	Tank	\$6,750.00	\$54,000
6. Water Control Construct Dewatering Pad	2,500	SY	\$45.17	\$112,925
Install Diversion Ditches and Berms	1,650	LF	\$3.64	\$6,006

Institutional Controls implemented for Site only	
Total excavation area (sf) based on Figure 4-2	138,098
Total excavation perimeter (ft) based on Figure 4-2	4,513
Total excavation volume (cy)	10,512
Area (sf) of soil for restoration	106,139
Area (sf) of wetlands for restoration	31,959
Area (sf) of building footprint	48,818
Volume (cy) of excavation for reuse	2,132
On-site excavation volume	9,442
Off-site excavation volume	1,070
Volume (cy) for off-site disposal	8,380

\*If the land use for the property is changed from commercial to recreational, then restricted residential Soil Cleanup Objectives would be utilized, which would allow for recreational use of the property. Accordingly, the PAH-contaminated soils would be excavated to a depth of two feet and backfilled with clean soil. This change would result in the excavation of an additional 1,650 cubic yards of PAH-contaminated soils and would cost an additional \$12,543.

# Table 7 – Cost Estimate Summary for the Selected Remedy

Description	Quantity	Unit of measure	Unit Cost (material/labor) (\$)	Annual Cost (\$)
Groundwater Treatment				
In-Situ Oxidation	26,400	LB	5	132,000
Materials				
In-Situ Oxidation	2	EA	100,000	200,000
Labor/Equipment				
Subtotal				332,000
Contingency (20%)				66,400
Engineering (10%)				33,200
Legal & Administrative (5%)				16,600
Groundwater Monitoring			(See Below)	56,800
			Grand Total (First Year)	505,000

**Operation and Maintenance Costs for Alternative GW-3 (Year 1)** 

# Annual Operation and Maintenance Costs for Remedy Alternative GW-3 (Years 2-30)

Description	Quantity	Unit of measure	Unit Cost (material/labor) (\$)	Annual Cost (\$)
Groundwater Monitoring				
Groundwater sampling (labor)	120	Hr/yr	100	12,000
Laboratory analysis	24	/yr	500	12,000
Data Analysis/Reporting	1	/yr	25,000	25,000
Sampling supplies/Equipment	2	event	1,000	2,000
Misc. Disposal Costs	2	Drum	300	600
Subtotal		1		51,600
Contingency Allowances (10%)				5,200
Total Annual O&M Cost				56,800

# Summary of Present-Worth Analysis

Year	Capital Cost	Annual O&M	Total Cost	Discount Eactor (7%)	Present Worth
		CUSL			
0	\$1,800,000		\$1,800,000	1.000	\$1,800,000
1		\$505,000	\$505,000	0.935	\$472,175
2		\$56,800	\$56,800	0.873	\$49,586
3		\$56,800	\$56,800	0.816	\$46,349
4		\$56,800	\$56,800	0.763	\$43,338
5		\$56,800	\$56,800	0.713	\$40,498

Year	Capital Cost	Annual O&M	Total Cost	Discount	Present Worth
		cost		Factor (7%)	
6		\$56,800	\$56,800	0.666	\$37,829
7		\$56,800	\$56,800	0.623	\$35,386
8		\$56,800	\$56,800	0.582	\$33,058
9		\$56,800	\$56,800	0.544	\$30,899
10		\$56,800	\$56,800	0.508	\$28,854
11		\$56,800	\$56,800	0.475	\$26,980
12		\$56,800	\$56,800	0.444	\$25,219
<b>13</b>		\$56,800	\$56,800	0.415	\$23,572
14		\$56,800	\$56,800	0.388	\$22,038
15		\$56,800	\$56,800	0.362	\$20,562
16		\$56,800	\$56,800	0.339	\$19,255
17		\$56,800	\$56,800	0.317	\$18,006
18		\$56,800	\$56,800	0.296	\$16,813
19		\$56,800	\$56,800	0.277	\$15,734
20		\$56,800	\$56,800	0.258	\$14,654
21		\$56,800	\$56,800	0.242	\$13,746
22		\$56,800	\$56,800	0.226	\$12,837
23	,	\$56,800	\$56,800	0.211	\$11,985
24		\$56,800	\$56,800	0.197	\$11,190
25		\$56,800	\$56,800	0.184	\$10,451
26		\$56,800	\$56,800	0.172	\$9,770
27		\$56,800	\$56,800	0.161	\$9,145
28		\$56,800	\$56,800	0.150	\$8,520
29		\$56,800	\$56,800	0.141	\$8,009
30		\$56,800	\$56,800	0.131	\$7,441
Totals		\$1,704,000	\$3,504,000		\$2,923,899

**Total Groundwater Present-Worth Cost** 

\$2,924,000

Total Soil and Groundwater Remedy Present-Worth Cost

\$6,924,000

# CROWN CLEANERS OF WATERTOWN, INC. SUPERFUND SITE RECORD OF DECISION

⊳

APPENDIX III

# ADMINISTRATIVE RECORD INDEX

	ADMINIST	RATIVE RE	CORD INDEX C	F DOCUMENTS	
			DRAFT		
		(	03/29/2012	Region Id: 02	
	Site Name: CERCLIS: OUID: SSID: Action:	CROWN CLEAN NYD986965333 01 02QF	ERS OF WATERTOWN	INC.	
Region Id: Docid: Bates: Date: Pages:	02 112846 03/29/2012 4	То:			
Title: Doc Type:	ADMINISTRATIVE REG WATERTOWN, INC. S INDEX	CORD INDEX FOI SITE	R OU1 FOR THE CROV	VN CLEANERS OF	
Author:	Name ,		Organization US ENVIRONMENTAL	PROTECTION AGENCY	
Region Id: Docid: Bates: Date: Pages: Title: Doc Type:	02 115779 R2-0000001 01/15/2004 1 TRANSMITTAL OF TH PLAN FOR THE CROV PLAN	To: R2-0000001 E DRAFT REMED	IAL INVESTIGATION / F WATERTOWN INCO	FEASIBILITY STUDY WORK RPORATED SITE	
	Name		Organization		
Author:	COLVIN, WILLIAM R		TETRA TECH, INC.		
Addressee:	BACHMANN JR., JOH	N	EPA, REGION 2		
Region Id: Docid: Bates: Date: Pages: Title:	02 115782 R2-0000002 01/15/2004 36 DRAFT REMEDIAL IN	<b>To:</b> R2-0000037 VESTIGATION / F	EASIBILITY STUDY WO	ORK PLAN FOR THE CROWN	
Doc Type:	CLEANERS OF WATE MAP PLAN FIGURE Name	RTOWN INCORP	ORATED SITE		
Author:	VOZZA, SCOTT		TETRA TECH FW, INC	<u>).</u>	
	Name		Organization		
Addressee:	TAMES, PAMELA		EPA		

-

# ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

# DRAFT 03/29/2012

Region Id: 02

Site Name:CROWN CLEANERS OF WATERTOWN INC.CERCLIS:NYD986965333OUID:01SSID:02QFAction:

Region Id:	02		
Docid:	115783		
Bates:	R2-0000038	To: R2-0000401	
Date:	06/07/2004		
Pages:	364		
Title:	APPENDICES A AND	B TO THE WORK	PLAN FOR THE REMEDIAL INVESTIGATION /
	FEASIBILITY STUDY	FOR THE CROWN	N CLEANERS OF WATERTOWN INCORPORATED SITE
Doc Type:	PLAN		
	Name		Organization
Author:	,		TETRA TECH FW, INC.
	,		US ENVIRONMENTAL PROTECTION AGENCY
Region Id:	: 02		
Docid:	115784		
Bates:	R2-0000402	To: R2-0000402	
Date:	06/07/2004		
Pages:	1		
Title:	TRANSMITTAL OF A	PPENDICES A AND EASIBILITY STUDY	D B TO THE WORK PLAN FOR THE REMEDIAL FOR THE CROWN CLEANERS OF WATERTOWN
Doc Type:	INCORPORATED SIT	ΓE	
	Name		Organization
Author:	VOZZA, SCOTT		TETRA TECH FW, INC.
	Name		Organization
Addressee:	TAMES, PAMELA		EPA
Region Id:	02		
Docid:	115781		
Bates:	R2-0000403	To: R2-0000570	
Date:	08/04/2004		
Pages:	168		
Title:	FINAL QUALITY ASS FEASIBILITY STUDY	URANCE PROJEC	T PLAN FOR THE REMEDIAL INVESTIGATION / N CLEANERS OF WATERTOWN INCORPORATED SITE
Doc Type:	PLAN		
	Name		Organization
Author:	COLVIN, WILLIAM R		TETRA TECH, INC.
	TAMES, PAMELA		EPA
	SIELSKI, MARK		TETRA TECH FW. INC.

# ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

# DRAFT

03/29/2012 Region Id: 02

Site Name:CROWN CLEANERS OF WATERTOWN INC.CERCLIS:NYD986965333OUID:01SSID:02QFAction:

	Name	Organization
Author:	GABRY, JON	TETRA TECH FW, INC.
	VOZZA, SCOTT	TETRA TECH FW, INC.
	ARABIA, LYNN	TETRA TECH FW, INC.
Region Id:	02	
Docid:	115785	
Bates:	R2-0000571	<b>To:</b> R2-0000571
Date:	08/04/2004	
Pages:	1	
Title:	: TRANSMITTAL OF THE FINAL QUALITY ASSURANCE PROJECT PLAN FOR THE CROWN CLEANERS OF WATERTOWN INCORPORATED SITE	
Doc Type:	LETTER	
	Name	Organization
Author:	VOZZA, SCOTT	TETRA TECH FW, INC.
	Name	Organization
Addressee:	TAMES, PAMELA	EPA
Region Id:	02	
Region Id: Docid:	02 112845	
Region Id: Docid: Bates:	02 112845 R2-0000572	<b>To:</b> R2-0002369
Region Id: Docid: Bates: Date:	02 112845 R2-0000572 12/02/2011	<b>To:</b> R2-0002369
Region Id: Docid: Bates: Date: Pages:	02 112845 R2-0000572 12/02/2011 1798	<b>To:</b> R2-0002369
Region Id: Docid: Bates: Date: Pages: Title:	02 112845 R2-0000572 12/02/2011 1798 FINAL REMEDIAL IN INC. SITE	To: R2-0002369 VESTIGATION REPORT FOR THE CROWN CLEANERS OF WATERTOWN,
Region Id: Docid: Bates: Date: Pages: Title: Doc Type:	02 112845 R2-0000572 12/02/2011 1798 FINAL REMEDIAL IN INC. SITE CHART / TABLE	To: R2-0002369
Region Id: Docid: Bates: Date: Pages: Title: Doc Type:	02 112845 R2-0000572 12/02/2011 1798 FINAL REMEDIAL IN INC. SITE CHART / TABLE REPORT	To: R2-0002369
Region Id: Docid: Bates: Date: Pages: Title: Doc Type:	02 112845 R2-0000572 12/02/2011 1798 FINAL REMEDIAL IN INC. SITE CHART / TABLE REPORT FORM	To: R2-0002369
Region Id: Docid: Bates: Date: Pages: Title: Doc Type:	02 112845 R2-0000572 12/02/2011 1798 FINAL REMEDIAL IN INC. SITE CHART / TABLE REPORT FORM FIGURE	To: R2-0002369
Region Id: Docid: Bates: Date: Pages: Title: Doc Type:	02 112845 R2-0000572 12/02/2011 1798 FINAL REMEDIAL IN INC. SITE CHART / TABLE REPORT FORM FIGURE Name	To: R2-0002369 VESTIGATION REPORT FOR THE CROWN CLEANERS OF WATERTOWN, Organization

# ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

# DRAFT

03/29/2012 Region Id: 02

Site Name:CROWN CLEANERS OF WATERTOWN INC.CERCLIS:NYD986965333OUID:01SSID:02QFAction:

Region Id: (	02	
Docid: 1	112843	
Bates: F	R2-0002370	<b>To:</b> R2-0002478
Date: 1	12/02/2011	
Pages: 1	109	
Title: F	FINAL FEASIBILITY SITE CHART / TABLE	STUDY REPORT FOR THE CROWN CLEANERS OF WATERTOWN, INC.
For Type: (	REPORT FIGURE	
<u>I</u> Author:,	Name ,	Organization TETRA TECH, INC
Author: ,	<b>Name</b> , 02	Organization TETRA TECH, INC
Author: , Region Id: 0 Docid: 1	Name , 02 112844	Organization TETRA TECH, INC
Author: , Region Id: 0 Docid: 1 Bates: F	Name , 02 112844 R2-0002479	Organization TETRA TECH, INC To: R2-0002498
Author: , Region Id: 0 Docid: 1 Bates: F Date: 1	Name , 02 112844 R2-0002479 12/12/2011	Organization TETRA TECH, INC To: R2-0002498
Author: , Region Id: 0 Docid: 1 Bates: F Date: 1 Pages: 2	<u>Name</u> , 02 112844 R2-0002479 12/12/2011 20	Organization TETRA TECH, INC To: R2-0002498
Author: , Author: , Region Id: 0 Docid: 1 Bates: F Date: 1 Pages: 2 Title: S Doc Type: F	<u>Name</u> , 02 112844 R2-0002479 12/12/2011 20 SUPERFUND PROP PLAN FIGURE	Organization TETRA TECH, INC To: R2-0002498 OSED PLAN FOR THE CROWN CLEANERS OF WATERTOWN, INC. SITE
Author: , Region Id: 0 Docid: 1 Bates: F Date: 1 Pages: 2 Title: S Doc Type: F	<u>Name</u> , 02 112844 R2-0002479 12/12/2011 20 SUPERFUND PROPO PLAN FIGURE <b>Name</b>	Organization TETRA TECH, INC To: R2-0002498 OSED PLAN FOR THE CROWN CLEANERS OF WATERTOWN, INC. SITE Organization

# CROWN CLEANERS OF WATERTOWN, INC. SUPERFUND SITE RECORD OF DECISION

# **APPENDIX IV**

# STATE LETTER OF CONCURRENCE

# New York State Department of Environmental Conservation

**Division of Environmental Remediation** 

Office of the Director, 12th Floor 625 Broadway, Albany, New York 12233-7011 Phone: (518) 402-9706 • Fax: (518) 402-9020 Website: www.dec.ny.gov

# · · · ·

### Sent Via Email Only

March 27, 2012

Mr. Walter Mugdan, Director (<u>mugdan.walter@epa.gov</u>) Emergency and Remedial Response Division U.S. Environmental Protection Agency, Region 2 290 Broadway New York, NY 10007-1866

> RE: Record of Decision Crown Cleaners of Watertown, Inc. NYSDEC Site No. 623010 / USEPA Site No. NYD986965333 Village of Herrings, Jefferson County

Dear Mr. Mugdan:

The New York State Department of Environmental Conservation (Department) and the New York State Department of Health (NYSDOH) have reviewed the March 2012 Record of Decision for the Crown Cleaners of Watertown, Inc. Site, prepared by the United States Environmental Protection Agency (USEPA). The site is located in the Village of Herrings, Jefferson County.

USEPA's Selected Remedy is Alternative S-3 for soils and sediments (building demolition, limited excavation of sediments, excavation of soil, and off-site disposal), and Alternative GW-3 for groundwater (source-area in-situ chemical oxidation and downgradient monitored natural attenuation).

The soil component for the Selected Remedy will include the excavation of PAHcontaminated soil to a depth of one foot (two feet if the land use for the property is changed from commercial to recreational use as a municipal public park before the design is finalized), and the excavation of PCE-contaminated soils to a depth of four feet. The excavated PAH-contaminated soils would also be utilized as backfill to a depth of not less than one foot (two feet in the case of a land use change to recreational, which would be restricted residential in 6NYCCR Part 375) below the ground surface in the areas where PCE-contaminated soil would be excavated. Before backfilling with clean soil those areas where residual PAH-contaminated soil would remain, a readily-visible and permeable subsurface demarcation delineating the interface between the residually-contaminated native soils and the clean backfill would be installed. PCE-contaminated sediment and soil from the adjacent wetlands will also be excavated to meet the protection of groundwater soil cleanup objectives (SCO), to be backfilled with clean soil. Implementation of the soil component of the Selected Remedy will require decontamination and demolition of the main on-site building to access contaminated soils. Following the demolition of the buildings, contaminated soils remaining within the footprint of the buildings will be addressed as described above. Building debris and the PCE-contaminated soils and sediments will be transported for disposal off-site.



Under the groundwater component of the Selected Remedy, an oxidizing agent would be injected into the contaminated groundwater at the source areas, which would chemically transform the VOCs into less toxic compounds or to carbon dioxide, and water. Lower contaminant concentrations in the groundwater outside the source areas would be addressed through monitored natural attenuation.

Because some contaminated soils will remain on-site following implementation of the Selected Remedy, and since the entire groundwater plume will not immediately achieve cleanup levels upon implementation of this alternative, an environmental easement will be filed in the property records of Jefferson County. A Site Management Plan would provide for the proper management of all post-construction remedy activities. The easement will, at a minimum, restrict the use of the site to commercial uses (or recreational use, in the event the Site-use is changed prior to design for future development of a public park), restrict intrusive activities in areas where residual contamination remains unless the activities are in accordance with an EPAapproved Site Management Plan, and prevent use of groundwater as a source of potable or process water unless groundwater quality standards are met.

It is my understanding that the USEPA has agreed to prepare the environmental easement, Site Management Plan (SMP) and Final Engineering Report consistent with Department guidance. Based on this information, the Department concurs with the Selected Remedy and believes it is protective of human health and the environment. If you have any questions, please contact Mr. David Crosby at (518) 402-9662 or Mr. Lincoln Fancher at (315) 785-2513.

Sincerely,

Dushis

Robert W. Schick, P.E. Acting Director Division of Environmental Remediation

ec:

D. Garbarini, USEPA (garbarini.doug@epa.gov)

J. Singerman, USEPA (singerman.joel@epa.gov)

P. Tames, USEPA (Tames.pam@Epa.gov)

S. Bates, NYSDOH (smb02@health.state.ny.us)

R. Fedigan, NYSDOH (rjf01@health.state.ny.us)

G. Rys, NYSDOH (gar02@health.state.ny.us)

M. Ryan

D. Crosby

P. Taylor

L. Fancher

# CROWN CLEANERS OF WATERTOWN, INC. SUPERFUND SITE RECORD OF DECISION

# APPENDIX V

# **RESPONSIVENESS SUMMARY**

# RESPONSIVENESS SUMMARY FOR THE RECORD OF DECISION CROWN CLEANERS OF WATERTOWN, INC. SUPERFUND SITE HERRINGS, JEFFERSON COUNTY, NEW YORK

# INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Crown Cleaners of Watertown, Inc. Superfund site (Site) Proposed Plan and provides the U.S. Environmental Protection Agency's (EPA's) responses to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision in the selection of a remedy to address the contamination at the Site.

# SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

EPA conducted field investigations at the Site from 2004 through 2011, which culminated in the completion of a remedial investigation and feasibility study (RI/FS)<sup>1</sup> report in December 2011. EPA's preferred remedy and the basis for that preference were identified in a Proposed Plan<sup>2</sup>. The RI/FS report and a Proposed Plan were released to the public for comment on December 12, 2011. These documents were made available to the public at information repositories maintained at the Carthage Free Library located at 412 Budd Street, Carthage, New York and the EPA Region II Office in New York City. A notice of availability for the above-referenced documents was published in the Watertown Daily Times on December 12, 2011. The public comment period ran from December 12, 2011 to January 17, 2012. On January 3, 2012, EPA conducted a public meeting at the Village of Herrings Town Hall to inform local officials and interested citizens about the Superfund process, to present the Proposed Plan for the Site, including the preferred remedy and to respond to guestions and comments from the approximately 20 attendees. Approximately 20 people, including residents, the media, local business people, and local government officials, attended the public meeting. On the basis of comments received during the public comment period, the public generally supports the selected remedy.

<sup>&</sup>lt;sup>1</sup> An RI determines the nature and extent of the contamination at a site and evaluates the associated human health and ecological risks and an FS identifies and evaluates remedial alternatives to address the contamination.

<sup>&</sup>lt;sup>2</sup> A Proposed Plan describes the remedial alternatives considered for a site and identifies the preferred remedy with the rationale for this preference.

# SUMMARY OF COMMENTS AND RESPONSES

Comments were received at the public meeting and in writing. Written comments were received from:

- Paul Smith, Supervisor, Town of Wilna, via a January 9, 2012 letter.
- Francis J. Burke via a January 10, 2012 e-mail.

The transcript from the public meeting can be found in Appendix V-d.

The written comments submitted during the public comment period can be found in Appendix V-e.

A summary of the comments provided at the public meeting and in writing, as well as EPA's responses to them, are provided below.

# Addressing Contamination in the On-Site Buildings

*Comment #1:* A commenter asked whether any asbestos was found in the basements of any of the buildings during the investigation of the site.

*Response #1:* Several New York State investigations were conducted at the site during the 1990s that resulted in the site being referred to EPA for further evaluation in 2000. As part of this effort, EPA removed friable asbestos-containing materials from the main building. While it is believed that asbestos may also be present in the basement of the building, because of concerns about the building's structural integrity, workers could not safely enter the basement. The selected remedy includes the decontamination and demolition of the building.

During the design, the building located in the rear of the property will be assessed to determine whether it contains any hazardous substances such as asbestos. If hazardous substances are present and the building can be safely accessed, then the building will be decontaminated. If the building cannot be safely accessed, then it will be demolished and the debris will be decontaminated, if necessary, and disposed of off-site.

*Comment #2:* A commenter asked how the asbestos would be removed if it is present.

*Response #2:* The procedures related to the decontamination and demolition of the building will be determined during the design of the selected remedy.

*Comment #3:* Several commenters expressed concern about the structural integrity and the potential that asbestos is present in the building located in the rear of the property.

*Response #3:* Because of the dilapidated condition of the building, it could not be safely assessed by EPA during its investigation of the site. During the design, the building will be assessed to determine whether it contains any hazardous substances. If hazardous substances are present and the building can be safely accessed, then the building will be decontaminated. If the building cannot be safely accessed, then it will be demolished and the debris will be decontaminated, if necessary, and disposed of off-site.

# Addressing Contaminants Attributable to Other Sources

*Comment #4:* A commenter noted that after the St. Regis Paper Company left the property, the facility was used to manufacture textiles. While the tetrachloroethylene (PCE) at the site is attributable to the disposal practices of the Crown Cleaners drycleaning facility, the commenter asked if contamination associated with the textile manufacturing process contributed any contamination to the site.

*Response #4:* During the investigation of the site, the soil and groundwater was thoroughly sampled for numerous contaminants. PCE and polycyclicaromatic hydrocarbons (PAHs) were determined to be the primary contaminants of concern. While the dry cleaning facility is the likely source of the PCE, it is not likely that it is the source of the PAHs. It is possible that the St. Regis Paper Company and/or the textile manufacturing facility are the source of the PAHs. Nevertheless, both PCE and PAHs will be addressed as part of the remedy for the site.

# Changing the Land Use to Recreational

*Comment #5:* A commenter remarked that the Village of Herrings and the Town of Wilna are presently pursuing several options to acquire the property and change its use to recreational. If such a change is made, another commenter wanted to know how changing the land use would affect the cost of the remedy.

*Response #5:* If the land use for the property is changed from commercial to recreational before the design of the remedy is approved, then EPA will use soil cleanup objectives that will allow for recreational use of the property. Accordingly, the PAH-contaminated soils would be excavated to a depth of two feet and backfilled with clean soil. This change would result in the excavation of an additional 1,650 cubic yards of PAH-contaminated soils and would cost an additional \$12,543.

# Leaving Contamination Behind

*Comment #6:* A commenter noted that a request has been made to the New York State Department of Transportation to straighten out the curve in the road located adjacent to the site to prevent traffic accidents. Since the construction of the road would likely require an excavation deeper than the 1 foot of PAH-contaminated soil that would need to be removed as called for in the remedy, the commenter inquired to whether or not contaminated soils would be encountered.

*Response #6:* The PAH-contaminated soil along the road is not deeper than one foot. Therefore, all of the PAH-contaminated soil will be removed at this location.

*Comment #7:* If the land use is changed to recreational, several commenters inquired as to whether the backfilling of PAH-contaminated soils in the areas where PCE-contaminated soil will be excavated and in the footprint of the building preclude intrusive activities on the site under a recreational use scenario (such as the planting of trees, installation of footers for swing sets, or constructing a water line for a water fountain?

*Response #7:* Under the recreational scenario, two feet of clean fill will be placed over the PAH-contaminated soils. Before backfilling with clean soil in these areas, a readilyvisible and permeable subsurface demarcation delineating the interface between the residually-contaminated native soils and the clean backfill will be installed. Intrusive activities in areas where residual contamination will remain will be permitted as long as they are performed in accordance with a Site Management Plan (SMP), which EPA will develop. All work performed in accordance with the SMP will need to be coordinated with the New York State Department of Environmental Conservation. It is anticipated that the SMP will not restrict intrusive activities above the subsurface demarcation.

# Additional Sources of Contamination

*Comment #8:* A commenter asked whether a dry cleaner that existed in a garage located to the east of the site was a source of contamination.

*Response #8:* The groundwater data did not show any additional sources to the east of the site.

# SUMMARY OF DOCUMENTS

Section V-a: December 2011 Proposed Plan

Section V-b: Public Notice

Section V-c: January 3, 2012 Public Meeting Sign-In Sheet

Section V-d: January 3, 2012 Public Meeting Transcript

Section V-e: Letters Received During the Comment Period

# RESPONSIVENESS SUMMARY

# **APPENDIX V-a**

# DECEMBER 2011 PROPOSED PLAN

# Crown Cleaners of Watertown, Inc. Superfund Site Jefferson County, New York

# **\$EPA**

PURPOSE OF THIS DOCUMENT This document describes the remedial alternatives considered for the Crown Cleaners of Watertown, Inc. Superfund site and identifies the preferred remedy with the rationale for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act. (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at the site and the remedial alternatives summarized in this Proposed Plan are described in the August 2010 remedial investigation (RI) report and August 2010 feasibility study (FS) report, respectively. EPA and NYSDEC encourage the public to review these documents to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted at the site.

This Proposed Plan is being provided as a supplement to the RI/FS reports to inform the public of EPA and NYSDEC's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred alternatives. The preferred remedy consists of decontamination and demolition of the main on-site building, excavation of contaminated wetland sediments and soils located adjacent to the former cleaner property, excavation of contaminated soil at the source area, off-site treatment/disposal of the excavated sediments, soils, and building debris, in-situ treatment of the contaminated groundwater near the source using chemical oxidation and downgradient using natural attenuation<sup>1</sup>, development of a Site Management Plan, and an environmental easement.

The remedy described in this Proposed Plan is the preferred remedy for the site. Changes to the preferred remedy, or a change from the preferred remedy to another remedy, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in the Proposed Plan and in the detailed analysis section of the RI/FS report because EPA and NYSDEC may select a remedy other than the preferred remedy.

<sup>1</sup> Natural attenuation is a variety of *in-situ* processes that under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. December 2011

# MARK YOUR CALENDAR

December 12, 2011 – January 17, 2012: Public comment period related to this Proposed Plan.

January 3, 2012 at 7:00 P.M.: Public meeting at the Village of Herrings Town Hall, Herrings, NY.

Copies of supporting documentation are available at the following information repositories:

> Carthage Free Library 412 Budd Street Carthage, New York 315-493-2620 and USEPA-Region II Superfund Records Center 290 Broadway, 18<sup>th</sup> Floor New York, NY 10007-1866 212-637-4308

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and this Proposed Plan have been made available to the public for a public comment period that begins on December 12, 2011 and concludes on January 17, 2012.

A public meeting will be held during the public comment period at the Village of Herrings Town Hall on January 3, 2012 at 7:00 p.m. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedy, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document that formalizes the

### selection of the remedy.

#### **COMMUNITY ROLE IN SELECTION PROCESS**

Written comments on the Proposed Plan should be addressed to:

Pamela Tames, P.E. Remedial Project Manager Central New York Remediation Section U.S. Environmental Protection Agency 290 Broadway, 20th Floor New York, New York 10007-1866

Telefax: (212) 637-3966 Internet: Tames.pam@epa.gov

# SCOPE AND ROLE OF ACTION

The primary objectives of this action are to remediate the sources of soil, sediment, and groundwater contamination, to minimize the migration of contaminants, and to minimize any potential future health and environmental impacts.

### SITE BACKGROUND

#### Site Description

The 9-acre Crown Cleaners of Watertown, Inc. site is a former dry cleaning and laundry facility located in the Village of Herrings, Jefferson County on New York State Route 3. The site is located approximately 300 feet south of the Village of Herrings' public water supply well, to the east and west of residential properties and vacant land and to the north of the Black River.

There are three buildings in poor condition and a mobile home on the site. The site is surrounded by a chain link fence.

One wetland area is located immediately west of the site and another wetland area is located approximately 800 feet southwest of the site. A significant amount of debris, including, paper waste from the former paper factory, old appliances, and several drum carcasses, is located in the wetland to the southwest.

#### Site History

From 1890 until the mid-1960's, the site was used by the St. Regis Paper Co. to produce paper bags. In the late 1970's, the property was purchased by Crown Cleaners of Watertown, Inc. and was operated until 1991 as a dry

### Crown Cleaners Superfund Site

cleaning and laundry facility. Tetrachloroethene (PCE) and machine oils and greases were used. Wastewater was discharged into basement storage pits, which then discharged through the foundation walls to the ground. Used dry cleaning machine filters were dumped on the site property.

The residences in the area use either private wells or a public supply well for potable water supply. In 1991, the New York State Department of Health (NYSDOH) determined that the Village of Herrings' water supply well was contaminated with PCE at concentrations ranging from 25 to 50 micrograms per liter (ug/L). Later that same year, NYSDEC installed a treatment system on the Village of Herrings' water supply system and determined that the source of PCE contamination was from the site.

Several New York State investigations were conducted at the site during the 1990's which resulted in the site being referred to EPA for further evaluation in 2000.

In 2000, EPA sampled the facility's storage pits, oil tanks, on- and off-property soils, and the groundwater. Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs, copper, iron, mercury, zinc, beryllium, arsenic, and chromium were detected in the soils above NYSDEC's soil cleanup objectives. The highest PCE concentration found in the shallow aquifer was 9,800 ug/L. In addition to this investigation, EPA secured the property, removed and disposed of VOCcontaminated sludge and debris, sump pit water, spent dry cleaning filters, removed friable asbestos-containing materials, demolished an unstable portion of the main building and disposed of approximately 5,000 gallons of waste oil.

On September 4, 2002, the site was listed on EPA's Superfund National Priorities List.

EPA conducted several field investigations at the site from 2004 through 2011. The activities included monitoring well installation, geological and hydrogeological investigations, an ecological assessment, wetlands delineation, a residential vapor intrusion investigation<sup>2</sup>, and collecting samples from the surface soil (top two feet of soil), subsurface soil (below two feet), wetland sediments, surface water and sediment from the Black River, groundwater, residential wells, and the public supply well. Because of the historical significance of the

2

<sup>&</sup>lt;sup>2</sup> Vapor intrusion is a process by which VOCs move from a source below the ground surface (such as contaminated groundwater) into the indoor air of overlying or nearby buildings.

### Crown Cleaners Superfund Site

structures on the property, a Phase 1A Cultural Resources survey was performed in 2007<sup>3</sup>.

#### SITE HYDROLOGY/HYDROGEOLOGY

### Site Hydrology

The site is located in the Erie-Ontario Lowlands physiographic province, which includes the Black River valley. Local surface water runoff flows toward the Black River, which runs adjacent to the site along its southern boundary. The Black River in the area where it runs adjacent to the site is classified by New York State as a "Class C" surface water body. These waters should be suitable for fish propagation and survival, as well contact recreation (6 NYCRR Part 701.8). The Herrings Station dam is located just east of the site and a roughly 20-foot surface water elevation difference is maintained across the dam.

Approximately 1.4 acres of the former dry cleaner property are located in the 100-year flood plain of the Black River according to the federal Emergency Management Agency. The remainder of the site is located outside the 500-year flood plain.

#### Site Hydrogeology

The hydrogeology is characterized by the existence of four units, Upper Carbonate, Middle Carbonate, Lower Carbonate, and Fractured Granitic Gneiss Units.

The upper part of the site hydrogeologic unit, the Upper Carbonate Unit, consists of an unconfined, fractured unit with low permeability that is subject to seasonal variations. The Middle Carbonate Unit is a dense, massive, very low to no permeability unit, which appears to behave as a semi-confining to confining unit. Below this unit is a confined Lower Carbonate unit that provides water resources to the local area. The deepest unit evaluated during the RI investigation was the Fractured Granitic Gneiss unit, which underlies the Lower Carbonate unit. Groundwater in the Upper Carbonate unit primarily flows in a south-southwesterly direction along bedding planes partings, with secondary flow through fractures and joints. In the Lower Carbonate and Granitic Gneiss units, groundwater flow is controlled by secondary porosity through enlarged bedding planes and fractures. Groundwater in both of these units flows in a

south-southwesterly direction and eventually discharges to the Black River.

# **RESULTS OF THE REMEDIAL INVESTIGATION**

Based upon the results of the RI, EPA has concluded that VOCs are the predominant contaminants in the groundwater, soils, and sediments in the wetlands. The primary contaminant of concern (COC) identified for the site is PCE and its breakdown products, primarily trichloroethylene (TCE).

### Groundwater

EPA and New York State Department of Health have promulgated health-based protective Maximum Contaminant Levels (MCLs), which are enforceable standards for various drinking water contaminants. MCLs, which ensure that drinking water does not pose either a short- or long-term health risk, will be used as the cleanup criteria for the groundwater. The MCL for both PCE and TCE is 5 ug/L.

Four rounds of groundwater sampling were conducted as part of the RI. During the first round in 2004, 24 existing monitoring wells, two piezometric wells and one residential well were sampled. In 2006, a second round of sampling was conducted and included the original 24 wells, two piezometric wells and one residential well plus 8 newly installed monitoring wells. A third sampling round covering 31 monitoring wells, five newly installed multiport wells, and two piezometers was conducted in 2009. A fourth round of groundwater sampling was conducted on these same wells in mid-2011.

Groundwater samples contained PCE in 11 of the 31 monitoring wells. Concentrations in these wells ranged from 6.7 ug/L to 6,500 ug/L. PCE was not detected in the multiport wells. The data indicates that the horizontal limit of the contaminant plume is defined by the Black River to the south, Route 3 to the north and is approximately 300 feet wide. The source of the plume occurs at the southwest corner of the main building on the property.

The data also suggests that a separate area of PCE contamination is present in the upper unit bedrock aquifer to the west-southwest of the site. Isotopic analysis of samples collected from site wells and wells to the west-southwest of the site indicates that the PCE detected in this area is of a similar origin to the PCE detected in groundwater on-site. Sample results from this area show decreasing PCE concentrations with increasing depth, suggesting a surface source in the vicinity. In addition, the measurement of groundwater levels at various

<sup>&</sup>lt;sup>3</sup> A Phase I cultural resources survey is designed to determine the presence or absence of cultural resources in the project's potential impact area. The Phase I survey is divided into two progressive units of study--Phase IA, a literature search and sensitivity study and, if necessary based upon Phase 1A survey, a Phase IB, field investigation to search for resources.

elevations within the bedrock indicates a downward hydraulic gradient. Since the dumping of debris has occurred in this area, the origin of the groundwater impacts west-southwest of the site is likely the result of the disposal of site-related wastes (e.g., drum(s)) in this area.

The data also shows a declining trend in PCE levels within the plume. Additionally, PCE's reductive dechlorination products, also known as daughter products, were detected in many of the same wells as PCE, indicating the slow natural breakdown or attenuation of the contaminants.

#### Soils

NYSDEC has identified soil cleanup objectives (SCOs) for the protection of the environment and for various contaminants based upon the assumed future usage of the site. Based upon the most recent active use of the site, the site will be cleaned up to "commercial" standards. The SCO for PCE for the protection of groundwater is 1.3 mg/kg<sup>4</sup>, and 16 mg/kg for arsenic for commercial use. The commercial SCO for PAHs varies depending on the contaminant <sup>5</sup>.

In 2004, soil samples were collected at 9 locations to a depth of 5 feet. An additional 42 soil locations were sampled in 2011 to a depth of 2 feet. Elevated PCE concentrations were found in five locations; primarily adjacent to the northern and western corners of the main building in the west-northwestern portion of the site (the highest concentration detected was 59,000 micrograms per kilogram [ug/kg]). These PCE-contaminated soils (hereinafter, "source area soils") are a source of contamination to the groundwater. In addition, elevated concentrations of polyaromatic hydrocarbons (PAHs) were detected in surface soil at 14 locations. The highest PAH concentrations detected were 58.4 mg/kg.

<sup>5</sup> While the land use of the site has historically been industrial/commercial, local elected officials have expressed a desire to develop a community park on the site following its remediation. In order for the property to be remediated using soil cleanup objectives that would be protective for a park (i.e. restricted residential), a local governmental entity must acquire the property. The Village Mayor and Town Supervisor are presently pursuing several options to acquire the property and change its use to recreational. If the land use for the property is changed from commercial to recreational before the design of the remedy that is ultimately selected is approved, then restricted residential SCOs would be utilized. Otherwise, commercial SCOs would be utilized.

### EPA Region II- December 2011

was detected in surface soil at one location at a concentration of 17.8 mg/kg.

#### Sediments

Sediment samples were collected from 15 locations in the wetland areas located immediately west and southwest of the buildings. Eight VOCs were detected in the sediment samples, including PCE as high as 0.17 mg/kg. Samples collected from the wetland area located to the southwest also showed the presence of PAHs, pesticides, and metals. Cleanup levels for wetland sediments are outlined in the NYSDEC's Guidelines for Screening Contaminated Sediments.

Attempts were made to obtain sediment samples from the Black River adjacent to the site, but there was insufficient sediment available to get a proper sample.

### SITE RISKS

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future property conditions. A baseline risk assessment is an analysis of the potential adverse human health effects caused by hazardous-substance exposure in the absence of any actions to control or mitigate these under current and reasonably anticipated future land uses<sup>6</sup>.

The human health estimates summarized below are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative estimates about the frequency and duration of an individual's exposure to the COCs, as well as the toxicity of these contaminants.

A screening level ecological risk assessment (SLERA) was also conducted to assess the risk posed to ecological receptors due to site-related contamination, which resulted in the performance of a BERA, which is discussed below.

3

<sup>&</sup>lt;sup>4</sup> 6 NYCRR PART 375, Environmental Remediation Programs, Subpart 375-6, New York State Department of Environmental Conservation, December 14, 2006.

<sup>&</sup>lt;sup>6</sup> As was noted in Footnote 5, while the land use of the site has historically been industrial/commercial, the Village Mayor and Town Supervisor are presently pursuing several options to acquire the property and change its use to recreational.

# Human Health Risk Assessment

As was noted above, the former Crown Cleaners property is not currently being used and is surrounded by a locked chain link fence. Although the site's historical usage was commercial/industrial, it is anticipated that the land use in the future will be recreational. The possibility that the site could be redeveloped for residential use was also considered.

The baseline risk assessment identified the current and potential future receptors that may be affected by contamination at the site, the pathways by which these receptors may be exposed to site contaminants in various environmental media, and the parameters by which these exposures and risks were quantified. A trespasser was the receptor evaluated under the current scenario. Future scenarios considered a hypothetical future commercial worker, on and off-site resident (adult and child), construction worker and utility worker.

The risks associated with potential exposures to the areawide soils and sediment, and on-site and off-site groundwater were assessed. Potential indoor air vapor intrusion concerns were previously evaluated by EPA and found to not warrant further assessment. Since the area is served by municipal water, it is not likely that the groundwater underlying the site will be used for potable purposes in the foreseeable future; however, since regional groundwater is designated as a drinking water source, potential exposure to groundwater was evaluated.

Based on anticipated future use of the site, no excess lifetime cancer risk above the EPA reference cancer risk range or HI greater than the EPA threshold value were projected relative to any foreseeable current or future receptor exposed to site-related COCs (PCE and its breakdown products) in soil or sediment. However, PCE in the soil serves as a source of contamination to the groundwater. All scenarios involving the use of the local groundwater as a drinking water source showed considerably elevated risks, due primarily to the presence of PCE in the groundwater. The greatest risk was estimated for the hypothetical on-site child resident at 2 x  $10^{-2}$ . Concentrations of PCE also exceed the state and federal MCLs for this compound.

# Ecological Risk Assessment

Terrestrial and wetland plants were determined to be at potential risk from toxic effects from copper, lead, and selenium, based upon the comparison to phytotoxic screening benchmarks; these constituents were identified as chemicals of ecological concern (COECs). However, a qualitative survey of vegetation cover-types present did

# WHAT IS RISK AND HOW IS IT CALCULATED?

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

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

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

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

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

not reveal any areas of stressed vegetation or areas devoid of vegetation. Based upon the exposure assessment, risk characterization, and associated uncertainties, the potential risk to this assessment endpoint was considered to be low.

The exposure assessment and risk characterization for soil and sediment invertebrates revealed potential risks from toxic effects from copper exposure in upland surface soils. Anecdotal evidence of an invertebrate community suggested this exposure is not acute in nature and the associated uncertainties would indicate this potential risk is limited to only one location. In the wetland sediments, the screening assessment, using benthic community benchmarks for community level impairment, identified PAHs, chlordane, antimony, arsenic, cadmium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc as posing a potential risk to benthic community structure and function.

The short-tailed shrew was used as a representative mammalian species that is indigenous to New York and would utilize the available upland habitats present. A mean exposure evaluation employing conservative exposure parameters for upland habitats revealed no observable adverse effects level (NOAEL) hazard quotient (HQs) <1 for all COPECs but cadmium and lead. No COPECs with lowest observable adverse effects level (LOAEL) HQs >1 were identified. The lack of a LOAEL HQ>1, and the associated conservative uncertainty associated with the exposure assessment, suggests potential risks to terrestrial mammals should be considered to be low in the upland habitats. The wetland exposure evaluation for the shrew identified seven metals, aluminum, antimony, arsenic, cadmium, lead, selenium, and silver, with NOAEL HQs >1. Aluminum was the only COPEC with a LOAEL HQ > 1.0 for this receptor. While exceedance of a LOAEL value may be a basis for the conclusion of significant risk, aluminum is one of the most abundant metals in the crust of the earth and is not typically associated with significant bioaccumulation in tissues. Therefore, the potential risks to mammals associated with these metals are considered to be low in the wetland areas. The American robin was used as a representative avian species that would utilize the available upland habitats present. A mean exposure evaluation employing conservative exposure parameters identified NOAEL HQs to remain <1 for all but cadmium. lead, and selenium. Of these, lead was the only metal with a mean exposure point dosage that exceeded the LOAEL-based exposure dosage. Based upon the exceedance of a LOAEL and given that lead is not an essential macronutrient for avian metabolism, lead was identified as a COEC in the upland soils. The mean exposure assessment for the wetland habitats revealed NOAEL HQs < 1 for all COPECs except lead and zinc.

### Crown Cleaners Superfund Site

Of these two metals, the mean lead exposure resulted in exceedance of the LOAEL dosage level for the receptor evaluated. Based upon the exceedance of a LOAEL, and that lead is not an essential macro-nutrient for avian nutrition, a potential significant risk exists for avian receptors from lead exposure in wetland sediments and is identified as a COEC for this environmental media.

No COECs were identified for surface waters of the Black River. PAHs, aluminum, barium, iron, and manganese were identified as being COECs for the surface waters of the site wetlands. The risks from these COECs are associated with some degree of uncertainty given the lack of applicable background samples for similar wetland environments and the potential for colloidal particles to have been entrained in the surface water sample during collection.

#### Summary of Human Health and Ecological Risks

The results of the human health risk assessment indicate that the contaminated groundwater presents an unacceptable exposure risk and the ecological risk assessment indicates that the contaminated soils and sediments pose an unacceptable exposure risk.

Based upon the results of the RI and the risk assessment, EPA has determined that actual or threatened releases of hazardous substances from the site, if not addressed by the preferred remedy or one of the other active measures considered, may present a current or potential threat to human health and the environment.

### **REMEDIAL ACTION OBJECTIVES**

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and sitespecific risk-based levels.

The following remedial action objectives were established for the site:

- Reduce or eliminate any direct contact, ingestion, or inhalation threat associated with contaminated soils and sediments;
- Minimize exposure of wildlife or fish to contaminated soils and sediments;
- Protect human health by preventing exposure to contaminated groundwater and soil vapor; and

### SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA '121(b)(1), 42 U.S.C. '9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA '121(d), 42 U.S.C. '9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA '121(d)(4), 42 U.S.C. '9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the site can be found in the FS report. The FS report presents four soil/wetland sediment alternatives, and five groundwater alternatives. It should be noted that a capping alternative was considered in the FS report, but was screened out due to questions about its effectiveness in preventing the migration of contaminants to the groundwater in high water table areas and technical difficulties in maintaining such a cap. In addition, in-situ vapor extraction was considered and was screened out due to questions about its effectiveness in high water table areas. To facilitate the presentation and evaluation of the alternatives, the FS report alternatives were reorganized in this Proposed Plan to formulate the remedial alternatives discussed below.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

The remedial alternatives are:

#### Crown Cleaners Superfund Site

# **Soil/Wetland Sediment Alternatives**

### Alternative S-1: No Action

Capital Cost:	\$0
Annual Operation, Maintenance, and Monitoring (OM&M) Cost:	\$0
Present-Worth Cost:	\$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative for soil does not include any physical remedial measures that address the problem of soil and sediment contamination at the property.

Because this alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils and sediments.

Alternative S-2: Building Demolition, Limited Excavation of Sediments, and Excavation of Soils with On-Site Treatment via Ex-Situ Soil Vapor Extraction

Capital Cost:	\$3,939,000
Annual OM&M Cost:	\$0
Present-Worth Cost:	\$3,939,000
Construction Time:	12 months

This alternative consists of decontaminating and demolishing the main building to obtain access to all of the PCE-contaminated soils underneath, transport for treatment and disposal of the building debris at an off-site Resource Conservation and Recovery Act (RCRA)-compliant disposal facility, excavation and offsite disposal of approximately 2,200 cubic yards of PAH and arsenic-contaminated soils located on-site to meet the commercial/industrial SCOs, and excavation and on-site treatment with ex-situ soil vapor extraction (ESVE) of approximately 8,400 cubic yards of PCE-contaminated source area soils and PCE-contaminated sediment and soil from the adjacent wetlands to meet the protection of groundwater SCO. Under the ESVE treatment process, a temporary on-site aboveground fully enclosed system

would be constructed to contain the excavated PCEcontaminated soil and sediment. Air would be forced through a series of pipes within the structure to volatilize the PCE. The extracted vapors would be treated by granular activated carbon and/or other appropriate technologies before being vented to the atmosphere.

Following the demolition of the building, contaminated soils remaining within the footprint of the building would be addressed as described above.

Cleared vegetation would be disposed of at a nonhazardous waste landfill or could be mulched and used elsewhere on-site.

While the actual period of operation of the ESVE system would be based upon sampling results that demonstrate that the affected soil and sediments have been treated to soil cleanup levels, it is estimated that the system would operate for a period of three years.

The excavated source areas would be backfilled with treated and untreated soil and sediment. Approximately 90 cubic yards of excavated soils which would not be suitable for treatment and backfilling, would be disposed of at a RCRA-compliant disposal facility. A one-foot deep cover of clean soil would be applied where necessary to meet the commercial SCOs. The wetland areas that would be excavated would be backfilled with soil that meets the unrestricted SCOs.

Areas where residual PAH-contaminated soil would remain would also require the placement of a readilyvisible and permeable subsurface demarcation delineating the interface between the residuallycontaminated native and/or backfilled soils and the clean soil cover layer. These areas, totaling approximately 3.6 acres, would be seeded with grass to stabilize the soil. The disturbed wetland areas would also be restored.

Under this alternative, institutional controls in the form of an environmental easement and/or restrictive covenant would be used to prohibit future residential development/use of the site and restrict intrusive activities in areas where residual contamination remains unless the activities are in accordance with an EPAapproved Site Management Plan.

The Site Management Plan would provide for the proper management of all post-construction remedy components. Specifically, the Site Management Plan would describe procedures to confirm that the requisite engineering (*e.g.*, demarcation layer) and institutional controls are in place and that nothing has occurred that would impair the ability of said controls to protect public health or the environment. The Site Management Plan

#### Crown Cleaners Superfund Site

would also include an excavation plan which details the provisions for management of future excavations in areas of remaining contamination; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of the above-noted environmental easement and/or restrictive covenant; a provision for the performance of the operation, maintenance, and monitoring required by the remedy; and a provision that the property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

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

Alternative S-3: Building Demolition, Limited Excavation of Sediments, Excavation of Soil, and Off-Site Treatment/Disposal

Capital Cost:	\$4,253,000
Annual OM&M Cost:	\$0
Present-Worth Cost:	\$4,253,000
Construction Time:	9 months

This alternative is similar to Alternative S-2 except instead of treating the excavated soils and sediments onsite using ESVE and using them for backfill, the excavated PCE-contaminated soil and sediment would be characterized and transported for treatment/disposal at an off-site RCRA-compliant facility and the excavated PAH and arsenic contaminated soil would be used for backfill on-site.

To meet the commercial SCOs, the excavated areas would be covered with one foot of clean soil and would be seeded with grass to stabilize the soil. Areas where residual PAH-contaminated soil would remain above the commercial SCOs would also require the placement of a readily-visible and permeable subsurface demarcation layer delineating the interface between the residuallycontaminated native and/or backfilled soils and the clean soil cover layer. The disturbed wetland areas would also be restored.

Similar to Alternative S-2, institutional controls in the form of an environmental easement and/or restrictive covenant would be used to prohibit future residential development/use of the site and restrict intrusive activities in areas where residual contamination remains

#### Crown Cleaners Superfund Site

unless the activities are in accordance with an EPAapproved Site Management Plan.

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

### **Groundwater Alternatives**

#### Alternative GW-1: No Action

Capital Cost:	\$0
Annual OM&M Cost:	\$0
Present-Worth Cost:	\$0

Construction Time: 0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative would not include any physical remedial measures to address the groundwater contamination at the site.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

### Alternative GW-2: Source Area Enhanced Bioremediation and Downgradient Monitored Natural Attenuation

Capital Cost:	\$1,435,800
Annual OM&M Cost:	\$57,000
Present-Worth Cost:	\$2,365,000
Construction Time:	12 months

Groundwater data for the site indicate that some level of natural biodegradation is occurring within the aquifer. This alternative would involve injecting reagents into the aquifer to enhance the natural degradation process in the source areas. Lower contaminant concentrations outside the source areas would be addressed through monitored natural attenuation, a variety of *in-situ* processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. For this site, these *in-situ* processes include degradation, dispersion, dilution, and adsorption.

For conceptual development of this alternative, it was assumed a supplemental carbon source (e.g., hydrogen releasing compound) would be injected into the most contaminated portions of the groundwater (PCE concentrations greater than 10 times the MCL) at the center of the plume to stimulate bioactivity. For development of this alternative, spacing of injection points was conservatively estimated at 20 feet and the injection rate was estimated at 5 pounds per vertical foot of treatment zone per injection point. However, benchand pilot-scale testing would be required to determine the nature of reagents necessary to stimulate biodegradation in the aquifer and determine the optimum strategy for introducing these materials.

Performance and compliance monitoring and testing would be performed during and after the injections to determine residual contaminant concentrations, assess the need for additional treatment, and monitor the natural attenuation<sup>7</sup> of the contamination at the periphery of the plume.

It has been estimated that it would take thirty years to remediate the contaminated groundwater to federal and state standards under this alternative.

Since the entire groundwater plume would not immediately achieve cleanup levels upon implementation of this alternative, an environmental easement would be required to prevent use of groundwater and would also require that future buildings on the site either be subject to vapor intrusion study or be built with vapor intrusion mitigation systems in place until the cleanup criteria have been achieved throughout the entire area.

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

<sup>7</sup> Monitored natural attenuation is the process by which a natural systems ability to attenuate contaminant(s) at a specific site is confirmed, monitored and quantified. Contaminant concentrations may attenuate in natural systems through biodegradation; sorption; volatilization; radioactive decay; chemical or biological stabilization; transformation dispersion; dilution and/or the destruction of contaminants (DER-10 1.3(b)(31).

Alternative GW-3: Source Area In-Situ Chemical Oxidation and Downgradient Monitored Natural Attenuation

Capital Cost:	\$2,424,000
Annual OM&M Cost:	\$57,000
Present-Worth Cost:	\$3,353,000
Construction Time:	12 months

Under this alternative, an oxidizing agent would be injected into the contaminated groundwater at the source areas to chemically transform the VOCs into less toxic compounds or to carbon dioxide, and water. Bench- and pilot-scale treatability studies would be performed to optimize the effectiveness of the injection system and to determine optimum oxidant delivery rates and locations for the injection-well points.

Lower contaminant concentrations outside the source areas would be addressed through monitored natural attenuation, a variety of *in-situ* processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. For this site, these *in-situ* processes include degradation, dispersion, dilution, and adsorption.

For conceptual development of this alternative, it was assumed the oxidant would be injected into the most contaminated groundwater (PCE concentrations greater than 10 times the MCL) at the center of the plume. For development of this alternative, spacing of injection points was conservatively estimated at 10 feet due to the rapid reaction time of oxidants, and the injection rate was estimated at 10 pounds per vertical foot of treatment zone per injection point. However, actual injection spacing and rates for remediation would need to be determined from pilot-scale treatability studies.

Performance and compliance monitoring and testing would be performed during and after the injections to determine residual contaminant concentrations, assess the need for additional treatment, and monitor the natural attenuation of the contamination at the periphery of the plume.

It has been estimated that it would take thirty years to remediate the contaminated groundwater to federal and state standards under this alternative.

Since the entire groundwater plume would not immediately achieve cleanup levels upon implementation of this alternative, an environmental

# Crown Cleaners Superfund Site

easement would be required to prevent use of groundwater and would also require that future buildings on the site either be subject to vapor intrusion studies or be built with vapor intrusion mitigation systems in place until the cleanup criteria have been achieved throughout the entire area.

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

# Alternative GW-4: Source Area Groundwater Extraction and Treatment and Downgradient Monitored Natural Attenuation

Capital Cost:	\$5,404,000
Annual OM&M Cost:	\$555,000
Present-Worth Cost:	\$13,987,000
Construction Time:	12 months

Under this alternative, four groundwater extraction wells would be installed to extract contaminated groundwater from the source areas.

Lower contaminant concentrations outside the source areas would be addressed through monitored natural attenuation, a variety of *in-situ* processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in groundwater. For this site, these *in-situ* processes include degradation, dispersion, dilution, and adsorption.

The extracted water would be treated at an on-site facility by air stripping, carbon adsorption, and methods appropriate for the treatment of metals. The treated water, which would meet applicable discharge requirements, would be discharged to surface water.

Air stripping involves pumping untreated groundwater to the top of a "packed" column, which contains a specified amount of inert packing material. The column receives ambient air under pressure in an upward direction from the bottom of the column as the water flows downward, transferring VOCs to the air phase. The air-stripping process would be followed by a groundwater polishing system using granular activated carbon and/or other appropriate technologies. To comply with New York State air guidelines, granular activated carbon treatment of the air strippers' air exhaust streams may be necessary.

# Crown Cleaners Superfund Site

### Superfund Proposed Plan

Pilot testing, including pump tests, would be required to determine final pumping rates, well spacing, optimum well locations, well design, and treatment options.

In order to evaluate the performance of this alternative, periodic monitoring of the groundwater would be performed. Monitoring of the treatment system performance would also be required. The resulting data would be used to optimize the treatment process and evaluate the effectiveness of this remedial alternative.

It has been estimated that it would take thirty years to remediate the contaminated groundwater to federal and state standards under this alternative.

Since the entire groundwater plume would not immediately achieve cleanup levels upon implementation of this alternative, an environmental easement would be required to prevent use of groundwater and would also require that future buildings on the site either be subject to vapor intrusion studies or be built with vapor intrusion mitigation systems in place until the cleanup criteria have been achieved throughout the entire area.

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

### **COMPARATIVE ANALYSIS OF ALTERNATIVES**

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance.

The evaluation criteria are described below.

- X <u>Overall protection of human health and the</u> <u>environment</u> addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- X <u>Compliance with ARARs</u> addresses whether or not a remedy would meet all of the applicable or

relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

х

X <u>Reduction of toxicity, mobility, or volume through</u> <u>treatment</u> is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

X <u>Short-term effectiveness</u> addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

X Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

- X <u>Cost</u> includes estimated capital and OM&M costs, and net present-worth costs.
- X <u>State acceptance</u> indicates if, based on its review of the RI/FS and Proposed Plan, the state concurs with the preferred remedy at the present time.
- X <u>Community acceptance</u> will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

A comparative analysis of these alternatives based upon the evaluation criteria noted above follows.

Overall Protection of Human Health and the Environment

Alternative S-1 would not be protective of the environment, since it would not actively address the contaminated sediments, which present an ecological risk. Alternative S-1 would also not be protective of

human health and the environment, since it would not actively address the contaminated soil, which presents unacceptable risks of ecological exposure and is a source of groundwater contamination, which poses a human health risk. Alternatives S-2 and S-3 would be protective of human health and the environment, since both of the alternatives rely upon a remedial strategy or treatment technology capable of eliminating human and ecological exposure and removing the source of groundwater contamination.

Since Alternative GW-1 would rely on natural attenuation (a process which has been demonstrated to be occurring on-site albeit slowly) to restore groundwater quality to drinking water standards, it would not be as protective as Alternatives GW-2, GW-3, and GW-4, which include active treatment of the groundwater either in-situ or exsitu. The institutional controls under Alternatives GW-2, GW-3, and GW-4 would provide protection of public health until groundwater standards are met.

Under Alternative GW-1, the restoration of the groundwater would take a significantly longer time (estimated to be at least 100 years) in comparison to the other alternatives. All three of the active groundwater alternatives are estimated to restore groundwater quality significantly faster (approximately thirty years) and, therefore, would be protective of human health and the environment.

### Compliance with ARARS

There are currently no federal or state promulgated standards for contaminant levels in sediments. There are, however, other federal or state advisories, criteria, or guidance (which are used as TBC criteria). Specifically, NYSDEC's sediment screening values are a TBC criteria. Soil cleanup objectives were evaluated against NYSDEC's 6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6, effective December 14, 2006.

Since the contaminated soils and sediments would not be addressed under Alternative S-1, this alternative would not achieve the cleanup levels for soils and the sediment cleanup objectives.

Alternatives S-2 and S-3 would attain the cleanup levels for soils and the sediment cleanup objectives.

Both Alternative S-2 and S-3 would be subject to New York State and federal regulations related to the off-site transportation of wastes.

Since Alternatives S-2 and S-3 would involve the excavation of contaminated soils and sediment, these

alternatives would require compliance with fugitive dust and volatile organic compound emission regulations. In addition, this alternative would be subject to New York State and federal regulations related to the transportation and off-site treatment/disposal of wastes. In the case of Alternatives S-2 and GW-4, compliance with air emission standards would be required for the ESVE and air stripper systems. Specifically, treatment of off-gases would have to meet the substantive requirements of New York State Regulations for Prevention and Control of Air Contamination and Air Pollution (6 NYCRR Part 200, *et seq.*) and comply with the substantive requirements of other state and federal air emission standards.

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10NYCRR, Chapter 1), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). Although the groundwater at the site is not presently being utilized as a potable water source, achieving MCLs in the groundwater is an applicable standard, because area groundwater is a source of drinking water.

Alternative GW-1 would not provide for any direct remediation of groundwater and would, therefore, rely upon natural processes to achieve chemical-specific ARARs. Alternatives GW-2, GW-3, and GW-4 would be more effective in reducing groundwater contaminant concentrations below MCLs, since they include active remediation of the contaminated groundwater source areas. Alternative GW-4 would also be subject to surface water discharge ARARs since treated water would be discharged into the Black River.

The provisions of New York State Environmental Conservation Law Section 27-1318, Institutional and Engineering Controls, is applicable to the environmental easements in Alternatives GW-2, GW-3, and GW-4.

#### Long-Term Effectiveness and Permanence

Alternative S-1 would involve no active remedial measures and, therefore, would not be effective in eliminating the potential exposure to contaminants in soil and would allow the continued migration of contaminants from the soil to the groundwater. Alternatives S-2 and S-3 would both be effective in the long term and would provide permanent remediation by removing the contaminated source area soils and contaminated wetland sediment and either treat them on-site or treat/dispose them off-site.

Under Alternative S-2, pilot-scale treatability testing would be required for the purpose of identifying the configuration and number of vacuum extraction pipes

within the treatment unit and evaluating and characterizing the extracted soil vapors and other performance parameters. These data would be used in the system design evaluation, and the system performance would be monitored with extracted vapor measurements and soil samples. Under Alternative S-2, the extracted vapors would be treated by granular activated carbon before being vented to the atmosphere. The granular activated carbon would have to be appropriately handled (off-site treatment/disposal). Alternatives S-1 and S-3 would not generate such treatment residuals.

Both action alternatives would maintain reliable protection of human health and the environment over time.

Alternative GW-1 would be expected to have minimal long-term effectiveness, since it would rely upon natural attenuation to restore groundwater quality. Alternative GW-4 would generate treatment residues that would have to be appropriately handled; Alternatives GW-2 and GW-3 would not generate such residues.

# Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative S-1 would provide no reduction in toxicity, mobility or volume. Under Alternative S-2, the toxicity, mobility, and volume of contaminants would be reduced or eliminated through on-site treatment. Under Alternative S-3, the mobility of the contaminants would be eliminated by removing the VOC-contaminated soil from the property and the toxicity would be reduced through treatment off-site.

Alternative GW-1 would not effectively reduce the toxicity, mobility, or volume of contaminants in the groundwater, as this alternative involves no active remedial measures. This alternative would rely on natural attenuation to reduce the levels of contaminants; a process that has been slowly occurring at this site. Alternatives GW-2, GW-3, and GW-4, on the other hand, would reduce the toxicity, mobility, and volume of contaminants, thereby satisfying CERCLA's preference for treatment.

### Short-Term Effectiveness

Alternative S-1 does not include any physical construction measures in any areas of contamination and, therefore, would not present any potential adverse impacts to remediation workers or the community as a result of its implementation. Alternatives S-2 and S-3 could present some limited adverse impacts to remediation workers through dermal contact and inhalation related to excavation activities. Noise from the

#### Under would have to be taken during excavation activities to

Since no actions would be performed under Alternative S-1, there would be no implementation time. It is estimated that Alternative S-2 would require three months to decontaminate and demolish the building, three months to construct the ESVE system, and six months to achieve the soil cleanup objectives. It is estimated that it would take require three months to decontaminate and demolish the building and three months to excavate and transport the contaminated soils to an EPA-approved treatment/disposal facility under Alternative S-3.

Alternative GW-1 would have no short-term impact to workers or the community and would have no adverse environmental impacts, since no actions would be taken. Alternatives GW-2, GW-3 and GW-4 might present some limited risk to remediation workers through dermal contact and inhalation related to groundwater sampling and injection activities. The installation of additional wells for the purpose of monitoring, groundwater extraction, and/or reagent injections would pose an additional risk to on-site workers, since it would involve the installation of wells through potentially contaminated soils and groundwater. The risks to on-site workers

#### Crown Cleaners Superfund Site

treatment unit and the excavation work associated with Alternatives S-2 and S-3, respectively, could present some limited adverse impacts to remediation workers and nearby residents. In addition, interim and postremediation soil sampling activities would pose some risk. The risks to remediation workers and nearby residents under all of the alternatives could, however, be mitigated by following appropriate health and safety protocols, by exercising sound engineering practices, and by utilizing proper protective equipment.

Since it is estimated that the on-site treatment of the excavated soil and sediment with ESVE would require 3 years under Alternative S-2, the excavation would remain open until the soils could be backfilled. Therefore, the excavation would have to be secured to prevent on-site worker injuries.

Alternative S-3 would require the off-site transport of contaminated soil (approximately 350 truck loads), which would potentially adversely affect local traffic and may pose the potential for traffic accidents, which in turn could result in releases of hazardous substances.

For Alternatives S-2 and S-3, there is a potential for

increased stormwater runoff and erosion during construction and excavation activities that would have to

be properly managed to prevent or minimize any adverse

impacts. For these alternatives, appropriate measures

prevent transport of fugitive dust and exposure of workers

and downgradient receptors to PCE.

#### Crown Cleaners Superfund Site

could, however, be minimized by utilizing proper protective equipment.

The time for implementing Alternative GW-2, including bench- and pilot-scale testing, bidding, selecting a contractor, and initiate treatment of the high concentration source areas, is estimated to be within 1 year of completion of the design. Multiple injections over several years would likely be necessary to sustain the enhanced biodegradation rates. The overall duration of this remedy to achieve the cleanup criteria throughout the entire groundwater plume is estimated to be 30 years.

For Alternative GW-3, treatment of the high concentration source areas by oxidation may achieve cleanup standards in the source area over a very short treatment period (*e.g.*, less than 1 year). Natural attenuation of the contamination at the periphery of the source areas would likely achieve the cleanup standards in 30 years.

For Alternative GW-4, the total time for implementing this alternative, including design, testing, bidding, selecting a contractor and the installation of the groundwater extraction and treatment systems, is estimated to be 2 years. The overall duration of this remedy to achieve the cleanup criteria throughout the entire groundwater plume is estimated to be 30 years.

#### Implementability

Alternative S-1 would be the easiest soil alternative to implement, as there are no activities to undertake.

Both Alternatives S-2 and S-3 would employ technologies known to be reliable and that can be readily implemented. Equipment, services, and materials needed for Alternatives S-2 and S-3 are readily available, and the actions under these alternatives would be administratively feasible. Sufficient facilities are available for the treatment/disposal of the excavated materials under Alternative S-3.

While soil excavation under Alternatives S-2 and S-3 is technically feasible, there are several site-specific complications related to this remedial approach. Since there would be insufficient room on the site to create a significant excavation stockpile, it is likely that the excavation and backfilling would need to be performed incrementally. At the same time, post-excavation sampling and rapid turnaround analyses would need to be integrated into the process. There would be a need to monitor for PCE and dust during the excavation, especially since there are nearby homes. Monitoring the effectiveness of the ESVE system under Alternative S-2 would be easily accomplished through soil and soil-vapor sampling and analysis. Under Alternative S-3, determining the achievement of the soil cleanup objectives could be easily accomplished through postexcavation soil sampling and analysis.

Since no action would be performed under Alternative GW-1, there would be no implementation time. Alternatives GW-2, GW-3, and GW-4 would each take about 12 months to implement.

Alternative GW-1 would be the easiest to implement, since they would not entail the performance of any activities.

Equipment, services, and materials needed for all of the groundwater action alternatives are readily available and the actions under these alternatives would be administratively feasible. Groundwater injections and extraction and treatment systems similar to that which would be used under Alternatives GW-2, GW-3 and GW-4 have been implemented successfully at numerous sites to treat contaminated groundwater.

The implementation of institutional controls would be relatively easy to implement under the groundwater alternatives.

There are considerable uncertainties in the potential radius of influence of injections for Alternatives GW-2 and GW-3. Furthermore, injection of the reagent slurry for Alternative GW-2 may be hindered by bridging across fractures, and limited mobility in tight fractures. Alternative GW-3 would not be subject to these limitations. There are also considerable uncertainties in the number and location of extraction wells and the achievable groundwater extraction rate for treatment for Alternative GW-4. In addition, it may be difficult to maintain continuous operations of an active treatment system (Alternative GW-4) during the winter months in this remote location, and Alternative GW-2 would require more maintenance than Alternatives GW-2 or GW-3.

<u>Cost</u>

The present-worth costs associated with the soil remedies are calculated using a discount rate of seven percent and a five-year time interval. The present-worth costs associated with the groundwater remedies are calculated using a discount rate of seven percent and a thirty-year time interval.

The estimated capital, OM&M, and present-worth costs for each of the alternatives are presented below.
#### Superfund Proposed Plan

#### Crown Cleaners Superfund Site

Alternative	Capital	Annual O&M	Total Present Worth
S-1	e e <b>\$0</b>	\$0	\$0
Š-2	\$3,939,000	\$0	\$3,939,000
S-3	\$4,253,000	\$0	\$4,253,000
GW-1	\$0	\$0	\$0
GW-2	\$1,436,000	\$57,000	\$2,365,000
GW-3	\$2,424,000	\$57,000	\$3,353,000
GW-4	\$5,404,000	\$555,000	\$13,987,000

#### State Acceptance

NYSDEC concurs with the proposed remedy.

#### **Community Acceptance**

Community acceptance of the preferred alternative will be addressed in the ROD following review of the public comments received on the Proposed Plan.

#### PROPOSED REMEDY

Based upon an evaluation of the various alternatives, EPA, in consultation with NYSDEC, recommends Alternative S-3 (building demolition, limited excavation of sediments, and excavation and disposal of soil) as the preferred alternative to address the contaminated soil and sediment at the site and Alternative GW-3 (source area in-situ chemical oxidation and downgradient monitored natural attenuation) as the preferred alternative for the groundwater.

The soil component for this remedy would include the excavation of PAH-contaminated soil to a depth of one foot<sup>8</sup> and the excavation of PCE-contaminated soils to a depth of four feet. The excavated PAH-contaminated soils would also be utilized as backfill to a depth of not less than 1 foot below the ground surface (bgs)<sup>9</sup> in the areas where PCE-contaminated soil would be excavated. Before backfilling with clean soil those areas where residual PAH-contaminated soil would remain, a readily-

visible and permeable subsurface demarcation delineating the interface between the residuallycontaminated native soils and the clean backfill would be installed. Following the demolition of the building, contaminated soils remaining within the footprint of the building will be addressed as described above. The wetland areas that would be excavated would be backfilled with soil that meets the unrestricted SCOs.

The remedy would also include the excavation of PCEcontaminated sediment and soil from the adjacent wetlands to meet the protection of groundwater SCO. These areas would be backfilled with clean soil.

Under the groundwater component of this remedy, the oxidizing agent that would be injected into the contaminated groundwater at the source areas would chemically transform the VOCs into less toxic compounds or to carbon dioxide, and water. Lower contaminant concentrations outside the source areas would be addressed through monitored natural attenuation.

During the design, samples would be collected to define the limits of the soil and sediment excavation.

Bench- and pilot-scale treatability studies would be performed to optimize the effectiveness of the injection system and to determine optimum oxidant delivery rates and locations for the injection-well points.

Performance and compliance monitoring and testing would be performed during and after the injections to determine residual contaminant concentrations, assess the need for additional treatment, and monitor the natural attenuation of the contamination at the periphery of the plume.

During the design, a Phase 1B Cultural Resources Survey would be performed to document the site's historic resources.

Since the entire groundwater plume will not immediately achieve cleanup levels upon implementation of this environmental easement/restrictive alternative. an covenant would be filed in the property records of Jefferson County. The easement/covenant would, at a minimum, restrict the use of the site to commercial and industrial uses, restrict intrusive activities in areas where residual contamination remains unless the activities are in accordance with an EPA-approved Site Management Plan (see below), and restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH or the County Department of Health.

<sup>&</sup>lt;sup>8</sup> If the land use for the property is changed from commercial to recreational before the design of the remedy is approved, then restricted residential SCOs would be utilized, which would allow for recreational use of the property. Accordingly, the PAH-contaminated soils would be excavated to a depth of two feet and backfilled with clean soil. This change would result in the excavation of an additional 1,650 cubic yards of PAH-contaminated soils and would cost an additional \$900,000.

<sup>&</sup>lt;sup>9</sup> The excavated PAH-contaminated soils would be utilized as backfill to a depth of not less than 2 feet bgs if the land use is changed to recreational.

The Site Management Plan would provide for the proper management of all post-construction remedy components. Specifically, the Site Management Plan would describe procedures to confirm that the requisite engineering (subsurface demarcation) and institutional controls are in place and that nothing has occurred that would impair the ability of said controls to protect public health or the environment. The Site Management Plan would also include a soil management plan, an inventory of any use restrictions, the necessary provisions for the implementation of the requirements of the above-noted environmental easement and/or restrictive covenant; a provision for the performance of the operation, maintenance, and monitoring required by the remedy; and a provision that the property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in In addition, if in the future, structures are place. proposed to be built on the property or any existing buildings are reoccupied, as required by the SMP, a soil vapor intrusion evaluation and, potentially, vapor intrusion mitigation systems may be needed until the cleanup criteria have been achieved throughout the entire area

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

#### **Basis for the Remedy Preference**

Alternative S-2 and Alternative S-3 would both effectively achieve the soil cleanup levels. While Alternative S-3 is slightly more expensive than Alternative S-2, Alternative S-2 would require the performance of pilot-scale treatability studies and would take longer to achieve the soil cleanup level than Alternative S-3. In addition, since it is estimated that the on-site treatment of the excavated soil and sediment with ESVE would require 3 years under Alternative S-2, the excavation would remain open until the soils could be backfilled. Therefore, the excavation would have to be secured to prevent on-site worker injuries. Therefore, EPA believes that Alternative S-3 would effectuate the soil cleanup while providing the best balance of tradeoffs with respect to the evaluating criteria.

There are considerable uncertainties in the number and location of extraction wells and the achievable groundwater extraction rate for treatment for Alternative GW-4. In addition, it may be difficult to maintain continuous operations of an active treatment system (Alternative GW-4) during the winter months in this remote location, and Alternative GW-4 would require more maintenance than Alternatives GW-2 or GW-3. In

#### EPA Region II- December 2011

addition, Alternative GW-4 is significantly more expensive than the other two action alternatives. There are considerable uncertainties in the potential radius of influence of injections for Alternatives GW-2 and GW-3. Furthermore, injection of the reagent slurry for Alternative GW-2 may be hindered by bridging across fractures, and limited mobility in tight fractures. It is estimated that Alternative GW-3 would achieve groundwater standards in significantly less time than Alternatives GW-2 and GW-4.

For these reasons, EPA has identified Alternative GW-3 as its preferred groundwater alternative since it would effectuate the groundwater cleanup while providing the best balance of tradeoffs among the alternatives with respect to the evaluating criteria.

The preferred remedy is believed to provide the greatest protection of human health and the environment, provide the greatest long-term effectiveness, be able to achieve the ARARs more quickly, or as quickly, as the other alternatives, and is cost effective. Therefore, the preferred remedy will provide the best balance of tradeoffs among alternatives with respect to the evaluating criteria. EPA and NYSDEC believe that the preferred remedy will treat principal threats, be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The preferred remedy also will meet the statutory preference for the use of treatment as a principal element.

The environmental benefits of the preferred remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy and NYSDEC's Green Remediation Policy<sup>10</sup>. This will include consideration of green remediation technologies and practices.

<sup>10</sup> See <u>http://epa.gov/region2/superfund/green\_remediation</u> and http://www.dec.ny.gov/docs/remediation\_hudson\_pdf/der31.pdf.





**F** ( **1** 



4 .



#### **RESPONSIVENESS SUMMARY**

#### APPENDIX V-b

#### PUBLIC NOTICE PUBLISHED IN THE WATERTOWN DAILY TIMES ON DECEMBER 12, 2011



U. S. Environmental Protection Agency to Hold Public Meeting for Cleanup of Crown Cleaners Of Watertown, Inc. Superfund Site, Village of Herrings, New York

The United States Environmental Protection Agency (EPA) has released a Proposed Plan that evaluates potential cleanup alternatives for the contaminated soil and groundwater at the Crown Cleaners of Watertown, Inc. Superfund site located on NYS Route 3, Village of Herrings, Town of Wilna, Jefferson County, New York. EPA, in concert with The New York State Department of Environmental Conservation, recommends the removal of contaminated soils from the site and treatment of the source area groundwater as the preferred remedy.

A public meeting to discuss the results of EPA's investigation, outline the preferred remedy and answer the public's questions will be held on Tuesday, January 3, 2012 at 7:00 pm at the Village of Herrings Municipal Office, 35983 NYS Route 3, Herrings, New York.

Documents in support of the preferred remedy are contained in the administrative record located at the Carthage Free Library located at 412 Budd Street, Carthage, New York and the EPA Region 2 Records Center, 290 Broadway, 18<sup>th</sup> Floor, New York, NY 10007-1866.

Should you have any comments regarding EPA's preferred remedy or the documents contained in the administrative record, they can be submitted by January 17, 2012 to Ms. Pamela Tames, Remedial Project Manager, U.S. Environmental Protection Agency, 290 Broadway, 20<sup>th</sup> Floor, New York, NY 10007-1866, or tames.pam@epa.gov or to Mike Basile, EPA Community Involvement Coordinator, Western New York Public Information Office, 186 Exchange Street, Buffalo, NY 14204 or basile.michael@epa.gov.

#### **RESPONSIVENESS SUMMARY**

### APPENDIX V-c

### JANUARY 3, 2012 PUBLIC MEETING SIGN-IN SHEET

# Tuesday January 3, 2012

	(Please Print)
Name:	John Ouca f
Street Address:	<u>5+ R+ 3</u>
City, State, Zip Code:	Carthage NY 13619
Daytime Phone #:	486-6413
Name:	Greda DA. Kennow Nkyn
Street Address:	35772 NYS Rt 3
City, State, Zip Code:	Carthage NII3619
Daytime Phone #:	315-486-2563
Name:	Mona Thomas
Street Address:	24519 First SP
City, State, Zip Code:	Serrings Ny 13619
Daytime Phone #:	315-493-4002
` 	
Name:	Elai Avallone Carthage Tribune
Street Address:	237 State St.
City, State, Zip Code:	Carthage, NG 13619
Daytime Phone #:	. 315 493-1276

## Tuesday January 3, 2012

	(Please Print)
Name:	Jennifer Harvill
Street Address:	NYS Tug Hill Commission
City, State, Zip Code:	317 Washington St., Watertown, NY 1360
Daytime Phone #:	315)785-2392 jennifer etughill.org
Name:	Revuer Decesedon
Street Address:	35923 NYS R+3
City, State, Zip Code:	CARTHAGE 13619
Daytime Phone #:	315 493 6548
Name:	hregory RIS
Street Address:	NTSTOOH - Herkimer
City, State, Zip Code: _	
Daytime Phone #:	
Name:	LINCOLNFANCHER NYSPEC
Street Address:	317 WASHINGTON ST.
City, State, Zip Code: _	WATERTOWN NT 18601
Daytime Phone #:	315-785-2513

### Tuesday January 3, 2012

(Please Print)		
Name:	LEON C BARLOW	
Street Address:	35527 NHS. RT3	
City, State, Zip Code:	HERRING MY. 13619	
Daytime Phone #:	778-5001	
Name:	Mary M. Mc Malon Welia Tom Clark	r Č
Street Address:	+14 State SI	
City, State, Zip Code:	Callhage, 1413619	
Daytime Phone #:	315 493-2771 ExT 1 WORK	
Name:	Mike Storms T/o WilHA Counciln	* > 1
Street Address:	37248 NVS R43	
City, State, Zip Code:	CARTHURGE X14, 13613	
Daytime Phone #:	493-1563	
Name:	Lance March	
Street Address:	36252 St. Rt. 3	
City, State, Zip Code:	Carthage, N.Y. 13619	
Daytime Phone #:	315-493-2865	

## Tuesday January 3, 2012

## **Crown Cleaners Superfund Site**

. ,	(Please Print)
Name:	FRANCIS M. SKUORAK
Street Address:	39860 N.Y.S. RT.3
City, State, Zip Code:	CARTHAGE M.Y.
Daytime Phone #:	493-2207
	·
Name:	Paul A Smith
Street Address:	20101 Strickland Rd.
City, State, Zip Code:	CARThage NY 13619
Daytime Phone #:	315 493-2549
Name:	Day Richardson
Street Address:	RD2
City, State, Zip Code:	CARIFURGE NY 13619
Daytime Phone #:	118 SIMZ AREA CODIE 315
	- Ω
Name:	Vames C. Childes
Street Address:	24509 First st.
City, State, Zip Code:	Carthage NY 13619
Daytime Phone #:	(315) 493-2963

3

# Tuesday January 3, 2012

(Please Print)		
Name:	Delaw peck	
Street Address:	35950 NYS RT3	
City, State, Zip Code:	Hening ny 13619	
Daytime Phone #:	493-3504	
Name:	DAN NEVILLS	
Street Address:	42494 N75 RT. 3 N	
City, State, Zip Code:	NATURAL BRIDGE N.Y.	
Daytime Phone #:	315 644 4875	
<b>-</b>		
Name:		
Street Address:		
City, State, Zip Code:	· · · · · · · · · · · · · · · · · · ·	
Daytime Phone #:		
Name:		
Street Address:		
City, State, Zip Code:		
Daytime Phone #:		

## Tuesday January 3, 2012

(Please Print)		
Name:	Bub Cantagallo - Tetra Tech	
Street Address:	1000 The American Read	
City, State, Zip Code:	Morry Plans, NJ 07950	
Daytime Phone #:	973-630-8132	
Name:	Jonet Acca	
Street Address:	V35950 NYS R+3	
City, State, Zip Code:	Nerings, 71.4. 131019	
Daytime Phone #:	493- 3504	
Name:	You A. Mulak	
Street Address:	35802 W15. R13	
City, State, Zip Code:	Herringo 13619 3340	
Daytime Phone #:	493-9829	
· · · · · · · · · · · · · · · · · · ·		
Name:	BRETT SURPLE	
Street Address:	PO. Bux 491	
City, State, Zip Code:	CARTHAGE, X/4 13614	
Daytime Phone #:	493-1769	

#### RESPONSIVENESS SUMMARY

#### APPENDIX V-d

### JANUARY 3, 2012 PUBLIC MEETING TRANSCRIPT

1 2 CROWN CLEANERS OF WATERTOWN, INC. SUPERFUND SITE 3 4 TOWN HALL PUBLIC MEETING 5 HELD AT: TOWN OF HERRINGS TOWN HALL 6 Herrings, New York 7 January 3, 2012 8 9 TOWN HALL PUBLIC MEETING 10 **APPEARANCES:** 11 ENVIRONMENTAL PROTECTION AGENCY 290 Broadway, 20th Floor 12 New York, New York 10007-1688 MICHAEL BASILE, COMMUNITY INVOLVEMENT COORDINATOR 13 BY: JOEL SINGERMAN, CHIEF, CENTRAL NEW YORK REMEDIATION PAMELA TAMES, P.E., REMEDIAL PROJECT MANAGER 14 TETRA TECH, INC. 15 1000 The America Road Morris Plains, New Jersey 07950 16 BY: ROBERT CANTAGALLO, SENIOR PROJECT MANAGER 17 NEW YORK STATE DEPARTMENT OF HEALTH 5665 State Route 5 18 Herkimer, New York 13350 BY: GREGORY RYS, PUBLIC HEALTH SPECIALIST 19 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION 20 DIVISION OF ENVIRONMENTAL REMEDIATION 317 Washington Street 21 Watertown, New York 13601-3787 BY: LINCOLN FANCHER, ENGINEERING GEOLOGIST II 22 23 Danielle A. Whitham, 24 Reporter. Job No. NJ369820 25

800-227-8440

Veritext/NJ Reporting Company

Page 2 PUBLIC MEETING AGENDA WELCOME AND INTRODUCTION: PG By Mr. Michael Basile SUPERFUND RESPONSE PROCESS By Mr. Joel Singerman SITE HISTORY and REMEDIAL INVESTIGATION By Mr. Robert Cantagallo PROPOSED PLAN By Ms. Pamela Tames QUESTION AND ANSWER By The Public 

Veritext/NJ Reporting Company

973-410-4040

800-227-8440

Page 3 1 (The following proceedings began at 7:00 p.m.) MR. BASILE: Welcome. My name is Mike Basile. 2 I'm the Community Involvement Coordinator for the 3 United States Environmental Protection Agency. I 4 want to thank you for taking the time to come up to 5 the meeting this evening. You have a copy of the 6 7 agenda in front of you. I just want to go over the agenda and who's going to be speaking, then I have 8 some people before you that I want to introduce who 9 are here from different agencies and entities who 10 won't be speaking this evening. 11 First of all, let me begin by welcoming you to 12 this Crown Cleaners National Priority Meeting. The 13 purpose of this meeting this evening is to explain 14 to you about what the State and what the Federal 15 Government - that's the agency that I work for -16 17 have proposed, and solicit your input. We are in what is called a public comment period, which began 18 on December the 12th and goes to January the 17th. 19 Any comments that you have this evening, they will 20 be recorded by the court stenographer. Our court 21 stenographer is Danielle Whitham. I'm going to ask 22 you this evening, not only for her purpose, but for 23 the purpose of some of the newspapers that are here, 24 that during the question and answer period, if you 25

Veritext/NJ Reporting Company

800-227-8440

	Page	4
1	have a question, I'd ask that you just I'll	
2	recognize you, if you wouldn't mind stating your	<u>.</u>
3	name and spelling your name for the stenographer	as as
4	well as giving your current address, just so we	have
5	it for the record. We will be looking at your	
6	comments this evening and anything that you have	e in
7	writing between now and January the 17th, that's	3
8	when our public comment period ends. If you fai	.l to
9	ask a question tonight and you remember it next	week
10	and you would still like to comment, at the bott	om
11	of the agenda is an address that you can send th	at
12	to. I will be introducing to you someone who wi	.11
13	be speaking this evening. Her name is Pam Tames	۶.
14	She's our Remedial Project Manager for this site	÷.
15	Her mailing address is at the bottom of the agen	da.
16	So if tonight you forget to ask a question and y	ou
17	want to put it in writing, you can still do that	
18	until January the 17th and you can mail it to he	:r
19	address at the bottom of the agenda.	
20	I would also like to introduce some	
21	individuals that I'd like to recognize who won't	be
22	participating actively in the agenda this evenin	g.
23	I'd like to, first of all, thank the Mayor of th	e
24	Village of Herrings, Rick Beirman, for making th	is
25	facility available. He's been very, very respon	sive

Veritext/NJ Reporting Company

800-227-8440

Page 5 to our agency, so thank you very much. I'd like to 1 2 recognize Mr. Paul Smith, the Supervisor for the 3 Town of Wilna. We have two individuals who have 4 worked for a long time on this site and they represent two State agencies. Greg Rys with the 5 Department of Health, he's a health specialist. And 6 7 Lincoln Fancher, he's an engineering geologist with the Department of Environmental Conservation. 8 He's with the DEC up here in the Watertown area. Again, 9 10 my name is Mike Basile. I'm the Community Involvement Coordinator. I work for the EPA. 11 We have a field office in Buffalo, New York and our 12 regional office is in New York City. Everyone from 13 the EPA that you will be listening to this evening 14 15 works for the EPA for Region 2. Our region covers the New York, New Jersey, the Virginia Islands and 16 17 Puerto Rico. To begin this evening's presentations, I'd 18 19 like to call upon Joel Singerman. Joel is in charge 20 of the Remediation Section for Central New York, and he's going to explain to you about the Superfund 21 22 process. Joel. 23 Several well publicized toxic MR. SINGERMAN: 24 waste disposal actions in the late 1970s shocked the 25 nation and highlighted the fact that the past ways

Veritext/NJ Reporting Company

of hazardous waste disposal practices were not safe. 1 In 1980 congress responded with a Comprehensive 2 3 Environmental Response Compensation and Liability 4 Law, more commonly known as Superfund. The Superfund law provides a federal fund for cleanup of 5 hazardous waste sites and enables the EPA to respond 6 to emergencies involving hazardous waste. 7 In 8 addition, the EPA was empowered to compel responsible parties to pay for hazardous waste 9 10 removal and conduct necessary response actions. 11 The work you see is very complex and takes 12 place in many stages. Once a site is discovered, an 13 inspection further identifies the hazards of the 14 contaminates. A determination is then made whether 15 to approve the site to be placed on the Superfund 16 National Priority List, a list of the nation's worst 17 hazardous waste sites. Sites placed on the national 18 priority list are primarily scored on the Hazard 19 Ranking System, which lists the risk posed by the site. Only sites that are place on the National 20 21 Priority List are eligible for removal of waste under Superfund. 22 The selection of sites for the National 23 Priority List are done by two studies, remedial 24 25 investigations and feasibility studies. The purpose

Veritext/NJ Reporting Company

800-227-8440

of the remedial investigation is to determine the nature and extent of contamination and provide you with studies of the risks on public health and the environment. The purpose of the feasibility study is to identify and evaluate the possible ways to clean up the site.

As a part of a Superfund process, the public is invited to participate in the decisions that were made to the site through community relations. Public meetings, such as this one, are held as necessary to keep the public informed of what's happening to each site. The public is also encouraged to ask questions about the remediation investigation that was done.

After considering the public's comments regarding a proposed plan, a Record of Decision is signed. The Record of Decision is a document that documents the decision based on what is or what is not appropriate for the site.

Following the selection of the purposed remedy, it then enters the remedial design phase with plans chosen to implement the cleanup.

23 Once a site no longer proposes a threat to any 24 healthy environment, at that time the site can be 25 taken off the Superfund's National Priorities List.

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

MR. BASILE: Our next speaker is Robert Cantagallo. He is from Tetra Tech and he is going to explain to you a little bit about the history of this site and the remedial investigation. Bob.

MR. CANTAGALLO: Thank you very much. My name is Bob Cantagallo. I'm the Project Manager. I work for Tetra Tech and we're a consultant for the EPS. Some of you folks may have seen me around here for the last five or six years. We are the company that did the large part of the remediation investigation overlooking the Crown Cleaners site.

In the late 1800s the Crown Cleaner site wasn't a dry cleaner, it was a paper mill. It was a paper mill primarily for the purpose of creating paper to be use in the manufacturing of paper bags for insecticides. As you can see, it was a fairly substantial facility. There was a mill, actually, right on the river itself. Portions of that building are still there today. There were rail lines or rail spurs coming in, and what appears to be, in the upper part of the picture, an on-site power plant. The St. Regis Paper Company used that site until the mid 1960s. At that point the property was then purchased by Crown Cleaners of Watertown in the late 1970s and operated until 1991

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

Page 9 in the Watertown facility. It was my understanding 1 that it served, among other entities, Fort Drum. 2 The primary containments of concern, because 3 they were a dry cleaner, were PCE and TCE. These 4 were two common chemicals and they're used to dry 5 clean clothes. They're still used today, in fact. 6 In addition to these two containments of 7 concern, other things which we were concerned about, 8 9 among other things, were PAHs. PAHs are common organic compounds that are found -- when you grill 10 your meat and you char that meat, that black 11 material that is on your steak is PAH. 12 13 PCBs. PCBs are found in plant forms and pesticides. At some point somebody wanted to knock 14 down the mosquito population and went out, probably 15 16 with a hand sprayer, and started sprayed. Here are a few pictures of the site. Now, 17 obviously, you folks who live around here are 18 familiar with what that site looks like. And I 19 think that one very interesting landmark is the 20 water tower that is shown there. The tower has been 21 22 there for, perhaps, 120 to 150 years. On the upper 23 right you can see what's left of the mill that was right on the river. Then, of course, a beautiful 24 shot, in the upper left, of the Black River itself. 25

Veritext/NJ Reporting Company

800-227-8440

Page 10 It really is a beautiful body of water. In 1991 it was discovered that PCE was in the Town of Herrings wells, which led to a series of investigations headed by the DEC from 1991 to 2000. In 2000 to 2001 the EPA continued investigations and also continued removal actions. What that means is, if they had any knowledge of the source of contamination of that site, at that point they removed the dirt. For example, behind the building, at one point, there was a pile of spent filters. During the dry cleaning processes, TCEs and PCEs were used and passed through filters so they could be used more than once. It was our understanding that some of the these filters were then deposited in the ground behind the building. So in light of that, at this time is when all of those filters were removed. In 2002, Crown Cleaners was put on the NPL list, and my company was tasked with the RI at the

19 list, and my company was tasked with the RI at the 20 site in September of 2002. If you recall from the 21 slides from earlier, the RI process is right smack 22 in the middle in the Superfund process. Discovery 23 has already occurred, actions have been initiated, 24 and then we were tasked with determining what is the 25 extent of the contamination and how it can best be

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

cleaned up.

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

Tetra Tech developed an investigation approach in 2003 to be conducted. Our first item of fieldwork, back in 2004, was relatively brief. It consisted of a full round of groundwater sampling, and at the time there were 24 wells put on the site. We collected the surface water and sediment samples from the Black River and some of the wetlands adjacent to the site and we conducted soil sampling. We summarized our findings in a Data Evaluation Report in 2005, and this allowed us to move onto the next phase of the investigation that started in 2006. We began with the installation of some additional wells at that point. These were deeper bedrock wells. These were wells in which we did some groundwater samplings. We did something called down hole geophysics to monitor some things. What we did was, we did some hammering into the rocks to see where there were cracks were in the rock. We also did some Packer Testing. Those cracks in the rocks that we saw, we wanted to see if those fractures were contaminated, so we did packer testing of our samples. We also conducted a fractor trace analysis. This is just to help us to determine what direction -- if there were fractures

Veritext/NJ Reporting Company

800-227-8440

in the rock, what direction the fractures were
going. We conducted a cultural resources survey.
We conducted some additional surface and water and
sediment samplings in the wetlands.

In 2007 we felt it was necessary to install three more wells. We also conducted something that's called isotopic analysis of on-site and side gradient wells. This was basically a process where we took a sample from the groundwater off site and sampled it from groundwater from the rest of the site. When I say, "site," I'm talking about, in this sence, the Crown Cleaners property. We compared those two groundwater samplings to determine if the PCE that was in it was the same PCE that came from the site. It did come from the same place. The answer is, yes.

In 2008 we deepened that MW-25. We also sent 17 18 a groundwater isotopic sampling of residential wells 19 for analysis. I don't know if anyone is here tonight who has a treatment system on their well. 20 21 We attempted to conduct the analysis on the wells 22 that we were able to sample. The PCE levels were 23 too low. They were so low, in fact, that we couldn't conduct the analysis. And, also, latter in 24 25 2008 we installed new fencing in this site.

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

In 2009 the EPA installed five additional 1 boreholes which were later turned into wells. Thev 2 3 follow a similar process as the geophysics and packer sampling. They installed wells in each of 4 those locations and they also did some vapor 5 intrusion sampling. The purpose of that was to 6 determine if the containments had any impact on the 7 homes by vapors or gases coming in from the rain. 8 This year another round of groundwater sampling was 9 10 collected, as well as some additional soil sampling on the Crown Cleaners property itself, kind of, 11 focusing the area that is going to be addressed in 12 the feasibility study. In other words, where 13 exactly are we going to have to clean up. 14 This is a figure that shows the Crown Cleaner 15 Property, itself. Each one of those dots is a 16 17 location where we collected a sample. The bull's-eye-looking symbols are monitoring wells. 18 19 The solid black dots are either soil samples of surface soil or water samples. As you can see, we 20 collected guite a few samples on and around the site 21 to see what was occurring. Next slide. 22 This is, kind of, the second half of that 23 It shows the wetlands area that is west to 24 area. the site. If you're looking at the building this 25

Veritext/NJ Reporting Company

800-227-8440

1	way, wha	at you're seeing there is off to the right
2	and down	into the woods. There's an area of
3	wetlands	down there. As you can see, there were
4	quite a	few samples collected there as well.
5	I'	d like to describe the site briefly. I'm
6	sure you	're all aware that the Black River, it flows
7	east to	west. When we attempted to collect sediment
8	for samp	ling in the Black River, there was no
9	sediment	right adjacent to the site. What that
10	means is	, that water is running right on top of
11	bedrock	adjacent to the site. And, of course, there
12	are wetl	ands to the west as we have shown you.
13	Th	e soil at the site is relatively thin. It's
14	known as	what is called a thin overburden. It's
15	mostly s	ilts and fill. You can actually see the
16	bedrock.	I think the most we saw was six to eight
17	feet. U	nderneath it is bedrock. It's a type of
18	bedrock	that is common in the area of Watertown.
19	It's kin	d of like a limestone. It's called
20	dolomiti	c limestone. That goes down about 150 feet
21	blow the	surface of the ground. What we found from
22	our frac	ture survey was that the bedrock dips to the
23	south.	Next slide.
24	Th	is is a figure which we included on our
25	report t	hat explains to you the subsurface area that

Veritext/NJ Reporting Company

800-227-8440

.

I just described. That, sort of, white, thin layer on top is what is referred to as the silt and fill overburden. The area below it that looks like bricks at an angle, if you will, is known as the dolomitic limestone. 150 feet below that you've reached the top of the what's called basement rock. That's a nice very, hard volcanic-like rock. Next slide.

Groundwater at the site. That's the site 9 10 where water actually occurs in the ground. In this case we're talking about in the bedrock itself. 11 Because the overburden is so thin, it doesn't have a 12 separate layer of groundwater except what's 13 trickling down from the bedrock. The groundwater of 14 the bedrock flows to the south towards the river. 15 The groundwater that we first encountered in shallow 16 bedrock was from about 5 to 25 feet below ground 17 surface. In other words, if you bore a hole in the 18 rock - which we did - you'll start running into 19 groundwater at about that level, 5 to 25 feet; it 20 depends on where on the site you look. We also 21 found that there was a downward gradient of 22 groundwater on that site. In other words, the 23 groundwater -- many of you may be familiar with the 24 term artesian conditions. In those kind of 25

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

973-410-4040

Page 15

1		conditions water is being forced up. What's more
2		common, which is what we have here at this site, is
3		a situation where the groundwater is flowing down
4		through the formation. Next slide.
5		Most of the early investigations at the site
6		that were overseen by the DEC were to find potential
7		contaminant sources. Some of the things that they
8		noted there was a former filter storage area at the
9		southwestern side of the site building. There was
10		an area in the northern corner of the building where
11		they brought in the PCE to be used for dry cleaning.
12		And, of course, within and around the building there
13	*	were collection tanks and piping systems that
14		potentially could have leaked. Next slide please.
15		What we found from the analysis of our soil
16		samplings was, that PCE - that is the main dry
17		cleaning agent - is present in the soils at the site
18		at levels that are above criteria. The highest
19		concentration of PCE contamination were generally
20		contained in the western end of the main building.
21		That coincides with where others found sources of
22		contamination. That's the area where the storage of
23		the filters had taken place.
24	·	Lead, pesticides and PAHs were also detected
25		in the soil on the property. Lead is probably from

Veritext/NJ Reporting Company

800-227-8440

just lead paint that was used on the buildings on the property and had flaked off. Pesticides. As I mentioned before, it's likely that the with the wetlands that were there that, at some point, somebody decided to knock down some of the mosquitos by spraying. And the PAHs are from a number of things that we found. Oil was found. That was from burning. So they could have gotten there in any different kind of forms. Next slide please.

In the groundwater the primary containments 10 that were found and that we were concerned about was 11 PCE contamination is in the upper portion of 12 PCE. the bedrock at the site. It does extend to the west 13 14 of the site. In addition to the west of the site, underneath that wetland area there is a separate 15 zone, if you will, or an area of PCE contamination 16 in the water. We found that a natural continuation 17 of contamination is occurring. In other words, 18 there are concern conditions in the subsurface of 19 the ground that will allow this material, PCE, to 20 break down over time, and those conditions exist 21 22 here at the site. What you can't see at the bottom, but obviously is very important, is that we found 23. from a number of groundwater samplings that the 24 plume doesn't extend into the town water. No 25

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

9

973-410-4040

Page 17

impacts were noted in the Black River although the PCE was present in the surface water and sediment in the wetland areas. There are some wetlands right on the edge of the Crown Cleaners property and then to the west. There were very little amounts of PCE there. Also noted in that area were PCBs and pesticides. Next slide.

Page 18

Now, in trying to evaluate our data, we do this in a number of different of ways. One way is to look at the data that we have and look at criteria - in this case it would be New York State criteria and and federal criteria - and see if our sample or our concentration of samples are numbers that exceed criteria ratios. That's step one.

Step two is to conduct an ecological risk assessment. That's where we take this information and we say, "Okay. We know it's there and about where it is. How has it effected the ecology? How is it effecting the plants and animals at the site?" What we found out -- what we determined is, that there's a low potential risk to terrestrial and wetland vegetation. In other words, the plants and invertebrates aren't being effected - those are things like earthworms - from metals. In the wetland sediments, things like PHAs, pesticides,

800-227-8440

1

2

3

4

5

6

.7

8

. 9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

Veritext/NJ Reporting Company

metals were identified to pose a potential risk to those invertebrates. Those are, essentially, the bugs that live on the bottom of these areas. That's important, because those insects serve as a food source for other animals. No risk was determined for carnivorous mammals or birds; in other words, foxes or red-tail hawks. No risks were identified for the surface water of the Black River. Potential risks to small mammals, things like mice, were very low. But there was a potential significant risk for avian receptors. By avian receptors we're talking about common birds, like Robins. They might land on the site and eat earthworms and ingest some of the soil. Next slide.

The third methodology that we used was to assess the site and to conduct a human health risk assessment. What we do is, we take the data and try to determine if there are any vapor intrusion risks to the mammals there and to human health. We've determined that there are areas where there are vapor intrusion risks when that sampling was done. The contamination were extremely low, if they existed at all.

24There was a potential long-term risk from the25western wetland areas. There's a potential future

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

973-410-4040

Page.19

Page 20 risk for future residents at the Crown Cleaner 1 property if the surface soil contamination is not 2 Some of you may be wondering why we are 3 addressed. going to bother to assess risk for people who aren't Δ there. And the answer to that is, there are a 5 number of things that could be done with that 6 7 property. One of them, of course, is it could be used as a park. Another one could be that it is 8 used as potential housing. We're required to 9 evaluate those situations and determine, "Okay. 10 Τf 11 somebody were to build houses over there, would there be a risk?" It was also determined that 12 groundwater on the site would pose a risk if it were 13 used for drinking. If they put houses at the site 14 and they sunk wells right down into the most 15 16 contaminated part of the ground and pulled water 17 out, then, over a period of time, it would be a risk to those people. Next slide, please. And that's 18 19 it. MR. BASILE: Thank you very much, Bob. 20 And now I'm going to introduce our Regional Project 21 Manager, Pamela Tames. She'll present to you the 22 23 proposed plan that we're going to recommend for 24 addressing the remediation of this site, after Bob has just given you the results of the remediation 25

Veritext/NJ Reporting Company

800-227-8440
investigation.

1

2

3

4

5

6

7

8

.9

10

11

12

MS. TAMES: I want to thank everyone for coming. We've looked at a number of different alternatives for the best way for cleaning up the contamination that we found on the Crown Cleaners property and the property adjacent where we found contamination.

So, first, we looked at the soil and the wetlands sediment. We looked at no action. We're required to look at a no-action alternative. That means doing nothing, just letting nature do its thing and no active remediation at all.

Then we looked at Alternative S-2, which is 13 demolishing the building. We would do limited 14 excavation of the contaminated sediments and we 15 would excavate the soil that is contaminated. 16 The soil that is contaminated with PCE, we would 17 excavate that and then treat it on site using what's 18 called ex-situ soil extraction. We would basically 19 build a shed and aerate the soil within this 20 facility and treat the air to clean it up. PCE 21 22 evaporates. If you pass enough air through the 23 soil, it will clean up the soil. Unfortunately, you can't do that with soil that's contaminated with 24 PAHs. So with this alternative we would clean up 25

Veritext/NJ Reporting Company

800-227-8440

1		the soil that just had the PCE, clean it up and then
2		put it back in the excavated holes. And the PAH
3		contaminated soil would be deposited of off site in
4		a landfill. Next slide please.
5		The third alternative that we looked at at
6	· · ·	this facility also required that we cleanup the soil
7		and it also included building demolition, the
8		excavation of sediments, the excavation of soil and
9	· ·	off-site treatment and disposal of the PCE
10		contaminated soil. The PAH contaminated soils were
11		not a threat to the groundwater, so they could be
12		reused on site. We would fill the holes left by the
13		excavation with the PAH contaminated soil and then
14		put a foot or two, depending on the eventual use of
15		the property, on top.
16		MR. DRUESEDOW: Foot or two of what?
17	1	MS. TAMES: Clean soil. For the groundwater
18	•	alternatives we looked at, also, no action; letting
19		the area clean itself out.
20		The second alternative was what we called the
21		source area enhanced bioremediation and downgradient
22		monitored natural attenuation. Enhanced
23		bioremediation would include adding, basically, food
24	· .	for bacteria that would help the bacteria break up
25		the contaminates in the groundwater. The monitor

800-227-8440

Veritext/NJ Reporting Company

national attenuation, we would monitor wells and just keep sampling the water on a regular basis to see how it is flushing itself out, but the most contaminated parts would be treated with the bioremediation.

The third alternative would use in-situ chemical oxidation and downgradient monitored natural attenuation. With the chemical oxidation, instead of using food for bacteria, we would use a chemical that would break down the PCE and TCE with an organic chemical. And by adding an oxidator, it would break down the chemicals into basically water; hydrogen and oxygen.

The fourth remaining alternative that we looked at was groundwater extraction and treatment, where we put in wells and pump water out and it goes through an airstripper which you pump up to the top of the tower and as the water trickles down you're blowing air up the tower and you're evaporating the PCE off the water. The air that comes off is then put through activated carbon. Next slide, please.

In each of these alternatives that I just mentioned we evaluated using different criteria. We looked at the overall protection of human health and the environment. We looked at if they're compliant

Veritext/NJ Reporting Company

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

Page 24 with applicable or relevant and appropriate 1 2 requirements. Those are rules. New York State has 3 certain cleanup standards. The federal government 4 has certain cleanup standards. With long-term 5 effectiveness and permanence we want to make sure 6 our remediation will last. With the reduction of 7 toxicity, mobility and volume, we'll try to reduce the amount of contamination that is left on-site. 8 With short-term effectiveness and implementability, 9 10 we want to be make sure that whatever we've chosen 11 we can actually do. We look at cost for each 12 alternative. With state acceptance, New York State 13 has to concur with whatever remedy we choose. And 14 with community acceptance, that's why we're here 15 tonight to present a plan to you and to get your 16 feedback and and your comments. 17 So the proposed remedy that we think will work 18 best for this site is Alternative S-3, the third 19 soil alternative, and Ground GW-3, which includes 20 demolition of the building, the excavation of the PCE and PAH contaminated soils and limited 21 22 excavation of the wetland sediments, in-situ chemical oxidation with monitored natural 23 24 attenuation and then long-term monitoring. 25 So this slide shows the areas that would be

Veritext/NJ Reporting Company

800-227-8440

excavated -- where the soil would be excavated.
 This is the building right here. This is the wetland area.

Now, these cleanup standards that we're using on this slide are for an industrial commercial cleanup. I know there's been some talk about the village acquiring the property and turning the property into a park, and we're hoping that we're able to work that out. Then I have another slide which shows the additional excavation that we would need to do if this is going to be used as a park.

This is the slide showing the plumes that 12 we're trying to clean up. So the yellow and orange 13 areas on the right is where we would make the 14 15 injection of the chemical oxidation. The green area is the area that will be monitored during the 16 17 long-term monitoring. On the left plume we are removing some of the contaminated soil which is 18 acting as a source, so that will eventually clean 19 itself out. Next slide, please. 20

This is the cost of the entire remedy. The soil and sediment remediation is 4.2 million. The groundwater is an additional almost 2 million. The operation of maintenance for the first year is \$505,000. That includes the injections of chemicals

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

9

10

11

973-410-4040

Page 25

1		for the chemical oxidation. And then annually the
2		natural monitoring that we would be doing of the
3		plumes, taking the groundwater samples is \$57,000.
4		So present worth of all of those parts of the remedy
5		come up to 7.6 million.
6		So as I mentioned before, the current proposal
7		is for commercial industrial cleanup. If the area
8		is going to become a park, it will require
9		restricted residential cleanup standards. And in
10		order to have the property cleaned up to those
11		additional standards, the village or the county or
12		the town must acquire the property before we can
13	,	adjust the design. And that's the additional
14		that's the excavation that would have to be done for
15	· ·	the restricted residential cleanup standards.
16		MR. BASILE: Thank you, Pam. Okay. I'm sure
17		you have some questions, and I'll just ask if you
18		wouldn't mind raising your hand, and remember you're
19		going to have to tell the stenographer your name,
20		spell your name and give her your address for the
21		record.
22		MR. DRUESEDOW: Denver Druesedo,
23		D-R-U-E-S-E-D-O-W. 35923 State Route 3, right next
24		door. A couple of corrections on your map here.
25		Every one of those things you got Xed in those

Veritext/NJ Reporting Company

800-227-8440

locations, those are inactive and no long in use 1 since the village put in a sewer system, so can you 2 3 take that off your maps. Okay? During the investigation was there any asbestos noted in the 4 basements of any of the buildings with the heating 5 and all of that stuff? 6 7 MS. TAMES: When we did the removal, we did remove some asbestos. There is some asbestos I 8 think, in the basement, but at the time the 9 buildings were not in good enough shape to send 10 people to the basement to clean it up. 11 MR. DRUESEDOW: So are you going to open those 12 basements up mechanically and then get the asbestos 13 that way or are you just going to crush it down or 14 what? 15 The building will be taken down MS. TAMES: 16 17 and removed however they decide, whatever the best way is to do it. The contractors, with the EPA's 18 oversight, will figure that out when the time 19 20 comes. MR. DRUESEDOW: Back on page one, on site 21 history, you have St. Regis Paper Company which 22 becomes another paper company, etcetera, etcetera, 23 24 then the Crown Cleaners. In the interim, Lolly's was in the area and they manufactured insulated 25

Veritext/NJ Reporting Company

800-227-8440

underwear, long underwear. So I don't know what 1 processes or anything else was used during that 2 manufacturing of those text tiles. 3 4 MS. TAMES: There use to be a big smokestack, which we took down in 2001. That smokestack is 5 6 probably where a lot of the PAHs came out of, 7 because the PAH contamination on the Crown Cleaners property is very shallow. It doesn't go down that 8 9 far. But the perchloroethylene and 10 trichloroethylene, the PCE and TCE, those are typically used in dry cleaning and cleaning metal 11 parts. And we did remove the dry cleaning machine 12 13 filters, and those filters were found -- I don't know if you want to go back to one of the maps. 14 They were found around here. If you go back to the 15 one with the plumes, that is the hottest spot. 16 That 17 red spot is the hottest spot. MR. DRUESEDOW: Go back to the map just before 18 19 that, please. I see the red crosses that are in 20 those areas. Are those buildings that are purposed 21 to be torn down? MS. TAMES: 22 Yes. MR. DRUESEDOW: My question is, we'd be taking 23 those down because of the contaminates or because of 24 the safety hazards? 25

Veritext/NJ Reporting Company

800-227-8440

-1	MS. TAMES: Because we need to get into that
2 .	corner of the building. And if we remove that
3	corner of the building, the rest of the
4	building would probably we can't leave an unstable
5	building.
6	MR. DRUESEDOW: Because the white building
7	the L-shaped white building, that's a very unsafe
8	building. It's presently falling down. And I don't
9	know how it's connected with the other buildings
10	with piping or what have you, but I feel that should
11	be included in this also. All right? Because
12	there's probably asbestos. It's been used as a dump
13	by passersbys, etcetera, etcetera. I don't know
14	what's in the bottom of the other building.
15	I like your results. I like lots of what I've
16	read and everything else. I'm actually thrilled,
17	because I live next door. Congratulations folks. I
18	hope you come to a very good resolution on this
19	whole project.
20	MR. BASILE: Thank you. Any other questions?
21	Does anyone else have a question? Yes, Mr. Mayor.
22	MR. BEIRMAN: Richard Beirman, B-E-I-R-M-A-N.
23	I'm the mayor for the Village of Herrings. Could
24	you go over which buildings are going off? Just the
25	main ones and the garage right here, right? Across

Veritext/NJ Reporting Company

800-227-8440

Page 30 the garage, that little caved-in garage, right 1 there --2 That's actually attached to 3 MR. SINGERMAN: that. 4 5 MR. BEIRMAN: Now, back to that L-shape building, you're not touching that, right? 6 7 MS. TAMES: We didn't really find contamination back there. 8 9 MR. BEIRMAN: But the building, like you guys said, was built in the late 1800s. And I've done a 10 11 lot of research on it and it started right around 12 the same time the village started in 1895, and it was in the 1800s that it was started and there's got 13 to be lead in there. There's got to be asbestos. 14 15 And I've got pictures of a lot of the safety issues in this building. The turbines in the back, I'm 16 17 afraid that a kid is going to fall in one of those and never be found where the old turbines used to 18 19 be. I just feel that it's a huge safety issue and 20 plus the possibility of lead and asbestos and I just fear for the people around it if that gets left. 21 MR. SINGERMAN: Is the building structurally 22 23 sound? 24 MR. BEIRMAN: No. There are pictures where you can see big huge holes where part of the walls 25

Veritext/NJ Reporting Company

800-227-8440

are already down. The foundation is in one of those pictures. I have those on a floppy too, if anybody needs them. There's a lot of devastation in that building and I just fear for the safety of my villagers. That's all I have.

MR. BASILE: Thank you, Mr. Mayor. Joel, did you want to make a comment?

MR. SINGERMAN: Well, basically, we're not going to make a selection until we hear your comments and then we'll assign a Record of Decision. And at this point we were hoping that, with an ambitious schedule, that perhaps by the end of January, early February is where we could make that decision, designs during the spring. And then, best case scenario if we have sufficient funds, to go start construction this summer. We have a very ambitious schedule. If we have sufficient funds to do -- I mean, it's 7.6 million, so that's a need before we start.

20 MR. BASILE: Thank you, Joel. I failed to 21 mention that in each of these areas where we're 22 doing remediations like this, and I have -- this is 23 1 of 38 sites that I have a responsibility for. We 24 established a repository. Your repository is noted 25 in the proposed plan at the Carthage Free Library.

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

Bob's presentation and Pamela's presentation on the purposed plan, all of this information sits in the Carthage Library, on Budd Street. So it you're ever looking for documents about this site, you can definitely go to the Carthage Library. Yes.

MR. SKVORAK: Frank Skvorak, S-K-V-O-R-A-K, with the Wilna Town Counsel. A few things. First of all, I believe that L-shape building is partly cantilevered over the river. Am I right? So in other words, what you're talking about is another safety hazard if you have holes in the floor or whatever.

Part of your thing on contamination. Years ago St. Regis Paper Company had a paper mill here and used a chemical. It was for a multi-ply trap baqs. They dispersed a solution. And I had the opportunity, many times, to run this machine that they had. And unfortunately, back then, no one was concerned about pollution. And one time the paper machine went down. They had to shut the mill down. And the foreman had a swift discussion, "Dump it." Where it did it go? Straight to the river. I'm talking 250 gallons of this stuff. There was roughly 75 pounds in this 200 plus gallon batch. You saw it on the ground; it wasn't just on the

Veritext/NJ Reporting Company

800-227-8440

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

1	ground. And they made this paper for many years for
2	insecticides, a multi-layer paper bag for seeds or
3	whatever to keep the bugs out.
4	 And being the State of the New York has blown
5	in the wind about whether to straighten this road
6	out. With this plan that you people are proposing,
7	who is going to pay for putting in the substrate or
8	whatever if we ever straighten that road out?
9	They've been saying they're going to straighten that
10	road out forever. Is that plan actually going to
11	make it to a point where they can straighten the
12	road out if the Village of Herrings wishes to do
13	that or allows them to do it or is forced into doing
14	it? Is your plan such that they could do that?
15	MS. TAMES: We wouldn't have anything against
16	the Department of Transportation straightening the
17	road.
18	MR. SKVORAK: If you take one foot off the top
19	of the soil and they have to go down more than one
20	foot for a substrate, now they're into contaminated
21	soil, if you, in fact, say we're only going
22	down that far. That's my question. What are you
23	planning to do with this chemical, industrial
24	cleanup that you're talking about? Then also, can
25	the State of New York put a roadway through there

Veritext/NJ Reporting Company

Page 34 without going through pollution controls, etcetera? 1 MS. TAMES: If you straighten the road this 2 3 way, right here, this will only be removing a foot 4 of soil, then we will be putting back clean soil. 5 MS. VENTIQUATTRO-THOMAS: What about what's underneath that contaminated soil is what their 6 7 getting at? Because when they put the 8 PAH contamination --9 MS. TAMES: Oh, no. The PAH contamination is 10 very shallow. 11 MR. CANTAGALLO: The answer is, the 12 contamination is very superficial, so nothing that 13 we would do as part of this remedy would impact the 14 State's ability to straighten the road out. MR. SKVOARK: So this industrial commercial 15 16 removal of one foot of the contaminated soil, that's 17 not permissible for the park system or building of 18 homes on it, right? With the plan you're 19 suggesting, for a village or park to do all of the things they would need to do with the footers for 20 21 swingsets and footers for a water line or whatever 22 is needed for a water fountain, with what you're 23 purposing, is that adequate for all the things that we would need to do to get it to that point? 24 They would have to abide by 25 MR. SINGERMAN:

Veritext/NJ Reporting Company

800-227-8440

1	the site manager's plan that would clean that. They
2	may have to excavate more soil to protect any of the
3	workers and the public. You could also avoid that
4	area so that they may not take that into effect,
5	because there may not be contamination. That is
6	what I would recommend. Anything that would come
7	into the design for a residential or park area, that
8	you look at the site where the contamination is and
9	try to go in an area where there's not contamination
10	or you may have to have expose all of the soil, and
11	then it's an issue of how to handle and manage it.
12	MR. SKVORAK: To say, "Okay, guys. You're on
13	your own now. We would like to do this, but we're
14	not here yet because we didn't go far enough."
15	That's kind of the question. I don't want to hammer
16	and talk this down, but it just seems to me that
17	these people are standing alone on this here. They
18	are holding the bag in a sense. So thank you for
19	your attention.
20	MR. BASILE: Any other questions?
21	MR. SMITH: Paul Smith, Town of Wilna.
22	S-M-I-T-H. You say that it's 7.6 million to do
23	this. What is the cost if you bring it back to a
24	recreational site?
25	MS. TAMES: I believe it was approximately a

à

Veritext/NJ Reporting Company

\$900,000 difference. 1 2 More to the project? MR. SMITH: MS. TAMES: 3 Yes. 4 MR. SMITH: You're not sure about the 5 buildings that are going to be taken down, if they are contaminated, if they are going to be taken off 6 7 site? And will the old dryer pits, will they be filled with soil and not the blocks from the 8 building itself? 9 10 I would think the foundation would MS. TAMES: 11 be removed. The buildings are built directly on 12 rock. 13 MR. SMITH: But usually when they put a paper machine in, like they did in Carthage, they pushed 14 it in in Carthage. But then the problem arises that 15 16 over years, all the soil you put on top seeps 17 through holes in the crevasses and it takes quite a while to fill the holes up. And even when you put 18 19 blacktop over it, you still have the underlying dirt 20 going down through all of these crevasses. So I would hope that somewhere along the line you would 21 22 remove the blocks and take them to some landfill 23 that would be preferable for this use. And I just 24 hope that the Town and the Village of Herrings, that we can come through with the ability to get this 25

Veritext/NJ Reporting Company

property and have use to get it back to a 1 2 recreational stage, because it's hard enough to get a grant for any type of these things. So the more 3 4 we could pressure you to get it to a recreational site -- we are in the process of trying to take over 5 6 ownership, but there are some legalities with the 7 DEC and maybe your areas. If we can get to an 8 agreement on who is going to be liable in the 9 future, in case there are some problems, would be good. And I do believe we had a discussion if 10 anything like a tree or a footer has to go in, in 11 the future, we will have to sit down with the DEC 12 13 and make sure that we are in the process of doing something right, that we don't jeopardize anyone's 14 health and stuff. Thank you. 15 MR. BASILE: Thank you, Paul. Are there any 16 other questions? Yes, sir. 17 MR. STORMS: Mike Storms, S-T-O-R-M-S. Town 18 I just feel that with this great project 19 of Wilna. that we're proposing here, and it's taking care of 20 21 an eye-sore, but there's no sense of cutting it 22 short, that we're able to bring this to a park grade 23 should be the minimal, because the chances of anyone ever building commercially over there are slim to 24 none in the North Country. What we should do is 25

Veritext/NJ Reporting Company

800-227-8440

973-410-4040

Page 37

		Page 38	
1		remove all and any soils that we possibly can, have	ž
2	· 、	them replaced with clean soil and try to beat any c	۶f
- 3		these questions of what you're going to do down the	ì
4		road. If you're going to put in a pavilion and	
5		running water, any time you poke a hole in the	
6		ground, you don't want to have to go through six	
7		months worth of procedures and site visits and this	1
8		and that and the other thing. It would just	
9		simplify things for us. And I am quite positive,	
10		with talks I've heard from Paul and the Mayor, that	
11		between the village and the town that something is	
12		going to be done park-wise with this. In a sense,	
13		in going through all of the billions of dollars and	
14		then stopping just short of what we really should	
15		have, doesn't make sence. Thank you.	
16		MR. BASILE: Thank you. Any other questions?	
17	ĸ	Does anyone have any other questions? If you don't	
18		have any other questions, I would just remind you	
19		that if you still have comments after this evening'	s
20		meeting, you can use this agenda for the address to	
21		send comments to Pamela Tames.	
22		On behalf of the State, the Environmental	
23		Protection Agency, the contractors, the Town and th	е
24		Village and the Mayor, I want to thank you for your	
25	· .	attendance. We want to thank you for your input.	

Veritext/NJ Reporting Company

800-227-8440

Page 39 It's really valuable to hear from you. Thank you for taking the time to come out here tonight. After we end the meeting, please feel free to speak to them if you have any more questions or concerns. Thank you very much and have a great year. Thank you. MS. TAMES: I want an e-transcript, if that makes it easier for you. (Whereupon, the Meeting concluded at 8:10 p.m.) -000-

Veritext/NJ Reporting Company

800-227-8440

[07950 - bag]

Page 1

0	317 1:21	addressed 13:12	approach 11:2
07050 1.16	<b>35923</b> 26:23	20:3	appropriate 7:19
0/950 1.10	38 31:23	addressing 20:24	24:1
<u>l</u>	4	adequate 34:23	approve 6:15
1 31:23	12 25.22	adjacent 11:9 14:9	approximately
1000 1:15	4.2 23.22	14:11 21:6	35:25
<b>10007-1688</b> 1:12	5	adjust 26:13	area 5:9 13:12,24,24
<b>120</b> 9:22	5 1:18 2:7 15:17,20	aerate 21:20	14:2,18,25 15:3
<b>12th</b> 3:19	<b>505,000</b> 25:25	afraid 30:17	16:8,10,22 17:15,16
13350 1:18	5665 1:18	agencies 3:10 5:5	18:6 22:19,21 25:3
13601-3787 1:21	<b>57,000</b> 26:3	agency 1:11 3:4,16	25:15,16 26:7 27:25
<b>150</b> 9:22 14:20 15:5	7	5:1 38:23	35:4,7,9
17th 3:19 4:7,18	7.6 26:5 31:18 35:22	agenda 2:2 3:7,8	areas 18:3 19:3,20
<b>1800s</b> 8:12 30:10,13	75 32:24	4:11,15,19,22 38:20	19:25 24:25 25:14
<b>1895</b> 30:12	7:00 3.1	agent 16:17	28:20 31:21 37:7
1960s 8:23	0	ago 32:14	arises 36:15
<b>1970s</b> 5:24 8:25	0	agreement 37:8	artesian 15:25
1980 6:2	8 2:9	air 21:21,22 23:19	asbestos 27:4,8,8,13
<b>1991</b> 8:25 10:2,4	8:10 39:9	23:20	29:12 30:14,20
2	. 9	airstripper 23:17	assess 19:16 20:4
<b>2</b> 5:15 21:13 25:23	900,000 36:1	allow 17:20	assessment 18:16
200 32:24	я	allowed 11:11	<b>19:17</b> .
2000 10:4,5	abida 34:25	allows 33:13	assign 31:10
2001 10:5 28:5	ability 24.14 26.25	alternative 21:10,13	attached 30:3
2002 10:18,20	able $12.22, 25.0$	21:25 22:5,20 23:6	attempted 12:21
2003 11:3	able 12.22 23.9	23:14 24:12,18,19	14:7
<b>2004</b> 11:4	57.22 aacontanaa 24.12.14	alternatives 21:4	attendance 38:25
2005 11:11	acceptance $24.12,14$	22:18 23:22	attention 35:19
2006 11:13	acquire 20:12	<b>ambitious</b> 31:12,17	attenuation 22:22
2007 12:5	acquiring 25:7	america 1:15	23:1,8 24:24
2008 12:17,25	acting 25:19	amount 24:8	available 4:25
2009 13:1	action 21:9,10 22:18	amounts 18:5	avian 19:11,11
<b>2012</b> 1:7	<b>actions</b> . 5:24 0:10	<b>analysis</b> 11:24 12:7	avoid 35:3
<b>20th</b> 1:12	-10.0,25	12:19,21,24 16:15	aware 14:6
<b>21</b> 2:11	activated 25.21	angle 15:4	b
<b>24</b> 11:6	active 21.12	animals 18:19 19:5	<b>b</b> 29:22
<b>25</b> 12:17 15:17,20	actively 4.22	annually 26:1	<b>back</b> 11:4 22:2
<b>250</b> 32:23	addition 6.8 0.7	answer 2:12 3:25	27:21 28:14.15.18
<b>26</b> 2:13	17.14	12:16 20:5 34:11	30:5.8.16 32:18
<b>290</b> 1:12	additional 11.14	anybody 31:2	34:4 35:23 37:1
3	12.2 12.1 10 25.10	anyone's 37:14	bacteria 22:24.24
2 1.7 2.5 24.19 10	12.5 15.1,10 25.10	appearances 1:10	23:9
J 177 2:5 24:10,19	23.23 20.11,13 address 1.1 11 15	appears 8:20	bag 33:2 35:18
20.25	4:19 26:20 38:20	applicable 24:1	

Veritext/NJ Reporting Company

800-227-8440

## [bags - connected]

Page 2

			·
bags 8:15 32:16	bore 15:18	case 15:11 18:11	comes 23:20 27:20
based 7:18	boreholes 13:2	.31:15 37:9	coming 8:20 13:8
basement 15:6 27:9	bother 20:4	caved 30:1	21:3
27:11	<b>bottom</b> 4:10,15,19	central 1:13 5:20	<b>comment</b> 3:18 4:8
basements 27:5,13	17:22 19:3 29:14	certain 24:3,4	4:10 31:7
basically 12:8 21:19	break 17:21 22:24	chances 37:23	<b>comments</b> 3:20 4:6
22:23 23:12 31:8	23:10,12	<b>char</b> 9:11	7:15 24:16 31:10
<b>basile</b> 1:13 2:5 3:2,2	bricks 15:4	charge 5:19	38:19,21
5:10 8:1 20:20	brief 11:4	chemical 23:7,8,10	commercial 25:5
26:16 29:20 31:6,20	briefly 14:5	23:11 24:23 25:15	26:7 34:15
35:20 37:16 38:16	bring 35:23 37:22	26:1-32:15 33:23	commercially 37:24
basis 23:2	broadway 1:12	chemicals 9:5 23:12	common 9:5,9 14:18
batch 32:24	brought 16:11	25:25	16:2 19:12
beat 38:2	budd 32:3	chief 1:13	commonly 6:4
beautiful 9:24 10:1	buffalo 5:12	choose 24:13	<b>community</b> 1:13 3:3
bedrock 11:15	<b>bugs</b> 19:3 33:3	<b>chosen</b> 7:22 24:10	5:10 7:9 24:14
14:11,16,17,18,22	build 20:11 21:20	<b>city</b> 5:13	company 8:9,22
15:11,14,15,17	<b>building</b> 8:19 10:9	<b>clean</b> 7:6 9:6 13:14	10:19 27:22,23
17:13	10:15 13:25 16:9,10	21:21,23,25 22:1,17	32:14
began 3:1,18 11:13	16:12,20 21:14 22:7	22:19 25:13,19	compared 12:13
behalf 38:22	24:20 25:2 27:16	27:11 34:4 35:1	compel 6:8
beirman 4:24 29:22	29:2,3,4,5,6,7,8,14	38:2	compensation 6:3
29:22 30:5,9,24	30:6,9,16,22 31:4	<b>cleaned</b> 11:1 26:10	complex 6:11
believe 32:8 35:25	32:8 34:17 36:9	cleaner 8:12,13 9:4	compliant 23:25
37:10	37:24	13:15 20:1	compounds 9:10
best 10:25 21:4	buildings 17:1 27:5	cleaners 1:3 3:13	comprehensive 6:2
24:18 27:17 31:14	27:10 28:20 29:9,24	8:11,24 10:18 12:12	concentration 16:19
big 28:4 30:25	36:5,11	13:11 18:4 21:5	18:13
billions 38:13	<b>built</b> 30:10 36:11	27:24 28:7	concern 9:3,8.17:19
bioremediation	<b>bull's</b> 13:18	cleaning 10:11	concerned 9:8 17:11
22:21,23 23:5	burning 17:8	16:11,17 21:4 28:11	32:19
birds 19:6,12	c	28:11,12	concerns 39:5
bit 8:3	call 5.19	<b>cleanup</b> 6:5 7:22	concluded 39:9
black 9:11,25 11:8	called 3.18 11.16	22:6 24:3,4 25:4,6	concur 24:13
13:19 14:6,8 18:1	12.7 14.14 19 15.6	26:7,9,15 33:24	conditions 15:25
19:8	21.19 22.20	clothes 9:6	16:1-17:19,21
blacktop 36:19	cantagallo 1.16 2.9	coincides 16:21	conduct 6:10 12:21
blocks 36:8,22	8.2 5 6 34.11	collect 14:7	12:24 18:15 19:16
<b>blow</b> 14:21	cantilevered 32.9	<b>collected</b> 11:7 13:10	conducted 11:3,9,23
blowing 23:19	carbon $23.21$	13:17,21 14:4	12:2,3,6
blown 33:4	care 37.20	collection 16:13	congratulations
<b>bob</b> 8:4,6 20:20,24	carnivorous 10.6	<b>come</b> 3:5 12:15 26:5	29:17
bob's 32:1	carthage 31.25 32.3	29:18 35:6 36:25	congress 6:2
<b>body</b> 10:1	32.5 36.14 15	39:2	connected 29:9
	54.5 50.17,15		

Veritext/NJ Reporting Company

800-227-8440

#### [conservation - epa]

800-227-8440

$\begin{array}{llllllllllllllllllllllllllllllllllll$	conservation       1:20       creating       8:14       designs       31:1         5:8       creating       8:14       creases       36:17,20       determination         considering       7:15       creating       8:12,12,14,23:23       determination         consultant       8:7       crosses       28:19       12:14 13:7         contained       16:20       crown       13:313 8:11       20:10         containents       9:3,7       13:11,15 18:4 20:1       19:5,20 20:       19:5,20 20:         contaminated       11:22       crush 27:14       developed 1       19:5,20 20:         contaminated       11:22       cutral       12:2       developed 1       19:5,20 20:         21:24 22:3,10,10,13       cutral       12:2       developed 1       different 3:1         23:20 34:6,16 36:6       d       26:23,23       different 3:1       18:9 21:3 2:         contamination       7:21       decide 27:17       different 3:1       different 3:2         28:7 30:8 32:13       34:8,9,12 35:5,8,9       decide 17:5       disposal 5:2       22:9         contractors       27:18       31:10,14       deep	·····
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} 5:8 \\ crevasses 36:17,20 \\ criteria 16:18 18:11 \\ 18:12,12,14 23:23 \\ crosses 28:19 \\ 12:14 13:7 \\ 20:10 \\ determined 16:20 \\ cntaminated 16:20 \\ crush 27:14 \\ cultural 12:2 \\ current 4:4 26:6 \\ contaminates 6:14 \\ 22:25 28:24 \\ contamination 7:2 \\ 10:8,25 16:19,22 \\ 20:2 21:5,7 24:8 \\ 33:20 34:6,16 36:6 \\ contaminates 6:14 \\ 22:25 28:24 \\ contamination 7:2 \\ 10:8,25 16:19,22 \\ 20:2 21:5,7 24:8 \\ 28:7 30:8 32:13 \\ 34:8,9,12 35:5,8,9 \\ contractors 27:18 \\ 38:23 \\ contractors 27:18 \\ 38:23 \\ contractors 26:24 \\ contractors 26:26 \\ contractors 26:26 \\ $	4 drum 9:2
$\begin{array}{c} \mbox{considering} 7:15 \\ \mbox{construction} 7:15 \\ \mbox{construction} 31:16 \\ \mbox{construction} 31:11,15 18:4 20:11 \\ \mbox{21:5} 27:24 28:7 \\ \mbox{construction} 31:3 \\ \mbox{cutrural} 12:2 \\ $	considering. 7:15     criteria 16:18 18:11     determination determinatindet determination determination determinatio	24 <b>dry</b> 8:13 9:4,5 10:11
$\begin{array}{c} \mbox{consisted } 11:5 \\ \mbox{consultant } 8:7 \\ consulta$	consisted 11:5 construction 31:16 consultant $8:7$ crosses $28:19$ crown 1:3 3:13 $8:11$ determine 7 $12:14$ $13:7$ $20:10$ containments 9:3,7 13:7 17:10 $8:12,24$ $10:18$ $12:12$ $13:11,15$ $18:420:1$ $13:11,15$ $18:420:1$ $13:11,15$ $18:420:1$ $13:11,15$ $18:420:1$ $13:11,15$ $18:420:1$ $13:11,15$ $18:420:1$ $19:5,20$ $20:$ determining devastation developed 1 devastation $19:12$ $21:24$ $22:3,10,10,13$ $23:424:21$ $25:1833:20 34:6,16 36:6contamination 7:210:8,25 16:19,2217:12,16,18 19:2220:22 15:7 24:820:22 21:5,7 24:820:22:7 21:5,7 24:820:22:7 21:5,7 24:820:10determine 710:2210:8,25,6,931:10,1410:1420:2724:2021:1120:2724:2022:921:1120:2724:2022:921:1120:2724:2022:921:1121:22 21:1121:22 21:111121:22 21:1111121:2221:111121:2221:1111121:2221:1111121:2221:1111121:2221:1111121:2221:1111121:2221:11111121:2221:11111121:2221:11111121:2221:11111121:2221:11111121:2221:11111111111111111111111111111111111$	<b>1</b> 6:14 16:11,16 28:11,12
construction 31:16 consultant 8:7 contained 16:20 containments 9:37 13:7 17:10       crosses 28:19 crosse 28:19       12:14 13:7 19:18 20:10       dump 29:12 32:21         containments 9:37 13:7 17:10       8:12,24 10:18 12:12 21:5 27:24 28:7       determined 18:20 19:5,20 20:12       get 20:16 21:15,16,17         containmant 16:7 contaminated 11:22 20:16 21:15,16,17       crush 27:14 cultural 12:2       determined 18:20 19:5,20 20:12       get 21:2 32:23 developed 11:2       get 21:2 32:23         20:16 21:15,16,17       current 4:4 26:6 cutting 37:21       different 3:10 17:9 discurrent 4:4 26:6 daniele 1:23 3:22 data 11:10 18:8,10 19:17       different 3:10 17:9 decide 27:17 decide 17:5 decision 7:16,17,18 33:20 3:55,8,9 contractors 27:18 38:23       discovered 6:12 discussion 32:16 disposal 5:24 6:1 22:9 division 1:20 document 7:17 document 7:17 document 7:17 decide 17:5 denoilshing 21:14 denoiltion 22:7 24:20       discussion 32:16 disposal 5:24 6:1 22:9 division 1:20 document 7:17 document 7:17 document 7:18 36:13 3:16,19 dommit 14:20 15:5 door 16:12 20:7       get 31:10,14       get 32:14 dommit 14:20 15:5       get 31:10,12 dommit 14:20 15:5       get 31:12 12:12 3:13 37:13 dollars 38:13 dollars 38:13 dollars 38:13 dollars 13:16,19 downgradient 22:21 23:7       get 31:22 3:13 37:13 dollars 38:13 dollars 38:13 dollars 13:16,19 downgradient 22:21 23:7       get 31:22 20:7       get 31:22 20:7	construction 31:16     crosses 28:19     12:14 13:7       consultant 8:7     crown 1:3 3:13 8:11     20:10       containments 9:3,7     13:11,15 18:4 20:1     19:5,20 20:       13:7 17:10     21:5 27:24 28:7     determined       contaminant 16:7     current 4:4 26:6     difference 3       contaminated 11:22     cultural 12:2     difference 3       20:16 21:15,16,17     current 4:4 26:6     difference 3       23:4 24:21 25:18     d     18:9 21:3 2:       33:20 34:6,16 36:6     d     26:23,23     different 3:1       33:20 34:6,16 36:6     d     26:23,23     discovere 6       10:8,25 16:19,22     discussion 3     37:10     discovere 6       10:2     37:7,12     december 3:19     disposal 5:22       contractors 27:18     31:10,14     deronlising 21:14     definitely 32:5       contractors 26:24     correr 16:10 29:2,3     denolition 22:7     24:20       contret 16:10 29:2	1 11:25 <b>drver</b> 36:7
$\begin{array}{c} \mbox{consultant $8:7$} \\ \mbox{contained $16:20$} \\ \mbox{containments $9:3,7$} \\ \mbox{13:11,15 $18:4 $20:1$} \\ \mbox{13:12 $27:24 $28:7$} \\ \mbox{current $4:4 $26:6$} \\ \mbox{current $3:10 $17:2$} \\ \mbox{data $11:10 $18:8,10$} \\ \mbox{14:22 $25 $28:24$} \\ \mbox{contaminatts $6:14$} \\ \mbox{22:25 $28:24$} \\ \mbox{contaminatts $7:2$} \\ \mbox{data $11:10 $18:8,10$} \\ \mbox{19:17 $dec $5:9 $10:4 $16:6$} \\ \mbox{37:7,12$} \\ \mbox{december $3:19$} \\ \mbox{decide $27:17$} \\ \mbox{decide $17:5$} \\ \mbox{decide $17:5$} \\ \mbox{decide $17:5$} \\ \mbox{decide $17:5$} \\ \mbox{decide $17:6$} \\ \mbox{38:23} \\ \mbox{corrent $16:10 $29:23$} \\ \mbox{corrent $1:12 $20:7$} \\ \mbox{demolition $22:7$} \\ \mbox{demolition $22:14$} \\ \mbox{demolition $22:21$} \\ demolitio$	consultant     8:7     crown     1:3:13     20:10       contained     16:20     13:11,15     18:12,24     10:18     19:5,20     20:10       13:7     17:10     21:5     27:24     28:7     determined       contaminated     11:22     cuttural     12:2     determined       20:16     21:15,16,17     current     4:4     26:6     difference     3       21:24     22:3,10,10,13     cutting     37:21     difference     3       23:4     24:21     25:18     d     difference     3       33:20     34:6,16     36:6     difference     3     18:9     21:32     difference     3       20:2     21:5,7     24:8     d     19:17     dec     5:9     10:4     16:6     10:2     discovered     10:2     discovered     10:2     discovered     10:2     discovered     10:2     discovered     10:2     discovered     10:2     2:9     2:9     division     12:2     2:9     division     12:2     2:9     2:9     2:9     2:9     2:9     2:9     2:9	9:18 dump 29:12 32:21
$\begin{array}{c} \mbox{containments} & 9:3,7 \\ 13:7 17:10 \\ \mbox{contaminant} & 16:7 \\ \mbox{cultural} & 12:2 \\ \mbox{cultural} & 12:2 \\ \mbox{cultural} & 12:2 \\ \mbox{cultural} & 37:21 \\ \mbox{contaminants} & 6:14 \\ \mbox{contaminants} & 7:2 \\ \mbox{contaminants} & 7:2 \\ \mbox{contaminant} & 7:2 \\ \mbox{contaminant} & 7:2 \\ \mbox{contaminant} & 7:7 \\ \mbox{contaminant} & 7:16 \\ \mbox{decide} & 77:16 \\ \mbox{decide} & 77:16 \\ \mbox{decide} & 7:16,17,18 \\ \mbox{3}:2:4 \\ \mbox{decomining} & 21:14 \\ \mbox{decisions} & 7:8 \\ \mbox{demolition} & 22:7 \\ \mbox{3}:2:3 \\ \mbox{contaminant} & 7:18 \\ \mbox{demolition} & 22:7 \\ \mbox{3}:2:3 \\ \mbox{contaminant} & 1:13 \\ \mbox{3}:2:4 \\ \mbox{domining} & 21:14 \\ \mbox{demolition} & 22:7 \\ \mbox{3}:2:3 \\ \mbox{contaminant} & 7:12 \\ \mbox{demolition} & 22:7 \\ \mbox{3}:2:3 \\ \mbox{contaminant} & 1:12 \\ \mbox{demolition} & 22:7 \\ \mbox{3}:2:3 \\ \mbox$	contained $16:20$ $8:12,24$ $10:18$ $12:12$ determinedcontainments $9:3,7$ $13:11,15$ $18:4$ $20:11$ $19:5,20$ $20:16$ contaminated $11:22$ $21:5$ $27:24$ $28:7$ determiningcontaminated $11:22$ $20:16$ $21:15,16,17$ $21:24$ $22:3,10,10,13$ $21:42$ $22:3,10,10,13$ $21:24$ $22:3,10,10,13$ $21:42$ $22:3,10,10,13$ $21:42$ $22:3,10,10,13$ $21:42$ $22:3,10,10,13$ $23:42$ $42:21$ $25:18$ $d$ $d$ $d$ $d$ $d$ $d$ $d$ $23:20$ $34:6,16$ $66:6$ $d$ $26:23,23$ $d$ </th <th></th>	
$\begin{array}{c} \mbox{containanents} 9:3,7 \\ 13:7 17:10 \\ \mbox{contaminant} 16:7 \\ \mbox{contaminant} 12:2 \\ \mbox{contaminant} 6:1:4 \\ \mbox{contaminant} 6:1:4 \\ \mbox{contaminant} 6:7:4 \\ \mbox{contaminant} 6:7:4 \\ \mbox{contaminant} 6:7:4 \\ \mbox{contaminant} 6:7:4 \\ \mbox{contaminant} 6:7:2 \\ \mbox{contaminant} 6:7:2 \\ \mbox{contaminant} 6:7:4 \\ \mbox{contaminant} 6:7:2 \\ \mbox{contaminant} 6:7:4 \\ \mbox{contaminat} 7:2 \\ \mbox{contaminat} 7:2 \\ \mbox{contaminat} 6:14 \\ \mbox{contaminat} 7:2 \\ \mbox{contaminat} 7:17 \\ \mbox{contaminat} 7:17 \\ \mbox{contaminat} 7:17 \\ \mbox{contaminat} 7:17 \\ \mbox{contaminat} 7:18 \\ \mbox{38:23} \\ \mbox{controls} 34:1 \\ \mbox{controls} 34:1 \\ \mbox{cont} 25:2 \\ \mbox{contaminat} 1:17 \\ \mbox{sof} 35:23 \\ \mbox{control} 26:24 \\ \mbox{cont} 25:2 \\ \mbox{contaminat} 1:17 \\ \mbox{sof} 25:2 \\ \mbox{control} 26:24 \\ \mbox{control} 25:1 \\ \mbox{control} 26:24 \\ \mbox{control} 22:14 \\ \mbox{deeper} 11:14 \\ \mbox{deeper} 10:14 \\ \mbox{control} 25:7 \\ \mbox{control} 26:24 \\ \mbox{cont} 22:2 \\ \mbox{control} 26:24 \\ \mbox{control} 22:14 \\ \mbox{deeper} 11:14 \\ \mbox{deeper} 11:14 \\ \mbox{dec} 25:21 \\ \mbox{control} 25:21 \\ \mbox{control}$	containments     9:3,7     13:11,15     18:4 20:1     19:5,20 20:       13:7 17:10     21:5 27:24 28:7     determining       contaminant     16:7     crush 27:14     developed 1       contaminated     11:22     cultural 12:2     difference 3       20:16 21:15,16,17     current 4:4 26:6     difference 3       21:24 22:3,10,10,13     current 4:4 26:6     different 3:1       23:20 34:6,16 36:6     d     26:23,23     different 3:1       contamination     7:2     danielle 1:23 3:22     different 3:1       33:20 34:6,16 36:6     d     26:23,23     different 3:1       contamination     7:2     data 11:10 18:8,10     19:17       10:8,25 16:19,22     dec 5:9 10:4 16:6     37:7,12     discovered 6       10:2     37:7,12     december 3:19     discovered 6       contractors     27:18     31:10,14     decide 17:5     disposal 5:2       controls     34:1     definitely 32:5     disposal 5:2     22:9     division 1:20       controls     34:1     controls     32:4     doing 21:11     31:22 3:13       controls     32:7     deepened 12:17	18:20
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	13:7 17:10     21:5 27:24 28:7     determining       contaminant 16:7     crush 27:14     developed 1       contaminated 11:22     cultural 12:2     developed 1       20:16 21:15,16,17     current 4:4 26:6     difference 3       21:24 22:3,10,10,13     current 4:4 26:6     difference 3       23:2 0 34:6,16 36:6     d     26:23,23     different 3:1       33:20 34:6,16 36:6     d     26:23,23     different 3:1       contamination 7:2     10:8,25 16:19,22     data 11:10 18:8,10     lifectly 36:       10:8,25 16:19,22     37:7,12     december 3:19     discovered 6       10:2     37:7,12     discovered 6     10:2       20:2 21:5,7 24:8     decide 27:17     disposal 5:2     disposal 5:2       20:1 21:5,7 24:8     decide 17:5     decide 17:5     decision 7:16,17,18     31:10,14       38:23     31:10,14     definitely 32:5     disposal 5:2     22:9       controls 34:1     corrections 26:24     cost 24:11 25:21     35:6,8 33:16     depends 15:21     dolomitic 14       25:23     32:7     describe 14:5     describe 14:5     describe 15:1     downgradient 23:7       coury 26:11	2 e 26:23,23 29:22
$\begin{array}{c} \mbox{contaminant} 16:7\\ \mbox{contaminated} 11:22\\ 20:16 21:15,16,17\\ 21:24 22:3,10,10,13\\ 23:24 24:21 25:18\\ 33:20 34:6,16 36:6\\ \mbox{contaminates} 6:14\\ 22:25 28:24\\ \mbox{contamination} 7:2\\ 10:8,25 16:19,22\\ 10:8,25 16:19,22\\ 10:8,25 16:19,22\\ 20:2 21:5,7 24:8\\ 28:7 30:8 32:13\\ 34:8,9,12 35:5,8,9\\ \mbox{continued} 10:5,6\\ \mbox{contractors} 27:18\\ 38:23\\ \mbox{contractors} 27:18\\ 38:23\\ \mbox{contractors} 27:18\\ 38:23\\ \mbox{contractors} 27:18\\ 38:23\\ \mbox{contractors} 26:24\\ \mbox{cost} 24:11 25:21\\ \mbox{cost} 24:11 25:21\\ \mbox{contractors} 26:24\\ \mbox{cost} 24:11 25:21\\ \mbox{cost} 24:11 25:21\\ \mbox{cost} 24:11 25:21\\ \mbox{cost} 24:11 25:21\\ \mbox{contractor} 26:24\\ \mbox{cost} 24:12 2:27\\ \mbox{contract} 15:16\\ \mbox{contract} 15:21\\ \mbox{contract} 15:22\\ \mbox{contract} 25:22\\ \mbox{contract} 25:22\\ \mbox{contract} 25:21\\ \mbox{contract} 25:22\\ \mbox{contract} 25:22\\ \mbox{contract} 25:22\\ \mbox{contract} 25:22\\ \mbox{contract} 25:22\\ \mbox{contract} 25:22\\ contr$	contaminant     16:7     crush     27:14     devastation       contaminated     11:22     cultural     12:2     developed     1       20:16     21:15,16,17     current     4:4 26:6     difference     3       21:24     22:3,10,10,13     current     4:4 26:6     difference     3       23:4     24:21     25:18     d     difference     3       33:20     34:6,16     36:6     d     26:23,23     directlop     directlop     directlop     3:1       22:25     28:24     d     26:59     10:4     16:6     37:7,12     discovered     0     10:2     discovered     10:2     2:9     disisovered	10:24
$\begin{array}{c} \mbox{contaminated } 11:22\\ 20:16 \ 21:15,16,17\\ 21:24 \ 22:3,10,10,13\\ 23:4 \ 24:21 \ 25:18\\ 33:20 \ 34:6,16 \ 36:6\\ contaminates \ 6:14\\ 22:25 \ 28:24\\ \mbox{contamination } 7:2\\ 10:8,25 \ 16:19,22\\ 17:12,16,18 \ 19:22\\ 20:2 \ 21:5,7 \ 24:8\\ 22:25 \ 28:24\\ \mbox{contamination } 7:2\\ 10:8,25 \ 16:19,22\\ 17:12,16,18 \ 19:22\\ 20:2 \ 21:5,7 \ 24:8\\ 22:3 \ 16:19,22\\ 20:2 \ 21:5,7 \ 24:8\\ 23:7,7 \ 12\\ \mbox{december } 3:19\\ \mbox{decide } 17:5\\ \mbox{decision } 7:8\\ \mbox{decision } 7:12\\ \mbox{decision } 1:17,20\\ \mbox{5:} 5:6,8 \ 3:16\\ \mbox{decision } 1:17,20\\ \mbox{docis } 1:120\\ \mbox{docis } 1:122:12\\ \mbox{docis } 1:122:1$	contaminated     11:22     cultural     12:2     developed     1       20:16 21:15,16,17     current     4:4 26:6     difference     3       21:24 22:3,10,10,13     current     4:4 26:6     difference     3       23:4 24:21 25:18     d     difference     3       33:20 34:6,16 36:6     d     26:23,23     different     3::       contaminates     6:14     22:25 28:24     direction     11       contamination     7:2     10:8,25 16:19,22     direction     11       10:8,25 16:19,22     17:7,12     decide     37:7,12     discovered     0       28:7 30:8 32:13     34:8,9,12 35:5,8,9     decide     17:17     decide     17:17     decide     17:17     dispersed     32:17       contractors     27:18     31:10,14     decisions     7:8     deeper     11:14     definitely     32:27       controls     34:1     20:2     24:20     dollars     38:12       corrections     26:24     25:6,8 33:16     depending     22:14     dollars     38:12       country     37:25     curres     15	31:3 earlier 10:21
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	20:16 21:15,16,17     current 4:4 26:6     difference 3       21:24 22:3,10,10,13     d     18:9 21:3 2:       33:20 34:6,16 36:6     d     26:23,23     different 3::       33:20 34:6,16 36:6     d     26:23,23     different 3::       contaminates 6:14     22:25 28:24     d     different 3::       contamination 7:2     10:8,25 16:19,22     data 11:10 18:8,10     different 3::       10:8,25 16:19,22     data 11:10 18:8,10     19:17     discovered 6       28:7 30:8 32:13     34:8,9,12 35:5,8,9     decide 27:17     decide 17:5     disposal 5:2       contractors 27:18     31:10,14     decisions 7:8     disposal 5:2     22:9     division 1:20       contractors 26:24     cost 24:11 25:21     32:4     doing 21:11     doilars 38:12       courrey 37:25     depending 22:14     depending 22:14     doilars 38:12     doilars 38:12       courrey 3:24 14:11     16:12 20:7     describe 14:5     describe 15:1     disered 26       courrey 5:15     35:7     difference 3     35:7     different 3:1	1:2 early 10:5 51:13
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	21:24 22:3,10,10,13     cutting 37:21     different 3:1       23:4 24:21 25:18     d     18:9 21:3 2:       33:20 34:6,16 36:6     d     26:23,23     dips 14:22       contaminates 6:14     22:25 28:24     direction 11       contamination 7:2     10:8,25 16:19,22     data 11:10 18:8,10     19:17       10:8,25 16:19,22     17:12,16,18 19:22     dec 5:9 10:4 16:6     37:7,12       20:2 21:5,7 24:8     december 3:19     decide 27:17     discovered 6       28:7 30:8 32:13     34:8,9,12 35:5,8,9     decide 17:5     dispersed 32       contractors 27:18     31:10,14     deepened 12:17     decisions 7:8     disposal 5:2       contractors 26:24     corrections 26:24     deepened 12:17     document 7:       corrections 26:24     denver 26:22     department 1:17,20     32:4     dolomitic 14       35:23     5:7     depending 22:14     dolom 22:7     24:20     dolom 26:24 2       country 37:25     depending 22:14     depending 22:14     dots 13:16,19       country 32:12     describe 14:5     downward 1       16:12 20:7     describe 14:5     downward 1       coure 5:15     35:7     downw	5:1 earthworms $18:24$
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	23:4 24:21 25:18     d     18:9 21:3 2:       33:20 34:6,16 36:6     d     26:23,23     dips 14:22       contaminates 6:14     22:25 28:24     direction 11       22:25 28:24     data 11:10 18:8,10     19:17       10:8,25 16:19,22     dec 5:9 10:4 16:6     37:7,12     discovered 6       17:12,16,18 19:22     37:7,12     december 3:19     discovered 6       28:7 30:8 32:13     34:8,9,12 35:5,8,9     decide 17:5     dispersed 32       contractors 27:18     38:23     deepened 12:17     dispersed 32       controls 34:1     decisions 7:8     deepened 12:17     dispersed 32       coordinator 1:13     31:10,14     definitely 32:5     demolishing 21:14     dispersed 32       deroution 22:7     24:20     diolars 38:13     dollars 38:13       course 3:24     10:12     5:6,8 33:16     depending 22:14     downgradient       describe 14:5     describe 14:5     dist 13:16,19     dist 13:16,19       course 9:24 14:11     16:12 20:7     describe 14:5     dist 13:16,19       course 5:15     describe 14:5     dist 13:16,19     dist 13:16,19       course 5:15     15:1     describe 15:1	0 17:9 19:13
$\begin{array}{c} 33:20\ 34:6,16\ 36:6\\ \mbox{contaminates}\ 6:14\\ 22:25\ 28:24\\ \mbox{contamination}\ 7:2\\ 10:8,25\ 16:19,22\\ 10:8,25\ 16:19,22\\ 10:8,25\ 16:19,22\\ 17:12,16,18\ 19:22\\ 20:2\ 21:5,7\ 24:8\\ 22:25\ 28:24\\ \mbox{cortamination}\ 7:2\\ 17:12,16,18\ 19:22\\ 20:2\ 21:5,7\ 24:8\\ 22:2\ 20:2\ 21:5,7\ 24:8\\ 22:2\ 20:2\ 21:5,7\ 24:8\\ 22:2\ 20:2\ 21:5,7\ 24:8\\ 22:3\ 20:2\ 21:5\ 20:2\ 21:5\ 20:2\ 22:14\\ \mbox{december}\ 3:19\\ \mbox{decide}\ 27:17\\ \mbox{decide}\ 27:17\\ \mbox{decide}\ 27:17\\ \mbox{decide}\ 17:5\\ \mbox{decide}\ 17:5\\ \mbox{decide}\ 17:5\\ \mbox{decide}\ 17:5\\ \mbox{decide}\ 17:5\\ \mbox{decision}\ 7:8\\ \mbox{decision}\ 7:8\\ \mbox{decision}\ 7:8\\ \mbox{decision}\ 7:8\\ \mbox{decision}\ 7:8\\ \mbox{decision}\ 7:14\\ \mbox{decision}\ 7:14\\ \mbox{decision}\ 7:16\\ \mbox{decision}\ 3:12\\ \mbox{document}\ 7:17\\ \mbox{decision}\ 3:12\\ \mbox{document}\ 3:13\\ \mbox{dollars}\ 3:13\\ \mbox{dollars}\ 3:13\\ \mbox{dollars}\ 3:13\\ \mbox{dollars}\ 3:10\ 9:2\\ \mbox{entrement}\ 7:4,24\\ \mbox{23:25}\\ \mbox{environment}\ 7:4,24\\ \mbox{23:25}\\ \mbox{environment}\ 7:4,24\\ \mbox{23:26}\ \m$	33:20 34:6,16 36:6     d     26:23,23       contaminates     6:14       22:25 28:24     danielle     1:23 3:22       contamination     7:2     data     11:10 18:8,10       10:8,25 16:19,22     19:17     dec     5:9 10:4 16:6       17:12,16,18 19:22     37:7,12     december     3:19       28:7 30:8 32:13     34:8,9,12 35:5,8,9     decide     27:17       continuation     17:17     decide     17:6,17,18       decide     12:17     decide     37:10       contractors     27:18     31:10,14     disposal     5:2       controls     34:1     definitely     32:5     demolishing     21:14       definitely     32:5     demolishing     21:14     document     32:4       doing     12:17     deepend     32:4     doing     21:11       35:23     35:11     country     37:25     depending     22:14     doilars     38:13       dollars     32:7     depending     22:14     dots     13:16,14       country     37:25     describe     15:1     downgradient <td< th=""><th>:23 east 14.7</th></td<>	:23 east 14.7
contaminates 6:14 22:25 28:24 contamination 7:2 10:8,25 16:19,22 17:12,16,18 19:22 20:2 21:5,7 24:8 28:7 30:8 32:13 34:8,9,12 35:5,8,9 continuation 17:17 continued 10:5,6 contractors 27:18 38:23 corrections 24:11 copy 3:6 corrections 24:11 25:21 decimation 12:17 country 37:25 counsel 32:7 country 26:11 country 26:11 country 26:24 country 26:24 country 26:24 country 26:24 country 26:24 country 26:24 country 26:24 country 37:25 counsel 32:7 country 37:25 country 26:11 country 26:11 country 26:11 country 26:24 country 26:11 country 26:11 country 26:11 country 26:11 country 26:11 country 26:24 country 26:25 coun	contaminates     6:14       22:25 28:24     danielle     1:23 3:22       contamination     7:2       10:8,25 16:19,22     dec     5:9 10:4 16:6       17:12,16,18 19:22     37:7,12     december     3:19       decide     27:17     decide     10:2       28:7 30:8 32:13     34:8,9,12 35:5,8,9     decide     27:17       continuation     17:17     decide     27:17       contractors     27:18     31:10,14     decisions     7:8       deepened     12:17     december     31:10,14       decisions     7:8     deepened     12:17       deepened     12:17     december     32:4       documents     31:10,14     documents     32:4       documents     32:27     24:20     documents     32:4       country     37:25     depending     22:14     depending     15:5       doposited     10:14     23:7     downward     1       16:12     20:7     describe     14:5     downward     1       describe     14:5     describe     15:1     downwa	east 14.7
$\begin{array}{c} 22:25\ 28:24\\ \mbox{contamination 7:2}\\ 10:8,25\ 16:19,22\\ 17:12,16,18\ 19:22\\ 20:2\ 21:5,7\ 24:8\\ 28:7\ 30:8\ 32:13\\ 34:8,9,12\ 35:5,8,9\\ \mbox{continuation 17:17}\\ \mbox{controls 34:1}\\ \mbox{controls 34:1}\\ \mbox{controls 34:1}\\ \mbox{controls 34:1}\\ \mbox{controls 34:1}\\ \mbox{control 16:10\ 29:2,3}\\ \mbox{corrections 26:24}\\ \mbox{corrections 26:24}\\ \mbox{controls 13:27}\\ \mbox{controls 32:11}\\ \mbox{controls 33:16}\\ \mbox{controls 33:16}\\ \mbox{controls 32:7}\\ \mbox{controls 32:7}\\ \mbox{controls 32:7}\\ \mbox{controls 34:1}\\ \mbox{controls 24:11\ 25:21}\\ \mbox{controls 33:16}\\ \mbox{controls 13:16}\\ \mbox{controls 13:16}\\ \mbox{controls 24:11\ 25:21}\\ \mbox{sole 22:24}\\ \mbox{controls 15:21}\\ \mbox{county 26:11}\\ \mbox{county 26:11}\\ \mbox{county 26:11}\\ \mbox{county 26:11}\\ \mbox{county 26:11}\\ \mbox{counts 24:11:11}\\ 16:12\ 20:7\\\\ \mbox{counts 24:14:11}\\ \mbox{16:12\ 20:7}\\ \mbox{counts 24:15:1}\\ \mbox{describe 14:5}\\ \mbox{describe 14:5}\\ \mbox{describe 15:1}\\\\\mbox{describe 15:1}\\\\\mbox{describe 15:1}\\\\\mbox{describe 15:1}\\\\\mbox{describe 15:1}\\\\\mbox{describe 15:1}\\\\\mbox{describe 15:1}\\\\\mbox{describe 15:1}\\\\\mbox{discore 16:10}\\ \mbox{describe 15:1}\\\\\mbox{describe 15:1}\\\\describe 1$	22:25 28:24     damene 1:23 3:22       contamination 7:2     directly 36:       10:8,25 16:19,22     19:17       10:8,25 16:19,22     dec 5:9 10:4 16:6       17:12,16,18 19:22     37:7,12       20:2 21:5,7 24:8     december 3:19       28:7 30:8 32:13     decide 27:17       34:8,9,12 35:5,8,9     decide 17:5       continuation 17:17     decide 17:5       contractors 27:18     31:10,14       38:23     deepened 12:17       coordinator 1:13     31:10,14       33:5:11     deepened 12:17       coordinator 1:13     demolition 22:7       3:3 5:11     demolition 22:7       corrections 26:24     depending 22:14       country 37:25     depending 22:14       country 37:25     depending 22:14       country 37:25     depending 22:14       country 26:11     describe 14:5       court 3:21,21     describe 14:5       covers 5:15     describe 14:5       covers 5:15     35:7	25 12:1 east 19:15
contamination7:2 10:8,25 16:19,22 17:12,16,18 19:22 20:2 21:5,7 24:8 28:7 30:8 32:13 $34:8,9,12 35:5,8,9$ continuation 17:17 continued 10:5,6 contractors 27:18 $38:23$ data 11:10 18:8,10 19:17 decdirt 10:9 36:19 discovered discovered discovered $37:7,12$ ecology 18:18 edge effect 10:2 discovered discovered discovered $32:13$ decide $34:8,9,12 35:5,8,9$ continued $10:5,6$ contractors $27:18$ $38:23$ dirt $10:2$ decide $27:17$ decide $31:10,14$ dirt $10:2$ discovered $32:16$ disposal $5:24 6:1$ $22:9$ dirt $10:2$ discovered $32:16$ disposal $5:24 6:1$ $22:9$ ecology $18:18$ effect $18:19$ effectiveness $24:5,9$ eight $14:16$ either $13:19$ eligible $6:21$ emergencies $6:7$ empowered $6:8$ encourtered $15:16$ encouraged $7:13$ ends $32:4$ dirt $10:20$ documents $7:17$ doscuments $32:4$ ecology $18:18$ effect $14:16$ eight $14:16$ eight $14:16$ eight $14:16$ encouraged $7:13$ ends $4:8$ engineering $1:22$ $5:7$ enhanced $22:21,22$ enters $7:12$ entice $22:21,22$ enters $7:12$ entice $22:21,22$ enters $7:12$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ enters $7:12$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ entice $22:21,22$ entice $22:22,22$ coursel $32:7$ county $32:21$ describe $22:3$	contamination     7:2     data     11:10     18:8,10     dirt     10:9 36       10:8,25     16:19,22     17:12,16,18     19:22     20:2 21:5,7 24:8     decide     37:7,12     discovered     0       28:7     30:8     32:13     34:8,9,12     35:5,8,9     decide     27:17     decide     17:10     10:2     discovered     0       28:7     30:8     32:13     decide     27:17     decide     17:10     16:17.5     decide     17:10     discovered     0     10:2     discovered     10:2     10:2     10:2     10:2     10:2     10:2     10:2     10:2     10:2     10:2     10:2     10:2     10:2     10:2     10:1     10:2     22:9     10:1     10:2     12:1     10:2     12:1     10:2     12:1     10:2     12:1     10:2     12:1     11:2     12:1 </th <th>1 ecological 18:15</th>	1 ecological 18:15
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	10:8,25 16:19,22     19:17     discovered (10:2)       17:12,16,18 19:22     20:2 21:5,7 24:8     dec 5:9 10:4 16:6       28:7 30:8 32:13     34:8,9,12 35:5,8,9     decide 27:17       continuation 17:17     decide 17:5     decide 17:5       contractors 27:18     31:10,14     dispersed 32       38:23     deepened 12:17     decument 7:6       controls 34:1     deepened 12:17     decument 7:6       coordinator 1:13     3:3 5:11     deepened 12:17       copy 3:6     denver 26:22     department 1:17,20       cost 24:11 25:21     5:6,8 33:16     depending 22:14       depending 22:14     describe 14:5     door 26:24 2       course 32:7     describe 14:5     downward 1       course 9:24 14:11     describe 14:5     describe 14:5       16:12 20:7     describe 14:5     describe 15:1       course 5:15     35:7     describe 15:1	19 ecology 18:18
17:12,16,18 19:22     dec 5:9 10:4 16:6     10:2     effect 35:4       20:2 21:5,7 24:8     37:7,12     discovery 10:22     effected 18:18,23       28:7 30:8 32:13     decide 27:17     decide 17:5     discussion 32:21     effecting 18:19       34:8,9,12 35:5,8,9     decide 17:5     decision 7:16,17,18     dispersed 32:16     eight 14:16       contractors 27:18     31:10,14     22:9     division 1:20     emergencies 6:7       controls 34:1     deepened 12:17     deeper 11:14     document 7:17     document 7:17       coordinator 1:13     definitely 32:5     demolising 21:14     demolising 21:11 26:2     31:22 33:13 37:13       corrections 26:24     denver 26:22     denver 26:22     dollars 38:13     endued 22:21,22       country 37:25     depending 22:14     deor 26:24 29:17     dots 13:16,19     entices 3:10 9:2       country 37:25     county 26:11     described 15:1     describe 14:5     downward 15:22     firking 20:14       16:12 20:7     describe 14:5     desribe 14:5     downward 15:22     environment 7:4,24	17:12,16,18 19:22     20:2 21:5,7 24:8     10:2       28:7 30:8 32:13     34:8,9,12 35:5,8,9     december 3:19       continuation 17:17     decide 27:17     decide 17:5       contractors 27:18     38:23     31:10,14     discovery 10       controls 34:1     decision 7:16,17,18     31:10,14       coordinator 1:13     31:10,14     decisions 7:8     deepened 12:17       deeper 11:14     definitely 32:5     demolishing 21:14     documents 7       documents 26:24     24:20     denver 26:22     dolars 38:13       coursel 32:7     24:20     5:6,8 33:16     depending 22:14       depending 22:14     describe 14:5     dosward 1       describe 14:5     describe 14:5     downward 1       course 9:24 14:11     describe 14:5     downward 1       16:12 20:7     describe 15:1     describe 15:1       court 3:21,21     35:7     discovery 10	:12 eage 18:4
20:2 21:5,7 24:8     37:7,12     discovery 10:22     effection 18:18,23       28:7 30:8 32:13     december 3:19     decide 27:17     discussion 32:21     effecting 18:19       34:8,9,12 35:5,8,9     decide 17:5     decide 17:5     dispersed 32:16     disposal 5:24 6:1     eight 14:16       contractors 27:18     31:10,14     decisions 7:8     deepend 12:17     document 7:17     emergencies 6:7       controls 34:1     deepened 12:17     deepened 12:17     document 7:17     document 7:17     emolishing 21:14     definitely 32:5     doing 21:11 26:2     anales 6:6     encourtered 15:16       corrections 26:24     denver 26:22     denver 26:22     dolars 38:13     dollars 38:13     ends 4:8     engineering 1:22     5:7       country 37:25     depending 22:14     depending 22:14     dov 26:24 29:17     dots 13:16,19     entire 25:21     entire 25:21       country 37:25     depending 22:14     describe 14:5     describe 14:5     downward 15:22     si10 9:2       course 9:24 14:11     16:12 20:7     describe 15:1     downward 15:22     environment 1:11     1:20,20 3:4 5:8 6:3	20:2 21:5,7 24:8     37:7,12       28:7 30:8 32:13     december 3:19       34:8,9,12 35:5,8,9     decide 27:17       continuation 17:17     decide 17:5       contractors 27:18     31:10,14       38:23     31:10,14       coordinator 1:13     31:3 5:11       coordinator 1:13     3:3 5:11       coordinator 1:13     depend 12:17       deeper 11:14     definitely 32:5       demolising 21:14     demolition 22:7       corrections 26:24     denver 26:22       cost 24:11 25:21     s5:6,8 33:16       country 37:25     depending 22:14       county 26:11     describe 14:5       course 9:24 14:11     16:12 20:7       court 3:21,21     describe 14:5       covers 5:15     35:7	effect 35:4
28:7 30:8 32:13 34:8,9,12 35:5,8,9 continuation 17:17 continued 10:5,6 contractors 27:18 38:23 controls 34:1 coordinator 1:13 3:3 5:11 copy 3:6 corrections 26:24 cost 24:11 25:21 35:23 counsel 32:7 country 37:25 country 37:25 country 26:11 country 26:12 country 26:	28:7 30:8 32:13     december 3:19     discussion 3       34:8,9,12 35:5,8,9     decide 27:17     discussion 3       continuation 17:17     decide 17:5     dispersed 32       contractors 27:18     31:10,14     dispersed 32       38:23     31:10,14     decisions 7:8     depend 12:17       controls 34:1     deepened 12:17     decombing 21:14     definitely 32:5       coordinator 1:13     denolition 22:7     24:20     doluments 7       corrections 26:24     depending 21:14     depending 22:14     dollars 38:13       counsel 32:7     depending 22:14     depending 22:14     dollars 38:13       country 37:25     describe 14:5     downgradient 23:7       country 26:11     22:3     downward 14       16:12 20:7     describe 14:5     describe 14:5       covers 5:15     35:7     describe 15:1	:22 effected 18:18,23
34:8,9,12 35:5,8,9     decide 27:17     37:10     effectiveness 24:5,9       continuation 17:17     decide 17:5     decide 17:5     decide 17:5     decide 17:5       continued 10:5,6     31:10,14     dispersed 32:16     disposal 5:24 6:1     22:9       38:23     decisions 7:8     deepened 12:17     deciment 7:17     decument 7:17       coordinator 1:13     definitely 32:5     demolishing 21:14     decoument 7:17     document 7:17       copy 3:6     demolition 22:7     24:20     doing 21:11 26:2     anables 6:6       corrections 26:24     denver 26:22     department 1:17,20     31:16,19     door 26:24 29:17       country 37:25     depending 22:14     door 26:24 29:17     dots 13:16,19     entire 25:21       country 26:11     deposited 10:14     23:7     downward 15:22     artific 23:25       course 9:24 14:11     16:12 20:7     describe 14:5     downward 15:22     artific 23:26       describe 14:5     describe 15:1     downward 15:22     artific 23:25     environment 1:11	34:8,9,12 35:5,8,9     decide 27:17       continuation 17:17     decide 17:5       contractors 27:18     31:10,14       38:23     decide 17:5       controls 34:1     decisions 7:8       coordinator 1:13     deepened 12:17       3:3 5:11     deepened 12:17       corrections 26:24     demolishing 21:14       cost 24:11 25:21     denver 26:22       depending 22:14     depending 22:14       depending 22:14     depending 22:14       depending 22:14     downward 1       describe 14:5     describe 15:1       describe 15:1     describe 15:1       describe 15:1     describe 15:1	2:21 effecting 18:19
continuation 17:17     decided 17:5     dispersed 32:16     eight 14:16       contractors 27:18     31:10,14     disposal 5:24 6:1     22:9       38:23     deepened 12:17     deepened 12:17     deepened 12:17     deepened 12:17       deepened 12:17     deepened 12:17     deepened 12:17     deepened 12:17     deepened 12:17       deepened 12:17     deepened 12:17     deepened 12:17     deepened 12:17     document 7:17       deepened 12:17     deepened 12:17     deepened 12:17     document 7:18     32:4       corner 16:10 29:2,3     demolishing 21:14     demolition 22:7     31:22 33:13 37:13     ends 4:8       cost 24:11 25:21     depending 22:14     dolomitic 14:20     5:7     enhanced 22:21,22       downgradient 22:21     downgradient 22:21     entities 3:10 9:2     environment 7:4,24       course 9:24 14:11     describe 14:5     describe 14:5     downward 15:22     23:25       downward 15:22     diriking 20:14     1:20,20 3:4 5:8 6:3	continuation 17:17     decided 17:5     dispersed 32       contractors 27:18     31:10,14     decision 7:16,17,18       38:23     31:10,14     decision 7:16,17,18       controls 34:1     decisions 7:8     deepened 12:17       coordinator 1:13     3:3 5:11     deepened 12:17       coordinator 1:13     definitely 32:5     demolishing 21:14       demolishing 21:14     demolition 22:7     24:20       denver 26:22     depending 22:14     dollars 38:12       depending 22:14     depending 22:14     dollars 38:12       depending 22:14     depending 22:14     dots 13:16,19       depending 22:14     describe 14:5     downgradient       county 26:11     describe 15:1     downward 1       course 9:24 14:11     16:12 20:7     describe 15:1     described 15:1       describe 15:1     described 15:1     described 15:1     druesedo 26       druesedo 26     35:7     druesedow 26     druesedow 26	effectiveness 24:5,9
continued 10:5,6     decision 7:16,17,18     disposal 5:24 6:1     either 13:19       38:23     decisions 7:8     deepened 12:17     deepened 12:17     deepened 12:17       coordinator 1:13     definitely 32:5     demolishing 21:14     document 7:17     document 7:17       copy 3:6     demolishing 21:14     demolition 22:7     24:20     doing 21:11 26:2     a1:22 33:13 37:13       cost 24:11 25:21     depending 22:14     depending 22:14     depending 22:14     depending 22:14       course 3:2:7     course 9:24 14:11     16:12 20:7     describe 14:5     describe 14:5     describe 15:1	continued 10:5,6     31:10,14     disposal 5:2       contractors 27:18     31:10,14     22:9       38:23     decisions 7:8     deepened 12:17       coordinator 1:13     3:3 5:11     definitely 32:5       corner 16:10 29:2,3     demolishing 21:14     doing 21:11       corrections 26:24     depending 22:7     24:20       cost 24:11 25:21     depending 22:14     dollars 38:13       country 37:25     depending 22:14     door 26:24 2       country 37:25     depending 22:14     deposited 10:14       course 9:24 14:11     16:12 20:7     describe 14:5     downgradient       covers 5:15     describe 15:1     describe 15:1     downward 1       design 7:21 26:13     35:7     35:7     divesedow 2	:16 eight 14:16
31:10,14     31:10,14     22:9     eligible 6:21       38:23     decisions 7:8     deepened 12:17     deepened 12:17     emergencies 6:7       coordinator 1:13     3:3 5:11     definitely 32:5     demolishing 21:14     definitely 32:5     demolishing 21:11 26:2     as:4       copy 3:6     demolishing 21:14     demolition 22:7     24:20     doing 21:11 26:2     as:13 37:13       corrections 26:24     department 1:17,20     5:6,8 33:16     depending 22:14     dollars 38:13     enters 7:21       downgradient 22:21     deposited 10:14     23:7     downgradient 22:21     entities 3:10 9:2       course 9:24 14:11     16:12 20:7     describe 14:5     describe 14:5     downward 15:22     as:7       downward 15:22     downward 15:22     environmental 1:11     1:20,20 3:4 5:8 6:3	31:10,14     31:10,14     22:9       38:23     decisions 7:8     deepened 12:17       coordinator 1:13     definitely 32:5     demolishing 21:14       copy 3:6     demolishing 21:14     doing 21:11       corrections 26:24     denver 26:22     depending 22:14       country 37:25     depending 22:14     doowngradient       country 37:25     depending 22:14     doowngradient       country 37:25     describe 14:5     downward 1       course 9:24 14:11     16:12 20:7     describe 14:5     downward 1       design 7:21 26:13     35:7     35:7     downward 20:13	6:1 either 13:19
38:23     decisions 7:8     deepened 12:17       coordinator 1:13     deepened 12:17     deepened 12:17       coordinator 1:13     definitely 32:5     demolishing 21:14       definitely 32:5     demolishing 21:14     demolition 22:7       corner 16:10 29:2,3     24:20     denver 26:22       cost 24:11 25:21     24:20     depending 22:14       depending 22:14     depending 22:14     downward 15:22       describe 14:5     describe 14:5     describe 14:5       describe 15:1     described 15:1     describe 15:2	38:23     decisions 7:8     division 1:20       38:23     deepened 12:17     deoument 7       coordinator 1:13     definitely 32:5     demolishing 21:14       copy 3:6     demolishing 21:14     doing 21:11       corrections 26:24     depending 22:7     24:20       cost 24:11 25:21     depending 22:14     dollars 38:12       counsel 32:7     depending 22:14     dolomitic 14       country 37:25     depending 22:14     deowngradient       county 26:11     describe 14:5     describe 14:5     downward 1       describe 14:5     describe 15:1     describe 15:1     division 1:20       course 9:24 14:11     16:12 20:7     describe 15:1     downward 1       covers 5:15     35:7     describe 15:1     describe 26:13	eligible 6:21
controls 34:1     deepened 12:17     division 1120     empowered 6:8       coordinator 1:13     3:3 5:11     definitely 32:5     document 7:17     document 7:17       copy 3:6     demolishing 21:14     definitely 32:5     doing 21:11 26:2     31:22 33:13 37:13       corrections 26:24     denver 26:22     depending 22:14     dollars 38:13     endocument 7:21       doing 21:11 25:21     depending 22:14     dollars 38:13     dollars 38:13     entres 7:21       counsel 32:7     depending 22:14     deposited 10:14     22:3     downgradient 22:21     5:7       course 9:24 14:11     16:12 20:7     describe 14:5     describe 15:1     describe 15:1     downward 15:22	controls     34:1       coordinator     1:13       3:3     5:11       copy     3:6       corner     16:10       corrections     26:24       cost     24:11       counsel     32:7       country     37:25       county     26:11       course     9:24       course     9:24       course     9:24       course     9:24       course     5:15       describe     14:5       describe     15:1       design     7:21       downward     1       drinking     20:       downward     26:213       35:7     26:213	emergencies 6:7
coordinator     1:13     deeper     11:14     documents     11:17       coordinator     1:13     3:3 5:11     definitely     32:5     documents     7:18       copy     3:6     demolishing     21:14     demolition     22:7     24:20     doing     21:11 26:2     31:22 33:13 37:13     ends     4:8     engineering     1:22       corrections     26:24     deperding     22:14     depending     22:14     dolomitic     14:20     15:5     6door     26:24 29:17     entire     25:21     entire     25:21     dots     13:16,19     entire     25:21     entire     23:7     23:25     environment     7:4,24     23:25     environment     1:11     1:20,20     3:4     5:8     6:3	coordinator     1:13       3:3 5:11     definitely     32:5       copy     3:6       corner     16:10 29:2,3       corrections     26:24       cost     24:11 25:21       35:23     24:20       country     37:25       country     37:25       country     37:25       country     37:25       country     37:25       country     26:11       course     9:24 14:11       16:12 20:7     describe       court     3:21,21       covers     5:15       35:7     35:7	empowered 6:8
definitely 32:5     definitely 32:5     definitely 32:5     definitely 32:5       3:3 5:11     demolishing 21:14     demolishing 21:14     doing 21:11 26:2     31:22 33:13 37:13       corrections 26:24     denver 26:22     department 1:17,20     31:22 33:13 37:13     ends 4:8       coursel 32:7     depending 22:14     depending 22:14     doing 21:11 26:2     5:7       country 37:25     5:6,8 33:16     depending 22:14     door 26:24 29:17     entire 25:21       deposited 10:14     22:3     describe 14:5     describe 14:5     downward 15:22       describe 15:1     described 15:1     describe 15:1     doing 20:14     1:20,20 3:4 5:8 6:3	3:3 5:11     definitely 32:5     32:4       corpy 3:6     demolishing 21:14     demolishing 21:14       corner 16:10 29:2,3     demolition 22:7     32:4       corrections 26:24     24:20     denver 26:22       cost 24:11 25:21     department 1:17,20     5:6,8 33:16       depending 22:14     depending 22:14     15:5       deposited 10:14     22:3     downgradient 23:7       country 37:25     describe 14:5     describe 15:1       course 9:24 14:11     16:12 20:7     describe 15:1     downward 1       covers 5:15     35:7     35:7     35:7	enables 6:6
copy 3:6     demolishing 21:14     doing 21:11 26:2     encouraged 7:13       corrections 26:24     24:20     doing 21:11 26:2     31:22 33:13 37:13       corrections 26:24     department 1:17,20     dollars 38:13     dollars 38:13       counsel 32:7     depending 22:14     depending 22:14     doing 21:11 26:2     5:7       country 37:25     county 26:11     depending 22:14     doing 21:16,19     enters 7:21       deposited 10:14     22:3     describe 14:5     describe 14:5     describe 14:5       16:12 20:7     describe 15:1     describe 15:1     distribuiction 22:21     downward 15:22	demolishing     21:14       demolition     22:7       24:20     24:20       denver     26:22       department     1:17,20       5:6,8     33:16       depending     22:14       depending     22:14       deposited     10:14       22:3     22:3       downward     1       downward     1       describe     15:1       design     7:21 26:13       35:7     26:27	encountered 15:16
corner     16:10 29:2,3       corrections     26:24       cost     24:11 25:21       35:23     depending       country     37:25       country     26:11       country     26:11       country     26:24       country     37:25       country     26:11       course     9:24 14:11       16:12 20:7     describe       16:12 20:7     describe       describe     15:1	corner     16:10 29:2,3       corrections     26:24       cost     24:11 25:21       35:23     denver     26:22       counsel     32:7       country     37:25       country     27:25       country     26:11       country     26:11       country     26:24       country     26:11       country     26:11       course     9:24 14:11       16:12 20:7     describe       court     3:21,21       covers     5:15       35:7     35:7	encouraged 7:13
corrections 26:24 cost 24:11 25:21 35:23     24:20 denver 26:22 department 1:17,20 5:6,8 33:16 depending 22:14 depending 22:14 depending 22:14 depending 22:14 depending 22:14 depending 22:14 depending 22:14 depending 1:22     engineering 1:22 5:7       counsel 32:7 country 37:25 county 26:11 couple 26:24 course 9:24 14:11 16:12 20:7     depending 22:14 depending 10:14 22:3     dolmars 38:13 dolomitic 14:20 15:5     engineering 1:22 5:7       dolwars 38:13 dolomitic 14:20 15:5     isticution of the pending 22:14 depending 22:14 depending 10:14 22:3     dolmars 38:13 dolomitic 14:20 15:5     enters 7:21 entire 25:21 downgradient 22:21 23:7       downgradient 22:21 describe 14:5 describe 15:1     23:7 downward 15:22 drinking 20:14     course 9:24 14:11 1:20,20 3:4 5:8 6:3	24:20     24:20       corrections     26:24       cost     24:11       35:23     22:20       counsel     32:7       country     37:25       country     26:11       couple     26:24       course     9:24       16:12     20:7       court     3:21,21       covers     5:15	37.13 ends 4:8
cost 24:11 25:21 35:23     denver 26:22 department 1:17,20 5:6,8 33:16 depending 22:14 depending 22:14 depending 22:14 depending 15:21 depending 15:22 describe 14:5 describe 15:1     denver 26:22 doinitic 14:20 15:5 door 26:24 29:17 dots 13:16,19 downgradient 22:21 23:7 downward 15:22 drinking 20:14     5:7 enhanced 22:21,22 entire 25:21 entities 3:10 9:2 environment 7:4,24 23:25 environmental 1:11 1:20,20 3:4 5:8 6:3	cost 24:11 25:21     denver 26:22     domitic 14       35:23     department 1:17,20     5:6,8 33:16       counsel 32:7     depending 22:14     door 26:24 2       country 37:25     depending 22:14     dots 13:16,14       county 26:11     deposited 10:14     23:7       course 9:24 14:11     describe 14:5     downward 1       16:12 20:7     described 15:1     design 7:21 26:13       covers 5:15     35:7     26:21	engineering 1:22
department     1:17,20       35:23     5:6,8 33:16       counsel     32:7       country     37:25       county     26:11       course     9:24 14:11       16:12 20:7     describe       16:12 20:7     describe	department     1:17,20       35:23     5:6,8 33:16       counsel     32:7       country     37:25       country     37:25       country     26:11       couple     26:24       course     9:24 14:11       16:12 20:7     describe       court     3:21,21       covers     5:15       35:7     35:7	20 5:7
5:6,8 33:16     5:6,8 33:16     enters 7:21       counsel 32:7     depending 22:14     door 26:24 29:17       country 37:25     depending 15:21     downgradient 22:21       county 26:11     deposited 10:14     23:7       course 9:24 14:11     describe 14:5     describe 14:5       16:12 20:7     described 15:1     describe 15:1	sounsel     32:7       country     37:25       country     26:11       couple     26:24       course     9:24       16:12     20:7       court     3:21,21       covers     5:15	enhanced 22:21,22
country 37:25     depending 22:14     door 20:21:25:17     entire 25:21       country 37:25     depending 15:21     door 10:12:125:17     entire 25:21       county 26:11     dependis 15:21     downgradient 22:21     entire 3:10:9:2       course 9:24 14:11     22:3     describe 14:5     describe 14:5     describe 15:1	country 37:25     depending 22:14     door 10:171       country 37:25     depending 22:14     dots 13:16,1       county 26:11     depends 15:21     downgradien       couple 26:24     22:3     describe 14:5     describe 14:5       court 3:21,21     design 7:21 26:13     druesedo 26       covers 5:15     35:7     depending 22:14	9·17 enters 7:21
county     26:11       couple     26:24       course     9:24       16:12     20:7     depends   15:21       deposited     10:14       22:3     describe     14:5       describe     15:1     describe     15:22       dista     15:22     entities     3:10       entities     3:10     9:2       entities     3:10     9:2       environment     7:4,24       23:7     downward     15:22       drinking     20:14       1:20,20     3:4     5:8	country 26:11     depends 15:21     downgradien       couple 26:24     22:3     describe 14:5       courts 9:24 14:11     describe 14:5     downward 1       16:12 20:7     described 15:1     design 7:21 26:13       covers 5:15     35:7     22:3	entire 25:21
couple       26:24       deposited       10:14       downgrutient       22:21       environment       7:4,24       23:25       environment       7:4,24       23:25       environment       1:11       1:11       1:12       20:14       1:11       1:12       1:20,20       3:4       5:8       6:3	couple     26:24       course     9:24 14:11       16:12 20:7     described     15:1       court     3:21,21       covers     5:15       35:7     35:7	22.21 entities 3:10 9:2
course       9:24       14:11       22:3       describe       14:5       downward       15:22       and an	course     9:24     14:11     22:3     downward     1       16:12     20:7     describe     14:5     drinking     20:       court     3:21,21     design     7:21     26:13     druesedo     26       covers     5:15     35:7     35:7     20:     14:5     14:5     14:5	environment 7:4,24
describe       14:5       describe       14:5       drinking       20:14       environmental       1:11         16:12 20:7       described       15:1       drinking       20:14       1:20,20       3:4       5:8       6:3	16:12 20:7     describe 14:5     drinking 20:       court 3:21,21     described 15:1     druesedo 26       covers 5:15     35:7     druesedo 26	5:22 23:25
described 15:1 1:20,20 3:4 5:8 6:3	court       3:21,21       described       15:1       druesedo       26         covers       5:15       35:7       druesedow       2	environmental 1:11
court 3.21.21 druggado 26.22	covers       5:15       design       7:21 26:13       druesedov       20         35:7       35:7       26:00       20	1:20,20 3:4 5:8 6:3
design 7:21 26:13 drussdow 22:16 38:22	35:7 uruesedow 2	38:22
oracks 11:10:20 35:7 01000 22:10 epa 5:11,14,15 6:6,8	racke = [1,10,70] [ $racke = [1,76,77,77,17]$	epa 5:11,14,15 6:6,8
	20.22 27.12, 20.12 72.12	10:5 13:1

Veritext/NJ Reporting Company

[epa's - ground]

epa's 27:18	fact 5:25 9:6 12:23	flows 14:6 15:15	σ
eps 8:7	33:21	flushing 23:3	
essentially 19:2	fail 4:8	focusing 13:12	gallon 32:24
established 31:24	failed 31:20	folks 8:8 9:18 29:17	gations 32:23
etcetera 27:23,23	fairly 8:16	follow 13:3	garage 29:25 30:1,1
29:13.13 34:1	fall 30:17	following 3:1 7:20	gases 15:8
evaluate 7:5 18:8	falling 29:8	food 19:4 22:23 23:9	generally 16:19
20:10	familiar 9:19 15:24	foot 22:14,16 33:18	geologist 1:22 5:7
evaluated 23:23	fancher 1:22 5:7	33:20 34:3,16	geophysics 11:17
evaluation 11:10	far 28:9 33:22 35:14	footer 37:11	15.5 cotting 24:7
evaporates 21:22	fear 30:21 31:4	footers 34:20,21	getting 54.7
evaporating 23:19	feasibility 6:25 7:4	forced 16:1 33:13	given 20.20
evening 3:6,11,14	13:13	foreman 32:21	giving A.A
3:20,23 4:6,13,22	february 31:13	forever 33:10	go 3.7.28.8.14.15.18
5:14	federal 3:15 6:5	forget 4:16	20.24 31.15 32.5 22
evening's 5:18 38:19	18:12 24:3	formation 16:4	33.19 35.9 14 37.11
eventual 22:14	feedback 24:16	former 16:8	38.6
eventually 25:19	feel = 29:10 30:19	forms 9:13 17:9	goes 3.19 14.20
ex 21:19	37:19 39:3	fort 9:2	23.16
exactly 13:14	feet 14:17,20 15:5	found 9:10,13 14:21	going 3:8.22 5:21
example 10:9	15:17,20	15:22 16:15,21 17:7	8:2 12:2 13:12.14
excavate 21:16,18	felt 12:5	17:7,11,17,23 18:20	20:4.21.23 25:11
35:2	fencing 12:25	21:5,6 28:13,15	26:8.19 27:12.14
excavated 22:2 25:1	field 5:12	30:18	29:24 30:17 31:9
25:1	fieldwork 11:4	foundation 31:1	33:7,9,10,21 34:1
excavation 21:15	figure 13:15 14:24	36:10	36:5,6,20 37:8 38:3
22:8,8,13 24:20,22	27:19	fountain 34:22	38:4,12,13
25:10 26:14	fill 14:15 15:2 22:12	fourth 23:14	good 27:10 29:18
exceed 18:14	36:18	foxes 19:7	37:10
exist 17:21	filled 36:8	fractor 11:23	gotten 17:8
existed 19:23	filter 16:8	fracture 14:22	government 3:16
explain 3:14 5:21	filters 10:10,12,14	fractures 11:22,25	24:3
8:3	10:16 16:23 28:13	12:1	grade 37:22
explains 14:25	28:13	Irank 32:6	gradient 12:8 15:22
expose 35:10	find 16:6 30:7	iree 31:25 39:3	grant 37:3
extend 17:13,25	findings 11:10	IFONU 5:/	great 37:19 39:5
extent /:2 10:25	<b>Hrst</b> 3:12 4:23 11:3	TUIL 11:5	green 25:15
extraction 21:19	15:10 21:8 25:24	luna 0.5 funda 21.15 17	greg 5:5
23:13	<i>32.1</i>	iunus 51:15,17	gregory 1:19
extremely 19:22	Hve 8:9 13:1 flaked 17:2	1011000000000000000000000000000000000	grill 9:10
eye 15:18 57:21	Hakeu 1/12 floor 1/12/20-11	<b>Juture</b> 19:25 20:1	ground 10:15 14:21
f	$\frac{11001}{1001}  1.12  32.11 \\ floppy  21.2 \\ floppy  21.2 \\ floppy  31.2 \\ floppy  31.$	57.7,12	15:10,17 17:20
facility 4:25 8:17	flowing 16.2		20:16 24:19 32:25
9:1 21:21 22:6	nowing 10.5		33:1 38:6

Veritext/NJ Reporting Company

800-227-8440

#### [groundwater - line]

Page 5

groundwater 11:5	hole 11:17 15:18	insecticides 8:16	k
11:16 12:9,10,13,18	38:5	33:2	k 32.66
13:9 15:9,13,14,16	holes 22:2,12 30:25	insects 19:4	$k_{000} = 7.11 23.2 33.3$
15:20,23,24 16:3	32:11 36:17,18	inspection 6:13	keep $7.1125.255.5$
17:10,24 20:13	homes 13:8 34:18	install 12:5	kind $13.11 23 14.10$
22:11,17,25 23:15	hope 29:18 36:21,24	installation 11:13	15.25 17.0 35.15
25:23 26:3	hoping 25:8 31:11	installed 12:25 13:1	15.25 17.9 55.15
guys 30:9 35:12	hottest 28:16,17	13:4	$k_{\rm HOCK} = 9.14 + 17.5$
gw 24:19	houses 20:11,14	insulated 27:25	25.6 28.1 14 29.9
h	housing 20:9	interesting 9:20	29.13
h 35.77	huge 30:19,25	interim 27:24	knowledge 10.7
half 13.73	human 19:16,19	<b>introduce</b> 3:9 4:20	known $6.4 14.14$
hall $1.4.60$	23:24	20:21	15.4
hammar 35:15	hydrogen 23:13	introducing 4:12	13.4
hammering 11.18	i .	introduction 2:4	<b>I</b>
hand 0.16.26.18	identified 10.17	intrusion 13:6 19:18	<b>1</b> 29:7 30:5 32:8
handle 35.11	identifies 6.12	19:21	land 19:12
hopponing 7.12	identify 7.5	invertebrates 18:23	landfill 22:4 36:22
hand 15.7.27.2		19:2	landmark 9:20
haru 15.757.2	II 1.22	investigation 2:8 7:1	large 8:10
hagand 6:19.7	impact 15:/ 54:15	7:14 8:4,10 11:2,12	late 5:24 8:12,25
<b>nazard</b> 0:18 32:11	impacts 18:1	21:1 27:4	30:10
<b>nazardous</b> 6:1,6,7,9	implement 7:22	investigations 6:25	law 6:4,5
0:17	implementability	10:4,5 16:5	layer 15:1,13 33:2
<b>hazards</b> 6:13 28:25	24:9	invited 7:8	lead 16:24,25 17:1
<b>neaded</b> 10:4	important 17:23	involvement 1:13	30:14,20
nealth 1:17,19 5:6,6	19:4	3:3 5:11	leaked 16:14
7:3 19:16,19 23:24	inactive 27:1	involving 6:7	leave 29:4
37:15	include 22:23	islands 5:16	led 10:3
healthy 7:24	included 14:24 22:7	isotopic 12:7.18	left 9:23,25 22:12
hear 31:9 39:1	29:11	issue 30:19 35:11	24:8 25:17 30:21
heard 38:10	includes 24:19	issues 30:15	legalities 37:6
heating 27:5	25:25	item 11:3	letting 21:11 22:18
held 1:6 7:10	individuals 4:21 5:3		level 15:20
help 11:24 22:24	industrial 25:5 26:7	<b>J</b>	levels 12:22 16:18
herkimer 1:18	33:23 34:15	<b>january</b> 1:7 3:19 4:7	liability 6:3
herrings 1:6,6 4:24	information 18:16	4:18 31:13	liable 37:8
10:3 29:23 33:12	32:2	jeopardize 37:14	library 31:25 32:3,5
36:24	informed 7:11	jersey 1:16 5:16	light 10:15
highest 16:18	ingest 19:13	<b>job</b> 1:25	limestone 14:19.20
highlighted 5:25	initiated 10:23	joel 1:13 2:7 5:19,19	15:5
history 2:8 8:3	injection 25:15	5:22 31:6,20	limited 21:14 24:21
27:22	injections 25:25		lincoln 1:22 5:7
holding 35:18	<b>input</b> 3:17 38:25		line 34:21 36:21

Veritext/NJ Reporting Company

800-227-8440

[lines - pamela's]

Page 6

lines 8:20	map 26:24 28:18	<b>mw</b> 12:17	occurs 15:10
list 6:16,16,18,21,24	maps 27:3 28:14	n	office 5:12.13
7:25 10:19	material 9:12 17:20		oh 34:9
listening 5:14	mayor 4:23 29:21	n . 29:22	oil 17:7
lists 6:19	29:23 31:6 38:10.24	name 3:2 4:3,3,13	okav 18:17 20:10
little 8:3 18:5 30:1	mean 31:18	5:10 8:5 26:19,20	26:16 27:3 35:12
live 9.18 19:3 29:17	means 10.6 14.10	nation 5:25	old 30.18.36.7
location 13:17	21:11	nation's 6:16	once $6.127.2310.13$
locations $13.5 27.1$	meat 9.11.11	national 3:13 6:16	ones 29.25
Inductions $13.5 27.1$	mechanically 27.13	6:17,20,23 7:25	000 39.10
long 5.4 19.24 24.4	meeting 1.4 9 2.2	23:1	open 27.12
24.24 25.17 27.1	3.6 13 14 38.20	natural 17:17 22:22	operated 8.25
28:1	39:3.9	23:8 24:23 26:2	operation 25.24
longer 7.23	meetings 7.10	nature 7:2 21:11	opportunity 32.17
look 15:21 18:10 10	mention 31.21	<b>necessary</b> 6:10 7:11	orange 25.13
21.10 24.11 35.8	mentioned 17.3	12:5	order 26:10
looked 21.3 8 9 13	23.23.26.6	need 25:11 29:1	organic 9.10 23.11
22.5 18 23.15 24 25	metal 28.11	31:18 34:20,24	overall 23.24
looking $4.5 13.18 25$	metals 18.74 19.1	needed 34:22	overburden 14.14
37·4	methodology 19.15	needs 31:3	15.3 12
Jooks 9.19 15.3	mice $10.0$	never 30:18	overlooking 8.11
lot 28.6 30.11 15	michael 1.13 2.5	<b>new</b> 1:6,12,12,13,16	overseen 16.6
31.3	mid 8.23	1:17,18,20,21 5:12	oversight 27.19
lots 29.15	mid $0.23$ middle $10.22$	5:13,16,16,20 12:25	ownershin 37.6
low 12.23 23 18.21	mike 3.2 5.10 37.18	18:11 24:2,12 33:4	$\begin{array}{c} \mathbf{avidation}  23.7.8 \end{array}$
10.10.22	mill 8.13 14 17 9.23	33:25	24.23 25.15 26.1
19.10,22	32.14.20	newspapers 3:24	ovidator 23.11
m	million 25.22 23	nice 15:7	$\begin{array}{c} \mathbf{OxVgen}  23.11 \\ \mathbf{OxVgen}  23.13 \end{array}$
m 29:22 35:22 37:18	26:5 31:18 35:22	nj369820 1:25	n
machine 28:12	mind $4.2.26.18$	north 37:25	<u> </u>
32:17,20 36:14	minimal 37.23	northern 16:10	<b>p.e.</b> 1:14
<b>mail</b> 4:18	mobility $24.7$	<b>noted</b> 16:8 18:1,6	<b>p.m.</b> 3:1 39:9
mailing 4:15	monitor 11.17 22.25	27:4 31:24	packer 11:20,22
main 16:16,20 29:25	23.1	<b>npl</b> 10:18	13:4
maintenance 25:24	monitored 22.22	number 17:6,24	page 27:21
making 4:24	23.7 24.23 25.16	18:9 20:6 21:3	<b>pah</b> 9:12 22:2,10,13
mammals 19:6,9,19	monitoring 13.18	numbers 18:13	24:21 28:7 34:8,9
manage 35:11	74.74 25.17 26.2	0	pahs 9:9,9 16:24
manager 1:14,16	months 38.7	<b>o</b> 26:23 32:6 37:18	17:6 21:25 28:6
4:14 8:6 20:22	morris 1.16	ohviously 9.18	paint 17:1
manager's 35:1	$\frac{1101115}{1.10}$	17.23	pam 4:13 26:16
manufactured	mosquitos 17.5	occurred 10.23	pamela 1:14 2:11
27:25	mosquitos 17.5	occurring 13.23	20:22 38:21
manufacturing 8:15	multi 32:15 33:2	17:18	pamela's 32:1

Veritext/NJ Reporting Company

#### [paper - read]

Page 7

paper 8:13,14,15,15	phase 7:21 11:12	potentially 16:14	provide 7:2
8:22 27:22,23 32:14	picture 8:21	pounds 32:24	provides 6:5
32:14,19 33:1,2	<b>pictures</b> 9:17 30:15	power 8:22	<b>public</b> 1:4,9,19 2:2
36:13	30:24 31:2	practices 6:1	2:13 3:18 4:8 7:3,7
<b>park</b> 20:8 25:8,11	<b>pile</b> 10:10	preferable 36:23	7:10,11,12 35:3
26:8 34:17,19 35:7	piping 16:13 29:10	present 16:17 18:2	public's 7:15
37:22 38:12	<b>pits</b> 36:7	20:22 24:15 26:4	publicized 5:23
<b>part</b> 7:7 8:10,21	place 6:12,20 12:16	presentation 32:1,1	puerto 5:17
20:16 30:25 32:13	16:23	presentations 5:18	pulled 20:16
34:13	placed 6:15,17	presently 29:8	<b>pump</b> 23:16,17
participate 7:8	plains 1:16	pressure 37:4	purchased 8:24
participating 4:22	plan 2:10 7:16 20:23	<b>primarily</b> 6:18 8:14	<b>purpose</b> 3:14,23,24
parties 6:9	24:15 31:25 32:2	primary 9:3 17:10	6:25 7:4 8:14 13:6
partly 32:8	33:6,10,14 34:18	priorities 7:25	purposed 7:20
parts 23:4 26:4	35:1	priority 3:13 6:16	28:20 32:2
28:12	planning 33:23	6:18,21,24	purposing 34:23
pass 21:22	plans 7:22	probably 9:15 16:25	pushed 36:14
passed 10:12	plant 8:22 9:13	28:6 29:4,12	<b>put</b> 4:17 10:18 11:6
passersbys 29:13	plants 18:19,22	problem 36:15	20:14 22:2,14 23:16
paul 5:2 35:21 37:16	please 16:14 17:9	problems 37:9	23:21 27:2 33:25
38:10	20:18 22:4 23:21	procedures 38:7	34:7 36:13,16,18
pavilion 38:4	25:20 28:19 39:3	proceedings 3:1	38:4
pay 6:9 33:7	<b>plume</b> 17:25 25:17	process 2:6 5:22 7:7	<b>putting</b> 33:7 34:4
<b>pcbs</b> 9:13,13 18:6	<b>plumes</b> 25:12 26:3	10:21,22 12:8 13:3	q
<b>pcbs</b> 9:13,13 18:6 <b>pce</b> 9:4 10:2 12:14	<b>plumes</b> 25:12 26:3 28:16	10:21,22 12:8 13:3 37:5,13	<b>q</b> question 2:12 3:25
<b>pcbs</b> 9:13,13 18:6 <b>pce</b> 9:4 10:2 12:14 12:14,22 16:11,16	plumes       25:12       26:3         28:16       plus       30:20       32:24	10:21,22 12:8 13:3 37:5,13 processes 10:11	<b>q</b> <b>question</b> 2:12 3:25 4:1 9 16 28:23
pcbs       9:13,13       18:6         pce       9:4       10:2       12:14         12:14,22       16:11,16       16:19       17:12,12,16	plumes       25:12       26:3         28:16       plus       30:20       32:24         ply       32:15       32:15       32:15	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2	<b>q</b> <b>question</b> 2:12 3:25 4:1,9,16 28:23 29:21 33:22 35:15
<b>pcbs</b> 9:13,13 18:6 <b>pce</b> 9:4 10:2 12:14 12:14,22 16:11,16 16:19 17:12,12,16 17:20 18:2,5 21:17	plumes     25:12 26:3       28:16     plus       30:20 32:24     ply       32:15     point       8:23 9:14 10:8	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14	<b>q</b> <b>question</b> 2:12 3:25 4:1,9,16 28:23 29:21 33:22 35:15 <b>questions</b> 7:13
pcbs       9:13,13       18:6         pce       9:4       10:2       12:14         12:14,22       16:11,16       16:19       17:12,12,16         17:20       18:2,5       21:17       21:21       22:1,9       23:10	plumes     25:12 26:3       28:16     plus       30:20 32:24     ply       32:15     point       8:23 9:14 10:8     10:10 11:14 17:4	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19	<b>q</b> <b>question</b> 2:12 3:25 4:1,9,16 28:23 29:21 33:22 35:15 <b>questions</b> 7:13 26:17 29:20 35:20
pcbs       9:13,13       18:6         pce       9:4       10:2       12:14         12:14,22       16:11,16       16:19       17:12,12,16         17:20       18:2,5       21:17       21:21       22:1,9       23:10         23:20       24:21       28:10       28:10       23:20       24:21       28:10	plumes     25:12 26:3       28:16     plus       30:20 32:24     ply       32:15     point       8:23 9:14 10:8     10:10 11:14 17:4       31:11 33:11 34:24	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19	<b>q</b> <b>question</b> 2:12 3:25 4:1,9,16 28:23 29:21 33:22 35:15 <b>questions</b> 7:13 26:17 29:20 35:20 37:17 38:3 16 17 18
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     pces     10:11	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12	q         question       2:12 3:25         4:1,9,16 28:23       29:21 33:22 35:15         questions       7:13         26:17 29:20 35:20       37:17 38:3,16,17,18         39:4       39:4
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     pces     10:11     people     3:9     20:4,18	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     guite       quite     13:21 14:4
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     pces     10:11     people     3:9     20:4,18       27:11     30:21     33:6     3:6     3:0     3:0	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     14:4
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     23:20     24:21     28:10       pces     10:11     people     3:9     20:4,18     27:11     30:21     33:6       35:17     35:17     35:17     35:17     35:17     35:17     35:17	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     39:4
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     pces     10:11     people     3:9     20:4,18       27:11     30:21     33:6     35:17     perchloroethylene	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12 portions 8:18	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10 26:12 28:8 37:1	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     r
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     pces     10:11     people     3:9     20:4,18       27:11     30:21     33:6     35:17     perchloroethylene     28:9	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12 portions 8:18 pose 19:1 20:13	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10 26:12 28:8 37:1 proposal 26:6	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     r       r     26:23 29:22 32:6
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     23:20     24:21     28:10       pces     10:11     people     3:9     20:4,18     27:11     30:21     33:6       35:17     perchloroethylene     28:9     period     3:18,25     4:8	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12 portions 8:18 pose 19:1 20:13 posed 6:19	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10 26:12 28:8 37:1 proposal 26:6 proposed 2:10 3:17	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     r       r     26:23 29:22 32:6       37:18     37:18
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     23:20     24:21     28:10       pces     10:11     people     3:9     20:4,18     27:11     30:21     33:6       35:17     perchloroethylene     28:9     period     3:18,25     4:8     20:17	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12 portions 8:18 pose 19:1 20:13 posed 6:19 positive 38:9	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10 26:12 28:8 37:1 proposal 26:6 proposed 2:10 3:17 7:16 20:23 24:17	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     r       r     26:23 29:22 32:6       37:18     rail       8:19,20     30
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     pces     10:11     people     3:9     20:4,18       27:11     30:21     33:6     35:17     perchloroethylene     28:9       period     3:18,25     4:8     20:17       permanence     24:5     24:5	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12 portions 8:18 pose 19:1 20:13 posed 6:19 positive 38:9 possibility 30:20	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10 26:12 28:8 37:1 proposal 26:6 proposed 2:10 3:17 7:16 20:23 24:17 31:25	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     r       r     26:23 29:22 32:6       37:18     rail       8:19,20     rain       13:8     54.14
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     23:20     24:21     28:10       pces     10:11     people     3:9     20:4,18     27:11     30:21     33:6       35:17     perchloroethylene     28:9     period     3:18,25     4:8     20:17       permanence     24:5     permissible     34:17	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12 portions 8:18 pose 19:1 20:13 posed 6:19 positive 38:9 possibility 30:20 possible 7:5	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10 26:12 28:8 37:1 proposal 26:6 proposed 2:10 3:17 7:16 20:23 24:17 31:25 proposes 7:23	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     r       r     26:23 29:22 32:6       37:18     rail       8:19,20     rain       raising     26:18
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17       21:21     22:1,9     23:10       23:20     24:21     28:10       pces     10:11       people     3:9     20:4,18       27:11     30:21     33:6       35:17     perchloroethylene       28:9     period     3:18,25       period     3:18,25     4:8       20:17     permanence     24:5       permissible     34:17     pesticides	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12 portions 8:18 pose 19:1 20:13 posed 6:19 positive 38:9 possibility 30:20 possible 7:5 possibly 38:1	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10 26:12 28:8 37:1 proposal 26:6 proposed 2:10 3:17 7:16 20:23 24:17 31:25 proposes 7:23 proposing 33:6	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     r       r     26:23 29:22 32:6       37:18     rail       8:19,20     rain       raising     26:18       ranking     6:19
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     pces     10:11     people     3:9     20:4,18       27:11     30:21     33:6     35:17     perchloroethylene     28:9       period     3:18,25     4:8     20:17       permanence     24:5     permissible     34:17       pesticides     9:14     16:24     17:2     18:7,25	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12 portions 8:18 pose 19:1 20:13 posed 6:19 positive 38:9 possibility 30:20 possible 7:5 possibly 38:1 potential 16:6 18:21	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10 26:12 28:8 37:1 proposal 26:6 proposed 2:10 3:17 7:16 20:23 24:17 31:25 proposes 7:23 proposing 33:6 37:20	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite       quite     13:21 14:4       36:17 38:9     r       r     26:23 29:22 32:6       37:18     rail       8:19,20     rain       raising     26:18       ranking     6:19       ratios     18:14
pcbs     9:13,13     18:6       pce     9:4     10:2     12:14       12:14,22     16:11,16     16:19     17:12,12,16       17:20     18:2,5     21:17     21:21     22:1,9     23:10       23:20     24:21     28:10     23:20     24:21     28:10       pces     10:11     people     3:9     20:4,18     27:11     30:21     33:6       35:17     perchloroethylene     28:9     28:9     period     3:18,25     4:8     20:17       permanence     24:5     permissible     34:17     pesticides     9:14     16:24     17:2     18:7,25       pg     2:4     2:4     16:24     17:2     18:7,25     18:7,25	plumes 25:12 26:3 28:16 plus 30:20 32:24 ply 32:15 point 8:23 9:14 10:8 10:10 11:14 17:4 31:11 33:11 34:24 poke 38:5 pollution 32:19 34:1 population 9:15 portion 17:12 portions 8:18 pose 19:1 20:13 posed 6:19 positive 38:9 possibility 30:20 possible 7:5 possible 7:5 possibly 38:1 potential 16:6 18:21 19:1,8,10,24,25	10:21,22 12:8 13:3 37:5,13 processes 10:11 28:2 project 1:14,16 4:14 8:6 20:21 29:19 36:2 37:19 property 8:24 12:12 13:11,16 16:25 17:2 18:4 20:2,7 21:6,6 22:15 25:7,8 26:10 26:12 28:8 37:1 proposal 26:6 proposed 2:10 3:17 7:16 20:23 24:17 31:25 proposes 7:23 proposing 33:6 37:20 protect 35:2	q       question     2:12 3:25       4:1,9,16 28:23     29:21 33:22 35:15       questions     7:13       26:17 29:20 35:20     37:17 38:3,16,17,18       39:4     quite     13:21 14:4       36:17 38:9     r       r     26:23 29:22 32:6       37:18     rail     8:19,20       rail     8:19,20     rain       raising     26:18     ranking       ratios     18:14     reached

Veritext/NJ Reporting Company

800-227-8440

[really - side]

Page 8

ļ

· · · · · · · · · · · · · · · · · · ·			
really 10:1 30:7	removing 25:18	road 1:15 33:5,8,10	25:22
38:14 39:1	34:3	33:12,17 34:2,14	sediments 18:25
recall 10:20	replaced 38:2	38:4	21:15 22:8 24:22
receptors 19:11,11	report 11:11 14:25	roadway 33:25	see 6:11 8:16 9:23
recognize 4:2,21 5:2	reporter 1:24	robert 1:16 2:9 8:1	11:19,21 13:20,22
recommend 20:23	repository 31:24,24	robins 19:12	14:3,15 17:22 18:12
35:6	represent 5:5	rock 11:19 12:1 15:6	23:3 28:19 30:25
record 4:5 7:16,17	require 26:8	15:7,19 36:12	seeds 33:2
26:21 31:10	required 20:9 21:10	rocks 11:18,21	seeing 14:1
recorded 3:21	22:6	roughly 32:24	seen 8:8
recreational 35:24	requirements 24:2	round 11:5 13:9	seeps 36:16
37:2,4	research 30:11	route 1:18 26:23	selection 6:23 7:20
red 19:7 28:17,19	residential 12:18	rules 24:2	31:9
reduce 24:7	26:9,15 35:7	<b>run</b> 32:17	sence 12:12 38:15
reduction 24:6	residents 20:1	running 14:10 15:19	send 4:11 27:10
referred 15:2	resolution 29:18	38:5	38:21
regarding 7:16	resources 12:2	rys 1:19 5:5	senior 1:16
region 5:15,15	respond 6:6	S	sense 35:18 37:21
regional 5:13 20:21	responded 6:2	s 21:13 24:18 26:23	38:12
regis 8:22 27:22	response 2:6 6:3,10	32:6 35:22 37:18.18	sent 12:17
32:14	responsibility 31:23	safe 6.1	separate 15:13
regular 23:2	responsible 6:9	safety 28.25 30.15	17:15
relations 7:9	responsive 4:25	30.19 31.4 32.11	september 10:20
relatively 11:4	rest 12:10 29:3	sample 12.9.22	series 10:3
14:13	restricted 26:9,15	13.17 18.13	serve 19:4
relevant 24:1	results 20:25 29:15	sampled 12.10	served 9:2
remaining 23:14	reused 22:12	samples 11.7.23	sewer 27:2
remedial 1:14 2:8	<b>ri</b> 10:19,21	13.19.20.21.14.4	shallow 15:16 28:8
4:14 6:24 7:1,21 8:4	richard 29:22	18.13.26.3	34:10
remediation 1:13,20	<b>rick</b> 4:24	sampling 11.5.9	shape 27:10 30:5
5:20 7:13 8:10	<b>rico</b> 5:17	12.18 13.4 6 9 10	32:8
20:24,25 21:12 24:6	<b>right</b> 8:18 9:23,24	14.8 19.21 23.2	shaped 29:7
25:22	10:21 14:1,9,10	samplings 11.16	she'll 20:22
remediations 31:22	18:3 20:15 25:2,14	12.4.13.16.16.17.24	shed 21:20
remedy 7:21 24:13	26:23 29:11,25,25	saw 11.21 14.16	shocked 5:24
24:17 25:21 26:4	30:1,6,11 32:9 34:3	32.25	short 24:9 37:22
34:13	34:18 37:14	saving 33.9	38:14
remember 4:9 26:18	risk 6:19 18:15,21	scenario 31.15	<b>shot</b> 9:25
remind 38:18	19:1,5,10,16,24	schedule 31.12.17	showing 25:12
removal 6:10,21	20:1,4,12,13,17	scored 6.18	shown 9:21 14:12
10:6 27:7 34:16	risks 7:3 19:7,9,18	second 13.73 77.70	shows 13:15,24
remove 27:8 28:12	19:21	section 5.20	24:25 25:10
29:2 36:22 38:1	river 8:18 9:24,25	sediment 11.7 12.4	shut 32:20
removed 10:9,17	11:8 14:6,8 15:15	14.7 9 18.7 21.9	side 12:7 16:9
27:17 36:11	18:1 19:8 32:9,22	17.7,7 10.2 21.7	· ·

Veritext/NJ Reporting Company

800-227-8440

## [signed - terrestrial]

Page 9

signed 7:17	smack 10:21	stage 37:2	superfund's 7:25
significant 19:10	small 19:9	stages 6:12	supervisor 5:2
silt 15:2	smith 5:2 35:21,21	standards 24:3,4	sure 14:6 24:5,10
<b>silts</b> 14:15	36:2,4,13	25:4 26:9,11,15	26:16 36:4 37:13
similar 13:3	smokestack 28:4,5	standing 35:17	surface 11:7 12:3
simplify 38:9	soil 11:9 13:10,19,20	start 15:19 31:16,19	13:20 14:21 15:18
singerman 1:13 2:7	14:13 16:15,25	started 9:16 11:12	18:2 19:8 20:2
5:19,23 30:3,22	19:14 20:2 21:8,16	30:11,12,13	survey 12:2 14:22
31:8 34:25	21:17,19,20,23,23	state 1:17,18,20	swift 32:21
sir 37:17	21:24 22:1,3,6,8,10	3:15 5:5 18:11 24:2	swingsets 34:21
sit 37:12	22:13,17 24:19 25:1	24:12,12 26:23 33:4	symbols 13:18
site 1:3 2:8 4:14 5:4	25:18,22 33:19,21	33:25 38:22	system 6:19 12:20
6:12,15,20 7:6,9,12	34:4,4,6,16 35:2,10	state's 34:14	27:2 34:17
7:19,23,24 8:4,11	36:8,16 38:2	states 3:4	systems 16:13
8:12,21,23 9:17,19	soils 16:17 22:10	stating 4:2	t ·
10:8,20 11:6,9 12:7	24:21 38:1	steak 9:12	t 35.22 37.18
12:9,11,11,15,25	solicit 3:17	stenographer 3:21	tail 19.7
13:21,25 14:5,9,11	solid 13:19	3:22 4:3 26:19	take 18.16 19.17
14:13 15:9,9,21,23	solution 32:16	step 18:14,15	27.3 33.18 35.4
16:2,5,9,17 17:13	somebody 9:14 17:5	stopping 38:14	36.22 37.5
17:14,14,22 18:19	20:11	storage 16:8,22	takan 7.25 16.23
19:13,16 20:13,14	sore 37:21	storms 37:18,18	27.16 26.5 6
20:24 21:18 22:3,9	sort 15:1	straight 32:22	27.10 30.3,0
22:12 24:8,18 27:21	sound 30:23	straighten 33:5,8,9	tally 25.6 25.16
32:4 35:1,8,24 36:7	source 10:7 19:5	33:11 34:2,14	talk 25.0 55.10
37:5 38:7	22:21 25:19	straightening 33:16	10.11 22.10 22
sites 6:6,17,17,20,23	sources 16:7,21	street 1:21 32:3	19.11 52.10,25
31:23	south 14:23 15:15	structurally 30:22	55.24 talks 28.10
sits 32:2	southwestern 16:9	studies 6:24,25 7:3	tamos 1:14 2:11
situ 21:19 23:6	speak 39:4	study 7:4 13:13	A.12 20.22 21.2
24:22	speaker 8:1	stuff 27:6 32:23	4.13 20.22 21.2
situation 16:3	speaking 3:8,11	37:15	22.17 27.7,10 20.4
situations 20:10	4:13	substantial 8:17	20.22 29.1 50.7
six 8:9 14:16 38:6	specialist 1:19 5:6	substrate 33:7,20	35.15 54.2,9 55.25
skvoark 34:15	<b>spell</b> 26:20	subsurface 14:25	50.5,10 50.21 59.7
skvorak 32:6,6	spelling 4:3	17:19	tanks 10.15
33:18 35:12	spent 10:10	sufficient 31:15,17	tasked 10.19,24
slide 13:22 14:23	spot 28:16,17,17	suggesting 34:19	tee 9:4 23:10 20:10
15:8 16:4,14 17:9	sprayed 9:16	summarized 11:10	tech 1,15,9,2,7,11,2
18:7 19:14 20:18	sprayer 9:16	summer 31:16	tell 1:15 8:2,7 11:2
22:4 23:21 24:25	spraying 17:6	sunk 20:15	torm 15.25 10.24
25:5,9,12,20	spring 31:14	superficial 34:12	24.4 0 24 25.17
slides 10:21	spurs 8:20	superfund 1:3 2:6	24.4,7,24 23:17
slim 37:24	st 8:22 27:22 32:14	5.21 6:4,5,15,22 7:7	10.21
		10:22	

Veritext/NJ Reporting Company

800-227-8440

# [testing - years]

Page 10

	27 12 22 14 22	1	· · · · · · · · · · · · · · · · · · ·
testing 11:20,23	37:18 38:11,23	use 8:15 22:14 23:6	week 4:9
tetra 1:15 8:2,7 11:2	toxic 5:23	23:9 27:1 28:4	welcome 2:4 3:2
text 28:3	toxicity 24:7	36:23 37:1 38:20	welcoming 3:12
thank 3:5 4:23 5:1	trace 11:24	usually 36:13	wells 10:3 11:6,14
8:5 20:20 21:2	transcript 39:7	v	11:15,15 12:6,8,18
26:16 29:20 31:6,20	transportation	v · 32.6	12:21 13:2,4,18
35:18 37:15,16	33:16	valuable 39.1	20:15 23:1,16
38:15,16,24,25 39:1	trap 32:15	vanar 13.5 19.18 21	went 9:15 32:20
39:5,6	treat 21:18,21	vapor 13.5 17.10,21	west 13:24 14:7,12
thin 14:13,14 15:1	treated 23:4	vegetation 18.22	17:13,14 18:5
15:12	treatment 12:20	ventiquattro 34.5	western 16:20 19:25
thing 21:12 32:13	22:9 23:15	village A:24 25:7	wetland 17:15 18:3
38:8	tree 37:11	26.11 27.2 20.22	18:22,25 19:25
things 9:8,9 11:17	trichloroethylene	20.11 27.2 29.23	.24:22 25:3
16:7 17:7 18:24,25	28:10	36.74 38.11 24	wetlands 11:8 12:4
19:9 20:6 26:25	trickles 23:18	30.24 30.11,24	13:24 14:3,12 17:4
32:7 34:20,23 37:3	trickling 15:14	vinagers 51.5	18:3 21:9
38:9	try 19:17 24:7 35:9	virginia 3.10	white 15:1 29:6,7
think 9:20 14:16	38:2	visits 50.7	whitham 1:23 3:22
24:17 27:9 36:10	trying 18:8 25:13	volume 24.7	wilna 5:3 32:7 35:21
third 19:15 22:5	37:5	volume 24.7	37:19
23:6 24:18	turbines 30:16,18	W	wind 33:5
thomas 34:5	turned 13:2	w 26:23	wise 38:12
threat 7:23 22:11	turning 25:7	walls 30:25	wishes 33:12
three 12:6	two 5:3,5 6:24 9:5,7	want 3:5,7,9 4:17	wondering 20:3
thrilled 29:16	12:13 18:15 22:14	21:2 24:5,10 28:14	woods 14:2
tiles 28:3	22:16	31:7 35:15 38:6,24	words 13:13 15:18
time 3:5 5:4 7:24	type 14:17 37:3	38:25 39:7	15:23 17:18 18:22
10:16 11:6 17:21	typically 28:11	wanted 9:14 11:21	19:6 32:10
20:17 27:9,19 30:12	u	washington 1:21	work 3:16 5:11 6:11
32:19 38:5 39:2	u 26·23	waste 5:24 6:1,6,7,9	8:6 24:17 25:9
times 32:17	underlying 36.19	6:17,21	worked 5:4
today 8:19 9:6	underneath 14.17	water 9:21 10:1 11:7	workers 35:3
tonight 4:9,16 12:20	17.15 34.6	12:3 13:20 14:10	works 5:15
24:15 39:2	understanding 0.1	15:10 16:1 17:17,25	worst 6:16
top 14:10 15:2,6	10.13	18:2 19:8 20:16	worth 26:4 38:7
22:15 23:17 33:18	underwoor 28.1.1	23:2,12,16,18,20	writing 4:7,17
36:16	underwear 20.1,1 unfortunately 21.23	34:21,22 38:5	x
torn 28:21	37.18	watertown 1:3,21	xed 26.25
touching 30:6	united 3.4	5:9 8:25 9:1 14:18	Act 20,23
tower 9:21,21 23:18	unsafe 29.7	way 14:1 18:9 21:4	<u> </u>
23:19	unstable $29.4$	27:14,18 34:3	year 13:9 25:24 39:6
town 1:4,6,6,9 5:3	unner 8.21 9.22 25	ways 5:25 7:5 18:9	years 8:9 9:22 32:13
10:3 17:25 26:12	17.12	we've 19:19 21:3	33:1 36:16
32:7 35:21 36:24	1/.12	24:10	

Veritext/NJ Reporting Company

800-227-8440

## [yellow - zone]

yellow 25:13
york 1:6,12,12,13,17
1:18,20,21 5:12,13
5:16,20 18:11 24:2
24:12 33:4,25
Z
<b>zone</b> 17:16

Page 11

# Veritext/NJ Reporting Company

800-227-8440

#### **RESPONSIVENESS SUMMARY**

## APPENDIX V-e

#### LETTERS RECEIVED DURING THE COMMENT PERIOD

# TOWN OF WILNA

414 State Street Carthage, New York 13619-1414 TDD# 1-800-622-1220

Town Clerk Mary M. McMahon Office: (315) 493-2771 Fax: (315) 493-8155

Highway Supt. Patrick O'Meara Office: (315) 493-3330 Fax: (315) 493-3330 Home: (315) 493-6109

January 9, 2012

Ms. Pamela Tames, P.E. US Environmental Protection Agency Region 2 290 Broadway, 20<sup>th</sup> Floor New York, NY 10007-1866

#### Re: Site 623010, Crown Cleaners, Herrings (V), Jefferson County

Dear Ms. Tames:

I first want to take this opportunity to thank you for your ongoing efforts through EPA to address short/long-term issues/concerns associated with contaminate/s in the Village of Herrings water supply, stemming from the Crown Cleaners of Watertown, Inc. Superfund Site. Also, I want to convey to you the interest and intent of the town and village in acquiring the property for public use and developing it as an active recreation park.

While privately owned at this time, the property owner has expressed interest and intent in giving the site to the Village of Herrings and/or the Town of Wilna for use as a public recreation park. Committed to assuming responsible public ownership of the property, the town and village have invested in legal counsel to guide next steps to indemnify the municipalities from future liabilities originating from the site. At such time indemnification can be assured, local officials will be in a position to advance efforts to acquire the property.

Constructed in the late 1800's from materials commonly used in paper mills, the wooden roof and floors have rotted through to the cellar to expose the building remnants to the natural elements. Once a vibrant and vital part of our community and local economy during the late 1800's through the mid 1900's as a paper mill, the 9-acre site now reflects a fenced in area with overgrown underbrush and vegetation surrounded by partially collapsed, decaying, blighted and dangerous industrial buildings. Vacant for over 20 years, time will only expedite the existing conditions of the buildings. Furthermore, lead and/or asbestos remnants remaining in the buildings will continue to leach contaminates into the area. As a local official I am concerned that if the issues/concerns associated with the site are not fully addressed at this time, public safety will be further jeopardized while costs to construct an active public recreation park any time soon will be prohibitive to the local community.

We are an equal opportunity provider and employer. Complaints of discrimination should be sent to: USDA, Director, Office of Civil Rights, 1400 Independence Ave., S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 or (202) 720-6382 (TDD).

Supervisor Paul H. Smith Office: (315) 493-3058 Fax: (315) 493-8155 Home: (315) 493-2549

> Councilman Marco Franchini Michael Storms Daniel Nevills Francis Skvorak

I want to take this opportunity to reiterate my appreciation for your ongoing efforts to resolve this matter and to clearly state my support for expanding the preferred EPA remedy as presented at the January 3, 2012 public meeting at the Village of Herrings Municipal Building to address the broader safety issues/concerns associated with the Crown Cleaners of Watertown, Inc. A forbidden & attractive nuisance passively inviting curious youth and unsuspecting passersby to explore, needs to give way to the public for reuse as a recreation park, realignment of NYS Route 3 and downtown revitalization efforts. Therefore, I am requesting EPA fully invest an additional \$900,000 to the proposed \$7,606,000 to address the broader issues/concerns of public safety, facilitate public reuse of the site and maximize cost efficiencies and effectiveness. If you have any questions/comments regarding this matter, please feel free to contact me at (315) 493-2771.

Sincerely,

Paul Smith Supervisor

Cc: Richard Beirman, Mayor of the Village of Herrings Lincoln Fancher, NYS DEC Region 6 Congressman William Owens Senator Patty Ritchie Senator Charles Schumer Senator Kristin Gillibrand Assemblyman Kenneth Blankenbush



*5*.

Herrigs EPA Report Francis J. Burke to:

Pam Tames 01/10/2012 04:20 PM Hide Details From: "Francis J. Burke" <fjburke@swbell.net>

To: Pam Tames/R2/USEPA/US@EPA

Dear Pamela,

I lived in the area for my first 18 years and read with interest in the January 5, 2012 edition of the Carthage Republican Tribune about the recent meeting with regard to the clean up of what was left by the Crown Cleaners at the former St Regis Paper Mill in the village of Herrings, New York.

I did not live in the area when the Crown Cleaners was in operation but I did live in the area when a Dry Cleaning service existed in the garage adjacent to the house across the road from the entrance to the Hydro-Electric Powerhouse at Herrings. (Look up the location on Google Earth)

I am wondering if per chance any spillage from this dry cleaning service was taken into account with regard to your pollution findings.

Sincerely,

Francis J Burke Tulsa, Ok

# CROWN CLEANERS OF WATERTOWN, INC. SUPERFUND SITE RECORD OF DECISION

#### **APPENDIX VI**

#### STATEMENT OF FINDINGS: FLOODPLAINS AND WETLANDS

#### RECORD OF DECISION CROWN CLEANERS OF WATERTOWN, INC. SUPERFUND SITE STATEMENT OF FINDINGS: FLOODPLAINS AND WETLANDS

#### Need to Affect Floodplains and Wetlands

Approximately 1.4 acres of a 100-year floodplain is located within the site boundary. The floodplain is associated with the Black River and occupies the southern extent of the study area. No portions of the 500-year floodplain are located within the Study area.

New York State Department of Environmental Conservation (NYSDEC) and United States Department of the Interior National Wetland Inventory (NWI) data regarding mapped freshwater wetlands were reviewed for the study area. Two NWI mapped wetlands were identified on the site. Approximately 0.79 acre of these mapped features occurred within the site boundary. These NWI mapped wetlands included a palustrine scrub shrub broad leaved deciduous seasonally flooded/saturated wetland located along the western site boundary and a lower perennial riverine, unconsolidated bottom, permanently flooded surface water body (the Black River) located along the southern site boundary. Two additional NWI mapped wetlands occur within the off-site portion of the study area, approximately 800 feet southwest of the site. These mapped wetlands total 0.84 acre and consist of palustrine forested, broad leaved deciduous, seasonally flooded/saturated wetlands. NYSDEC mapped wetlands were not identified within the Study area.

A significant amount of debris, including, paper waste from the former paper factory, old appliances, and several drum carcasses, is located in the wetland to the southwest.

Soils located on the floodplain and sediments located in the wetland located immediately west of the site and the wetland located to the southwest of the site are contaminated with volatile organic compounds (VOCs), metals, and polycyclic aromatic hydrocarbons (PAHs). The Baseline Ecological Risk Assessment prepared for this site determined that these contaminated areas pose risks to ecological receptors. Specifically, in the wetland sediments, the screening assessment, using benthic community benchmarks for community level impairment, identified PAHs, chlordane, antimony, arsenic, cadmium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium, and zinc as posing a potential risk to benthic community structure and function. The results of the baseline risk assessment indicate that the contaminated soils on the site, including those located in the floodplain pose an unacceptable risk to human health due, primarily, to the presence of VOCs, PAHs, and metals. Accordingly, remedial action alternatives were developed in the fasibility study (FS) report to
remediate site soils and the wetland and floodplain areas. The selected remedial alternative S-3 includes, among other things, the excavation of contaminated soils and sediments from the floodplain and wetlands.

In addition to the selected remedy, the FS also considered a No Action alternative, which does not entail excavation of contaminated wetlands/floodplains sediments/soils. Under the No Action alternative, the highly contaminated sediments/soils would remain in place, posing a high risk to on-site ecological receptors, and would remain as a source of contamination for other areas. Thus, the no action alternative would not be protective of ecological or human receptors. The implementation of any of the action alternatives developed in FS would be more protective of human health and the environment than the no-action alternative since they would meet the remedial action objectives and preliminary remediation goals for the site and would result in residual risks less than the no-action alternative.

The Environmental Protection Agency (EPA) and NYSDEC have determined that there is no practicable alternative that is sufficiently protective of human health and the environment which would not result in the excavation of the sediments and soils located in the floodplain and wetlands. Consequently, since remedial action is necessary, any remedial action that might be taken would necessarily affect the floodplain and wetlands associated with the Crown Cleaners of Watertown, Inc. site.

## Effects of Proposed Action on the Natural and Beneficial Values of Floodplains and Wetlands

Excavation of contaminated sediments and soils in the wetlands and floodplain will result in temporary, localized disturbance to the wetlands and floodplain. The total construction period is estimated at nine months. It is not anticipated that implementation of the selected remedy will result in any significant alteration of the existing site hydrology, which is critical for wetland restoration.

The principal benefit of EPA's selected remedy will be the removal of sediment-bound contaminant mass from the wetlands and soil-bound contaminant mass from the floodplain. The contaminated sediments will be removed from the wetlands and will no longer function as a source of contamination for the downstream areas or pose risk to ecological receptors. In this context, the selected remedy will have a substantial positive impact on both the natural and beneficial values of the floodplain and wetlands.

## Compliance with Applicable State or Local Floodplain Protection Standards

All remedial work in the wetlands and floodplain bed will need to comply with the substantive requirements of with New York State Environmental Conservation Law Article 24 and 6 NYCRR Part 663 requirements, as well as Executive Order 11990, 40 CFR Part 6 Appendix A, "Statement of Procedures on Floodplains Management & Wetlands Protection," and Section 404 of the Clean Water Act.

## Measures to Mitigate Potential Harm to the Floodplains and Wetlands

The following mitigation measures will be undertaken to reduce impacts on floodplains and wetlands:

• Engineering procedures (*e.g.*, berms, silt curtains, etc.) will be applied to the wetlands during remediation to prevent spreading of contaminated sediments particularly during a flood event.

• Restoration of the disturbed remediated wetlands and floodplain soils will include backfilling the excavated areas with clean material that is compatible with wetland, floodplain, and stream restoration, and the areas will be re-planted with appropriate native species.

Existing floodplain resources that will be affected by the selected remedial action will be addressed and restored.

During the remedial design phase of the project, a wetlands restoration monitoring plan will be devised, to ensure that wetlands restoration achieves the desired results, and to protect against the establishment of unwanted invasive species.

Routine inspection of the restored wetlands will be conducted for several years' to ensure adequate survival of the planted vegetation. Replanting will be performed, if necessary.