SDMS Document
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RECORD OF DECISION

Hooker Chemical/Ruco Polymer Superfund Site

Town of Oyster Bay, Hicksville
Nassau County, New York

United States Environmental Protection Agency
Region II
New York, New York
September 2000

500001

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Hooker Chemical/Ruco Polymer Superfund Site
Town of Oyster Bay, Hicksville, Nassau County, New York

Superfund Site Identification Number: EPA ID # NYD002920312
Operable Unit 3

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Hooker Chemical/Ruco Polymer Superfund Site (Hooker/Ruco Site), which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 400. This decision document explains the factual and legal basis for selecting the remedy for this Site.

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

The information supporting this remedial action decision is contained in the administrative record for this Site. The index for the administrative record is attached to this document (Appendix III).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Hooker/Ruco Site, if not addressed by implementing the response actions selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to the public health or welfare, or to the environment.

DESCRIPTION OF THE SELECTED REMEDY

The remedial action described in this document represents the third remedial phase or operable unit involving the Hooker/Ruco Site. It addresses the downgradient commingled contaminated groundwater plume beyond the Hooker/Ruco Facility and also the contaminated groundwater beneath the Hooker/Ruco Facility which was previously included as part of the first operable unit (OU-1) remedy.

The selected groundwater remedy includes in-situ treatment of the vinyl chloride monomer (VCM) subplume by bioremediation using

biosparging (and supplemental nutrient addition, if necessary) to achieve cleanup standards and prevent the need for supplemental treatment at the downgradient Northrop Treatment System.

The major components of the remedy include:

- The use of biosparging technology in an in-situ application to enhance the VCM degradation with the goal of achieving State drinking water standards or Federal maximum contaminant levels (MCLs). Biosparging is a form of bioremediation that involves the introduction of air/oxygen into the aquifer to increase the dissolved oxygen content in the aquifer, which will enhance aerobic degradation of the VCM subplume.

- Vertical injection wells will be installed in the area of the VCM subplume to a depth of 200 to 400 feet. Additives (air/oxygen, nutrients) will be forced into the formation using either static head within the well or using pump-supplied pressure.

- Vadose zone or unsaturated zone monitoring program will be implemented to ensure that air stripping of VOCs, particularly VCM, is not occurring as a result of biosparging.

- If necessary, the selected remedy will also utilize a supplemental aerobic bioremediation technology following the biosparging treatment. Supplemental bioremediation would involve the injection of nutrients (potentially including nitrogen and phosphorus along with suitable carbon sources such as methane) to enhance the growth and metabolic activities of indigenous microbial populations to effect the degradation of VCM in the aquifer.

- A long-term monitoring program will be developed to monitor groundwater quality in the area of the VCM subplume and to evaluate the fate and migration of VOCs southward and westward beyond the VCM subplume. New monitoring wells would be added to the existing network of monitoring wells to increase the network's area of coverage. The objective of the long-term monitoring program is to evaluate the effectiveness of the selected remedy.

The selected remedy is also based on the recognition that an existing groundwater extraction and treatment system (Northrop Treatment System) which is operating as an Interim Remedial Measure at the downgradient Northrop/Grumman Aerospace Corporation (Northrop) Site is containing and remediating a commingled plume of trichloroethylene (TCE) and perchloroethylene (PCE) contamination from the Northrop, Naval Weapons Industrial

Reserve Plant and the Hooker/Ruco Sites. EPA's selected remedy, designated as Operable Unit Three (OU-3), together with the Northrop Treatment System, which is expected to continue to operate for at least the next thirty years, will prevent further migration of groundwater contamination and will effectively address the contamination emanating from the Hooker/Ruco Facility.

If it is determined during the implementation and long-term monitoring of the selected remedy that the technology selected is not effective in adequately reducing the VCM concentrations in a reasonable time frame, then VCM subplume extraction and treatment would be implemented as a contingency remedy. Further, if either the Northrop treatment system or the VOC removal system ceases operation before the regional aquifer is restored, or if the Northrop Treatment System is not capturing contaminants emanating from the Hooker/Ruco Facility, EPA would re-evaluate the protectiveness of the selected remedy.

The components of the contingency remedy include:

- Extraction and treatment of groundwater within the area of the VCM subplume with a goal of achieving State drinking water standards or Federal MCLs.

- Extraction wells would be placed in the area of highest concentration of VCM and at the leading edge of the VCM subplume.

- The extracted water would be sent to an air stripping treatment system, which will be constructed within the vicinity of the Hooker/Ruco Facility.

- The treated effluent would be discharged to a recharge basin on the Hooker/Ruco Facility.

- A long-term monitoring program will be developed to monitor groundwater quality in the area of the VCM subplume and to evaluate the fate and migration of VOCs southward and westward beyond the VCM subplume. New monitoring wells would be added to the existing network of monitoring wells to increase the network's area of coverage. The objective of the long-term monitoring program would be to evaluate the effectiveness of the selected contingency remedy.

The Remedial Action Objectives for groundwater are to protect human health from exposure (via ingestion, inhalation, and dermal contact) to VCM, TCE, PCE and tentatively identified compounds (TICs) in groundwater at concentrations in excess of New York

State groundwater standards and Federal MCLs and also to restore the aquifer to meet New York State Groundwater Standards and New York State and Federal MCLs in a timely manner.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA §121, 42 U.S.C. §9621. It is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume of contaminants as their principal element.

Because this remedy will result in hazardous substances remaining at the Site above levels that allow for unlimited use of and unrestricted exposure to the Site, a review will be conducted at least once every five years after commencement of the 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.

- Chemicals of concern and their respective concentrations (see ROD, pages 14-16);
- Baseline risk represented by the chemicals of concern (see ROD, pages 16-22);
- Cleanup levels established for chemicals of concern and the basis for these levels (see ROD, pages 21 and Appendix II);
- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater considered in the baseline risk assessment and ROD (see ROD, pages 17-19);
- How source materials constituting principal threats are addressed (see page 30);

- Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see ROD, pages 32-35);

- Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see ROD, page 31); and

- Key factors that led to selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (see ROD, pages 36-40).

Jeanne M. Fox
Regional Administrator

Date 9/29/00

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SITE NAME, LOCATION AND DESCRIPTION

The Hooker Chemical/Ruco Polymer Site (Hooker/Ruco Site) is located off of New South Road in Hicksville, Town of Oyster Bay, Nassau County, New York, approximately 25 miles east of New York City (see Figure 1, which is a compilation of several United States Geological Survey (USGS) topographic maps showing the Hooker/Ruco Site and its surroundings). The Hooker/Ruco Site includes an active chemical manufacturing facility in a heavily industrialized section of Hicksville. The facility (Hooker/Ruco Facility or Facility), which is currently owned and operated by Sybron Chemicals, Inc., contains six buildings used for the manufacture and storage of chemical products (Plants 1,2,3, the Pilot Plant, a warehouse, and an administration building)(see Figure 2). The remainder of the 14-acre facility contains parking areas, chemical storage tanks, four recharge basins (sumps) and small ancillary buildings. The facility currently employs approximately 100 people.

Historically, the two major industrial facilities in the area of the Hooker/Ruco Site were the Northrop Grumman Aerospace Corporation (Northrop) and the Naval Weapons Industrial Reserve Plant (NWIRP). The NWIRP, which is within the footprint of the Northrop complex, is now shut down and the Northrop operations are substantially downsized. Northrop and the U.S. Navy are both in the process of transferring parcels of their property to other parties. There are many other small industries, commercial operations, residential areas, utilities, transportation corridors, and storm-water management basins in the area.

Commerce Street and adjacent industrial development comprise the 880-foot northern Hooker/Ruco Facility boundary. Along the Facility's 1,000-foot eastern side is a large warehouse building formerly-owned by Northrop. A small portion of undeveloped land abuts the Hooker/Ruco Facility's 250-foot southern property boundary. Two active tracks of the Long Island Railroad parallel the Hooker/Ruco Facility's 940-foot southwestern property boundary. The Hooker/Ruco Facility is bounded on its 270-foot western boundary by New South Road. The property is enclosed by a chain-link fence. Four surface-water sumps are located on the Hooker/Ruco Facility along the eastern property boundary.

The area surrounding the Hooker/Ruco Site also includes residential complexes. Residential dwellings comprise approximately 22 percent of the area and are located southwest of the Hooker/Ruco Facility. Approximately 65 percent of the area land use is industrial or commercial.

SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

Site remediation activities are sometimes segregated into different phases, or operable units (OUs), so that remediation of different environmental media or areas of a site can proceed separately, resulting in an expeditious remediation of the entire site. EPA has designated three separate distinct phases or OUs for this site. The OUs for this Site are divided as follows:

- OU-1: Addresses the majority of the Ruco property soil contamination.
- OU-2: Addressed the PCB-contaminated soils.
- OU-3: Addresses the downgradient commingled contaminated groundwater plume beyond the Hooker/Ruco Facility and the contaminated groundwater beneath the Hooker/Ruco Facility which was previously included under OU-1.

Subsequent to EPA's issuance of the January 1994 Record of Decision (ROD) for OU-1, which called for soil flushing and extraction and treatment of groundwater beneath the Hooker/Ruco Facility, the Northrop Treatment System and the coordinated groundwater investigations were completed. Based on the results of the groundwater investigations, which included sampling and analysis of wells beyond the Hooker/Ruco Facility, EPA reevaluated the need to extract the groundwater at the Hooker/Ruco Facility boundary. OU-3 now addresses the downgradient commingled contaminated groundwater plume beyond the Hooker/Ruco Facility and also the contaminated groundwater beneath the Hooker/Ruco Facility which was previously included under OU-1. The soil flushing component of the OU-1 ROD will be implemented. The source of water to be used for soil flushing will no longer be from an extraction and treatment system.

The primary objectives of the remedial action described in this ROD are to reduce contaminant levels in groundwater to achieve State drinking water standards or Federal MCLs; to prevent the need for supplemental treatment at the Northrop Treatment System; and to protect human health and the environment from risks associated with the contaminated groundwater.

HOOKER/RUCO SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Hooker/Ruco Site was developed by the Rubber Corporation of America, a small, privately-held company. Operations at the Hooker/Ruco Site began in 1945 and included natural latex

storage, concentration and compounding. Five years later, the company began producing small volumes of plasticizers. These activities were expanded and modified throughout the years. In 1956, a polyvinyl chloride (PVC) plant was built and was initially operated under the name of Insular Chemical Corporation. At that time, the two companies, Insular Chemical Corporation and the Rubber Company of America occupied the Hooker/Ruco Site. Although they were two separate corporations, they shared the same pilot plant. The two companies eventually merged into the Rubber Corporation of America. In 1965, the company was purchased by the Hooker Chemical Company (currently known as the Occidental Chemical Corporation or Occidental) and was known and operated as the Ruco Division. In 1982, the employees of the Ruco Division bought the company from Occidental and it became known as the Ruco Polymer Corporation (not affiliated with Occidental). In 1998, Sybron Chemicals Inc., acquired the Ruco Polymer Corporation. The facility is currently used for the production of various polymers, PVC, styrene/butadiene latex, vinyl chloride/vinyl acetate copolymer, and polyurethane, as well as ester plasticizers.

During Hooker/Ruco Site operations between 1956 and 1975, industrial process wastewater and storm water runoff from the facility was discharged to six on-Site recharge basins or sumps. This wastewater contained, among other things, vinyl chloride, trichloroethylene, barium and cadmium soap, vinyl acetate, organic acids, and styrene condensate. Drums containing various chemicals were also stored on-Site where occasional spills would occur. As a result of these releases, groundwater beneath and downgradient from the Hooker/Ruco Site has been contaminated. Limited areas of residual soils contamination exist above levels that would be considered protective of groundwater quality. Currently, only noncontact cooling water is discharged into one sump (No. four) and a sump that collects surface water run-off (No. three). From 1975 to 1991, a concrete settling basin was used to store ester waste prior to being incinerated on-Site. Ester wastes are presently stored in an on-Site, aboveground tank prior to off-Site disposal or incineration on-Site. Hazardous wastes are stored in drums on-Site until they are disposed of at a permitted off-Site facility.

From 1946 to 1978, the pilot plant used a heat transfer fluid called Therminol, which contained PCBs. During this period of operation of the facility, there was a release of Therminol to the soil adjacent to the pilot plant. Some of this contaminated soil was spread to surrounding areas by surface water runoff, sediment transport, and truck traffic.

Initial investigations by Occidental were started at the Hooker/Ruco Site in 1978. Originally, efforts were directed towards understanding past manufacturing processes, waste generation and disposal. A Site background report was prepared in 1981. This report presented the Site in the context of its surroundings and examined waste disposal, regional geology and hydrogeology, regional water withdrawals and water quality. At that time, the New York State Department of Environmental Conservation (NYSDEC) was the lead government agency. A work plan for conducting a soil and groundwater investigation was submitted to the NYSDEC in 1983. This work plan was approved in 1983 and the investigation commenced. The investigation consisted of installing and sampling six groundwater monitoring well clusters at locations downgradient of suspected areas of waste disposal, the drilling and sampling of two deep test borings in formerly active sumps, and drilling and sampling four shallow borings in the vicinity of the reported Therminol spill. The results of this study were presented in a report entitled "Report of Groundwater & Soils Investigation at the Former Ruco Division Plant Site, Hicksville, New York" dated August 1984.

These initial investigations led to the Hooker/Ruco Site being placed on the National Priorities List (NPL) in 1984.

From March 1985 to September 1988 a series of investigations were conducted in an attempt to further define the nature and extent of the contamination at the Hooker/Ruco Site.

In July 1988, EPA notified Occidental and Ruco Polymer of their potential liability and offered them the opportunity to conduct a Remedial Investigation and Feasibility Study (RI/FS). In September 1988, Occidental agreed to perform the RI/FS and entered into an Administrative Order on Consent with EPA. In September 1989, RI/FS field work commenced. Field work was completed in February 1990 and a draft RI Report was submitted in April 1990. Portions of the RI Report pertaining to the PCB-contaminated areas were approved to expedite the remediation of those areas. Based on the partially approved RI Report, a Focused Feasibility Study (FFS) was prepared by Occidental and approved by EPA in August 1989.

A ROD for OU-2 which addressed a PCB-contaminated area surrounding the pilot plant building and a portion of sump No. three, was issued by EPA on September 28, 1990. A Special Notice letter for implementation of the OU-2 remedial design/remedial action (RD/RA) was sent to Occidental and Ruco Polymer on December 20, 1990. An Administrative Order was issued unilaterally by EPA to Occidental and Ruco Polymer on June 27,

1991. Notices of Intent to Comply with the Order were submitted by both Occidental and Ruco Polymer on July 17, 1991.

Occidental has assumed responsibility for the OU-2 RD/RA. Mobilization for the performance of the OU-2 RA took place on May 4, 1992. Field operations for the work were monitored by an EPA oversight contractor. A notice of Final Inspection was received by EPA on July 22, 1992. EPA inspected the Site on September 3, 1992 and concluded that the remedial action was completed. Occidental's Remedial Action Report was approved on March 12, 1993. This concluded the activities associated with OU-2. The remainder of the RI report was approved in December of 1992.

In January 1994, also based on the results of the 1992 RI, EPA issued a second ROD (OU-1) which called for additional soil sampling, excavation of shallow soils in limited areas and soil flushing with extraction and treatment of contaminated groundwater beneath the Hooker/Ruco Facility. EPA unilaterally issued an administrative order to implement the OU-1 ROD. A pre-design Workplan for addressing the soil component of the OU-1 ROD is being prepared to better delineate the soil areas to be flushed. Thereafter, EPA and NYSDEC began to reevaluate the remedial approach for groundwater under the OU-1 ROD.

In April 1994, under EPA's direction, Occidental initiated a program to further investigate groundwater conditions beyond the Hooker/Ruco Facility which involved collecting additional groundwater data around and primarily west of the Hooker/Ruco Facility. These activities are described in the document entitled "Work Plan for Groundwater Investigations Beyond the Hooker/Ruco Facility, August 1994" and in a subsequent Addendum, dated September 1995.

Since the groundwater contamination associated with the Hooker/Ruco Facility has commingled with groundwater contamination from the Northrop and NWIRP sites, in the Spring of 1995, EPA and NYSDEC agreed to proceed with a coordinated effort to evaluate and develop remedial alternatives to address the commingled plume.

<u>The Northrop Site</u>

The Northrop site was initially more than 600 acres in area. However, as a result of several remedial activities taken at the Northrop Site, NYSDEC has reclassified some portions of the site and delisted other portions of the site from the New York State Registry of Inactive Hazardous Waste Disposal Sites.

The Northrop plant was established in the early 1930's and developed and manufactured a series of naval carrier aircraft, amphibious vehicles and space exploration vehicles. The main activities of this facility were the engineering, manufacturing, primary assembly, and research, development and testing of a variety of military and aerospace crafts. The plant is presently undergoing closure operations. The facility included numerous buildings and seven industrial production wells. The recharge basins located in the southern end of the property received treated industrial wastewater from the late 1940's until 1981. Since 1981, treated wastewater has been discharged to a sanitary sewer and the recharge basins have been used to discharge only non-contact cooling water and storm water runoff. Discharges to the on-Site recharge basins are regulated in accordance with a State Pollutant Discharge Elimination System (SPDES) permit. Between 1996 and 1998, a soil vapor extraction (SVE) system was operating on a portion of the Northrop site in order to remediate the soil. An RI was conducted at the Northrop site between 1991 and 1994. The RI included the investigation of chemical and waste storage and disposal areas.

Naval Weapons Industrial Reserve Plant (NWIRP)

The NWIRP facility was established within the Northrop site during the early 1930's. Historically, this was a government-owned and contractor-operated facility with the mission of design engineering, research prototyping, testing, fabrication and primary and subassembly of various naval aircraft. Several waste source areas were identified at the site during an investigation, which was conducted from 1991 to 1995. Currently, air sparging technology and an SVE system are being operated at the NWIRP site for soil remediation.

Coordinated Groundwater Investigation

EPA and NYSDEC have identified that the regional groundwater aquifer in the area downgradient of the Hooker/Ruco Facility has also been contaminated by the Northrop and the NWIRP sites. These two facilities are designated as NYSDEC hazardous waste sites. Northrop is a potentially responsible party (PRP) for the Northrop site and the National Division Naval Facilities Engineering Command (the U.S. Navy) is a PRP for the NWIRP site. Figure 3 provides an outline of the Hooker/Ruco, Northrop and NWIRP facilities. Northrop has signed a Consent Order and the U.S. Navy has signed a Memorandum of Understanding with NYSDEC for the performance of an RI/FS at their respective facilities. The RIs for the Northrop and NWIRP sites were completed in September 1994 and October 1993, respectively. Based on the findings of these reports, Northrop and the U.S. Navy have

implemented two groundwater interim remedial measures. One measure provides for VOC removal and treatment at the Bethpage Water District wells downgradient of the Northrop/NWIRP sites. The second measure consists of pumping and treatment of groundwater from four wells (GP-1, ONCT-1, 2 & 3) at the Northrop facility and includes a long-term groundwater monitoring program.

While EPA and NYSDEC have conducted independent investigations of the source areas at each of the three sites, the Agency and the State have coordinated the investigation of the regional groundwater contamination to avoid duplication of effort. The regional groundwater contaminant plume contains VOCs which are related to past waste disposal at each of the facilities and which have commingled. Based on the available data, the Northrop, NWIRP and Hooker/Ruco facilities are sources of TCE, perchloroethylene (PCE), vinyl chloride monomer (VCM), semivolatile organic compounds (SVOCs) and inorganics. The main source of VCM, however, is attributed to historic wastewater discharges from the Hooker Ruco Facility. In the Spring of 1995, EPA and NYSDEC agreed to proceed with a coordinated effort to evaluate and develop remedial alternatives to address the commingled plume. In November 1998, EPA directed Occidental to prepare an FS which addressed the VCM subplume within the regional groundwater plume and NYSDEC directed Northrop and NWIRP to prepare an FS to address the remainder of the regional VOC groundwater plume. It is noted that the decision to approach remediation of the regional plume in this manner was based on administrative and not technical considerations. In the Fall of 2000, NYSDEC intends to issue a Proposed Plan which, in addition to addressing the regional groundwater contamination, will identify source control measures for the Northrop and NWIRP sites. The FS prepared by Occidental for addressing the VCM subplume was completed in July 2000.

The RI/FS Reports for Operable Unit 3 (OU-3), the OU-3 Proposed Plan and Responsiveness Summary, along with other Site-related documents, provide the basis for this Record of Decision.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The OU-3 RI/FS Reports and the Proposed Plan for the Site were released to the public for comment on July 28, 2000. These documents, as well as other documents in the Administrative Record (see Administrative Record Index, Appendix III) have been made available to the public at two information repositories maintained at the EPA Docket Room in Region II, New York, NY and the Hicksville Public Library, located at 169 Jerusalem Avenue, Hicksville, NY. A public notice announcing the public meeting on the Proposed Plan as well as the availability of the above-

referenced documents was published in *Newsday* on July 28, 2000. The public notice established a thirty-day comment period.

The public meeting was held at the Oyster Bay Town Hall, located at 54 Audrey Avenue, Oyster Bay, New York to present the Proposed Plan to interested citizens and to address any questions concerning the Plan and other details related to the RI/FS Reports. Responses to the comments and questions received at the public meeting, along with other written comments received during the public comment period, are included in the Responsiveness Summary (see Appendix V).

EPA subsequently received a request for an extension of the public comment period through September 12, 2000. The Agency's decision to extend the comment period was announced at the August 15, 2000 public meeting on the Proposed Plan, as well as publicized through mailings to more than 400 interested parties on the site mailing list.

SUMMARY OF SITE CHARACTERISTICS

As discussed above, a RI was completed in December 1992. As part of the RI, a total of 32 monitoring wells in the immediate vicinity of the Hooker/Ruco Facility were sampled and analyzed. Based on the sampling conducted prior to, and during the RI, the evidence indicates that groundwater beneath the Hooker/Ruco Facility contains chemical constituents above the New York State (NYS) drinking water standards, NYS groundwater quality standards and EPA MCLs. Groundwater containing VCM, PCE, dichloroethylene (DCE), TCE, tentatively identified compounds (TICs) and arsenic is moving downgradient from the Hooker/Ruco Facility.

In April 1994, under EPA's direction, Occidental initiated a program to investigate groundwater conditions beyond the Hooker/Ruco Facility which involved collecting additional groundwater data around and primarily west of the Hooker/Ruco Facility. The activities were described in the document entitled "Work Plan for Groundwater Investigations Beyond the Hooker/Ruco Property, August 1994" and in a subsequent Addendum, dated September 1995.

Since the groundwater contamination associated with the Hooker/Ruco Facility has commingled with groundwater contamination from the Northrop and NWIRP sites, in the Spring of 1995, EPA and NYSDEC agreed to proceed with a coordinated effort to evaluate and develop remedial alternatives to address the commingled plume.

The additional groundwater investigations (see July 2000 RI Report) performed at the Hooker/Ruco Site included the following activities:

- Collection and analysis of 133 hydropunch samples.
- Collection and analysis of 14 wells installed during the Beyond Ruco Property (BRP) investigations at eight different locations plus two wells (MW-50J1 and MW-50J2) installed during the RI.
- Collection and analysis of groundwater samples from Northrop Wells GP-6, GP-8 and GP-14.
- Collection and analysis of 20 existing wells on and in close proximity to the Hooker/Ruco Facility to determine current groundwater chemical concentrations.
- Collection and analysis of groundwater samples from seven wells to determine whether natural attenuation processes (e.g., biodegradation) are contributing to the reduction of groundwater chemical concentrations.

Physical Site Conditions

The 14-acre triangular shaped Hooker/Ruco Facility is composed of parking areas, undeveloped land, industrial buildings and chemical storage structures. As shown on Figure 2, Commerce Street and adjacent industrial development comprise the 880 foot northern Site boundary. Along the Facility's 1,000-foot eastern side is a large warehouse building owned by Northrop. A small portion of undeveloped Northrop land abuts the Facility's 250-foot southern property boundary. Two active tracks of the Long Island Rail Road (LIRR) parallel the Facility's 940-foot southwestern property boundary. The Facility is bounded on the 270-foot western boundary by New South Road. The property line is demarcated by a chain-link fence which completely encompasses the Hooker/Ruco Facility.

Vehicular access to the Site is via New South Road. South and southeast of the parking lot area is approximately 3 acres of undeveloped land. Access to the active areas of the Facility is along a paved roadway passing a security building and freight scales. The paved roadway extends to the central, eastern and southern portions of the Facility.

In addition to vehicular traffic, a spur of the LIRR enters the property's southwestern boundary. The rail spur, once on the Facility, splits into two diverging sidings, one that progresses

east toward the corners of Plants 2 and 3, and the other siding angling south between Plant 1 and the warehouse.

Plant 1, located in the south/central portion on the Facility, is the largest structure, comprising approximately 44,800 square feet. The single-story brick building, built in 1945, consists of manufacturing and latex storage. A small office complex was added to the building's front side in 1964 and houses the plant's engineering division. The northern portion of Plant 1 contains a small laboratory.

Adjacent to, but south of Plant 1, is a warehouse, constructed of sheet metal, installed in 1952 covering approximately 12,000 square feet. The warehouse is used for storage of raw and finished stock. A loading dock for shipping and receiving is located in the northern portion of the building.

Northeast of Plant 1 is a small, approximately 2,300 square foot, brick and sheet metal structure, termed the Pilot Plant. The Pilot Plant, installed in 1945, is an independent facility used to pilot test new/emerging products prior to full production.

The Plant 2 complex is located in the north/central portion of the Facility and is composed of Plant 2, an adjacent tank farm, and a small, 300-square foot refrigerated building, termed the cold room, which was an integral part of the discontinued plastic manufacturing process. Plant 2, built in 1956, is composed of the filter storage and reactor buildings covering approximately 11,000 square feet. The filter storage building in the southern portion of Plant 2 contains offices, a small laboratory and maintenance, with the rotary drier associated with production in the rear of the building. Adjacent, in the northern half of Plant 2, are a series of chemical reactors used in the production stages of manufacturing. Because of the reactor's dimensions, the northern half of Plant 2 is a two-story building.

North of Plant 2 is an above-ground tank farm, previously used to store raw plastic stocks, and currently storing solvents and alcohols. The tank farm consists of a 30,000-gallon, two 25,000-gallon and three 15,000-gallon above ground horizontal storage tanks. These storage tanks are surrounded and separated by a 5-foot earthen dike. Just to the east of the tank farm is the cold room.

Plant 3 is an approximately 10,800-square-foot, two-story, sheet metal building, located in the central portion of the Facility. Plant 3 is primarily used for raw and finished stock storage. Adjacent to Plant 3, along the building's south side, are five 100,000-gallon silos used for product storage.

The administration building is approximately 7,700 square feet and is located along the Facility's northern boundary. The administration building, formerly the plastic research and development complex, has been converted from a laboratory to offices for corporate accounting and production personnel. Use of the rear of the building was discontinued in 1975. With the exception of an ester tank farm, all of the structures at the Facility are currently in use.

Four surface water sump basins are located along the Facility's eastern property boundary. Sumps No. 1 and No. 2 are located in the southern portion of the Facility, southeast of Plant 1. Sump No. 1 is approximately 5 feet deep, has been partially backfilled and contains a series of six concrete settling basins. Sump No. 2 is adjacent to Sump No. 1. Sump No. 3, installed in 1968, is located east of the Pilot Plant and contains surface water derived from plant runoff. Sump No. 4, located east of Plant 2, also contains standing surface water. The interior of Sump No. 4 has been subdivided into three substructures by an earthen dike.

Sumps No. 5 and No. 6 have been backfilled to grade surface and are not topographically represented. Sump No. 6 was approximately 5,000 square feet and square in shape. The sump was located adjacent to Sump No. 4 in the area between Plant 2 and the cold room. Sump No. 5 was a rectangular shaped sump along the Facility's northeastern-most boundary and covered approximately 8,000 square feet.

Water supply at the Facility is now derived from city water mains running beneath the Facility from New South Road. A 150,000-gallon tank and two 400-square-foot cooling water towers are located along the Facility's eastern boundary. Miscellaneous structures, including a pump house and two maintenance garages, are located in the vicinity adjacent to sump No. 3. Electrical power is brought to the Facility via above ground utility poles and below-grade electrical lines. Three transformer vaults distribute the electricity to individual buildings. The transformer vault, adjacent to Plant 1, consists of three transformer banks. The Facility is currently served by a public sanitary sewer system. In the past, septic waste was discharged to on-Site septic systems.

The surface of the Facility slopes gently to the south and is primarily permeable except for the presence of the buildings and limited paved areas. Surface water from precipitation drains from the buildings, paved areas and other areas into a recharge basin (Sump No. 3) located along the eastern edge of the Facility.

Geology and Hydrogeology

There are three major aquifers underlying the Site. These are: the unconfined Upper Glacial aquifer; the semi-confined Magothy aquifer; and, the confined Lloyd Sand aquifer. The total thickness of these three aquifers beneath the Site is approximately 1,200 feet. The two aquifers of environmental concern for this Site are the Upper Glacial and the Magothy; the Lloyd Sand is a deep aquifer (1000 feet) and is not hydrogeologically connected to the above aquifers. Studies have indicated that the Upper Glacial and Magothy aquifers are hydrogeologically connected under the Site. The Magothy aquifer is totally dependent upon downward percolating rainfall and recharge from the overlying Upper Glacial deposits for its replenishment.

The Raritan Formation is an Upper Cretaceous age coastal plain deposit which lies unconformably on the bedrock below and consists of two members. The lower member is the Lloyd Sand, the top of which is about 750 feet below sea level. This is a stratified deposit of sand, gravel, sandy clay, silt and clay generally occurring in discontinuous and lenticular beds. The upper member is the Raritan Clay, which is composed of primarily silt and clay, but which has some lenses of sand and clayey sand. The Raritan Clay functions as an aquiclude, separating the ground water within the Lloyd Sand from the groundwater within the overlying Magothy Formation. Beneath the Site, the Lloyd Sand is approximately 200 to 300 feet thick and the relatively impermeable Raritan Clay is approximately 160 feet thick. The total formation thickness ranges from 300 to 600 feet and is the deepest unconsolidated deposit beneath the Site.

The Magothy Formation is a thick sequence of Upper Cretaceous age sediments which were deposited upon the underlying Raritan Formation. At the Site, the Magothy Formation is approximately 680 feet thick and is composed of marine and terrestrially deposited, stratified, coastal plain sediments. The sediments are primarily fine sand, clayey sand, silt and clay, but may also contain discontinuous lenses of coarse sand and gravel.

Lying unconformably on the Magothy Formation are glacio-fluvial outwash deposits from the Quaternary Age. These Pleistocene deposits which comprise the Upper Glacial aquifer deposits are approximately 30 to 50 feet thick directly under the Site. The Upper Glacial sediments consist of horizontally stratified beds of fine to coarse sands and gravel. The Magothy and the Upper Glacial aquifers have historically been distinguished by differences in sediment color, texture and composition.

The direction and relatively rapid rate of shallow (near the top of the water table) groundwater flow beneath the Site is southerly. The water table at the Site was found to be between 50 to 60 feet below the surface. Deeper into the Magothy aquifer, the groundwater flow is to the south with an easterly component of flow that results from the influence of high pumping rates at the Northrop site adjacent to the Site.

Groundwater supplies the public and private needs of the entire population of Nassau County. The two most commonly tapped aquifers for water supply purposes are the Upper Glacial and the Magothy. The Magothy aquifer is the primary source of potable drinking water in the area of the Site. Water is pumped from municipal supply wells to the homes and businesses in the vicinity of the Site. The Hicksville, Bethpage and Levittown Water Districts supply the businesses and residents in the vicinity of the Site as well as areas to the south. All of the local public supply wells are advanced to and completed within the Magothy aquifer. The nearest municipal well field is located upgradient at 2,000 feet to the north of the Hooker/Ruco Facility (Hicksville supply wells). The groundwater flow in this area is to the south. Other municipal supply wells are located 3,500 feet to the west (Hicksville supply well) and 6,000 feet to the east (Bethpage supply well). Municipal well fields located down-gradient are 5,500 feet southwest (Hicksville and Levittown) and approximately 10,000 feet south-southeast (Bethpage supply wells).

The industrial area, including the Site, as well as the surrounding residential areas are above the groundwater aquifer that supplies the surrounding communities with water. This aquifer is designated as a sole source aquifer.

Ecology

The Hooker/Ruco Facility is fully developed as an industrial facility and is surrounded by industrial and residential properties. There are no natural surface water bodies, wetlands, or sensitive flora or fauna within the Site. The only observed animal life on-Site were Canadian geese, that are nesting in known contaminated areas. However, they are not expected to be part of a higher food chain, and therefore, any impacts to the geese on-Site are not expected to affect the area wildlife population.

The contaminants of concern are located in the groundwater starting at a depth of approximately 50 feet below ground surface. A screening evaluation of ecological risk was conducted as part of the 1992 RI. Through this evaluation, EPA has determined that there are no significant ecological resources in

the area of the site, and no evident pathways by which Site contaminants could migrate and create ecological risk concerns.

Groundwater Contamination

As a result of the field work and sampling performed both as part of the RI for the Site and the adjacent Northrop and NWIRP sites, the nature and extent of chemical contamination was further defined at these properties. A general discussion of these findings is presented below. For a more complete examination of the analytical results of the RI/FS, see Tables 1 through 10. Figure 4 provides an outline of borehole, monitoring well and pumping well locations. Figure 5 summarizes VOC compounds detected in groundwater above ARARs. Figures 6 - 8 summarize TCE, PCE and VCM concentrations from the OU-3 remedial investigation.

The groundwater sampling and analyses conducted for the Northrop, NWIRP and Hooker/Ruco sites indicated that past activities at each of the sites have resulted in the contamination of groundwater resources within the Upper Glacial aquifer and Magothy aquifer. Sampling demonstrated that the groundwater beneath the Hooker/Ruco Facility, specifically underlying the southeastern portion of the Facility, and beneath the Northrop and NWIRP sites, contains chemical constituents above the NYS drinking water standards, NYS groundwater quality standards and EPA MCLs. The NYSDEC and EPA have determined that the primary groundwater contaminants of concern in the region of the three sites are VOCs (primarily TCE, PCE and VCM). The secondary contaminants are SVOCs, TICs, and inorganics which are associated with the three sites as noted below:

1) Hooker/Ruco: TICs (including glycols and acids) and metals;

2) Northrop: inorganics including arsenic, cadmium, and chromium, and;

3) NWIRP: SVOCs including: bis[2-ethylhexyl]phthalate, di-n-butylphthalate, di-n-octylphthalate, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, naphthalene, acenaphthylene, fluoranthene, benzo[b]fluoranthene, pyrene and TICs including polyaromatic hydrocarbons, substituted benzenes, alkanes, substituted phenols, and carboxylic acids; and inorganics including cadmium, chromium and thallium.

The most prevalent VOCs and their corresponding maximum concentrations detected in the groundwater in the vicinity of the sites were as follows: TCE at 58,000 parts per billion (ppb) at

NWIRP, 25,000 ppb at the Northrop facility; and 1100 ppb at the Hooker/Ruco Facility. The highest concentrations of PCE detected were 490 ppb at the Northrop site and 350 ppb at the Hooker/Ruco Facility. Similarly, the highest concentrations of VCM detected were 6,400 ppb at the Hooker/Ruco Facility in the area of monitoring well 52 (MW-52 area) and 550 ppb at Northrop. The highest concentrations of total SVOCs and VOC TICs detected at the Hooker/Ruco Facility were 5100 ppb and 493 ppb, respectively. Individual TIC concentrations ranging from 2 ppb to 800 ppb were detected in two of the wells located at the downgradient boundary of the Hooker/Ruco Facility. In addition, antimony and arsenic were detected at the Hooker/Ruco Facility at concentrations as high as 22 ppb and 83 ppb, respectively. Based on computer-generated groundwater plume modeling developed as part of the Northrop RI Report (prepared by Geraghty and Miller (G&M) in 1994) and the report entitled "Regional Groundwater Feasibility Study," prepared by G&M in March 1998, VOC-impacted groundwater beneath and downgradient of each of the three sites is estimated to be approximately 12,100 feet long (along its north-south axis) 9,600 feet wide (along its east-west axis) and 580 feet deep (at its deepest point). The Northrop FS addresses this plume in detail. Similarly, using G&M's computer-generated groundwater plume modeling, the area of the VCM subplume is estimated to be 2000 feet long (at its longest point), by 1350 feet wide (at its widest point), by 430 feet deep.

In general, the regional direction of the shallow horizontal groundwater flow is to the south/southeast away from the sites. Because of the direction of groundwater flow, the fact that a total of 14 production wells at these sites have historically pumped as high as 12 to 14 million gallons a day and that recharge occurs at the Northrop and NWIRP sites, much of the VOC-impacted groundwater from all three sites has been drawn onto and/or beneath the Northrop and NWIRP sites. However, because the degree of hydraulic containment obtained from the production wells was not 100 percent, some of the VOC-impacted groundwater has migrated downgradient. In addition, available data indicate that several public supply wells from the Bethpage Water District have been affected by VOCs which are likely attributed to all three sites. These supply wells, however, have been equipped with VOC treatment units provided by Northrop and NWIRP. The water fed to these distribution systems continues to meet all New York State and Federal drinking water standards. Currently, there are no private drinking water supply wells in the residential areas surrounding the sites. A Nassau County ordinance, Public Health Ordinance Article IV, prohibits the installation of new private drinking water wells in areas served by public water. As discussed in the above Section on Geology and Hydrogeology, the public water supply is obtained from the sole source groundwater aquifer.

SUMMARY OF SITE RISKS

Based upon the results of the 1992 RI, EPA conducted a baseline risk assessment to estimate the potential risks associated with current and future exposure to Hooker/Ruco Site contaminants. Since this operable unit is focused on groundwater, the baseline assessment estimates the human health and ecological risk which could result from exposure to the contaminated groundwater at the Hooker/Ruco Site if no remedial actions were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action.

Human Health Risk Assessment

The Hooker/Ruco Facility is currently zoned industrial with residential neighborhoods in close proximity. Currently, there are no private drinking water wells on the Hooker/Ruco Facility or in the adjacent residential areas surrounding the Hooker/Ruco Site. EPA believes that, based on the historical uses of the Hooker/Ruco Facility, the most reasonably anticipated future land use of the Hooker/Ruco Facility is most likely to be commercial/industrial. However, a resident was assumed to live at the downgradient property line and use the sole source aquifer as a water supply. Therefore, the baseline risk assessment focused on potential future health effects for both adults and children, in a residential setting, that could result from potential exposure to groundwater via ingestion, inhalation, and dermal contact.

A four-step process is utilized for assessing Site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification*--identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration. *Exposure Assessment*--estimates - the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed. *Toxicity Assessment*--determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). *Risk Characterization*--summarizes and combines results of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks.

Hazard Identification

In this step, the contaminants of concern (COCs) at the Hooker/Ruco Site in groundwater were 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. Several inorganic chemicals and organic compounds meeting appropriate QA/QC requirements were selected as COCs because of the potential hazard they pose to human health and the environment under current and future conditions. The COCs in the groundwater at the Hooker/Ruco Site include organic compounds and metals such as VCM, tetrachloroethene, PCE, TCE, bis(2-ethylhexyl) phthalate, arsenic, antimony, and beryllium. Of these chemicals, arsenic and VCM are classified as Class A carcinogens; known to cause cancer in humans.

Table 11 summarize the chemicals detected in the groundwater at the Hooker/Ruco Site. This table include the range of concentrations detected for each chemical (minimum and maximum), the mean concentration, and the 95% upper confidence limit on the mean concentration.

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. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to 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.

At the Hooker/Ruco Site, the complete exposure pathways evaluated were groundwater ingestion, inhalation, and dermal contact. The potentially exposed populations evaluated were future residential adults and children.

The exposure parameters representing such values as exposure frequency, exposure duration, body weight, groundwater ingestion rate, etc. are found in Tables 12 and 13. These values are used in the exposure equations to calculate chronic daily intakes.

Toxicity Assessment

In this step, the types of adverse health effects associated with chemical exposures, and the relationship between the magnitude of exposure (dose) and severity of adverse effects (response) are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health effects, 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 effects.

Oral and inhalation cancer slope factors and oral and inhalation reference doses were used to estimate the carcinogenic risks and noncarcinogenic hazards associated with Hooker/Ruco Site contaminants. The chronic toxicity information for the COCs based on information in EPA's Integrated Risk Information System (IRIS), the 1997 Health Effects Assessment Summary Tables, and from EPA's National Center for Environmental Assessment Superfund Technical Support Team is found in Table 14.

A number of chemicals lack adequate toxicity information to quantify the potential risks and hazards associated with exposure. A list of the chemicals not quantitatively evaluated are provided in the Hooker/Ruco Site documents. Lack of data to quantify risks and hazards for these chemicals may cause the risks and hazards at the Hooker/Ruco Site to be underestimated.

Risk Characterization

This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of Hooker/Ruco 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 one additional cancer may be seen in a population of 10,000 people as a result of exposure to Hooker/Ruco Site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk to a reasonably maximally exposed individual 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). Action is generally warranted when excess lifetime cancer risk exceeds one-in-ten-thousand (10^{-4}).

For noncancer health effects, a hazard index (HI) equal to or less than 1.0 is considered an acceptable exposure. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The Reference Dose (RfD) represents a level that an individual may be exposed to that is not expected to cause any deleterious effects. The ratio of exposure to toxicity is represented as a Hazard Quotient. Hazard Quotients less than 1 indicate that a receptor's dose of a single contaminant is less than the RfD, and that toxic noncarcinogenic effects from that chemical are unlikely. The HI is the sum of multiple chemical exposures across multiple routes. The key

concept for a noncancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which noncancer health effects are not expected to occur. An HI greater than 1.0 indicates a potential for noncarcinogenic health effects.

The results of the baseline risk assessment indicate that the current use of groundwater at the Hooker/Ruco Site is not a risk since no one uses the groundwater for domestic purposes. The future residential groundwater use scenario showed unacceptable risks to human health. Future groundwater ingestion exposures yielded carcinogenic risks to adults of 2.2×10^{-3} and 8.8×10^{-4} for children. The groundwater inhalation exposure to adult residents in the future use scenario results in a potential carcinogenic risk of 5.0×10^{-4}. Tables C-1 and C-2 of the Risk Assessment and Table 2.1 of the FS Report show that the majority of the carcinogenic risk (65 to 99 percent) can be attributed to potential exposure to the VCM. Potential groundwater ingestion by adults and children also yielded HIs of 4.89 and 10.2, respectively. The cancer risk values and noncancer hazard indices for the residential adult and child can be found in Tables 15 and 16, respectively.

The groundwater risk calculations were prepared using the data set in the 1992 RI Report which showed a maximum VCM concentration of 560 ppb. More recent groundwater sampling data contained in the 2000 RI Report has shown higher VCM concentrations with a maximum value of 6,400 ppb. These more recent sampling results showing higher VCM concentrations would produce carcinogenic risks estimates from exposure to groundwater greater than the risks listed above and would also be considered unacceptable.

The results of the risk assessment indicate that the potential for carcinogenic risks and noncarcinogenic hazards exists for future adult and child residents through exposure to contaminated groundwater at the Hooker/Ruco Site especially from the VCM. Remedial action is warranted to address the unacceptable groundwater cancer risks greater than 10^{-4} and noncancer HIs greater than 1.0.

Ecological Risk Assessment

As discussed in above in the Section on Ecology, the Hooker/Ruco Facility is fully developed as an industrial facility and is surrounded by industries and residential properties. The media of concern for this operable unit is groundwater. Since there are no natural surface water bodies or wetlands within the Hooker/Ruco Site vicinity, there is no potential for the migration of contaminated groundwater to impact ecological resources. The only observed animal life at the Hooker/Ruco Site

were transient Canada geese, which would not come into contact with contaminated groundwater. The results of this evaluation indicate that the contaminated groundwater at the Hooker/Ruco Site does not pose an unacceptable ecological risk.

Discussion of Uncertainties in Risk Assessment

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

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

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

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

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

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the Risk Assessment Report.

Actual or threatened releases of hazardous substances from the Hooker/Ruco Site, if not addressed by the selected alternative or

one of the other remedial measures considered, may present an imminent and substantial endangerment to the public health, welfare, 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), site-specific risk-based levels and the most reasonably anticipated future land use for the Hooker/Ruco Site (that is, industrial/commercial use).

The Risk Assessment has identified a number of contaminants of concern (COCs) in the groundwater. As stated previously, the COCs in the groundwater of the Hooker/Ruco Site include organic compounds and metals such as vinyl chloride, tetrachloroethene, PCE, TCE, bis(2-ethylhexyl) phthalate, arsenic, antimony, and beryllium. The contaminants in the groundwater pose a future carcinogenic and noncarcinogenic health risk to residents who may reside at the downgradient (southern) Hooker/Ruco Facility boundary. These contaminants in groundwater are subject to a number of regulations for cleanup and discharge. These regulations include the New York State Water Quality Regulations, specifically, 6 NYCRR and 10 NYCRR as well as Federal MCLs. A complete list of the groundwater ARARs is included in Table 17. The treatment of groundwater will also address compounds which are not COCs, but exceed the ARARs.

The following remedial action objectives were established for the Hooker/Ruco Site:

1) Protect human health from exposure (via ingestion, inhalation, and dermal contact) to VCM, TCE, PCE and TICs in groundwater at concentrations in excess of New York State groundwater standards and Federal MCLs.

2) Restore the aquifer to meet New York State Groundwater Standards and New York State and Federal MCLs in a timely manner.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected remedy be protective of human health and the environment, be cost-effective, comply with other laws and regulation, and utilize permanent solutions, alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for

the reduction of toxicity, mobility, or volume of the hazardous substances.

The active remedial alternatives for the contaminated groundwater originating from the Hooker/Ruco Site were designed to primarily address the VCM subplume. VOC's other than VCM would be addressed by the Northrop Treatment System. EPA recognizes that this system as it is currently designed, would be unable to treat the VCM subplume without the system exceeding its air discharge limitations. This treatment system is expected to require more than 30 years of operation to restore the aquifer to meet drinking water standards.

The remedial alternatives developed to address the VCM subplume at the Hooker/Ruco Site are presented in detail below.

The construction time for each alternative reflects only the time required to construct or implement the remedy and not the time required to design the remedy, negotiate its performance by the parties responsible for the contamination, or procure contracts for design and construction.

SUMMARY OF GROUNDWATER REMEDIAL ALTERNATIVES

ALTERNATIVE 1: NO FURTHER ACTION

Capital Cost:	$0
Annual Monitoring Cost:	$6000
Construction Time:	N/A
30-Year Present Worth Monitoring Cost (7% discount factor):	$74,000

The Superfund program requires that the "No-Action" Alternative be considered as a baseline level to which other remedial technologies and alternatives can be compared.

The No Further Action Alternative does not include any remedial measures to address the groundwater contamination at the Hooker/Ruco Site. It is recognized, however, that the regional VOC plume is being addressed by the Northrop Treatment System, which has been demonstrated to contain and prevent further migration of the portion of the plume that remains upgradient of the extraction system.

Because this alternative would result in elevated concentrations of VCM contamination remaining at the Hooker/Ruco Site above health-based levels, CERCLA requires that the remedy be reviewed every five years to evaluate groundwater conditions.

This alternative would include a long-term groundwater monitoring program. Under this monitoring program, groundwater samples would be collected and analyzed semi-annually.

The No Further Action Alternative would also include the development and implementation of a public awareness and education program for the residents in the area surrounding the Hooker/Ruco Site. This program would include the preparation and distribution of informational press releases and circulars and convening public meetings. These activities would serve to enhance the public's knowledge of the conditions at the Hooker/Ruco Site.

ALTERNATIVE 2: VCM SUBPLUME EXTRACTION, TREATMENT AND DISCHARGE TO ACHIEVE GROUNDWATER ARARS

Capital Cost:	$ 4,195,000
Annual O&M Cost:	$ 722,000
Construction Time:	12-18 Months
Present worth cost (operating period of 30 years at a discount factor of 7%):	$13,200,000

Alternative 2 involves extraction and treatment of groundwater within the area of the VCM subplume with a goal of restoring the water quality of the aquifer to State drinking water standards or Federal MCLs. The State drinking water standard and EPA's MCL for VCM is 2 ppb. The treatment system would be built in the immediate vicinity of the Hooker/Ruco Facility. Conceptually, one extraction well would be placed approximately 500 feet downgradient of the MW-52 area (where current VCM concentrations exceed 1000 ppb) with two additional wells located 1000 feet downgradient of the MW-52 area (where current VCM concentrations range between 10 and 100 ppb). The exact locations of the extraction wells would be determined during remedial design. The three extraction wells were estimated to pump at a combined flow rate of 1000 gallons per minute. The effluent from the treatment system would be discharged to recharge basins on the Hooker/Ruco Site. Based on the hydrogeologic modelling presented in Appendix A of the FS, it is projected that the VCM concentrations in the VCM subplume would be reduced to levels below the MCL of 2 ppb in approximately 30 years. By containing and treating the VCM within the VCM subplume, supplemental VCM treatment would not be required at the downgradient treatment system which Northrop is operating as an interim remedial measure.

Alternative 2 relies on the continued operation of the groundwater extraction and treatment system at the Northrop Facility which is preventing further migration of the regional

VOC plume beyond the Northrop Treatment System. This system is expected to operate for the next 30 years.

A long-term monitoring program will be developed to monitor groundwater quality in the area of the VCM subplume and to evaluate the fate and migration of VOCs southward and westward beyond the VCM subplume. New monitoring wells would be added to the existing network of monitoring wells to increase the network's area of coverage. The objective of the long-term monitoring program is to evaluate the effectiveness of the selected remedy.

If the long-term monitoring program identifies the migration of the VCM subplume farther southward of the Hooker/Ruco Facility beyond the VCM source control wells at concentrations which may require supplemental VCM treatment at the Northrop Treatment System, additional extraction and treatment wells at the Hooker/Ruco Site may be required.

ALTERNATIVE 3: IN SITU TREATMENT OF VCM SUBPLUME BY BIOREMEDIATION USING BIOSPARGING (PLUS SUPPLEMENTAL NUTRIENT ADDITION, IF NECESSARY)

Capital cost:	$1,260,000
O&M costs (per year):	$319,000
Construction Time:	6-8 Months
Present worth cost for 10 years of biosparging and 2 years of nutrient addition (using a discount factor of 7%):	$3,800,000

This alternative utilizes in-situ biosparging technology to treat the VCM subplume. Biosparging is a form of bioremediation and involves the introduction of air/oxygen into the aquifer to increase the dissolved oxygen content in the aquifer, which would enhance aerobic degradation of VCM. This alternative is designed to remove and reduce the concentration of VCM to a level that achieves State drinking water standards or Federal MCLs and whereby supplemental treatment for VCM at the Northrop Treatment System is not required. Aerobic conditions in the aquifer would result in an increased microbial population which would also enhance the degradation of TICs. Aerobic conditions will not enhance the degradation of PCE, and will enhance the degradation of TCE only when sufficient quantities of a suitable carbon source such as methane is present; therefore, the effect of biosparging on TCE and PCE would be limited.

If necessary, this alternative would also utilize a supplemental bioremediation technology following the biosparging treatment. Supplemental bioremediation would involve the injection of nutrients (possibly nitrogen and phosphorus, along with suitable

carbon sources such as methane) to enhance the growth and metabolic activities of indigenous microbial populations to effect the degradation of VCM in the aquifer. The addition of nutrients to stimulate the microbial population would also enhance the degradation of TCE, PCE and TICs. It is estimated that the nutrient addition would occur over a two-year period. The exact nutrient requirement is dependent on the presence of other constituents in groundwater and would be determined through treatability studies.

Conceptually, twelve injection wells would be installed in the area of the VCM subplume to a depth of 200 to 400 feet using common drilling techniques. Additives (air/oxygen, nutrients) would be forced into the formation using either static head within the well or using pump-supplied pressure. Increasing or decreasing the number of air/oxygen and nutrient injection locations and the rate of injection, would also affect the duration. Periodic or pulsed injections (monthly, bimonthly, quarterly) are suitable for biosparging. The exact locations of the injection wells and the treatment scenario would be determined after conducting appropriate pilot studies during remedial design. The primary goal of in-situ biosparging is to reduce the concentration of VCM to the MCL of 2 ppb. Because it is considered an innovative technology, performance criteria would be developed during remedial design to measure the effectiveness of this technology at the Hooker/Ruco Site.

Similar to Alternative 2, to ensure that the regional groundwater VOC plume is adequately addressed, Alternative 3 also relies on the ongoing and anticipated long-term operation of the Northrop Treatment System.

Alternative 3 also would include the same long-term monitoring program described for Alternative 2. Similarly, Alternative 3 also acknowledges the possible need to expand the biosparging system to ensure that the Northrop treatment system will meet its air discharge limitations for vinyl chloride.

COMPARATIVE ANALYSIS OF GROUNDWATER ALTERNATIVES

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

Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with applicable or relevant and appropriate requirements (ARARs) 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. Other federal or state advisories, criteria or guidance are To-be-Considered (TBCs). TBCs are not required by the NCP, but may be very useful in determining what is protective for a site or how to carry out certain actions or requirements.

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. This criteria also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

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

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

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

Cost includes estimated capital and operation and maintenance (O&M) costs, and net present worth costs.

State acceptance indicates whether, based on its review of the RI/FS and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred remedy.

Community acceptance is 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.

Overall Protection of Human Health and the Environment

Alternative 1, No Further Action, would be the least effective of the alternatives in protecting human health and the environment because no active remedial measures are included under this alternative. Furthermore, Alternative 1 would allow the VCM subplume to migrate to the Northrop Treatment System which would cause this system to release unacceptable levels of vinyl chloride to the environment. Alternatives 2 and 3 would be protective of human health and the environment as these would remove a sufficient mass of contamination from the VCM subplume to achieve MCLs and so that supplemental treatment for VCM at the Northrop Treatment System would not be required. Alternative 2 would be more protective than Alternative 3 because Alternative 2 would remove all VOCs to levels that would restore the aquifer to drinking-water quality in the area of the VCM subplume.

Compliance with ARARs

Alternatives 2 and 3, but not Alternative 1, would comply with chemical-specific ARARs, which consist primarily of Federal and State MCLs for the sole source aquifer under Long Island. In time, Alternative 1 would result in the downgradient Northrop Treatment System exceeding its permit limitations for vinyl chloride.

The discharge of treated groundwater to recharge basins under Alternative 2 would also meet groundwater discharge standards. Both Alternatives 2 and 3 would also reduce the concentration of the VCM subplume to the level that supplemental treatment for VCM at the Northrop Treatment System would not be required. For a complete listing of groundwater ARARs see Table 17.

Long-Term Effectiveness and Permanence

Alternative 1 would not be effective in protecting human health and the environment. In fact, Alternative 1 would result in the downgradient Northrop Treatment System exceeding its permit limitation for vinyl chloride. Both Alternatives 2 and 3 would be effective over the long-term in protecting public health and the environment. Both alternatives require long-term operation and both rely on the continued operation of the Northrop Treatment System. However, they are permanent remedies for the restoration of the aquifer to its productiveness as a source of drinking water.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 would provide no additional reduction of toxicity, mobility or volume of the contaminants at the Hooker/Ruco Site

except as provided by the Northrop Treatment System. Alternative 2 would be most effective in reducing the toxicity, mobility and volume of all VOC contaminants, as this alternative would involve an established technology which is more certain to restore the aquifer to drinking water quality in the area of the VCM subplume. Alternative 3, which is an innovative technology, would also reduce the toxicity and volume of VCM, other VOCs and TICs, but perhaps to a lesser extent, through the introduction of air/oxygen, and possibly substrates and nutrients to promote in-situ bioremediation. Alternative 3 would also reduce the VCM subplume to a level that supplemental treatment at the Northrop Treatment System would not be required in order to comply with the air discharge limitation for vinyl chloride. Further, under Alternative 3, any residual contamination that might not be treated by biosparging or bioremediation would be captured and treated by the Northrop Treatment System.

Short-Term Effectiveness

Alterative 1 would not involve any remediation and therefore would not pose any short-term impacts to the Hooker/Ruco Site workers or the community. Over the long-term, however, Hooker/Ruco Site workers and the community would be at potential risk under Alternative 1 because of exposure to VCM at levels that are likely to exceed the air discharge limitations at the Northrop Treatment System. Although Alternative 2 would have potential short-term impacts to the Hooker/Ruco Site workers during the construction of the groundwater extraction and treatment system, these impacts would be minimized by following appropriate health and safety measures. Risks to operators of the treatment system would be minimized by following appropriate operation and maintenance procedures and adhering to personal safety measures. Under Alternative 2, catalytic oxidation would be used to treat the off-gas air stream from the treatment of the VCM in order to protect the on-Site workers and the community. Because there would be fewer construction activities, Alternative 3 would pose less short-term risk to Hooker/Ruco Site workers than Alternative 2. Risks during installation of the air/oxygen delivery systems would be minimized by following appropriate health and safety measures. Risks to operators of the system would be similarly minimized.

A benefit of Alternative 3 when compared to Alternative 2 is that groundwater is not extracted or discharged from/to the aquifer. This would result in less stress to the environment and less chance of exposure to contaminants. Additionally the construction of the treatment system, recharge basins and force mains would not be required.

Implementability

Alternative 1 would be the easiest alternative to implement as it does not include any remedial measures. Alternative 2 would be readily implementable as it is a widely used and proven treatment technology. However, Alternative 2 would take longer to implement than Alternatives 1 and 3, because it would require the construction of a groundwater extraction and treatment system. Alternative 3 would involve installation of a delivery system for providing air/oxygen (and also nutrients, if necessary) for the in-situ treatment of the VCM and would be easier to implement than Alternative 2 because it would have fewer construction activities.

Cost

The present-worth cost of the alternatives are calculated using a discount factor of seven percent and a 30-year time interval for Alternative 2 and 12-year interval for Alternative 3. The estimated capital, operation, maintenance and monitoring (O&M) and present-worth costs for each of the alternatives are presented below:

Alt.	Capital Cost	Annual O&M Cost*	Present-Worth Cost
Alt-1	$0	$6000	$74,000
Alt-2	$4,195,000	$722,000	$13,200,000
Alt-3	$1,260,000	$319,000	$3,800,000

* Alternative 1 includes monitoring cost only.

As can be seen by the cost estimates, Alternative 1 would be the least costly alternative to implement. Alternative 2 would be the most costly alternative to implement. The high cost of implementing this alternative is due to the construction and long-term O&M and monitoring of a groundwater extraction and treatment system.

State Acceptance

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

Community Acceptance

Community acceptance of the proposed remedy for groundwater was were assessed during the public comment period. EPA believes that the community generally supports this approach. Specific responses to public comments are addressed in the Responsiveness Summary (Appendix V).

PRINCIPAL THREAT WASTES

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

SELECTED REMEDY

Based upon the results of the RI/FS and other investigative reports and after careful evaluation of the various alternatives and considering community acceptance of the proposed remedy, EPA has selected Alternative 3 - In-Situ Treatment of the VCM Subplume by Bioremediation using Biosparging (Plus Supplemental Nutrient Addition, if necessary) as the selected remedy for the Hooker/Ruco Site groundwater remediation.

If it is determined during the implementation and long-term monitoring of the selected remedy that the technology selected is not effective in adequately reducing the VCM concentrations in a reasonable time frame, then VCM subplume extraction and treatment will be implemented as a contingency remedy.

Summary of the Rationale for the Selected Remedy

The selected remedy will provide the best balance of trade-offs among the alternatives with respect to the evaluating criteria as described below.

Alternative 3 is being selected because it is a cost-effective and reliable measure to significantly decrease the VCM concentrations within the center of the subplume in a relatively short time frame, compared to the other treatment alternative.

The remedy will permanently mitigate the threat posed by VCM, and will result in less disruption of the Hooker/Ruco Facility than Alternative 2. Alternative 3 will remove and reduce the concentration of VCM to a level that achieves State drinking water standards or Federal MCLs and whereby supplemental

treatment for VCM at the Northrop Treatment Facility will not be required.

A benefit of Alternative 3 when compared to Alternative 2 is that groundwater is not extracted from or discharged to the aquifer. Additionally, the construction of a treatment system, recharge basins and force mains will not be required. Therefore, Alternative 3 will result in less stress to the environment than Alternative 2.

Alternative 3 relies on the continued operation of the Northrop Treatment System to address the commingled VOC groundwater plume. This system, which is expected to operate for the next thirty years, will also prevent the plume's further migration.

The Selected Remedy will be protective of human health and the environment, will comply with ARARs, will be cost-effective, and will utilize permanent solutions and treatment technologies to the maximum extent practicable.

Description of Selected Remedy

The selected remedy is Alternative 3: In-Situ Treatment of VCM Subplume by Bioremediation Using Biosparging (Plus Supplemental Nutrient Addition, If Necessary). The components of Alternative 3 include the use of biosparging technology in an in-situ application to enhance the VCM degradation. Biosparging is a form of bioremediation and involves the introduction of air/oxygen into the aquifer to increase the dissolved oxygen content in the aquifer, which would enhance aerobic degradation of VCM. The goal of the selected remedy is to remove and reduce the concentration of VCM to achieve the State drinking water standard and Federal MCL of 2 ppb whereby supplemental treatment for VCM at the Northrop Treatment System is not required. Aerobic conditions in the aquifer will result in an increased microbial population which will also enhance the degradation of TICs. Aerobic conditions will not enhance the degradation of PCE, and will enhance the degradation of TCE only when sufficient quantities of a suitable carbon source such as methane is present; therefore, the effect of biosparging on TCE and PCE would be limited.

If necessary, the selected remedy will also utilize a supplemental bioremediation technology following the biosparging treatment. Supplemental bioremediation will involve the injection of nutrients (potentially including nitrogen and phosphorus along with suitable carbon sources such as methane) to enhance the growth and metabolic activities of indigenous microbial populations to effect the degradation of VCM in the aquifer. The addition of nutrients to stimulate the microbial

population will also enhance the degradation of TCE, PCE and TICs. It is estimated that the nutrient addition will occur over a two-year period to effectively enhance the degradation of the VOCs. The exact nutrient requirement is dependent on the presence of other constituents in groundwater, and will be determined through treatability studies.

Conceptually, twelve injection wells will be installed in the area of the VCM subplume to a depth of 200 to 400 feet using common drilling techniques. Additives (air/oxygen, nutrients) could be forced into the formation using either static head within the well or using pump-supplied pressure. Increasing or decreasing the number of air/oxygen and nutrient injection locations, and the rate of injection, would also affect the duration. Periodic injections (monthly, bimonthly, quarterly) are suitable for biosparging. The exact locations of the injection wells and the treatment scenario will be determined after conducting appropriate pilot studies during remedial design. Although in-situ biosparging has been used effectively at other sites, because it is considered an innovative technology, the performance criteria used to measure the effectiveness of this technology at the Hooker/Ruco Site will also need to be developed during the remedial design phase. A vadose zone or unsaturated zone monitoring program will be implemented to eliminated/minimized the air stripping of VOCs, particularly VCM, as a result of biosparging.

As stated previously, the selected remedy addresses the downgradient commingled contaminated groundwater plume beyond the Hooker/Ruco Facility and the contaminated groundwater beneath the Hooker/Ruco Facility which was previously included as part of the remedy in the OU-1 ROD.

A long-term monitoring program will be developed to monitor groundwater quality in the area of the VCM subplume and to evaluate the fate and migration of VOCs southward and westward beyond the VCM subplume. New monitoring wells will be added to the existing network of monitoring wells to increase the network's area of coverage. The objective of the long-term monitoring program is to evaluate the effectiveness of the selected remedy. If it is determined during the implementation and long-term monitoring of the selected remedy that the technology selected is not effective in adequately reducing the VCM concentrations in a reasonable time frame, then VCM Subplume Extraction and Treatment (Alternative 2) will be implemented as a contingency remedy.

In order to ensure that the regional groundwater plume is adequately addressed, the selected remedy also relies on the ongoing and anticipated long-term operation of the Northrop

Treatment System. If this system ceases operation before the aquifer is restored, or if the Northrop system is not capturing the contamination emanating from the Hooker/Ruco Facility, EPA will re-evaluate the protectiveness of the selected remedy.

The components of the contingency remedy include extraction and treatment of groundwater within the area of the VCM subplume with a goal of restoring the water quality of the aquifer to State drinking water standards or Federal MCLs. The State drinking water standard and EPA's MCL for VCM is 2 ppb. The treatment system would be built at the southwest corner of the Hooker/Ruco Site. Conceptually, one extraction well would be placed approximately 500 feet downgradient of the MW-52 area (where current VCM concentrations exceed 1000 ppb) with two additional wells located 1000 feet downgradient of the MW-52 area (where current VCM concentrations range between 10 and 100 ppb). The exact locations of the extraction wells will be determined during remedial design. The three extraction wells will pump at a combined flow rate of 1000 gallons per minute. The treated effluent from the treatment system would be discharged to recharge basins on the Hooker/Ruco Site. Based on the hydrogeologic modelling presented in Appendix A of the FS, it is projected that the VCM concentrations in the VCM subplume would be reduced to levels below the MCL of 2 ppb in approximately 30 years. By containing and treating the VCM subplume, potential need for supplemental VCM treatment at the downgradient Northrop Treatment System would not be a concern.

Summary of the Estimated Remedy Costs

The estimated present worth cost to implement the selected remedy is $3,800,000. The capital cost for the remedy is estimated to be $1.2 million and the estimated average annual O&M costs are approximately $319,000 (biosparging). The present worth costs are calculated using a discount factor of seven percent and a 12-year interval.

The estimated present worth cost to implement the contingency remedy (pump and treat) is $13,200,000. The capital cost for the remedy is estimated to be $4,195,000 and the estimated average annual O&M cost are approximately $722,000 (pump and treat). The present worth costs are calculated using a discount factor of seven percent and a 30-year operating period.

The information in this cost estimate summary is based on the best available information regarding the anticipated scope of the remedial alternatives. These are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project. Changes in the cost elements are likely to occur as a result of new information and data

collected during the engineering design of the components of this remedial alternative. Major changes may be documented in the form of a memorandum in the administrative record file, an Explanation of Significant Differences (ESD), or a ROD amendment.

Expected Outcomes of Selected Remedy

The selected remedy will adequately reduce the toxicity and volume of VCM, and to a lesser extent, other VOCs and TICs to a cleanup level achieves State drinking water standards or Federal MCLs and that would not require supplemental treatment at the downgradient Northrop Treatment System. Further, under the selected remedy, any residual contamination that might not be treated by biosparging or bioremediation would be captured and treated by the Northrop Treatment System. The selected remedy, together with the Northrop Treatment System is expected to effectively capture and treat the contamination emanating from the Hooker/Ruco Facility and to restore the aquifer to its beneficial use.

The selected remedy poses very few short-term risks to site workers when compared to Alternative 2 (under which catalytic oxidation would be used to treat the off-gas air stream from the treatment of the VCM) because there will be very few construction activities under this remedy. Further, the selected remedy will be easier to implement than Alternative 2 for the same reason.

Design of the selected remedy system is expected to take approximately one year and construction is expected to take six to eight months.

STATUTORY DETERMINATIONS

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

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment. The selected remedy is designed to reduce the concentration of VCM to a level that achieves State drinking water standards or Federal MCLs and whereby supplemental treatment for VCM at the Northrop Treatment System is not required. To ensure that the regional VOC groundwater plume is adequately addressed, the selected remedy recognizes and relies on the ongoing and anticipated long-term operation of the Northrop Treatment System. The selected remedy also recognizes that the Northrop system is expected to continue to prevent further migration of the plume it contains and that the system is expected to operate for the next thirty years. As the Northrop and NWIRP sites are New York State-lead sites, EPA and NYSDEC agreed to undertake a coordinated effort to address the commingled plume. This approach acknowledges that there are both administrative and practical considerations behind the division of responsibility for components of the remedial work so as to avoid duplication of efforts and the resulting expense to all parties involved. As such, EPA and the State's remedies will each target different facilities and different contaminants, though some overlap may be inevitable; when conducted together, these components will eventually result in the groundwater meeting the drinking water standards.

Available data indicate that several public supply wells from the Bethpage Water District have been affected by VOCs attributable to the commingled plume emanating from the three sites. These supply wells, however, have been equipped with VOC treatment units provided by Northrop and the U.S. Navy. The water fed to these distribution systems continues to meet all New York State and Federal drinking water standards. Currently, there are no private drinking water supply wells in the residential areas surrounding the three sites. A Nassau County ordinance, Public Health Ordinance Article IV, prohibits the installation of new private drinking water wells in areas served by public water.

Compliance with ARARS

The NCP (§§300.430(f)(5)(ii)(B) and (C)) requires that the selected remedy attain Federal and State ARARs. The selected remedy and/or the contingency remedy will comply with the following action-, contaminant- and action-specific ARARs identified for the Hooker/Ruco Site and will be demonstrated through monitoring, as appropriate.

Action-Specific ARARs:

Air Quality:

- Clean Air Act, 42 U.S.C. §§ 7401 et seq.
- National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 61.
- Air Pollution Control Act (New York State Environmental Conservation Law ("ECL") 19-0101 et seq.)
- Air Pollution Control Regulations, 6 NYCRR Parts 200 to 257.

Water Quality:

- Water Pollution Control (New York State Environmental Conservation Law ("ECL") 17-0101 et seq.)
- Reclassification of Waters (Water Classifications and Quality Standards), 6 NYCRR Parts 609, 700-704.
- Small System Compliance Technology List for the Surface Water Treatment Rule (EPA 815-R-97-002).
- Small System Compliance Technology List for the Surface Water Treatment Rule and Total Coliform Rule (EPA 815-R-98-001).
- Small System Compliance Technology List for the Non-Microbial Contaminants Regulated Before 1996 (EPA 815-R-98-002).
- Variance Technology Findings for Contaminants Regulated Before 1996 (EPA 815-R-98-003).

Hazardous Waste:

- Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 et seq.
- Standards for Handling, Transportation and Disposal of Hazardous Waste, including Land Disposal Restrictions, 40 CFR 260-268.
- Collection, Treatment and Disposal of Refuse and other Solid Waste (Solid and Hazardous Waste Management Laws), ECL 27-0101 et seq.
- Waste Transporter Permit Regulations, 6 NYCRR Part 364.
- Standards for Handling, Transportation and Disposal of Hazardous Waste - DOT transportation regulations, 6 NYCRR Parts 370-376.
- Hazardous Waste Program Fees, 6 NYCRR Parts 483 Hazardous Waste Program fees) and 484 (Waste Transporter Fees).

Chemical-Specific ARARs:

- Clean Water Act, 33 U.S.C. §§ 1251-1387.
- Safe Drinking Water Act, 42 U.S.C. §§ 300f et seq.

- Safe Drinking Water Act Maximum Contaminant Levels (MCLs), 40 CFR Part 141.
- Surface water and Groundwater Quality Standards and Groundwater Effluent Standards, 6 NYCRR Part 703.
- Drinking Water Supplies (New York Public Water Supply Regulations), 10 NYCRR Part 5.
- Ambient Air Quality Standards, 6 NYCRR Parts 256 and 257.
- Water Classifications and Quality Standards, 6 NYCRR Parts 609, 700-704.

To-Be-Considered:

- New York State Air Guide I (1991) - NYSDEC Control of Toxic Ambient Air Contaminants
- New York State Technical Manual "Contained-In" Criteria for Environmental Media
- Reference Doses (RFD), EPA Office of Research and Development
- Carcinogenic Potency Factors, EPA environmental Criteria and Assessment Office; EPA Carcinogen Assessment Group
- Health Advisories, EPA Office of Drinking Water
- Air/Superfund National Technical Guidance Study Services
- Groundwater Protection Strategy (EPA, 1984)
- Control of Air Emissions from Superfund Air Strippers at Superfund Groundwater Sites (OSWER Directive 9355.0-28)

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 less time. The contingent remedy, while more expensive, would also nevertheless be cost-effective as it would only be implemented if the selected remedy is ineffective in achieving the remediation goals.

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital costs and O&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual costs were calculated for the estimated life of an alternative using a seven percent discount rate (consistent with the FS and Proposed Plan). For a detailed breakdown of costs associated with the selected remedy and contingency remedy, please see Tables 18 and 19.

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

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at this Site. The selected remedy (biosparging and enhanced bioremediation) utilizes permanent solutions to address the groundwater contamination by reducing the toxicity and volume of the VCM subplume at the Hooker/Ruco Site to levels that achieve State standards and Federal MCLs. The selected remedy represents the most appropriate solution for the Hooker/Ruco Site because it provides the best balance of trade-offs among the alternatives with respect to the evaluation criteria. The contingency remedy also provides for the same level of permanence and treatment.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied through the use of the innovative treatment measures (biosparging) to adequately reduce the toxicity and volume of contamination in the aquifer emanating from the Hooker/Ruco Facility.

Five-Year Review Requirements

Because this remedy will result in hazardous substances remaining at the Hooker/Ruco Site above levels that allow for unlimited use of and unrestricted exposure to the Hooker/Ruco Site, a review will be conducted no less often than once every five years after commencement of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes from the preferred remedy presented in the Proposed Plan.

RECORD OF DECISION

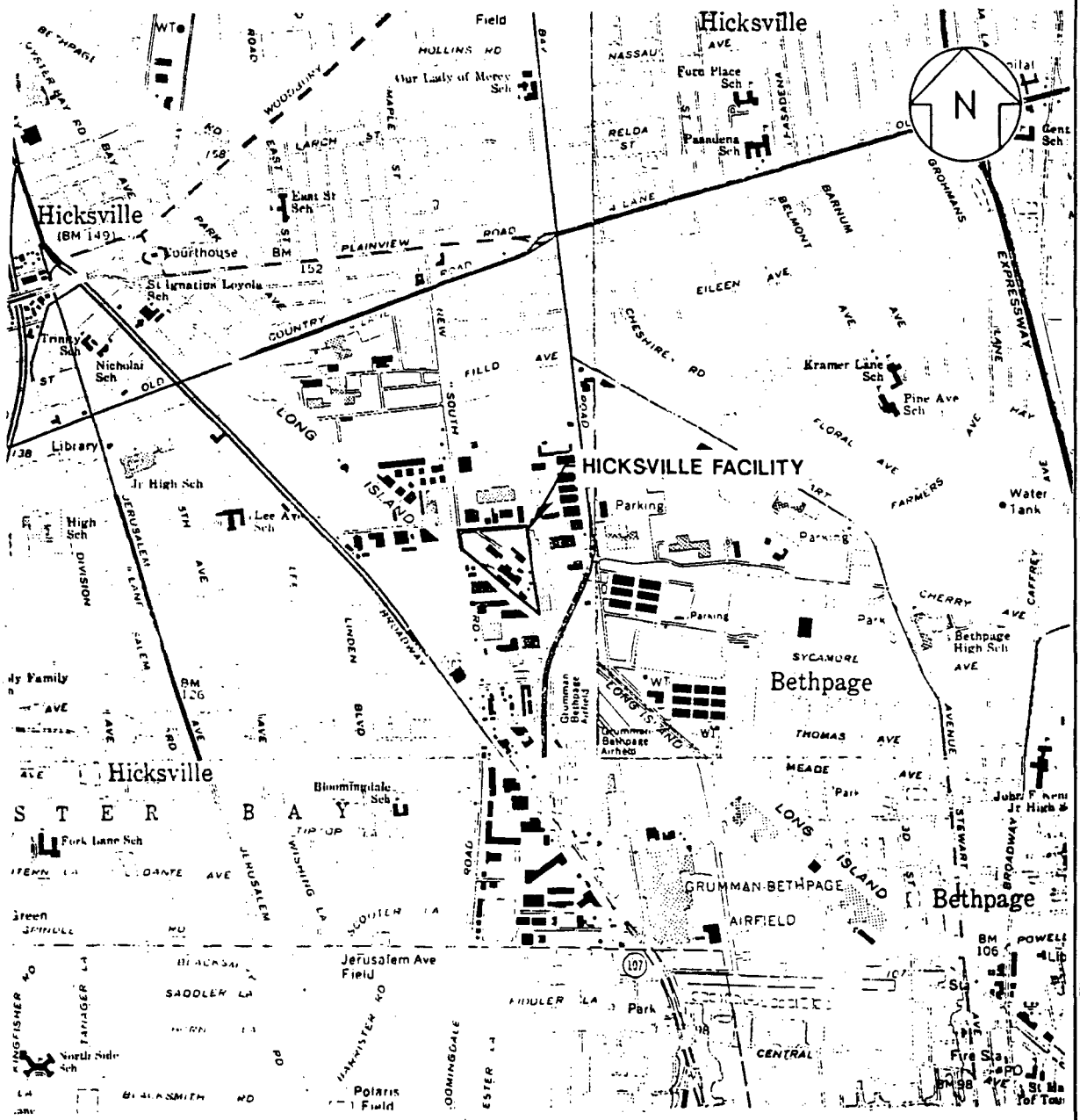
HOOKER CHEMICAL/RUCO POLYMER SUPERFUND SITE

APPENDICES

APPENDIX I

FIGURES

Figure 1 - Site Location Map
Figure 2 - Site Map
Figure 3 - Northrop Grumman Aerospace Corporation, Hooker Chemical/Ruco Polymer and Naval Weapons Industrial Reserve Plant Sites
Figure 4 - Borehole, Monitoring Well, and Pumping Well Locations
Figure 5 - VOC Compounds Detected in Groundwater Above ARARs
Figure 6 - Groundwater Trichloroethylene Concentrations
Figure 7 - Groundwater Tetrachloroethylene concentrations
Figure 8 - Groundwater Vinyl Chloride Monomer Concentrations



SOURCE: USGS TOPOGRAPHIC QUADRANGLES HICKSVILLE, N.Y., FREEPORT, N.Y., HUNTINGTON, N.Y. AND AMITYVILLE, N.Y.

HOOKER CHEMICAL/RUCO POLYMER SITE LOCATION MAP

Figure 1

Modified from LBG Engineering Services Inc. (2/93)

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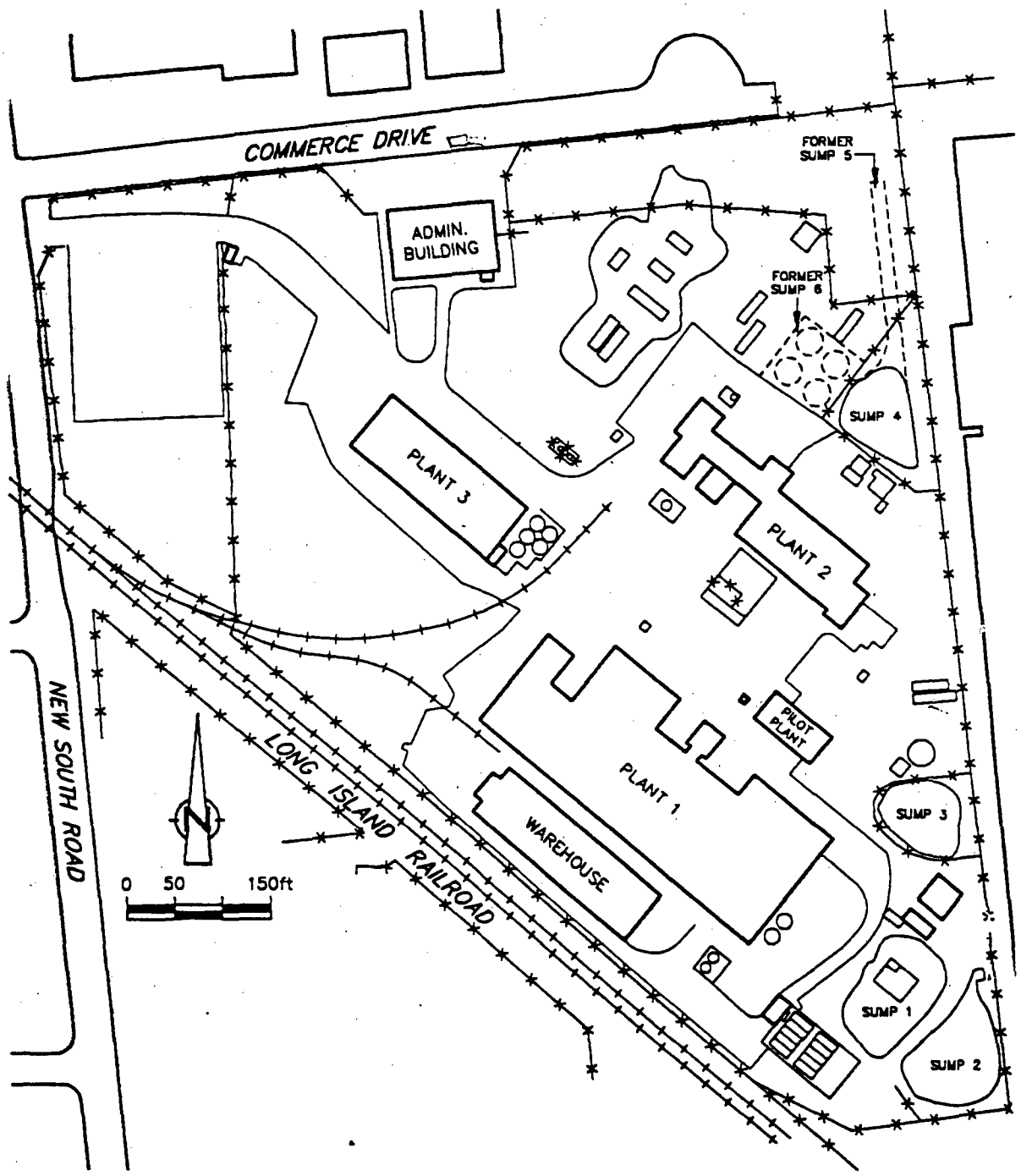
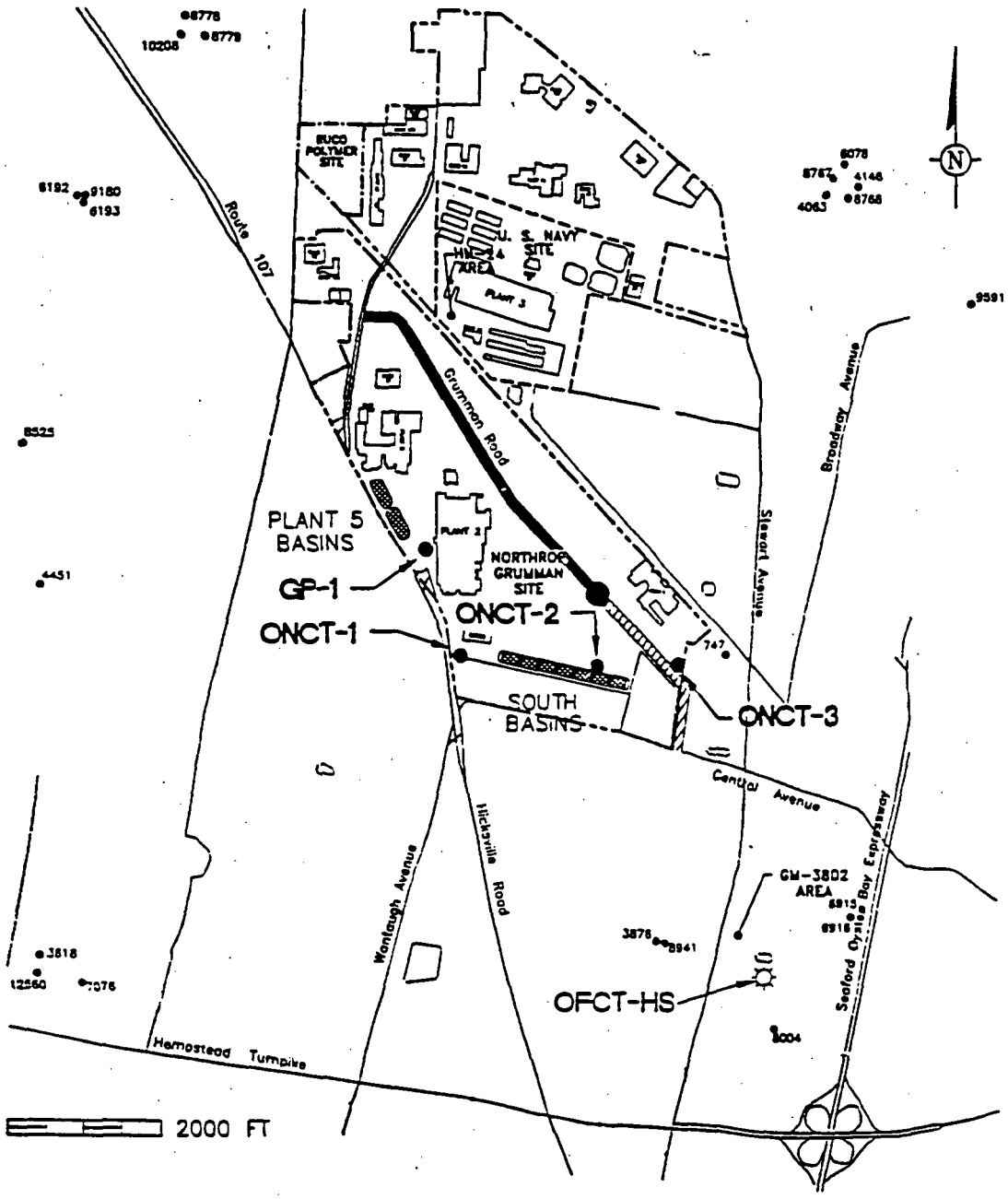


HOOKER CHEMICAL/RUCO POLYMER
SITE LOCATION MAP

Figure 2

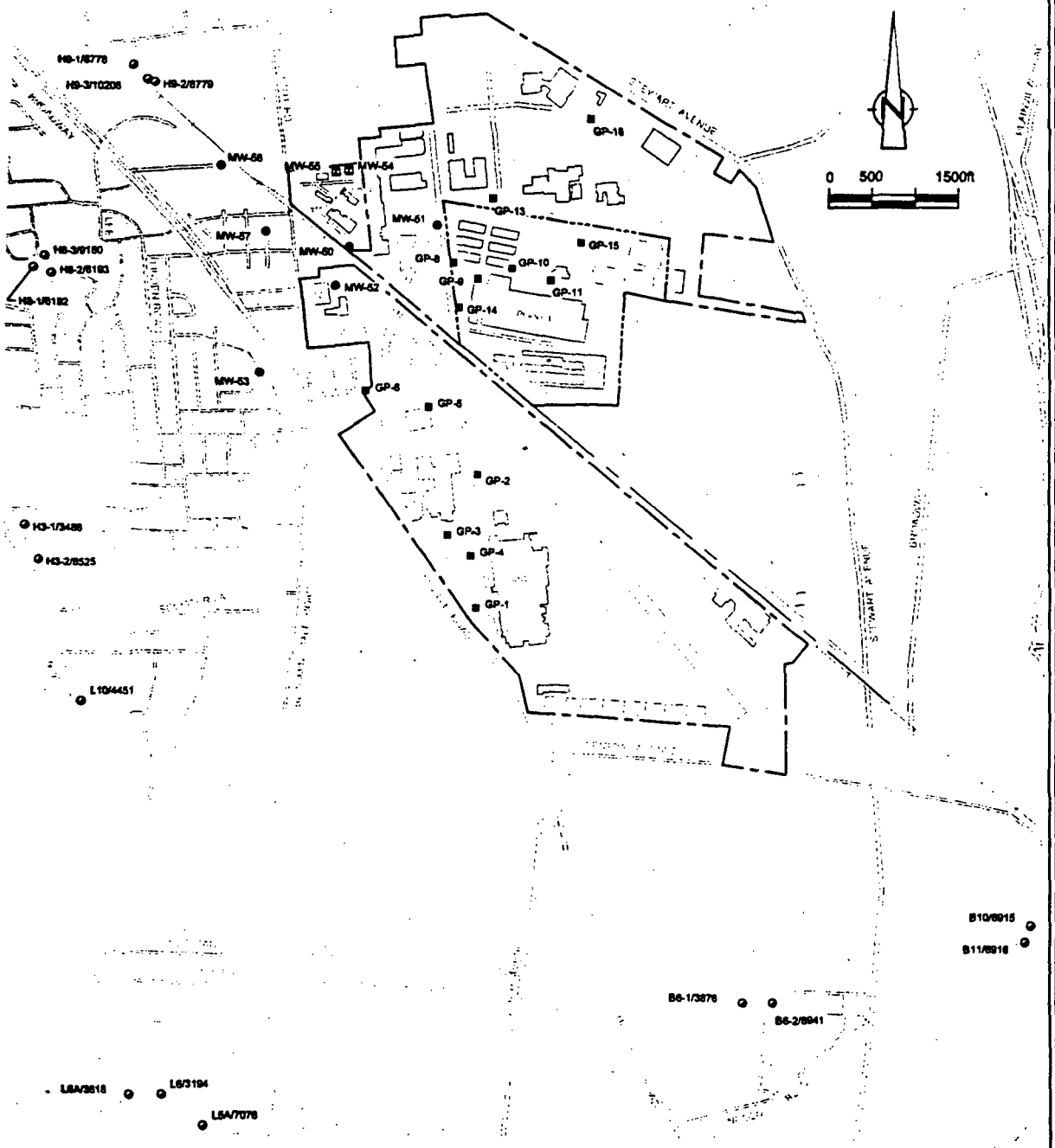
Modified from Conestoga-Rovers & Associates (11/99)



NORTHRUP/GRUMMAN AEROSPACE CORPORATION, HOOKER CHEMICAL/RUCO POLYMER SITE AND AND NAVAL WEAPONS INDUSTRIAL RESERVE PLANT SITES

Figure 3

Modified from ARCADIS Geraghty & Miller



BOREHOLE, MONITORING WELL, AND PUMPING WELL LOCATIONS
OU-3 REMEDIAL INVESTIGATION
HOOKER CHEMICAL/RUCO POLYMER SITE
Figure 4

Modified from Conestoga-Rovers & Associates. (11/99)

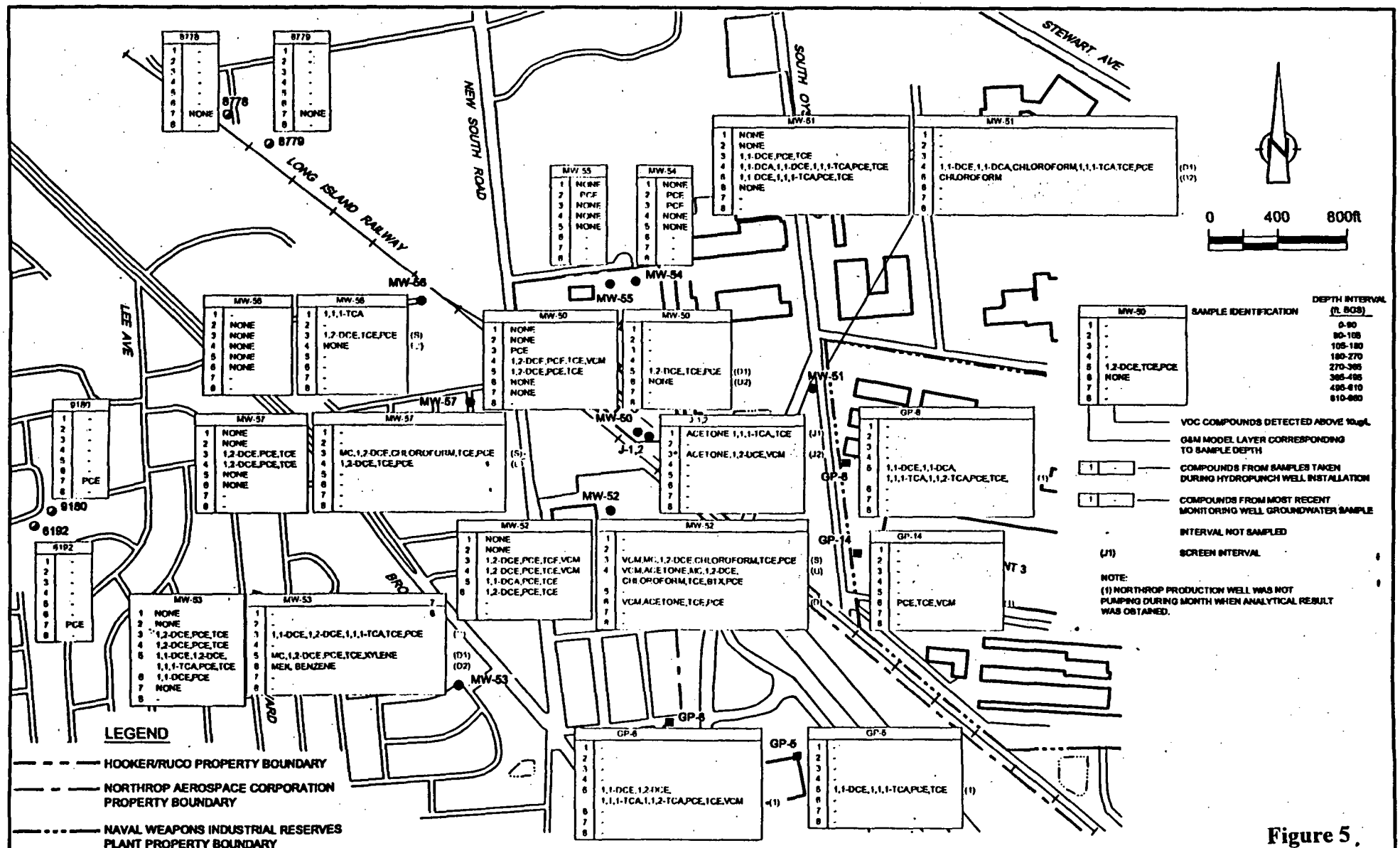


Figure 5.

VOC COMPOUNDS DETECTED IN GROUNDWATER ABOVE ARARS
OU-3 REMEDIAL INVESTIGATION
Hooker/Ruco Site, Hicksville, New York

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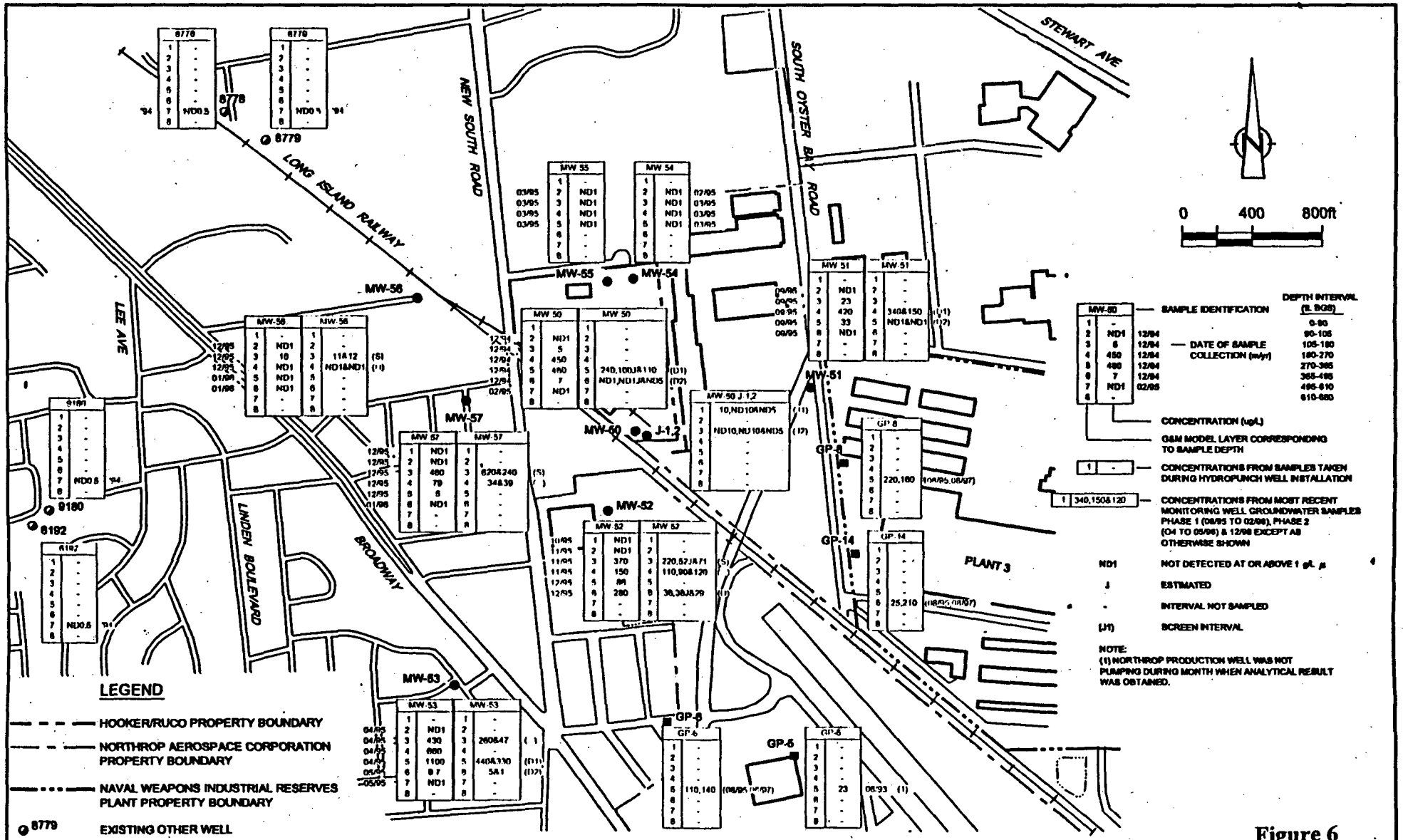

Figure 6

GROUNDWATER TRICHLOROETHYLENE CONCENTRATIONS
OU-3 REMEDIAL INVESTIGATION
Hooker/Ruco Site, Hicksville, New York

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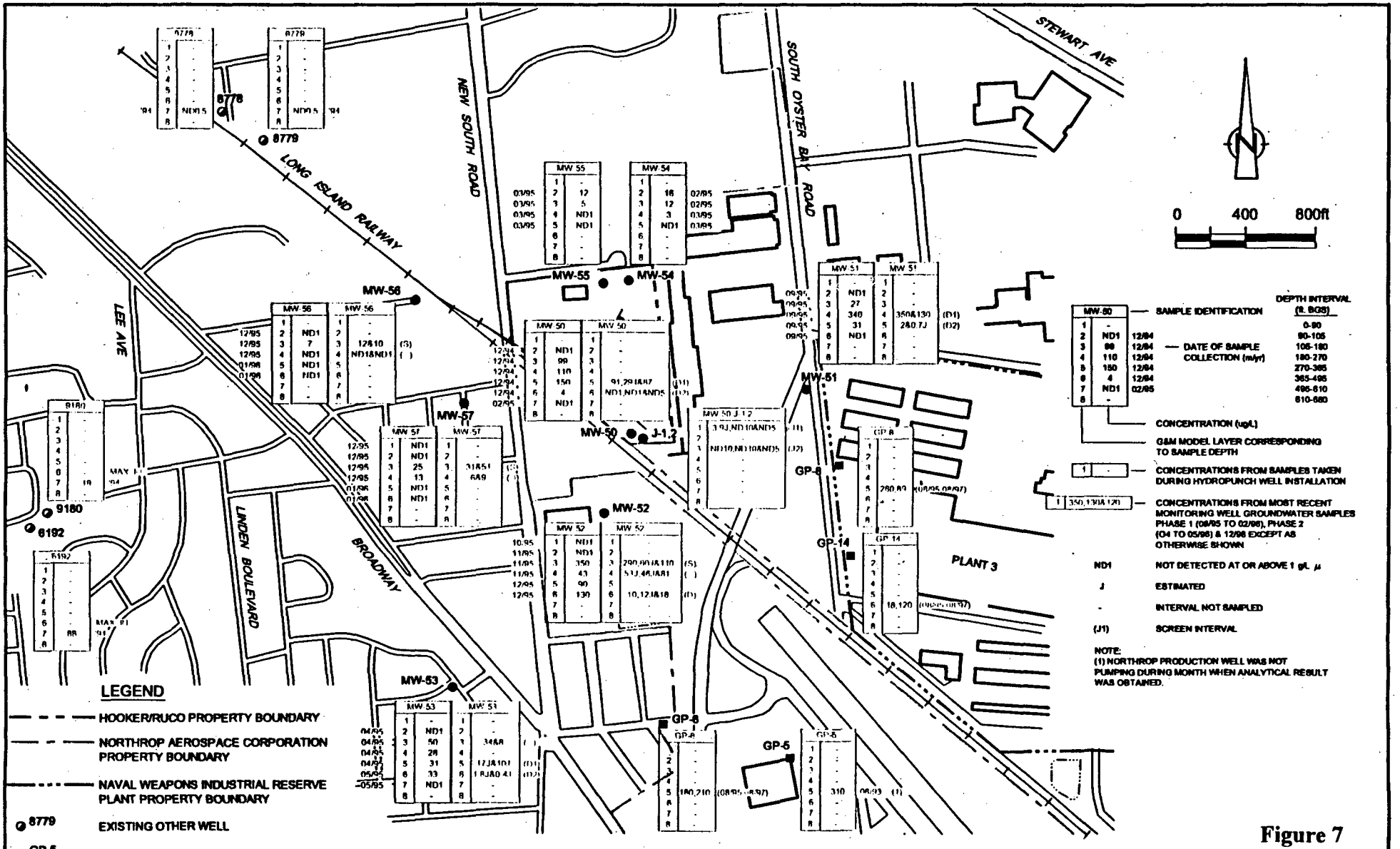

Figure 7

GROUNDWATER TETRACHLOROETHYLENE CONCENTRATIONS
OU-3 REMEDIAL INVESTIGATION
Hooker/Ruco Site, Hicksville, New York

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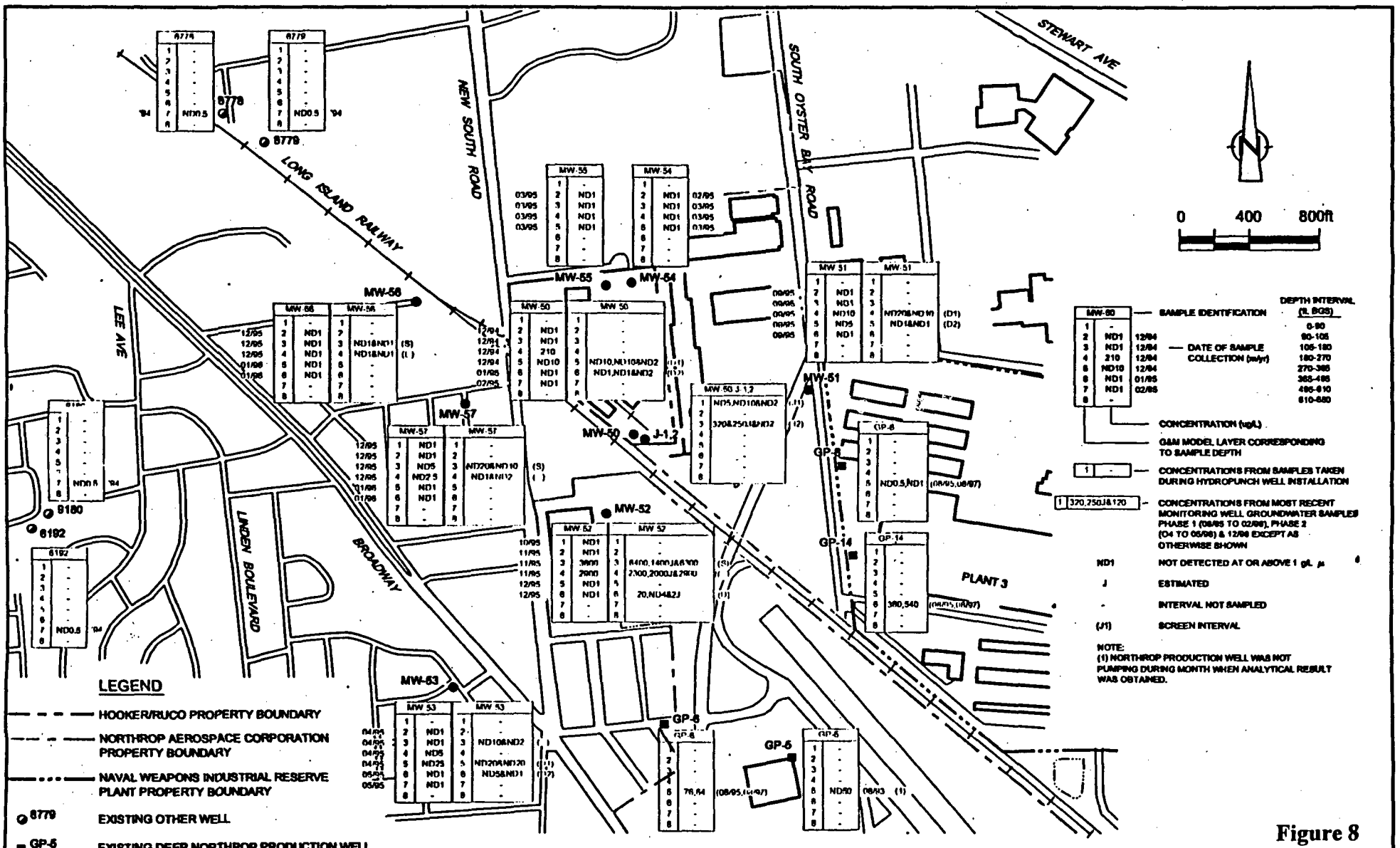

Figure 8

GROUNDWATER VINYL CHLORIDE MONOMER CONCENTRATIONS
OU-3 REMEDIAL INVESTIGATION
Hooker/Ruco Site, Hicksville, New York

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APPENDIX II

TABLES

Table 1 - Mid-1970s Analytical Results from Northrop Production wells
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Table 9 - Summary of Detected Groundwater Inorganics, Pre-Design Investigation
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Table 11 - Summary of Chemical Compounds Detected in Groundwater
Table 12 - Parameters and Assumptions to Calculate Groundwater Exposure Pathways-Adults
Table 13 - Parameters and Assumptions to Calculate Groundwater Exposure Pathways-Children
Table 14 - Toxicity Data for Noncarcinogenic and Potential Carcinogenic Effects
Table 15 - Summary Across Exposure Pathways, Present/Future Use Scenarios-Resident Adult
Table 16 - Summary Across Exposure Pathways, Present/Future Use Scenarios-Resident Children
Table 17 - ARARs/TBCs for Groundwater Chemicals of Concern (ug/L)
Table 18 - Detailed Cost Estimate of Selected Remedy
Table 19 - Detailed Cost Estimate of Contingency Remedy

TABLE 1

MID-1970s ANALYTICAL RESULTS FROM NORTHROP PRODUCTION WELL SAMPLING EVENTS (1)
OU-3 REMEDIAL INVESTIGATION
HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Northrop Well No.	*Trichloroethylene*		*Tetrachloroethylene*		*Vinyl Chloride*		*1,1,1-Trichloroethane*		*1,1-Dichloroethane*		*1,1-Dichloroethylene*		*cis-1,2-Dichloroethylene*	
	Sample Date	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*
GP-1	–	–	11/17/75	ND	11/17/75	ND	11/17/75	ND			7/11/78	ND 5	11/17/75	ND
	7/12/76	350	7/12/76	490	9/10/76	6	7/2/76	14					7/12/76	220
	9/26/78	2000	9/26/78	10	7/11/78	0	10/22/78	5						
GP-2	9/10/76	240	10/27/76	19	9/10/76	60	10/27/76	25					10/27/76	ND 10
	1/17/77	120	1/17/77	16	1/17/77	90	1/17/77	37			7/25/78	15	1/17/77	28
	8/10/78	200	12/5/78	22	7/11/78	0	12/5/78	22					12/5/78	NA
GP-3	10/27/76	570	12/8/76	18	12/8/76	20	9/16/76	20			10/17/78	ND 5	12/8/76	ND 10
	1/17/77	860	1/17/77	11	1/17/77	270	1/17/77	10					1/17/77	8
	8/22/78	510	10/17/78	18	8/22/78	0	10/17/78	3					12/12/78	NA
GP-4	12/8/76	25000	12/8/76	40	9/16/76	72	12/2/76	30					10/27/76	ND 10
GP-5	–	–	11/17/75	ND	11/17/75	ND	11/17/75	ND					11/17/75	ND
	7/12/76	66	9/16/76	510	9/16/76	14	7/12/76	14					7/12/76	33
GP-6	4/1/74	ND	4/1/74	ND	4/1/74	ND	4/1/74	ND			7/11/78	ND5	4/1/74	ND
	9/16/76	16	7/12/76	28	9/16/76	ND 5	7/12/76	10					7/12/76	23
	8/22/78	56	8/22/78	330	8/22/78	48	7/11/78	ND 5						
GP-8	4/1/74	ND	4/1/74	ND	4/1/74	ND	4/1/74	ND					4/1/74	ND
	8/4/75	16	8/4/75	88			11/17/75	ND						
	7/12/76	56	7/12/76	120	9/10/76	6	9/10/76	130					7/12/76	83
GP-9	9/10/76	12	7/1/76	16	9/10/76	ND 5	7/1/76	7.2			10/10/78	5	7/12/76	4
	12/5/78	57	12/5/78	120	10/17/78	16	10/17/78	14					12/5/78	NA
GP-10	12/2/76	190	12/8/76	24	12/8/76	ND 10	12/2/76	120			7/11/78	8	12/2/76	ND 10
	12/12/78	100	12/12/78	20	7/11/78	0	12/12/78	44					12/5/78	NA

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TABLE 1

MID-1970s ANALYTICAL RESULTS FROM NORTHROP PRODUCTION WELL SAMPLING EVENTS (1)
OU-3 REMEDIAL INVESTIGATION
HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Northrop	*Trichloroethylene*		*Tetrachloroethylene*		*Vinyl Chloride*		*1,1,1-Trichloroethane*		*1,1-Dichloroethane*		*1,1-Dichloroethylene*		*cis-1,2-Dichloroethylene*	
Well No.	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*
GP-11	11/30/76	60	11/30/76	54	12/7/76	ND 5	12/7/76	11			9/26/78	ND 5	12/7/76	ND 10
	4/1/77	25	4/1/77	36	4/1/77	ND 5	4/1/77	8					4/1/77	ND 5
	9/26/78	26	9/26/78	15	9/26/78	0	9/26/78	5						
GP-13	11/30/76	39	12/7/76	ND 5	12/7/76	ND 5	11/30/76	1.4			7/11/78	ND 5	12/7/76	ND 10
	4/1/77	7	1/17/77	ND 50	4/1/77	ND 5	4/1/77	ND 5					4/1/77	ND 5
	8/10/78	8	7/25/78	ND 5	7/11/78	0	7/25/78	ND 5					12/12/78	NA
GP-14	4/1/74	ND	4/1/74	ND	4/1/74	ND	4/1/74	ND			7/11/78	ND 5	4/1/74	ND
	8/4/75	500	8/4/75	65	8/4/75	50	11/17/75	ND						
	7/12/76	30	7/12/76	79	12/8/76	17	7/12/76	5					7/12/76	1
	9/26/78	38	8/22/78	200	10/10/78	71	10/17/78	ND 5						
GP-15	11/30/76	59	11/30/76	19	12/7/76	ND 5	12/7/76	20			7/11/78	ND 5	12/7/76	ND 10
	1/14/77	35	4/1/77	10	4/1/77	ND 5	1/17/77	47					4/1/77	6
	8/22/78	7	7/11/78	ND 5	8/10/78	ND 5	8/22/78	9						
GP-16	11/30/76	50	12/7/76	ND 5	12/7/76	7	11/30/76	31			9/26/78	ND 5	12/7/76	ND 10
	1/17/77	17	1/17/77	ND 50	1/17/77	24	1/17/77	41					4/1/77	18
	9/26/78	42	12/5/78	ND 1	12/5/78	NA	12/5/78	15					12/5/78	NA

Notes:

(1) - Source - Nassau County Department of Health, Division of Environmental Services - chronological summary of Northrop well organics sampling.
NA - Not Analyzed.
ND - Not Detected.
NDx - Not Detected at or above x µg/L.

500058

TABLE 2

MID-1970s ANALYTICAL RESULTS FROM MUNICIPAL WELL SAMPLING EVENTS (1)
OU-3 REMEDIAL INVESTIGATION
HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Municipal Well No.	Trichloroethylene Sample Date	Trichloroethylene Conc. (µg/l)	Tetrachloroethylene Sample Date	Tetrachloroethylene Conc. (µg/l)	Vinyl Chloride Sample Date	Vinyl Chloride Conc. (µg/l)	1,1,1-Trichloroethane Sample Date	1,1,1-Trichloroethane Conc. (µg/l)	1,1-Dichloroethane Sample Date	1,1-Dichloroethane Conc. (µg/l)	1,1-Dichloroethylene Sample Date	1,1-Dichloroethylene Conc. (µg/l)	cis-1,2-Dichloroethylene Sample Date	cis-1,2-Dichloroethylene Conc. (µg/l)
Hicksville														
H3-1/3488	12/6/76	ND 1	12/6/76	ND 5	11/29/76	68*	12/6/76	24					11/29/76	ND
	1/13/77	ND 10	1/13/77	ND 10	12/6/76	ND 10	5/24/77	32					1/13/77	ND 10
					1/13/77	ND 10								
H3-2/8525	1/19/77	ND 10	1/19/77	ND 10	1/19/77	ND 10	1/19/77	ND 10	3/28/78	ND 1			1/19/77	ND 10
	3/28/78	ND 1	3/28/78	ND 1	3/28/78	NA	3/28/78	ND 1					3/28/78	ND 1
H8-1/6192	12/20/76	4.3	12/20/76	9.3	12/20/76	ND 1	12/20/76	ND 1	1/25/78	ND 2	1/25/78	ND 6	12/20/76	14
	1/13/77	ND 10	1/13/77	ND 10	1/13/77	ND 10	1/13/77	ND 10					1/13/77	ND 10
	1/25/78	ND 4	1/25/78	ND 2	1/25/78	NA	1/25/78	52					1/25/78	ND 2
H8-2/6193	11/1/75	ND	11/1/75	ND	11/1/75	ND	11/1/75	ND	1/25/78	ND 1	1/25/78	ND 3	11/1/75	ND
	3/4/77	ND 10	3/4/77	ND 10	3/4/77	ND 10	3/4/77	ND 10					3/4/77	ND 10
	1/25/78	ND 4	7/7/78	1	1/25/78	NA	1/25/78	ND 2					1/25/78	ND 1
H8-3/9180	3/29/78	ND 2	3/29/78	ND 2	3/20/78	NA	3/29/78	ND 2	3/29/78	ND 2	3/29/78	ND 4	3/29/78	ND 2
H9-1/8778	12/20/76	ND 1	12/20/76	4	12/20/76	ND 1	12/20/76	ND 1	5/3/78	ND 1	5/3/78	ND 3	12/20/76	13
	1/13/77	ND 10	1/13/77	ND 10	1/13/77	ND 10	1/13/77	ND 10					1/13/77	ND 10
	5/3/78	ND 1	5/3/78	ND 1	5/3/78	NA	5/3/78	ND 1					5/3/78	ND 1
H9-2/8779	12/20/76	5.2	12/2/76	ND 2.5	12/2/76	ND 10	12/20/76	2.8	5/3/78	ND 1	5/3/78	ND 3	12/20/76	0.8
	1/13/77	ND 10	1/13/77	ND 10	1/13/77	ND 10	1/13/77	ND 10					1/13/77	ND 10
	5/3/78	ND 1	5/3/78	ND 1	5/3/78	NA	5/3/78	ND 1					5/3/78	ND 1
Levittown														
L6/3194	11/29/79	ND	11/29/76	ND	11/29/76	ND	11/29/76	ND	12/6/78	ND 1	12/6/78	ND 1	11/29/76	ND
	4/12/78	ND 1	4/12/78	ND 1	4/12/78	NA	4/12/78	ND 1					12/6/78	ND 1
L6A/3618	11/29/76	ND	11/29/76	ND	11/29/76	ND	11/29/76	ND					11/29/76	ND
	1/25/78	ND 4	1/25/78	ND 2	1/25/78	NA	1/25/78	ND 4					10/26/78	NA

500059

TABLE 2

MID-1970s ANALYTICAL RESULTS FROM MUNICIPAL WELL SAMPLING EVENTS (1)
OU-3 REMEDIAL INVESTIGATION
HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Municipal Well No.	Trichloroethylene Sample Date	Trichloroethylene Conc. (µg/l)	Tetrachloroethylene Sample Date	Tetrachloroethylene Conc. (µg/l)	Vinyl Chloride Sample Date	Vinyl Chloride Conc. (µg/l)	1,1,1-Trichloroethane Sample Date	1,1,1-Trichloroethane Conc. (µg/l)	1,1-Dichloroethane Sample Date	1,1-Dichloroethane Conc. (µg/l)	1,1-Dichloroethylene Sample Date	1,1-Dichloroethylene Conc. (µg/l)	cis-1,2-Dichloroethylene Sample Date	cis-1,2-Dichloroethylene Conc. (µg/l)
Levittown														
L10/4451	7/1/76	ND	7/12/76	ND	7/12/76	ND	7/12/76	ND	1/26/78	ND 1	1/26/78	ND 1	7/12/76	ND
	3/15/78	ND 4	3/15/78	ND 2	3/15/78	NA	3/15/78	ND 2					1/26/78	ND 1
L5A/7076	1/3/77	5	1/18/77	ND 10	1/3/77	ND 10	1/18/77	ND 10	12/6/78	ND 1	12/6/78	ND 1	1/18/77	ND 10
	3/1/78	ND 1	3/1/78	ND 1	3/1/78	NA	3/1/78	ND 1					12/6/78	ND 1
Bethpage														
B6-1/3876	12/6/76	60	12/6/76	17	12/6/76	ND 10	12/6/76	15					12/20/76	ND 1
	1/21/77	340	5/24/77	2.5	1/21/77	ND 10	1/21/77	300					1/21/77	ND 10
	12/27/78	87	12/27/78	4	3/14/78	NA	12/27/78	5					3/14/78	NA
B6-2/8941	12/2/76	ND	12/2/76	ND	12/2/76	ND	12/2/76	ND 1						
	12/20/76	2.6	12/20/76	1.4	12/20/76	ND 1	12/20/76	1.6	9/27/78	ND 1	9/27/78	ND 2	12/20/76	ND 1
	10/20/77	ND 4	10/20/77	ND 2	10/20/77	NA	10/20/77	ND 2					10/20/77	NA
	9/27/78	ND 1	4/11/78	ND 1	4/11/78	NA	4/11/78	ND 1					9/27/78	ND 1
B10/6915	12/20/76	5.0	12/20/76	1.3	12/20/76	ND 1	12/20/76	ND 1	10/4/78	ND 1	10/4/78	ND 2	12/20/76	ND 1
	10/4/78	ND 1	4/11/78	ND 1	4/11/78	ND	4/11/78	ND 1					10/4/78	ND 1
B11/6916	11/1/75	ND	11/1/75	ND	11/1/75	ND	11/1/75	ND	9/27/78	ND 1	9/27/78	ND 2	11/1/75	ND
	12/20/76	7.0	12/20/76	1.3	12/20/76	ND 1	12/20/76	ND 1					12/20/76	ND 1
	4/11/78	ND 1	4/11/78	ND 1	4/11/78	ND	4/11/78	ND 1					9/27/78	ND 1

Notes:

(1) - Source - Nassau County Department of Health, Division of Environmental Services - chronological summary of municipal well organics sampling.

NA - Not Analyzed.

ND - Not Detected.

NDx - Not Detected at or above x µg/L.

* - This detection of Vinyl Chloride was reported to have resulted from a lab error. A resampling of this well in the following 2 months confirmed the lab error.

500060

TABLE 3

1980s ANALYTICAL RESULTS FROM NORTHROP PRODUCTION WELL SAMPLING EVENTS (1)
OU-3 REMEDIAL INVESTIGATION
HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Northrop Well No.	*Trichloroethylene*		*Tetrachloroethylene*		*Vinyl Chloride*		*1,1,1-Trichloroethane*		*1,1-Dichloroethane*		*1,1-Dichloroethylene*		*cis-1,2-Dichloroethylene*	
	Sample Date	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*
GP-2	11/10/87	770	11/10/87	37	11/10/87	39	11/10/87	11	11/10/87	ND 4				
GP-3	11/13/87	170	11/13/87	34			11/13/87	1	11/13/87	ND 4				
GP-5	11/10/87	1200	11/10/87	110	4/4/80	15	11/10/87	20	11/10/87	ND 4				
					11/10/87	25								
GP-6	3/22/89	ND 1	3/22/89	ND	4/4/80	2.6	3/22/89	ND			3/22/89	3	3/22/89	ND
GP-8	11/13/87	65	11/13/87	120	4/4/80	11	11/13/87	68	11/13/87	ND 4				
					11/13/87	93								
GP-9	11/13/87	79	11/13/87	5	11/13/87	3	11/13/87	52	11/13/87	ND 4				
GP-10	11/13/87	42	11/13/87	6	11/13/87	2	11/13/87	5	11/13/87	ND 4				
GP-11	11/10/87	17	11/10/87	7	11/10/87	1	11/10/87	2	11/13/87	ND 4				
GP-13	11/10/87	ND 1	11/10/87	ND 1	11/10/87	ND 1	11/10/87	ND 1	11/10/87	ND 4				
GP-14	11/10/87	43	11/10/87	130	11/10/87	27	11/10/87	1	11/10/87	ND 4	3/20/89	2	3/20/89	14
	3/20/89	42	3/20/89	130	3/21/88	250	3/21/88	3						
GP-15	11/13/87	12	11/13/87	3	11/13/87	1	11/13/87	4	11/13/87	ND 4				
GP-16	11/10/87	8	11/10/87	ND 1	11/10/87	6	11/10/87	7	11/13/87	ND 4				

Notes:

(1) - Sources - New York State Department of Health, Division of Laboratories and Research. April 15, 1980 Memorandum.
Northrop Aerospace Corporation Production Well Water Quality Reports. Feldman et al., 1992.

ND - Not Detected.

NDx - Not Detected at or above x µg/L.

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TABLE 4

1980s ANALYTICAL RESULTS FROM MUNICIPAL WELL SAMPLING EVENTS (1)
OU-3 REMEDIAL INVESTIGATION
HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Municipal Well No.	*Trichloroethylene*		*Tetrachloroethylene*		*Vinyl Chloride*		*1,1,1-Trichloroethane*		*1,1-Dichloroethane*		*1,1-Dichloroethylene*		*cis-1,2-Dichloroethylene*	
	Sample Date	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*
Hicksville														
H3-2/8525	3/11/81	ND 1	3/20/80	ND 2	3/11/81	ND 1	3/11/81	ND 2	3/11/81	ND 1	3/11/81	ND 1	3/11/81	ND 1
H8-1/6192	10/20/80	ND 4	1/2/81	ND 2	3/10/81	ND 1	10/20/80	ND 2	10/20/80	ND 1	10/20/80	ND 1	3/10/81	ND 1
H8-2/6193	10/20/80	ND 4	10/20/80	ND 2	3/25/81	ND 1	10/20/80	ND 2	10/20/80	ND 1	10/20/80	ND 1	3/25/81	ND 1
H8-3/9180	1/21/81	ND 4	1/29/81	1	6/12/80	ND 0.5	1/2/81	ND 2	3/13/80	ND 1	3/13/80	ND 1	3/13/80	ND 1
H9-1/8778	6/6/80	ND 4	6/6/80	ND 2	1/29/81	ND 1	3/4/80	ND 3	1/29/81	ND 1	3/4/80	ND 2	1/29/81	ND 1
H9-2/8779	6/6/80	ND 4	6/6/80	ND 2	3/10/81	ND1	6/6/80	ND 2	3/10/81	ND 1	3/10/81	ND 1	3/10/81	ND 1
Levittown														
L5A/7076	4/23/80	ND 4	7/30/80	ND 3	6/26/80	ND 0.5	7/30/80	ND 3	--	--	--	--	4/23/80	NA
LH6A/3618	7/30/80	ND 3	7/30/80	ND 3	6/26/80	ND 0.5	2/6/81	2	--	--	--	--	6/26/80	NA
L10/4451	5/8/80	ND 4	2/24/81	3	6/26/80	ND 0.5	3/18/80	ND 3	--	--	--	--	6/26/80	NA
Bethpage														
B6-2/8941	5/20/80	ND 4	5/20/80	ND 2	3/11/81	ND 1	5/20/80	ND 2	8/21/80	ND 1	8/21/80	ND 1	8/21/80	ND 1
B10/6915	5/5/81	ND 4	5/5/81	ND 2	6/11/80	ND 0.5	5/5/81	ND 2	8/21/80	ND 1	7/19/81	ND 1	8/21/80	ND 1
B11/6916	11/5/80	ND 4	11/5/80	ND 2	2/19/81	ND 1	11/5/80	ND 2	2/19/81	ND 1	2/19/81	ND 1	2/19/81	ND 1

Notes:
(1) - Source = Nassau County Department of Health, Division of Environmental Services - chronological summary of municipal well organics sampling.
NA - Not Analyzed.
ND - Not Detected.
NDx - Not Detected at or above x µg/L.

CRA 6883 (17)

500062

TABLE 5

EARLY 1990s ANALYTICAL RESULTS FROM NORTHROP PRODUCTION WELL SAMPLING EVENTS (1)
OU-3 REMEDIAL INVESTIGATION
HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Northrop Well No.	*Trichloroethylene*		*Tetrachloroethylene*		*Vinyl Chloride*		*1,1,1-Trichloroethane*		*1,1-Dichloroethane*		*1,1-Dichloroethylene*		*cis-1,2-Dichloroethylene*	
	Sample Date	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*
GP-1	8/24/93	2800	8/24/93	ND 200	8/24/93	ND 200	8/24/93	ND 200	8/24/93	ND 200	8/24/93	ND 200	8/24/93	ND 200
GP-2	8/30/93	3000	8/30/93	52J	8/30/93	ND 200	8/30/93	24J	8/30/93	ND 200	8/30/93	30J	8/30/93	ND 200
GP-5	8/30/93	23	8/30/93	11	8/30/93	ND 200	8/30/93	ND 200	8/30/93	ND 200	8/30/93	ND 200	8/30/93	ND 200
GP-6	9/18/92	160	9/23/93	67	9/18/92	550	9/23/93	28	9/18/92	3	9/23/93	17	9/23/93	43
GP-8	8/30/93	240	8/30/93	310	8/30/93	ND 50	8/30/93	550	8/30/93	11J	8/30/93	420	8/30/93	ND 50
GP-10	12/6/91	110	12/6/91	9	12/6/91	ND 10	12/6/91	20J	12/6/91	ND 5	12/6/91	7	12/6/91	ND 5
GP-11	12/6/91	100	12/6/91	10	12/6/91	ND 10	12/6/91	17J	12/6/91	ND 5	12/6/91	7	12/6/91	ND 5
GP-13	12/6/91	26	12/6/91	2J	12/6/91	ND 10	12/6/91	6J	12/6/91	ND 5	12/6/91	2J	12/6/91	ND 5
GP-14	9/23/93	120	6/5/90	88	8/30/93	370	6/22/92	12	8/30/93	ND 20	6/22/92	4	9/23/93	14
GP-15	12/6/91	6	12/6/91	2J	12/6/91	ND 10	12/6/91	ND 5	12/6/91	ND 5	12/6/91	ND 5	12/6/91	ND 5

Notes:

(1) - Source - RI Report, Northro/Grumman Aerospace Corporation, Bethpage, New York, Geraghty and Miller, Inc., September 1994.

NDx - Not Detected at or above x µg/L.

J - Estimated value.

500063

TABLE 6

EARLY 1990s ANALYTICAL RESULTS FROM MUNICIPAL WELL SAMPLING EVENTS (1)
OU-3 REMEDIAL INVESTIGATION
HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Municipal Well No.	*Trichloroethylene*		*Tetrachloroethylene*		*Vinyl Chloride*		*1,1,1-Trichloroethane*		*1,1-Dichloroethane*		*1,1-Dichloroethylene*		*cis-1,2-Dichloroethylene*	
	Sample Date	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*	*Sample Date*	*Conc. (µg/l)*
Hicksville														
H3-2/8525	12/12/94	ND 0.5	12/12/94	1	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5
H8-1/6192	12/12/94	2.7	12/12/94	88	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5
H8-3/9180	12/12/94	ND 0.5	12/12/94	18	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5
H9-1/8778	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5
H9-2/8779	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	0.7	12/12/94	1.1	12/12/94	ND 0.5	12/12/94	ND 0.5
H9-3/10208	12/12/94	0.7	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5	12/12/94	ND 0.5
Bethpage														
B6-1/3876	9/2/93	200	9/2/93	6.5	9/2/93	ND 0.5	9/2/93	2.4	9/2/93	ND 0.5	9/2/93	4.2	9/2/93	1.7
B6-2/8941	9/2/93	0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 1
B10/6915	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 1
B11/6916	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 0.5	9/2/93	ND 1

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Notes:

(1) - Sources: Hicksville municipal well water quality data for 1994, H2M group. RI Report, Northrop Aerospace Corporation, Bethpage, New York, Geraghty and Miller, Inc., September 1994.

NDx - Not Detected at or above x µg/L.

TABLE 7

SUMMARY OF ORGANIC COMPOUNDS
MONITORING WELL RESULTS
OU-3 REMEDIAL INVESTIGATION
HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

Location:	GP-14	GP-8	GP-6	MW-50 D1		MW-50 D2		MW-50J2		MW-50J1		Groundwater Discharge ARAR
Sample Date:	8/1/95	8/1/95	8/1/95	8/8/95	5/02/96	8/8/95	5/02/96	8/8/95	5/01/96	8/8/95	5/01/96	
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	
TCL Volatiles												
Chloromethane	ND 0.5	ND 0.5	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	5
Vinyl chloride	360	ND 0.5	76	ND 10	ND 10	ND 1	ND 1	320	250J / 250J	ND 5	ND 10	2
Acetone	11J	R	R	R	R	R	R	R	130J / 53J	R	470J	50
Methylene Chloride	ND 2	ND 2	ND 2	ND 10	ND 10	ND 2	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	5
Carbon Disulfide	ND 0.5	ND 0.5	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 ND10	ND 5	ND 10	50
1,1-Dichloroethylene	ND 0.5	360J	14J	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	5
1,1-Dichloroethane	1	12	3	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	5
1,2-Dichloroethylene (total)	1.6	4.1	94	81	20J	ND 1	ND 1	17	36J / 36J	1.6J	ND 10	5
Chloroform	ND 0.5	ND 5.3	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	7
1,2-Dichloroethane	ND 0.5	ND 0.5	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	0.6
2-Butanone (MEK)	R	R	R	R	R	R	R	R	R / R	R	R	50
1,1,1-Trichloroethane	1.1	390	10	1.5J	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	5.6	ND 10	5
Carbon tetrachloride	ND 0.5	0.63	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	5
Bromodichloromethane	ND 0.5	ND 0.5	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	50
Trichloroethylene	25	220	110	240	100J	ND 1	ND 1	ND 10	ND10 / ND10	10	ND 10	5
1,1,2-Trichloroethane	ND 0.5	1.4	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	1
Benzene	ND 0.5	ND 0.5	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	0.7
Tetrachloroethylene	18	260	180	91	29J	ND 1	ND 1	ND 10	ND10 / ND10	3.9J	ND 10	5
Toluene	ND 0.5	ND 0.5	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	5
Chlorobenzene	ND 0.5	ND 0.5	0.22J	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	ND 5	ND 10	5
Ethylbenzene	ND 0.5	ND 0.5	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	0.94J	ND 10	5
Xylene (total)	ND 0.5	ND 0.5	ND 1	ND 10	ND 10	ND 1	ND 1	ND 10	ND10 / ND10	4J	ND 10	5
TCL Semivolatiles												
Phenol	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND40 / ND10	ND 10	17	1*
1,2-Dichlorobenzene	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND40 / ND10	ND 10	ND 10	3
4-Methylphenol	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND40 / ND10	ND 10	23	1*
Naphthalene	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	3J / ND10	ND 10	ND 10	50
2-Methylnaphthalene	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND40 / ND10	ND 10	ND 10	NL
Dimethylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND40 / ND10	ND 10	ND 10	50
Diethylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND40 / ND10	ND 10	ND 10	50
Di-n-butylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	0.8J	ND 10	ND40 / ND10	ND 10	ND 10	50
Butylbenzylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND40 / ND10	ND 10	ND 10	50
bis(2-Ethylhexyl)phthalate	ND 10	ND 10	ND 10	11	11	56	ND 10	ND 10	ND40 / ND10	ND 10	ND 10	50
Total TICs	2J	4J	ND	650J	26J	240J	41J	180J	530J / 2500J	3400J	1300J	50 (1)
Pesticides / PCBs	NA	NA	NA	NA	NA	ND	NA	ND	NA / NA	ND	NA	

Notes:

TCL - Target Compound List
ND x - Not detected at or above x µg/L
J - Associated value is estimated.
R - Data were rejected.
TICs - Tentative Identified Compounds
ND - Not Detected
NA - Not Analyzed
(1) - Each Individual Compound
* - Sum of compounds
- Exceeded ARAR
NL - Not Listed

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TABLE 7

SUMMARY OF ORGANIC COMPOUNDS
MONITORING WELL RESULTS
OU-3 REMEDIAL INVESTIGATION
AUGUST 1995 - MAY 1996

Location:	MW-53 D2		MW-53 Shallow		MW-53 D1		MW-51D1		MW-51D2		MW-52S		Groundwater Discharge ARAR
Sample Date:	8/8/95	4/29/96	8/8/95	4/29/96	8/8/95	4/30/96	2/22/96	4/30/96	2/23/96	4/30/96	2/21/96	5/01/96	
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	
TCL Volatiles													
Chloromethane	ND 5	0.9J	ND 10	ND 2	ND 20	ND 20	ND 20	ND 10	ND 1	ND 1	ND 200	ND50 / ND50	5
Vinyl chloride	ND 5	ND 1	ND 10	ND 2	ND 20	ND 20	ND 20	ND 10	ND 1	ND 1	6400	1400J / 1400J	2
Acetone	R	R	R	R	R	R	R	R	R	R	R	R / 300J	50
Methylene Chloride	ND 5	ND 1	ND 10	ND 2	ND 20	9J	ND 20	4J	ND 1	ND 1	ND 200	22J / ND50	5
Carbon Disulfide	ND 5	0.9J	ND 10	ND 2	ND 20	ND 20	ND 20	ND 10	ND 1	11J	ND 200	ND50 / ND50	50
1,1-Dichloroethylene	2.6J	ND 1	ND 10	11	1.3J	ND 20	390	100	ND 1	0.2J	ND 200	ND50 / ND50	5
1,1-Dichloroethane	3.3J	1	ND 10	ND 2	ND 20	ND 20	20	8J	0.43J	0.6J	ND 200	ND50 / ND50	5
1,2-Dichloroethylene (total)	0.65J	0.3J	10	2	88	49	ND 20	2J	ND 1	ND 1	ND 200	25J / 26J	5
Chloroform	ND 5	ND 1	ND 10	ND 2	ND 21	ND 20	98	22	28	3	520	ND50 / 19J	7
1,2-Dichloroethane	ND 5	0.4J	ND 10	ND 2	ND 20	ND 20	ND 20	ND 10	ND 1	ND 1	ND 200	ND50 / ND50	0.6
2-Butanone (MEK)	76J	R	R	R	R	R	R	R	R	R	R	R / R	50
1,1,1-Trichloroethane	2.9J	1	1.8J	20	2.1J	2J	520	160	0.67J	ND 1	ND 200	ND50 / ND50	5
Carbon tetrachloride	ND 5	ND 1	ND 10	ND 2	ND 20	ND 20	ND 20	ND 10	ND 1	ND 1	ND 200	ND50 / ND50	5
Bromodichloromethane	ND 5	ND 1	ND 10	ND 2	ND 20	ND 20	7.2J	ND 10	2.4	ND 1	ND 200	ND50 / ND50	50
Trichloroethylene	5	1	260	47	440	330	340	150	ND 1	ND 1	220	46J / 52J	5
1,1,2-Trichloroethane	ND 5	ND 1	ND 10	ND 2	ND 20	ND 20	ND 20	ND 10	ND 1	ND 1	ND 200	ND50 / ND50	1
Benzene	2.4J	1	ND 10	ND 2	ND 20	ND 20	ND 20	ND 10	ND 1	ND 1	ND 200	ND50 / ND50	0.7
Tetrachloroethylene	1.8J	0.4J	34	8	17J	10J	350	130	2.3	0.7J	290	31J / 60J	5
Toluene	ND 5	0.4J	ND 10	ND 2	ND 20	5J	ND 20	ND 10	ND 1	0.2J	ND 200	ND50 / ND50	5
Chlorobenzene	ND 5	ND 1	ND 10	ND 2	ND 20	ND 20	ND 20	ND 10	ND 1	ND 1	ND 200	ND50 / ND50	5
Ethylbenzene	0.39J	ND 1	ND 10	ND 2	ND 20	2J	ND 20	ND 10	ND 1	ND 1	ND 200	ND50 / ND50	5
Xylene (total)	2J	ND 1	ND 10	0.4J	ND 20	13J	ND 20	ND 10	ND 1	ND 1	ND 200	ND50 / ND50	5
TCL Semivolatiles													
Phenol	ND 10	3J	ND 10	3J	ND 10	4J	ND 10	ND 10	ND 10	ND 10	ND 10	ND10 / ND10	1*
1,2-Dichlorobenzene	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	9J	4J	ND 10	ND 10	ND 10	ND10 / ND10	3
4-Methylphenol	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND10 / ND10	1*
Naphthalene	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND10 / ND10	50
2-Methylnaphthalene	0.3J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND10 / ND10	NL
Dimethylphthalate	ND 10	ND 10	ND 10	ND 10	0.7J	0.9J	8J	2J	ND 10	ND 10	ND 10	ND10 / ND10	50
Diethylphthalate	ND 10	ND 10	ND 10	0.6J	ND 10	2J	ND 10	ND 10	0.2J	ND 10	ND 10	ND10 / ND10	50
Di-n-butylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND10 / ND10	50
Butylbenzylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND10 / ND10	50
bis(2-Ethylhexyl)phthalate	38	30	ND 10	20	19	67J	ND 10	ND 10	ND 10	ND 10	ND 10	ND10 / ND10	50
Total TICs	190J	28J	270J	38J	240J	140J	29J	10J	47J	130J	65J	31J	50 (1)
Pesticides/PCBs	ND	NA	ND	NA	ND	NA	NA	NA	NA	NA	NA	NA / NA	

Notes:

TCL - Target Compound List
ND x - Not detected at or above x µg/L.
J - Associated value is estimated.
R - Data were rejected.
TICs - Tentative Identified Compounds
ND - Not Detected
N - Not Analyzed
(1 - Each Individual Compound
* - Sum of compounds
- Exceeded ARAR
NL - Not Listed

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TABLE 7

SUMMARY OF ORGANIC COMPOUNDS
MONITORING WELL RESULTS
OU-3 REMEDIAL INVESTIGATION
AUGUST 1995 - MAY 1996

Location:	MW-52I		MW-52D		MW-56S		MW-56I		MW-57S		MW-57I		Groundwater Discharge ARAR
Sample Date:	2/22/96	5/01/96	2/21/96	5/01/96	2/19/96	4/29/96	2/19/96	4/29/96	2/20/96	4/30/96	2/20/96	4/30/96	
Units:	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	
TCL Volatiles													
Chloromethane	ND 100	ND 100	ND 10	ND 4	ND 1	ND 1	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	5
Vinyl chloride	2300	2000J	20	ND 4	ND 1	ND 1	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	2
Acetone	R	1400J	330J	R	R	R	R	R	R	R	18J	R	50
Methylene Chloride	ND 100	420J	ND 12	ND 4	ND 1	ND 2	ND 1	ND 1	ND 20	6J	ND 1	ND 2	5
Carbon Disulfide	ND 100	ND 100	ND 10	ND 4	ND 1	ND 1	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	50
1,1-Dichloroethylene	ND 100	ND 100	ND 10	ND 4	0.38J	ND 1	ND 1	ND 1	ND 20	ND 10	ND 1	0.7J	5
1,1-Dichloroethane	ND 100	ND 100	ND 10	ND 4	0.46J	0.5J	ND 1	0.5J	ND 20	ND 10	1.5	2	5
1,2-Dichloroethylene (total)	ND 100	40J	ND 10	4J	13	14	ND 1	ND 1	340	180	14	10	5
Chloroform	140	190J	ND 10	ND 4	ND 1	ND 1	ND 1	ND 1	63	ND 10	ND 1	ND 2	7
1,2-Dichloroethane	ND 100	ND 100	ND 10	ND 4	ND 1	ND 1	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	0.6
2-Butanone (MEK)	R	R	R	R	R	R	R	R	R	R	R	R	50
1,1,1-Trichloroethane	ND 100	ND 100	ND 10	ND 4	5.4	4	ND 1	ND 1	ND 20	ND 10	3.5	4	5
Carbon tetrachloride	ND 100	ND 100	ND 10	ND 4	ND 1	ND 1	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	5
Bromodichloromethane	22J	ND 100	ND 10	ND 4	ND 1	ND 1	ND 1	ND 1	6.8J	ND 10	ND 1	ND 2	50
Trichloroethylene	110	90J	36	38J	11	12	ND 1	ND 1	620	240	34	35	5
1,1,2-Trichloroethane	ND 100	ND 100	ND 10	ND 4	ND 1	ND 1	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	1
Benzene	ND 100	36J	ND 10	ND 4	ND 1	ND 1	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	0.7
Tetrachloroethylene	53J	46J	10	12J	12	10	ND 1	ND 1	81	5J	8.4	9	5
Toluene	ND 100	44J	ND 10	ND 4	ND 1	0.6J	ND 1	ND 1	ND 20	0.3J	ND 1	ND 2	5
Chlorobenzene	ND 100	ND 100	ND 10	ND 4	ND 1	ND 1	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	5
Ethylbenzene	ND 100	4J	ND 10	ND 4	0.26J	0.2J	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	5
Xylene (total)	ND 100	12J	ND 10	ND 4	2	1	ND 1	ND 1	ND 20	ND 10	ND 1	ND 2	5
TCL Semivolatiles													
Phenol	ND 10	ND 10	ND 10	ND 10	ND 10	8J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	1*
1,2-Dichlorobenzene	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	5J	3
4-Methylphenol	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	1*
Naphthalene	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	50
2-Methylnaphthalene	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	NL
Dimethylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	2J	50
Diethylphthalate	ND 10	ND 10	ND 10	ND 10	0.3J	ND 10	ND 10	ND 10	0.4J	ND 10	ND 10	ND 10	50
Di-n-butylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	50
Butylbenzylphthalate	ND 10	ND 10	ND 10	ND 10	ND 10	4J	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	50
bis(2-Ethylhexyl)phthalate	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	ND 10	50
Total TICs	31J	11J	77J	ND	17J	21J	24J	7J	14J	9J	12J	14J	50 (1)
Pesticides / PCBs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

Notes:

TCL - Target Compound List
ND n - Not detected at or above n µg/L.
J - Associated value is estimated.
R - Data were rejected.
TICs - Tentative Identified Compounds
ND - Not Detected
NA - Not Analyzed
(1) - Each Individual Compound
* - Sum of compounds
Exceeded ARAR
NL - Not Listed

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*GP-6*		*GP-8*		*GP-14*	
		TBC	*Collection Date:*	*08/01/95*	*08/18/97*	*08/01/95*	*08/18/97*	*08/01/95*	*08/18/97*
Parameters	**Units**	***Criteria***							
TCL Volatiles									
Vinyl chloride	µg/L	2		76	64	ND 0.5	ND 1	360	540
Chloroethane	µg/L	NL		--	--	--	--	--	--
Methylene chloride	µg/L	NL		ND 2	ND 1	ND 2	ND 1	ND 2	ND 1
Acetone	µg/L	50		R	10	R	ND 1	11 J	54
Carbon disulfide	µg/L	50		ND 1	--	ND 0.5	--	ND 0.5	--
1,1-Dichloroethene	µg/L	NL		14 J	11	360 J	290	ND 0.5	7
1,1-Dichloroethane	µg/L	NL		3	--	12	--	1	--
1,2-Dichloroethene(total)	µg/L	5		94	160	4.1	5	1.6	25
2-Butanone	µg/L	50		R	29	R	16	R	4
Chloroform	µg/L	7		ND 1	ND 1	ND 5.3	11	ND 0.5	2
1,1,1-Trichloroethane	µg/L	NL		10	7	390	200	1.1	13
Carbon tetrachloride	µg/L	NL		ND 1	ND 1	0.63	ND 1	ND 0.5	1
Bromodichloromethane	µg/L	NL		ND 1	--	ND 0.5	--	ND 0.5	--
Trichloroethene	µg/L	5		110	140	220	160	25	210
Benzene	µg/L	0.7		ND 1	ND 1	ND 0.5	ND 1	ND 0.5	ND 1
1,1,2-Trichloroethane	µg/L	NL		ND 1	--	1.4	--	ND 0.5	--
4-Methyl-2-pentanone	µg/L	50		--	ND 1	--	ND 1	--	ND 1
2-Hexanone	µg/L	NL		--	--	--	--	--	--
Tetrachloroethene	µg/L	5		180	210	260	89	18	120
Toluene	µg/L	NL		ND 1	ND 1	ND 0.5	ND 1	ND 0.5	ND 1
Chlorobenzene	µg/L	5		0.22 J	--	ND 0.5	--	ND 0.5	--
Ethylbenzene	µg/L	5		ND 1	--	ND 0.5	--	ND 0.5	--
Xylene(total)	µg/L	5		ND 1	ND 1	ND 0.5	ND 1	ND 0.5	3
Total TICs	µg/L	50 (1)		ND	ND	ND	ND	ND	ND

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	GP-6		GP-8		GP-14	
		TBC	Collection Date:	08/01/95	08/18/97	08/01/95	08/18/97	08/01/95	08/18/97
Parameters	Units	*Criteria*							
TCL Semi-Volatiles									
Phenol	µg/L	NL		ND 10	--	ND 10	--	ND 10	--
4-Methylphenol	µg/L	NL		ND 10	--	ND 10	--	ND 10	--
Naphthalene	µg/L	50		ND 10	--	ND 10	--	ND 10	--
Diethylphthalate	µg/L	NL		ND 10	--	ND 10	--	ND 10	--
Di-n-butylphthalate	µg/L	50		ND 10	--	ND 10	--	ND 10	--
bis(2-Ethylhexyl)phthalate	µg/L	50		ND 10	--	ND 10	--	ND 10	--
Butylbenzylphthalate	µg/L	NL		ND 10	--	ND 10	--	ND 10	
Di-n-octylphthalate	µg/L	50		ND 10	--	ND 10	--	ND 10	--
Total TICs	µg/L	50 (1)		ND	--	4 J	--	2 J	--
PCBs									
Aroclor-1242	µg/L	NL		--	--	--	--	--	--

Notes:
(1) Each individual TIC cannot exceed 50 µg/L
NDx Not detected at or above x
TCL Target Compound List
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated January 1999
Exceeds TBC Criteria
27/23 Duplicate Analysis

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	R-1		A-1		D-1	
		TBC	Collection Date:	01/25/90	12/14/98	01/25/90	12/14/98	01/15/90	12/14/98
Parameters	Units	*Criteria*							
TCL Volatiles									
Vinyl chloride	µg/L	2		ND 0.17	ND 2	ND 0.17	ND 2	ND 0.17	ND 2
Chloroethane	µg/L	NL		ND 0.1	ND 10	ND 0.1	ND 10	ND 0.1	ND 10
Methylene chloride	µg/L	NL		ND 0.03	ND 10	2 R	ND 10	ND 0.03	ND 10
Acetone	µg/L	50		ND 10	ND 10	ND 10	ND 10	6 RJ	ND 10
Carbon disulfide	µg/L	50		ND 5	ND 10	ND 5	ND 10	ND 5	ND 10
1,1-Dichloroethene	µg/L	NL		ND 0.12	ND 10	ND 0.12	ND 10	ND 0.12	ND 10
1,1-Dichloroethane	µg/L	NL		ND 0.04	ND 10	ND 0.04	ND 10	ND 0.04	ND 10
1,2-Dichloroethene(total)	µg/L	5		ND 0.1	ND 5	ND 0.1	ND 5	54 J	39
2-Butanone	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Chloroform	µg/L	7		ND 0.03	ND 7	ND 0.03	ND 7	ND 0.03	ND 7
1,1,1-Trichloroethane	µg/L	NL		ND 0.08	ND 10	ND 0.08	ND 10	ND 0.08	ND 10
Carbon tetrachloride	µg/L	NL		ND 0.21	ND 10	ND 0.21	ND 10	ND 0.21	ND 10
Bromodichloromethane	µg/L	NL		ND 0.08	ND 10	ND 0.08	ND 10	ND 0.08	ND 10
Trichloroethene	µg/L	5		ND 0.19	ND 5	ND 0.19	ND 5	18	14
Benzene	µg/L	0.7		ND 0.04	ND 0.7	ND 0.04	ND 0.7	ND 0.04	ND 0.7
1,1,2-Trichloroethane	µg/L	NL		ND 0.1	ND 10	ND 0.1	ND 10	ND 0.1	ND 10
4-Methyl-2-pentanone	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
2-Hexanone	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Tetrachloroethene	µg/L	5		5 J	11	ND 0.14	ND 5	98	82
Toluene	µg/L	NL		ND 0.11	ND 10	ND 0.11	ND 10	ND 0.11	ND 10
Chlorobenzene	µg/L	5		ND 0.04	ND 5	ND 0.04	ND 5	ND 0.04	ND 5
Ethylbenzene	µg/L	5		ND 0.06	ND 5	ND 0.06	ND 5	ND 0.06	ND 5
Xylene(total)	µg/L	5		ND 0.1	ND 5	ND 0.1	ND 5	ND 0.1	ND 5
Total TICs	µg/L	50 (1)		ND	ND	--	ND	--	ND

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*R-1*		*A-1*		*D-1*	
		TBC	*Collection Date:*	*01/25/90*	*12/14/98*	*01/25/90*	*12/14/98*	*01/15/90*	*12/14/98*
Parameters	**Units**	***Criteria***							
TCL Semi-Volatiles									
Phenol	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
4-Methylphenol	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Naphthalene	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Diethylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Di-n-butylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
bis(2-Ethylhexyl)phthalate	µg/L	50		2 RJ	ND 10	4 RJ	ND 10	ND 26 R	ND 10
Butylbenzylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Di-n-octylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 2 J	ND 10
Total TICs	µg/L	50 (1)		ND	14	ND	68	ND	2
PCBs									
Aroclor-1242	µg/L	NL		ND 0.5	–	ND 0.05	–	ND 0.05	–

Notes:

(1) Each individual TIC cannot exceed 50 µg/L
NDx Not detected at or above x
TCL Target Compound List
J Reported value is estimated
R Reported value was rejected
– Not Analyzed
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated January 1999
Exceeds TBC Criteria
27/23 Duplicate Analysis

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*P-1*		*E-1*		*E-2*	
		TBC	*Collection Date:*	*01/30/90*	*12/15/98*	*01/16/90*	*12/15/98*	*01/16/90*	*12/15/98*
Parameters	**Units**	***Criteria***							
TCL Volatiles									
Vinyl chloride	µg/L	2		83 J	ND 2	15	17	8	ND 2
Chloroethane	µg/L	NL		ND 0.1	ND 10	ND 0.1	ND 10	ND 0.1	ND 10
Methylene chloride	µg/L	NL		ND 0.03	ND 10	ND 0.03	ND 10	ND 0.03	ND 10
Acetone	µg/L	50		ND 10	58 J	8 RJ	ND 10J	2 RJ	ND 10J
Carbon disulfide	µg/L	50		11 R	ND 10	5 R	ND 10	4 RJ	ND 10
1,1-Dichloroethene	µg/L	NL		ND 0.12	ND 10	ND 0.12	ND 10	ND 0.12	ND 10
1,1-Dichloroethane	µg/L	NL		ND 0.04	ND 10	ND 0.04	ND 10	ND 0.04	ND 10
1,2-Dichloroethene(total)	µg/L	5		21	2J	19 J	46	12 J	ND 5
2-Butanone	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Chloroform	µg/L	7		ND 0.03	ND 7	ND 0.03	ND 7	ND 0.03	ND 7
1,1,1-Trichloroethane	µg/L	NL		ND 0.08	ND 10	ND 0.08	ND 10	ND 0.08	ND 10
Carbon tetrachloride	µg/L	NL		ND 0.21	ND 10	ND 0.21	ND 10	ND 0.21	ND 10
Bromodichloromethane	µg/L	NL		ND 0.08	ND 10	ND 0.08	ND 10	ND 0.08	ND 10
Trichloroethene	µg/L	5		ND 0.19	ND 5	ND 0.19	2J	2	ND 5
Benzene	µg/L	0.7		ND 0.04	ND 0.7	ND 0.04	ND 0.7	ND 0.04	ND 0.7
1,1,2-Trichloroethane	µg/L	NL		ND 0.1	ND 10	ND 0.1	ND 10	ND 0.1	ND 10
4-Methyl-2-pentanone	µg/L	50		320 J	ND 10	19	ND 10	ND 10	ND 10
2-Hexanone	µg/L	NL		8 RJ	ND 10	ND 10	ND 10	ND 10	ND 10
Tetrachloroethene	µg/L	5		ND 0.14	ND 5	ND 0.14	4J	ND 0.14	ND 5
Toluene	µg/L	NL		ND 0.11	ND 10	ND 0.11	ND 10	ND 0.11	4J
Chlorobenzene	µg/L	5		6	ND 5	2	ND 5	ND 0.04	ND 5
Ethylbenzene	µg/L	5		8	ND 5	3	ND 5	ND 0.06	ND 5
Xylene(total)	µg/L	5		15	ND 5	6	ND 5	ND 0.1	ND 5
Total TICs	µg/L	50 (1)		–	134	–	111	–	ND

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*P-1*		*E-1*		*E-2*	
Parameters	Units	*TBC Criteria*	*Collection Date:*	*01/30/90*	*12/15/98*	*01/16/90*	*12/15/98*	*01/16/90*	*12/15/98*
TCL Semi-Volatiles									
Phenol	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10J
4-Methylphenol	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10J
Naphthalene	µg/L	50		ND 10	ND 10	2 J	ND 10	ND 10	ND 10
Diethylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Di-n-butylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
bis(2-Ethylhexyl)phthalate	µg/L	50		4 RJ	ND 10	2 RJ	ND 10	12 R	ND 10
Butylbenzylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Di-n-octylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Total TICs	µg/L	50 (1)		4200	222	130	73	2310	650
PCBs									
Aroclor-1242	µg/L	NL		ND 0.05	2.0	ND 0.05	ND 1.0	ND 0.05	ND 1.0

Notes:

(1) Each individual TIC cannot exceed 50 µg/L
NDx Not detected at or above x
TCL Target Compound List
J Reported value is estimated
R Reported value was rejected
– Not Analyzed
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated January 1999
Exceeds TBC Criteria
27/23 Duplicate Analysis

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*K-1 (GM-9S)*		*K-2 (GM-9I)*		*MW-50J1*	
		TBC	*Collection Date:*	*02/02/90*	*12/15/98*	*02/02/90*	*12/15/98*	*01/23/90*	*08/08/95*
Parameters	Units	*Criteria*							
TCL Volatiles									
Vinyl chloride	µg/L	2		ND 0.17	ND 2	ND 0.17	3	ND 0.17	ND 5
Chloroethane	µg/L	NL		ND 0.1	ND 10	ND 0.1	ND 10	ND 0.1	ND 5
Methylene chloride	µg/L	NL		ND 0.03	ND 10	10 R	ND 10	ND 0.03	ND 5
Acetone	µg/L	50		ND 10	ND 10J	ND 10	ND 10	20 R	R
Carbon disulfide	µg/L	50		ND 5	ND 10	ND 5	ND 10	11 R	ND 5
1,1-Dichloroethene	µg/L	NL		ND 0.12	ND 10	ND 0.12	ND 10	ND 0.12	ND 5
1,1-Dichloroethane	µg/L	NL		ND 0.04	ND 10	ND 0.04	ND 10	ND 0.04	ND 5
1,2-Dichloroethene(total)	µg/L	5		ND 0.1	ND 5	ND 0.1	ND 5	2 J	1.6 J
2-Butanone	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	R
Chloroform	µg/L	7		ND 0.03	ND 7	ND 0.03	ND 7	ND 0.03	ND 5
1,1,1-Trichloroethane	µg/L	NL		ND 0.08	ND 10	ND 0.08	ND 10	ND 0.08	5.6
Carbon tetrachloride	µg/L	NL		ND 0.21	ND 10	ND 0.21	ND 10	ND 0.21	ND 5
Bromodichloromethane	µg/L	NL		ND 0.08	ND 10	ND 0.08	ND 10	ND 0.08	ND 5
Trichloroethene	µg/L	5		ND 0.19	ND 5	ND 0.19	ND 5	ND 0.19	10
Benzene	µg/L	0.7		ND 0.04	ND 0.7	ND 0.04	ND 0.7	ND 0.04	ND 5
1,1,2-Trichloroethane	µg/L	NL		ND 0.1	ND 10	ND 0.1	ND 10	ND 0.1	ND 5
4-Metlfyl-2-pentanone	µg/L	50		ND 10	ND 10	ND 10	ND 10	11 J	ND 25
2-Hexanone	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 25
Tetrachloroethene	µg/L	5		ND 0.14	ND 5	ND 0.14	ND 5	ND 0.14	3.9 J
Toluene	µg/L	NL		ND 0.11	ND 10	ND 0.11	ND 10	ND 0.11	ND 5
Chlorobenzene	µg/L	5		ND 0.04	ND 5	ND 0.04	ND 5	ND 0.04	ND 5
Ethylbenzene	µg/L	5		ND 0.06	ND 5	ND 0.06	ND 5	ND 0.06	0.94 J
Xylene(total)	µg/L	5		ND 0.1	ND 5	ND 0.1	ND 5	2 J	4 J
Total TICs	µg/L	50 (1)		–	ND	–	ND	–	–

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*K-1 (GM-9S)*		*K-2 (GM-9I)*		*MW-50J1*	
		TBC	*Collection Date:*	*02/02/90*	*12/15/98*	*02/02/90*	*12/15/98*	*01/23/90*	*08/08/95*
Parameters	**Units**	***Criteria***							
TCL Semi-Volatiles									
Phenol	µg/L	NL		ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10
4-Methylphenol	µg/L	NL		ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10
Naphthalene	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Diethylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Di-n-butylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
bis(2-Ethylhexyl)phthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	2 RJ	ND 10
Butylbenzylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Di-n-octylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10	ND 10
Total TICs	µg/L	50 (1)		1000	41	ND	250	5100	3400J
PCBs									
Aroclor-1242	µg/L	NL		ND 0.05	--	ND 0.05	--	ND 0.5	ND 1

Notes:

(1) Each individual TIC cannot exceed 50 µg/L
NDx Not detected at or above x
TCL Target Compound List
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated January 1999
Exceeds TBC Criteria
27/23 Duplicate Analysis

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*MW-50J1*		*MW-50J2*			
		TBC	*Collection Date:*	*05/01/96*	*12/16/98*	*01/18/90*	*08/08/95*	*05/01/96*	*12/16/98*
Parameters	Units	*Criteria*							
TCL Volatiles									
Vinyl chloride	µg/L	2		ND 10	ND 2	29	320	250J/250J	ND 2/ND 2
Chloroethane	µg/L	NL		ND 10	ND 10	ND 0.1	ND 10	ND10/ND10	ND 10/ND 10
Methylene chloride	µg/L	NL		ND 10	ND 10	ND 0.03	ND 10	ND 10/ND 10	ND 10/ND 10
Acetone	µg/L	50		407 J	41	ND 10	R	R/R	ND 10/ND 10
Carbon disulfide	µg/L	50		ND 10	ND 10	ND 5	ND 10	ND 10/ND 10	ND 10/ND 10
1,1-Dichloroethene	µg/L	NL		ND 10	ND 10	ND 0.12	ND 10	ND 10/ND 10	ND 10/ND 10
1,1-Dichloroethane	µg/L	NL		ND 10	ND 10	ND 0.04	ND 10	ND 10/ND 10	ND 10/ND 10
1,2-Dichloroethene(total)	µg/L	5		ND 10	ND 5	3 J	17	36J/36J	ND 5/ND 5
2-Butanone	µg/L	50		R	ND 10	3 RJ	R	R/R	ND 10/ND 10
Chloroform	µg/L	7		ND 10	ND 7	ND 0.03	ND 10	ND 10/ND 10	ND
1,1,1-Trichloroethane	µg/L	NL		ND 10	ND 10	ND 0.08	ND 10	ND 10/ND 10	ND 10/ND 10
Carbon tetrachloride	µg/L	NL		ND 10	ND 10	ND 0.21	ND 10	ND 10/ND 10	ND
Bromodichloromethane	µg/L	NL		ND 10	ND 10	ND 0.08	ND 10	ND 10/ND 10	ND
Trichloroethene	µg/L	5		ND 10	ND 5	ND 0.19	ND 10	ND 10/ND 10	ND 5/ND 5
Benzene	µg/L	0.7		ND 10	ND 0.7	ND 0.04	ND 10	ND 10/ND 10	ND 0.7/ND 0.7
1,1,2-Trichloroethane	µg/L	NL		ND 10	ND 10	ND 0.1	ND 10	ND 10/ND 10	ND 10/ND 10
4-Methyl-2-pentanone	µg/L	50		R	ND 10J	ND 10	ND 50	R/R	ND 10J/ND 10J
2-Hexanone	µg/L	NL		R	ND 10	ND 10	ND 50	R/R	ND 10/ND 10
Tetrachloroethene	µg/L	5		ND 10	ND 5	ND 0.14	ND 10	ND 10/ND 10	ND 5/ND 5
Toluene	µg/L	NL		ND 10	ND 10	7 R	ND 10	ND 10/ND 10	ND 10/ND 10
Chlorobenzene	µg/L	5		ND 10	ND 5	ND 0.04	ND 10	ND 10/ND 10	ND 5/ND 5
Ethylbenzene	µg/L	5		ND 10	ND 5	7 J	ND 10	ND 10/ND 10	ND 5/ND 5
Xylene(total)	µg/L	5		ND 10	4J	6 J	ND 10	ND 10/ND 10	ND 5/ND 5
Total TICs	µg/L	50 (1)		--	493	--	--	--	27/23

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*MW-50J1*		*MW-50J2*			
Parameters	*Units*	*TBC Criteria*	*Collection Date:*	*05/01/96*	*12/16/98*	*01/18/90*	*08/08/95*	*05/01/96*	*12/16/98*
TCL Semi-Volatiles									
Phenol	µg/L	NL		17	ND 10	ND 10	ND 10	ND 40/ND 10	ND 10/ND 10
4-Methylphenol	µg/L	NL		23	ND 10	ND 10	ND 10	ND 40/ND 10	ND 10/ND 10
Naphthalene	µg/L	50		ND 10	ND 10	ND 10	ND 10	3J/ND 10	ND 10/ND 10
Diethylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 40/ND 10	ND 10/ND 10
Di-n-butylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 40/ND 10	ND 10/ND 10
bis(2-Ethylhexyl)phthalate	µg/L	50		ND 10	ND 10	2 RJ	ND 10	ND 40/ND 10	ND 10/ND 10
Butylbenzylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 40/ND 10	ND 10/ND 10
Di-n-octylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10/ND 10
Total TICs	µg/L	50 (1)		1300J	802	130	180J	530J/2500J	60/53
PCBs									
Aroclor-1242	µg/L	NL		--	--	ND 0.5	ND 1	-- / --	-- / --

Notes:
(1) Each individual TIC cannot exceed 50 µg/L
NDx Not detected at or above x
TCL Target Compound List
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated January 1999
Exceeds TBC Criteria
27/23 Duplicate Analysis

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	MW-50D1			MW-50D2			Composite-1
		TBC	Collection Date:	08/08/95	05/02/96	12/19/98	08/08/95	05/02/96	12/16/98	12/16/98
Parameters	Units	*Criteria*								
TCL Volatiles										
Vinyl chloride	µg/L	2		ND 10	ND 10	ND 2	ND 1	ND 1	ND 2	ND 2
Chloroethane	µg/L	NL		ND 10	ND 10	ND 10	ND 1	ND 1	ND 10	ND 10
Methylene chloride	µg/L	NL		ND 10	ND 10	ND 10	ND 2	ND 1	ND 10	ND 10
Acetone	µg/L	50		R	R	ND 10	R	R	ND 10	7J
Carbon disulfide	µg/L	50		ND 10	ND 10	ND 10	ND	ND	ND 10	ND 10
1,1-Dichloroethene	µg/L	NL		ND 10	ND 10	1 J	ND 1	ND 1	ND 10	ND 10
1,1-Dichloroethane	µg/L	NL		ND 10	ND 10	2 J	ND 1	ND 1	ND 10	ND 10
1,2-Dichloroethene(total)	µg/L	5		51	20 J	14	ND 1	ND 1	ND 5	ND 5
2-Butanone	µg/L	50		R	R	ND 10	R	R	ND 10	ND 10
Chloroform	µg/L	7		ND 10	ND 10	ND 7	ND 1	ND 1	ND 7	ND 7
1,1,1-Trichloroethane	µg/L	NL		1.5 J	ND 10	2 J	ND 1	ND 1	ND 10	ND 10
Carbon tetrachloride	µg/L	NL		ND 10	ND 10	ND 10	ND 1	ND 1	ND 10	ND 10
Bromodichloromethane	µg/L	NL		ND 10	ND 10	ND 10	ND 1	ND 1	ND 10	ND 10
Trichloroethene	µg/L	5		240	100 J	110	ND 1	ND 1	ND 5	ND 5
Benzene	µg/L	0.7		ND 10	ND 10	ND 0.7	ND 1	ND 1	ND 0.7	ND 0.7
1,1,2-Trichloroethane	µg/L	NL		ND 10	ND 10	ND 10	ND 1	ND 1	ND 10	ND 10
4-Methyl-2-pentanone	µg/L	50		ND 50	R	ND 10	ND 5	R	ND 10	ND 10
2-Hexanone	µg/L	NL		ND 50	R	ND 10	ND 5	R	ND 10	ND 10
Tetrachloroethene	µg/L	5		91	29 J	67	ND 1	ND 1	ND 5	ND 5
Toluene	µg/L	NL		ND 10	ND 10	ND 10	ND 1	ND 1	ND 10	ND 10
Chlorobenzene	µg/L	5		ND 10	ND 10	ND 5	ND 1	ND 1	ND 5	ND 5
Ethylbenzene	µg/L	5		ND 10	ND 10	ND 5	ND 1	ND 1	ND 5	ND 5
Xylene(total)	µg/L	5		ND 10	ND 10	ND 5	ND 1	ND 1	ND 5	ND 5
Total TICs	µg/L	50 (1)		ND	ND	7	ND	ND	ND	187

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	MW-50D1			MW-50D2			Composite-1
		TBC	Collection Date:	08/08/95	05/02/96	12/19/98	08/08/95	05/02/96	12/16/98	12/16/98
Parameters	Units	*Criteria*								
TCL Semi-Volatiles										
Phenol	µg/L	NL		ND 10	ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10
4-Methylphenol	µg/L	NL		ND 10	ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10
Naphthalene	µg/L	50		ND 10	ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10
Diethylphthalate	µg/L	NL		ND 10	ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10
Di-n-butylphthalate	µg/L	50		ND 10	ND 10	ND 10J	ND 10	0.8J	ND 10	ND 10
bis(2-Ethylhexyl)phthalate	µg/L	50		11	11	ND 10J	ND 10	ND 10	ND 10	ND 10
Butylbenzylphthalate	µg/L	NL		ND 10	ND 10	ND 10J	56	ND 10	ND 10	ND 10
Di-n-octylphthalate	µg/L	50		ND 10	ND 10	ND 10J	ND 10	ND 10	ND 10	ND 10
Total TICs	µg/L	50 (1)		650J	26J	16	240J	41J	85	544
PCBs										
Aroclor-1242	µg/L	NL		--	--	--	--	--	--	--

Notes:
(1) Each individual TIC cannot exceed 50 µg/L
NDx Not detected at or above x
TCL Target Compound List
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated January 1999
Exceeds TBC Criteria
27/23 Duplicate Analysis

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*MW-52I*			*MW-52S*		
		TBC	*Collection Date:*	*02/22/96*	*05/01/96*	*12/17/98*	*02/21/96*	*05/01/96*	*12/17/98*
Parameters	**Units**	*Criteria*							
TCL Volatiles									
Vinyl chloride	µg/L	2		2300	2000J	2900	6400	1400J/1400J	6300
Chloroethane	µg/L	NL		ND 100	ND 100	ND 10	ND 200	ND50/ND50	9J
Methylene chloride	µg/L	NL		ND 100	420J	ND 10	ND 200	22J/ND 50	ND 10
Acetone	µg/L	50		R	1400J	ND 10	R	R/300J	ND 10
Carbon disulfide	µg/L	50		ND 100	ND 100	ND 10	ND 200	ND 50/ND 50	ND 10
1,1-Dichloroethene	µg/L	NL		ND 100	ND 100	2J	ND 200	ND 50/ND 50	3J
1,1-Dichloroethane	µg/L	NL		ND 100	ND 100	ND 10	ND 200	ND 50/ND 50	ND 10
1,2-Dichloroethene(total)	µg/L	5		ND 100	40J	60	ND 200	23J/26J	63
2-Butanone	µg/L	50		R	R	ND 10	R	R/R	ND 10
Chloroform	µg/L	7		140	190J	ND 7	520	ND 50/19J	ND 7
1,1,1-Trichloroethane	µg/L	NL		ND 100	ND 100	ND 10	ND 200	ND 50/ND 50	ND 10
Carbon tetrachloride	µg/L	NL		ND 100	ND 100	ND 10	ND 200	ND 50/ND 50	ND 10
Bromodichloromethane	µg/L	NL		22J	ND 100	ND 10	ND 200	ND 50/ND 50	ND 10
Trichloroethene	µg/L	5		110	90J	120	220	46J/52J	71
Benzene	µg/L	0.7		ND 100	36J	ND 0.7	ND 200	ND 50/ND 50	2
1,1,2-Trichloroethane	µg/L	NL		ND 100	ND 100	ND 10	ND 200	ND 50/ND 50	ND 10
4-Methyl-2-pentanone	µg/L	50		ND 100	R	ND 10J	ND 200	R/R	ND 10J
2-Hexanone	µg/L	NL		ND 100	R	ND 10	R	R/R	ND 10
Tetrachloroethene	µg/L	5		53J	46J	81	290	51J/60J	110
Toluene	µg/L	NL		ND 100	44J	ND 10	ND 200	ND 50/ND 50	2J
Chlorobenzene	µg/L	5		ND 100	ND 100	ND 5	ND 200	ND 50/ND 50	ND 5
Ethylbenzene	µg/L	5		ND 100	4J	ND 5	ND 200	ND 50/ND 50	2J
Xylene(total)	µg/L	5		ND 100	12J	4J	ND 200	ND 50/ND 50	5
Total TICs	µg/L	50 (1)		ND	9	9	ND	ND/ND	54

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*MW-52I*			*MW-52S*		
		TBC	*Collection Date:*	02/22/96	05/01/96	12/17/98	02/21/96	05/01/96	12/17/98
Parameters	Units	*Criteria*							
TCL Semi-Volatiles									
Phenol	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10
4-Methylphenol	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10
Naphthalene	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10
Diethylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10
Di-n-butylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10
bis(2-Ethylhexyl)phthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10
Butylbenzylphthalate	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10
Di-n-octylphthalate	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10
Total TICs	µg/L	50 (1)		31J	11J	146	65J	31J	175
PCBs									
Aroclor-1242	µg/L	NL		--	--	--	--	--	--

Notes:
(1) Each individual TIC cannot exceed 50 µg/L
NDx Not detected at or above x
TCL Target Compound List
J Reported value is estimated
R Reported value was rejected
– Not Analyzed
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated January 1999
Exceeds TBC Criteria
27/23 Duplicate Analysis

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	MW-52D			GM-10I			Composite-2
		TBC	Collection Date:	02/21/96	05/01/96	12/17/98	10/25/91	08/27/93	12/17/98	12/16/98
Parameters	**Units**	**Criteria**								
TCL Volatiles										
Vinyl chloride	µg/L	2		20	ND 4	2J	ND10/ND10	ND 10	ND 2	3000
Chloroethane	µg/L	NL		ND 10	ND 4	ND 10	ND10/ND10	ND 10	ND 10	5J
Methylene chloride	µg/L	NL		ND 12	ND 4	ND 10	ND5/ND5	ND 10	ND 10	ND 10
Acetone	µg/L	50		330J	R	ND 10	ND12/ND10	ND 10	ND 10	ND 10
Carbon disulfide	µg/L	50		ND 10	ND 4	ND 10	ND5/ND5	ND 10	ND 10	ND 10
1,1-Dichloroethene	µg/L	NL		ND 10	ND 4	2J	2J/3J	3J	ND 10	ND 10
1,1-Dichloroethane	µg/L	NL		ND 10	ND 4	3J	ND5/ND5	ND 10	ND 10	ND 10
1,2-Dichloroethene(total)	µg/L	5		ND 10	4J	3J	3J/3J	ND 10	2J	54
2-Butanone	µg/L	50		R	R	ND 10	R/R	ND 10	ND 10	ND 10
Chloroform	µg/L	7		ND 10	ND 4	ND 7	ND5/ND5	ND 10	ND 7	ND 7
1,1,1-Trichloroethane	µg/L	NL		ND 10	ND 4	2J	7/10	5J	2J	ND 10
Carbon tetrachloride	µg/L	NL		ND 10	ND 4	ND 10	ND5/ND5	ND 10	ND 10	ND 10
Bromodichloromethane	µg/L	NL		ND 10	ND 4	ND 10	ND5/ND5	ND 10	ND 10	ND 10
Trichloroethene	µg/L	5		36	38J	29	25/32	19	7	76
Benzene	µg/L	0.7		ND 10	ND 4	ND 0.7	ND5/ND5	ND 10	ND 0.7	1
1,1,2-Trichloroethane	µg/L	NL		ND 10	ND 4	ND 10	ND5/ND5	ND 10	ND 10	ND 10
4-Methyl-2-pentanone	µg/L	50		ND 10	R	ND 10J	ND10/ND10	ND 10	ND 10J	ND 10
2-Hexanone	µg/L	NL		R	R	ND 10	ND10/ND10	ND 10	ND 10	ND 10
Tetrachloroethene	µg/L	5		10	12J	18	6/7	6J	4J	74
Toluene	µg/L	NL		ND 10	ND 4	ND 10	ND5/ND5	ND 10	ND 10	ND 10
Chlorobenzene	µg/L	5		ND 10	ND 4	ND 5	ND5/ND5	ND 10	ND 5	ND 5
Ethylbenzene	µg/L	5		ND 10	ND 4	ND 5	ND5/ND5	ND 10	ND 5	ND 5
Xylene(total)	µg/L	5		ND 10	ND 4	ND 5	ND5/ND5	ND 10	ND 5	3J
Total TICs	µg/L	50 (1)		ND	ND	ND	--/--	--	ND	ND

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*MW-52D*			*GM-10I*			*Composite-2*
		TBC	*Collection Date:*	*02/21/96*	*05/01/96*	*12/17/98*	*12/17/98*	*12/17/98*	*12/17/98*	*12/16/98*
Parameters	Units	*Criteria*								
TCL Semi-Volatiles										
Phenol	µg/L	NL		ND 10	ND 10	ND 10J	--	--	ND 10	ND 10
4-Methylphenol	µg/L	NL		ND 10	ND 10	ND 10J	--	--	ND 10	ND 10
Naphthalene	µg/L	50		ND 10	ND 10	ND 10J	--	--	ND 10	ND 10
Diethylphthalate	µg/L	NL		ND 10	ND 10	ND 10J	--	--	ND 10	ND 10
Di-n-butylphthalate	µg/L	50		ND 10	ND 10	ND 10J	--	--	ND 10	ND 10
bis(2-Ethylhexyl)phthalate	µg/L	50		ND 10	ND 10	ND 10J	--	--	ND 10	ND 10
Butylbenzylphthalate	µg/L	NL		ND 10	ND 10	1J	--	--	ND 10	ND 10
Di-n-octylphthalate	µg/L	50		ND 10	ND 10	3.5J	--	--	ND 10J	ND 10
Total TICs	µg/L	50 (1)		77J	ND	13J	--	--	34	252
PCBs										
Aroclor-1242	µg/L	NL		--	--	--	--	--	--	--

Notes:
(1) Each individual TIC cannot exceed 50 µg/L
NDx Not detected at or above x
TCL Target Compound List
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated January 1999
Exceeds TBC Criteria
27/23 Duplicate Analysis

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*F-1*		*F-2*		*I-1*		*I-2*	
		TBC	*Collection Date:*	*01/18/90*	*12/18/98*	*01/18/90*	*12/18/98*	*01/17/90*	*12/19/98*	*01/17/90*	*12/19/98*
Parameters	Units	*Criteria*									
TCL Volatiles											
Vinyl chloride	µg/L	2		ND 0.017	7	ND 0.017	1J	ND 0.017/ND 0.017	ND 2	94 J	45
Chloroethane	µg/L	NL		ND 0.1	ND 10	ND 0.1	ND 10	ND 0.1/ND 0.1	ND 10	ND 0.1	2J
Methylene chloride	µg/L	NL		2 RJ	ND 10	1 R	ND 10	ND 0.03/ND 0.03	ND 10	ND 0.03	ND 10
Acetone	µg/L	50		35 R	ND 10	7 RJ	ND 10	ND 10/ND 10	ND 10	ND 10	ND 10
Carbon disulfide	µg/L	50		4 RJ	ND 10	1 RJ	ND 10	ND 5/ND 5	ND 10	ND 5	ND 10
1,1-Dichloroethene	µg/L	NL		ND 0.12	ND 10	ND 0.12	ND 10	ND 0.12/ND 0.12	ND 10	ND 0.12	ND 10
1,1-Dichloroethane	µg/L	NL		ND 0.04	ND 10	ND 0.04	ND 10	ND 0.04/ND 0.04	ND 10	ND 0.04	ND 10
1,2-Dichloroethene(total)	µg/L	5		ND 0.1	2J	ND 0.1	ND 5	24J/22J	ND 5	ND 0.1	ND 5
2-Butanone	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND	ND 10	ND 10	ND 10
Chloroform	µg/L	7		ND 0.03	ND 7	ND 0.03	ND 7	ND	ND 7	ND 0.03	ND 7
1,1,1-Trichloroethane	µg/L	NL		ND 0.08	ND 10	ND 0.08	ND 10	ND 0.08/ND 0.08	ND 10	ND 0.08	ND 10
Carbon tetrachloride	µg/L	NL		ND 0.21	ND 10	ND 0.21	ND 10	ND	ND 10	ND 0.21	ND 10
Bromodichloromethane	µg/L	NL		ND 0.08	ND 10	ND 0.08	ND 10	ND	ND 10	ND 0.08	ND 10
Trichloroethene	µg/L	5		ND 0.19	ND 5	ND 0.19	ND 5	5/5	1J	ND 0.19	ND 5
Benzene	µg/L	0.7		ND 0.04	ND 0.7	ND 0.04	ND 0.7	ND 0.04/ND 0.04	ND 0.7	ND 0.04	ND 0.7
1,1,2-Trichloroethane	µg/L	NL		ND 0.1	ND 10	ND 0.1	ND 10	ND	ND 10	ND 0.1	ND 10
4-Methyl-2-pentanone	µg/L	50		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10	ND 10	ND 10
2-Hexanone	µg/L	NL		ND 10	ND 10	ND 10	ND 10	ND 10/ND 10	ND 10	ND 10	ND 10
Tetrachloroethene	µg/L	5		ND 0.14	ND 5	ND 0.14	ND 5	69/64	85	2 R	5
Toluene	µg/L	NL		ND 0.11	ND 10	ND 0.11	ND 10	ND 0.11/ND 0.11	ND 10	ND 0.11	ND 10
Chlorobenzene	µg/L	5		ND 0.04	ND 5	ND 0.04	3J	ND 0.04/ND 0.04	ND 5	ND 0.04	ND 5
Ethylbenzene	µg/L	5		ND 0.06	ND 5	ND 0.06	2J	ND 0.06/ND 0.06	ND 5	ND 0.06	ND 5
Xylene(total)	µg/L	5		1	ND 5	1 J	3J	ND 0.1/ND 0.1	ND 5	ND 0.1	ND 5
Total TICs	µg/L	50 (1)		--	168	--	281	-- / --	ND	--	ND

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TABLE 8

SUMMARY OF DETECTED ORGANIC COMPOUNDS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*F-1*		*F-2*		*I-1*		*I-2*	
		TBC	*Collection Date:*	*01/18/90*	*12/18/98*	*01/18/90*	*12/18/98*	*01/17/90*	*12/19/98*	*01/17/90*	*12/19/98*
Parameters	*Units*	*Criteria*									
TCL Semi-Volatiles											
Phenol	µg/L	NL		-	ND 10J	ND 10	ND 10J	ND 10/ND 10	ND 10J	ND 10	ND 10J
4-Methylphenol	µg/L	NL		-	ND 10J	ND 10	ND 10J	ND 10/ND 10	ND 10J	ND 10	ND 10J
Naphthalene	µg/L	50		-	ND 10J	ND 10	1J	ND 10/ND 10	ND 10J	ND 10	ND 10J
Diethylphthalate	µg/L	NL		-	ND 10J	ND 10	ND 10J	ND 10/ND 10	ND 10J	ND 10	ND 10J
Di-n-butylphthalate	µg/L	50		-	ND 10J	ND 10	ND 10J	ND 10/ND 10	ND 10J	ND 10	ND 10J
bis(2-Ethylhexyl)phthalate	µg/L	50		-	ND 10J	2 RJ	ND 10J	2 RJ/5 RJ	ND 10J	6 RJ	ND 10J
Butylbenzylphthalate	µg/L	NL		-	ND 10J	ND 10	ND 10J	ND 10/ND 10	ND 10J	ND 10	ND 10J
Di-n-octylphthalate	µg/L	50		ND 10	ND 10J	ND 10	ND 10J	ND 10/ND 10	ND 10J	ND 10	ND 10J
Total TICs	µg/L	50 (1)		520	330	110	936	ND / ND	7	ND	29
PCBs											
Aroclor-1242	µg/L	NL		ND 0.5	--	ND 0.5	--	ND 0.053/ND 0.053	ND 1.0J	ND 0.5	ND 1.0J

Notes:
(1) Each individual TIC cannot exceed 50 µg/L
NDx Not detected at or above x
TCL Target Compound List
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated January 1999
Exceeds TBC Criteria
27/23 Duplicate Analysis

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	R-1		A-1		D-1	
		TBC	Collection Date:	01/25/90	12/14/98	01/25/90	12/14/98	01/15/90	12/14/98
Parameters	*Units*	*Criteria*							
TAL Metals (total)									
Aluminum	µg/L	NR		140	ND 32.3	690 J	2160	410 J	ND 32.3
Antimony	µg/L	6		ND 34	ND 2.9	ND 34	6.4	ND 20	ND 2.9
Arsenic	µg/L	25		ND 2	ND 2.4	ND 2	ND 2.4	ND 2	ND 2.4
Barium	µg/L	1000		47	34.3	96	60.3	41	42.5
Beryllium	µg/L	1		ND 0.2	ND 0.30	1.5 J	0.67	ND 2	ND 0.30
Cadmium	µg/L	5		ND 2	ND 0.50	ND 2	ND 0.50	ND 1	ND 0.50
Calcium	µg/L	NR		12000 J	9730	17000 J	8380	25000 J	27700
Chromium	µg/L	50		ND 2	3.9	11 R	821	160 J	58.0
Cobalt	µg/L	NR		ND 3	ND 3.6	ND 3	ND 3.6	ND 1	ND 3.6
Copper	µg/L	200		ND 3	ND 2.2	16	19.8	ND 0.3	ND 2.2
Iron	µg/L	300 (1)		130 J	55.1	73 R	3740	1300 J	168
Lead	µg/L	15		5 J	ND 1.0	3 J	5.4	3 J	ND 1.0
Magnesium	µg/L	NR		2300	2370	3300	1720	5700 J	7360
Manganese	µg/L	300 (1)		7	4.1	140 J	46.6	53 J	10.0
Nickel	µg/L	NR		ND 6	ND 3.2	11 R	11.8	3	ND 3.2
Potassium	µg/L	NR		780	926J	3800	1800J	3300	3520J
Selenium	µg/L	10		ND 2	ND 1.9	ND 2	ND 1.9	ND 2	ND 1.9
Silver	µg/L	50		ND 2 J	ND 0.60	6 J	ND 0.60	1	ND 0.60
Sodium	µg/L	20000		4200	5380	54000 J	38600	18000 J	16800
Thallium	µg/L	NL		ND 2	1.2	ND 2	1.3	ND 2	ND 1.2
Vanadium	µg/L	NR		ND 4	ND 1.9	5	3.3	11 R	ND 1.9
Zinc	µg/L	300		ND 6	ND 5.6	10 R	ND 12.1	5	ND 7.1
TAL Metals (filtered)									
Iron	µg/L	300 (1)		--	ND 16.6	--	ND 16.6	--	--
Manganese	µg/L	300 (1)		--	2.8	--	20.0	--	--

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

		Location ID:	*R-1*		*A-1*		*D-1*	
		Collection Date:	*01/25/90*	*12/14/98*	*01/25/90*	*12/14/98*	*01/15/90*	*12/14/98*
Parameters	***Units***							
General Chemistry (total)								
Cyanide	mg/L		ND 10	--	ND 10	--	ND 10	ND 0.010
BOD5	mg/L		--	ND 2	4	ND 2	--	ND 2
COD	mg/L		--	ND 10.0	--	ND 10.0	--	ND 10.0
Hardness	mg/L		--	--	58	--	--	--
TSS	mg/L		--	37.6	ND 3	56.8	--	6.8
TDS	mg/L		--	ND 79	240	184	--	207
TOC	mg/L		--	--	--	--	--	1.5

Notes:
NDx Not detected at or above x
TAL Target Analyte List
BOD Biological Oxygen Demand
COD Chemical Oxygen Demand
TSS Total Suspended Solids
TDS Total Dissolved Solids
TOC Total Organic Carbon
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
Exceeds TBC Criteria
Mercury was not detected and thus not listed.
NL Not Listed in Table 5.2 of Predesign Work Plan
For Operable Unit-1, Revision 2, dated Jan/99
NR Not Regulated
(1) Sum not to exceed 500 µg/L
(2) Not analyzed for inorganics during RI performed by Northrop

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	*P-1*		*E-1*		*E-2*	
		TBC	*Collection Date:*	*01/30/90*	*12/15/98*	*01/16/90*	*12/15/98*	*01/16/90*	*12/15/98*
Parameters	*Units*	*Criteria*							
TAL Metals (total)									
Aluminum	µg/L	NR		33 R	126	22 J	ND 46.1	26 J	ND 86.9
Antimony	µg/L	6		ND 34	ND 2.9	ND 20	ND 2.9	ND 20	ND 2.9
Arsenic	µg/L	25		ND 2	5.7	ND 2	ND 2.4	20 J	24.0
Barium	µg/L	1000		19	53.2	19	52.1	9	9.8
Beryllium	µg/L	1		ND 2	ND 0.30	ND 2	ND 0.30	ND 2	ND 0.30
Cadmium	µg/L	5		4	ND 0.50	1	ND 0.50	3	ND 0.50
Calcium	µg/L	NR		4600	21200	3200	14600	12000 J	13800
Chromium	µg/L	50		ND 2	2.5	ND 1	ND 0.90	ND 1	ND 0.90
Cobalt	µg/L	NR		ND 3	ND 3.6	2	ND 3.6	4	ND 3.6
Copper	µg/L	200		ND 2	ND 2.2	ND 0.3	ND 2.2	ND 0.3	ND 2.2
Iron	µg/L	300 (1)		9700 J	14200	9200 J	6170	30000 J	21800
Lead	µg/L	15		3 R	1.5	ND 4 J	ND 1.0	ND 2 J	1.9
Magnesium	µg/L	NR		1000	5150	720	3500	1200	3120
Manganese	µg/L	300 (1)		790 J	110	460 J	90.7	83 J	95.2
Nickel	µg/L	NR		ND 6	ND 3.2	ND 2	ND 3.2	3 R	ND 3.2
Potassium	µg/L	NR		880	1250J	1300	1210J	860	993J
Selenium	µg/L	10		ND 2	ND 2.5	2 J	ND 1.9	ND 2 J	ND 1.9
Silver	µg/L	50		ND 2 J	ND 0.60	2 J	ND 0.60	ND 1 J	ND 0.60
Sodium	µg/L	20000		19000 J	4540	17000 J	2760	3300 J	2920
Thallium	µg/L	NL		ND 2	ND 1.2	ND 2	ND 1.2	ND 2	ND 1.2
Vanadium	µg/L	NR		ND 4	ND 1.9	2 R	ND 1.9	ND 1	ND 1.9
Zinc	µg/L	300		ND 2	12.4	16 R	7.2	19 R	ND 5.6
TAL Metals (filtered)									
Iron	µg/L	300 (1)		--	--	--	--	--	--
Manganese	µg/L	300 (1)		--	--	--	--	--	--

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

		Location ID:	P-1		E-1		E-2	
		Collection Date:	01/30/90	12/15/98	01/16/90	12/15/98	01/16/90	12/15/98
Parameters	**Units**							
General Chemistry (total)								
Cyanide	mg/L		ND 10	ND 0.010	ND 10	ND 0.010	ND 10	ND 0.010
BOD5	mg/L		--	4	--	ND 4	--	7
COD	mg/L		--	34.9	--	ND 10.0	--	11.6
Hardness	mg/L		--	74.2	--	50.9	--	47.3
TSS	mg/L		--	32.8	--	6.4	--	47.2
TDS	mg/L		--	ND 124	--	ND 88	--	ND 87
TOC	mg/L		--	ND 3.6	--	ND 2.1	--	ND 2.3

Notes:
NDx Not detected at or above x
TAL Target Analyte List
BOD Biological Oxygen Demand
COD Chemical Oxygen Demand
TSS Total Suspended Solids
TDS Total Dissolved Solids
TOC Total Organic Carbon
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
Exceeds TBC Criteria
Mercury was not detected and thus not listed.
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated Jan/99
NR Not Regulated
(1) Sum not to exceed 500 µg/L
(2) Not analyzed for inorganics during RI performed by Northrop

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	K-1 (GM-9S)		K-2 (GM-9I)		MW-50J1	
		TBC	Collection Date:	02/02/90	12/15/98	02/02/90	12/15/98	01/23/90	12/16/98
Parameters	*Units*	*Criteria*							
TAL Metals (total)									
Aluminum	µg/L	NR		330	406	440	ND 51.4	260 J	ND 26.9
Antimony	µg/L	6		ND 34	ND 2.9	ND 34	ND 2.9	ND 34	ND 2.9
Arsenic	µg/L	25		24	24.0	59	54.7	68	83.4
Barium	µg/L	1000		31	25.9	20	9.6	92	98.6
Beryllium	µg/L	1		0.66 J	ND 0.30	0.36 J	ND 0.30	ND 2	ND 0.30
Cadmium	µg/L	5		3	ND 0.50	2	ND 0.50	ND 2	ND 0.50
Calcium	µg/L	NR		15000	6070	11000	3890	33000 J	15800
Chromium	µg/L	50		2	ND 0.90	4	ND 0.90	2	ND 0.90
Cobalt	µg/L	NR		6	ND 3.6	3	ND 3.6	17	ND 3.6
Copper	µg/L	200		13	4.9	8.2	ND 2.2	4.6	ND 2.2
Iron	µg/L	300 (1)		55000	46000	23000	57800	75000 J	118000
Lead	µg/L	15		3 J	2.6	2 J	3.8	2 J	5.2
Magnesium	µg/L	NR		1800	2030	1400	1290	1700	5610
Manganese	µg/L	300 (1)		230	174	120	116	420 J	430
Nickel	µg/L	NR		ND 6	ND 3.2	7	ND 3.2	23	ND 3.2
Potassium	µg/L	NR		890	1030J	12000	931J	1400	3160J
Selenium	µg/L	10		ND 20	ND 1.9	ND 2	ND 2.9	ND 20	ND 1.9
Silver	µg/L	50		ND 2 J	2.6	ND 2 J	3.3	ND 2 J	5.8
Sodium	µg/L	20000		1200	2420	23000	10200	8400 J	5000
Thallium	µg/L	NL		ND 2	ND 1.2	ND 2	ND 1.2	ND 2	ND 1.2
Vanadium	µg/L	NR		ND 4	ND 1.9	ND 4	ND 1.9	ND 4	ND 1.9
Zinc	µg/L	300		3	ND 5.6	10	ND 5.6	19 J	ND 5.6
TAL Metals (filtered)									
Iron	µg/L	300 (1)		--	--	--	--	--	106000
Manganese	µg/L	300 (1)		--	--	--	--	--	407

500090

TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

		Location ID:	K-1 (GM-9S)		K-2 (GM-9I)		MW-50J1	
		Collection Date:	02/02/90	12/15/98	02/02/90	12/15/98	01/23/90	12/16/98
Parameters	*Units*							
General Chemistry (total)								
Cyanide	mg/L		ND 10 J	ND 0.010	ND 10 J	ND 0.010	ND 10	ND 0.010
BOD5	mg/L		8/18	9	7/17	6	--	26
COD	mg/L		41	11.3	35	13.9	--	66.5
Hardness	mg/L		46	23.5	36	15.0	--	62.6
TSS	mg/L		70	38.4	56	110.4	--	81
TDS	mg/L		150	ND 98	170	ND 83	--	190
TOC	mg/L		7	ND 2.0	8	ND 3.1	--	13.9

Notes:
NDx Not detected at or above x
TAL Target Analyte List
BOD Biological Oxygen Demand
COD Chemical Oxygen Demand
TSS Total Suspended Solids
TDS Total Dissolved Solids
TOC Total Organic Carbon
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
Exceeds TBC Criteria
Mercury was not detected and thus not listed.
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated Jan/99
NR Not Regulated
(1) Sum not to exceed 500 µg/L
(2) Not analyzed for inorganics during RI performed by Northrop

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

Parameters	Units	TBC Criteria	MW-50J2 (01/18/90)	MW-50J2 (12/16/98)	MW-50D2 (12/16/98)	Composite-1 (12/16/98)	MW-52I (12/17/98)	MW-52S (12/17/98)
TAL Metals (total)								
Aluminum	µg/L	NR	370	ND 21.1/90.3	782	ND 48.2J	ND 40.1J	543J
Antimony	µg/L	6	ND 20.0	ND 2.9/ND 2.9	ND 2.9	ND 2.9	ND 2.9	ND 2.9
Arsenic	µg/L	25	43 J	48.7/49.0	3.1	61.6	ND 2.4	ND 2.4
Barium	µg/L	1000	14.0	11.2/11.4	22.2	46.7	ND 13.9	28.3
Beryllium	µg/L	1	ND 2.0	ND 0.30/ND 0.30	ND 0.30	ND 0.30	ND 0.30	ND 0.30
Cadmium	µg/L	5	1	ND 0.50/ND 0.50	ND 0.50	ND 0.50	ND 0.50	ND 0.50
Calcium	µg/L	NR	29000 J	11200/11300	66800	14000	5070	19100
Chromium	µg/L	50	ND 1.0	1.6/1.4	9.6	ND 0.90	ND 0.90	ND 0.90
Cobalt	µg/L	NR	3.0	ND 3.6/ND 3.6	ND 3.6	ND 3.6	ND 3.6	ND 3.6
Copper	µg/L	200	ND 0.3	ND 2.2/ND 2.2	ND 2.2	ND 2.2	ND 2.2	18.3
Iron	µg/L	300 (1)	12000 J	32100/32300	ND 48.3	72500J	ND 40.3J	1630J
Lead	µg/L	15	2 J	4.2/4.0	ND 1.0	ND 4.6	ND 1.0	8.7
Magnesium	µg/L	NR	3200	2290/2310	ND 76.3	3810	1560	3070
Manganese	µg/L	300 (1)	170 J	314/315	1.0	390	7.8	402
Nickel	µg/L	NR	15 R	ND 3.2/ND 3.2	ND 3.2	ND 3.2	ND 3.2	5.4
Potassium	µg/L	NR	9600 J	1370J/1380J	1480J	2080	1110	3300
Selenium	µg/L	10	ND 2 J	ND 1.9/ND 1.9	ND 1.9	3.0	ND 1.9	ND 1.9
Silver	µg/L	50	ND 1 J	1.7/ND 1.7	ND 0.60	5.3	ND 0.60	ND 0.60
Sodium	µg/L	20000	25000 J	17500/17700	6830	11500	18400	19400
Thallium	µg/L	NL	ND 2	1.2/1.8	ND 1.2	ND 1.3	ND 1.5	ND 1.2
Vanadium	µg/L	NR	3 R	ND 1.9/ND 1.9	14.9	ND 1.9	ND 1.9	ND 1.9
Zinc	µg/L	300	52 J	ND 5.6/ND 6.1	ND 5.6	ND 6.3	ND 8.0	194
TAL Metals (filtered)								
Iron	µg/L	300 (1)	--	30700/32200	--	--	ND 16.6	452
Manganese	µg/L	300 (1)	--	316/331	--	--	7.7	374

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

		Location ID:	*MW-50J2*		*MW-50D2*	*Composite-1*	*MW-52I*	*MW-52S*
		Collection Date:	*01/18/90*	*12/16/98*	*12/16/98*	*12/16/98*	*12/17/98*	*12/17/98*
Parameters	*Units*							
General Chemistry (total)								
Cyanide	mg/L		ND 10	ND 0.010/ND 0.010	ND 0.010	ND 0.010	ND 0.010	ND 0.010
BOD5	mg/L		--	3/3	ND 2	9	ND 2	ND 2
COD	mg/L		--	ND 10.0/11.3	ND 10.0	ND 24.4	ND 10.0	ND 21.8
Hardness	mg/L		--	37.4/37.6	167	50.7	133	60.4
TSS	mg/L		--	66.4/63.6	6	151	ND 4	169
TDS	mg/L		--	115/ND 110	216	121	ND 92	133
TOC	mg/L		--	ND 1.5/ND 1.4	ND 1.1	ND 5.5	ND 1.1	ND 1.4

Notes:
NDx Not detected at or above x
TAL Target Analyte List
BOD Biological Oxygen Demand
COD Chemical Oxygen Demand
TSS Total Suspended Solids
TDS Total Dissolved Solids
TOC Total Organic Carbon
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
Exceeds TBC Criteria
Mercury was not detected and thus not listed.
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated Jan/99
NR Not Regulated
(1) Sum not to exceed 500 µg/L
(2) Not analyzed for inorganics during RI performed by Northrop

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	MW-52D	GM-10I [2]	Composite-2	F-1		F-2	
		TBC	Collection Date:	12/17/98	12/17/98	12/16/98	01/18/90	12/18/98	01/18/90	12/18/98
Parameters	*Units*	*Criteria*								
TAL Metals (total)										
Aluminum	µg/L	NR		ND 86.1J	ND 51.6J	300J	14 R	ND 15.1J	94	ND 21.7J
Antimony	µg/L	6		ND 2.9	ND 2.9	ND 2.9	22	ND 2.9	66 J	ND 2.9
Arsenic	µg/L	25		ND 2.4	ND 2.4	ND 2.4	45 J	32.1	40 J	75.4
Barium	µg/L	1000		30.5	29.3	21.6	57	34.6	16	18.1
Beryllium	µg/L	1		ND 0.30	ND 0.30	ND 0.30	ND 2	ND 0.30	ND 2	ND 0.30
Cadmium	µg/L	5		ND 0.50	ND 0.50	ND 0.50	ND 1	ND 0.50	3	ND 0.50
Calcium	µg/L	NR		19800	4410	12000	14000 J	13200	7500 J	7300
Chromium	µg/L	50		ND 0.90	ND 0.90	ND 0.90	1	ND 0.90	ND 1	ND 0.90
Cobalt	µg/L	NR		ND 3.6	5.7	ND 3.6	8	ND 3.6	4	ND 3.6
Copper	µg/L	200		ND 2.2	5.4	5.4	2.1	ND 2.2	0.3	ND 2.2
Iron	µg/L	300 (1)		299J	ND 16.6J	726J	84000 J	68600J	72000 J	101000J
Lead	µg/L	15		ND 1.6	ND 1.0	4.1	ND 2 J	3.7	ND 4 J	5.8
Magnesium	µg/L	NR		6420	1640	2460	29000	3000	1700	2390
Manganese	µg/L	300 (1)		11.1	214	219	120 J	156	970 J	255
Nickel	µg/L	NR		7.2	ND 3.2	ND 3.2	19 R	ND 3.2	16 R	ND 3.2
Potassium	µg/L	NR		1970	63000	2090	1800	1250	1400	1610
Selenium	µg/L	10		5.4	ND 1.9	ND 1.9	ND 2 J	ND 1.9	ND 20 J	ND 1.9
Silver	µg/L	50		ND 0.60	ND 0.60	ND 0.60	ND 1 J	3.2	ND 1 J	4.7
Sodium	µg/L	20000		20100	47900	19800	4900 J	12100	7300 J	9960
Thallium	µg/L	NL		ND 1.2	ND 1.5	ND 1.2	ND 2	ND 1.2	ND 2	ND 1.2
Vanadium	µg/L	NR		ND 1.9	ND 1.9	ND 1.9	ND 1	ND 1.9	ND 1	ND 1.9
Zinc	µg/L	300		ND 17.3	ND 9.3	87.6	33 R	ND 5.6	18 R	ND 5.6
TAL Metals (filtered)										
Iron	µg/L	300 [1]		--	ND 16.6	--	--	--	--	--
Manganese	µg/L	300 [1]		--	172	--	--	--	--	--

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

		Location ID:	MW-52D	GM-10I (2)	Composite-2	F-1		F-2	
		Collection Date:	12/17/98	12/17/98	12/16/98	01/18/90	12/18/98	01/18/90	12/18/98
Parameters	*Units*								
General Chemistry (total)									
Cyanide	mg/L		ND 0.010	ND 0.010	ND 0.010	ND 10	ND 0.010	ND 10	ND 0.010
BOD5	mg/L		ND 2	ND 2	2	--	3	--	2
COD	mg/L		ND 10.0	ND 10.0	10.0	--	16.5	--	29.7
Hardness	mg/L		75.9	17.7	40.0	--	45.4	--	27.9
TSS	mg/L		46.0	ND 4	35.2	--	8	--	38.4
TDS	mg/L		191	270	118	--	193	--	138
TOC	mg/L		ND 1.3	ND 1.1	ND 1.2	--	ND 2.8	--	ND 4.8

Notes:
NDx Not detected at or above x
TAL Target Analyte List
BOD Biological Oxygen Demand
COD Chemical Oxygen Demand
TSS Total Suspended Solids
TDS Total Dissolved Solids
TOC Total Organic Carbon
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
Exceeds TBC Criteria
Mercury was not detected and thus not listed.
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated Jan/99
NR Not Regulated
(1) Sum not to exceed 500 µg/L
(2) Not analyzed for inorganics during RI performed by Northrop

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

			Location ID:	MW-50D1	I-1		I-2	
		TBC	Collection Date:	12/18/98	01/17/90	12/19/98	01/17/90	12/19/98
Parameters	*Units*	*Criteria*						
TAL Metals (total)								
Aluminum	µg/L	NR		929J	230/200	ND 11.5J	200 J	120J
Antimony	µg/L	6		ND 2.9	ND 20/ND 20	ND 2.9	ND 20	ND 2.9
Arsenic	µg/L	25		6.2	5/6	ND 2.4	2	5.7
Barium	µg/L	1000		ND 17.6	140/140	114	17	19.9
Beryllium	µg/L	1		ND 0.30	ND 2/ND 2	ND 0.30	ND 2	ND 0.30
Cadmium	µg/L	5		ND 0.50	1/ND 1	ND 0.50	ND 1	0.69
Calcium	µg/L	NR		37100	38000J/38000J	29200	15000 J	14600
Chromium	µg/L	50		3.3	ND 1/ND 1	ND 0.90	ND 1	3.2
Cobalt	µg/L	NR		ND 3.6	49/46	ND 3.6	ND 1	3.9
Copper	µg/L	200		7.2	ND 0.3/ND 0.3	ND 2.2	5.4	3.2
Iron	µg/L	300 (1)		1370J	5100J/5100J	38.7J	2700 J	14000J
Lead	µg/L	15		4.1	ND 2J/ND 2J	ND 1.0	3 J	2.8
Magnesium	µg/L	NR		3120	4500/4600	5060	2900	4200
Manganese	µg/L	300 (1)		38.1	470J/460J	159	680 J	1230
Nickel	µg/L	NR		5.1	23R/11R	5.7	14 R	37.8
Potassium	µg/L	NR		ND 1110	3000/2900	2500	2400	2430
Selenium	µg/L	10		ND 1.9	ND 2J/ND 2J	2.4	ND 2 J	ND 1.9
Silver	µg/L	50		ND 0.60	ND 1J/ND 3J	ND 0.60	3 J	ND 0.60
Sodium	µg/L	20000		16000	21000J/21000J	11700	20000 J	12900
Thallium	µg/L	NL		ND 1.2	ND 2/ND 2	ND 1.2	ND 2	ND 1.2
Vanadium	µg/L	NR		13.5	ND 1/ND 1	ND 1.9	ND 1	ND 1.9
Zinc	µg/L	300		12.6	78R/78R	8.6	23 R	6.1
TAL Metals (filtered)								
Iron	µg/L	300 (1)		ND 16.6	--	--	--	13900
Manganese	µg/L	300 (1)		4.6	--	--	--	1240

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TABLE 9

SUMMARY OF DETECTED INORGANICS - GROUNDWATER
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

		Location ID:	MW-50D1	I-1		I-2	
		Collection Date:	12/18/98	01/17/90	12/19/98	01/17/90	12/19/98
Parameters	*Units*						
General Chemistry (total)							
Cyanide	mg/L		ND 0.010	ND 10/ND 10	ND 0.010	ND 10	ND 0.010
BOD5	mg/L		ND 2	--	4	--	2
COD	mg/L		11.3	--	ND 10.0	--	ND 10.0
Hardness	mg/L		104	--	91.8	--	53.6
TSS	mg/L		418	--	4.4	--	42
TDS	mg/L		187	--	146	--	121
TOC	mg/L		ND 1.1	--	ND 1.8	--	ND 1.0

Notes:
NDx Not detected at or above x
TAL Target Analyte List
BOD Biological Oxygen Demand
COD Chemical Oxygen Demand
TSS Total Suspended Solids
TDS Total Dissolved Solids
TOC Total Organic Carbon
J Reported value is estimated
R Reported value was rejected
-- Not Analyzed
Exceeds TBC Criteria
Mercury was not detected and thus not listed.
NL Not Listed in Table 5.2 of Predesign Work Plan For Operable Unit-1, Revision 2, dated Jan/99
NR Not Regulated
(1) Sum not to exceed 500 µg/L
(2) Not analyzed for inorganics during RI performed by Northrop

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TABLE 10

SUMMARY OF REDOX PARAMETERS
PREDESIGN INVESTIGATION
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

	Location ID:	R-1	A-1	MW50J1	MW50J2	MW50J2	MW52I	MW52S	GM-10I
	Sample ID:	DJT-001	DJT-002	DJT-011	DJT-012	DJT-013	DJT-017	DJT-018	DJT-020
	Collection Date:	12/14/98	12/14/98	12/16/98	12/16/98	12/16/98	12/17/98	12/17/98	12/17/98
Parameters	Units					Duplicate			
T. Organic Carbon (TOC)	mg/L	-	-	13.9	ND 1.5	ND 1.4	ND 1.1	ND 1.4	ND 1.1
Dissolved Oxygen (DO)	mg/L	10.46	11.82	5.94	1.62	-	2.82	0.71	5.16
ORP	mV	225	241	-38	-63	-	133	80	1.9
Nitrate-Nitrite (As N)	mg/L	1.1	2.3	ND 0.24	ND 0.11	ND 0.15	1.2	ND 0.10	4.9
Nitrite (As N)	mg/L	ND 0.05J	ND 0.05	0.12	ND 0.05	0.05	ND 0.05	ND 0.05	ND 0.05
Ammonia (As N)	mg/L	0.14	ND 0.05	2.1	1.3	1.1	ND 0.12	0.48	0.49
Manganese (dissolved-lab)	mg/L	0.003	0.020	0.407	0.316	0.331	0.008	0.374	0.172
Iron (dissolved-lab)	mg/L	ND 0.0166	ND 0.0166	106	30.7	32.2	ND 0.0166	0.452	ND 0.0166
Iron (dissolved-field)	mg/L	0.26	0.04	5.2	5.45	-	0.05	0.47	NA
Sulfate	mg/L	27.9	43.1	ND 1.0	17.3	17.1	24.3	24.3	14.2
Sulfide	mg/L	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5	ND 0.5
Methane	mg/L	ND 0.001	ND 0.001	13	0.430J	0.120J	0.016	0.42	ND 0.0019
Ethane	mg/L	ND 0.001	ND 0.001	0.51	0.0039	0.0016	ND 0.0005	0.0038	ND 0.0005
Ethene	mg/L	ND 0.001	ND 0.001	0.0017	0.055J	0.026J	0.65	0.81	0.0016

Notes:

- \- Not Applicable.
- J Estimated.
- NDx Not detected at or above x.
- TAL Target Analyte List.
- TCL Target Compound List.

TABLE 11

HOOKER CHEMICAL/RUCO POLYMER SITE
SUMMARY OF CHEMICAL COMPOUNDS (DETECTS + UNDETECTS/2)
GROUNDWATER

COMPOUND	VALID OCCUR	UN-DETECT	EST	REJECT	FREQ DETECT	MINIMUM DETECTED CONCENTRATION	SAMPLE ID	MAXIMUM DETECTED CONCENTRATION	SAMPLE ID	MEDIAN CONCENTRATION	GEOMETRIC MEAN	MEAN CONCENTRATION	LOWER QUARTILE	UPPER QUARTILE	STNDRD. DEV.	95% CI UPPER LIMIT
[] Low Detection Limit Volatile (LDL VOA) ug/L																
(Halogenated Volatiles)																
Chlorobenzene	36	3	33	0	0	0.08	2.000	E1	6.000	P1	0.020	0.027	0.241	0.020	0.020	3.335	0.100
Chloromethane	36	3	33	1	0	0.08	9.000	N 1059 3	10.000	N1 D	0.065	0.086	0.589	0.065	0.065	3.183	0.290
Tetrachloroethene	34	14	20	6	2	0.41	0.800	S2	98.000	D1	0.070	0.507	11.979	0.070	5.000	15.382	275.570 X
trans-1,2-Dichloroethene	36	16	20	13	0	0.44	1.000	B2	54.000	D1	0.050	0.358	4.863	0.050	3.000	12.117	55.590 X
Trichloroehtene	36	11	25	1	0	0.31	2.000	C2	18.000	D1	0.095	0.297	2.096	0.095	2.000	6.694	6.150
Vinyl Chloride	36	8	28	3	0	0.22	7.000	D2	560.000	N 1059 3	0.085	0.278	22.180	0.085	0.085	12.565	68.530
TOTAL ====>							21.800		746.000								
(Non-Halogenated Volatiles)																
2-Butanone	36	2	34	1	0	0.06	3.000	J2	3.000	J2	5.000	4.930	4.944	5.000	5.000	1.089	5.070 X
4-Methyl-2-Pentanone	36	4	32	2	0	0.11	11.000	J1	320.000	P1	5.000	5.953	14.306	5.000	5.000	2.073	10.190
Acetone	35	35	0	0	1	1.00	10.000	A1	10.000	S2	10.000	10.000	10.000	10.000	10.000	1.000	10.000
Benzene	36	2	34	0	0	0.06	10.000	N 1059 3	10.000	N 1059 3	0.020	0.024	0.297	0.020	0.020	2.817	0.070
Carbon Disulfide	33	6	27	4	3	0.18	1.000	D2	4.000	F1	2.500	2.367	2.455	2.500	2.500	1.349	2.720
Ethylbenzene	36	4	32	1	0	0.11	3.000	E1	8.000	P1	0.030	0.046	0.528	0.030	0.030	4.337	0.290
Xylene (total)	36	7	29	3	0	0.19	1.000	F1	15.000	P1	0.050	0.100	0.903	0.050	0.050	5.088	0.970
TOTAL ====>							39.000		370.000								

NOTE: (X), IN 95% CI COLUMN, INDICATES VALUE IS GREATER THAN MAXIMUM CONCENTRATION; (*), ASTERISKS, INDICATE THAT THE NUMBER OF OCCURRENCES IS TOO SMALL TO ALLOW CALCULATION

500099

TABLE 11

HOOKER CHEMICAL/RUCO POLYMER SITE
SUMMARY OF CHEMICAL COMPOUNDS (DETECTS + UNDETECTS/2)
GROUNDWATER

COMPOUND	VALID	OCCUR	UN-DETECT	EST	REJECT	FREQ DETECT	MINIMUM DETECTED CONCENTRATION	SAMPLE ID	MAXIMUM DETECTED CONCENTRATION	SAMPLE ID	MEDIAN CONCENTRATION	GEOMETRIC MEAN	MEAN CONCENTRATION	LOWER QUARTILE	UPPER QUARTILE	STNDRD. DEV.	95% CI UPPER LIMIT
[] Base Neutral Acid (BNA) ug/L																	
(Polycyclic Aromatic Hydrocarbons)																	
NAPHTHALENE	34	1	33	1	0	0.03	2.000	E1	2.000	E1	5.000	4.867	4.912	5.000	5.000	1.170	5.168 X
					TOTAL	====>	2.000		2.000								
(Phthalate Esters)																	
BIS(2-ETHYLHEXYL)PHTHALATE	29	16	13	16	5	0.55	1.000	H1 0	6.000	I2	5.000	3.557	3.897	2.000	5.000	1.603	4.747
DI-n-BUTYLPHTHALATE	34	1	33	0	0	0.03	45.000	P1	45.000	P1	5.000	5.334	6.176	5.000	5.000	1.458	6.468
DI-n-OCTYL PHTHALATE	34	1	33	1	0	0.03	2.000	D1	2.000	D1	5.000	4.867	4.912	5.000	5.000	1.170	5.168 X
					TOTAL	====>	48.000		53.000								
[] Pesticide/Polychlorinated Biphenyl (PEST/PCB) ug/L																	
(Pesticides)																	
DIELDRIN	35	1	34	1	0	0.03	0.004	G2	0.004	G2	0.050	0.050	0.062	0.050	0.050	1.799	0.073 X
HEPTACHLOR EPOXIDE	35	2	33	2	0	0.06	0.003	G2	0.015	L1	0.025	0.025	0.031	0.025	0.025	1.724	0.035 X
				1		====>	0.007		0.019								
[] Inorganic (INORG) ug/L																	
ALUMINUM	31	31	0	20	4	1.00	12.000	A2	1200.000	S2	230.000	198.558	345.194	160.000	380.000	3.446	791.917
ANTIMONY	35	3	32	1	0	0.09	22.000	F1	66.000	F2	17.000	15.363	17.286	10.000	17.000	1.543	19.478
ARSENIC	35	13	22	7	0	0.37	2.000	I2	68.000	J1	1.000	2.999	11.314	1.000	8.000	4.882	26.844

NOTE: (X), IN 95% CI COLUMN, INDICATES VALUE IS GREATER THAN MAXIMUM CONCENTRATION; (*), ASTERISKS, INDICATE THAT THE NUMBER OF OCCURRENCES IS TOO SMALL TO ALLOW CALCULATION

500100

TABLE 11

HOOKER CHEMICAL/RUCO POLYMER SITE
SUMMARY OF CHEMICAL COMPOUNDS (DETECTS + UNDETECTS/2)
GROUNDWATER

COMPOUND	VALID	OCCUR	UN-DETECT	EST	REJECT	FREQ DETECT	MINIMUM DETECTED CONCENTRATION	SAMPLE ID	MAXIMUM DETECTED CONCENTRATION	SAMPLE ID	MEDIAN CONCENTRATION	GEOMETRIC MEAN	MEAN CONCENTRATION	LOWER QUARTILE	UPPER QUARTILE	STNDRD. DEV.	95% CI UPPER LIMIT
BARIUM	35	35	0	2	0	1.00	8.000	S2	140.000	I1 D	39.000	36.233	51.314	19.000	74.000	2.402	75.258
BERYLLIUM	35	8	27	0	0	0.23	0.210	G2	2.000	A1	1.000	0.611	0.799	0.585	1.000	2.480	1.346
CADMIUM	35	14	21	1	0	0.40	1.000	D2	130.000	C1	1.000	1.329	5.129	1.000	1.500	2.789	3.640
CALCIUM	35	35	0	29	0	1.00	2400.000	A2	150000.000	S1 D	15000.000	14381.603	23140.000	8650.000	21000.000	2.465	31423.703
CHROMIUM	30	17	13	2	5	0.57	1.000	F1	160.000	D1	2.000	1.788	8.383	0.500	4.000	4.066	11.326
COBALT	35	19	16	1	0	0.54	2.000	E1	49.000	I1	3.000	3.025	7.143	1.500	6.000	3.631	13.720
COPPER	33	17	16	2	2	0.52	0.340	F2	16.000	A1	2.000	1.123	3.230	0.150	4.300	5.253	12.181
IRON	34	34	0	26	1	1.00	49.000	H1 D	84000.000	F1	3900.000	2206.835	15496.971	370.000	23000.000	11.469	303657.356 X
LEAD	31	13	18	13	4	0.42	2.000	D2	44.000	N 1059 3	1.000	1.790	3.290	1.000	3.000	2.300	3.596
MAGNESIUM	35	35	0	4	0	1.00	360.000	S1 D	6400.000	G1	2600.000	1977.031	2457.429	1250.000	3150.000	2.076	3401.812
MANGANESE	33	33	0	25	2	1.00	4.000	B1	1700.000	N 1059 3	120.000	88.625	276.121	23.000	460.000	5.990	1469.572
MERCURY	35	1	34	0	0	0.03	0.200	B1	0.200	B1	0.100	0.102	0.103	0.100	0.100	1.124	0.106
NICKEL	22	7	15	1	13	0.32	3.000	D1	150.000	H2	3.000	4.079	11.318	3.000	7.000	2.999	15.020
POTASSIUM	34	34	0	5	1	1.00	660.000	A2	22000.000	S2	1600.000	2074.450	3169.706	1100.000	3600.000	2.294	4089.514
SELENIUM	35	1	34	1	0	0.03	4.000	L1	4.000	L1	1.000	1.354	2.114	1.000	1.000	2.150	2.422
SILVER	33	7	26	6	2	0.21	1.000	D1	6.000	A1	1.000	0.954	1.182	0.500	1.000	1.812	1.406
SODIUM	35	35	0	30	0	1.00	1200.000	K1	54000.000	A1	17000.000	11648.655	15551.429	6200.000	20500.000	2.338	23383.772
VANADIUM	28	6	22	2	7	0.21	4.000	H1 D	16.000	S2	2.000	1.720	2.679	0.500	2.000	2.567	4.270
ZINC	22	11	11	6	13	0.50	3.000	K1	100.000	L1	4.000	5.209	13.273	3.000	10.000	3.663	30.911
					TOTAL	=====>	4738.750		320251.200								

500101

TABLE 12

PARAMETERS AND ASSUMPTIONS TO CALCULATE
GROUND WATER EXPOSURE PATHWAYS
FUTURE USE SCENARIO
HOOKER/RUCO SITE

Receptor: Residents–Adults

Exposure Route	Ingestion	Dermal Contact	Inhalation
Exposure Frequency *days/year*	350	350	350
Exposure Duration *years/life time*	30	30	30
Body Weight *kg*	70	70	70
Bioavailability Factor	1	-	1
Ingestion Rate *L/day*	2	-	-
Skin Surface Area *cm2*	-	20000	-
Exposure Time *hours/day*	-	0.25	0.33
Inhalation Rate *M3/Hr*	-	-	1.4

Parameters for Shower

Shower Frequency=1/day
Shower Room Vol.(m^3)=12.0
Droplet Diam.(mm)=1.0
Shower Water Flow Rate (l/min.)=10.0
Bathroom Air Exchange Rate (exch/hr)=1.0

Shower Water Temperature (C)=45.0
Droplet Drop Time (sec.)=2.000
Shower Duration (min.) =15.0
Time in Room After Shower (min.) =5.0
Viscosity of Shower Water (cp) = 0.601

TABLE 13

PARAMETERS AND ASSUMPTIONS TO CALCULATE
GROUND WATER EXPOSURE PATHWAYS
FUTURE USE SCENARIO
HOOKER/RUCO SITE

Receptor: Residents–Children

Exposure Route	Ingestion	Dermal Contact	Inhalation
Exposure Frequency *days/year*	350	350	350
Exposure Duration *years/life time*	6	6	6
Body Weight *kg*	35	35	35
Bioavailability Factor	1	-	1
Ingestion Rate *L/day*	2	-	-
Skin Surface Area *cm2*	-	12000	-
Exposure Time *hours/day*	-	0.25	0.33
Inhalation Rate *M3/Hr*	-	-	1.5

Parameters for Shower

Shower Frequency=1/day
Shower Room Vol.(m^3)=12.0
Droplet Diam.(mm)=1.0
Shower Water Flow Rate (l/min.)=10.0
Bathroom Air Exchange Rate (exch/hr)=1.0

Shower Water Temperature (C)=45.0
Droplet Drop Time (sec.)=2.000
Shower Duration (min.) =15.0
Time in Room After Shower (min.) =5.0
Viscosity of Shower Water (cp) = 0.601

TABLE 14

HOOKER/RUCO SITE
TOXICITY DATA FOR NONCARCINOGENIC
AND POTENTIAL CARCINOGENIC EFFECTS
DOSE RESPONSE EVALUATION

Chemical Name	Noncarcinogen Reference Dose		Subchronic Noncarcinogen Reference Dose		Carcinogen Slope Factor				Compounds w/o Criteria
	RfD(oral) (mg/Kg-day)	RfD(inhalation) (mg/Kg-day)	RfD (oral sub) (mg/Kg-day)	RfD(inhalation, sub) (mg/Kg-day)	Oral SF (mg/Kg-day)-1	Weight	Inhalation SF (mg/Kg-day)-1	Weight	
Volatiles:									
1,1,1-Trichloroethane	9.00E-02	3.00E-01	9.00E-01	3.00E+00	NA	D	NA	D	
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	2.00E-01	C	2.00E-01	C	
1,1-Dichloroethene	9.00E-03	ND	9.00E-03	ND	6.00E-01	C	1.20E+00	C	
2-Butanone	5.00E-02	9.00E-02	5.00E-01	9.00E-01	NA	D	NA	D	
4-Methyl-2-pentanone	5.00E-02	2.00E-02	NA	NA	NA	NA	NA	NA	
Acetone	1.00E-01	NA	1.00E+00	NA	NA	D	NA	D	
Benzene	NA	NA	NA	NA	2.90E-02	A	2.90E-02	A	
Bromodichloromethane	2.00E-02	ND	2.00E-02	ND	1.30E-01	B2	ND	B2	
Carbon Disulfide	1.00E-01	2.90E-03	1.00E-01	2.90E-03	NA	NA	NA	NA	
Carbon Tetrachloride	7.00E-04	ND	7.00E-03	ND	1.30E-01	B2	1.30E-01	B2	
Chlorobenzene	2.00E-02	5.00E-03	2.00E-01	5.00E-02	NA	D	NA	D	
Chloroform	1.00E-02	NA	1.00E+00	NA	6.10E-03	B2	8.10E-02	B2	
Chloromethane	NA	NA	NA	NA	1.30E-02	C	6.30E-03	C	
Ethylbenzene	1.00E-01	2.90E-01	1.00E+00	2.90E-01	NA	D	NA	D	
Styrene	2.00E-01	ND	2.00E+00	ND	3.00E-02	B2	2.00E-03	B2	
Tetrachloroethene	1.00E-02	NA	1.00E-01	NA	5.10E-02	B2	1.80E-03	B2	
Toluene	2.00E-01	5.70E-01	2.00E+00	2.70E-01	NA	D	NA	D	
Total Xylenes	2.00E+00	8.60E-02	4.00E+00	8.60E-02	NA	D	NA	D	
Trans-1,2-Dichloroethene	2.00E-02	ND	2.00E-01	ND	NA	NA	NA	NA	
Trichloroethene	NA	NA	NA	NA	1.10E-02	B2	1.70E-02	B2	
Vinyl Chloride	NA	NA	NA	NA	1.90E+00	A	2.90E-01	A	

EPA Weight of Evidence Classifications are as follows:

Group A:- Human Carcinogen. *Sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer.*
Group B1:- Probable Human Carcinogen. Limited evidence of carcinogenicity in human from epidemiological studies.
Group B2:- Probable Human Carcinogen. Sufficient evidence of carcinogenicity in animals. Inadequate evidence of carcinogenicity in humans.
Group C:- Possible Human Carcinogen. Limited evidence of carcinogenicity in animals.
Group D:- Not Classified. Inadequate evidence of carcinogenicity in animals.

Note: All toxicity Values unless otherwise noted are from Integrated Risk Information System (IRIS) June 1992 sessions, and from Health Effects Assessment Summary Tables (HEAST)-1990 4th Quarter (USEPA, 1990).
NA :Not Available
ND : Not Determined

500104

TABLE 14

HOOKER/RUCO SITE
TOXICITY DATA FOR NONCARCINOGENIC
AND POTENTIAL CARCINOGENIC EFFECTS
DOSE RESPONSE EVALUATION

Chemical Name	Noncarcinogen Reference Dose		Subchronic Noncarcinogen Reference Dose		Carcinogen Slope Factor				Compounds w/o Criteria
	RfD(oral) (mg/Kg-day)	RfD(inhalation) (mg/Kg-day)	RfD (oral sub) (mg/Kg-day)	RfD(inhalation, sub) (mg/Kg-day)	Oral SF (mg/Kg-day)-1	Weight	Inhalation SF (mg/Kg-day)-1	Weight	
Semi-Volatiles;									
Benzoic Acid	4.00E+00	NA	4.00E+00	NA	NA	D	NA	D	2-Methylnaphthalene
Bis(2-ethylhexyl)phthalate	2.00E-02	ND	2.00E-02	NA	1.40E-02	B2	ND	B2	Benzo (g,h,i) perylene
Butyl benzyl phthalate	2.00E-01	NA	2.00E+00	NA	NA	C	NA	C	4-Methylphenol
Di-n-butyl phthalate	1.00E-01	NA	1.00E+00	NA	NA	D	NA	D	Phenanthrene
Di-n-octyl phthalate	2.00E-02	NA	2.00E-02	NA	NA	NA	NA	NA	Dibenzofuran
Hexachlorobenzene	8.00E-04	ND	8.00E-04	ND	1.60E+00	B2	1.60E+00	B2	
n-Nitrosodiphenylamine	NA	NA	NA	NA	4.90E-03	B2	NA	B2	
Phenol	6.00E-01	NA	6.00E-01	NA	NA	D	NA	D	
Carcinogenic PAHs (1)	NA	NA	NA	NA	5.80E+00	B2	6.10E+00	B2	
Noncarcinogenic PAHs									
Acenaphthene	6.00E-02	NA	6.00E-01	NA	NA	D	NA	D	
Anthracene	3.00E-01	NA	3.00E+00	NA	NA	D	NA	D	
Fluoranthrene	4.00E-02	NA	4.00E-01	NA	NA	NA	NA	NA	
Fluorene	4.00E-02	NA	4.00E-01	NA	NA	D	NA	D	
Naphthalene	4.00E-03	NA	4.00E-02	NA	NA	D	NA	D	
Pyrene	3.00E-02	NA	3.00E-01	NA	NA	D	NA	D	

EPA Weight of Evidence Classifications are as follows:

Group A:- Human Carcinogen. Sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer.
Group B1:- Probable Human Carcinogen. Limited evidence of carcinogenicity in human from epidemiological studies.
Group B2:- Probable Human Carcinogen. Sufficient evidence of carcinogenicity in animals. Inadequate evidence of carcinogenicity in humans.
Group C:- Possible Human Carcinogen. Limited evidence of carcinogenicity in animals.
Group D:- Not Classified. Inadequate evidence of carcinogenicity in animals.

Note: All toxicity Values unless otherwise noted are from Integrated Risk Information System (IRIS) June 1992 sessions, and from Health Effects Assessment Summary Tables (HEAST)-1990 4th Quarter (USEPA, 1990).

(1). All carcinogenic PAHs are evaluated as Benzo(a)pyrene

NA :Not Available
ND : Not Determined

TABLE 14

HOOKER/RUCO SITE
TOXICITY DATA FOR NONCARCINOGENIC AND POTENTIAL CARCINOGENIC EFFECTS DOSE RESPONSE EVALUATION

Chemical Name	Noncarcinogen Reference Dose		Subchronic Noncarcinogen Reference Dose		Carcinogen Slope Factor				Compounds w/o Criteria
	RfD(oral) (mg/Kg-day)	RfD(inhalation) (mg/Kg-day)	RfD (oral sub) (mg/Kg-day)	RfD(inhalation, sub) (mg/Kg-day)	Oral SF (mg/Kg-day)-1	Weight	Inhalation SF (mg/Kg-day)-1	Weight	
PCBs And Pesticide:									
4,4'-DDD	NA	NA	NA	NA	2.40E-01	B2	NA	B2	
4,4'-DDE	NA	NA	NA	NA	3.40E-01	B2	NA	B2	
4,4'-DDT	5.00E-04	NA	5.00E-04	NA	3.40E-01	B2	3.40E-01	B2	
Beta-BHC	NA	NA	NA	NA	1.80E+00	C	1.80E+00	C	
Chlordane (2)	6.00E-05	ND	6.00E-05	ND	1.30E+00	B2	1.30E+00	B2	
Dieldrin	5.00E-05	NA	5.00E-05	NA	1.60E+01	B2	1.60E+01	B2	
Heptachlor Epoxide	1.30E-05	NA	5.00E-04	NA	9.10E+00	B2	9.10E+00	B2	
Total PCBS (3)	ND	ND	NA	NA	7.70E+00	B2	ND	B2	

EPA Weight of Evidence Classifications are as follows:

Group A:- Human Carcinogen. Sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer.
Group B1:- Probable Human Carcinogen. Limited evidence of carcinogenicity in human from epidemiological studies.
Group B2:- Probable Human Carcinogen. Sufficient evidence of carcinogenicity in animals. Inadequate evidence of carcinogenicity in humans.
Group C:- Possible Human Carcinogen. Limited evidence of carcinogenicity in animals.
Group D:- Not Classified. Inadequate evidence of carcinogenicity in animals.

Note: All toxicity Values unless otherwise noted are from Integrated Risk Information System (IRIS) June 1992 sessions, and from Health Effects Assessment Summary Tables (HEAST)-1990 4th Quarter (USEPA, 1990).

NA :Not Available
ND : Not Determined

(2) Alpha chlordane is evaluated as chlordane.
(3) All PCBs are evaluated as Aroclor 1260

500106

TABLE 14

HOOKER/RUCO SITE
TOXICITY DATA FOR NONCARCINOGENIC AND POTENTIAL CARCINOGENIC EFFECTS DOSE RESPONSE EVALUATION

Chemical Name	Noncarcinogen Reference Dose		Subchronic Noncarcinogen Reference Dose		Carcinogen Slope Factor				Compounds w/o Criteria
	RfD(oral) (mg/Kg-day)	RfD(inhalation) (mg/Kg-day)	RfD (oral sub) (mg/Kg-day)	RfD(inhalation, sub) (mg/Kg-day)	Oral SF (mg/Kg-day)-1	Weight	Inhalation SF (mg/Kg-day)-1	Weight	
Inorganics:									
Antimony	4.00E-04	NA	4.00E-04	NA	NA	NA	NA	NA	Cobalt
Arsenic	3.00E-04	NA	1.00E-03	NA	1.75E+00	A	1.50E+01	A	Copper
Barium	7.00E-02	1.00E-04	5.00E-02	1.00E-03	NA	NA	NA	NA	Iron
Beryllium	5.00E-03	NA	5.00E-03	NA	4.30E+00	B2	8.40E+00	B2	Lead
Cadmium	1.00E-03food 5.00E-04water	NA	NA	NA	NA	B1	6.30E+00	B1	
Chromium (III)	1.00E+00	NA	1.00E+00	NA	NA	NA	NA	NA	
Chromium (VI)	5.00E-03	NA	2.00E-02	NA	NA	NA	4.20E+01	A	
Manganese	1.00E-01	1.10E-04	1.00E-01	1.10E-04	NA	D	NA	D	
Mercury	3.00E-04	8.60E-05	3.00E-04	8.60E-05	NA	D	NA	D	
Nickel	2.00E-02	NA	2.00E-02	NA	NA	A	8.40E-01	A	
Selenium	5.00E-03	NA	NA	NA	NA	D	NA	D	
Silver	3.00E-03	NA	3.00E-03	NA	NA	D	NA	D	
Thallium	8.00E-05	NA	7.00E-04	NA	NA	D	NA	D	
Vanadium	7.00E-03	NA	7.00E-03	NA	NA	NA	NA	NA	
Zinc	2.00E-01	NA	2.00E-01	NA	NA	D	NA	D	

EPA Weight of Evidence Classifications are as follows:

Group A:- Human Carcinogen. Sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer.
Group B1:- Probable Human Carcinogen. Limited evidence of carcinogenicity in human from epidemiological studies.
Group B2:- Probable Human Carcinogen. Sufficient evidence of carcinogenicity in animals. Inadequate evidence of carcinogenicity in humans.
Group C:- Possible Human Carcinogen. Limited evidence of carcinogenicity in animals.
Group D:- Not Classified. Inadequate evidence of carcinogenicity in animals.

Note: All toxicity Values unless otherwise noted are from Integrated Risk Information System (IRIS) June 1992 sessions, and from Health Effects Assessment Summary Tables (HEAST)-1990 4th Quarter (USEPA, 1990).
NA :Not Available
ND : Not Determined

500107

TABLE 15

HOOKER/RUCO SITE
SUMMARY ACROSS EXPOSURE PATHWAYS
PRESENT/FUTURE USE SCENARIOS-RESIDENTS ADULTS

Future Use Scenarios: Fence-Line Adult Residents	Carcinogenic Risk Levels Reasonable Maximum Exposure	Noncarcinogenic Hazard Index Values Reasonable Maximum Exposure
1) Exposure to Ground Water		
Ingestion	2.21E-03	4.89E+00
Inhalation	5.06E-04	5.82E-02
Dermal Contact	1.12E-04	2.01E-01
2) Exposure to Surface Soil		
Inhalation	6.40E-09	1.64E-09

Total Health Risk = Ground water ingestion + Ground water inhalation + Ground water dermal contact + Surface soil inhalation

SUMMATION RESULTS

Carcinogens

Reasonable Maximum Exposure= 2.83E-03

Noncarcinogens

Reasonable Maximum Exposure= 5.15E+00

500108

TABLE 15

HOOKER/RUCO SITE
SUMMARY ACROSS EXPOSURE PATHWAYS
PRESENT/FUTURE USE SCENARIOS-RESIDENTS ADULTS

Present/Future Use Scenarios: Off-Site Adult Residents	Carcinogenic Risk Levels Reasonable Maximum Exposure	Noncarcinogenic Hazard Index Values Reasonable Maximum Exposure
1) Exposure to Surface Soil		
Inhalation	6.40E-09	1.64E-09
Total Health Risk = Surface soil inhalation		
SUMMATION RESULTS		
Carcinogens		
Reasonable Maximum Exposure=	6.40E-09	
Noncarcinogens		
Reasonable Maximum Exposure=	1.64E-09	

500109

TABLE 16

HOOKER/RUCO SITE
SUMMARY ACROSS EXPOSURE PATHWAYS
PRESENT/FUTURE USE SCENARIOS-RESIDENT CHILDREN

Future Use Scenarios: Off-Site Child Residents	Carcinogenic Risk Levels Reasonable Maximum Exposure	Noncarcinogenic Hazard Index Values Reasonable Maximum Exposure
1) Exposure to Ground Water		
Ingestion	8.84E-04	1.02E+01
Inhalation	1.09E-04	1.25E-01
Dermal Contact	1.34E-05	1.22E-01
2) Exposure to Surface Soil		
Inhalation	2.56E-09	3.28E-09

Total Health Risk = Ground water ingestion + Ground water inhalation + Ground water dermal contact + Surface soil inhalation

SUMMATION RESULTS

Carcinogens

Reasonable Maximum Exposure= 1.01E-03

Noncarcinogens

Reasonable Maximum Exposure= 1.04E+01

500110

TABLE 16

HOOKER/RUCO SITE
SUMMARY ACROSS EXPOSURE PATHWAYS
PRESENT/FUTURE USE SCENARIOS-RESIDENT CHILDREN

Present/Future Use Scenarios: Off-Site Child Residents	Carcinogenic Risk Levels Reasonable Maximum Exposure	Noncarcinogenic Hazard Index Values Reasonable Maximum Exposure
1) Exposure to Surface Soil		
Inhalation	2.56E-09	3.28E-09

Total Health Risk = Surface soil inhalation

SUMMATION RESULTS

Carcinogens

Reasonable Maximum Exposure= 2.56E-09

Noncarcinogens

Reasonable Maximum Exposure= 3.28E-09

500111

TABLE 17

ARARs/TBCs FOR GROUNDWATER CHEMICALS OF CONCERN (µg/L)
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

Compound	CRQL/ CRDL	RI Results: Location of Maximum Conc. [a]	RI Results: Range of Detected Conc.	Federal Standards MCLs/MCLGs	NY State Standards: MCLs [b][c]	NY State Standards: GW Quality Standards	NY State Guidance TAGM [f]	NY State GW Effluent Standard	PRG
Volatile Organics (Geraghty & Miller, 1994; HNUS, 1994)									
Trichloroethene	5	HN24I	ND-58,000	5 (FMCL)	5	5	5	10	5
Toluene	5	HN29S	ND-39	1,000 (FMCL)	5	5	5	NA	5
1,1-Dichloroethane	5	HN29S	ND-880	---	5	5	5	NA	5
1,2-Dichloroethene	5	HN29S	ND-3,600	70 cis (FMCL) 100 trans	5	5	5 (cis) [g] 5 (trans) [g]	NA	5
1,1,1-Trichloroethane	5	HN29S	ND-10,000	200 (FMCL)	5	5	5	NA	5
Tetrachloroethene	5	HN-29S	ND-1,400	5 (FMCL)	5	5	5	NA	5
1,1-Dichloroethene	5	GP-8	ND-420	7 (FMCL)	5	5	5	NA	5
Carbon tetrachloride	5	HN24I	ND-8	5 (FMCL)	5	5	5	5	5
Xylenes	5	HN29S	ND-19	10,000 (FMCL)	5	5	5 (ortho) 5 (meta) 5 (para)	NA	5
Vinyl chloride	2	MW-52I	ND-2,300	2 (FMCL)	2	2	2	NA	2
Semi-Volatile Organics (HNUS, 1994)									
Bis(2ethylhexyl)phthalate	10	GP-11	ND-150	6 (FMCL)	50	50	50	4,200	6
Total Phenols [h]	10(individual)	HN29S	ND-11 J	---	50	1 (total phenols)	1 (total phenols)	NA	1 (total phenols)
Benzo(b)fluoranthene	10	USGS N10623 [i]	ND-2 J	0.2 (PMCL)	50	---	0.002	NA	0.002 (TOGS)
Inorganics (Total) (HNUS, 1994) (Legette, Brashears, & Graham, Inc. 1990) (Geraghty and Miller, 1994) [g]									
Aluminum	200	HN27S	ND-33,800	200 (FSMCL)	---	---	---	2,000	200 (FMCL)
Arsenic	10	K-2	ND-59	50 (Review)	50	25	25	50	25
Cadmium	5	HN27S	ND-392	5 (FMCLG)	10	10	5 [g]	20	5
Chromium, Total	10	HN27S	ND-169	100 (FMCLG)	100	50	50	NA	50
Chromium, Hexavalent	10	HN25	ND-174 J	---	---	50	50	100	50
Copper	100	GM13S	ND-838 J	1,300 (FMCLG)	1,000 (SMCL)	200	200	1,000	200
Iron	3	GM15S	114-229,000	300 (FSMCL)	300 (SMCL) [e]	300 [e]	300 [e]	600	300
Lead	5,000	GM15S	ND-169	15 (Action Level)	15 (Action Level)	25	15 [g]	50	15

500112

TABLE 17

ARARs/TBCs FOR GROUNDWATER CHEMICALS OF CONCERN (µg/L)
HOOKER/RUCO SITE
HICKSVILLE, NEW YORK

Compound	RI Results: CRQL/ CRDL	RI Results: Location of Maximum Conc. [a]	RI Results: Range of Detected Conc.	Federal Standards MCLs/MCLGs	NY State Standards: MCLs [b][c]	NY State Standards: GW Quality Standards	NY State Guidance TAGM [f]	NY State GW Effluent Standard	PRG
Manganese	0.2	GM13S	7.65-1,720 J	200 (LMCLG)	300 (SMCL) [e]	300[e]	300[e]	600	200 (LMCLG)
Thallium	50	HN24I	ND-3.1 J	2 (FMCL)	---	---	4	NA	2 (FMCL)
Vanadium	20	HN29S	ND-419	---	---	---	250	NA	250
Cyanide	---	HN27S	ND-2,690	200 (FMCL)	---	100	100	400	100 (FMCL)
Nickel	5,000	GM13S	ND-132	100 (FMCL)	---	---	100	2,000	100 (FMCL)

Notes:

--- - Not Detected
F - Final
L - Listed
P - Proposed
S - Secondary
CRDL - Contract Required Detection Limit
CRQL - Contract Required Quantitation Limit
IDL - Instrument Detection Limit
MCL - Maximum Contaminant Level
MCLG - Maximum Contaminant Level Goals
PRG - Preliminary Remedial Action Goal = most stringent of FMCLs Groundwater Quality Standard or Contained in Policy.
(a) - Includes data from all sampling rounds since 1990.
(b) - Total Principal Organic Contaminants (POCs) (i.e., includes listed volatile organics and Unspecified Organic Contaminants (UOCs) not to exceed 100 µg/L total.
(c) - Reference: New York Public Supply Regulations, Part 5-1, 07/17/92
(d) - Reference: New York Water Classifications and Quality Standards, Title 6, Chapter V, Part 703.
(e) - Combined concentration of iron and manganese shall not exceed 500 µg/L. Iron and manganese not to exceed 300 µg/L.
(f) - Reference: New York Technical Manual, "Contained In" Criteria for Environmental Media.
(g) - Only monitoring wells on NWIRP property (designated with prefix HN-) and Hooker/Ruco Site (such as K-2) were sampled and analyzed for semi-VOCs. Only a summary of analytical data is available from the Hooker/Ruco Site.
(h) - Total Phenols = 2-Methylphenol + 4-Methylphenol + 2,4-Dimethylphenol.
(i) - Benzo(b)fluoranthene was detected only in USGS well N10623. This detection is suspected to be due to runoff from a nearby asphalt road through leakage in the well cap.

500113

TABLE 18
SELECTED REMEDY (ALTERNATIVE 3) COST ESTIMATES

CAPITAL COST		
Well Installation	A. Injection	$270,000
	B. Monitoring	$90,000
Forcemain	A. Header Pipe	$190,000
	B. Down Well Piping	$0
Land Purchase		$150,000
Materials and Installation	A. Site Improvements	$17,000
	B. Equipment	$135,000
	C. Mechanical	$25,000
	D. Electrical	$36,000
Engineering (10%)		$91,300
Field Construction (5%)		$45,650
Contingency (20%)		$209,990
TOTAL CAPITAL COST		**$1,259,940**
ANNUAL O&M COST		
VCM Monitoring		$28,000
Utilities - Electric		$93,000
Reporting		$34,000
Labor (full time)		$65,000
Equipment Replacement (5%)		$45,650
Contingency (20%)		$53,130
TOTAL ANNUAL COST		**$318,780**
PRESENT WORTH COST*		**$3,800,000**

* assumes a 10-year operating period plus 2 supplemental years of nutrient addition and a 7% discount rate

TABLE 19
CONTINGENCY REMEDY (ALTERNATIVE 2) COST ESTIMATE

CAPITAL COST	
Well Installation	$560,000
Well Pumps	$50,000
Forcemain	$445,000
Recharge Basin	$55,000
Land Purchase / Access Payments	$300,000
VCM Treatment System - Equipment	$725,000
VCM Treatment System - Materials & Installation	$905,000
Engineering and Procurement	$304,000
Field Construction Expense	$152,000
Contingency (20%)	$699,000
TOTAL CAPITAL COST	**$4,195,000**
ANNUAL O&M COST	
VCM Treatment System	$300 000
VCM Monitoring	$47,000
Reporting (monthly)	$34,000
Labor (1 person - full time)	$65,000
Equipment Replacement (5%)	$160,000
Contingency (20%)	$121,000
TOTAL ANNUAL O&M COST	**$727,000**
PRESENT-WORTH COST*	**$13,200,000**

* assumes an 30-year operating period and a discount rate of 7%.

APPENDIX III

ADMINISTRATIVE RECORD INDEX

HOOKER CHEMICAL/RUCO POLYMERS SUPERFUND SITE
OPERABLE UNIT 3
ADMINISTRATIVE RECORD
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.4 Remedial Investigation Reports

p. 300001-300741 Report: Remedial Investigation Report, Operable Unit 3, Hooker Chemical/Ruco Polymers Superfund Site, Hicksville, New York, prepared by Conestoga-Rovers & Associates, prepared for U.S. EPA, Region II, July 21, 2000.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

p. 400001-400041 Report: Evaluation of MW-52 Area Groundwater Extraction System for Recovery of Groundwater from the Hooker/Ruco Site, Hicksville, New York, prepared by Conestoga-Rovers & Associates, prepared for U. S. EPA, Region II, July 1998.

p. 400042-400382 Report: Feasibility Study for Operable Unit 3, Vinyl Chloride Subplume in the Vicinity of MW-52, Hicksville, New York, prepared by Conestoga-Rovers & Associates, prepared for U.S. EPA, Region II, July 25, 2000. (Attachment: Rationale for Calculating the Present-Worth Cost for Alternatives 1, 2 and 3.)

10.0 PUBLIC PARTICIPATION

10.1 Comments and Responses

P. 10.00001-10.00004 Letter to Mr. Syed Quadri, Western New York Remediation Section, Emergency and Remedial Response Division, U. S. EPA, Region II, from Mr. Steve Whyte, Project Manager, Glenn Springs Holdings, Inc., re: Proposed Remedial Action Plan

(PRAP), Hooker Chemical/Ruco Polymer Corporation Site, Hicksville, New York, August 25, 2000.

P. 10.00005-10.00009 Letter to Mr. Syed Quadri, U. S. EPA, Project Manager, from Mr. Carlo SanGiovanni, Project Manager, and Mr. Michael F. Wolfert, Project Director, ARCADIS Geraghty & Miller, Inc., re: Comments on the proposed groundwater PRAP for the Ruco site on behalf of the Northrop Grumman Corporation, August 28, 2000.

10.4 Public Meeting Transcripts

P. 10.00010-10.00111 Transcript: Public Meeting for the Proposed Plan for the Hooker Chemical/Ruco Polymer Site, Oyster Bay Town Hall, prepared by Fink & Carney Reporting, prepared for U. S. EPA, Region II, August 15, 2000.

10.10 Correspondence

P. 10.00112-10.00112 Letter to Mr. Syed M. Quadri, Project Manager, New York Remediation Branch, Emergency and Remedial Response Division, U. S. EPA, from Mr. Joseph A. F. Sadowski, re: request for a copy of the minutes, undated.

Note: The report titled Revised Final Risk Assessment and Fate and Transport Report, Operable Unit 1, Hooker Chemical/Ruco Polymer Site, Hicksville, New York, is available in the Administrative Record for the Hooker/Ruco Site, Operable Unit 1, and is numbered HKR-001-1409 to 1746.

APPENDIX IV

STATE LETTER OF CONCURRENCE

500119

New York State Department of Environmental Conservation
Division of Environmental Remediation, Room 260B
50 Wolf Road, Albany, New York 12233-7010
Phone: (518) 457-5861 • **FAX:** (518) 485-8404
Website: www.dec.state.ny.us

John P. Cahill
Commissioner

Mr. Richard L. Caspe
Director
Emergency Response and Remedial Division
USEPA Region II
290 Broadway - Floor 19 - #E38
New York, New York 10007-1866

SEP 28 2000

Dear Mr. Caspe:

RE: Hooker/Ruco Federal Superfund Site
Nassau County Site No. 1-30-004

The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) have reviewed the Hooker Chemical/Ruco Polymer (Hooker Ruco Site) Operable Unit 3 (OU3) Record of Decision (ROD). The selected remedy includes in-situ treatment of vinyl chloride monomer (VCM) through bio-sparging. If necessary, nutrients will be added to enhance biological activity. The ROD contains a contingency plan for groundwater extraction and treatment to contain and remove the VCM subplume if in-situ bioremediation fails to prevent the VCM from reaching the Northrop Grumman Onsite Containment (ONCT) system. The ROD also merges the onsite groundwater extraction and treatment and soils flushing component of the OU1 ROD with OU3, and also recognizes that the downgradient Northrop Grumman Onsite Containment (ONCT) System is intercepting this plume.

There will be a monitoring plan that will verify the effectiveness of all the components of the Hooker Ruco Site OU3 groundwater remedy including the fate and transport of VCM, the capture of residual VOC contamination by the Northrop Grumman ONCT system, and the attenuation of the tentatively identified compounds (TICs). This will include groundwater sampling for VCM, total volatile organics including site related percloroethylene (PCE) and trichloroethylene (TCE) and TICs. Special monitoring of the vadose zone for site related contaminants will also take place in the area of the bio-sparging.

Therefore, the remedy selected in the Hooker Ruco OU3 ROD, in conjunction with existing and proposed controls addressing the regional VOC groundwater contaminant plume, will be protective of human health and the environment. The NYSDEC concurs with this remedy.

Sincerely,

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

c: J. La Padula, USEPA
A. Carlson, NYSDOH
C. Hodgeman, NCDOH

500120

APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
HOOKER CHEMICAL/RUCO POLYMER SUPERFUND SITE

INTRODUCTION

A responsiveness summary is required by Superfund regulation. It provides a summary of public comments and concerns received during the public comment period and the responses of the United States Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) to those comments and concerns. All comments summarized in this document have been considered in EPA and NYSDEC's final decision for the selected remedy for the Hooker Chemical/Ruco Polymer Superfund Site (Site).

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

Community involvement at the Site has been moderate. EPA has served as the lead agency for community relations and remedial activities at the Site.

The Remedial Investigation/Feasibility Study (RI/FS) Report for Operable Unit 3 and the Proposed Plan for the Site were released to the public for comment on July 28, 2000. These documents, as well as other documents in the administrative record (see Administrative Record Index, Appendix III) have been made available to the public at information repositories maintained at the EPA Region II Docket Room located at 290 Broadway, New York, New York and the Hicksville Public Library, Hicksville, New York. A public notice announcing the public meeting on the Proposed Plan as well as the availability of the above-referenced documents was published in Newsday on July 28, 2000. The public comment period established in the public notice was from July 28 to August 28, 2000. A request for a 2-week extension to the public comment period was granted by EPA and the public comment period was extended through September 12, 2000. EPA's decision to extend the comment period was announced at the August 15, 2000 public meeting, as well as publicized through mailings to the more than 400 citizens and other interested parties on the Site mailing list.

The August 15th public meeting was held at the Oyster Bay Town Hall, 54 Audrey Avenue, Oyster Bay, New York to present the Proposed Plan and to address questions and comments concerning the Plan and other details related to the RI/FS Report raised by local officials, residents and other interested parties. Responses to the comments and questions received at the public meeting, along with other written comments received during the public comment period, are included in this Responsiveness Summary.

OVERVIEW

The selected remedy includes in-situ biosparging technology to treat the vinyl chloride monomer (VCM) subplume to a level that achieves cleanup standards and whereby supplemental treatment for VCM at the groundwater extraction and treatment system[1] at the downgradient Northrop Grumman Aerospace Corporation (Northrop) facility is not required. If necessary, this alternative would also utilize a supplemental bioremediation technology (nutrient addition) following the biosparging treatment to enhance the degradation of VCM in the aquifer. The addition of nutrients to stimulate the microbial population would also enhance the degradation of volatile organic compounds (VOCs) such as trichloroethylene (TCE), perchloroethylene (PCE) as well as other VOCs which have been tentatively identified (TICs). It is estimated that biosparging will be required for a maximum period of 10 years and the supplemental nutrient addition would occur over a two-year period to effectively enhance the degradation of the VOCs.

If it is determined during the implementation and long-term monitoring of the selected remedy that the technology selected is not effectively reducing the VCM concentrations in a reasonable time frame, then VCM subplume extraction and treatment would be implemented as a contingency remedy. Further, if the treatment system at the Northrop facility ceases operation before the regional aquifer is restored, EPA would re-evaluate the protectiveness of the selected remedy.

The selected remedy for Operable Unit 3 also amends the ROD for components of the Operable Unit 1 remedy.

Attached to this Responsiveness Summary are the following Appendices:

Appendix A - Proposed Plan
Appendix B - Public Notice
Appendix C - August 15, 2000 Public Meeting Attendance Sheet
Appendix D - Letters Submitted During the Public Comment Period

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[1] This treatment system is being operated as an Interim Remedial Measure (IRM).

SUMMARY OF COMMENTS AND EPA'S RESPONSES

Specific comments have been organized as follows:

- General Site Issues
- Site Characteristics and Aquifer Characteristics
- Public Health and Risk Assessment Issues
- Remedy Selection Issues
- Remedy Implementation Issues
- Miscellaneous

A summary of comments and concerns regarding the Site investigation and remedy selection process and EPA's responses are provided below. A number of comments were addressed to the New York Department of Health (NYSDOH) and pertained to their activities. EPA has also received questions directed to the NYSDEC concerning the Northrop and Navy sites. Those questions were not addressed in this responsiveness summary but have been forwarded to the respective Departments.

General Site Issues

Comment # 1: Were soil samples collected from the surrounding properties?

Response # 1: Yes. Soil samples were collected in the suspected source areas at the Hooker/Ruco Facility. Sampling continued outward from the source area until the contamination was fully delineated. There has been extensive sampling of the soils on the Northrop and Naval Weapons Industrial Reserve Plant (NWIRP) sites as portions of these sites were remediated and removed from the State superfund list or are undergoing closure pursuant to the Resource Conservation and Recovery Act (RCRA).

Comment # 2: Will the liability provisions of CERCLA prevent anyone from purchasing the property?

Response # 2: The liability provision of CERCLA should not deter purchasing the Site property. EPA encourages responsible redevelopment of sites and believes that environmental cleanup and economic redevelopment are not mutually exclusive. EPA promotes the redevelopment of previously contaminated properties by facilitating the transfer of property, removing liability barriers, and providing financial assistance to States and Tribes. Over the past several years, EPA has initiated several administrative reforms to aid in this task and has identified various options to encourage the cleanup and redevelopment of contaminated properties, giving prospective purchasers, lenders, and property owners more

assurances that acquisition of such property will not also mean acquisition of liability. Two of the most effective tools have been development of prospective purchaser agreements (PPAs) and issuance of comfort letters. EPA guidance documents and fact sheets on these tools and others can be found at:

http://www.epa.gov/superfund/programs/reforms/types/econ.htm

Site Characteristics and Aquifer Characteristics

Comment # 3: Specifically, where does the Site lie in relation to the Long Island groundwater divide? Does the clay identified in some borings cause the groundwater to flow north? The validity of the interpretation of the groundwater data in the FS Report was also questioned.

Response # 3: The groundwater divide is at least two to three miles to the north of the Site. The general groundwater flow in the area of the Site is south from the groundwater divide. During the years that Grumman was in operation, pumping from its production wells exerted an influence of the groundwater inducing an eastward component of flow. During the various investigations, a series of monitoring wells have been placed in the area. Measurements from those wells confirm that the direction of ground water flow in the area is to the south-southeast. While there have been sporadic findings of clay in some of the borings, there is no indication that there is any connection between those areas, i.e., there is no continuous layer of clay where water or contaminants entering the ground would pool or move in a northward direction for any distance. Water entering the ground moves downward until it reaches the water table then migrates in a south-southeasterly direction. The groundwater movement as depicted in the FS report has been reviewed by EPA, NYSDEC, and the United States Geological Survey. All reviewers have concluded that the interpretation of the groundwater flow depicted in the FS Report is valid.

Comment # 4: Metals are present in the groundwater beneath the Site and arsenic and manganese exceeded the to-be-considered (TBC) criteria. However, these excursions were limited to only a few wells and at concentrations only slightly above the published health standard criteria. Consequently, the presence of the two metals in a few wells does not make metals contaminants of concern at the Site, especially when compared to the organic chemicals present.

Response # 4: Metals were not identified as primary contaminants of concern in the Proposed Plan, but rather as secondary contaminants. This classification is intended to place the

emphasis on VOCs, but notes the presence of metals above levels of concern in a manner consistent with the comment.

Comment # 5: How large is the plume of contamination and what are the geographic boundaries using New South Road and Route 107 as reference points?

Response # 5: The regional VOC plume is approximately 12,100 ft long, 9,600 ft wide and 580 ft deep. Approximate boundaries are New South Road and Route 107 to the West and Stewart Avenue to the East. In the deeper groundwater to the South, the plume approaches Hempstead Turnpike.

Comment # 6: Figure 4.2 of the Remedial Investigation Report (RI Report) shows that pollutants are entering the regional groundwater divide then entering the Lloyd Aquifer.

Response # 6: Figure 4.2 depicts a generalized regional hydrogeologic cross-section through Nassau County in the area of the Site and does not depict the contaminant plume but rather general groundwater flow direction for the area. The Site is located several miles to the south of the regional groundwater divide. Contamination entering the groundwater from the Site would flow toward the south.

Comment # 7: Figure H.5.7 and Figure 5.1 of the RI Report shows the Ruco, Grumman and Navy facilities and two public supply wells with contaminants falling into the Lloyd Aquifer by following the well casings.

EPA Response # 7: Figure H.5.7 depicts the calculated hydraulic head in the Magothy Aquifer at a model layer from 360 ft to 495 ft below sea level. Figure 5.1 depicts trichloroethylene (TCE) concentrations detected in wells during the mid 1970's in the study area. The deepest monitoring wells are completed in the Magothy Aquifer. The Magothy Aquifer is separated from the Lloyd Aquifer by an extensive layer of clay (the Raritan Confining Unit). The are no wells in the study area that are deep enough to enter the Lloyd Aquifer. Therefore, contamination cannot enter the Lloyd by traveling down well casings.

Comment # 8: Since the contaminants are found at 600 ft deep the water tested is from the Lloyd Aquifer.

Response # 8: The Magothy Aquifer extends below 600 ft. in the area of the Site where the contaminants are at their deepest. Below the Magothy lies a layer of low permeability known as the Raritan Confining Unit that averages 175 ft thick that would act as

a barrier to prevent contaminants from moving from the Magothy to the Lloyd.

Comment # 9: Figure 5.12 of the RI Report shows pools heading to the north - north east.

Response # 9: Figure 5.12 depicts a schematic of aquifer zones in the area of the Hooker/Ruco Site at various depths. Included within each zone are contours showing the concentrations of TCE detected in monitoring wells. These contours are not underground streams or pools. The drawing also notes that the vertical direction is not to scale. The flow directions are not shown on the concentration schematic and it is incorrect to state that groundwater flows to the north based on this drawing. Groundwater and contaminant flow directions are depicted on other drawings that show the flow is to the south-southeast.

Public Health and Risk Assessment Issues

Comment # 10: What health studies have been performed in the area of the Site?

Response # 10: NYSDOH has done several cancer incidence investigations in and around the Bethpage area. Information about these can be obtained by calling the toll-free telephone number for the NYSDOH Center for Environmental Health: 1-800-458-1158, extension 2-7530.

Comment # 11: Are Bethpage and the other water districts prepared for any situation that may arise from the local plume of groundwater contamination?

Response # 11: The Bethpage Water District has VOC removal treatment systems at its three well fields downgradient of the sites. The treatment system that is being operated by Northrop under NYSDEC oversight as an IRM is designed to prevent further migration of the contaminant plume to the area of the wells. Monitoring programs will continue to track any movement of the plume and to evaluate the effectiveness of the VOC removal treatment systems. If other wells become threatened by the plume or if the treatment systems fails, these monitoring systems will provide early warnings and alert authorities in sufficient time to take action to ensure the continued supply of clean water to the public.

Comment # 12: The future exposure scenario outlined in the Proposed Plan is highly unlikely to occur considering that:

i) a Nassau County ordinance permits obtaining drinking water only from a public supply source; and
ii) the public supply sources are being monitored and treatment is being implemented as needed.

This unlikely future exposure scenario should be reiterated so that public concerns regarding the estimated future residential groundwater use scenario risks are put in perspective.

Response # 12: The ROD, the Proposed Plan, and the risk assessment state that the current use of groundwater at the Site does not pose a unacceptable risk to human health since no one is using the groundwater for domestic purposes. However, the purpose of the risk assessment is to determine whether unacceptable risk to the public would be incurred if groundwater at the Site is used without treatment. This determination is based upon conditions at the Site, irrespective of controls used at downgradient receptor locations. In this manner, appropriate action can be taken before contaminants are detected either in future on-Site wells or in downgradient water supply wells or public water distribution systems. The fact that public water supplies are monitored and treated is good, but not directly relevant to the baseline determination. It is agreed that the future on-Site groundwater use scenario is conservative, but it is appropriately so. The groundwater at the Site is classified as Class GA by New York State, suitable for potable supply. This is reflected in the ROD. It should be noted that at the public meeting, the public was informed that current drinking water supplies are protected from the groundwater plume of contamination.

By way of clarification, Nassau County Public Health Ordinance Article IV prohibits the installation of new private water wells in areas served by public water supplies. The installation of public water wells is not prohibited under Article IV.

Remedy Selection Issues

Comment # 13: Who will make the decision as to what remedy is selected and are the local officials invited to participate?

Response # 13: After considering the comments received on the Proposed Plan and the FS Report, including comments from local officials, the Regional Administrator for EPA Region 2 will make the remedial decision. EPA will then issue this determination as a ROD for the Hooker/Ruco Site.

Comment # 14: The Proposed Plan identifies Alternative 2 (pumping and treatment to groundwater to meet ARARs) as the contingency

remedy if in-situ biosparging is not effective. It is possible, that during the operation of the biosparging remedy, new technologies may be developed. Thus, it is suggested that new treatment technologies be considered if a contingency remedy becomes necessary in the future, so that the most effective technology will be selected.

Given the recent acknowledgment of the value of natural attenuation, it may not be necessary to pump and treat down to concentrations that meet ARARs. Some monitored natural attenuation may also be included as part of the contingency remedy. Thus an alternative to the specified contingency remedy is to pump and treat to remove a sufficient mass of VCM such that supplemental VCM treatment of the air discharge from the Northrop Treatment System would not be needed. This would then be consistent with the level of remediation effort proposed for the preferred remedial alternative.

Response # 14: EPA's preferred remedy has as its goal achieving MCLs in groundwater. The contingency remedy was identified from alternatives that are currently available. If the selected remedy were not to be effective in achieving these goals, the contingency remedy would be implemented. EPA can reevaluate remedy decisions where significant new scientific information, technological advancements or other considerations become available to achieve the proper level of protectiveness of human health and the environment while enhancing overall remedy and cost-effectiveness. Further, if the data collected by the monitoring program indicates that natural attenuation is occurring and will restore the aquifer to its beneficial use without further contaminant migration, it could be evaluated as part of this process.

Comment # 15: All remedial approaches considered should intercept and treat the VCM subplume before it affects the downgradient Northrop Treatment System.

Response # 15: A major consideration in the evaluation of alternatives in selecting the remedy for the Site is that the potential remedy treat the VCM sufficiently so that the Northrop Treatment System is not impacted. In addition, the proposed sentry monitoring is intended to confirm that biosparging and supplemental enhanced bioremediation are effectively addressing the VCM contamination and provide sufficient lead time to implement the contingency remedy if VCM adequate reduction is not progressing as planned.

Comment # 16: If it is shown that biosparging is not effective and a pump and treat system is needed (as a contingency remedy), it

should be designed so that it does not interfere with the goals of the downgradient Northrop Treatment System.

Response # 16: EPA agrees that if a pump and treat system is needed, it should not interfere with the Northrop Treatment System. Groundwater modeling would be undertaken to ensure that no detrimental interference occurs.

Comment # 17: Based on a review of the pre-design data collected by Conestoga Rovers & Associates (CRA), the subsurface environment at the Hooker/Ruco Facility and immediately downgradient is anaerobic and reducing. Biosparging, by its very nature of adding oxygen to the subsurface, will disrupt the anaerobic and reducing environment that exists at and south-southeast of the Site and will disrupt the natural degradation of the source-derived chlorinated compounds, i.e., TCE and PCE. Except for the TCE, PCE and DCE that is stripped during the biosparging process, there will be no additional remediation of these compounds via the biosparge system. Therefore, the Northrop Treatment System will have to treat these compounds from the Hooker/Ruco Facility and the previously anaerobic off-Site area. An evaluation must be made to assess the impact that the disruption of the anaerobic biodegradation zone would have on the downgradient Northrop Treatment System.

Response # 17: It is true that the aquifer geochemical conditions immediately downgradient of the Site are reducing and that biosparging is intended to create more oxidizing conditions. Therefore, it is agreed that the aerobic biosparging process will disrupt the anaerobic and reducing environment in the area where the biosparging system will be injecting air/oxygen.

Due to the overall low concentrations of organic carbon, however, the degree of reductive chlorination, which appears to be occurring in the area of strongly reducing conditions, is expected to be fairly limited. While some degradation of PCE and TCE is likely occurring under the present conditions, the impact of biosparging on these compounds is expected to be limited.

Pursuant to Occidental's proposed OU-3 Predesign Investigation Measures Plan, submitted on June 11, 1999, test injection wells are to be installed downgradient of GW-10I and MW-52, which are downgradient of the area of anaerobic reducing conditions. Furthermore, based on the data currently available, the full scale biosparging injection system will likely be installed downgradient of well cluster MW-52. Thus, the proposed OU-3 predesign testing and most likely the full scale biosparging system should not influence the area of anaerobic reducing conditions and will not

disrupt the natural degradation of PCE and TCE in this area.

VCM, however, would significantly impact the existing Northrop Treatment System if VCM were not treated, so it is the focus of the treatment. Because VCM is a reduced compound, it is generally more easily oxidized than reduced. For this reason, biosparging was chosen, although it is acknowledged that reductive dechlorination is also possible. It should be noted that the Record of Decision allows for "supplemental bioremediation" in the event that biosparging is not achieving the remedial objectives.

During the remedial design phase an evaluation will be made to assess the impact that the biosparging could have on the anaerobic biodegradation zone and the Northrop Treatment System.

Comment # 18: Biosparging downgradient of the source area (in the transitional and aerobic environments where VCM persists, but the aerobically degradable compounds, like ketones and alcohols, are depleted) should enhance the degradation of VCM.

Response # 18: EPA agrees.

Comment # 19: The goal of the biosparge treatment system is to treat the VCM subplume to a level that will ensure that there will be no need for supplemental treatment of VCM at the Northrop Treatment System. However, a VCM contingency plan should be developed to protect the treatment system from levels of untreated VCM that, if treated by the Northrop system, would result in excursions of air discharge standards.

Response # 19: The goal of the selected remedy is to restore the groundwater to meet MCLs. The selected remedy includes a contingency to pump and treat the VCM subplume if biosparging is not effective. Also, monitoring of the remedial action will provide an early warning if the VCM is migrating to the extent that the ability of the existing Northrop Treatment System to effectively treat the VCM subplume might be compromised. Should migration occur, ample time will be available to put measures in place to ensure the public is protected and air discharge limits are not exceeded. The biosparging system includes VCM monitoring at sentry wells which are located 1800 to 2400 feet upgradient of the closest Northrop Treatment System well (GP-1). If these sentry wells show VCM migration to well GP-1 at concentrations which could affect the operation of the Northrop Treatment System, sufficient time is available to select, design, and construct a VCM treatment component for the Northrop Treatment System off-gas.

Comment # 20: Why is biosparging being considered as a solution when it only addresses one of the many contaminants?

EPA Response # 20: The contaminants other than VCM are being addressed by the treatment system in operation on the Northrop facility. Because VCM from the Site has not reached that system and it system would not be effective in treating VCM, the VCM will be treated using the biosparging.

Remedy Implementation Issues

Comment # 21: If EPA decides to use the contingency of pumping and treating the VCM subplume, will the local municipalities be notified?

Response # 21: Yes. Before the contingency is implemented, EPA would notify local authorities and addressees on the Site's mailing list.

Comment # 22: Is there a depth threshold for the organisms that will be breaking down the VCM by biosparging?

Response # 22: In the last ten years, there has been a significant amount of research in subsurface microbiology. It has been learned that these microorganisms can live as deep as 3,000 feet or more below land surface. There is evidence that at this Site there is biological activity at least to the bottom of the plume which occurs at approximately 600 ft below ground surface.

Comment # 23: There are references in the Proposed Plan for Alternative 1 that state that the Northrop Treatment System will exceed its air discharge limitations and this statement is based upon the results of computer simulations. Because of the uncertainty associated with simulated results, it is suggested that text such as "could potentially exceed its air discharge limitations without the addition of supplemental treatment capability" be used instead of the more definitive phrasing used in the Proposed Plan.

Response # 23: It is true that the predicted VCM concentrations are based on computer simulations with inherent uncertainty. However, computer simulations are considered a useful tool to predict the behavior of the aquifer and many of the statements regarding other alternatives are based on computer simulations, including the predicted behavior of the VCM subplume.

Comment # 24: The Proposed Plan states that aerobic degradation of TCE and PCE is limited. While this is true for PCE, it is not

correct for TCE. TCE degradation does readily occur under aerobic conditions, although not as quickly as occurs under anaerobic conditions. The text should be revised to reflect the different aerobic degradation rates for these two compounds.

Response # 24: It is true that TCE will more readily degrade under aerobic conditions, while PCE will not. Aerobic biodegradation of TCE requires the addition of a carbon energy source (such as methane) in addition to oxygen for degradation to proceed at adequate rates. The biosparging remedy does not include a carbon source as an initial matter. Addition of nutrients and carbon sources are possible supplements. Under the conditions of strict biosparging without the addition of a carbon source, TCE biodegradation will be limited. Appropriate sections of the ROD address the topic as follows: "aerobic conditions will not enhance the degradation of PCE but will enhance the degradation of TCE only when sufficient quantities of a suitable carbon source such as methane are present; therefore, the effect of biosparging on TCE and PCE would be limited."

Comment # 25: Because it will be necessary to sparge at extreme depths (greater than 350 feet) air will have to be forced at pressures in excess of 180 pounds per square inch (psi) to overcome the head exerted by the water column. Thus, all the wellhead assemblies must be constructed in accordance with American Society of Mechanical Engineers (ASME) code requirements for similar pressures. Wellhead retrofits may be required at existing wellheads and proper health and safety precautions should be adhered to, particularly where public access cannot be controlled.

Response # 25: The biosparging system (wellhead assemblies and retrofits, flanges, fittings and piping) will be designed for the appropriate pressures according to ASME specifications. Proper health and safety procedures will be followed, especially where public access is an issue.

Comments # 26A-26E: Several comments were made which pertained to biosparging process issues that may preclude the use of biosparging under the Site conditions as described in comments 26A-26E below:

> **Comment # 26A:** Because of the high pressure at which the system must operate to successfully sparge to depths of 320 feet below the water table, the air is compressed when it is released into the groundwater. The pressure, upon release will be on the order of 140 to 180 psi (i.e., 10 to 13 atmospheres). At this pressure, the actual airflow will be approximately 30 standard cubic feet per minute (scfm). As the air rises and the pressure declines, the air volume will increase. This phenomenon will

lead to a reduction in aquifer permeability and a "damming-effect" (a decrease in the velocity of groundwater flow) can result. The more air forced in, the greater the effect on the permeability.

Response # 26A: The concern that large volumes of air might significantly reduce hydraulic conductivity in the formation near injection locations can be mitigated through the use of a pulsed injection strategy. It is anticipated that the cycle would consist of one day of injection (or possibly 1 or 2 hours per day) followed by a week or a month of no injections. The net result is that over the vast majority of the time, injection will not be occurring. This pulsing will allow the injected air/oxygen to dissipate and be solubilized by groundwater flowing through the formation, thereby limiting the reduction in aquifer permeability and reducing the probability of a "damming-effect."

Comment # 26B: Because the air is released under 10 atmospheres of pressure, the saturation concentration of oxygen in the water is more than 10 times that under atmospheric pressure. This high oxygen concentration will poison the bacterial population.

Response # 26B: It is possible that the bacteria in close proximity to the injection location will not survive the high oxygen content of the injected air. Short distances from the injection locations, however, dissolved oxygen (DO) concentrations are expected to decrease to levels that are not toxic to the bacteria. Thus, it is believed that any die-off would be limited to the area in the immediate proximity of the injection location. Furthermore, groundwater will continue to flow, diluting the DO concentrations and will bring "new" bacteria to the area of the injection location. Thus, any die-off would be expected to be a short-term event and limited in extent. If this does occur, it may actually benefit the operation by preventing bacterial buildup around the injection well screen.

The testing to be performed during the predesign phase will be used to evaluate this potential issue.

Comment # 26C: When air is injected into the ground, it will rise along the path of least resistance to the water table. The geology at the Site is heterogeneous due to its depositional history. As a result, there are layers of variable permeability throughout the depth of the formation. This layering has some influence on groundwater flow, but has a much greater affect on airflow. This layering will lead to the preferential flow of

the air along high permeability lenses horizontally. During pilot testing, it is critical that the farthest monitoring wells be located at a minimum of twice the total injection depth to monitor this effect. In addition, the air can carry stripped VCM outward from the target groundwater zone, thus potentially spreading the VCM impacts both in the groundwater and in the vadose zone. Monitoring points should be included to track this effect and accurately define it.

Response 26C: The heterogeneous layering of the formation will be considered when developing the scope of the predesign activities. Preferential horizontal flow along high permeability lenses beneath a low permeability lens is in fact desirable as it will enhance the areal distribution of the injected air/oxygen. Also, the highly permeable zones are the pathways in which most of the groundwater flow and chemical flux occur. Thus, enhanced oxygenation in these zones is desirable.

Monitoring wells will be located from approximately 50 to 600 feet from the expected locations of the predesign injection wells. The 600-foot distance is approximately twice the depth of proposed injection wells. In addition, monitoring points for the vadose zone will be installed.

Comment # 26D: VCM is a very volatile organic compound. At the proposed rates of air injection, stripping of the VCM from groundwater will occur and could represent the chief mechanism of mass removal. Monitoring points should be added to track this effect and accurately define it. In addition, lower airflow rates should be tested to try to minimize this effect.

Response # 26D: It is again noted that the air/oxygen injection will be pulsed and will not be continuous. Therefore, stripping would be minimized and would be monitored.

Comment # 26E: The proposed rate of injection of 300 scfm is higher than typical biosparge applications, which will exacerbate all the negative potential effects described above. At a minimum, lower rates should be tested and the proposed rate of 300 scfm should be reconsidered.

Response # 26E: Pulsing was selected to enhance solubilization of the injected air/oxygen and reduce/eliminate air stripping and the potential detrimental impacts of VCM migration to the vadose zone.

The results of the predesign activities will be used to determine the appropriate air/oxygen injection rate and

period/volume required to reduce the stripping of VCM from the groundwater.

Comment # 27: The FS evaluation and cost projections summarized in the Proposed Plan do not account for some of the biosparging process issues described above (in Comments 26A-26E). There are ways to overcome some of these issues (such as the use of blended gases - air plus nitrogen for example - to control the concentration of dissolved oxygen that can enter the groundwater) but at higher cost. Such considerations should be included in the cost comparison. At a minimum, these issues and costs must be included in the pilot test program and in the subsequent data evaluation and full-scale design and costing.

Response # 27: The issues identified are appropriate to consider at the detailed design and pilot testing phases and are not necessary to the evaluation of alternatives in the FS and Proposed Plan. In addition, the cost estimates presented in the Proposed Plan and the ROD contain a 20 percent contingency to account for issues such as those cited in the preceding comment. One purpose of the predesign activities is to determine the design and operating parameters of the full-scale biosparging system (e.g., spacing/number of injection wells needed).

The test results will be used to refine the cost estimates for the full-scale biosparging system. Other issues identified by the testing which were not specifically included in the Proposed Plan cost estimates will also be included in the cost estimate for the full scale system.

Comment # 28: The Proposed Plan includes a contingency for the addition of nitrogen and phosphorous to supplement the aerobic biodegradation of VCM in the groundwater. Given the fact that the groundwater is used for drinking water supplies in the area, the application of nutrients will require extensive permitting and monitoring.

Response # 28: EPA agrees that the application of nutrients would be monitored closely. Such additions would be designed such that the nutrients are completely utilized within a defined treatment zone. Permits would not be required because the remedial action is being conducted under CERCLA, but the substantive requirements of appropriate permits would need to be met. Initially, it is not planned to add nutrients to the biosparging system. The intent is to attempt to use injected air/oxygen only. The predesign testing will help determine whether any nutrient addition is necessary.

The amount of nutrients added, if any, will be limited to that amount estimated to be consumed during the biosparging process. Furthermore, the concentration of any nutrients added will be less than the drinking water standards and will be consumed before reaching the Northrop wells. In addition, monitoring for such nutrients, if utilized, will be performed.

Comment # 29: What is the time frame for the project?

Response # 29: After the ROD is issued, EPA will enter into a period of negotiations for several months with the Potentially Responsible Parties ("PRPs") in a attempt to secure performance of the selected remedy. The remedial design will take approximately one year to complete. The remedy should then take an additional six to eight months to be constructed.

Miscellaneous

Comment # 30: The Proposed Plan states that "...available data indicate that several public supply wells from the Bethpage Water District have been affected by VOCs which are likely attributed to all three sites." One commenter stated that the chemicals, however, could not have impacted the Bethpage public supply wells because the Hooker/Ruco VOC chemicals have not reached wells which are located upgradient of those public supply wells.

Response # 30: While it is true that VCM has not reached these public supply wells, other VOC's such as TCE and PCE have been detected in wells between the Hooker/Ruco Facility and these public supply wells. The intent of the sentence was to communicate that there is a regional commingled VOC plume. For clarification the sentence has been worded in the appropriate section of the ROD as follows: "Available data indicate that several public supply wells from the Bethpage Water District have been affected by VOCs attributable to the commingled plume emanating from the three sites."

Comment # 31: A typographical error was identified in the Comparison of Alternatives Section of the Proposed Plan where the word "not" had been mistakenly omitted.

Response # 31: The text has been changed appropriately in the ROD, which reads "[b]oth Alternatives 2 and 3 would reduce the concentration of the VCM subplume to the level that supplemental treatment for VCM at the Northrop Treatment System would <u>not</u> be required.

Comment # 32: In estimating present worth costs a discount factor of 5 percent is used in one section of the Proposed Plan and a value of 7 percent is used in another section.

Response # 32: The appropriate text of the ROD has been changed to reflect that the 7 percent discount rate is used consistently.

Comment # 33: What products are made from vinyl chloride? What products are made at the plant located at the Hooker/Ruco Facility?

Response # 33: Vinyl chloride is a manufactured substance that is used to make polyvinyl chloride (PVC). PVC is used to make a variety of plastic products, including pipes and wire and cable coatings. These products were never made at the plant. The plant is currently used for the production of various polymers, PVC, styrene/butadiene latex, vinyl chloride/vinyl acetate copolymer, and polyurethane, as well as ester plasticizers.

Comment # 34: Does biosparging have a proven track record?

Response # 34: While biosparging is a relatively new technology, it is being used successfully at a number of other Superfund sites, such as Eielson Air Force Base, Alaska; Oralaska Municipal Landfill, Wisconsin; and Applied Environmental Services, New York.

Comment # 35: The Proposed Plan recognizes that a portion of the VOC plume originating from the Site is not addressed by the proposed remedy, but has been and continues to be treated by the downgradient Northrop treatment system and the VOC removal system for VOC-impacted public supply wells funded by Northrop and the U.S Navy. Hence, Occidental Chemical Corporation (Occidental) should share the costs for these other treatment systems as well as the long-term operation and maintenance (O&M). Therefore, Occidental's share of these costs should be addressed in the consent order to be issued to Occidental for the Remedial Design/Remedial Action (RD/RA) phase of the project.

Response # 35: The commingled regional VOC plume is not directly addressed by the selected remedy. However, EPA's ROD acknowledges that the groundwater in the region has been contaminated by three sites: the Hooker/Ruco Facility, the NWIRP site, and the Northrop site and the ROD relies on the continued operation of the IRMs, together with the remedy EPA is selecting in the ROD, to ensure restoration of the aquifer. EPA and NYSDEC agreed to undertake a coordinated effort to address the commingled groundwater plume. This approach acknowledges that there are both administrative and practical considerations behind the division of responsibility for components of the remedial work so as to avoid duplication of

effort and the resulting expense to all parties involved. As such, the primary focus of EPA's and the State's remedies will target different facilities and different contaminants, though some overlap may be inevitable; when conducted together, these components will form a comprehensive remedy for the cleanup of the regional groundwater plume.

Following the issuance of the ROD, EPA will ascertain whether Occidental and Ruco Polymer Corp. are willing to enter into a Consent Decree pursuant to CERCLA for the RD/RA of the selected remedy. The selected remedy does not involve construction of the IRMs, as they were already constructed pursuant to NYSDEC's agreements with the PRPs for the Northrop and NWIRP sites. These treatment systems, which were early, interim actions for these sites will become part of the State's selected remedy for those sites. In addition, the long-term operation of the IRMs will be managed as part of the remedies for these State-lead sites.

The PRPs involved with the three sites can negotiate a private agreement concerning their respective shares of the expenses associated with the IRMs.

Comment # 36: Figure H.2.8 of the RI Report shows that rainwater inside the study area would run into the Hicksville water wells at plant 9.

Response # 36: Figure H.2.8 depicts the lines of hydraulic head for a layer of the study area. The study area depicted on Figure H.2.8 includes an area larger than the area impacted by the Site. The groundwater flows perpendicular to the lines of equal head from the higher numbers to the lower. This shows the groundwater generally flows to the south. The influence of pumping wells, including the Hicksville wells, is also shown. The figure shows that the influence of the Hicksville wells does not extend to the Site.

Comment # 37: There were two dates for the public meeting given in mailings. Should another meeting be scheduled?

Response # 37: On July 28, 2000, an advertisement was placed in Newsday announcing the issuance of the Proposed Plan and that a public meeting would be held on August 15th to discuss the Site. EPA also sent notices to people on the Hooker/Ruco Site mailing list. Due to a clerical error, the date for the public meeting was incorrect on the mailing. The error was detected and an additional mailing was sent to the same mailing list the next day. The meeting was well attended. Therefore, EPA does not believe an additional meeting was warranted.

RESPONSIVENESS SUMMARY

Appendix A

Proposed Plan

Hooker Chemical/Ruco Polymer Site

Hicksville, Nassau County, New York

EPA
Region 2

July 2000

MARK YOUR CALENDAR

July 28 through August 28, 2000: Public comment period on the Proposed Plan.

August 15, 2000 at 7:00 PM: Public meeting at the Oyster Bay Town Hall (Town Board Hearing Room) 54 Audrey Avenue, Oyster Bay, NY 11771

COMMUNITY ROLE IN SELECTION PROCESS

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 Hooker Ruco Remedial Investigation and Feasibility Study (RI/FS) and other investigative reports along with this Proposed Plan have been made available to the public for a public comment period which begins on July 28, 2000 and concludes on August 28, 2000.

A public meeting will be held during the public comment period at the Oyster Bay Town Hall (Town Board Hearing Room) 54 Audrey Avenue, Oyster Bay, NY 11771 on August 15, 2000 at 7:00 PM to present the conclusions of the RI/FS, to discuss the preferred remedy, and to receive public comments on the preferred remedy.

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 which formalizes the selection of the remedy.

PURPOSE OF PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for contaminated groundwater at the Hooker Chemical/Ruco Polymer Site (Site), and identifies the preferred remedial alternative with the rationale for this preference. The Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) in consultation with the New York State Department of Environmental Conservation (NYSDEC). The preferred remedial alternative proposed in this plan would protect human health and the environment from risks associated with the contaminated groundwater at the Site.

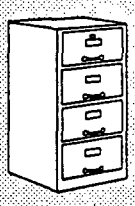
This Proposed Plan is being provided as a supplement to the Remedial Investigation and Feasibility Study (RI/FS) reports to inform the public of EPA and NYSDEC's preferred remedy and to solicit public comments pertaining to all the remedial alternatives evaluated, including the preferred alternative. Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended, and Section 300.430(f) of the National Oil & Hazardous Substance Pollution Contingency Plan (NCP) require EPA to solicit public comments on proposed plans. The alternatives summarized here are more fully described in the FS report contained in the Administrative Record file for the Site.

EPA's preferred remedy involves the use of an innovative in-situ treatment technology (biosparging) to remediate a localized vinyl chloride monomer (VCM) plume of groundwater contamination which originated from the Site. EPA and NYSDEC recognize that an existing groundwater extraction and treatment system which is operating as an Interim Remedial Measure (IRM) at the downgradient Northrop/Grumman Aerospace Corporation Site (Northrop) is containing and remediating a commingled plume of groundwater contamination from the Northrop, Naval Weapons Industrial Reserve Plant (NWIRP) and the Hooker/Ruco Facility sites. EPA's preferred remedy together with this existing treatment system will protect the downgradient users against the migration of groundwater contamination present in the aquifer. If it is determined that biosparging would not be effective in reducing the VCM contamination in a reasonable time frame, then groundwater extraction and treatment would be implemented as a contingency remedy.

This Proposed Plan also presents a change to the groundwater component of the 1994 Record of Decision (ROD) for the first operable unit (OU-1) at the Site because the Northrop IRM and the proposed remedy together would obviate the need to perform any additional groundwater action selected in the OU-1 ROD.

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 FS report because EPA and NYSDEC may select a remedy other than the preferred remedy.

The administrative record file, which contains the information upon which the selection of the response action will be based, is available at the following locations:



Hicksville Public Library
169 Jerusalem Avenue
Hicksville, NY 11801
(516) 931-1417
Contact: Reference Desk

Hours: Monday-Thursday 9 AM - 9 PM
Friday 9 AM - 5 PM
Saturday 9 AM - 5 PM

USEPA-Region II
Superfund Records Center
290 Broadway, 18th Floor
New York, NY 10007-1866
(212) 637-4308

Hours: Monday-Friday, 9:00 AM - 5:00 PM

Written comments on this Proposed Plan should be addressed to:

Syed M. Quadri
Project Manager
New York Remediation Branch
Emergency and Remedial Response Division
United States Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007-1866

Telefax: (212) 637-4284
Internet: quadri.syed @epamail.epa.gov

SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes segregated into different phases, or operable units (OUs), so that remediation of different environmental media or areas of a site can proceed separately, resulting in an expeditious remediation of the entire site. EPA has designated three operable units for the Site. Operable Unit 1 (OU-1) addresses contaminated soils at the Hooker/Ruco Facility. Operable Unit 2 (OU-2) addresses polychlorinated biphenyl (PCB) contaminated surface soils. Operable Unit 3 (OU-3), which is the subject of this Proposed Plan, addresses the downgradient commingled contaminated groundwater plume beyond the Hooker/Ruco Facility and also the contaminated groundwater beneath the Hooker/Ruco Facility which was previously included under OU-1.

The primary objectives of the comprehensive remedial action described in this Proposed Plan are to reduce contaminant levels in groundwater, to minimize the migration of contaminants and to protect human health and the environment from risks associated with the contaminated groundwater.

SITE BACKGROUND

Site Description

The Hooker/Ruco Facility (refer to Figure 1) is an active chemical manufacturing facility located in Hicksville, Long Island, New York. The area surrounding the Hooker/Ruco Facility is comprised of an industrial corridor and residential complexes. The Hooker/Ruco Facility currently contains four buildings used for the manufacture and storage of chemical products and an administration building. The remainder of the 14-acre property contains parking areas, chemical storage tanks, recharge basins (sumps) and small ancillary structures. The Hooker/Ruco Facility currently employs about 100 individuals and manufactures polyester, polyols, and powder coating resins.

Site History

Operations at the Hooker/Ruco Facility began in 1945 and included natural rubber latex storage, concentrating, and compounding. These activities were expanded and modified through the years to include production of plasticisers and polyvinyl chloride (PVC). The Hooker/Ruco Facility was owned and/or operated by several companies including the Rubber Corporation of America, the Hooker Chemical Company (currently known as the Occidental Chemical Corporation or Oxy) and the Ruco Polymer Corporation (Ruco Polymer). In 1998, Sybron Chemicals Inc. acquired Ruco Polymer.

During operations between 1951 and 1975, industrial wastewater and storm water from the Hooker/Ruco Facility was discharged to on-Site recharge basins or sumps (sumps 1, 2, 3, 4, 5 & 6). This wastewater contained among other things, vinyl chloride, trichloroethylene (TCE), barium and cadmium soap, vinyl acetate, organic acids and styrene condensate. After 1975, the waste stream was incinerated on the Hooker/Ruco Facility. Sump 1 continued to receive discharge from the floor drains in part of the plant until 1976. As a result of these releases, the groundwater beneath and downgradient of the Hooker/Ruco Facility has been contaminated.

The Hooker Chemical/Ruco Polymer Site was placed on the National Priorities List in 1986. In September 1988, Oxy agreed to perform an RI/FS to determine the nature and extent of contamination at the Hooker/Ruco Facility. The study identified an area of PCB contamination in the

surface soils surrounding the plant. In September 1990, EPA signed a Record of Decision (ROD) to address the PCB-contaminated soil. Under an Unilateral Administrative Order (UAO), Oxy conducted the action specified in the ROD under EPA's oversight. A total of approximately 3,200 tons of PCB-contaminated soils with concentration ranging between 10-500 parts per million (ppm) were excavated and sent to an off-Site landfill. In addition, 85.2 tons of soils with PCB concentrations greater than 500 ppm were excavated and sent to an off-Site incinerator. This action was completed in December 1992.

In January 1994, also based on the results of the RI/FS completed in December 1992, EPA issued a second ROD which called for additional soil sampling, excavation of shallow soils in limited areas and soil flushing with extraction and treatment of contaminated groundwater beneath the Hooker/Ruco Facility.

In April 1994, under EPA's direction, Oxy initiated a program to investigate groundwater conditions beyond the Hooker/Ruco Facility which involved collecting additional groundwater data around and primarily west of the Hooker/Ruco Facility. The activities were described in the document entitled "Work Plan for Groundwater Investigations Beyond the Hooker/Ruco Facility, August 1994" and in a subsequent Addendum, dated September 1995.

Since the groundwater contamination associated with the Hooker/Ruco Facility has commingled with groundwater contamination from the Northrop and NWIRP sites, in the Spring of 1995, EPA and NYSDEC agreed to proceed with a coordinated effort to evaluate and develop remedial alternatives to address the commingled plume.

Coordinated Groundwater Investigation

EPA and NYSDEC have identified that the regional groundwater aquifer in the area downgradient of the Hooker/Ruco Facility has also been contaminated by two adjacent sites, Northrop and the NWIRP. These two facilities are designated as NYSDEC hazardous waste sites. Northrop is a potentially responsible party (PRP) for the Northrop site and the National Division Naval Facilities Engineering Command (the U.S. Navy) is the PRP for the NWIRP site (see Figure 2). Northrop has signed a Consent Order and the US Navy has signed a Memorandum of Understanding for their respective facilities with NYSDEC for the performance of an RI/FS. The RIs for the Northrop and NWIRP sites were completed in September 1994 and October 1993, respectively. Based on the findings of these reports, Northrop and the U.S. Navy have implemented two groundwater IRMs. One measure provides for VOC removal treatment at the Bethpage Water District wells downgradient of the Northrop/NWIRP sites. The second measure consists of pumping and treatment of groundwater from four wells (GP-1, ONCT-1,2 &3) at the Northrop Facility and includes a long-term groundwater monitoring program.

The Northrop/Grumman Site (Northrop)

The Northrop/Grumman Site (formerly Grumman Aerospace Corporation) was initially more than 600 acres in area. However, as a result of several remedial activities taken at the site, NYSDEC has reclassified some portions of the site to Class 4 and delisted other portions of the site on the New York State Registry of Inactive Hazardous Waste Disposal Sites.

The Northrop plant was established in the early 1930's and developed and manufactured a series of naval carrier aircraft, amphibious vehicles and space exploration vehicles. The plant is presently undergoing closure operations. The facility included numerous buildings, 7 industrial production wells and four recharge basin areas. The main activities of this facility have been the engineering, manufacturing, primary assembly, and research and development testing of a variety of military and aerospace crafts. The recharge basins located in the southern end of the property received treated industrial wastewater from the late 1940's until 1981. Since 1981, the treated wastewaters have been discharged to a sanitary sewer and the recharge basins have been used to discharge only non-contact cooling water and storm water runoff. Discharges to the on-site recharge basins are regulated in accordance with a State Pollutant Discharge Elimination System (SPDES) permit. Between 1996 and 1998, a soil vapor extraction (SVE) system was operating at Plant 2 of the Northrop Site for soil remediation.

Naval Weapons Industrial Reserve Plant (NWIRP)

The NWIRP facility was established on the Northrop property during the early 1930's. Historically, this was a government-owned and contractor-operated facility with the mission of design engineering, research prototyping, testing, fabrication and primary and subassembly of various naval aircraft. The facility included seven industrial production wells and one recharge basin. Several waste source areas were identified at the site during the RI/FS which was conducted from 1991 to 1995. Currently, air sparging and SVE systems are being operated at the NWIRP Site for soil remediation.

While EPA and NYSDEC have conducted independent investigations of the source areas at each of the three sites, the Agency and the State have coordinated the investigation of the regional groundwater contamination to avoid duplication of effort. The regional groundwater contains volatile organic compounds (VOC) contaminants which are related to past waste disposal at each of the facilities and which have commingled. Based on the available data, the Northrop, NWIRP and Ruco Facilities are sources of TCE, perchloroethylene (PCE), vinyl chloride monomer (VCM), semivolatile organic compounds (SVOCs) and inorganics. The main source of VCM, however, is attributed to historic wastewater discharges

from the Site. In the Spring of 1995, EPA and NYSDEC agreed to proceed with a coordinated effort to evaluate and develop remedial alternatives to address the commingled plume. Upon further agreement in November 1998, EPA directed Oxy to prepare an FS which addressed the VCM subplume within the regional groundwater plume and NYSDEC directed Northrop and NWIRP to prepare an FS to address the remainder of the regional VOC groundwater plume. It is noted that the decision to approach remediation of the regional plume in this manner was based on administrative and not technical considerations. In the summer of 2000, NYSDEC intends to issue a Proposed Plan which, in addition to addressing the regional groundwater contamination, will identify source control measures for the Northrop and NWIRP Facilities.

Regional Hydrogeology

The subsurface conditions beneath the area generally consist of a shallow Upper Glacial aquifer and a deeper Magothy aquifer. The Upper Glacial aquifer consists of glacial out wash sand and gravel deposits that range in thickness from approximately 30 ft to 75 ft. The Magothy aquifer consists of a heterogeneous deposit of sand and gravel interbedded with discontinuous lenses of silty to solid clay. The Magothy aquifer is approximately 600 ft to 650 ft in thickness. A 175-foot thick clay deposit underlies the Magothy aquifer and is considered to represent the lower impermeable boundary of the groundwater flow system. Within the vicinity of the Site, the Magothy aquifer is the primary source of water for municipal and industrial usage. Groundwater flow in the Upper Glacial and Magothy aquifers in the vicinity of the three sites generally occurs from north to south. The aquifers are sustained primarily by precipitation recharge, storm water runoff and industrial water discharge to recharge basins or sumps. Downward vertical gradients from the Upper Glacial aquifer to the Magothy aquifer are predominant over upward vertical gradients. Groundwater flow directions are influenced significantly by the localized effects of municipal and industrial pumping centers and recharge basins.

REMEDIAL INVESTIGATION SUMMARY

The groundwater sampling and analyses conducted as part of the RIs for the Northrop, NWIRP and Ruco Facilities indicated that past activities at each of the sites have resulted in the contamination of groundwater resources within the Upper Glacial aquifer and Magothy aquifer. Sampling demonstrated that the groundwater beneath the Site, specifically underlying the south eastern portion of the Site, and the Northrop and NWIRP sites, contains chemical constituents above the New York State (NYS) drinking water standards, NYS groundwater quality standards and EPA maximum contaminant levels (MCLs). The NYSDEC and EPA have determined that the primary groundwater contaminants of concern in the region of the three sites are volatile organic compounds (VOCs), primarily TCE, PCE and VCM. The secondary contaminants are SVOCs and inorganics and are associated with the three sites as noted below:

1) Hooker/Ruco: tentatively identified compounds referred to as TICs (including glycols and acids) and metals;

2) Northrop: inorganics including arsenic, cadmium, and chromium; and

3) NWIRP: SVOCs including: bis[2-ethylhexyl]phthalate, di-n-butylphthalate, di-n-octylphthalate, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, naphthalene, acenaphthylene, fluoranthene, benzo[b]fluoranthene, pyrene and TICs including polyaromatic hydrocarbons, substituted benzenes, alkanes, substituted phenols, and carboxylic acids; and inorganics including cadmium, chromium, and thallium.

The most prevalent VOCs and their corresponding maximum concentrations detected in the groundwater in the vicinity of the sites were TCE at a concentration of 58,000 parts per billion (ppb) at NWIRP (Figure 4.9 of Final Remedial Investigation Report, NWIRP, May 1992); 25,000 ppb at the Northrop facility; and 1100 ppb at the Site. The highest concentrations of PCE detected were 490 ppb at the Northrop site and 350 ppb at the Site. Similarly, the highest concentrations of VCM detected were 6,400 ppb at the Site in the area of monitoring well 52 (MW-52 area) and 550 ppb at Northrop. The highest concentrations of total SVOCs and VOC TICs detected at the Site were 4200 ppb and 493 ppb, respectively. Individual TICs concentrations ranging from 2 ppb to 800 ppb were detected in two of the wells located at the downgradient boundary of the Site. In addition, antimony and arsenic were detected at the Site at concentrations as high as 22 ppb and 83 ppb, respectively. Please refer to the Hooker/Ruco RI/FS Reports for OU-1(August 1992) and OU-3 (July 2000) and the Northrop RI/FS reports for a detailed evaluation of the analytical results obtained to date for the three sites. Based on the computer generated groundwater plume modeling maps developed as part of the Northrop RI Report (prepared by Geraghty and Miller (G&M) in 1994 and the report entitled "Regional Groundwater Feasibility Study," prepared by G&M in March 1998), VOC-impacted groundwater beneath and downgradient of each of the three sites is estimated to be approximately 12,100 feet long (along its north-south axis) 9,600 feet wide (along its east-west axis) and 580 feet deep (at its deepest point). The Northrop FS addresses this plume in detail. Similarly, using G&M's computer generated groundwater plume modelling (see Appendix A of Ruco FS, July 2000), the area of the VCM subplume is

estimated to be 2000 feet long (at its longest point), by 1350 feet wide (at its widest point), by 430 feet deep.

In general, the regional direction of shallow horizontal groundwater flow is to the south/southeast away from the sites. Because of the direction of groundwater flow, the fact that a total of 14 production wells at these sites have historically pumped as high as 12 to 14 million gallons a day and that recharge occurs at the Northrop and NWIRP sites, much of the VOC-impacted groundwater from all three sites has been drawn onto and/or beneath the Northrop and NWIRP sites. However, because the degree of hydraulic containment obtained from the production wells was not 100 percent, some of the VOC-impacted groundwater has migrated downgradient. In addition, available data indicate that several public supply wells from the Bethpage Water District have been affected by VOCs which are likely attributed to all three sites. These supply wells, however, have been equipped with VOC treatment units provided by Northrop and NWIRP. The water fed to these distribution systems continues to meet all New York State and Federal drinking water standards. Currently, there are no private drinking water supply wells in the residential areas surrounding the sites. A Nassau County ordinance permits obtaining drinking water only from a public supply source. The public water supply is obtained from the sole source groundwater aquifer.

SUMMARY OF SITE RISKS

Based upon the results of the RI at the Site, EPA conducted a baseline risk assessment to estimate the potential risks associated with current and future exposure to Site contaminants. Since this operable unit is focused on groundwater, the baseline assessment estimates the human health and ecological risk which could result from exposure to the contaminated groundwater at the Site, if no remedial actions were taken. The box entitled "What Is Risk and How Is It Calculated?" describes the four-step process used to calculate potential carcinogenic risks and noncarcinogenic human health effects for the Site.

Human Health Risk Assessment

The Hooker/Ruco Facility is currently zoned industrial with residential neighborhoods in close proximity. Currently, there are no known private drinking water wells on the Hooker/Ruco Facility or in the adjacent residential areas surrounding the Hooker/Ruco Facility. The future use of the Hooker/Ruco Facility was assumed to remain industrial. However, a resident was assumed to live at the downgradient property line and use the sole source aquifer as a water supply. Therefore, the baseline risk assessment focused on potential future health effects for both adults and children, in a residential setting, that could result from future exposure to groundwater via ingestion, inhalation, and dermal contact.

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 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 (COC) 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 identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to 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 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 effects, 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 effects.

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 non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime 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 non-cancer 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 non-cancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which non-cancer health effects are not expected to occur.

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The contaminants of concern in the groundwater at the Site include metals and VOCs such as vinyl chloride, tetrachloroethene, arsenic, antimony, and bis(2-ethylhexyl) phthalate. Of these chemicals, arsenic and VCM are classified as Class A carcinogens (known to cause cancer in humans).

For known or suspected carcinogens, EPA has established an acceptable cancer risk range of one- in-a-million (1×10^{-6}) to one-in-ten-thousand (1×10^{-4}). Action is generally warranted when excess lifetime cancer risk exceeds one-in-ten-thousand. In other words, for every 10,000 people that could be exposed, one extra cancer *may* occur as a result of exposure to site contaminants (i.e., one more person could develop cancer than would normally be expected from all other causes).

The results of the baseline risk assessment indicated that the current use of groundwater at the Site does not pose a risk to human health since no one uses the groundwater for domestic purposes. The future residential groundwater use scenario showed unacceptable risks to human health. Future groundwater ingestion exposures yielded carcinogenic risks to adults of 2.2×10^{-3} and 8.8×10^{-4} for children. The groundwater inhalation exposure to adult residents in the future use scenario results in a potential carcinogenic risk of 5.0×10^{-4}. Tables C-1 and C-2 of the Risk Assessment and Table 2.1 of the Ruco FS Report (July 2000) show that the majority of the carcinogenic risk (65 to 99 percent) can be attributed to potential exposure to VCM.

The groundwater risk calculations were prepared using the data set from the Hooker/Ruco OU-1 RI (August 1992) which revealed a maximum VCM concentration of 560 ug/l. More recent groundwater sampling has shown higher VCM concentrations with a maximum value of 6,400 ug/l. These higher VCM concentrations would produce carcinogenic risk estimates greater than those listed above.

In conclusion, EPA has determined that the preferred alternative or another active remedial alternative identified in this Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

Ecological Risks

The Hooker/Ruco Facility is fully developed as an industrial facility and is surrounded by industrial and residential properties. There are no natural surface water bodies, wetlands, or sensitive flora or fauna within the Site. The contaminants of concern are located in the groundwater starting at a depth of approximately 50 feet below ground surface. A screening evaluation of ecological risk was conducted as part of the RI. Therefore, EPA has determined that the contaminants of concern present at the Site poses no ecological risks.

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), site-specific risk-based levels and the most reasonably anticipated future land use for the site i.e., industrial/commercial use.

The following remedial action objectives were established for the Site:

1. Protect human health from exposure (via ingestion, inhalation, and dermal contact) to VCM, TCE, PCE and TICs in groundwater at concentrations in excess of New York State groundwater standards and Federal MCLs.

2. Restore the aquifer to meet New York State Groundwater Standards and New York State and Federal MCLs in a timely manner. If the aquifer cannot be restored to meet standards, then, minimize further migration of VCM, TCE, PCE and TICs to prevent adverse impact on downgradient public and private users.

Summary of Remedial Alternatives

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

The remedial approach for the contaminated groundwater originating from the Site is designed to primarily address the VCM subplume. This approach will provide supplemental treatment for the existing treatment system that is operated by Northrop as an IRM. EPA recognizes that this treatment system, as it is currently designed, would be unable to treat the VCM subplume without the system exceeding it air discharge limitations. The plume is comprised of commingled contamination originating from the Site and the Northrop and NWIRP sites. This treatment system is expected to require more than 30 years of operation to restore the aquifer to meet drinking water standards.

The remedial alternatives developed to address the VCM subplume at the Site are presented in detail below.

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The construction time for each alternative reflects only the time required to construct or implement the remedy and not the time required to design the remedy, negotiate its performance by the parties responsible for the contamination, or procure contracts for design and construction.

SUMMARY OF GROUNDWATER REMEDIATION ALTERNATIVES

ALTERNATIVE 1: NO-FURTHER ACTION

Capital Cost:	$0
Annual Monitoring Cost:	$6000
Construction Time:	N/A
30-Year Present Worth Monitoring Cost (7% discount factor):	$74,000

The Superfund program requires that the "No-Action" Alternative be considered as a baseline level to which other remedial technologies and alternatives can be compared.

The No-Further Action Alternative does not include any remedial measures to address the contamination at the Site. It is recognized, however, that the regional VOC plume is being addressed by the extraction and treatment of contaminated groundwater at the Northrop Facility which has been demonstrated to contain and prevent further migration of the regional plume.

Because this alternative would result in elevated concentrations of VCM contamination remaining at the Site above health-based levels, CERCLA requires that the remedy be reviewed every five years to evaluate groundwater conditions.

This alternative would include a long-term groundwater monitoring program. Under this monitoring program, groundwater samples would be collected and analyzed semi-annually.

The No-Further Action Alternative would also include the development and implementation of a public awareness and education program for the residents in the area surrounding the Site. This program would include the preparation and distribution of informational press releases and circulars and convening public meetings. These activities would serve to enhance the public's knowledge of the conditions at the Site.

ALTERNATIVE 2: VCM SUBPLUME EXTRACTION, TREATMENT AND DISCHARGE TO ACHIEVE GROUNDWATER ARARS

Capital Cost:	$ 4,195,000
Annual O&M Cost:	$ 722,000
Construction Time:	12-18 Months
Present worth cost (operating period of 30 years at a discount factor of 7%):	$13,200,000

Alternative 2 involves extraction and treatment of groundwater within the area of the VCM subplume with a goal of restoring the water quality of the aquifer to State drinking water standards or Federal MCLs. The State drinking water standard and EPA's MCL for VCM is 2 ppb. The treatment system would be built at the southwest corner of the Site. Conceptually, one extraction well would be placed approximately 500 feet downgradient of the MW-52 area (where current VCM concentrations exceed 1000 ppb) with two additional wells located 1000 feet downgradient of the MW-52 area (where current VCM concentrations range between 10 and 100 ppb). The exact locations of the extraction wells will be determined during remedial design. The three extraction wells were estimated to pump at a combined flow rate of 1000 gallons per minute. The effluent from the treatment system would be discharged to recharge basins on the Site. Based on the hydrogeologic modelling presented in Appendix A of the FS, it is projected that the VCM concentrations in the VCM subplume would be reduced to levels below the MCL of 2 ppb in approximately 30 years. By containing and treating the VCM within the VCM subplume, supplemental VCM treatment would not be required at the downgradient treatment system which Northrop and the U.S. Navy are operating as an IRM.

Alternative 2 recognizes that the regional VOC plume is captured by the groundwater extraction and treatment at the Northrop Facility which is preventing its further migration beyond the Northrop IRM. This system is expected to operate for the next 30 years. Alternative 2 also acknowledges the VOC removal treatment at the Bethpage Water District municipal wells.

A long-term sampling program would be developed to monitor groundwater quality in the area of the VCM subplume. New monitoring wells would be added to the existing network of monitoring wells to increase the network's area of coverage. The objective of the long-term monitoring program would be to evaluate the effectiveness of the groundwater extraction and treatment remedy and to detect if VCM is migrating southward beyond the VCM source control wells at concentrations which may require supplemental VCM treatment at the Northrop IRM.

If the long-term monitoring program identifies the migration of the VCM subplume farther southward of the Site beyond the VCM source control wells at concentrations which may require supplemental VCM treatment at the Northrop IRM, additional extraction and treatment wells at the Site may be required.

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ALTERNATIVE 3: IN SITU TREATMENT OF VCM SUBPLUME BY BIOREMEDIATION USING BIOSPARGING (PLUS SUPPLEMENTAL NUTRIENT ADDITION, IF DEEMED NECESSARY)

Capital cost:	$1,260,000
O&M costs (per year):	$319,000
Construction Time:	6-8 Months
Present worth cost for10 years of biosparging and 2 years of nutrient addition (using a discount factor of 7%):	$3,800,000

This alternative utilizes in-situ biosparging technology to treat the VCM subplume. Biosparging is a form of bioremediation and involves the introduction of air/oxygen into the aquifer to increase the dissolved oxygen content in the aquifer, which would enhance aerobic degradation of VCM. This alternative is designed to remove and reduce the concentration of VCM to a level whereby supplemental treatment for VCM at the groundwater extraction and treatment system at the Northrop IRM is not required. Aerobic conditions in the aquifer would result in an increased microbial population which would also enhance the degradation of TICs. Aerobic conditions would not typically enhance the degradation of TCE and PCE, therefore the effect of biosparging on TCE and PCE would be limited.

If deemed necessary, this alternative would also utilize a supplemental bioremediation technology following the biosparging treatment. Supplemental bioremediation would involve the injection of nutrients (potentially including nitrogen and phosphorus along with suitable carbon sources such as methane) to enhance the growth and metabolic activities of indigenous microbial populations to effect the degradation of VCM in the aquifer. The addition of nutrients to stimulate the microbial population would also enhance the degradation of TCE, PCE and TICs. It is estimated that the nutrient addition would occur over a two-year period to effectively enhance the degradation of the VOCs. The exact nutrient requirement is dependent on the presence of other constituents in groundwater, and would be determined by treatability studies.

Conceptually, twelve injection wells would be installed in the area of VCM subplume to a depth of 200 to 400 feet below ground water using common drilling techniques. Additives (air/oxygen, nutrients) could be forced into the formation using either static head within the well or using pump supplied pressure. Increasing or decreasing the number of air/oxygen and nutrient injection locations, and the rate of injection, would also affect the duration. Periodic injections (monthly, bimonthly, quarterly) are suitable for biosparging. The exact locations of the injection wells and the treatment scenario would be determined after conducting appropriate pilot studies during remedial design. Although in-situ biosparging has been used effectively at other sites, because it is considered an innovative technology, the performance criteria which would measure the effectiveness of this technology at the Site would also need to be developed during remedial design.

Similar to Alternative 2, to ensure that the regional groundwater plume is adequately addressed, Alternative 3 also relies on the ongoing and anticipated long-term operation of the groundwater extraction and treatment system at the Northrop facility and treatment at the Bethpage Water District wells.

Alternative 3 also would include the same long-term monitoring program described for Alternative 2. Similarly, Alternative 3 also acknowledges the possible need to expand the biosparging system to ensure that the Northrop treatment system will meet its air discharge limitations for vinyl chloride.

EVALUATION 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, and volume through treatment; short-term effectiveness; implementability; cost; and NYSDEC and community acceptance. The evaluation criteria are described below.

•Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

•Compliance with applicable or relevant and appropriate requirements (ARARs) 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.

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

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

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

•Cost includes estimated capital and operation and maintenance (O&M) costs, and net present worth costs.

•State acceptance indicates whether, based on its review of the RI/FS and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred remedy.

•Community acceptance would 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.

COMPARATIVE ANALYSIS OF GROUNDWATER REMEDIAL ALTERNATIVES

Overall Protection of Human Health and the Environment

Alternative 1, No Further Action, would be the least effective of the alternatives in protecting human health and the environment because no active remedial measures are included under this alternative. Furthermore, Alternative 1 would allow the VCM subplume to migrate to the treatment system at the Northrop facility which would cause this system to release unacceptable levels of vinyl chloride to the environment. Alternatives 2 and 3 would be protective of human health and the environment as these would remove a sufficient mass of contamination from the VCM subplume so that supplemental treatment for VCM at the Northrop IRM would not be required. Alternative 2 would be more protective than Alternative 3 because Alternative 2 would remove all VOCs to levels that would restore the aquifer to drinking-water quality in the area of the VCM subplume.

Compliance with ARARs

Alternatives 2 and 3, but not Alternative 1, would comply with chemical-specific ARARs, which consist primarily of Federal and State MCLs for groundwater. In time, Alternative 1 would result in the downgradient treatment system at the Northrop facility exceeding its permit limitations for vinyl chloride.

Alternative 2 would reduce the contaminant concentrations in the VCM subplume to achieve MCLs which are the regulatory requirements for the sole source aquifer under Long Island. The discharge of treated groundwater to recharge basins under Alternative 2 would also meet groundwater discharge standards. Both Alternatives 2 and 3 would reduce the concentration of the VCM subplume to the level that supplemental treatment for VCM at the Northrop IRM would be required. For a complete listing of ARARs, see Tables 3.1, 3.2 and 3.3. of the Hooker/Ruco FS (July 2000).

Long-Term Effectiveness and Permanence

Alternative 1 would not be effective in protecting human health and the environment. In fact, Alternative 1 would result in the downgradient treatment system at the Northrop Facility exceeding its permit limitations for VCM. Both Alternatives 2 and 3, would be effective over the long-term in protecting public health and the environment. Alternative 2, however, would be more protective than Alternative 3, because Alternative 2 is designed to remove all VOCs to levels that will restore the aquifer to drinking water quality in the area of VCM subplume. Also, because in-situ biosparging is an innovative technology, the performance criteria, which would measure the effectiveness of this technology at the Hooker/Ruco Facility, would also need to be developed during remedial design.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 would provide no additional reduction of toxicity, mobility or volume of the contaminants at the Site except as provided downgradient by the Northrop Facility's IRM. Alternative 2 would be most effective in reducing the toxicity, mobility and volume of all VOC contaminants, as this alternative would be designed to restore the aquifer to drinking water quality in the area of the VCM subplume. Alternative 3 would reduce the toxicity and mass of VCM and other VOCs and TICs through the introduction of air/oxygen, and possibly substrates and nutrients to promote aerobic in-situ bioremediation. Alternative 3 would reduce the VCM subplume to a level that supplemental treatment at the downgradient Northrop IRM would not be required in order to comply with air discharge limitations for VCM. Further, under Alternative 3, any residual contamination that would not be treated by biosparging or bioremediation would be captured and treated by the Northrop IRM.

Short-Term Effectiveness

Alterative 1 would not involve any remediation and therefore would not pose any short-term impacts to the site workers or the community. Over the long-term, however, site workers and the community would be at potential risk under Alternative 1 because of exposure to VCM at levels that are likely to exceed the air discharge limitations at the Northrop treatment system. Although Alternative 2 would have potential short-term impacts to the site workers during the construction of the groundwater extraction and

treatment system, these impacts would be minimized by following appropriate health and safety measures. Risks to operators of the treatment system would be minimized by following appropriate operation and maintenance procedures and adhering to personal safety measures. Under Alternative 2, catalytic oxidation would be used to treat the off-gas air stream from the treatment of the VCM in order to protect the on-site workers and the community. Because there would be fewer construction activities, Alternative 3 would pose less short-term risk to site workers than Alternative 2. Risks during installation of the air/oxygen delivery systems would be minimized by following appropriate health and safety measures. Risks to operators of the system would be similarly be minimized.

Implementability

Alternative 1 would be the easiest alternative to implement as it does not include any remedial measures. Alternative 2 would be readily implementable as it is a widely used and proven treatment technology. However, Alternative 2 would take longer to implement than Alternative 1 and 3, because it would require the construction of a groundwater extraction and treatment system. Alternative 3 would involve installation of a delivery system for providing air/oxygen (and also nutrients, if necessary) for the in-situ treatment of the VCM and would be easier to implement then Alternative 2 because Alternative 3 would have fewer construction activities.

Cost

The present-worth costs are calculated using a discount factor of five percent and a 30-year time interval for Alternative 2 and 12-year interval for Alternative 3. The estimated capital, operation, maintenance and monitoring (O&M) and present-worth costs for each of the alternatives are presented below:

Alt.	Capital Cost	Annual O&M Cost*	Present-Worth Cost
Alt-1	$0	$6000	$74,000
Alt-2	$4,195,000	$722,000	$13,200,000
Alt-3	$1,260,000	$319,000	$3,800,000

* Alternative 1 includes monitoring cost only.

As can be seen by the cost estimates, Alternative 1 would be the least costly alternative to implement. Alternative 2 would be the most costly alternative to implement. The high cost of implementing this alternative is due to the construction and long-term monitoring of a groundwater extraction and treatment system.

State Acceptance

NYSDEC concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD following review of the public comments received on the RI/FS reports and the Proposed Plan.

PREFERRED ALTERNATIVE

Based upon the results of the RI/ FS and other investigative reports and after careful evaluation of the various alternatives, EPA and NYSDEC recommend Alternative 3 - In-Situ Treatment of the VCM Subplume by Bioremediation using Biosparging (Plus Supplemental Nutrient Addition, if deemed necessary) as the preferred alternative. Alternative 3 would be a cost effective and reliable measure to address the VCM subplume contamination at a cost significantly less than Alternative 2. The in-situ method would remove a sufficient mass of the VCM that supplemental treatment of VCM at the downgradient treatment system at the Northrop Facility would not be required to ensure compliance with the air discharge for this treatment system. Because in-situ biosparging is an innovative technology, the performance criteria, which would measure the effectiveness of the technology at the Hooker/Ruco Facility, would need to be developed during the remedial design.

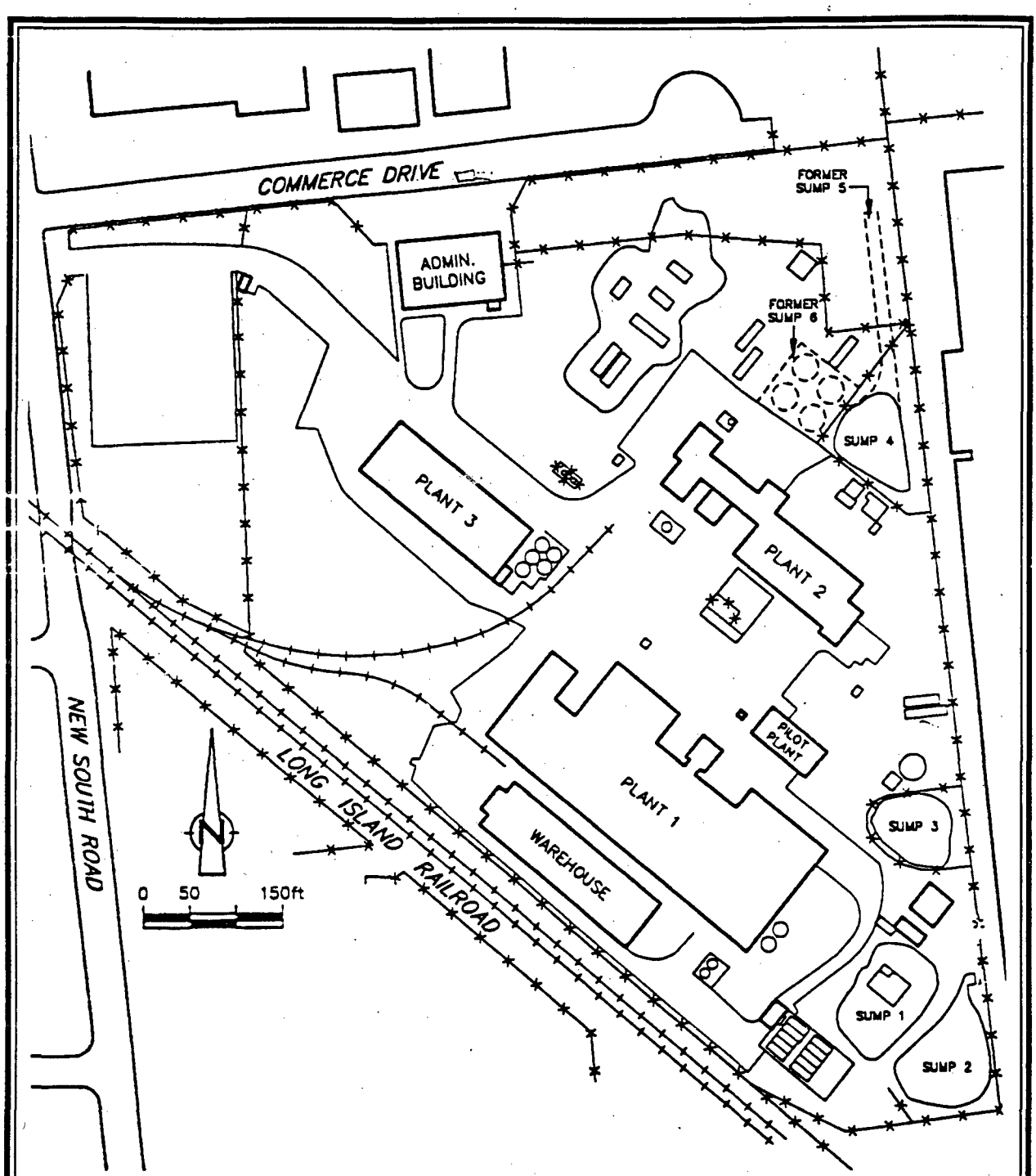
It is expected that the biosparging treatment would be required continued for approximately 10 years to reduce the toxicity of VCM to a level whereby supplemental treatment for VCM at the groundwater extraction and treatment system at the Northrop Facility is not required. If needed, the biosparging could be supplemented with nutrient addition for approximately two additional years to meet the remedial action objectives for a total operating period of 12 years. If it is determined that biosparging would not be effective in reducing the VCM concentrations in a reasonable time frame, then Alternative 2, VCM Subplume Extraction and Treatment, would be implemented as a contingency remedy.

Alternative 3 recognizes that the regional VOC plume is captured by the groundwater extraction and treatment at the Northrop facility and is expected to continue to prevent its further migration. This system is expected to operate for the next thirty years. Alternative 3 also acknowledges the ongoing treatment of the regional VOC plume at the Bethpage Water District municipal wells. If the IRM ceases operation before the aquifer is restored, EPA would re-evaluate the protectiveness of the proposed remedy.

The preferred alternative would provide the best balance of trade-offs among alternatives with respect to the evaluating criteria. EPA and NYSDEC believe that the Preferred Alternative would be protective of human health and the

environment, would comply with ARARs, would be cost-effective, and would utilize permanent solutions to the maximum extent practicable.

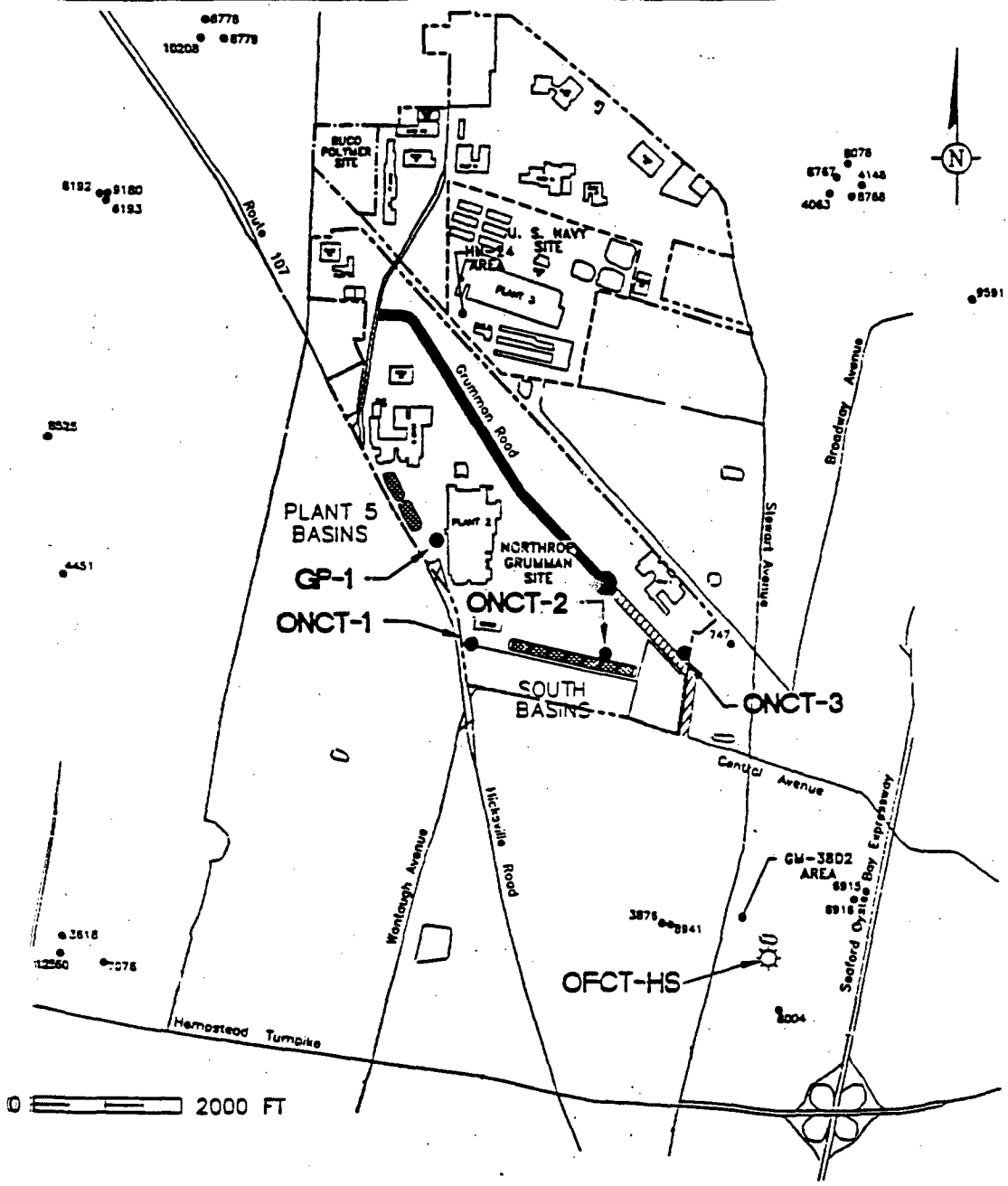
500151



HOOKER CHEMICAL/RUCO POLYMER SITE MAP

Figure 1

Modified from Conestoga-Rovers & Associates (11/99)



NORTHRUP/GRUMAN AEROSPACE CORPORATION AND NAVAL WEAPONS INDUSTRIAL RESERVE PLANT SITES

Figure 2

Modified from ARCADIS Geraghty & Miller

RESPONSIVENESS SUMMARY

Appendix B

Public Notice

The United States Environmental Protection Agency
Invites Public Comment on the
Proposed Remedial Alternative for the
HOOKER CHEMICAL/RUCO POLYMER SUPERFUND SITE
Hicksville, New York

The Hooker Chemical/Ruco Polymer Site (Ruco Facility) is an active chemical manufacturing facility comprising approximately 14 acres located in the Town of Hicksville, Nassau County, New York in a mixed industrial and residential area. The United States Environmental Protection Agency (EPA), in consultation with the New York State Department of Environmental Conservation, recently completed a Feasibility Study (FS) that evaluated cleanup alternatives to address contamination at the site. EPA has prepared a Proposed Plan that describes the remedial alternatives and identifies a preferred alternative with the rationale for that preference and is soliciting comments on all of the alternatives. A 30-day public comment period opens on Friday, July 28, 2000.

EPA's preferred alternative is designated as Alternative 3 in the Proposed Plan. This alternative involves the use of an innovative in-situ treatment technology (biosparging) to remediate a localized vinyl chloride monomer (VCM) plume of groundwater contamination which originated from the Ruco Facility.

The Remedial Investigation Report, Risk Assessment, FS, Proposed Plan, and other Site-related documents are contained in the information repositories established for the site, which are available for public review at the following locations:

Hicksville Public Library
169 Jerusalem Avenue
Hicksville, NY 11801
(516) 931-1417
Hours: Mon.-Thurs. 9 am - 9 pm
Fri. 9 am - 5 pm
Sat. 10 am - 5 pm

USEPA Region II
Superfund Records Center
290 Broadway, 18th Floor
(212) 637-637-4308
Hours: Mon.-Thurs. 9 am - 5 pm

EPA will hold a public meeting to discuss the Proposed Plan for the site on Tuesday, August 15, 2000, at 7:00 p.m. at the Oyster Bay Town Hall (Town Board Hearing Room), 54 Audrey Avenue, Oyster Bay, New York. During this meeting, EPA will further elaborate on the reasons for recommending the preferred remedy and public comments will be received.

EPA relies on public input to ensure that the selected remedy for each Superfund Site meets the needs and concerns of the local community. It is important to note that although EPA has identified a preferred alternative for the Ruco Facility, no final decision will be made until EPA has considered all public comments received during the public comment period. EPA will summarize these comments along with EPA's responses in a Responsiveness Summary, which will be included in the Administrative Record file as part of the Record of Decision.

Written comments and questions regarding the Hooker Chemical/Ruco Polymer Site, postmarked no later than August 28, 2000, may be sent to:

Syed Quadri, Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
Telephone: (212) 637-4233
Telefax: (212) 637-4284
Internet: quadri.syed @epamail.epa.gov

NEWSDAY, FRIDAY, JULY 28, 2000

ADVERTISEMENT ADVERTISEMENT ADVERTISEMENT

The United States Environmental Protection Agency
Invites Public Comment on the
Proposed Remedial Alternatives for the
HOOKER CHEMICAL/RUCO POLYMER SUPERFUND SITE
Hicksville, New York

The Hooker Chemical/Ruco Polymer Site (Ruco Facility) is an active chemical manufacturing facility comprising approximately 14 acres located in the Town of Hicksville, Nassau County, New York in a mixed industrial and residential area. The United States Environmental Protection Agency (EPA), in consultation with the New York State Department of Environmental Conservation, recently completed a Feasibility Study (FS) that evaluated cleanup alternatives to address contamination at the site. EPA has prepared a Proposed Plan that describes the remedial alternatives and identifies a preferred alternative with the rationale for that preference and is soliciting comments on all of the alternatives. a 30-day public comment period opens on Friday, July 28, 2000.

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Syed Quadri, Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
Telephone: (212) 637-4233
Telefax: (212) 637-4284
Internet: quadri.syed@epamail.gov

YD.70YH0280

EPA

The United States Environmental Protection Agency

HAS EXTENDED THE PUBLIC COMMENT PERIOD

FOR THE

PROPOSED CLEANUP PLAN for the HOOKER CHEMICAL/RUCO POLYMER FEDERAL SUPERFUND SITE

TO

SEPTEMBER 12, 2000

If you would like to submit written comments, please send them to Syed M. Quadri, Project Manager, New York Remediation Branch, US EPA, 290 Broadway, 20th Floor, New York, New York, 10007-1866. Copies of the proposed cleanup plan are available for review at the Hicksville Public Library, located at 169 Jerusalem Avenue. If you have any questions, please call Syed at (212) 637-4233.

500157

RESPONSIVENESS SUMMARY

Appendix C

August 15, 2000 Public Meeting Attendance Sheet

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

Hooker Chemical/ Ruco Polymer Superfund Site
Hicksville, New York

Done 8/16/00

Tuesday, August 15, 2000 @7:00PM
ATTENDESS

(Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING
✓ Dan Devine	4 Peter Rd	Hicksville	11801	5169337823	Self
John Armentano	572 Walt Whitman Road	Melville NY		631 427 5665	
Kevin Ryan	90 Conklin St	Farmingdale	11735		Ruco Polymer / Nelson, Pope & Voorhis
✓ Alicia Reilly	18 Murray Rd	Hicks.	11801	516 433-1820	Self
Raymond Manzo	183 Broadway Rm 310	Hicks	11801	5169383168	Assemblyman Marc Herbst
Steven Scharf	NYSDEC	50 Wolf Rd	Albany	(518) 457-3395	
Richard Pfaender	TOB	54 Audrey Ave	OB		Supervisor Venditto
Gregory Yatzyshyn	4 Byron Pl	Hicksville, NY			Self
Karen Zeeder	415 S. Broadway	N.Y			OMV
Councilwoman Bonnie Eisen	54 Audrey Ave	Oyster Bay NY	1177		
Matthew Russo	35 Banker Ln	Hicksville			TOB Engineering
William Gilday	NYSDOH	Flanigan Sq. Troy		(518) 402-7880	
Patrick P Sherbo Jr	95 Lee Ave	Hicksville NY		(516) 935-4533	Geise Park Civic President
Holly Bender	5 North St.	Syosset NY	11791		
Jim Kay					CRA

500159

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

Hooker Chemical/ Ruco Polymer Superfund Site
Hicksville, New York

Tuesday, August 15, 2000 @7:00PM
ATTENDESS

(Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING
✓ John & Elaine Simonelli	6 Power ST.	Hicksville		433-4247	
✓ Bill & Ruth Kennedy	21 Murray Rd.	Hicksville		938-5778	
Gary Miller/HZM	575 Broadhollow Rd	Melville NY	11747	(631) 756-8000	HZM
Dale Bennett	19 Schiller St.	Hicksville NY	11801	935-0845	North West Civic Assoc
Michael Lanbin	132 Fordi Ct	Mineola		Anton Newspapers 747-8282	
LINDA LANGONE	33 MAPLE ST	W. BABYLON		942-0223	NYS-DMV
Hattu Parish	STONY BROOK.			444-0241	NYS DEC
Jim Ray	50 Briar Lane	Basking Ridge NJ	07920	908 953-0336	Self
✓ Irmgard Tuechler	57 First St	Hicksville NY	11801	935-6163	self
JOAN COTMAN	M/S D08-001	BETHPAGE	NY	11714	
Anthony Maccagrone	✓ 54 Andrew Ave	Oyster Bay	11771	624-6618	Town Board
Stephen Whyte					Day

500160

RESPONSIVENESS SUMMARY

Appendix D

Letters Submitted During the Public Comment Period

GLENN SPRINGS HOLDINGS, INC.

2480 Fortune Drive, Suite 300 - Lexington, KY 40509

Steve Whyte
Project Manager

Telephone (859) 543-2151
Facsimile (859) 543-2171

August 25, 2000

Mr. Syed Quadri
Western New York Remediation Section
Emergency and Remedial Response Division
United States Environmental
Protection Agency, Region II
290 Broadway, 20th Floor
New York, NY 10007-1866

Dear Mr. Quadri:

Re: Proposed Remedial Action Plan (PRAP)
Hooker Chemical/Ruco Polymer Corporation Site
Hicksville, New York

Glenn Springs Holdings, Inc. (GSHI) has reviewed the Proposed Remedial Action Plan (PRAP) issued on July 28, 2000 for the Hooker Chemicals/Ruco Polymer Site (Hooker/Ruco Site) located in Hicksville, New York. Overall, the PRAP provides an accurate summary of the conditions at and in the vicinity of the Site and of the remedial action alternatives evaluated for the vinyl chloride monomer (VCM) subplume. GSHI agrees with the preferred remedy selected by the EPA and for which concurrence from the New York State Department of Environmental Conservation (NYSDEC) has been given.

GSHI has the following specific comments/suggestions regarding the PRAP.

1. Remedial Investigation Summary, Third Paragraph, Fourth Sentence

   This sentence reads "In addition, available data indicate that several public supply wells from the Bethpage Water District have been affected by VOCs which are likely attributed to all three sites".

   Chemicals from the Hooker/Ruco Site could not have impacted the Bethpage Water District public supply wells located downgradient of the Northrop site. The Hooker/Ruco chemicals have not even reached halfway to the location of the Northrop IRM extraction wells and these wells are located approximately halfway to the Bethpage Water District public supply wells. Consequently, the chemicals from the Hooker/Ruco Site are less than one quarter of the distance to the Bethpage Water District public supply wells.

This sentence could stop after "VOCs" and would still accurately describe the VOC presence without attributing responsibility, which is a matter to be resolved among the PRPs.

2. Remedial Investigation Summary

It is agreed that metals are present in the groundwater beneath the Site. Arsenic and manganese did exceed their to-be-considered (TBC) criteria in the groundwater samples collected for the OU-1 Predesign Investigation. However, their exceedences of the criteria were limited to only a few wells and at concentrations only slightly above their published health standard criteria. Arsenic was present at up to 3.3 times the standard and manganese was present at up to 4.1 times the standard. Consequently, the presence of two metals in a few wells does not make metals a contaminant of concern at the Hooker/Ruco Site, especially when compared to the organic chemicals present.

3. Summary of Site Risks, Human Health Risk Assessment, Third Paragraph

The future exposure scenario is highly unlikely to occur, considering that:

i) a Nassau County ordinance permits obtaining drinking water only from a public supply source; and
ii) the public supply sources are being monitored and treatment implemented as needed.

This highly unlikely future exposure scenario should be reiterated so that public concerns regarding the estimated future residential groundwater use scenario risks are put in perspective.

4. There are many references in the PRAP for Alternative 1 that state that the Northrop IRM will exceed its air discharge limitations. This statement is based on the results of computer simulations that result in only simulated exceedences. Because of the uncertainty associated with such simulated results, it is suggested that text such as "could potentially exceed its air discharge limitations without the addition of supplemental treatment capability" be used.

5. Alternative 3: In-Situ Treatment of VCM Subplume by Bioremediation Using Biosparging - First Paragraph, Last Sentence

The text states that aerobic degradation of TCE and PCE is limited. While this is true for PCE , it is not correct for TCE. TCE degradation does readily occur under aerobic conditions, although not as quickly as occurs under anaerobic conditions. This sentence should be revised to reflect the different aerobic degradation rates for these two compounds.

6a. Comparative Analysis of Groundwater Remedial Alternatives - Compliance with ARARs. Second Paragraph, Second Last Sentence

It is believed that "not" should be inserted between "would" and "be required".

6b. Cost - First Sentence

A discount factor of 5 percent is stated as being used for the estimated present worth costs shown in this section. This should be corrected to 7 percent to be consistent with the discount rate of 7 percent shown in the section entitled "Summary of Groundwater Remediation Alternatives".

7. Preferred Alternative

The PRAP identifies Alternative 2 (pump and treat to groundwater ARARs) as the contingency remedy if in-situ biosparging is not effective. It is possible that during the time period of operation of the in-situ biosparging remedy, existing treatment technologies may become more effective or new effective technologies may be developed. Thus, rather than limiting the contingency remedy to a pump and treat system to meet ARARs, it is suggested that the text be rewritten so that the treatment technologies then available be evaluated to select the potentially most effective remedy applicable to the conditions existing at that time.

Given the more recent acknowledgement of the value of natural attenuation, it is also believed that it may not be necessary to pump and treat down to concentrations that meet ARARs. Some monitored natural attenuation may also be included as part of the contingency remedy. Thus an alternative to the specified contingency remedy is to pump and treat to remove a sufficient mass of VCM such that supplemental VCM treatment of the air discharge from the Northrop IRM would not be needed. This would then be consistent with the level of remediation effort proposed for the preferred remedial alternative.

Should you have any questions on the above, please do not hesitate to contact me at (859) 543-2151 or e-mail at steve_whyte@oxy.com.

Sincerely yours,

James Kay for

Steve Whyte
Project Manager

KDS/cm/6883/44
Encl.

c.c.: K. Lynch (USEPA)
M. E. Wieder (USEPA)
S. Scharf (DEC)
D. Brown
J. Kay

August 27, 2000

U.S. Environmental Protection Agency
Region II
290 Broadway
New York, New York 10007-1866

Attention: Cecilia Echols
Community Relations Coordinator

Re: Hooker Chemical/Ruco Polymer Superfund site
Hicksville, Nassau County, New York

Gentlemen:

Thank you for sending me your literature regarding the above-referenced matter. After reading the literature, it is my opinion that Alternative 2 is the appropriate action to take.

Although Alternative 2 is the costliest option, it is also the most thorough and, therefore, it will be the best for our environment, a consideration that should have been given a lot more thought a long time ago. I feel we owe it to our future to make sure that the right thing is done now.

Thank you for this opportunity to voice my opinion. I hope that it will be given consideration.

Very truly yours,

ANDREA SMITH
29 Lawrence Street
Hicksville, New York
516 – 681 - 5647

500166

ARCADIS GERAGHTY&MILLER

ARCADIS Geraghty & Miller, Inc.
88 Duryea Road
Melville
New York 11747
Tel 631 249 7600
Fax 631 249 7610

ENVIRONMENTAL

Syed Quadri
USEPA
Project Manager
290 Broadway
New York, New York 10007

Melville,
28 August 2000

Contact:
Michael F. Wolfert

Extension:
(631) 391-5238

Dear Mr. Quadri:

ARCADIS Geraghty & Miller has reviewed the proposed groundwater PRAP for the Ruco site and on behalf of the Northrop Grumman Corporation offer the following comments:

1. Northrop Grumman Corporation (NGC) is opposed to any remedial approach that does not intercept and treat the Vinyl Chloride Monomer(VCM) subplume before it affects the downgradient NGC treatment plant.

2. The alternative remedy proposed, should biosparging be shown not to be effective, is pump and treat. If a pump and treat system is needed, it should be designed so that it does not interfere with the goals of the downgradient NGC pump and treat system.

3. Based on a review of the pre-design data collected by Conestoga Rover Associates (CRA), the subsurface environment at the Ruco site and immediately downgradient is anaerobic and reducing. Biosparging, by its very nature will disrupt the anaerobic and reducing environment that exists at and off-site (south and southeast) of the Ruco site. The subsurface environment upgradient of the Ruco source area is primarily oxidizing; downgradient of the impacted zone the natural environment reasserts itself with a transitional change to a somewhat oxidizing environment. The biosparging process proposed will disrupt the natural degradation of the source derived chlorinated compounds, i.e., trichloroethene (TCE) and tetrachloroethene (PCE). It is likely that where oxygen is supplied the anaerobic conditions will be disrupted. This will contribute to an increase in the flux of Ruco site-related PCE and TCE downgradient of the source area. Except for the TCE, PCE and dichloroethene (DCE) that is stripped during the biosparge process, there will be no additional remediation of these compounds via the biosparge system. Therefore, the NGC treatment system will have to treat these compounds from the Ruco property and the previously anaerobic off-site area. An evaluation must be made to assess the impact that the disruption of the anaerobic biodegradation zone and the resulting flux of TCE and PCE would have on the downgradient NGC treatment plant.

4. Biosparging downgradient of the source area – in the transitional and aerobic environments where VCM persists, but the aerobically degradable compounds, like ketones and alcohols, are depleted – should enhance the degradation of VCM.

5. The following practical issue concerning the application of biosparging must be addressed:

   - It will be necessary to sparge at extreme depth (greater than 350 feet bls in the downgradient area, where primarily VCM is present). This means that air will have to be forced at pressures in excess of 180 psi to overcome the head exerted by the approximately 320 feet of water column. Thus all the wellhead assemblies must be constructed in accordance with ASME code requirements for similar pressures. Flanges, fittings, and piping must be properly selected and designed for these conditions. This includes the pilot test wells and equipment, as well as the full-scale system components. Wellhead retrofits may be required at existing wellheads and proper health and safety precautions should be adhered to, particularly where public access cannot be controlled.

6. There are several process issues that are also critical and may, in fact, preclude the use of biosparging under the site conditions as follows:

   - Because of the high pressure at which the system must operate to successfully sparge to depths of 320 feet below the water table, the air is compressed when it is released into the groundwater. The pressure upon release will be on the order of 140 to 180 psi (i.e. 10 to 13 atm). At these pressures the actual airflow will be approximately 30 acfm. As the air rises and the pressure declines, the air volume will increase in inverse proportion to the ratio of the initial pressure to the changing pressure. This phenomenon will lead to a reduction in aquifer permeability and a "damming-effect" – a decrease in the velocity of groundwater flow - can result. The more air forced in – and by most standards the volumes proposed are high for biosparging – the greater the effect on the permeability.

   - Another impact is more subtle, but somewhat more disastrous. Because the air is released under 10 atm of pressure, the saturation concentration of oxygen in the water is more than 10 times that under atmospheric pressure or in excess of 150 mg/l. That is good if more dissolved oxygen is needed, but is bad for any bacteria trying to survive at depth in the formation. The high oxygen concentration will poison the bacterial population. This effect will be reduced as the air rises and the pressure drops to a point where the DO

can fall into a more reasonable range – less than 50 mg/l. This translates to a depth of less than 100 feet.

- When air is injected into the ground, it will rise along the path of least resistance to the water table. The geology at the site is heterogeneous due to its depositional history. As a result there are layers of variable permeability throughout the depth of the formation. This layering has some influence on groundwater flow, but has a much greater affect on airflow. This layering will lead to the preferential flow of the air along high permeability lenses horizontally. During pilot testing it is critical that the furthest monitoring wells be located at a minimum of 2 times the total injection depth to monitor this effect. In addition, the air can carry stripped VCM outward from the target groundwater zone, thus potentially spreading the VCM impacts both in the groundwater and in the vadose zone. Monitoring points should be included to track this effect and accurately define it.

- VCM is a very volatile organic compound. At the proposed rates of air injection stripping of the VCM from groundwater will occur and could represent the chief mechanism of mass removal. Monitoring points should be added to track this effect and accurately define it. In addition, lower airflow rates should be tested to try to minimize this effect, although it is likely that the effect cannot be eliminated completely.

- Finally, the rate of injection is higher than typical biosparge applications, which exacerbates all the effects described above. At a minimum lower rates should be tested and the proposed rate of 300 scfm should be seriously reconsidered.

7. The FS evaluation and cost projections summarized in the PRAP do not account for some of the issues described above. There are ways to overcome some of these issues (such as the use of blended gases -air plus nitrogen for example - to control the concentration of DO that can enter the groundwater) but at higher cost. Such considerations should be included in the cost comparison. At a minimum these issues and costs must be included in the pilot test program and in the subsequent data evaluation and full scale design and costing.

8. The PRAP includes a contingency for the addition of nitrogen and phosphorous to supplement the aerobic biodegradation of VCM in the groundwater. Given the fact that the groundwater is used for drinking water supplies in the area, the application of nutrients will require extensive permitting and monitoring.

9. The goal of the biosparge treatment system is to treat the VCM to a level that will ensure that there will be no need for supplemental treatment for VCM at the NGC treatment system. However, a VCM contingency plan should be developed to protect the NGC treatment plant from levels of untreated VCM that, if treated by the NGC plant, would result in exceedance of air discharge standards.

10. The PRAP recognizes that a portion of the chlorinated plume originating from the Ruco site is not addressed by the proposed remedy, but has been and continues to be treated by the NGC treatment system and the wellhead treatment systems provided for impacted public supply wells and funded by NGC and the Navy. It is clear that OCC should share the costs for these other treatment systems as well as the long-term O&M. Therefore, it is requested that the issue of cost recovery be addressed in the consent order to be issued to OCC for the RD/RA phase of the project.

If you have any questions please call us.

Sincerely,

ARCADIS Geraghty & Miller, Inc.

Carlo SanGiovanni
Project Manager

Michael F. Wolfert
Project Director

Copies:
John Colman – NGC
Larry Leskovjan – NGC
Steve Scharf - NYSDEC

TO THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

209 Broadway
New York, New York
10007-1866

EMERGENCY AND REMEDIAL RESPONSE DIVISION

NEW YORK REMEDIATION BRANCH

WESTERN NEW YORK REMEDIATION SECTION

To: Syed M. Quadri

Phone: 212-637-4233 Fax: 212-637-4284

Joseph Sadowski
30 Murray Road
Hicksville, New York 11801
516-935-4176

Rebecca Carley, MD
9 Sutherland Road
Hicksville, New York 11801
516-433-0774

As per the telephone conversation for the extension, for the comment period, this is set forth to the United States Environmental Protection Agency upon facts and request in which is found in the information set forth from the reports and meeting which should be

500171

complied with as asked for by proof of submission with exhibits paid for by the people.

ALPHA TO OMEGA

ALPHA

Feasibility studies were completed in August 1992 and August 1993, respectively, for the Hooker/Ruco Polymer Site.

At this time, why did the Board of Health neglect to place a warning around the area that the water may be contaminated if for no one else, at least the women that were pregnant?

In April 1994, Occidental Chemical Corporation initiated a program to investigate ground water conditions beyond the Ruco Property. The feasibility study was to address the off-site vinyl chloride monomer subplume in Bethpage Regional Aquifer (Operable Unit - 3).

EXHIBIT # 1 FIGURE A.3.4

VCM DISTRIBUTION IN THE VERY DEEP ZONE

This clearly shows the heavy concentration of contamination in our water supply

500172

and is clearly heading in a westerly direction, not as the D.E.C. states water moves from North to South.

EXHIBIT # 2 FIGURE 4.2

GENERALIZED REGIONAL HYDROGEOLOGIC SECTION THROUGH NASSAU COUNTY 0U-3 REMEDIAL INVESTIGATION HOOKER/RUCO SITE, HICKSVILLE, NEW YORK

This clearly shows the regional ground water divide with the approximate location of study area, with the investigating company leaving off the scale for measurement, one can only believe they are trying to hide from the public the distance between the two.

This clearly shows, to the North of the study area and the distance to the South of the REGIONAL GROUND WATER DIVIDE, the pollutants are entering the REGIONAL GROUND WATER DIVIDE, which in turn does enter the LLOYD AQUIFER by this example.

EXHIBIT #3 FIGURE H.2.8

UPDATED G & M CALIBRATED GROUND WATER FLOW MODEL

STEADY-STATE HYDRAULIC HEAD IN LAYER 7

500173

You will find that at this level when nature takes its course and rains, that being inside the study area the water would have to run into Hicksville water wells at Plant # 9 and at the water plant at # 4 Dean Street in Hicksville. As you can see, the elevation is the same as Plant # 9, and the plant at Dean Street which sits within the elevation of 66 on the exhibit with a lower elevation running into the public wells, therefore running into and around the casing which are placed into the ground for the supply of public water.

EXHIBIT # 4 FIGURE H.5.7

NORTHROP 1 RM STEADY - STATE HYDRAULIC HEAD IN LAYER 6 OF REFINED MODEL AND FIGURE 5.1 MID-1970'S TRICHLOROETHYLENE GROUNDWATER CONCENTRATIONS OU-3 REMEDIAL INVESTIGATION

These exhibits clearly show that **Hooker Rucco Chemical** and the **Navy facility** and **Grumman Corporation** exist above this level showing at Layer 6 two public water wells sit on this level with contaminants falling into the LLOYD AQUIFER by means of the quickest way of following the flow, which is following the casing that has been placed in by man, and breaching the natural protection of our LLOYD'S AQUIFER.

In 1994, Occidental Chemical Corporation initiated a program to investigate groundwater conditions beyond the Ruco Property to collect additional ground water data around and primarily west of the Hooker/Ruco Site to complete the RI, and to prepare a FS to address the off site vinyl chloride monomer.

This exhibit clearly shows misinformation. This is *just one of a few* misinformed exhibits shown to the public. You will notice town water wells on the top left corner of the page. This exhibit shows these wells on the East side of the railroad. They show they are on LILCO property.

You will also note that this exhibit does not even show the Levitown water well or tower.

EXHIBIT #6 FIGURE 4.5

POTENTIOMETRIC SURFACE ELEVATION OF THE MAGOTHY AQUIFER BETHPAGE - HICKSVILLE LEVITTOWN AREA, APRIL 1986

0U - 3 REMEDIAL INVESTIGATION

This exhibit clearly shows the public- supply well used for water. You will note

that the wells are on the West side of the railroad tracks for plant # 9 at Alicia Street.

This is marked yellow on the top left corner of the page.

EXHIBIT 7 FIGURE 5.11

GROUND WATER TRICHLOROETHYLENE CONCENTRATIONS OU - 3

REMEDIAL INVESTIGATION

This exhibit clearly shows that the test well M.W. 56 across from Hooker/Ruco Chemical at a stones throw across the railroad tracks is no where near the public wells.

EXHIBIT # 8 FIGURE H . 2 . 8

UPDATED G & M CALIBRATED GROUND WATER FLOW MODEL

STEADY - STATE HYDRAULIC HEAD IN LAYER 7 OU - 3

REMEDIAL INVESTIGATION

This exhibit clearly shows that plant # 9 is on the west side of the railroad which clearly shows conflicting evidence to a super fund commission which in turn shows that this report is *made up at will.*

If you please take note that Hooker/Ruco Chemical and the Navy and Grumman

Corporation are at the same plateau as the two water companies. This is marked in green, and runs from East to West without any doubt as to your report.

EXHIBIT 9 FIGURE 5.12

GROUND WATER TRICHLOROETHYLENE CONCENTRATIONS

SCHEMATIC OU - 3 REMEDIAL INVESTIGATION

This exhibit clearly shows in which the water flows and disagrees with the statement of the D . E . C .

The stream on Layer 3 clearly shows (in green) that the water is running to the North and/or shows a grate pool beginning in Layer 4. It is clear that this pool is heading to the North - NorthEast.

In Layer 5, it is clear that there is a vane and a pool and possibly a large pool or that pool is heading to the East, *not the South,* which is polluting the water in Levittown.

In layer 6, there is no doubt that there is a small pond shown. This is at a level of 380 feet to 495 feet.

EXHIBIT # 10 FIGURE 5 . 14

500177

GROUND WATER TETRACHLOROETHYLENE CONCENTRATIONS

SCHEMATIC OU - 3 REMEDIAL INVESTIGATION

If we please go to the Layer # 6 @ the 360 to 495 foot level, you will find the pond moving downward to Layer # 7. This is the 495 - 610 foot level, and you will see the pond is dropping off to the West and it is moving in a downward position.

Please go back to Exhibit # 2 Regional Ground Water Divide. You will notice at that level that the contamination has fallen into the LLOYD AQUIFER, **therefore contaminating all of Long Island's water supply.**

EXHIBIT # 11

HICKSVILLE WATER DISTRICT

4.6 MILLION DOLLARS TO BE PAID FOR AIR STRIPPING UNITS AND GENERAL REHABILITATION OF THE PLANT AND SITE , PLANT # 9

The public was asked to pay for air stripping units which had nothing to do with the natural course of the refining of the water. This so called air stripping unit was built to take contaminants out of the water, which in turn should have been paid for by

Hooker/Ruco Chemical, the Navy, and Grumman Corp; *instead of raising the price of water.*

EXHIBIT # 12

A LETTER FROM JANICE ZIEGELE OF LINDENHURST, NEW YORK

The concerns of the public. This person works in Farmingdale, just East of Grummans. This states: many females in the office became afflicted with cysts of the ovaries; all age groups and all races. **Coincidence?**

THEY WANT AN ANSWER! I HAVE IT! The water contaminants are traveling into the regional ground water divide as its location to the location of the study area of contaminants which is shown on Exhibit # 2.

EXHIBIT # 13

MINUTES BY FINK & CARNEY REPORTING PUBLIC MEETING FOR PROPOSED PLAN FOR THE HOOKER CHEMICAL/RUCO POLYMER SITE

OYSTER BAY TOWN HALL

AUGUST 15, 2000

Exhibit 13, pg. 58, starting from line 14 to line 19. Mr. Simonello: "So you're

saying from New (line 15) South over and out towards ---" line 16, Mr. Scharf: "It's approaching Hempstead Turnpike" , line 17: "in the deeper groundwater"

line 18: Mr. Lynch: "It's close to 600 feet deep."

Stephen Scharf is from New York State Department of Environmental Protection Agency. **Without a doubt, it has declared that the contaminants is approaching or in the Hempstead Turnpike area. This means that the gases are being released through the ground in residential areas** and has passed Grummans, the Navy, and Hooker/Chemical Ruco Polymer Site.

Then we have Mr. Kevin Lynch. He is the Chief of Western New York Remediation Section. On line 18 of page.58 of these minutes, **it is clearly admitted to the contaminants being in and around the 600 foot level.**

Exhibit # 2 clearly shows that at 600 feet or a well point pulling a liquid to be tested out of the well **is in the LLOYD'S AQUIFER.**

EXHIBIT # 14

MINUTES FROM TOWN HEARING, PAGE 59, LINE 14.

The Navy or Grumman and the Navy facility is operated by Grumman.

To set the record straight, **whereever the Navy is, it is a protected compound, a *federal* compound protected by Federal Police and are responsible for whatever happens upon it; *whether it's rented property or not.***

Starting back in the early 80's, the state approached Grumman to do something about the water cleanup. So, even though the contamination has been around the area for 20 years, **addressing the Grumman problem**, (as well as the Hooker Chemical/Ruco problem) **as a superfund *left no liability on the proper people*, such as the, Navy, Grumman, and Hooker Chemical.**

WHY DID THE FEDERAL GOVERNMENT PASS THE 6 YEARS ENVIRONMENTAL IMPACT STUDY TIME LIMIT?

WHY DID THE GOVERNMENT AND THE STATE ALLOW THE STATUTE OF LIMITATION TO RUN OUT ON GRUMMAN'S, AND HOOKER CHEMICAL/RUCO POLYMER?

WHY DID THE FEDERAL GOVERNMENT NOT TAKE ACTION WHEN IT WAS CLEAR THAT THE NAVY WAS IN A LARGE WAY RESPONSIBLE FOR THIS CONDITION?

WHY, WHEN AS PER THE CONSTITUTION OF THE UNITED STATES, WHEN THE ARMED FORCES CREATES DAMAGES TO THE PUBLIC IN PEACE TIME AND THE DAMAGES ARE TO BE CORRECTED AND COMPENSATION SHALL BE PAID TO EACH PERSON ON THE LEVEL OF DAMAGE WHICH WAS CREATED?

WHY SHOULD GRUMMAN AEROSPACE PROGRAM, WHICH BUILT EXPERIMENTAL AIRCRAFT FOR THE GOVERNMENT, THE ARMED FORCES, A BIDDER ON ALL, CONTRACT WITH BONDS THAT HAD TO BE PRODUCED BEFORE THE SIGNING OF EACH CONTRACT, (THEREFORE, A BUSINESS FOR THE GOVERNMENT), BE EXEMPT FROM LIABILITY, WITH THE BONDS IN PLACE FOR DAMAGES TO THE GOVERNMENT AND THE PEOPLE?

500182

WHY DID THE GOVERNMENT NOT PLACE A LEAN ON THE PROPERTY OF THE GRUMMAN AERO-SPACE PROPERTY?

WHY DID THE FEDERAL D . E . C . NOT SEIZE THE PROPERTY OF GRUMMAN AERO-SPACE PROPERTY FOR DAMAGES TO THE PEOPLE?

WHY DID THE FEDERAL GOVERNMENT ALLOW GRUMMAN AERO-SPACE TO CLOSE THEIR LARGE PLANT, PUTTING MANY PEOPLE OUT OF WORK; AND THEN ALLOW GRUMMAN TO SELL THE PROPERTY?

WHY DID THE FEDERAL GOVERNMENT NOT CALL IN ALL BONDS THAT WERE PUT UP BY GRUMMAN AERO-SPACE WHICH HAD A CLAUSE OF REPAIRING OR REPLACING DAMAGE TO ANY ONE, OR ALL PERSONS THAT WERE DAMAGED?

WHY DID THE DEPARTMENT OF HEALTH NOT PUT A WARNING TO THE PUBLIC THAT THERE WAS A PROBLEM WITH THE DRINKING WATER?

WHY DID THE DEPARTMENT OF HEALTH NOT PUT OUT A

WARNING WITH A LIST OF CHEMICALS TO THE PUBLIC THAT EACH OF THE CHEMICALS IN THE POLLUTED AREA CAUSES CANCER IN TEST ANIMALS ?

WHY DID THE DEPARTMENT OF HEALTH NOT INFORM PREGNANT WOMEN THAT THE WATER MAY BE A HAZARD TO THE WELL BEING OF THEIR FETUS?

EXHIBIT # 15

TRANSCRIPT OF D . E . C . MEETING, PAGE 6, LINE # 9

(Mr. Kevin M. Lynch, Chief, Western New York Remediation Section)

"We find a community with a heavily contaminated water supply , we can supply alternate water"

EXHIBIT # 16

TRANSCRIPT PAGE 7, MR. LYNCH, LINE 5

"In addition, we can have any of those people perform the studies and the clean-up, or what we can do is we go spend the money from the Superfund, and then we have the authorization to go after them to recover the money that we used to pay for it"

WHY DIDN'T THE D . E . C . START THE CLEAN UP AFTER THEY HAD KNOWLEDGE OF THE CONTAMINATION?

EXHIBIT # 17

TRANSCRIPT PAGE 9, LINE 5 TO 10, MR. LYNCH

"We then move into the feasibility study stage, and what the feasibility study is, it's a study of various alternative solutions to the site that we compare to one another and we use criteria that the regulations require us to look for to compare one site on the other."

The feasibility study was completed in 1993. **This being the case, why didn't the Board of Health, after seeing a hazard to the water supply, do NOTHING**?

WHY IS BIOSPARGING EVEN BEING CONSIDERED AS A SOLUTION, WHEN IT ONLY ADDRESSES *ONE* OF THE *MANY* CONTAMINANTS (i.e., VINYL CHLORIDE) *ALL OF WHICH CAUSE CANCER IN TEST ANIMALS?*

EXHIBIT # 18

EXECUTIVE SUMMARY # 1 INTRODUCTION LINE 2

"A remedial investigation (RI) and feasibility study (FS) **were completed in**

August 1992 and August 1993"

This clearly shows with your own information that a feasibility study was completed.

EXHIBIT # 19

MR. LYNCH, TRANSCRIPT PAGE 10, LINES # 5 TO 9

"We look at the long-term effect in this, we're looking for something that is going to work in the long-term, we don't just want to put a bandaid and walk away from it and have a problem crop up later."

As per exhibit 17 comments (supra), **WHY IS BIOSPARGING EVEN BEING CONSIDERED AS A SOLUTION, WHEN IT ONLY ADDRESSES *ONE* OF THE *MANY* CONTAMINANTS (i.e., VINYL CHLORIDE) *ALL OF WHICH CAUSE CANCER IN TEST ANIMALS?* WORSE YET, WHEN THE VINYL CHLORIDE CONTINUES TO MIGRATE IF THE BACTERIA DO NOT RECEIVE ENOUGH OXYGEN TO SUSTAIN THEM AS THEY METABOLIZE THE VINYL CHLORIDE ?**

500186

WHY WASN'T THE PUBLIC NOTIFIED THAT THE PROBLEM EXISTED, AND WHY DIDN'T THE B . O . H . NOTIFY ALL OF US TO PUT OUR *OWN* BANDAID ON THE WATER LINES COMING INTO THE HOMES OF THE PEOPLE UNTIL THE *ULTIMATE SOLUTION* WAS FOUND?

WHY DID IT TAKE AN ADDITIONAL 7 YEARS FOR THE D . E . C . TO COME UP WITH A PROPOSED PLAN?

WHY DIDNT THE B . O . H . ANNOUNCE TO THE PUBLIC, AT THE MEETING HELD ON AUGUST 15, 2000, THAT THERE IS A SERIOUS PROBLEM WITH THE WATER *ALL OVER LONG ISLAND (SINCE THE CONTAMINANTS HAVE REACHED THE LLOYD'S AQUIFER (SUPRA), AND THAT IT WILL TAKE 20-30 YEARS TO TREAT THE PROBLEM?*

WHY WASN'T THE PUBLIC INFORMED THAT IT IS *NOT* JUST THE *DRINKING* WATER THAT IS A PROBLEM; BUT ALSO THEIR *BATHING* WATER, SINCE AS MUCH IF NOT MORE OF THE CARCINOGENIC CONTAMINANTS ARE ENTERING THE BODIES OF LONG ISLANDERS

THROUGH THEIR PORES OPENED BY WARM WATER WHEN THEY BATHE AS ENTERS ORALLY VIA INGESTION OF THE WATER?

WHY WASN'T THE PUBLIC INFORMED THAT THERE IS A QUICK *FIX* (AS OPPOSED TO A *BANDAID)* AVAILABLE TO THEM VIA A COMPUTER WATER MONITORING FILTER INSTALLED AT THE INTAKE LEVEL INTO THE RESIDENCE; BETTER YET, WHEN SUCH A SYSTEM CAN BE PURCHASED FOR AS LITTLE AS $300/HOUSEHOLD?

EXHIBIT # 20

MR. SCHARF, LINE # 16 TO 25, THE TRANSCRIPT

"Its approaching Hempstead Turnpike in the deeper ground water"

WHY IS IT NOT SHOWN EXACTLY AS TO WHERE THE CONTAMINANTS HAVE ARRIVED AS THEY APPROACH HEMPSTEAD TURNPIKE?

WHY WERE THE RESIDENTS IN THE AREA NOT NOTIFIED THAT THERE IS A POTENTIAL GAS BEING RELEASED THROUGH THE

GROUND WHICH IS ODORLESS, AND CAUSES NERVE DAMAGE AND CANCER?

GAS POCKETS ARE ONLY "POCKETS" WHEN SURROUNDED BY A CLAY BASE MATERIAL, AND WILL BE RELEASED THROUGH THE GROUND WHERE THERE IS SAND AND GRAVEL!

AS WE *ALL KNOW*, LONG ISLAND IS SAND AND GRAVEL.

As per Mr. Lynch, "It's close to 600 feet deep"...

ACCORDING TO EXHIBIT # 2 OF THE RECORD, THIS LEVEL REACHED AT 600 FEET IS IN THE <u>LLOYD'S AQUIFER, WHICH COMMUNICATES WITH THE REST OF LONG ISLAND</u>!

MR. SIMONELLO, WHY HAS IT TAKEN 20 YEARS?

WE HEARD ABOUT THIS SAME PROBLEM IN THE HICKSVILLE PUBLIC LIBRARY APPROXIMATELY 18 YEARS AGO WHEN THIS WAS ALL DISCUSSED AND THE AREA WAS DESIGNATED AS A SUPERFUND SITE; WE WERE TOLD *NOT TO WORRY*. <u>WHY WERE WE TOLD NOT TO</u>

WORRY?

EXHIBIT # 21

TRANSCRIPT LINE 4 TO 25

(see exhibit # 21 for text)

Line 14- "and the Navy facility is operated by Grumman, has been pumping 14 million gallons of water a day"

The Grumman Corp. has been well aware that the ground water was contaminated mainly from their sources and some from other sources. And starting probably back in the early 70's, the State had approached Grumman to do something about this.

THIS CLEARLY SHOWS THAT THE PROBLEM EXISTED FOR OVER 30 YEARS. WHY DID THE D . O . H . ALLOW THE PUBLIC NOT TO KNOW THEIR RIGHT OF THE EXACT POLLUTION AND THAT IT WAS POSSIBLY NON-ODOROUS (AND THEREFORE UNDETECTABLE)?

EXHIBIT # 22

500190

TRANSCRIPT PAGE 61, LINES 5 TO 11

(SEE EXHIBIT FOR TEXT)

MR. SCHARF MAKES NO MISTAKE ABOUT IT, IT'S A PROBLEM!

EXHIBIT # 23

TRANSCRIPT MR. GILDAY, PAGE 62, LINE 8 TO 22

"If you could see what they're extracting through the carbon, actually able to extract T . C . E . out of the ground water to a tune of probably about one drum, a 55 gallon drum per week, maybe every other week, and that's about 95 % pure T . C . E . through the system they have"

WHY WEREN'T THE PEOPLE TOLD WHAT THEY ARE PUMPING INTO DRUMS TO THE TUNE OF 55 GALLONS/WEEK?

WHY WEREN'T THE PEOPLE TOLD THAT IF THEY ARE TAKING THAT MUCH OUT, THAT THERE HAS TO BE AN ENORMOUS AMOUNT UNDERGROUND, *SINCE THE ENTIRE LLOYD'S AQUIFER HAS BEEN CONTAMINATED?*

AS PER EXHIBIT # 19 (SUPRA), WHY WASN'T THE PUBLIC INFORMED THAT THERE IS A QUICK *FIX* (AS OPPOSED TO A *BANDAID)* AVAILABLE TO THEM VIA A COMPUTER WATER MONITORING FILTER INSTALLED AT THE INTAKE LEVEL INTO THE RESIDENCE; BETTER YET, WHEN SUCH A SYSTEM CAN BE PURCHASED FOR AS LITTLE AS $300/HOUSEHOLD?

Line 22: "Those areas had a lot of either perchlorethylene or trichlorethylene or even PCB's in there"

WHY WASN'T THE PUBLIC TOLD THAT ALL THESE CHEMICALS CAUSE CANCER?

EXHIBIT # 24

TRANSCRIPT MR. SCHARF, PAGE 64, LINES 3 TO 5

"1995, when we were dealing with one of the more contaminated PCB areas on the site, that was part of plant 3 that the Navy..."

THIS PROVES THAT THE NAVY HAS POLLUTED OUR GROUND

WATER!

EXHIBIT # 25

TRANSCRIPT PAGE 66, LINE 12 TO 17

"knowing that vinyl chloride, the main contaminant concerned, is a known carcinogen, is a paramount issue"

line 15: "that we don't ever want that material to be exposed, and it's for the protection of human health and the environment"

IN 1970, SCIENTISTS FOUND THAT INHALATION OF VINYL CHLORIDE BY RATS LED TO VASCULAR AND BONE CHANGES AND TO CANCER. IT HAS BEEN FOUND TO CAUSE CANCER OF THE LIVER IN HUMANS THAT CANNOT BE DIAGNOSED *UNTIL IT IS INCURABLE.*

WHY WERE HOMES ALLOWED TO BE BUILT ON THE RUNWAYS OF GRUMMAN (where transmission fluid containing PCB's has seeped into the ground) , WHEN ALL THESE CONTAMINANTS *WHICH DO NOT BREAK DOWN* WERE KNOWN TO BE BENEATH?

500193

EXHIBIT # 26

TRANSCRIPT MR. GILDAY , PAGE 75, LINE 4 TO 16

Mr. Gilday: "we'll go down as far as we need to until it is clean"

Line 7: Mr. Gilday: "in fact **we asked a number of people from Grumman** about that, if we have contamination and it's not found at that depth, we say go down deeper until you find the bottom of it"

THIS IS DANGEROUS, AS EACH TIME THEY BREAK THROUGH THE LLOYD'S AQUIFER, THEY CREATE A CONDITION OF MORE CONTAMINANT GOING INTO THE LLOYD'S AQUIFER

Line 15, Mr. Andriola: "and the wells are anywhere from 580 to 640 feet"

EXHIBIT # 2 CLEARLY SHOWS THAT THIS IS IN THE LLOYD'S AQUIFER

EXHIBIT # 27

TRANSCRIPT, PAGE 81, LINE 12 TO 16, MR. SIMONELLO

"I don't know if you can answer this question, but the U . S . Navy was supposed to

come down and clean up the site, the 108 acres of the Grumman property; whatever became of that?"

WHAT IS THE NAVY DOING ABOUT THE DESTRUCTION OF THE WATER SOURCE FOR ALL OF LONG ISLAND FOR WHICH THEY ARE LARGELY RESPONSIBLE?

EXHIBIT # 28

TRANSCRIPT, PAGE 83, LINES 10 TO 12

"There will be residuals, perhaps it will be 20 feet down, it will be 10 feet down, it may be on the surface"

THE SAME WAY GOLD WORKS ITS WAY TO THE SURFACE AS IT IS LIGHTER, GASES WORK THEIR WAY TO THE SURFACE; AND CHEMICAL COMPOUNDS , AS THEY ARE BROKEN UP, SOME WILL WORK THEIR WAY TO THE SURFACE.

EXHIBIT # 29

TRANSCRIPT, MR. SCHARF, PG. 84, LINES 11 TO 13

"But again, these are questions really that we should hold off to the Navy public meeting that's coming up."

WHY SHOULD MORE AND MORE PEOPLE GET SICK WHILE WAITING FOR THE NAVY TO DECIDE IF SOMEONE ELSE IS GOING TO CLEAN UP THE AQUIFER? WHEN, IN FACT, IT IS THEIR *OBLIGATION AND RESPONSIBILITY* AS PER THE CONSTITUTION OF THE UNITED STATES TO STOP THE POLLUTION WHICH WAS CREATED BY THE FEDERAL GOVERNMENT. AS EACH DAY GOES BY, MORE AND MORE PEOPLE GET SICK.

EXHIBIT # 30

PAGE 86, TRANSCRIPT, LINE 4 TO 25

This refers to the collection of chemicals in carbon then *burned* with the end results of the burnt materials and gases going out the smoke stacks and then causes a fallout, THE POLLUTION FROM WHICH OBVIOUSLY GETS ADDED INTO THE GROUNDWATER AS WELL AFTER RAINFALL CAUSES ITS SEEPAGE

INTO THE GROUND.

EXHIBIT # 31

TRANSCRIPT, PAGE 97, LINE 3

"There were **two dates shown on the mailing**. This would be August 15 and 16, 2000".

ANY MEETING OF THE FEDERAL GOVERNMENT MUST SHOW THE DATE OF WHICH THE MEETING IS GOING TO BE HELD.

WAS THIS DONE CORRECTLY, AND, IF NOT, SHOULD ANOTHER MEETING BE SCHEDULED AS A REMEDY?

WORSE YET, WAS THIS DONE *INTENTIONALLY* TO CAUSE A DECREASED ATTENDANCE AT THE MEETING?

***I*, MR. SADOWSKI *AM* THE CHAIRMAN OF A CORPORATION ; AND, AS SUCH, WOULD HAVE TO RESCHEDULE SUCH A MEETING.**

NEITHER* D . E . C . NOR D . E . P . *WOULD ALLOW THIS TO HAPPEN;

WORSE YET, I, JOSEPH SADOWSKI, WAS ASKED *NOT TO ASK ANY MORE*

TECHNICAL QUESTIONS UNTIL THE END OF THE MEETING.. WHY?

EXHIBIT 32

INVESTIGATION REPORT 5.4

PESTICIDES/PCB'S

NO PESTICIDES (SEE SECTION 3 . 4 . 1) WERE COLLECTED IN THE GROUND WATER FROM WELLS M . W . 50 AND M . W . 53. THEREFORE, PESTICIDES WERE NOT REQUIRED TO BE COLLECTED AND ANALYZED FOR *ANY FUTURE B . R . P . GROUND WATER SAMPLES.*

SINCE IT IS A KNOWN FACT THAT:

1 - MOST LONG ISLANDERS FOR *YEARS* HAVE USED PESTICIDES AND FERTILIZERS ON THEIR LAWNS AND GARDENS, (ESPECIALLY WHEN THE ISLAND WAS COVERED WITH FARMS);

#2 - WE ARE ALSO SPRAYED WITH PESTICIDES FOR ALLEGED MICROORGANISMS IN OUR ENVIRONMENT (FOR EXAMPLE, WEST NILE VIRUS, WHICH IS KNOWN TO BE EXPERIMENTED ON IN ANOTHER

FEDERALLY FUNDED ENTITY; i.e., *PLUM ISLAND)*;

#3 - BREAST CANCER IN PARTICULAR IS SPECIFICALLY CAUSED BY PESTICIDES, WHICH ARE STORED IN FATTY TISSUE (OF WHICH THE BREAST IS LARGELY COMPOSED) ;

#4 - LONG ISLAND HAS ONE OF THE HIGHEST BREAST CANCER RATES *ON THE PLANET; AND HAS ALSO DRAMATICALLY INCREASED IN THE NUMBER OF ESTROGEN RECEPTOR POSITIVE BREAST CANCERS;*

5 - RESEARCHERS VERA GO, JOAN GAREY, MARY WOLFF AND BEATRIZ POGO FROM THE MOUNT SINAI SCHOOL OF MEDICINE HAVE LOOKED AT FOUR INSECTICIDES FROM THE SYNTHETIC PYRETHROID FAMILY (SUMITHI, FENVALERATE, ALLETHRIN AND PERMETHRIN), AND FOUND THAT *BOTH PROLIFERATION OF BREAST CANCER CELLS, AS WELL AS ACTIVITY OF A GENE CALLED pS2 (WHOSE* ACTIVITY IS DIRECTLY PROMOTED BY ESTROGEN) WERE INCREASED;

SINCE THE SPECIFIC INCREASE IN BREAST CANCER IS OBVIOUSLY DUE TO PESTICIDE USE ON LONG ISLAND SEEPING INTO THE LLOYD'S AQUIFER, WATER FROM WHICH BATHES THE BREASTS OF ALL WOMEN ON LONG ISLAND ; HOW COULD A NON-FINDING OF PESTICIDES IN THE GROUND WATER BE BE*LIE*VABLE?

EXHIBIT 33

4 PAGES; COMMENTS OF JIMMY (HUSBAND OF MARGARET) FLEMING AT A MEETING FOR HOOKER CHEMICAL PUBLISHED IN THE HICKSVILLE ILLUSTRATED NEWS

Published concerns of the Flemings regarding the water have caused them to purchase, at their *own expense*, bottled water ever since the September 16, 1993, meeting discussed in the enclosed article. Such purchase of bottled water, however, has not

prevented exposure to toxins through the pores of their skin, as is also true for EVERY OTHER LIVING CREATURE ON LONG ISLAND. **Mr. And Mrs. Fleming started to purchase said bottled water due to their belief that the situation was not going to be handled properly. HAS THE FEDERAL GOVERNMENT PROPERLY HANDLED THE INVESTIGATION AND CLEAN-UP OF THE CARCINOGENS NOW CONTAMINATING THE WATER SUPPLY OF THE ENTIRE ISLAND WHICH WAS CAUSED BY FEDERAL ENTITIES?**

THE DUE PROCESS OF LAW AND EQUAL PROTECTION OF THE LAW CLAUSES OF FEDERAL AND STATE CONSTITUTIONS PROTECTS THE RIGHTS ALONE, AND HAVE NO REFERENCE TO THE MERE CONCESSIONS OR MERE PRIVILEDGES WHICH MAY BE BESTOWED OR WITHHELD BY THE STATE OR A MUNICIPALITY AT WILL. (BUNN V. City of Atlanta, 19 S.E. 2 d, 553, 554, 67 Ga. App. 147.)

EXHIBIT # 34

TRANSCRIPT, PAGE 99, LINE 6

"MR. SADOWSKI: I HAVE ONE OTHER COMMENT. I STATED TO YOU THAT THE INFORMATION IS OFF, THE EVIDENCE IS CONFLICTING INSIDE; AND *ACCORDING TO RULE 9 OF THE FEDERAL COURT OF PROCEDURE, I HAVE TO NOTIFY YOU OF THAT AT THIS HEARING BECAUSE YOU THEN THEREFORE HAVE TO FOLLOW [THE RULES OF CIVIL PROCEDURE OF THE FEDERAL COURT AT THIS TIME]..*

CLOSING STATEMENT OF DR. REBECCA CARLEY

EACH AND EVERY ONE OF THE CONTAMINATING CHEMICALS IN OUR WATER SUPPLY HAVE BEEN SHOWN IN LABORATORY EXPERIMENTS TO BE CARCINOGENIC TO ANIMALS.

THE SUGGESTED REMEDIES ARE INEFFECTIVE AT BEST, AND BYPASS AN OBVIOUSLY MORE EFFECTIVE AND ECONOMICAL SOLUTION AT THE LEVEL OF THE INDIVIDUAL HOMEOWNER (i.e., the computerized water filters at the intake level of the water into each home).

THERE ARE "NO PESTICIDES" FOUND IN THE SAMPLES, EVEN THOUGH THE EPIDEMIC OF BREAST CANCER IN LONG ISLAND *ITSELF PROVES THAT SAID PESTICIDES ARE IN THE WATER.*

LAST BUT NOT LEAST, (AS PER EXHIBIT 26), THE *TESTING ITSELF BEING DONE AT THE HANDS OF THE FEDERAL GOVERNMENT IS ACTUALLY WORSENING THE CONTAMINATION OF THE LLOYD'S AQUIFER WITH CARCINOGENIC CHEMICALS THAT ARE NOW BEING DISTRIBUTED IN THE WATER OF THE ENTIRE ISLAND VIA LLOYD'S AQUIFER.*

OMEGA

IN SERVICE TO THE TRUTH TO THE PEOPLE,

JOSEPH SADOWSKI
30 MURRAY ROAD
HICKSVILLE, NEW YORK 11801
516-935-4176

REBECCA CARLEY, MD
9 SUTHERLAND ROAD
HICKSVILLE, NEW YORK 11801
516-433-0774

RESPONSIVENESS SUMMARY

Appendix E

Transcript of The August 15, 2000 Public Meeting
For
The Hooker Chemical/Ruco Polymer Site Proposed Plan

PUBLIC MEETING
FOR THE PROPOSED PLAN FOR
THE HOOKER CHEMICAL/RUCO POLYMER SITE

Oyster Bay Town Hall
Audrey Avenue, Oyster Bay, New York 11771
August 15, 2000
7:00 p.m.

Fink & Carney Reporting
24 West 40th Street
New York, N.Y. 10018
(212) 869-1500

Fink & Carney Reporting and Video Services
(800) NYC-FINK FAX # 212-869-3063

Appearances:

Kevin M. Lynch, Chief, Western New York Remediation Section

Cecilia R. Echols, Community Involvement Coordinator

William Gilday, New York State DOH

Stephen Scharf, New York State DEC

Kent S. Sorenson, Jr., Project Engineer

Marla Wieder, Esq., EPA Assistant Regional Counsel

Fink & Carney Reporting and Video Services
(800) NYC-FINK FAX # 212-869-3063

MS. ECHOLS: Good evening. We're ready to start.

My name is Cecilia Echols, and I'm with the U.S. Environmental Protection Agency and I'm the Community Relations Coordinator for the Hooker Chemical/Ruco Polymer site located in Hicksville.

On our agenda today I'll be your moderator, and we have Kevin Lynch, he is the Chief of the Western New York Remediation Section; we also have Marla Wieder, she's the Assistant Regonal Counsel; we have Kent Sorenson with Integrated Earch Sciences; Steve Sharf and Walter Parish with D.E.C.

The purpose of the meeting today is to discuss EPA's alternatives for the groundwater clean-up at the site. The community relations program is a program where we have the decision making process from you all, and we bring you all into helping us clean-up the site, so we like to hear back and forth from you during different stages of the clean-up of this site.

We have an information depository, if you're looking for any information pertaining to

Fink & Carney Reporting and Video Services
(800) NYC-FINK FAX # 212-869-3063

this site you can always go to the Hicksville Public Library.

Once we receive all comments here at the meeting or in writing, there will be a response summary developed, and then, hopefully, a record of decision will be signed by the regonal administrator.

We have a stenographer here, at the end of Kevin's presentation we will open up for question, and please state your name clearly so he can get it accurate for the record.

I hope everyone signed in so I can add you to the mailing list and give you an update on what's happening at the site.

MR. LYNCH: As Cecelia said, my name is Kevin Lynch, I'm one of the section chiefs at the Superfund branch in New York City. What I will do is give a quick synopsis of the law, the Superfund law we work under, a history of how it came about, a quick runthrough of our regulations require us to address the site, then a summary of the proposed plan, a summary of what we found out at the site, and run through the alternatives we've looked at, to the remedial

alternatives to remedy the situation, and then we'll present the final alternative and look for your comments on it.

In 1979 a number of environmental disasters occurred, the best of which is Love Canal, where people found that they were on an abandoned hazardous waste site. Another one you may be familiar with was the chemical control site in Elizabeth, New Jersey, which was supposed to be a hazardous waste incinerator, but they never burned anything, they just collected drums from people, took the money, they collected tens of thousands of drums that did catch fire one night.

The Federal Government discovered this time that they had no way to address environmental disasters; the Love Canal was addressed was through a presidential declaration just similar to a declaration of disaster for a hurricane. So in 1980 congress passed the Comprehensive Environmental Response Compensation and Liability Act, the acronym is CERCLA.

And what this act did, it gave us authority to take actions at hazardous waste

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2 sites in environmental emergencies, it let us
3 take actions in two different ways. One, it let
4 us take an emergency response action, this would
5 be an action to take where, if something was on
6 fire, we could pay to put it out, if we discover
7 a warehouse full of drums that is a fire hazard,
8 we can clean that warehouse out of drums, when
9 we find a community with a heavily contaminated
10 water supply we can supply alternate water.
11 They've created a way for pay for this,
12 they created, at that time it was a 1.6 billion
13 dollar fund, which was called the Superfund,
14 which is what the law is commonly called, the
15 Superfund Law. That's a lot of money, but there
16 were a lot more sites out there than anybody
17 thought there were, so the money doesn't go that
18 far to clean up these site.
19 The law also gave us another way to
20 approach it, to have someone else pay for the
21 site, and that's how they get what is called the
22 potentially responsible party pay for that. And
23 that can be the people who either owned or
24 operated the site, it can be the generator of
25 the hazardous substances that are causing the

1
2 problem at the site, or it can be the trans-
3 porter who brought those hazardous substances to
4 the site.
5 In addition, we can have any of those
6 people perform the studies and the cleanups, or
7 what we can do is we can go spend the money
8 from the Superfund, and then we have the
9 authorization to go after them to recover the
10 money that we used to pay for it.
11 Besides these emergency removal sites, we
12 have the authority to do what we call a remedial
13 site. What this is, these are for the bigger,
14 long term clean-ups, looking for a more
15 permanent clean-up. When the site is
16 discovered, most of the sites that we get are
17 referred to us by the state. We do what's
18 called a preliminary assessment and a site
19 investigation, which is gathering the
20 information that already exists on the site, the
21 state usually has a lot of information as to why
22 they think the site is a problem; the site
23 investigation, we can go out and take samples of
24 the waste, of the hazardous substances to try to
25 determine what's out there. We also get

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information as in where the closest water supply it, what the population is; this all goes into a mathematical formula and it comes out with a number. If it gets above a certain number it goes on the National Priorities List, the national priorities list is trying to arrange the sites so that we would address the worst sites first, if it goes below that number it goes back to the states, and the states usually handle it, New York State handles it with the state Superfund.

Once it gets on the National Priorities List and we can spend Superfund monies to clean up the site, we then do what we call a remedial investigation and a feasibility study. The remedial investigation is a study where we go out, take samples of the soil, take samples in the surrounding community and on the site, take samples of any waste or hazardous substance on the site, we also put in monitoring wells to measure what's in the groundwater and to find out where the groundwater is moving.

What we're looking for is we're looking for what's on the site, where is it going and

what problems is it causing, what are the potential problems it can cause if it hasn't caused them yet.

We then move into the feasibility study stage, and what the feasibility study is, it's a study of various alternative solutions to the site that we compare to one another and we use criteria that the regulations require us to look for to compare one site on the other.

There are nine criteria, the first one is overall protection of human health and the environment; we are not allowed to select a remedy that doesn't protect human health. Compliance with ARARs is the second, and ARAR is an applicable or relevant and appropriate standard of regulation. What this means is there are regulations out there that you have to follow that are directly applicable to whatever you are doing. For instance, if you're discharging water there are water regulations that you have to follow.

We obviously have to follow those, but this make us go one step further. If there are regulations that would make sense that we do

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2 follow, but since this doesn't fit in the exact
3 nitch that the law was written for, we still
4 have to follow them.
5 We look at the long-term effect in this,
6 we're looking for something that is going to
7 work in the long-term, we don't just want to put
8 a bandaid and walk away from it and have a
9 problem crop up later. We look for the
10 reduction of toxicity, mobility or volume at the
11 site by treatment. We also look at the short
12 term affect, and what we look at there is we
13 want to make sure that what we do doesn't cause
14 a bigger problem in the short time while we're
15 trying to solve a long term problem. An example
16 of this is you don't want to do things, like dig
17 things up and expose the population to it that
18 could cause problems because you dug it up that
19 didn't exist if you treated it some other way.
20 Implementability. It has to be something
21 we can do. It sounds like a great idea, but if
22 you can't go out there and do it it's not going
23 to work. We look at cost, we look for the state
24 acceptance and we also look for community
25 acceptance.

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How we determine if we have community acceptance is the process we're going through today. We take the information, we put it into a proposed plan, we propose that proposed plan, hold a public meeting and look for input from the public. That input is both in the form of comments that you will give us today and also in written comments.

The proposed plan is in the back, if you don't have a copy you should get one, and in the proposed plan is the address and the name of the person you should be sending written comments to, and we encourage you to send those comments.

The Hooker/Ruco site is a 14 acre site in Hicksville. It is bordered on New South Road and the railroad, immediately to the east of it is another hazardous waste site, the Grumman site. It didn't come out that well in the slide, but it is the largest site outlined in the green, and the Site Number 3 here is the Navy site, which is another hazardous waste site. Neither of these sites are National Priority List sites, they are being addressed under the state authority, under the State

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2 Superfund. We are coordinating our actions with
3 them, but the site we are here to talk about is
4 the Ruco Site.
5 The facility began operations in 1945,
6 and they continued in operation, what they do is
7 they manufacture resins and polymers, basically
8 raw material that others take and make plastics
9 and a lot of other consumer items from. It's
10 been operating, as I say, since 1945. When it
11 commenced operation, and up until the '70s, it
12 disposed of its waste through various sumps on
13 the site. Since 1975, however, all of the waste
14 from the site has either been treated on the
15 site or shipped offsite for treatment and
16 disposal.
17 The site was placed on the National
18 Priorities List in 1986. In 1988 the Occidental
19 Chemical Corporation, which is the former owner
20 and operator of the site, agreed to do the
21 remedial investigation feasibility studies at
22 the site.
23 The remedial investigation found a number
24 of things. The first thing it found was an area
25 of PCV contamination around the pilot plants and

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2 around sump 3. These are elevated levels of
3 PCVs we felt were hazardous to the workers in
4 the plant; the plant is totally fenced and not
5 accessible to the public, so we didn't think it
6 was a public problem, but it was a problem that
7 we addressed by doing a feasibility study on
8 this specific problem.
9 What we will do on most of our sites is
10 we will break them up into what we call operable
11 units, we'll go out and design a study to find
12 out what's at the site, but when we find things
13 out, and if it's something that we can split out
14 and take an action on, we like to do that of
15 waiting for the entire, for everything to be
16 known about the site, because that can and does
17 take years. We did that in this site, we did a
18 focus feasibility study we at a public meeting,
19 we made a decision to excavate the PCB
20 contaminated soil, dispose of it offsite, there
21 are some 3,200 tons of contaminated soil were
22 disposed of in a TOSCA regulated landfill and
23 about 800 tons were incinerated, 800 tons of the
24 most highly concentrated PCVs.
25 We also found other areas of contamina-

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2 tion, soil contamination at the site. We found
3 in an area where drums with formerly disposed of
4 there was some residual contamination, in an
5 area close to sump 3 there was also another area
6 of contamination, and in sumps 1 and sumps 2
7 there was soil contamination, the first two were
8 near the surface, and the sumps, they were much
9 deeper. The contamination here is a solvent
10 contamination, it consists mostly of tetra or
11 perchlorethylene and trichlorethelene and a
12 number of other volatile organics and semi-
13 volatile organics are in there.
14 What was also found, though, which is
15 more significant, is that there was significant
16 groundwater contamination that has moved off the
17 site. The chemicals that we'll be talking
18 about, we found various chemicals out there, but
19 the three big actors that are out there are
20 vinyl chloride or VCMs, vinyl chloride monomer,
21 perchlorethylene and trichlorethylene.
22 The reason why these are the three
23 biggest actors at the site is the perchlor-
24 ethylene and the trichlorethylene is mostly what
25 the contamination is, there's more of that than

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anything else that's out there; we found some other chemicals that we'll be addressing as we address these, but these are the ones we're following the most.

The perchlorethylene and the trichlorethylene, as I said, because it's the most out there, the vinylchloride is also significant because it's very toxic and you have to handle it differently than you do the perchlorethylene and the trichlorethylene.

The contamination has moved off the site-- I don't know how well you can see it in this slide-- the Hooker/Ruco is up in this other corner here, the other sites are around it. This is trichlorethylene in the groundwater and where it was in 1999. This is a compilation of the data from all three sites wherever it was found.

When the groundwater moves off the Ruco site, while Grumman was operating they were taking a lot of water out of the aquifer for their production, they were averaging more than 6,000 gallons per minute, and that had a big influence on all of the groundwater around it.

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When the groundwater would move off the site it would tend to be pulled over to Grumman, where it would mix with the contamination from the Grumman and Navy site, and there's trichlor-ethlene and perchlorethlene, once it mixes up like that, you don't know who's contamination is who's, so it's just one big regonal problem.

The general groundwater flow in the area is to the south. So if there's no one out there pumping, anything you put into the aquifer should be moving down. The pumping in the Grumman only accentuated that from the Ruco site, it pulled it down and more to the south.

We had made a decision, we slid off the site into another operable unit, we had made a decision to address the soil contamination and some of the groundwater contamination, the soil contamination by excavating those two surface areas, the deeper sump contamination we were going do address by flushing water through that and collecting it on wells that we were going to put in right at the edge of the Ruco property; this is to prevent anymore contamination from leaving Ruco and to collect that groundwater

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2 that we're going to put in to clean the things
3 out of the lower sumps.
4 What we also needed at that time was more
5 information, moving to the west of Ruco, as to
6 where the contamination was. As I said, we
7 expected that it would move south and move to
8 the east, but we had not defined a clean line to
9 the west of the site. So we also went out to
10 the west of the Ruco site an put in another
11 series of monitoring wells to make sure that the
12 theory was right and things weren't moving off
13 to the western direction.
14 As we were doing that, the state came to
15 us and had some suggestions how we could better
16 coordinate the studies at the two sites. At
17 that time they were discussing with Grumman the
18 installation of what they call an interim
19 remedial measure. This is a measure that's
20 designed to go out and prevent the problem from
21 getting any worse, hopefully make the problem
22 better. What they were discussing is putting in
23 a series of wells, or actually they're existing
24 wells, but pumping these existing wells, there's
25 well GP-1, there's CNCT-1, 2 and 3, and pumping

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2 them and treating that groundwater so to prevent
3 anymore migration of contamination from the
4 Grumman site, it what this will do and what it
5 is actually doing, it is in place and working
6 now, and it is preventing any of the
7 contamination from all three sites from moving
8 south down through the aquifer.
9 The Ruco site presented a problem with
10 this, though, is that Ruco does have a-- this is
11 contamination that's coming out, the chemicals
12 the vinylchloride that I mentioned before acts
13 differently than the perchlorethylene and the
14 trichlorethylene. Again, this scale is tough to
15 see this, but the Ruco site is here and the
16 small green area is a plume that contains vinyl-
17 chloride. As I say, most of the contamination,
18 you can't tell one from the other, but this is a
19 plume that comes out of vinylchloride that you
20 can attribute to Ruco alone. It hasn't moved as
21 far off the site because of the properties and
22 because of how it reacts in the environment, but
23 the problem it does present is that it cannot be
24 treated the same way as you treat the perchlor-
25 ethylene and the tetrachlorethylene.

The treatment that is used in the IRM is water is collected in the four wells, it is then sent to a treatment system where the treatment used is air stripping. The water comes to the surface where you pass water, an air stream through the water, and what happens is the chemicals volatize into air from the water, you then collect the air in a carbon treatment unit, the chemicals cling to the carbon, the air comes out clean, the water comes out clean, and you dispose of or regenerate the carbon.

The problem with vinylchloride is that it doesn't adhere to the carbon the way the tetrachlorethylene and perchlorethylene does, so that if the vinylchloride migrates down to these wells and into that system, it would go through the system without being treated and would be exposed to the air and discharge to the air above standards, and this would create an unhealhy situation. So what we decided to do about this is that we decided since basically the problem on all three sites has mixed together, is that the EPAs feasibility study will concentrate on that vinylchloride plume,

and remediating that problem where the state's feasibility study will look at the bigger picture of the plume that has extended down the entire length of the site.

We've looked at a number of different alternatives for the vinylchloride plume. One of the things that we have to look for through the regulations is a no action alternative. We have to look and see what happens if we don't do anything out there, are things going to get any worse? Well, we've looked at this, and as we said before, we know that this isn't protective because it's a vinylchloride, when it gets down to these wells it will create an unacceptable risk. What it also, then, has us do is compare all of the other alternatives, this is the baseline of what happens if you do nothing, and you look at other alternatives where you do take an action.

The first alternative we looked at was a pump and treat alternative. The technology is similar to the IRM that's operation now. The vinylchloride is depicted by these irregular circles, what they are in different depths of

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2 the aquifer. We would put one into the most
3 concentrated area and two wells at the leading
4 edge of the plume. We'd pump those wells to
5 contain the plume and collect the contamination,
6 pipe it back up to the Ruco facility where we
7 would build a treatment plant, we would use a
8 different treatment system, and it would be one
9 that would burn off the vinylchloride so it
10 wasn't put out into the air; the air discharge
11 and the water discharge would meet all
12 applicable standards. And this would also, we
13 wouldn't just be cleaning up the vinylchloride
14 with this, we would be cleaning up any
15 contamination that would be in this area, in
16 this small area. It would still need this IRM
17 to operate to take care of the rest of the
18 problem.
19 In order to clean up the vinylchloride to
20 drinking water standards, which are the
21 standards that we use for the water in the
22 aquifer, the idea of anything we do here is
23 we're trying to restore that aquifer to drinking
24 water quality, and to do that we calculated that
25 we will have operate this system for 30 years

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2 and it would cost some 13 million dollars to do
3 so.
4 The other alternative we're looking at is
5 a bioremediation alternative, and what the
6 bioremediation is is taking advantage of
7 nature's ability to clean itself, and we look
8 out there and see what can we do to help it.
9 There's a natural process of breakdown in
10 chemicals when they get in the environment, this
11 is the chain of tetra of perchlorethylene, what
12 it would, if it goes through its whole process,
13 breakdown to. What we've done is gone out into
14 the vinylchloride plume and measured what's out
15 there to try to determine is this happening?
16 Well, since there have been perchlorethylene and
17 trichlorethylene, vinylchloride and to some
18 extent the dischlorals, you really can't tell
19 one is coming into the other because there's so
20 much out there.
21 One thing we have seen, though, is that a
22 ethene and ethane out there, but it wasn't
23 discharged out there, so we believe the vinyl-
24 chloride is breaking down. And how this
25 breaksdown, it's a natural process, but the

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2 process is done in the presence of oxygen.
3 Basically there's a bacteria that will digest
4 the vinylchloride, but they need air to breathe
5 in order to work, so they are breaking it down
6 some, but they're also using the air that's in
7 the formation, when the air is gone, the oxygen
8 is gone, well, it stops working and the
9 vinylchloride continues to migrate.
10 The technology that we looked at is
11 something called biosparging, and what that is
12 is that you replace that air that is lost. The
13 points in the plume now are wells, but what they
14 are they are injection wells. The idea is that
15 you place wells into the area that has the
16 vinylchloride and you inject air to replace the
17 oxygen that's being digested by the micro-
18 organisims. You go out and do this in steps,
19 you do a pilot study first, you put in a series
20 of wells, three to six wells, and you vary the
21 amount of air you put in until you can measure
22 what kind of an effect you have, how many wells
23 you have to put in, how far can you push that
24 air. You also, though, have to be careful that
25 you don't put too much air in, because what you

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2 don't want to do is rush air through this and
3 work like an airstripper that can take the
4 vinylchloride out of the water and then put it
5 up into the soil gas and thus into the
6 atmosphere. So you go out there and study on a
7 small scale to find out what's the best
8 parameters, you design the full scale study and
9 you operate it.
10 And this, though, only addresses the
11 vinylchloride, the TC, PCE that's in this plume
12 also, then, would rely on the IRM to full
13 remediation. In order to remediate the vinyl-
14 chloride so that it will not get down to these
15 wells in a level that would cause a problem, we
16 think it would take 10 to 12 years, and this
17 would cost about three and a half million
18 dollars.
19 We've taken those alternatives and once
20 again gone gone through those nine criteria that
21 we talked about before. And when we've gone
22 through those criteria we've come up with a
23 proposed plan, a suggested alternative that we
24 believe should be selected for the site, and
25 that is the air sparging alternative. When you

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2 look at both alternatives they both are
3 protective of human health and the environment.
4 One thing that I neglected to mention, I
5 forgot to mention when I told you about the
6 state's IRM, that was the second IRM that was
7 done at this site. Earlier, what they did, the
8 Navy and Grumman, through the state did, is they
9 made available treatment to the Bethpage wells
10 that were downgrading from the site to make sure
11 that no one would be drinking contaminated water
12 from the Bethpage wells, some of the deep plume
13 has reached some of those wells, but all the
14 wells do have treatment on them.
15 So currently the risks that are out there
16 are all potential risks because no one is
17 drinking contaminated groundwater. But as the
18 overall protection of human health in the
19 environmental, both the air sparging and the put
20 and treat are equally protective, they rely, a
21 lot of it, though, on the IRMs that are out
22 there, also. The compliance with ARARs, they
23 are both designed to meet all air emission
24 standards, all water discharge standards and
25 eventually they're designed to clean up the

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2 aquifer to drinking water standards. The
3 long-term effectiveness and permanence-- for
4 anything to be long-time out there, it's things
5 are going to have to be operating and pumping
6 and controlling that plume somewhat for 30
7 years. So in that they're both pretty much
8 equal on both of those.
9 The reduction in toxicity, mobility of
10 volume through treament. Well, they both reduce
11 the toxicity through treatment. The biosparging
12 will be reducing the toxicity of the
13 vinylchloride by the bioremediation, the pump
14 and treat, though, does reduce the toxicity of
15 more chemicals since it treats everything in
16 that plume of vinylchloride, not just the vinyl-
17 chlorides.
18 The short term effectiveness, we think
19 this air sparging has an advantage in the short
20 term effectiveness as you're not bringing
21 anything up to the surface to treat it; what
22 you're doing is you're treating it down in the
23 subsurface where no one is being exposed to it.
24 The pump and treat alternatives bring the water
25 with the contamination up to the surface.

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2 Although we don't think it's a real big risk,
3 pump and treat systems are out there and have
4 been used for years and they're operated very
5 safely.
6 Implementability, it's actually easier to
7 go out in the field and put in the biosparging
8 unit, it takes less equipment, you bring
9 equipment right to the area where you're going
10 to be doing biosparging, the wells are easier to
11 put in, they're smaller wells. The pump and
12 treat system, you have to put in the wells and
13 then you have to put in the associated piping to
14 bring it up to the facility, and you also have
15 to build a treatment plant. So the biosparging
16 can be installed quicker, and it's a little bit
17 easier to implement; it is a little trickier,
18 though, to operate, because as I said, you have
19 to continually monitor it to make sure that you
20 are putting enough air in so that the system is
21 working as it's supposed to, but you're not
22 putting too much air in that you're blowing the
23 vinylchloride up to the service.
24 Both of these remedies include
25 monitoring. Either remedy that we would choose

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we would install monitoring wells, downgrading that vinylchloride plume for a couple of reasons, one is to make sure it's working. They're both designed to stop the vinylchloride plume from migrating down to those others wells, the monitoring wells that were put in will measure the air so we know we're not being successful, and the other thing it does, it gives an early warning to those wells downgradient, where if these don't work the the vinylchloride continues to migrate to those wells, well then you can put treatment systems on those wells before the vinylchloride is brought up to the service and put out into the air.

The cost, the biosparging has a big advantage in cost, it costs 3-1/2 million dollars versus 13 million dollars for that treat remedy.

But getting back to the implementability of it. The biosparging is an inovative technology, this isn't something that's been around and being used for a long time, it's being used more and more in sites around the

country, people are finding out that this works and that it's effective. But in the region, we don't have one yet, but we have completed it and walked away and said we have been successful.

So what we're recommending is that we choose the bioremediation, but there's a contingency in our remedy, and what that congingency is is that we would go out and design the remedy, implement the remedy and then monitor it very closely, and if the vinyl-chloride does not stop the drop as designed in a pretty short timeframe, we would then go right ahead and put in that pump and treat technology.

So it's something where normally if we would pick a remedy and it doesn't work, we would then have to go back through the system and go to the proposed plan together, look at the-- do a feasibility study and a public meeting. In this what we would say is we're going to do it, we believe that this will work, but if it doesn't we won't hesitate to go to pump treat.

The state acceptance, the state has concurred with our approach, especially the

contingency approach, they think it's the right way do do this, they think it's a good mix with us taking care of the vinylchloride, with the biosparging while they address the larger plume. They also like the idea, though, of a contingency that if this doesn't work we can get out there more quickly than we normally would in order to put another remedy in.

And the community acceptance is what we're looking for today, we're looking for your comments, for your questions, as I said, both comments here at the meeting and written comments will come in. There is a depository that Cecilia mentioned in the Hicksville Library that if you want to know in more detail the studies that have been made and look at those studies and have comments on those, we would also encourage you to do that.

At this point I would like to open the floor to any comments or questions.

MR. SIDOWSKI: My name is Joe Sidowski.

On your figures, which would be your Exhibit Number 1, if you go to 4.2, you come up with Regional Ground Water Division. Do you

have 1 up there?

MR. LYNCH: Is this from the proposed plan?

MR. SIDOWSKI: Yes. I got all of them.

MR. LYNCH: Okay.

Which figure are you referring to?

MR. SIDOWSKI: On the bottom you have the plan GNWA001, July 21, 2000, that would be the numbers on the page. Figure 4.2.

Where I'm going here is regonal groundwater divide.

Now, we have the approximate location of the study area. Now, the approximate location of the study area where we have contamination is about a mile away from this regonal groundwater is divide. Now the regonal groundwater divide would be in area where there is no obstruction and water would go down to the Lloyd quarry, that's the main quarry, this is above bedrock.

Now, you have in here papers that contradict one after another; I don't know if you've gone over these page by page.

MR. LYNCH: I have actually.

MR. SIDOWSKI: I've been studying this

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for the last week.

If you put up on your screen, you will find drawings number 1 to show the public that GNWA002, July 21, 2000.

MS. ECHOLS: Excuse me, sir. What are your reading from?

MR. SIDOWSKI: What am I reading from? Your book.

MR. LYNCH: There's a number of things that are out there.

MR. SIDOWSKI: We have--

MR. LYNCH: This is not the proposed plan we brought today.

I do know the figure you're talking about in the regional groundwater divide, but it's not in the proposed plan that we sent out this time.

MR. SIDOWSKI: Operable Unit 3, we got Hooker Chemical Ruco In Hicksville. It's the big book.

MR. LYNCH: Okay.

MR. SIDOWSKI: We can go to the small book now.

MR. LYNCH: Because the regonal ground water divide is the area where, in Long Island,

1
2 the groundwater when the ran falls, it either
3 runs to the ocean or to the sound.
4 MR. SIDOWSKI: Right.
5 MR. LYNCH: And that is in here to show
6 where this is in relation to the regional flow.
7 That's why we believe that the flow in this area
8 should be to the south, to the ocean.
9 MR. SIDOWSKI: Should be.
10 MR. LYNCH: Yes.
11 MR. SIDOWSKI: We have contaminates.
12 According to this report, running to the west,
13 according to the report, at different levels; at
14 200 foot levels, at 250 foot levels, each one
15 keeps changing.
16 Now, if you go over to drawing number 1,
17 again GNWA002, you will find on one if your test
18 wells, N5390, if you get to that.
19 MR. SCHARF: If I could interject for a
20 second.
21 I'm Steve Scharf, New York State DEC.
22 One of the problems with the site is that
23 there are three different sites rolled into one,
24 and there are monitoring wells that are
25 installed by the Navy, monitoring wells

installed by Northrup Grumman, monitoring wells installed by Occidental, and there are different reports and different samples at different times, sometimes it can get very confusing. I think the N wells are Nassau County wells, those are associated with wells that are put in by the county to monitor the groundwater.

MR. SIDOWSKI: Then we're dealing with an N well here, then?

MR. SCHARF: Right; that N well.

Now, you mentioned something about some figures showing the groundwater moving east-west, others north-south, others showing the contamination moving down. I think one of the things that Kevin had mentioned is that over the last decade, as the Grumman facility shut down, they changed the rate at which they were extractin groundwater. Back in, let's say they had full production in 1990, they were pumping out, what was the rate, about 6,000 gallons a minute, and what happened is a lot of the contamination, rather than moving the normal flow, was moving either directly down or moving to the east, towards the Navy facility, and that

ended up drawing some of the vinylchloride onto the Navy property and Grumman property. That's where you may be getting confused--

MR. SIDOWSKI: No, I'm not getting confused, you didn't hear where I'm going yet.

MR. SCHARF: You're right, I shouldn't say "confused."

MR. SIDOWSKI: I'm using that particular well right now as reference.

That particular well, going down to the 150 foot mark, 135 foot mark, you have dense clay, and that runs down from 35 to 45 feet. Now, this is at a peak, this is at the east side of the Hooker site, and right in the middle of the Hooker site you have the drain line, the movement line where your water goes down.

MR. LYNCH: Actually no, that isn't in the middle of the Hooker site, that is to the north of the Hooker site.

MR. SIDOWSKI: It's right here; that's why I said put it up and you'll see.

MR. LYNCH: I don't have an overhead of everything.

MR. SIDOWSKI: Anyway, that's running

1
2 back towards our plant over on Murray Road; now
3 that is only one quarter of a mile away from
4 this particular site. I know, I live on Murrray
5 Road.
6 All through this book you find where,
7 whoever did the report, you will find that plant
8 number 9, Elisia Street, is on the west side of
9 the railroad. According to the information in
10 this book we have plant number 9 sitting east of
11 the railroad. This is just one incident.
12 When dense clay is involved, and, of
13 course, we all know water runs like a root to
14 find it's easiest path, and it won't move. You
15 can drill holes all day long and not find it,
16 but then you'll find it. When you get into one
17 of these roots, one of these pools, you'll be
18 able to test, and when you test you'll be able
19 to get levels.
20 Now, going into a time when we have heavy
21 rain, okay, the contaminants can only spread,
22 because you have a 35 foot dense clay backup
23 from the top of that underground river going
24 north or upward; right? That would mean that
25 all that water can only run back to the north,

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1
2 over the lip and come back down towards the
3 centerline. This is the very threatening study,
4 I enjoyed it.
5 MR. LYNCH: I think you're misinterpret-
6 ing the data that is in the study, though.
7 MR. SIDOWSKI: That is what?
8 MR. LYNCH: I think you are misinterpret-
9 ing the data that is in this study.
10 MR. SIDOWSKI: According to a couple of
11 people, we've been been sitting down and reading
12 these thinks, we have the site here, you have
13 the site map on your next page here of all of
14 Long Island, Figure 4.3.
15 MR. LYNCH: It's very hard for me to
16 follow--
17 MR. SIDOWSKI: You are here to fix the
18 problem that we have, and we have a problem with
19 contaminated water in our main quarry; okay,
20 because of this own report here that clearly
21 shows regonal groundwater division, our polluted
22 problem is right next to it, and that's the only
23 place where the water can actually go straight
24 down, start to divide, or then therefore divide.
25 If we are then at that place, on that hill, and

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it starts to run and starts to wash back the other way, we have all of Hicksville, upper Hicksville, all west of Hicksville, and it's all east of the railroad coming down on the backside of Bethpage. This is all in your report, and it's not misinterpretation.

MR. LYNCH: That is not what's in the report.

MR. SIDOWSKI: Okay. We can go--

MR. LYNCH: You're looking at data on here and you're interpreting it in a different way than than our geologist interpreted it, and without looking at the exact figures you're talking about, I really can't can't comment on this.

MR. SIDOWSKI: We have groundwater-- okay, if you go to page 514, this is your site. See this page right here. It shows it in levels. We got 5.14.

MR. LYNCH: Okay.

MR. SIDOWSKI: We've got seven levels that drop off of water, and water pools in veins. As you get down to the last level, number 7, you have on the west side, you have it

falling down into the quarry. Why? Because we're near the centerline.

I dig wells.

MR. LYNCH: I'm not a geologist, and I would like a geologist to interpret this, but this does not show that the contamination is going to--

MR. SIDOWSKI: You see that little circle there on the left side?

MR. LYNCH: Yes.

MR. SIDOWSKI: It says model layer 7. It has 495 feet to 610 feet. See the little circle right at the bottom? That shows a pool, the outside of a pool. And that pool is going west. As this water is dropping you can actually see the water falling down towards the west.

MR. LYNCH: Actually what this is, this isn't necessarily a pool. What these lines that are on this thing are contour lines. What you do is you look at the different points that you get, the spots that are there are wells, and what you try to do is interpret, you look at how much, what the level is in that spot, that blue line is the contour of, I think it's a 10 part

1
2 per billion contour of tetrachlorethylene, and
3 what you do is you take all of the information
4 that's out there and you try to make sense of it
5 to see where things are moving and where it's
6 gotten.
7 MR. SIDOWSKI: And that shows where it's
8 traveling. That would mean that the water is
9 traveling that way.
10 MR. LYNCH: You also look at the water
11 levels and see which way water is traveling, and
12 at this area of the site the water is not
13 traveling to the north, it is traveliong to the
14 south.
15 MR. SIDOWSKI: If you go back to the
16 original chart that I sent you, it shows you
17 exactly where the water is traveling on here;
18 you have to pull that out right here.
19 MR. LYNCH: What was that one, again?
20 MR. SIDOWSKI: Okay. WA002, and that's
21 drawing number 1, that's the big drawing; that
22 would be in the back of the book, folded.
23 MR. SCHARF: I think that what you need
24 to do is look at the overall hydrogeology of
25 Long Island. In general the clay lens that you

are talking about were various deposits over the glaciation period over the last 100,000 years, if you want to believe the way layout was supposed to happen. The permability layers slant towards the Atlantic Ocean, and in the area of the Ruco site, the Northrup Grumman and the Navy site, the ground water is moving to the the south-south east, general trend. And the area of deep recharge you're talking about is further to the north, it's somewhere around by the Long Island Expressway, and that's got to be at least 2 to 3 miles to the north. That's a long distance away, and that's what I was trying to explain before, it can get a little confusing when you look at the end result from the wells, and some of them are taken at different times, and its hard to figure out a trend. And that's why, for instance, on the Grumman site we started up a quarterly monitoring program to try and get data that's current, and you want to look at the groundwater elevation data, we put together the direction the groundwater is flowing, plus the current condition of the groundwater, and the geologists have looked at

1
2 these repots and found that the groundwater is
3 moving to the south-southeast, especially now
4 that the Grumman Corporation has stopped pumping
5 most of the water from their site.
6 And so you're right, that's just a
7 generalized figure of the overall hydrogeology
8 of Long Island.
9 MR. SIDOWSKI: You're talking about
10 contaminated areas is a generalized area, too.
11 MR. LYNCH: Yes. And actually I do see
12 now that the figure you're talking about is--
13 MR. SIDOWSKI: With heavy rains, any time
14 that we have storms or heavy rains, what happens
15 is that would back up, just like a door that
16 would be closed, that could not hold all of that
17 water coming down.
18 MR. LYNCH: Yes.
19 MR. SIDOWSKI: We now have a condition
20 where that water has to spread out.
21 MR. LYNCH: Right. But the one thing on
22 here, if you look at the rest of them also,
23 there is not a continuous band of clay that
24 would prevent the water from coming down, there
25 would be little pockets here and there, and what

1
2 happens is the water does go down and go around
3 it; this is an unconfined aquifer, it is not a
4 good clay layer-- a good clay layer we'd like to
5 find because then you could just keep the
6 contamination on top and catch it. But it has
7 gone down, and gone down almost to those levels.
8 MR. SIDOWSKI: If we read all the other
9 ones, the MW-54, MW-55, you read all of them you
10 can get all the levels of what you have here;
11 sand and gravel, gravel, sand, right down the
12 line here, you have a potential hazard to see
13 which way the water is moving. It's got to go
14 someplace.
15 MR. LYNCH: And in general it does go
16 down and it moves through-- this is not a
17 confined aquifer, it does not move in like a
18 fractured rock where it could move through one
19 fracture, this is a general groundwater flow and
20 the water does flow.
21 MR. SCHARF: Long Island is basically an
22 underground river full of sand, and the water
23 that percolates down through the it from the
24 recharge basins, it takes time to get down
25 there. The groundwater levels can fluctuate by

season, but not that much. Basically in this area it's about 55 feet, the groundwater, and a five inch rain hits the recharge basin, the water slowly works it's way down. So by the time it gets to the watertable, which is about 60 feet down, it might increase the level all around on Long Island maybe a foot or two, depending on where it's being drawn, but overall the trend is well documented, especially in this area, it's been well studied in the last ten years by Northrup's consultants, by Navy's consultants.

MR. LYNCH: So what you're saying is a plane of clay and the water is going to spill off.

MR. SIDOWSKI: You're right. These are the people who creating the contaminants. You're right.

MS. ECHOLS: Try and keep your questions short. If you have any detailed questions could you just hold them to the end?

MR. LYNCH: We can come back and address this at the end. It's easier to talk about it with the things in front of us.

1
2 MR. DEVINE: My name is Dan Devine.
3 I want to thank Mr. Sidowski for being a
4 concerned citizen and for investigating and
5 researching the background. I also want to
6 thank the law for allowing public participation
7 in this process, and I appreciate you all being
8 down here.
9 I just have maybe three questions. One
10 is who makes the decision as far as what method
11 is decided? I mean I can go down and complain
12 about the rates of the buses going up, it's a
13 public authority that makes the decision. The
14 second thing is what exactly is the product that
15 vinylchloride is, what kind of products does
16 vinylchloride make. And three is is Hooker
17 Chemical Company, are they still making these
18 products; and then the last question was that
19 are businesses and is my local government
20 invited to participate in this sort of thing?
21 Were they invited to be included and they
22 decided not to attend?
23 Those are my four basic questions.
24 MR. LYNCH: The first question is who
25 does make the decision in this case is the

1
2 Regonal Administrator in New York, he's the head
3 of the EPA region. All we will do is present to
4 her all of the data, basically the proposed
5 plan, and then the record of decision which is
6 in more detail, we'll also present to her all of
7 the comments that people have made, all of the
8 questions they have asked and our responses to
9 those comments, and also our recommendation,
10 whether the preferred alternative is the one
11 we're still recomending or if we change it based
12 on these public comments. And she will
13 eventually make that decision.
14 MR. DEVINE: The VCM, the vinylchloride,
15 what did Ruco make that's made of vinylchloride?
16 Is that vinyl in cars or what product is made
17 from that?
18 MR. LYNCH: In the past--
19 MR. SCHARF: PVC pipe.
20 MR. DEVINE: Pipe for plumbing?
21 MR. SCHARF: All sorts of purposes.
22 MR. LYNCH: PVC was a very well used
23 plastic
24 that would be in cars and pipes.
25 MR. SCHARF: They also made specialty

1
2 plastics.
3 MR. DEVINE: So it's all plastics.
4 MR. LYNCH: Right. Right now they're
5 basically not making the plastics themselves,
6 what they're doing now is making the raw
7 materials that someone else is making the
8 plastic somewhere else.
9 MR. DEVINE: My state senator, is he the
10 guy that's going to be speaking with the EPA
11 Administrator, so if I had a question, if I
12 wanted to lobby for a particular purpose, like
13 for instance the accuracy of the study, I would
14 write to the state senator, like Carl
15 Marcilleno? Is he my state senator?
16 COUNCILMAN EISLER: Excuse me, may I
17 interrupt you?
18 I'm Counselman Bonnie Eisler from the
19 Town of Oyster Bay, and I'm here with Counselman
20 Macagnone, he's also a Councilman from the Town
21 of Oyster Bay. (Indistinct)
22 MR. DEVINE: That pretty much answers all
23 my questions. I thank you.
24 MR. LYNCH: Actually the local officials
25 and also the state and the federal congressman

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2 often do comment on these plans and talk to our
3 administrator all the time, and we will respond.
4 Believe me, one of the most important things we
5 get inquiries from the elected officials, they
6 make sure we respond.
7 MR. GILDAY: My name is Bill Gilday, I'm
8 with the New York State Department of Health,
9 and I'd just like to add to that, that the Water
10 Districts, Bethpage Water District, Hicksville
11 Water District and Levittown Water District have
12 been involved on basically what was called a
13 technical coordinating committee for a number of
14 years as the regonal groundwater was being
15 studied, and they all were either were in
16 attendance or had representatives, some of their
17 consultants, engineering firms were at these
18 meetings. So the water districts, too, got
19 involved through the process.
20 COUNCILMAN MACAGNONE: Councilman
21 Macagnone, Town of Oyster Bay.
22 Recently I'm seeing finally some progress
23 in cleaning up the Liberty site after 18 some
24 odd years of promises. What time frame are we
25 looking at in this project?

MR. LYNCH: This project, we have a 30 day public comment period, if it has to be extended it would be a 60 day public comment period.

COUNCILMAN MACAGNONE: We had that 18 years in Farmingdale also. What's the time frame?

MR. LYNCH: Were intending to sign the Record of Decision on this site before the end of September. We then go to the responsible parties and ask them to perform the remedy. We have 120 day negotiation period. If they agree, we then take a little bit more time, probably another three months to negotiate a consent order that would be lodged with the court, at that time we would go into design, design should take six to nine months in this system, and after that nine months we would go out and implement the system. So it would be roughly a year and a half from now is when we hope to be out there.

COUNCILMAN MACAGNONE: Thank you.

MR. LYNCH: Yes.

MS. TUECHLER: I'm Irmgard Tuechler. I

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1
2 walked around protesting the plant when it was
3 still in operation 18 or 20 years ago, also.
4 Has it been going on this long?
5 MR. LYNCH: Well, the site did get listed
6 on the National Priority List in '86, so we have
7 being trying to address this for some 14 years
8 now.
9 MS. TUECHLER: Okay. Just because it was
10 brought up about Farmingdale, you mentioned
11 that, but I would like to know what health
12 studies have been done, the incidents of cancer
13 in Hicksville and Bethpage, and also how this
14 relates to the mapping of the breast cancer on
15 Long Island.
16 MR. LYNCH: The EPA doesn't do health
17 studies when we're looking at the sites, we just
18 look at the environmental problems; you could
19 ask the Health Department.
20 The ATSDR, the agency for Toxic
21 Substances Disease Registry, does look at these
22 sites and does do a health assessment, but they
23 do not go to the level of the study of cancer
24 incidence or things like that.
25 MR. GILDAY: I'm going to give you a

1-800 number and a person's name who can tell you the various studies that have been done or in the process of being done in the area as far as small area studies, I know, related to the Old Bethpage landfill, there have been two studies, and that's part of a greater study about landfill gas. There have also been studies in South Farmingdale, North Massapequa, and I know there is a study in the Levittown area there's been ongoing, it may be nearing completion. I will give you, in fact I'll give you two names. One person who knows the local area studies and one person who's involved with the cancer mapping initiative in New York State, and she can answer those questions, either of those.

MS. TUECHLER: You don't know off the top your head if it's affecting the health of the people in Hicksville?

MR. GILDAY: In order for some health effects to occur from a chemical there needs to be exposure to a chemical, and the exact route of exposure here might be the groundwater contamination issue through the drinking water

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2 supply. Historically some of the Bethpage wells
3 did have concentrations of volatile organic
4 compounds in them that were distributed to the
5 public water district prior to 1976, that's when
6 testing began, and that's when the science was
7 actually available to start looking at these
8 chemical at very low concentrations in the
9 water. The concentrations at that time were
10 lower than what the Health Department and some
11 of the other agencies had as far as the drinking
12 water guideline. That number has since come
13 down, and those numbers that people were exposed
14 to historically in Bethpage are at least
15 associated with one particular well at one of
16 their-- I think they had nine well fields
17 historically. Those concentrations, although
18 they were below the standard guidelines at the
19 time, they are above the present drinking water
20 standards. How long people were exposed or what
21 concentrations we do not know. It's my
22 understanding that through a number of the
23 studies that have been done, there haven't been
24 any inceased incidences of cancer noted in that
25 area. But one of the things we're doing in New

1
2 York State, as Kevin mentioned, the ATSDR and
3 assorted interfaces with the cancer map
4 initiative. We have a VOC registry, volatile
5 organic compound register, and people who may
6 have been exposed or definitely were exposed to
7 volatile organic compounds for some period of
8 time, we're putting these people on a registry,
9 small groups of people or entire communities
10 that may have been exposed, and over time we'll
11 be able to see if, in this group or these
12 groups, where we know there was exposure, if
13 there is any kind of increased incidence of
14 various, either cancers or different types of
15 non-cancerous disease.
16 I'll give you Lorraine Benton's name. In
17 fact I see people taking notes here.
18 1 800 458-1158, and do extension 2-- you can get
19 information about that from there.
20 VOICE: I have a meeting, I believe, like
21 September 19th.
22 MR. GILDAY: Use extension 2-7530 for
23 local area studies that have been done or are
24 being done, ask for Lorraine Benton; and for the
25 cancer initiative, the mapping of cancer

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surveillance initiative it would be Gwen Mergian. And they would be able to speak to these issues a lot better than I can.

You could also call me at extension 2-7880, and my name is Bill Gilday, and I know more about the nuts and bolts of the contamination and the site and what's going on, and I work with Steve of the D.E.C., and we interact with the EPA, too.

So those are the three names and they would be interested in talking to you.

MR. SIMONELLO John Simonello from Hicksville

I have a couple of questions. Number one, you mentioned a plume of contaminated water, and what I would like do know in reference lines of New South Road and Stewart Avenue and Old Country Road and 107, the width and lenth of that plume. That's one part. And the second part is, as we all know, anybody can tell you this, PCBs are airborne. Over the period of all these years has anybody gone around and taken soil samples of the surrounding neighborhoods off the site? Because PCBs are

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airborne, as you know.

MR. LYNCH: I don't believe we have taken any samples off the property, what we do is we take samples starting with the contaminated area and go outward until we don't find it anymore.

What we've also done now is we have taken air samples while we are doing this work while we're putting in wells.

MR. SIMONELLO: I'm not talking about air samples presently, I'm talking from 1939 to 1976 or '45, whenever it started, to 1982.

MR. LYNCH: Form 1945 to 1975?

MR. SIMONELLO: In 1975 there were contaminants dispelled into the air, they had an asbestos brake shop on that road over there, they had the plastics plant, the Ruco plant. They've had many different types of operations there, and Grumman, and whatever came out of those stacks before they came in with the filtering systems on the stacks was spread out on the surrounding community. Now, it goes up, and it might just clear the boundaries of the land and then come back down again. Has anybody done a one mile perimeter around there to check

samples? I mean PCBs or whatever in that soil where people plant their gardens, their children are playing and digging in the dirt or whatever. I mean somebody should look into that.

MR. LYNCH: We haven't looked into a widespread sampling of the soil in the neighborhoods, but what we have done is the soil that we do find on the plant itself, where we would expect the concentrations to be higher, we find large areas that are not affected, that do not have surface contamination. We just found isolated pockets of surface contamination, and that has been attributed to spills of the actual material, not anything that has come through the air.

But we will follow that out until we find a clean area, and I would expect that if it was coming down through the air it would be pretty uniform, and the closer to the stack-- actually I'm not much in that area.

MR. SIMONELLO: It disburses before it comes down.

MR. LYNCH: Okay.

MR. SIMONELLO: So you won't find it

1
2 right in the immediate vicinity, you'll find it
3 further out.
4 And in reference to that plume, I would
5 like to know the width and the length.
6 MR. LYNCH: Actually I did leave that
7 out; I'm glad you brought that up, because it is
8 very big. The width is approximately 900 feet,
9 the length is--
10 MR. SIMONELLO: New South Road and
11 Steward Avenue and Old Country Road and 107 as
12 reference points if you can give me the size on
13 that?
14 MR. LYNCH: I'll put back up the map.
15 MR. SCHARF: There is a section in the
16 report which discusses that. And you have to
17 remember, as Kevin was presenting the
18 information that was gathered on the site, is
19 that the plume from the Ruco facility has
20 comingled with that of the Northrup-Grumman and
21 Navy facility.
22 MR. SIMONELLO: I'm not worried about
23 that, I just want to know the size of the plume.
24 MR. SCHARF: Basically the entire area is
25 well over a 2000 acres site.

MR. SIMONELLO: 2000 acres.

MR. SCHARF: Correct.

MR. GILDAY: When you said New South Road and 107, those were good boundaries on the western side. If you go across what used to be the Navy property, over to about Steward Avenue, it's not as concentrated over there, it's less concentrated, but if you follow that south across Central and actually to about the place where there used to be Mid-Island Hospital, maybe, that's about the leading edge of the plume.

MR. SIMONELLO: So you're saying from New South over and out towards--

MR. SCHARF: It's approaching Hempstead Turnpike in the deeper groundwater.

MR. LYNCH: It's close to 600 feet deep, also.

MR. SIMONELLO: Why has it taken 20 years? We heard about the same problem in the Hicksville Public Library 18 years ago. This was all discussed, and they said Superfund is in there, you don't have to worry about it, and 20 years later I'm hearing the same rhetoric, and

1
2 the plume is getting bigger. I don't understand
3 it.
4 MR. SCHARF: If I can interject.
5 The thing is, granted, we're here today
6 and it's taken awhile for us to get to this
7 point, and this is the final remedy for the
8 Hooker/Ruco site; okay? There have been other
9 operable units in addressing that. As I
10 mentioned, the contaminated groundwater has
11 comingled with that of the Northrup-Grumman
12 facility and that of the Navy facility. But
13 keep in mind, partly just by coincidence, that
14 the Navy or Grumman, and the Navy facility is
15 operated by Grumman, has been pumping 14 million
16 gallons of water a day, and the Grumman
17 Corporation has been well aware that the
18 groundwater was contaminated mainly from their
19 sources and some from other sources. And
20 starting probably back in the early '80s the
21 state had approach Grumman to do something about
22 this, and what they did was they began to clean
23 up the groundwater that they were using for
24 non-toxic cooling water. So even though the
25 contamination has been around in this area for

20 years, most of it was contained within the Grumman facility. That which wasn't contained was drawn down deeper, where the groundwater moves slower, and that's what we're tracking right now with the other site, the Grumman site and the Navy site, which we'll be addressing in a public meeting that's coming up in the near future.

So we've known about it for awhile.

In addition to that, as Grumman made a decision and the Northrup Corporation made a decision to close the Grumman facility, an IRM was implemented that Kevin talked about to contain the contamination that's still on the Grumman site by pumping four wells at the rate of about 4,000 gallons a minute. And so most of that area, that's the area under the water coming off the Grumman site, is being contained right now.

MR. SIMONELLO: You said before that's the state's problem, that's not Supervisor Fund problem.

MR. LYNCH: It's actually everyone's problem, but the state is addressing it, we're

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1
2 addressing the Ruco problem, the state is
3 addressing the Grumman problem under our
4 separate authorities.
5 MR. SCHARF: Make no mistake about it,
6 it's a problem, that's why we're here today and
7 that's why it's a state Superfund and federal
8 Superfund site; we've been monitoring the
9 groundwater, and the state, about a year ago,
10 asked Grumman to put together a quarterly
11 monitoring program. They were doing several
12 distinct monitoring programs around the site,
13 but they put one whole program together to track
14 what's going on, where the plume is going, and
15 we see what's on the site it being contained, we
16 had them do a modeling, a groundwater modeling
17 to help to prove that, as well as corroborate
18 that with anylitical data data, and that
19 contamination just passed the site, we are now
20 going to address, in the upcoming remedy for the
21 north Grumman site, and that will be a public
22 meeting which will be, hopefully, within the
23 next four to six weeks
24 MR. GILDAY: Could I just over a few
25 things.

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2 During the ensuing so many years since
3 the state got involved, a lot has happened at
4 the property. Steve mentioned the IRM, the
5 containment of the worse part of the plume at
6 the site's southern boundary. Those systems
7 there he talked about are pumping about 4,000
8 gallons per minute. If you could see what
9 they're extracting through the carbon, they're
10 actually able to extract TCE out of the
11 groundwater to the tune of probably about one
12 drum, a 55 gallon drum, per week, maybe every
13 other week, and that's about 95 percent pure TCE
14 through the system they have. So they have been
15 taking a lot of this-- to me it's exciting
16 because I see real science cleaning up the mess
17 that has been made, and they're actually
18 extracting out. So there's a lot of material
19 that's being taken back out of the groundwater.
20 Also, the areas where the spillage had occurred
21 on and around the campus, the 600 acre campus,
22 both Navy and Grumman, those areas had a lot of
23 either perchlorethylene or trichlorethylene or
24 even PCBs in there. They have largely been
25 remediated by this time; there have been

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numerous activities going on to clean up what we call source areas during the last 10, 15 years.

Another thing that's been going on, and this gets to the issue of soil sampling and the PCB soil sampling, as various portions of the Grumman properties have been closed out, there's another program called the RECRA Program. We primarily are dealing with the Superfund program, dealing with what we call the hazardous waste cites. Well, there's been other areas on the plant that have had contamination that needs to be remediated. These have been done as various plants are being closed through the RECRA program, and we're actually-- the different program are in communication with each other, making sure that-- while we don't want to overlap, we do want to make sure that nothing falls through the cracks.

I can say that there have been literally thousands of soil samples taken around the Grumman area, and I've gotten dizzy and headaches going through this data, looking at it, in part dealing with the closure of potentially contaminated areas.

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1
2 There has been, in the past, I believe it
3 was '95, when we were dealing with one of the
4 more contaminated PCB area on the site, that was
5 part of Plant 3 that the Nave has. When we
6 realized that this was towards the eastern end
7 of the plant we have actually did, the State
8 Health Department went into some of the yards
9 near that property, and the good news is we
10 didn't come with PCBs in the yards there. The
11 bad news is that on the plant there's a lot of
12 PCB contamination, and that's the subject of an
13 entire another remedial action that the Navy and
14 Grumman are implementing now.
15 There's also some other studies going on,
16 some PCB contaminated areas that Grumman is
17 actually delineating, the extent of it, how much
18 they're going to have to do. There has
19 definitely been a lot of soil sampling
20 throughout what I call the campus, the Navy
21 Grumman campus, and wherever we see that data
22 getting close to the public, their homes, to
23 parks or whatever, we say you got to go offsite,
24 you got to take the soil samples and make sure
25 it's not in people's gardens, make sure that

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1
2 people aren't close to it. So there is a lot
3 going on.
4 MR. SCHARF: There has been health
5 studies doen by the state, all around the state,
6 making sure of the grade of sampling.
7 And you've just got to keep in mind,
8 you've heard of PCBs too, how ubiquitous it was
9 in terms of use before 1975; almost every
10 refrigerator had capacitators in it that had
11 PCBs in it, diswashers, washing machines. Even
12 back, dating to the 1960s and before, automatic
13 transmissions in cars used, as part of this
14 hydamatic fluid PCBs. I'm not sure of the exact
15 date of that. But as we realized that this
16 material didn't break down and had residual
17 effect, that we had to stop using it, and to the
18 best of our ability worked to clean that up, but
19 unfortunately you may find it in certain areas,
20 you may find that if you look hard enough.
21 MR. SIMONELLO: I appreciate what you're
22 doing, but you've got to appreciate what we're
23 going through and our frustration; okay.
24 MR. SCHARF: You know, I grew up on Long
25 Island, I've been drinking this water, I raised

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1
2 my own kids here. I understand that. I
3 graduated Stony Brook, I know this is a very
4 important issue, and the cancer question that
5 Bill has talked about on Long Island is a
6 paramount issue because it's apparently a
7 concern, like it is everwhere else in the state,
8 but there are certain elevated numbers, if I'm
9 correct.
10 MR. GILDAY: Increased incidences.
11 MR. SCHARF: And that's a concern. And
12 knowing that vinylchloride, the main contaminant
13 concerned, is a known carcinogen is a paramount
14 issue, and that's why Kevin is here to present
15 the plan, that we don't ever want that material
16 to be exposed, and its for the protection of
17 human health and the environment. And we found
18 that this chemical can be easily oxidized, and
19 that's what the whole program is that EPA is
20 putting forth here.
21 MR. YATZYSHYN: My name is Greg Yatzyshyn.
22 I, too, remember these two people when we
23 demonstrated at Hooker Chemical in 1981, and as
24 excited as you are about what you see coming out
25 their ground, my daughter was nine years old,

1
2 she's 28 year old and married, and we're sitting
3 here right now. This is what we're talking
4 about when we talk about our confidence in
5 government at this point.
6 I understand that you probably use the
7 full disclosure law in having Ruco or Hooker or
8 Occidental Petroleum let me know where the
9 situations are, where the problems were, any
10 type of chemicals that they used, the amounts of
11 chemicals, and the list goes on. I read on the
12 web site the summary your conclusion, I read all
13 of that, and unfortunately, like I was saying
14 earlier, you kind of beat us, you beat us to the
15 point where we got tired of waiting and they
16 figured we would go away, and we did, pretty
17 much. And now we're here again. And I threw
18 away most of the stuff; I don't know if anybody
19 has ever seen. Has anybody ever seen this,
20 anybody that's working on the project?
21 This is a book from 1980, it was down by
22 NYPER, and it's called Toxics on Tap, Chemical
23 Contamination of Long Island's Drinking Water.
24 This was a 1980 book. So anything that you're
25 telling us is certainly not a bulletin to us;

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all right?

My question is, and I'm sorry I threw away everything, I really did, I threw out a lot of things in disgust. But my recollection has three laytex tanks being buried on the site. Are you familiar with that?

MR. LYNCH: Yes.

MR. YATZYSHYN: Was that remediated?

MR. LYNCH: Yes, they have been removed.

MR. YATZYSHYN: I'm trying to do this from memory now, I'm talking, you know, 20 years and 30 pounds later. I'm trying to do a lot of this from memory, but what I will do later, but that's really all-- oh.

My other question was is Bethpage and the other water districts, are they prepared for any situations that might arise? Is this going to be a strangle, is there going to be a problem down the road that they are not ready for if it affects this plume traveling into their drinking water?

MR. LYNCH: Bethpage has three of their wells have treatment on the wells already designed for the contamination that is here,

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2 together with the IRM that the state is doing,
3 and then the action we will take, monitoring
4 programs will continue to try to track and
5 assure that things are not moving any further
6 once these things are operating, and we're in
7 communicate with them and they have all of our
8 data. So there are things-- everyone will know,
9 anyone who can you be affected, before they
10 would be affected.
11 MR. GILDAY: And what the state is going
12 to be proposing shortly, and I don't want to
13 steal Steve's thunder here, but there are
14 contingency plans if water district wells are
15 threatened that there needs to be some type of
16 treatment ready to go, and typically what we do
17 is a sentinal new or sentry wells between what
18 we know to be the plume in those wells so we'll
19 see it as it's approaching and have time to
20 implement the program.
21 MR. YATZYSHYN: Would the Lloyd still be
22 protected for, let's say, Long Beach? I
23 understand that the Lloyd is protected for Long
24 Beach? I understand that the water is protected
25 for Long Beach and all of these other lower

areas where the salt water intrusion is a problem. Would that ever be a consideration, not to protect them, just to make it available?

MR. LYNCH: I don't think I quite got your question.

MR. YATZYSHYN: In other words, the Lloyd is protected for other areas that have salt water intrusion, okay, so that's going to be their access to drinking water. Is there any type of contingency plan to allow anybody else to tap that aquifer?

MR. LYNCH: That I don't know. That would be a question for the state.

MR. GILDAY: Not specifically, but it is an aquifer that is available, but it's so deep to go down there it would be quite an expenditure for a district to do. But I know it's there.

As far as depth, that is one thing that we consider; we want to profile this contamination at depth, we don't just want to capture it at 300 feet and find later on, oops, it slid by at 400 feet. So we make sure that our monitoring is down at that depth so that we

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capture the plume both horizontally and vertically.

MS. SIMONELLO: Knowing the background of this property I could never understand how they could build those senior citizen developments on the Grumman campus that you referred to, and now you're talking about contaminated soil. Was it considered when they built that, by Sunnyside?

MR. SCHARF: I think that even though that question really isn't relevant to the program of Ruco, but that's something-- that would be referred to as the south end of the runway of the Grumman property, and the contamination that we're dealing with here is in the groundwater, deeper; low visibility solvents that are moving offsite in the groundwater.

MS. SIMONELLO: But you mentioned the air, that some of the stuff went into the soil

MR. SCHARF: The area where they built the former Grumman parcel, that property was sold in order to build the homes, and that was never used for industrial purposes. And I'm not up on all of it, but there was extensive testing done to show that that would meet criterion for

1
2 residential development before it was released
3 to do that. I wasn't working on the project at
4 that time, it was approved, but I or Bill can
5 find out more answers for you on that question.
6 There was a meeting held with the citizens that
7 live in that community and there was a lot of
8 data was a assembled.
9 MR.GILDAY: Well, basically there's
10 another thing. Over the years, as various parts
11 of the facility was closed out, another thing
12 was happening concurrently with that. Pieces of
13 the property were deemed clean after certain
14 studies had been done to make sure that they
15 were indeed clean, and they were delisted from
16 the state's inactive hazardous waste site
17 registry. Those pieces, before they were de-
18 listed, the State Health Department and D.E.C.
19 looked at certain aspects of it to make sure if
20 there was any question, is the sampling data
21 there to verify the fact this is a property
22 that's suitable for a residential development.
23 In that particular case it was a delisting
24 petition and we denied the first one, we said
25 make sure you've done soil testing, we knew that

the ground water contamination was deep, in fact it's below the water table at that point, so that wasn't an issue of exposure there, and the the public water to the people would be provided What we said, there are certain chemicals that are used maybe for deicing planes, different glycols, we wanted to make sure that those were checked, and those were tested first, and when we looked at the data and was satisfied that there was nothing there we went ahead with the delist. So there was special testing done in that particular area, as with other areas around the property that have been delisted and are being developed even as we speak.

MR. SCHARF: The groundwater there is about 50 feet below grade, and that property is now south of where this groundwater reception program is, and the area that you're talking about, I think it's called Parcel 01; is that correct, Bill?

MR. GILDAY: There's different parcels.

MR. SCHARF: In that area there are two onsite containment wells that never had very high concentrations to date, and the ground-

1
2 water in wells in that area, the shallow
3 groundwater wells are all cleaned up. So
4 there's no route of exposure to anyone in those
5 homes.
6 And that's where that lies. But again,
7 that's not part of this site. If you want to
8 put more questions on that you should come month
9 the next meeting, to the Northrup Grumman
10 proposed plant, the overall regional groundwater
11 program, and you can ask more of the questions
12 on both Northrup-Grumman and Navy at that time.
13 MR. ANDRIOLA: My name is John Andriola,
14 I live at 64 New South Road in Hicksville,
15 right up the street from where Hooker Chemical
16 is.
17 Now, first of all I'd like to ask you
18 when you say that you test samples of ground,
19 how for down do you go with the testing? Just
20 at the subsurface, or down--
21 MR. GILDAY: It depends on how we were
22 concerned the contamination got in the certain
23 place; it was from either spillage or deposition
24 from the wind, say the question that came up
25 earlier, we would check the surface first.

MR. ANDRIOLA: But you don't go down a hundred feet?

MR. GILDAY: We'll go down as far as we need to until we get clean.

MR. ANDRIOLA: Okay.

MR. GILDAY: In fact we asked a number of people from Grumman about that, if we have contamination and it's not found at that depth we say go down deeper until you find the bottom of it.

MR. LYNCH: In these places where you see the monitoring wells put in we also monitor the soil all the way down.

MR. ANDRIOLA: And the wells are anywhere from 580 to 640 feet in depth down below; okay? Now, since 1976 you say up until 1985, or whatever, they were putting pollutants into this here water. Eventually that has to go down into the water table. Furthermore, they built this big water tower on Grumman property; are you familiar with that?

MR. GILDAY: Sure.

MR. ANDRIOLA: I think that the amount of gallonage is a million 800 thousand gallons of

1
2 water. Now, where are they pulling that water
3 from?
4 MR. SCHARF: The water in those tanks, I
5 believe that the water in the tank is from the
6 tank on New Grumman Road on the former Grumman
7 property. Those come from the Bethpage Water
8 District Wells.
9 MR. ANDRIOLA: But it's only a short way
10 from Hooker Chemical.
11 MR. SCHARF: I'm not sure exactly where
12 their supplyline was.
13 MR. ANDRIOLA: I know, I live there.
14 MR. SCHARF: But it's not on the Hooker
15 property.
16 MR. ANDRIOLA: It's the underground
17 water is pulling from that there area.
18 Second of all, when they monitor the
19 purity of water, who does the monitoring of
20 this? Is it a private company, is it the water
21 district themselves?
22 MR. GILDAY: That's actually a good
23 point.
24 MR. ANDRIOLA: The purity of the water;
25 that's what I want to know.

1
2 MR. GILDAY: The water districts in Long
3 Island, actually I mentioned in 1976 we started
4 monitoring, we could finally see these chemicals
5 at lower levels, by 1980 Nassau County, and I
6 believe Suffolk County, had a requirement that
7 monthly or-- I'm sorry, quarterly monitoring was
8 required for these chemicals from every public
9 water supply well in the different counties.
10 And that monitoring has been going on since
11 then, at Bethpage in particular, we've got the
12 quarterly monitoring data, we can see if there's
13 any chemicals or not in the water. When there
14 is a problem, some contamination, the county is
15 required-- that's also, I should say in 1989
16 that became a state regulation, that quarterly
17 monitoring must be done to these supply wells.
18 You have an excellent water program, both
19 in Nassau and Suffolk County. They had
20 implemented what later, nine years later, became
21 the state regulation. They go beyond that now.
22 If there's contamination in any water supply
23 well the county will require of the districts,
24 they will require monthly monitoring of those
25 affected wells, and if there's treatment on the

well, that monthly monitoring has to include after the treatment, usually it includes the before and after so we can see that the treatment is being effective. At Bethpage, because of the issue between the contamination from Navy/Grumman, and also the water district, there's joint monitoring going on, both the water district and Grumman and the Navy will do different monitoring events.

MR. ANDRIOLA: You can understand where I'm coming from.

MR. GILDAY: Right.

MR. ANDRIOLA: With the water table being pulled up there.

MR. GILDAY: Sure.

MR. ANDRIOLA: And another thing. From the place where they removed all the soil, what did they go down; 20 feet. And with this contamination for the last 40 years, how can 20 feet of soil being removed clean up that site?

MR. LYNCH: Well, it doesn't clean up the site, it's just a small portion of what's being done there.

MR. ANDRIOLA: And another thing. Along

1
2 107, across from Waldbaum's shopping center,
3 there's a sump there, I see green water
4 constantly coming out those big sewer lines.
5 Oh, incidentally, it's nine people who
6 died from cancer; okay?
7 And Miss Nickol, you're right on track,
8 your putting a moratorium on the building here
9 on that Underhill property; don't back off,
10 don't let them take it. I know you're opposed
11 to it.
12 MR. DEVINE: I know you mentioned PRPs.
13 MR. LYNCH: The potential responsible
14 parties?
15 MR. DEVINE: Right.
16 Who owned or operated actual usage or
17 transporting property.
18 MR. LYNCH: Right.
19 MR. DEVINE: Is Bethpage property
20 considered an economic development area?
21 Because like there are areas of Nassau County
22 that are considered EDAs. I never knew though
23 it was considered an area that say Stephen
24 Speilberg wants to take over. Are PRPs
25 contingent-- like if this goes on for the next

1
2 ten years, is everyone going to stay clear of
3 that property, for economic purposes, in order
4 to avoid being liable to clean up that property?
5 MR. LYNCH: Actually no. What we do--
6 that's actually a very good question-- it's one
7 that has bothered people and it has prevented
8 people from nominating sites on the National
9 Priority List for that reason. But what we will
10 do on a site, on the National Priority List
11 site, if someone wants to come in and develop
12 the site, which do encourage, what we will do,
13 we will sign an agreement with them, what we
14 call a prospective purchaser agreement, that we
15 will not hold them liable for the clean-up at
16 the site. Usually what-- when we do that we
17 also get something back from them, which would
18 be access to the site, which would be permission
19 to monitor all the different wells, they usually
20 do monitoring themselves, sometimes they'll
21 volunteer to clean up a portion of the site.
22 But it is something that has been encouraged,
23 very much so, recently by the Environmental
24 Protection Agency is that we do want to
25 redevelop these sites, these sites that have

been contamination, you don't want to take a fresh parcel of land and use that, and potential problems even come to that. These are great sites to reuse for industry. So we do try to limit the libility to anyone who will be taking over the site.

MR. ANDRIOLA: Thank you.

THE CHAIRMAN: Does anybody have any questions about how we propose to take up vinylchloride?

MR. SIMONELLO: I don't know if you can answer this question, but the U.S. Navy was supposed to come down and clean up the site, the 108 acres on the Grumman property. Whatever became of that? Last year we went to a meeting and there was three different phases, residential, commercial and industrial that they were going to clean up. Did anything ever come of that?

MR. SCHARF: Are you referring to the Remedial Advisory Board meeting that the Navy put on at their facility?

MR. SIMONELLO: Yes.

MR. SCHARF: That is ongoing right now,

1
2 and the current plan is that the Navy wants to
3 give the property to Nassau County, and they are
4 going through different scenarios of industrial
5 versus residential use, and if I'm correct, I
6 think they settled on industial use of the
7 property?
8 MR. GILDAY: I think so. We're still
9 looking at it.
10 MR. SIMONELLO: But are they going to
11 clean it up before they try to sell it?
12 MR. SCHARF: They have been in the
13 process of cleaning up the site, and they've
14 done a very good job of-- they've emptied out
15 all the toxic chemicals in the building, they
16 removed soil beneath the building, they
17 installed-- over the last ten years the Navy
18 has been making judgment on what's going on at
19 the Grumman site; they put monitoring wells in,
20 they've been monitoring groundwater, they've
21 addressed the recharge basins in the back, the
22 PCB contamination on some areas of the site, and
23 those areas that still require remediation have
24 been earmarked to stay under Navy ownership. So
25 the entire facility is not slated, at this time,

to be turned over the Nassau County.

MR. GILDAY: There will probably be site use restrictions on that parcel and limiting it to either commercial or light industrial or industrial use in general. Now, that doesn't mean that gross contamination will be left, typically what happens is you attack any of the really bad contamination, you get it, as much as feasible-- there will be residuals, perhaps it will be 20 feet down, it will be 10 feet down, it may be near the surface, and what we will often do when it gets into the development question, there will be deed restrictions, deed notifications, there will be what we call institutional controls, literal documents that we file with the county and town clerks, whoever has jurisdiction, that every property owner will know about that, that contamination is there, and the state would have to be involved in any plan to dig that up.

MR. SCHARF: Also, any time you have an industrial facility like that, and as large as that facility was, as active as it was, there's always a possibility, as detailed as the

1
2 investigation we do and an intensive as has been
3 performed, there's always a possibility that
4 some old tank that may have gone unidentified or
5 whatever, and the Navy is required, by law, to
6 come back and take care of any problems found on
7 the site after the fact, and they make no bones
8 about it. As long as there's a country there's
9 going to a Navy, so that's not a problem, and
10 that's the key.
11 But again, these are questions really
12 that we should hold off to the Navy public
13 meeting that's coming up.
14 MR. ANDRIOLA: I'm concerned with the
15 groundwater right now.
16 MR. SCHARF: Right. Well, the
17 groundwater, there's contamination on the Navy
18 site, there's no two ways about the groundwater,
19 and we're aware of it, and that's going to be
20 part of the overall program that we're going to
21 have.
22 MR. DEVINE: You mentioned disposing or
23 regenerating carbon. What's that's all about?
24 How do get rid of it or whatever? What's the
25 point of that? Because they're actually talking

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about, you know, I read about the Hanford Nuclear Waste Site, where they want to start regenerating plutonium and stuff like that. Is this a good thing that they're talking about, disposing or regenerating carbon?

MR. LYNCH: This is a typical thing that's done when you're using carbon to treat either groundwater or an air problem. You can either dispose of it in a secure landfill, or what you can do is you can put it through a heat process that would drive the volatile organics that adhere to that carbon, drive them off and then incinerate them so that you can reuse that carbon again. It's not something that would be done at the site, it is removed and done in a separate facility that's designed just to do that. So it's actually a good thing, it's actually recycling the carbon for further use.

MR. DEVINE: Which process is that?

MR. LYNCH: That's the process where you would take the carbon, you would drive off the the volatiles with the heat and incinerator; that would be the regeneration of the carbon.

MR. GILDAY: Can I just add?

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1
2 For IRM at the Grumman facility, that is
3 actually happening on site; right, Steve?
4 MR. SCHARF: When the carbon is full of
5 these chemicals, to extract those chemicals back
6 off the carbon into a, still basically a
7 separator, and that's where you can actually see
8 the TCE coming out in that process.
9 MR. DEVINE: Is that going on where the
10 four stacks are?
11 MR. GILROY: Well, that's the co-gen
12 facility, that's where power generation occurs.
13 That's off of South Oyster Bay Road right at the
14 fork.
15 MR. DEVINE: That's a power generator?
16 MR. GILDAY: Yes, right.
17 MR. SCHARF: It generates steam there.
18 MR. GILDAY: Right; but steam is used in
19 the Grumman facility.
20 MR. ANDRIOLA: I have one more question.
21 On trichlorethylene, now we have this
22 trichlorethlene in our water supply
23 (indistinct). Now, we have this
24 trichlorethylene in our water supply. Now, is
25 this carbon filtration also taking this trichlor

1
2 out of the water?
3 MR. LYNCH: The air striping takes the--
4 he's asking what takes the trichlor out of the
5 water, and the carbon striping is what takes it
6 off the air that has come from the water into
7 the air, you take it and capture it in that
8 carbon.
9 (Indistinct)
10 MR. LYNCH: Actually, basically, it ends
11 up in the carbon, yes. It comes from the ground
12 water and where it ends up is in that carbon and
13 then it's removed from the carbon and disposed
14 of.
15 MR. ANDRIOLA: And that came from Hooker?
16 MR. LYNCH: It came from all of them.
17 MR. PFAENDER: I'm Rich Pfaender, I'm
18 repesenting Supervisor Venditto.
19 Question. This remedial alternative
20 deals with the DCM subsoil.
21 MR. LYNCH: Right.
22 MR. PFAENDER: Biosparging, it's a new
23 technology. Is there a track record on this
24 technology working in other areas, number one,
25 and number two, since the water districts,

1
2 specifically Bethpage and Hicksville, are the
3 districts that are involved, have you had
4 comments on this preferred alternative from
5 those water districts, either positive or
6 negative?
7 MR. LYNCH: We have not had any comments
8 yet from the water districts, we expect them.
9 It is a new technology, it is being used
10 in a number of places, one Superfund site, I'm
11 trying to think of the name of it up in New
12 England, in Massachusetts, it's been used
13 effectively, but we haven't had any programs yet
14 where we have completed it and said yes, it is
15 done and what went into the plume is gone.
16 MR. PFAENDER: So is that the reason you
17 put the contingency plan into place to go to
18 alternative 2, which would be to pump the water
19 out?
20 MR. LYNCH: That's exactly why we did it.
21 MR. PFAENDER: It's a "safety net." How
22 far will you go with the biosparging before you
23 decide that, A, it is not being effective in a
24 timely manner, and then proceed to your conting-
25 ency plan?

MR. LYNCH: We don't have a hard time-frame yet, what we'll do is look at the design, and we'll design a time which we'll work through there will also be plenty of monitoring wells downgrading from the vinylchloride, and if the vinylchloride does reach those monitoring wells, we will definitely, at that point, show that it is not working, that it's reaching high levels, continuing downgrading, we would put the contingency in.

MR. PFAENDER: Will there be a notification to local municipalities that you are going to do the contingency plan?

MR. LYNCH: Yes, we would, we would send out a notice to anyone on the mailing list. What we will be sending out, we will be sending out a notice of progress when we are starting the air sparging, and then if we do change it at all we would also, then, be putting out a mailing saying that we are changing it.

MR. SCHARF: With an explanation.

MR. LYNCH: Well, we wouldn't have to.

What Steve is referring to is that if we do change, if we change the remedy that we

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2 select in certain ways, we don't necessarily
3 have to redo the ROD we put out, what we call an
4 Explanation of Significant Difference. Since
5 this is a contiguous that is selected we don't
6 have to do that, we would do it in the normal
7 course of business, send out a notification that
8 we're moving to the next phase.
9 MR. SCHARF: And the other thing to keep
10 in mind is that the vinylchloride is substituted
11 for VCM, it's called VCM by Occidental because
12 they use it in monitoring to make products that
13 may be produced by a breakdown of the products,
14 as it's moving in the groundwater, in the
15 natural flow, it's moving towards the on-site
16 containment wells that Grumman has put in, and
17 there was always a bone of contention between
18 the two companies there, originally Grumman was
19 saying two years and Occidental was saying seven
20 years, and then Grumman said Occidental was
21 there 40 years and Grumman said ten years, so
22 somewhere in there it has moved down to deeper;
23 the rate of flow is slower there, so it's easier
24 to monitor and track the path. So if nothing
25 else happens and the biosparging fails, it's

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2 going to move in towards those wells, and if
3 necessary, treatment can be put on the air
4 stream of the on-site containment wells to treat
5 it at that point. But we have a lot of time to
6 think about it, it's not going to be tomorrow.
7 MR. PFAENDER: There's a follow-up on
8 your answer.
9 The responsible party here would then
10 still be Occidental if the biosparging didn't
11 work and remediation had to take place closer to
12 the Grumman site and Bethpage, would this burden
13 them revert back after a number of years still
14 to Occidental to pick up the tab?
15 MR. SCHARF: That's an enforcement issue.
16 MR. LYNCH: I would say this Vinyl-
17 chloride plume has been identified with the Ruco
18 site, and the responsibility for that
19 Vinylchloride--
20 MR. PFAENDER: Whatever need to be done.
21 MR. LYNCH: Occidental will be the
22 potentially responsible party for that.
23 MR. SCHARF: And keep in mind there are
24 other contaminants that knows no bounds, and
25 they came from Occidental, and a lot more came

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2 from the Navy and Grumman site, that is along
3 commingled. So that's under the Grumman
4 facility. Right now Grumman is treating for all
5 of that, we know that's moving off their site,
6 and that's something that you have to keep in
7 mind that's all been an issue in dealing with
8 the regional remedy, and that's based on the
9 remedy for the regonal ground water the state
10 will present that will rectify all that because
11 it will make sure that it will protect the
12 health and environment with those remedies we
13 have in place.
14 MR. ARMENTANO: John Armentano.
15 With the biosparging is there a depth
16 threshold? These are organisms that are
17 breaking down the VCMs. Is there a depth
18 threshold that they can survive at?
19 MR. SORENSON: I'm Kent Sorenson, I'm
20 with the Idaho National Engineering
21 Environmental Lab, I'm an environmental
22 engineer.
23 Surprisingly, it's been in the last ten
24 years that there's been a lot of research on
25 subsurface microbiology an what sort of

organisms can live underground. It's actually been discovered, primarily by researchers at Cornell, that these microorganism can live as deep as 3,000 feet or more below land surface, so they can live very deep, and there is evidence at this site that there is biological activity at least to the bottom of the plume where wells are completed. So you're not going to run into a depth limitation from a biology standpoint.

MRS. TREDER: I'm Karen Treder from the New York State Department of Motor Vehicles.

We have a facility in Hicksville, presently in the Hicksville-Bethpage ares.

On 52 of the map where it says Plant 5B has any water or soil samples been taken in that area?

MR. LYNCH: Yes, there have been water samples that have been taken deep below that area, and the plume of contamination does extend underneath that area.

MRS. TREDER: Is it vinylchloride?

MR. LYNCH: No; this would be the plume containing the perchlorethylene and the tri-

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chlorethylene.

Steve, would you know if there were any soil samples taken in that area?

MR. SCHARF: I believe on the Grumman property itself, the area your talking about is Plant 5B, that's a residential and commercial area?

MRS. TREDER: Yes.

MR. SCHARF: And offhand I don't know, Bill, maybe you know if there was sampling done there.

MR. GILDAY: I don't know exactly how close to the basins or around the basins; there's been at least a number of testing samples there, but the Plant 5 closure included a lot of soil samplings around the facility, and I know it was far enough to the south that I was satisfied they had gone far enough. I know the Plant 2, there was a delist petition several years ago for Plant 2, as part of that there were soil samples collected around Plant 2, even prior to that.

MRS. TREDER: I'm talking about the west side.

MR. GILDAY: Yes, yes; on all sides of the plant.

And prior to that there was a lot of soil sampling and I know soil vapor sampling. One of the things with PCB, it's a volatile chemical, and if you have significant, what we call source areas, by sniffing the gas, basically, you can put a probe down in the ground and you can sniff, you don't sniff it physically, but maybe some people do, but you actually take specific types of chemistry, if you find it in the soil vapor you will know that you have a source near there and then you take the soil samples and find the actual source. That was done in conjunction with soil sampling around the Plant 2 facility, around Plant 5, actually across many of plants on the property. So there's been a lot of different samplings done.

As part of the closure, those plants are going to be used by Grumman for awhile. When they're ready to close those out there will be another round of sampling at that area.

If there was a source area, it's been remediated. If it was near the surface, if

there were surface levels near the surface it's been remediated. If it were deeper, and I don't believe there were any deeper things there with respect to soil sampling, north of there there's an area of leach pools that served Plant 5, and that contamination has been remediated at least down to 10 foot depth and backfilled. That's going to be noted in one of the deed restrictions that I mentioned earlier for the Plant 5 closure.

So the state has looked at it, we're satisfied with the work that's been done, with the controls that are going on.

MRS. TRADER: (Indistinct)

MR. GILDAY: Yes; as those pools are closed they will. But right now there part of actually the IRM.

MRS. TRADER: What's the IRM?

MR. GILDAY: That's the containment of the large plume at the southern boundary, the pumping wells.

MS. ECHOLS: Can we take a five minute break for the stenographer?

MR. DEVINE: I just want to ask a

question.

Who mailed these out.

MS. ECHOLS: I did.

MR. DEVINE: You did?

Because the one I received was missing pages 2-- every other page was missing, so it wasn't a complete thing to read, it was incomplete.

Thank you for your time.

MR. LYNCH: Thanks for telling us about that.

(Recess)

MR. LYNCH: We're ready to resume.

If anyone has anymore questions or some more comments. Especially we're looking for comments on the proposal that we have for the vinylchloride plume, if we could concentrate on that we'd appreciate it.

Steve said there will be a public meeting on the groundwater plume sometime, I think it's in the next month. So if we can concentrate the questions on the vinylchloride I would appreciate it.

MR. SIDOWSKI: I'm Joseph Sidowski, I live in Hicksville.

You have a cutoff date of the 28th for anyone putting papers in?

MR. LYNCH: It's for comments on this proposed plan.

MR. SIDOWSKI: Okay. Comment only.

Can that dated be extended?

MR. LYNCH: Yes, it can.

MR. SIDOWSKI: I'm now asking that date to be extended for at least 15 more days.

MR. LYNCH: Okay. We'll have that in the transcript; and we can extend that date.

Could I ask you to write that in a letter, just so we put it on the record. It's real easier for me to have a paper trail.

MR. SIDOWSKI: Who do I send it to?

MR. LYNCH: You send it to the name that's in the plan which I buried someplace.

MS. ECHOLS: It's right here. It's on the second page.

MR. LYNCH: Project Manager, New York Remediation Branch.

MR. SIDOWSKI: I'll see if I got it in

the other book.

MR. LYNCH: I'll give you this one.

MR. SIDOWSKI: Do I direct it to you?

MR. LYNCH: You can direct it to me.

MR. SIDOWSKI: I have one other comment.

I did state to you that the information is off, the evidence is conflicting inside of the report itself, and according to Rule 9 of the Federal Court of procedure, I have to notify you of that at it's hearing, because you, then, therefore, have to follow Rule 9.

Thank you.

MS ECHOLS: Any more questions from anyone?

MRS. TUECHLER: I just want a clarification of the 2,000 acres that you mentioned that were contaminated, the plume of water.

MR. SCHARF: That's based on the area below ground surface where there's contaminated water.

MRS. TUECHLER: Below ground surface.

MR. SCHARF: And below, most of it is below the water table.

MR. LYNCH: It would be the plume of

contaminated water that lies below granite.

MR. SCHARF: And keep in mind, too, that the magnitude of this site, in terms of depth, width, the concentration varies greatly, and it took me a long time to get all the information as a layperson looking at this, what it all means, so there's a lot involved here and it's is not an easy task to understand all the information. But when we say 2,000 acres, it's basically the extent of the groundwater contamination we found, starting at Occidental, the Ruco facility and going all the way down past the Bethpage Water District.

VOICE: For the next hearing related to the Grumman property, will there been another mailing similar to the one you put out this time?

MR. SCHARF: What we'll have to do is coordinated with the EPA, because I'm starting to draft a news letter, and we'll have to put a mailing out, and it gets quite extensive. As it is, we have a mailing-- I'm not sure, what did you do with the mailing, did you take a map?

MS. ECHOLS: It was a mailing that was

given to me. I have updated it as much as possible.

MR. SCHARF: What we can do is ask the EPA for a copy of that. At the minimum I can take a copy of who attended the meeting tonight.

We will also require that Grumman put out a public notice in the newspaper, and maybe given the magnitude of that site we might make a radio announcement on it. We'll probably hold that meeting in Bethpage, at the Bethpage High School.

We have certain small points we want to resolve, and hopefully resolve that in the nect couple of weeks, in the early part of September. What that will do is will bring together all these things.

MR. LYNCH: I want to thank everybody for taking the time to come out tonight.

If you have any other comments or questions don't hesitate, please, to write to us; the address is in that handout you have. Thanks again.

1
2 C E R T I F I C A T E
3 STATE OF NEW YORK)
) ss.
4 COUNTY OF NEW YORK)
5 I, JULES REHFIELD, a Shorthand
6 (Stenotype) Reporter and Notary Public
7 of the State of New York, do hereby
8 certify that the foregoing
9 Proceedings, taken at the time and
10 place aforesaid, is a true and correct
11 transcription of my shorthand notes.
12 I further certify that I am
13 neither counsel for nor related to any
14 party to said action, nor in any wise
15 interested in the result or outcome
16 thereof.
17 IN WITNESS WHEREOF, I have
18 hereunto set my hand this 18th day of
19 August, 2000.
20
21 Jules Rehfield
22 JULES REHFIELD
23
24
25