PROPOSED REMEDIAL ACTION PLAN

ROBINTECH/COMPUDYNE, INC.
Inactive Hazardous Waste Site

Town of Owego, Tioga County, New York
Site No. 7-54-007

January 1995

SECTION 1: PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) is proposing Groundwater Withdrawal and Treatment and Iterative Groundwater Withdrawal and Treatment with Iterative Source Control Pumping for the Robintech/Compudyne, Inc., Operable Unit 1 (OU1) main plant site.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the rationale for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments submitted during the public comment period.

This PRAP is issued by the NYSDEC as an integral component of the citizen participation plan responsibilities provided by the New York State Environmental Conservation Law (ECL), 6 NYCRR Part 375. This document is a summary of the information that can be found in greater detail in the Remedial Investigation (RI) and Feasibility Study (FS) reports on file at the document repositories.

The NYSDEC may modify the preferred alternative or select another response action presented in this PRAP and the RI/FS Report based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

The public is encouraged to review the documents at the repositories to gain a more comprehensive understanding of the site and the investigations conducted there. The project documents can be reviewed at the following repositories:

Owego Town Hall
Town Clerk's Office
Route 434
Owego, NY 13827
(607) 687-2194
Contact: Town Clerk
Hours: M-F: 9 am - 4 pm

NYSDEC
Region 7 Kirkwood Office
1679 NY Rt. 11
Kirkwood, NY 13795
(607) 775-2545
Contact: Tom Suozzo, Project Manager
Hours: M-F: 9 am - 4 pm

NYSDEC - DHWR
50 Wolf Road
Albany, NY 12233-7010
(518) 457-4343
Contact: Robert Schick
Hours: M-F: 9 am - 4 pm

Written comments on the PRAP can be submitted to Mr. Suozzo, project manager, at the above address.

DATES TO REMEMBER:

Public comment period on RI/FS Report, PRAP, and preferred alternative starts on January 31, 1995 and ends on March 1, 1995.

Public meeting will be held on **February 7,1995** at **7 PM at the** Owego Town Hall, Route 434,Owego, New York 13827

SECTION 2: SITE LOCATION AND DESCRIPTION

The Robintech/Compudyne site is located at 1160 Taylor Road in the Town of Owego, Tioga County, New York with Site No. 754007. Hadco Corporation (Hadco) maintains and operates a large manufacturing facility on the site. The site occupies a property of approximately 17.3 acres which is bordered to the south by a municipal sewage treatment plant, and to the east by Barnes Creek. The site is located approximately one half mile north of NY Route 17, and NY Route 17C. A wetland is located south of the site, and the Susquehanna River is located approximately one half mile south of the site as shown by the site maps (Figures 1&2).

The land to the west of the site is undeveloped while the land to the north and east has been developed for industrial use. Loral Corp. (formerly IBM), site number 7-54-006 (Class 4), owns and operates a large facility east of the Hadco facility. In addition, the Broadway Complex, site number 754013 (Class 2a), which is also located immediately east of the Hadco facility is leased by Loral Corp. A complex of buildings referred to as the Victory Plaza is located northeast of the site.

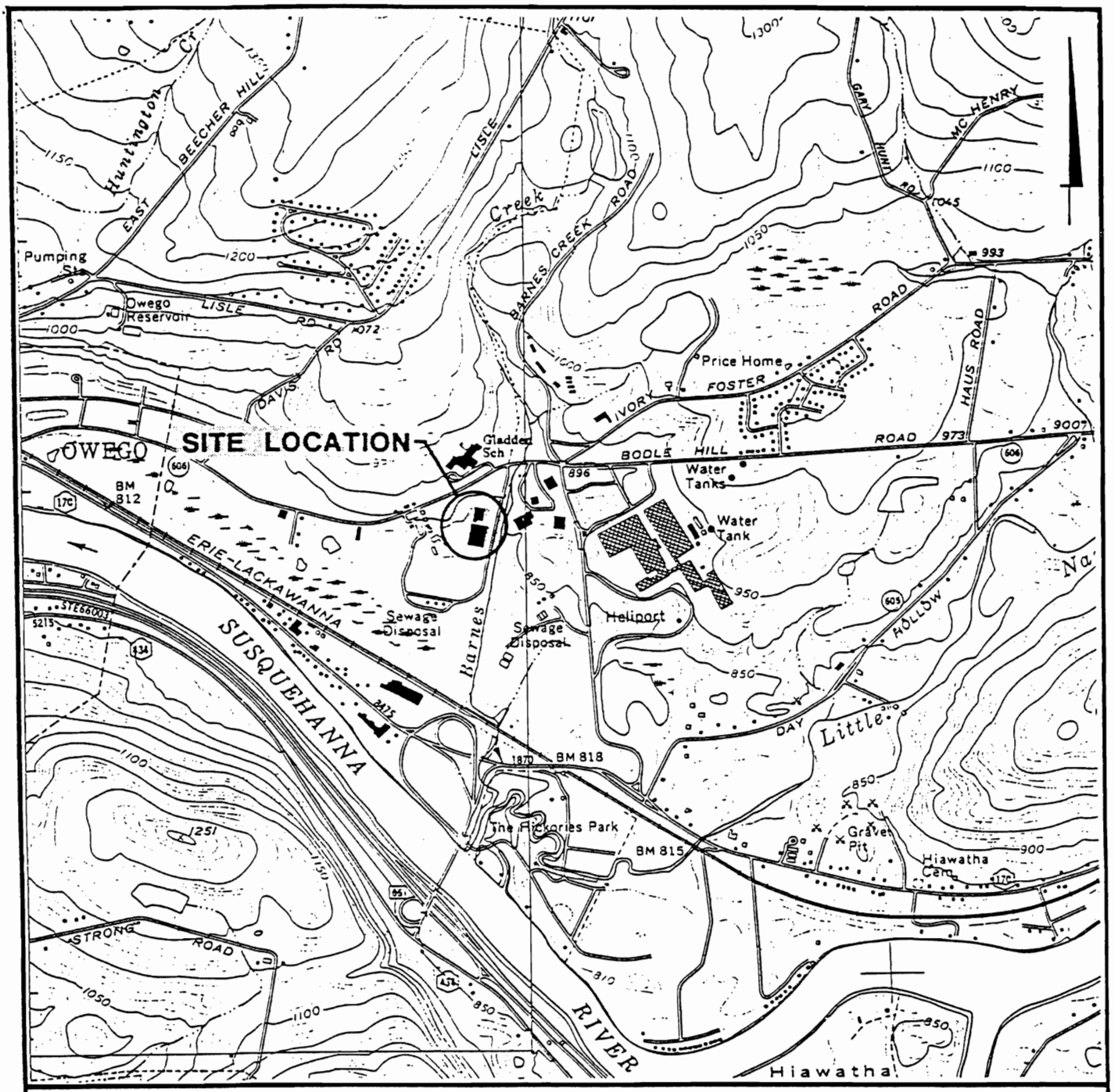
Operable Unit No. 1, which is the subject of this PRAP, consists of the Robintech/Compudyne main plant site. An Operable Unit represents a discrete portion of the remedy for a site which for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the contamination present at a site. A second potential operable unit for this site is described in Section 3.2 below.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The original property was subdivided from the Taylor family farm in 1956 and sold to Mr. George Warneke. He then sold the property to the Owego Development Company which developed this and surrounding properties for industrial use. The property was then leased to Mutual Design which operated the first manufacturing operation at the facility through 1970. The organization which owned and operated this facility from 1970 through 1979

FIGURE 1



HADCO CORPORATION
OWEGO, NEW YORK

CONTOUR INTERVAL = 10 FEET

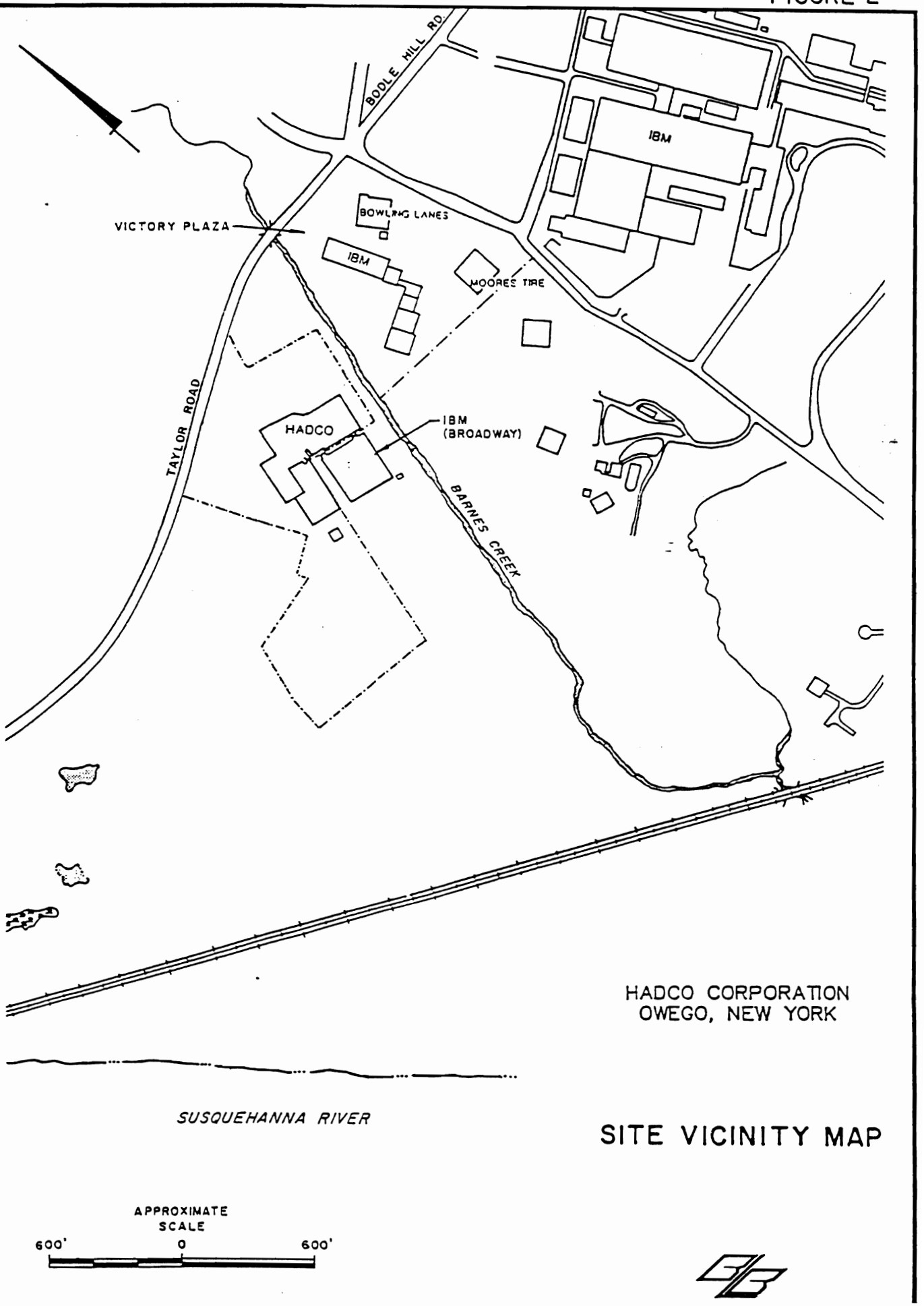
SITE LOCATION MAP

SCALE:

2000' 0 2000'

SOURCE: USGS 7 1/2 MINUTE TOPOGRAPHIC QUADRANGLE:
APALACHIN, NEW YORK, 1973

FIGURE 2


BODLE HILL RD.
IBM
VICTORY PLAZA
BOWLING LANES
IBM
MOORES TIRE
TAYLOR ROAD
HADCO
IBM
(BROADWAY)
BARNES CREEK
HADCO CORPORATION
OWEGO, NEW YORK
SUSQUEHANNA RIVER
SITE VICINITY MAP
APPROXIMATE
SCALE
600'
0
600'

was Robintech, Inc. During this period, Robintech expanded the facility in 1975 and again in 1977. The Robintech facility and the original 3.6 acre parcel of land it occupied were purchased by Hadco in 1979. The size of the site was increased to its current size of 17.3 acres through the purchase of two adjacent parcels of land in 1981 (4.5 acres) and in 1984 (9.2 acres). Since acquiring the site, Hadco has expanded the facility five times, including two expansions in 1983, an addition in 1984, another in 1985 and most recently in 1988. A separate building was also constructed south of the main facility to house an on-site biological wastewater treatment system.

A review of the site history had indicated that there were two areas at the site which were potential sources of hazardous waste to the subsurface environment. These potential source areas included:

- A former Robintech septic system leach field located under the wet process area of the plant, which is no longer considered a source; and
- A former Robintech chemical storage area located under the existing "clean room".

3.2: Remedial History

The previous investigations implemented at the site have included: a Preliminary Site Evaluation; a Phase I Hydrogeologic Investigation; a Phase II Hydrogeologic Investigation; and the performance of an initial RI task associated with the establishment of a site-specific Project Compound List (PCL). As part of these previous programs a network of sixteen monitoring wells was installed at the locations indicated on Figure 2. The analytical results of these previous investigations have shown dissolved volatile constituents in the groundwater underlying this site. The main plant site has been investigated as Operable Unit 1 (OU1) and is the subject of this PRAP.

A possible impact of metals to a wetland immediately south of the facility has been identified. Preliminary work has been performed in an attempt to determine whether Robintech/Compudyne, Inc. is a possible source of the contamination and if other sources exist. If it is confirmed that an impact to the wetlands has occured, then the wetlands will undergo an RI/FS.

SECTION 4: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health or the environment, the HADCO has recently completed a Remedial Investigation/ Feasibility Study (RI/FS).

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

The RI was conducted in two phases. The first phase was conducted between February 1991 and December 1992 the second phase between December 1992 and November 1993. The reports entitled "Remedial Investigation Report, HADCO Corporation, Owego, New York," dated December 1992, and "Supplemental Remedial Investigation Report," dated November 1993 have been prepared describing the field activities and findings of the RI in detail.

The RI activities consisted of the following:

- Geophysical survey to determine depth to bedrock.

- Installation of soil borings and monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions.

- Excavation of test pits to locate underground drainage/ leachfields.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the analytical data obtained from the RI was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Robintech/Compudyne, Inc. site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. For the evaluation and interpretation of soil and sediment analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used to develop remediation goals for soil.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure rates, certain areas and media of the site require remediation
These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb) or parts per million (ppm). For comparison purposes, SCGs are given for each medium.

Soils: A total of 24 soil borings were installed in or near the former chemical storage area to characterize the physical and chemical nature of the subsurface soil. Based on the analytical results of those borings, it was determined that the concentrations of several volatile organic compounds, primarily trichloroethene (TCE, < 1 ppm to 17,000 ppm), 1,1,1-trichloroethane (TCA, < 1 ppm to 210 ppm), methylene chloride (< 1 ppm to 22 ppm), 1,1 dichloroethene (1,1-DCE, < 1 ppm to 45 ppm), tetrachloroehtene (PCE, < 1 ppm to 110 ppm), toluene (< 1 ppm to 200 ppm), and total xylenes (< 1 ppm to 10 ppm), were detected in the soil samples at levels above Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels (TAGM) 4046. The TAGM soil cleanup levels were established based on soil cleanup objectives that will be protective of human health and/or the environment.

The concentrations of most inorganic constituents detected in the soil samples from the former chemical storage area were within the common background range for central New York State. However, the range of concentrations of both chromium (18.8 ppm to 3,490 ppm) and copper (18.8 ppm to 2,680 ppm) were above the common background levels of New York State, which range from 1.5 to 40 ppm for chromium and from 1 to 50 ppm for copper.

Groundwater: The analytical results of the groundwater samples collected from the monitoring wells located on and adjacent to the Robintech/Compudyne site indicate the presence of organic and inorganic constituents at concentrations exceeding NYSDEC Class GA Groundwater standards.

The organic constituents detected in the groundwater samples include a number of halogenated VOCs, principally TCE (< 1 ppm to 630 ppm), TCA (< 1 ppm to 690 ppm), and DCE (< 1 ppm to 23 ppm), and several aromatic hydrocarbons, including toluene (< 1 ppm to 24 ppm), ethylbenzene (< 1 ppm to 2.1 ppm), and xylenes (< 1 ppm to 2.9 ppm). The principal source of VOCs for the groundwater beneath the Robintech/ Compudyne facility appears to be the contaminants in the soil identified near the former chemical storage area. Groundwater samples collected from the shallow overburden

monitoring well located immediately downgradient of the former chemical storage area (MW-19, see figure 3) consistently contained the highest concentrations of TCE (up to 630 ppm). The concentrations of TCE detected in the groundwater samples collected from MW-19 were nearly 50% of the solubility of TCE in water indicating a likely source exists in the ground as a separate phase.The groundwater standard for the above noted VOC compounds is 5 ppb.

Several inorganic constituents (beryllium, 0.0056 ppm to 0.011 ppm; chromium, <1 ppm to 18.1 ppm; copper, <1 ppm to 22.5 ppm; lead, 0.004 ppm to 0.133 ppm; and zinc, 0.01 ppm to 1.628 ppm) were detected in groundwater samples at concentrations which exceed their respective NYSDEC Class GA groundwater standards.The standards for the above noted inorganics are as follows; beryllium 11 ppb, chromium 50 ppb, copper 200 ppb, lead 25 ppb, and zinc 300 ppb.

Surface Water and Sediments: The RI included the collection of surface water and sediment samples from four locations along Barnes Creek for the purpose of evaluating the potential impacts to surface water quality from the Robintech/Compudyne, site. The RI also included the collection of two sediment samples from the wetlands downgradient of the site to evaluate the potential for the site to have impacted these wetlands.

The results of the analyses performed on the surface water and sediment samples indicate that the Robintech/Compudyne site is not adversely impacting Barnes Creek. The concentrations of inorganics detected in the samples collected adjacent to and downstream of the Robintech/Compudyne site are generally consistent with the concentrations detected in the samples collected upstream. With respect to the organic compounds, TCE (<1 ppm) was detected in the upstream surface water sample, indicating a source of TCE upstream of the Robintech/Compudyne site, and only trace concentrations of several volatile constituents were detected in the sediment samples.

The results of VOC analyses performed on the wetlands sediment samples show no indication of the presence of VOCs in the sediment. The results of the inorganic analyses show concentrations of chromium ranging from 683 to 790 mg/kg, copper ranging from 8.3 to 162 mg/kg, and zinc ranging from 48 to 102 mg/kg. Based on these findings, this wetland will be further evaluated as described in section 3.2.

4.2 Interim Remedial Measures:

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

An IRM was implemented at the site in October 1993, to begin remediating VOCs in the groundwater downgradient of the source area. The IRM, which consists of groundwater extraction and treatment as described below, will continue to be operated as part of the final groundwater remedial alternative.

The interim groundwater extraction and treatment system consists of the following:

- Extraction of groundwater from monitoring well PW-3 at a flow rate between 10 to 12 gallons per minute (gpm). The location of PW-3 is shown on figure 4;
- On site treatment of the extracted groundwater using a low profile, shallow tray air stripper with the necessary emission controls; and
- Discharge of treated effluent to the Town of Owego's Publicly Owned

Treatment Works (POTW).

4.3 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at and around the site. A more detailed discussion of the health risks can be found in Section 5.0 of the RI Report.

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

Potential exposure pathways for this site include:

1. Exposure to contaminated on-site soils via dermal contact and the inhalation of organic vapors and/or airborne particulates released from these on-site soils.

   The exposure pathways for on-site soil contamination were considered potentially complete only for on-site excavation workers.

2. Exposure to contaminated grondwater via ingestion, dermal contact, and the inhalation of organic vapors relesed from the grondwater.

   The exposure pathways for grondwater were considered potentially complete only for off-site residents that might use the contaminated grondwater and on-site excavation workers that might encounter contaminated groundwater.

   Downgradient private wells were sampled and no site contamination was detected. Aditional monitoring wells, which will also serve as early warning wells, are planned for installation between the site and the private wells during the investigation of the wetland. The expanded groundwater recovery and treatment provided for in the proposed remediation should effectively contain and clean-up the groudwater contamination and substantially reduce the possibility of any future impact to the private wells. A monitoring program will confirm this.

4.4 Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposures which may be presented by the site. The Habitat Based Assessment included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources. The following pathways for environmental exposure have been identified.

- Barnes Creek was investigated and only trace contaminants were identified (TCE < 1 ppm), therefore remediation will not be necessary.

- A potential impact to the Susquehanna River should contaminated groundwater continue to migrate from this site.

- Elevated levels of inorganics specifically chromium (up to 790 ppm) and copper (up to 162 ppm) have been detected in the regulated wetland located south of the facility. As stated previously, the wetland will be futhur investigated to determine whether the

Robintech/Compudyne site has impacted or has contributed to an impact to this wetland. If an impact is attributed to this site it will be addressed as a separate operable unit.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The NYSDEC and the Hadco Corp. entered into a Consent Order on February 8, 1989. The Order obligates the responsible party to implement a RI/FS remedial program. Upon issuance of the Record of Decision the NYSDEC will approach the PRPs to implement the selected remedy under an Order on Consent.

The following is the chronological enforcement history of this site.

Date	Index No.	Subject of Order
2/8/89	A701518809	RI/FS
3/31/93	A701518809	IRM

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. These goals are established under the overall goal of meeting all standard, criteria, and guidance (SCGs) and protecting human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Reduce, control, or eliminate the contamination present within the soils on site.
- Mitigate the impacts of contaminated groundwater to the environment.
- Prevent, to the extent possible, migration of contaminants in the soil to the groundwater.
- Provide for attainment of SCGs for groundwater quality at the limits of the area of concern (AOC).

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the Robintech/ Compudyne Inc. site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled "Focused Feasibility Study, Robintech/ Compudyne, Inc. Site," July 1994. A summary of the detailed analysis follows.

7.1: Description of Alternatives

The potential remedies are intended to address the contaminated soils and groundwater at the site.

Based on the results of a preliminary screening, the following remedial alternatives for these two media were retained for detailed evaluation:

- Alternative 1: No Action

Capital Cost	$ 0
Annual O&M	$ 150,000
Present Worth	$ 230,000

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. Under this alternative, the site would remain in its present condition, and human health and the environment would not be provided any additional protection.

The no action alternative would not use any remedial technologies for the treatment of soil or groundwater. The site would remain in its current condition, and no effort would be made to change the current site conditions. However, a groundwater monitoring program would be implemented. To effectively monitor the groundwater beneath and in the vicinity of the site, select existing wells would be sampled on a semi-annual basis and analyzed for target compound list VOCs, chromium, copper, lead, and zinc.

- Alternative 2: Groundwater Withdrawal and Treatment

Capital Cost	$ 159,585
Annual O&M	$ 121,248
Present Worth:	$ 2,023,167

This alternative would consist of withdrawing groundwater using extraction wells, pretreating the groundwater on-site and then discharging the treated groundwater to the sanitary sewer for final treatment at the Town of Owego POTW. Under this alternative, existing on-site well PW-3, and downgradient overburden and bedrock wells located near the southern property boundary would be pumped.

- Alternative 3 Soil Vapor Extraction and Groundwater Withdrawal and Treatment

Capital Cost	$ 910,507
Annual O&M	$ 121,248
Present Worth	$ 2,774,089

This alternative would consist of withdrawing, treating, and disposing of groundwater at the Town of Owego POTW; and implementing soil vapor extraction (SVE) technology in the unsaturated zone of the contaminated source area soils. The SVE process induces a negative pressure gradient within the soil through vapor extraction wells. As the induced vacuum moves through the subsurface soils, VOCs at the soil/groundwater interface vaporize, and VOC vapors migrate toward the vacuum extraction well, where they are drawn to the surface and treated or removed with emission controls.

- Alternative 4 Off-site Disposal of Soil at a Permitted Facility and Groundwater Withdrawal and Treatment

Capital Cost	$ 1,553,988
Annual O&M	$ 121,248
Present Worth	$ 3,417,570

This alternative would consist of withdrawing, treating, and properly disposing of groundwater at the Town of Owego POTW (as outlined in Alternative 3) and excavating the contaminated soils located below the clean room to a depth of 10 feet below ground surface. The excavated soil would be diposed of at at an off site facility in accordence with all appicable federal and state laws and regulations.

- Alternative 5: Soil Vapor Extraction, Groundwater Withdrawal and Treatment with Source Control Pumping

Capital Cost	$ 962,507
Annual O&M	$ 144,528
Present Worth	$ 3,183,902

This alternative would consist of withdrawing, treating, and disposing of groundwater at the Town of Owego POTW; implementing SVE technology in the unsaturated zone of the source

area soils; and installing a withdrawal well immediatly downgradient of the source area saturated soils to remove the contamionants by pumping the groundwater in this area.

- Alternative 6: Groundwater Withdrawal and Treatment with Iterative Source Control Pumping

Capital Cost	$	255,675
Annual O&M (Years 0 through 6)	$	123,048
Annual O&M (Years 7 through 30)	$	144,528
Present Worth	$	2,367,952

Remedial Alternative 6 would consist of withdrawing, treating, and disposing of groundwater at the Town of Owego POTW; and implementing an iterative source control pumping program in the saturated zone of the source area soils.

This Iterative Pumping Program (refered to as iterative soil flushing in the referenced documents) is defined as phased groundwater withdrawal from discrete zones within the overburden aquifer immediately downgradient of the contaminated source area. By increasing the rate of groundwater flow through the highly contaminated source area, solubilization and/or dissolution of the chemicals of concern would occur. The compounds of concern would be flushed from the contaminated soil. The contaminated groundwater would be withdrawn by a recovery well and treated. Residual DNAPLs (Dense Non-Aqueous Phase Liquids) present in a particular zone of the overburden aquifer should be effectively removed bythis process.

The pumping would start with the upper portion of the aquifer and continue to lower segment(s). This iterative process would continue until the residual DNAPLs throughout the overburden aquifer have been adequately addressed. An evaluation would be performed to consider whether an expansion of the recovery process would be required to incorporate the bedrock aquifer at a future date.

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

The six alternatives being considered have been restated below as a reference for the following evaluation:

- Alternative 1: No Action
- Alternative 2: Groundwater Withdrawal and Treatment
- Alternative 3: Soil Vapor Extraction and Groundwater Withdrawal and Treatment
- Alternative 4: Off-site Disposal of Soil at a Permitted Facility, and Groundwater Withdrawal, and Treatment
- Alternative 5: Soil Vapor Extraction, Groundwater Withdrawal with Source Control Pumping
- Alternative 6: Groundwater Withdrawal and Treatment with Iterative Source Control Pumping

1. Compliance with New York Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

All of the remedial alternatives (except no-action) would be designed and implemented to meet SCGs. However, complete restoration of the bedrock is technically impracticable using currently available remedial techniques. The development of remedial techniques to address groundwater impacted by DNAPLs is rapidly progressing. It would be recommended that a review of available groundwater remediation techniques be conducted periodically to determine if a remedial technique would be implemented at the Robintech/Compudyne site to achieve SCGs and to cost-effectively reduce the overall time frame for implementation.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assesses whether each alternative is protective.

All of the alternatives, except no-action, would be protective of human health and environment. All of the remedial alternatives, except the no-action alternative, would be expected to hydraulically control the chemicals of concern in the overburden groundwater with the goal to achieve the RAOs off-site and provide removal of the dissolved phase VOCs observed in the bedrock at the downgradient property boundary.

3. Short-term Effectiveness The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared with the other alternatives.

All of the remedial alternatives, except for the no-action alternative, involve some degree of soil excavation or disturbance activities. However, Alternatives 3 through 6 involve more soil excavation activities than Alternative 2 due to implementation of the SVE and pumping systems. Alternative 4 involves significantly more soil excavation activities than the other Alternative because, under Alternative 4, the source area soils would be excavated. Soil alternatives that involve soil excavation activities present a potential for short-term risks to on-site workers due to dust migration and volatilization of chemicals during implementation.

Potential short-term risks, if any, to public health from inhalation of organic vapors associated with the groundwater treatment system, and SVE system would be evaluated during the remedial design. An analysis of the potential air quality impacts, including compliance with 6NYCRR Part 212, would be required and air pollution control system would be installed for the protection of human health and compliance with air emission standards.

Although the duration of the treatment alternatives (Alternatives 2 through 6) cannot be accurately predicted, it is expected that these alternatives would be implemented for a period of time (i.e., greater than 30 years) due to the period associated with the groundwater component of the alternatives. This implementation period would not be expected to decrease appreciably, even if the source area soils were treated using a SVE system or if they were excavated, because the saturated overburden beneath the site would continue to act as a source. Similarly, implementation of source pumping with SVE would not appreciably reduce the implementation period of the groundwater component of Alternative 5 due to the potential presence of DNAPLs and the time period required for successful implementation of the soil flushing technology. Thus, implementation of the alternatives which provide for reduction of

VOC mass within the unsaturated zone of the overburden in the source area (Alternatives 3, 4, and 5), would not be expected to reduce the duration of the groundwater component of these alternatives to less than 30 years.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of alternatives after implementation of the response actions. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

The no-action alternative would not meet RAOs (Remedial Action Objectives) for the Robintech/ Compudyne site. Risks identified in the RA (Risk Assessment) resulting from the chemicals of concern present in the groundwater and source area soils, would not be eliminated or reduced under the no-action alternative. The no-action alternative also allows continued leaching of chemicals of concern to the groundwater. The remaining remedial alternatives would meet the RAOs for the site, except for complete restoration of the bedrock, which is currently considered technically impracticable due to the possible presence of DNAPLs in the fractured bedrock. Each alternative (except Alternative 1- No-Action) involves pumping of the overburden groundwater, which would be expected to reduce downward plume migration into the bedrock, and pumping of a bedrock well located near the downgradient property boundary to remove observed dissolved phase VOCs. There are no known receptors of the bedrock groundwater. Thus, even if complete restoration of the bedrock is not achieved, Alternatives 2 through 6 would be protective of human health.

The installation of a withdrawal well immediatly downgradient from the source saturated soils with pumping just above the bedrock included in Alternative 5 may induce increased mobility of the residual DNAPL which is believed to exist within the source area, thus potentially worsening conditions in the bedrock. However, the iterative groundwater withdrawal at the source area component of Alternative 6 would mitigate the concern of exacerbating the groundwater conditions through the solubilization and removal of DNAPL from the shallow overburden prior to the initiation of pumping from the deep overburden.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

The no-action alternative would not reduce the toxicity, mobility, or volume of the chemicals of concern in site soils. Alternatives 2 through 6 would reduce the toxicity, mobility, and volume of the chemicals of concern in groundwater. Alternatives 3, 4 and 5 would also address the relatively small volume of chemicals of concern in the unsaturated source area soils.

6. Implementability. The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personal and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

All of the remedial alternatives are technically feasible and would be implemented at the site. All alternatives (except no-action) would require performing pump tests on the downgradient pumping wells to estimate groundwater capture zones. Excavation of contaminated soils would require the removal of a portion of a large

building and disruption of the manufacturing activities of the plant, this negative impacts the implementability of this alternative. Treatability testing of the SVE system would be required prior to implementation of Alternatives 3 and 5, based on tightness of soils and the limited area of vadose zone contamination, SVE would not be practicable; and pump testing to assist in estimating groundwater pump rates and capture zones in the saturated overburden source area soils required prior to implementation of Alternatives 5 and 6.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 1.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan are evaluated. A " Responsiveness Summary" will be prepared that describes public comments received and how the Department will address the concerns raised. If the final remedy selected differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PREFERRED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing Alternative 6 as the remedy for this site.

This selection is based upon the comparative analysis of six alternatives:

The no-action alternative (Alternative 1) would not reduce the toxicity, mobility, or volume of the VOCs in groundwater or site soils. Alternatives 2 through 6 would reduce the toxicity, mobility, and volume of the VOCs in groundwater; and Alternatives 3, 4, and 5 would also reduce the toxicity, mobility, and volume of VOCs in the unsaturated source area soils. Alternatives 5 and 6 provide additional reduction of VOCs present in groundwater, compared to Alternatives 2,3, and 4 through the implementation of the source pumping component. Alternative 6 would provide the additional reduction in the toxicity, mobility, and volume while mitigating the concern of exacerbating current groundwater conditions due to potential remobilization of DNAPL.

All of the alternatives except no-action, would be protective of human health and the environment. However, Alternative 6: Groundwater Water Withdrawal and Treatment, and Iterative Soil Flushing would be the most cost-effective alternative capable of satisfying the seven evaluation criteria outlined previously, and meeting the Remedial Action Objectives (RAOs) for the site.

Therefore, Alternative 6 is the proposed remedial alternative for treatment of the chemicals of concern at the Robintech/ Compudyne site (See Figure 4).

The estimated present worth cost to implement the remedy would be $ 2,400,000. The cost to construct the remedy has been estimated to be $ 256,000 and the estimated average annual operation and maintenance cost for 30 years is $ 145,000.

The elements of the selected remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the

construction, operation and maintenance, and monitoring of the remedial program. Uncertainties identified during the RI/FS would be resolved.

2. Pump test to establish optimum pumping rates for the iterative source control pumping system. Groundwater extraction has been estimated at 1 gpm.

3. Iterative source control pumping, which consists of groundwater withdrawal through a well located immediately downgradient of the source area which is designed and operated to increase groundwater flow through the saturated soils beneath the source area. Perfomance criteria will be established for this system during the remedial design phase.

4. Installation of a groundwater withdrawal well(s) at the southern boundary of the site. Prior to installation a pump test will be performed to determine the optimum location and flow rate for the well(s). This well(s) would be operated in conjunction with the existing IRM well and the iterative pumping well to hydralically contain the plume. See Figure 4.

5. Groundwater extracted by the wellswould be pretreated on-site using the existing IRM treatment system, with the necessary air emission controls, and discharged to the POTW at the Town of Owego, in accordance with Hadco's existing POTW discharge permit.

6. After the remediation of the source area overburden saturated soils has been completed, the need and feasibility of remediating the bedrock aquifer would be evaluated.

6. Confirmatory sampling would be performed to determine the effectiveness of the iterative source control pumping sustem and hydralic contaiment of the plume. Groundwater elevation data will also be obtained to verify the effectiveness of the hydralic containment.

7. Since the remedy results in hazardous waste remaining untreated at the site, a long term monitoring program would be instituted. This program would allow the effectiveness of the selected remedy to be monitored. This long term monitoring program would be a component of the operations and maintenance for the site.

TABLE 1 ESTIMATED REMEDIAL COSTS

ALTERNATIVE	CAPITAL COST	ANNUAL O&M	PRESENT WORTH
1- No Action	$ 0	$ 150,000	$ 230,000
2- Groundwater Withdrawl & Treatment	$ 159,000	$ 121,248	$ 2,030.167
3- Soil Vapor Extraction with Groundwater Withdrawl and Treatment	$ 910,507	$ 121,248	$ 2,774,089
4- Off-Site Disposal of Soil at a Permitted Facility and Groundwater Withdrawl and Treatment	$ 1,553,988	$ 121,248	$ 3,417,570
5- Soil Vapor Extraction, Groundwater Withdrawl and Treatment with Source Control Pumping	$ 962,507	$ 144,528	$ 3,183,902
6- Groundwater Withdrawl and Treatment with Iterative Source Control Pumping	$ 255,675	$ 123,048 (Yrs. 0-6) $ 144,528 (Yrs. 7-30)	$ 2,367,952

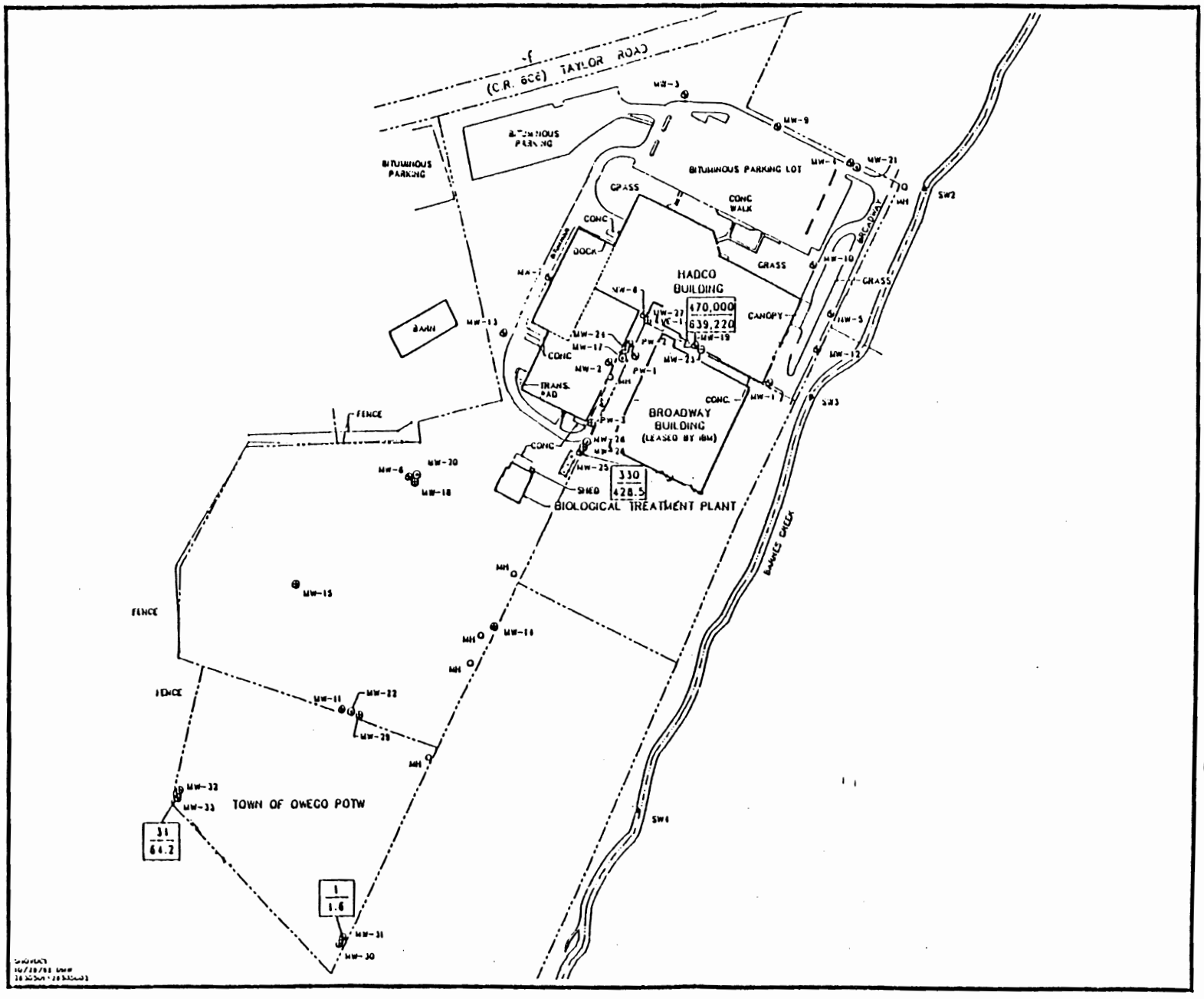


FIGURE 3

LEGEND

- INTERMITTENT STREAM WITH TOP OF STREAM BANKS SHOWN
- SHALLOW OVERBURDEN MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- BEDROCK MONITORING WELL
- SURFACE WATER SAMPLE
- VAPOR EXTRACTION WELL

CONCENTRATIONS (ppb):

330 — TRICHLOROETHENE
428.5 — TOTAL VOCs

HADCO CORPORATION
OWEGO, NEW YORK

DISTRIBUTION OF VOCs IN SELECTED SHALLOW OVERBURDEN GROUND-WATER SAMPLES AUGUST/SEPT. 1992

SCALE
200' 0 200'

BLASLAND & BOUCK ENGINEERS, P.C.

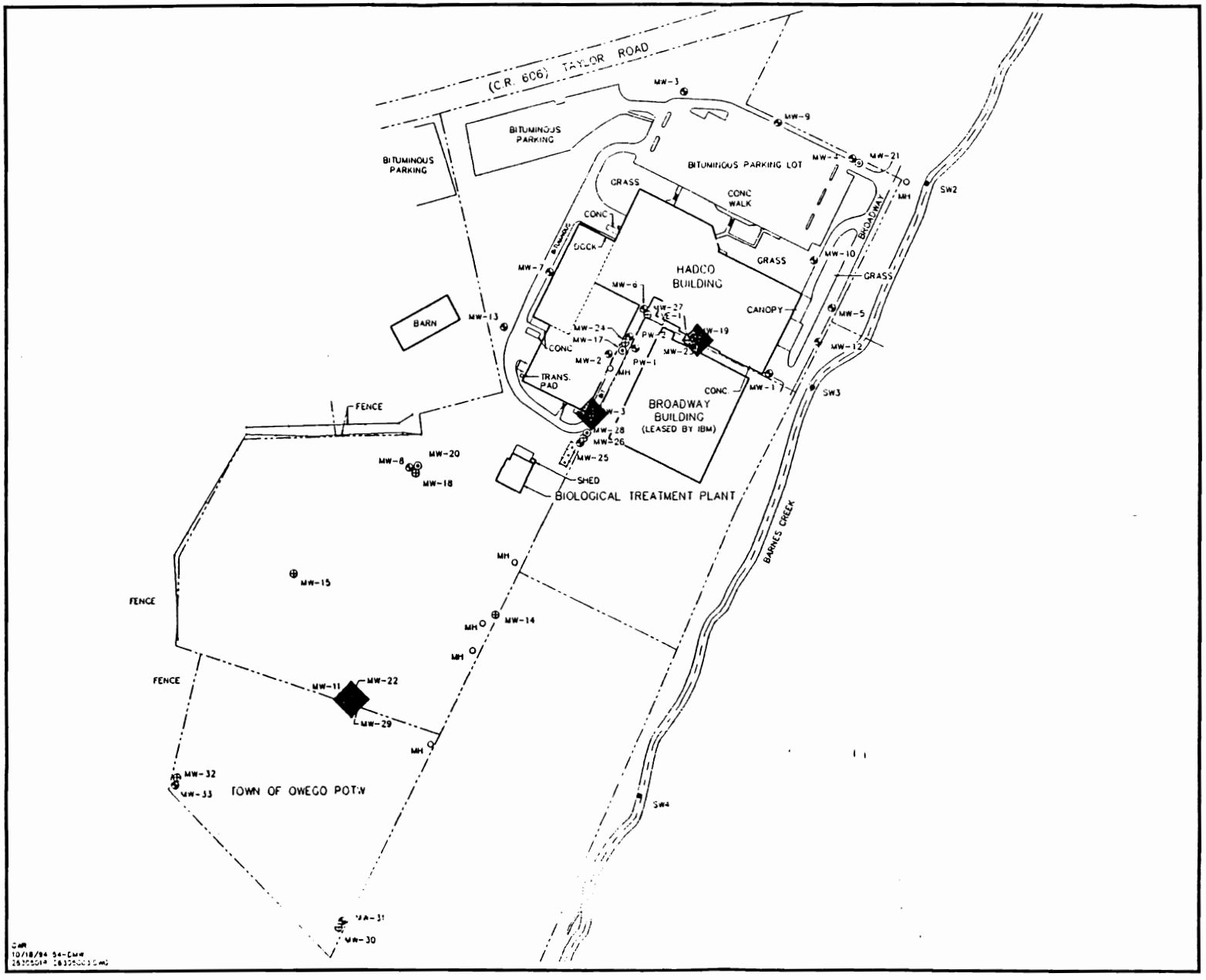


FIGURE 4

LEGEND

- INTERMITTENT STREAM WITH TOP OF STREAM BANKS SHOWN
- SHALLOW OVERBURDEN MONITORING WELL
- DEEP OVERBURDEN MONITORING WELL
- BEDROCK MONITORING WELL
- SURFACE WATER SAMPLE
- VAPOR EXTRACTION WELL
- GROUND-WATER RECOVERY LOCATION

ROBINTECH/COMPUDYNE, INC. SITE
OWEGO, NEW YORK

ALTERNATIVE 6 GROUND-WATER RECOVERY LOCATION MAP

SCALE
200' 0 200'

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS