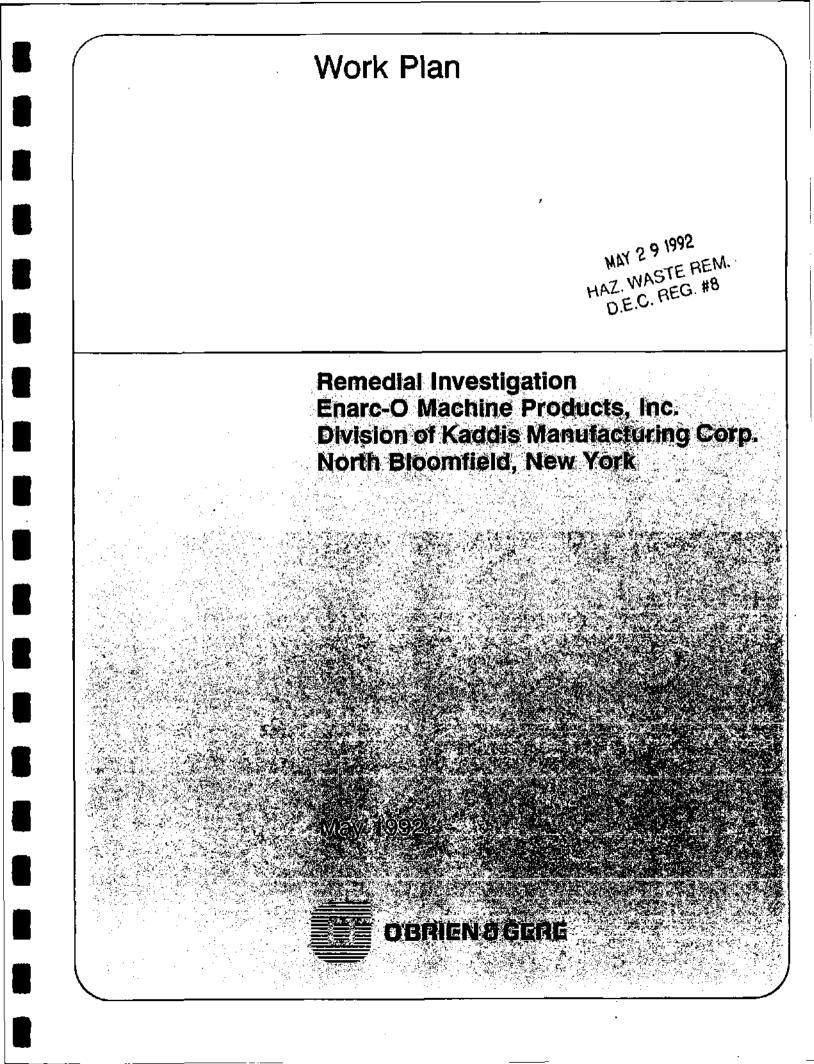
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WORK PLAN

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REMEDIAL INVESTIGATION

ENARC-O MACHINE PRODUCTS, INC. DIVISION OF KADDIS MANUFACTURING CORPORATION

NORTH BLOOMFIELD, NEW YORK

MAY 1992

NAY 29 1992 HAZ WASTE PEN. D.E.C. PEG. #8

O'BRIEN & GERE ENGINEERS, INC. 5000 BRITTONFIELD PARKWAY SYRACUSE, NEW YORK 13221

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FIGURES

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Site Location Map 1

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Site Map Proposed Soil Vapor Investigation Area and Soil Borings

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SECTION 1 - INTRODUCTION

<u>1.01 General</u>

This Work Plan presents the rationale and tasks necessary to complete a Remedial Investigation (RI) at the Kaddis Corporation's Enarc-O facility. In January 1992, Harter, Secrest & Emery, Enarc-O's counsel, received a draft Order of Consent (index #B-8-0112-91-04) from the New York State Department of Environmental Conservation (NYSDEC) for the completion of a Remedial Investigation/Feasibility Study (RI/FS) at the site. The January letter also contained a draft Scope of Work that the NYSDEC suggested be completed as part of the RI. This Work Plan incorporates many of the NYSDEC's suggestions. Once approved by the NYSDEC, this Work Plan will be appended to the Order of Consent presently being negotiated.

1.02 Site History

Kaddis Corporation (Kaddis) owns and operates a metal machining facility, Enarc-O Machine Products, Inc. (Enarc-O), located at 1175 Bragg Street, in the community of North Bloomfield, Town of Lima, Livingston County, New York (Figure 1). This facility is situated approximately one mile southeast of the Village of Honeoye Falls, about 400 feet west and south of Honeoye Creek, at an approximate elevation of 722 feet above mean sea level (MSL). The site encompasses an area slightly larger than six acres in size.

The area surrounding the Enarc-O facility is predominantly residential. The area to the west of the site is agricultural. A small auto repair shop is presently located adjacent and to the south of the Enarc-O property. This shop has reportedly been operating since approximately the mid 1960's. The former residence of Mr. Wesley P. Crane, the founder and previous owner and operator of Enarc-O, is adjacent and to the east of the Enarc-O facility. Mr. Crane initiated operations in the basement of this residence in 1954. In 1955, the operations moved into a double garage on Mr. Crane's property. In 1960, the operations moved onto the current Enarc-O Machine Products, Inc. property.

Plant solvent use at the Enarc-O facility has been limited to a vapor degreasing process which is used to clean oil residues from newly machined parts. This vapor degreasing process takes place within a contained, closed-loop system which circulates cleaning fluids, thus allowing the fluids to be continually reused. Trichloroethylene (TCE) was used in this system from Enarc-O's inception in 1954 until 1980. Between 1980 and 1985, 1,1,1-trichloroethane (TCA) was used in this process. Since 1985, Stoddard Solvent (Kensol 30) has been used. No chlorinated solvents have been used at the facility since 1985. No reported loss of solvents has ever occurred from this system.

On June 18, 1985 a small spill of TCA (approximately 5 gallons) occurred near the facility's above ground TCA storage tank as a result of overfilling of the storage tank by an employee of a solvent supply company (Figure 2). Plant personnel immediately notified NYSDEC, which sent a representative to the spill site. Upon recommendation by the NYSDEC representative, the soils impacted by the chlorinated solvent spill were excavated to a depth of 2 feet, spread out on the southeast corner of the parking area and were frequently raked by Enarc-O personnel to allow volatilization to occur. Shortly thereafter Enarc-O removed the solvent storage tank and discontinued use of chlorinated solvents.

In 1985, the New York State Department of Health (NYSDOH), NYSDEC, and Livingston County Department of Health (LCDOH) collected and analyzed ground water samples collected from the Enarc-O supply well and 35 area residential wells. Analytical results revealed detectable concentrations of volatile organic compounds (VOCs), including TCA and TCE, in the Enarc-O well and 21 of the 35 residential wells. The Enarc-O well showed the highest detectable concentration

of TCA. The sample collected from the Enarc-O well was collected directly from the well using a bailer while the samples at individual residences were collected from available spigots.

As a result of the detection of VOCs in the ground water in the area, bottled water was subsequently supplied to those residences with wells which contained detectable concentrations of VOCs. This supply was continued until a public potable water system was installed in 1988.

1.03 Previous Investigations

In July 1987, the United States Environmental Protection Agency (USEPA) Region II requested that Kaddis develop a site assessment work plan to evaluate the general hydrogeologic characteristics and, in particular, the ground water quality in the vicinity of the property. The USEPA identified specific areas on the Enarc-O property which were to be targeted for investigation. At this time, Kaddis Corporation retained O'Brien & Gere Engineers to prepare a work plan and to implement the site assessment. A work plan dated March 1989 was approved by the USEPA on July 31, 1989 and was incorporated into an Administrative Order on Consent (order) (Index No. II-CERCLA-90204) between USEPA and Kaddis which became effective on September 28, 1989. As part of the site assessment, the following tasks were completed:

Task 1 - Background Information Review

Task 2 - Fracture Trace Analyses and Geophysical Survey

Task 3 - Interim Technical Memorandum

Task 4 - Soil Sampling and Analyses

Task 5 - Ground Water Monitoring Well Installations

Task 6 - Ground Water Sampling and Analyses

Task 7 - Data Interpretation and Report Preparation

The site assessment report completed by O'Brien & Gere was submitted to the USEPA in May 1991 and was subsequently approved in July 12, 1991. This fulfilled the requirements of the order. Specific details about the site assessment are found in the report. The conclusions of the site assessment were as follows:

- The overburden materials at the site ranged in thickness from 10 to 18 feet and were comprised of three distinct units: a surficial sandy deposit with varying amounts of clay, gravel and silt; a clayey silt with occasional pebbles; and a basal clayey material with fragments of the underlying bedrock.
- Bedrock at the site is the Onondaga Formation which is a fine grained, grey limestone with chert deposits.
- 3. The primary joint fractures in the bedrock trended N 20 to 60 degrees west with a secondary lineation trend of N 40 to 50 degrees W. The secondary lineation appears to control the stepped nature of the Honeoye Creek channel.
- 4. Ground water was not encountered within the overburden material on the site, but occurred between 4 and 12 feet below the bedrock surface.
- 5. The ground water flow potential within the bedrock appeared to be towards the north to northwest with an anomalously high water level observed in MW-3.

- 6. The ground water elevation data suggested that Honeoye Creek was losing water to the bedrock on the occasions when ground water elevation data were collected.
- 7. The data collected from the soil borings in the vicinity of B-2, B-3, and B-4 indicated that soils in this area may be contributing to the VOCs observed in the ground water in the on-site monitoring wells.
- Soils from B-1, located in the vicinity of the former gasoline UST, contained toluene and xylene in the upper 6 ft. VOCs were not detected in the deeper samples.
- VOCs were not detected in any the borings installed within the parking lot area (B-5a through B-5e) or B-6, which is adjacent to the storage building (Figure 2).
- 10. VOCs were not detected in the water within the SPDES-permitted drain line.
- 11. VOCs were present in the on-site monitoring wells, with the highest concentrations observed in wells MW-2 and MW-3. The distribution and concentrations of VOCs observed in the on-site monitoring wells suggests that multiple sources may be present in the vicinity of the site.

Following fulfillment of the order, the USEPA relinquished regulatory responsibility to the NYSDEC. In January 1992, Harter, Secrest & Emery, Enarc-O's counsel, received a draft Order of Consent (index #B-8-0112-91-04) from the NYSDEC for the completion of a Remedial Investigation/Feasibility Study (RI/FS) at the site. The January letter also contained a draft Scope

of Work that the NYSDEC suggested be completed as part of the RI. This Work Plan incorporates many of the NYSDEC's suggestions.

1.04 Objectives

The broad project goals of an RI are to provide the information necessary to characterize the site, define site dynamics, and evaluate human health and ecological risks. Specifically, at the Enarc- O site, the objectives for the RI are to further evaluate if ground water in the area is being used for potable water, evaluate possible sources of contamination at the site, evaluate ground water contaminant migration in the bedrock aquifer and assess human health and ecological risks. Should data indicate that unacceptable risks are associated with the site, then a Feasibility Study (FS) will be completed to evaluate remedial options for the site.

SECTION 2 - REMEDIAL INVESTIGATION PLANS & MANAGEMENT

The RI Work Plan is comprised of four separate plans as specified by USEPA's Interim Final Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA 6-89/004 October 1988. The plans are as follows:

- 1. Sampling & Analysis Plan (SAP)
 - 1A. Field Sampling Plan (FSP)
 - 1B. Quality Assurance Project Plan (QAPP)
- 2. Health and Safety Plan (HASP)
- 3. Citizen Participation Plan (CPP)

The SAP is comprised of the FSP and QAPP. The FSP is included in Section 3 of this document and defines the level of effort and specific field and data collection activities to be undertaken during the RI. Included in the FSP is a general discussion of the methods used for drilling, sampling, and other field procedures. The types and numbers of samples to be collected for each matrix are also presented.

The QAPP, HASP, and CPP will be prepared as the first task of the FSP. In general, the QAPP defines the data quality objectives and presents the specific protocols for completing the field work and analytical procedures to be used during the investigation to meet the data quality objectives. The HASP specifies the protective measures to be used by investigators and site visitors to minimize exposure to-materials present at the site. The CPP establishes a framework for coordinating the elements of the site's remedial program with a strategy for public participation.

2.01 Project Management

A project organization chart will be included in the QAPP. In general, James T. Mickam, CPG, Vice President of O'Brien & Gere Engineers will be project officer and Deborah Wright, CPG, will be the project manager. Detailed discussions as to the responsibilities of these individuals as well as other personnel to be involved in the project will be presented in the QAPP.

As part of project management, progress reports will be prepared and submitted monthly to the NYSDEC by the project manager. At a minimum, the progress reports will address the following: (1) status of work at the site and progress to date; (2) problems encountered during the reporting period which affect the project schedule; (3) actions being taken to correct the problems; (4) activities planned for the following month; and (5) changes in key personnel.

SECTION 3- FIELD SAMPLING PLAN

3.01 Task 1 - Preparation of Ouality Assurance Project Plan. Health and Safety Plan and Community Participation Plan

A QAPP will be prepared in accordance with USEPA's Interim Guidelines and Specifications for preparing Quality Assurance Project Plans, QAMS-005/80,1980. The objective of the QAPP is to provide sufficiently thorough and concise descriptions and methodologies of the tasks to be completed during the RI such that the data generated will be of a known and acceptable level of precision and accuracy. The QAPP will set forth specific procedures to be used during well installation, sampling, and other field activities. Additionally, specific analytical documentation and procedures will be defined.

As part of Task 1, a HASP will be prepared by a certified health and safety professional in accordance with 29 CFR 1910. This plan will specify protective measures and procedures to be followed by investigators and site visitors to minimize exposure to site related materials.

A CPP will be developed in accordance with the New York State Inactive Hazardous Waste Site CPP Guidance Document dated August 1988. The plan addresses Enarc-O's and NYSDEC's goal to keep the public informed of site activities as well as meeting regulatory citizen participation requirements and policy.

3.02 Task 2 - Soil Gas Survey Method Testing

A limited soil vapor investigation consisting of up to 30 soil vapor points will be completed at the site. The data will be evaluated to assess whether this method can be used to identify possible source areas of VOC contamination, if any, and to aid in the selection of additional soil borings locations. Due to the fine grained nature of the soils which would limit the migration of soil vapor, this method may not provide useful data regarding the presence of additional source areas. Should the results of the limited investigation indicate that the method is useful, then the soil vapor investigation will be expanded.

To evaluate if the method is effective, a total 10 soil vapor samples will be collected in the vicinity of the former TCA tank as indicated on Figure 3. Should the results of the soil vapor analyses indicate that significant concentrations (ppm range) of VOCs are present, then up to 20 additional soil vapor samples will be collected from the vicinity of MW-2 and MW-3 to assess whether potential soil sources of VOCs are present.

The samples will be collected from a depth of 5 ft below the ground surface using protocols which are acceptable to the NYSDEC as outlined in the QAPP. Analyses will be completed on-site for TCE, TCA and other related break-down products using a portable gas chromatographic (GC) unit. The portable GC will expedite sample analyses so the results can be used to direct the soil gas survey points being completed thereafter. It is recognized that the sample locations will be directed based upon field conditions, soil vapor analytical results, and consultation with the on-site NYSDEC representative.

Appropriate QA/QC will be used including decontamination of field sampling equipment, chain of custody forms, and other field documentation. Analytical QA/QC procedures will include analyses of field blanks, duplicate analyses, syringe blanks, and confirmatory analyses by a NYSDEC certified laboratory. Specific details regarding the sample collection and analyses will be presented in the QAPP.

The collected data will be discussed in the Phase I Remedial Investigation Report and may be used to direct the location of soil borings completed as Task 3 and ground water monitoring wells to be installed as Task 9, if required.

3.03 Task 3 - Additional Soil Borings

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A total of 12 soil borings will be completed at the site and selected soil samples will be submitted for laboratory analyses. Specifically, four soil borings will be located in the vicinity of each of the following areas: 1) former TCA tank, 2) MW-2, and 3)MW-3.

To further characterize potential source areas, one of the four soil borings in each area (B-10/TCA tank, B-14/MW-2 area, and B-18/MW-3 area) will be installed where the soil vapor data indicate the greatest concentrations of VOCs or in the center of each area should the soil vapor data be inconclusive. One selected sample from each boring (B-10, B-14, and B-18) will be submitted to a laboratory for analyses of Target Compound List (TCL) parameters using NYSDEC Superfund protocols.

To further evaluate the horizontal and vertical extent of contamination, the three remaining borings in each area (B-7, B-8, B-9/TCA tank area, B-11, B-12, B-13/MW-2 area, and B-15, B-16, B-17/MW-3 area) will be completed where the soil vapor data do not indicate the presence of VOCs or as indicated on Figure 3. One soil sample from each boring will be submitted for analyses of VOCs according to NYSDEC - Analytical Services Protocol (ASP). The resulting data will be validated. The location of the borings may vary based upon findings of Task 2 (Soil Gas Survey Method Testing) and will be agreed upon in the field by the on-site NYSDEC representative.

The test borings will be advanced using hollow stem auger drilling methods. Continuous split spoon soil samples will be completed to the top of bedrock or auger refusal per ASTM method D-1586-84. The drilling rig and split barrel samplers will be decontaminated as specified in the QAPP. Upon completion, each borehole will be grouted to the surface with a cement/bentonite grout.

A list of site indicator parameters will be selected based upon the analytical results of the TCL analyses and previous water analytical data collected at he site. Further analytical work to be

completed as part of this investigation will be based on the site indicator parameters. The list of site indicator parameters will be presented to the NYSDEC as part of Task 7.

3.04 Task 4 - Facility Inspection

An inspection of the Enarc-O facility will be completed to evaluate if solvents could have been lost from the process equipment. The inspection will be completed in the area used for degreasing in addition to other manufacturing areas of the facility.

3.05 Task 5 - Septic Tank Sampling

One sludge sample will be collected for analyses from the on-site septic tank to evaluate if solvents were disposed through the septic system. The sample will be analyzed for TCL parameters in accordance with NYSDEC - Superfund protocols. It should be noted that past experience suggests that the detection limits per ASP protocols will not be met due to matrix interferences (ie, foaming from hand soap, and elevated dichlorobenzene concentrations from urinal cakes, if used at the facility). The sample will be collected in accordance with the specifications presented in the QAPP.

3.06 Task 6 - Residential Well Inspection and Borehole Logging

A residential well survey will be conducted to identify wells within one-quarter mile hydraulically upgradient of the facility and 1 mile hydraulically downgradient of the facility. Data regarding the present use of the well, depth, water quality, accessibility, location and other related information will be obtained from either the appropriate government agencies or conversations with the homeowners. Based on the well survey information, five residential wells, in addition to the on-site supply well, will be selected by OBG, with approval from the NYSDEC, for borehole logging. The data collected will be used to provide information regarding the location and size of fractures (major water bearing zones) and potential contaminant migration pathways.

The occurrence of fractures will be evaluated using caliper logging and temperature logging. Appropriate QA/QC procedures as presented in the QAPP will be followed. The results of the borehole logging will be used to select discreet intervals in each well for the collection of ground water samples to be completed as Task 8.

3.07 Task 7 - Phase I Remedial Investigation Report

Following completion of Tasks 1 through 6, a Phase I RI Report will be prepared which describes the methods, investigation procedures, results and observations. The report will include the data collected including analytical data, well logs, chain of custody forms, data validation and other appropriate documentation. The data will be presented in an appropriate format and will include figures, tables and appendices.

The report will provide the rationale for the location and approximate depths of additional monitoring wells that may be installed at the facility. Additionally, a list of site indicator parameters will be selected based upon the analytical results of the TCL soil analyses completed in Task 3 and previous analytical data collected at the site. Further analytical work to be completed as part of this investigation will be based on the site indicator parameters.

3.08 Task 8 - Residential Well Sampling

Ground water samples will be collected from each of the five residential wells and the onsite supply well where borehole logging was completed as part of Task 6. Ground water samples will be collected from two discreet intervals where the borehole logging data indicated the presence of fractures (major water bearing zones).

The samples will be collected using an inflatable packer system per the protocols presented in the QAPP. The samples will be analyzed for site indicator parameters. QA/QC samples including a trip blank, field blank and a field duplicate will be collected as outlined in the QAPP.

3.09 Task 9 - Additional Ground Water Monitoring Well Installation and Sampling

The exact location, depth, and number of ground water monitoring wells to be installed as part of this investigation, if any, will be assessed based on the findings of Tasks 1 through 6 and as specified in the Phase I RI Report completed as Task 7.

Should additional ground water monitoring wells be deemed necessary, they will be installed in bedrock using air rotary drilling techniques. It is anticipated that well casing will be installed several feet into bedrock. The borehole will be advanced to a depth specified by the supervising hydrogeologist at which time 2-inch I.D. PVC well materials will be installed.

Following installation, each monitoring well will be developed to clear the well of any fine grained sediments that may have accumulated in the wells during construction. The development water will be allowed to drain on the ground surface. The location and elevation of each monitoring well will be subsequently established by a licensed surveyor.

As part of the RI, ground water samples will be collected from the newly installed wells and existing wells on one occasion for analyses of site indicator parameters.

3.10 Task 10 - Surface Water Sampling and Creek/Aquifer Hydraulic Evaluations

Two surface water gauges will be installed adjacent to/or within Honyeoye Creek to evaluate the relationship of surface water elevations to ground water elevations. One gauge will be installed immediately upstream of the site and one gauge will be installed immediately downstream of the site. Subsequent to completion, the surface water gauges will be surveyed to establish their horizontal location and vertical elevation relative to the site datum.

As part of this evaluation, the surface water and ground water elevations will be monitored during a storm event. A pressure transducer system will be used to evaluate the rate and change in water elevations in the ground water and surface water system. The pressure transducer system will be set to record measurements during a one week period in the spring, summer or fall at 0.5-hour intervals. Precipitation data will also be obtained from a local weather station. Monthly water level measurements will be collected from the monitoring wells and surface water gauges for a period of one year to evaluate variations in seasonal ground water flow conditions.

Surface water samples will be collected from Honeoye Creek on one occasion as part of the RI. The data will be used to assess the impact that the site may have on the creek. Two samples (one upstream and one downstream) will be collected during low flow conditions (summer) adjacent to the surface water gauges. The samples will be collected according to the procedures outlined in the QAPP and analyzed for site indicator parameters. Sediment samples will not be collected as the stream channel is comprised of bedrock.

3.11 Task 11 - Ground Water Quality Monitoring

Ground water samples will be collected on a quarterly basis from selected monitoring wells for a period of one year to evaluate the seasonal variation of ground water chemistry. The samples will be collected according to procedures presented in the QAPP and will be analyzed for site indicator parameters selected in the Phase I RI Report and approved by the NYSDEC.

3.12 Task 12 - Risk Assessment

A human health and environmental risk assessment will be will be completed to evaluate the potential adverse effects in receptor human and wildlife populations potentially exposed to chemical residues at or originating from the site. The risk assessment will be conducted in accordance with the latest USEPA guidance documents on preparation of risk assessments (<u>Risk Assessment</u> <u>Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part A) Interim Final,</u> EPA/540/1089/002, and <u>Volume II Environmental Evaluation Manual</u>, EPA/540/1-89/001).

The risk assessment process is organized into four basic sections: data evaluation, exposure assessment, toxicity assessment, and risk characterization.

<u>Data Evaluation</u> - The objective of data evaluation is to evaluate whether the data generated by field sampling and analysis are suitable for risk assessment purposes, and to identify a set of data that are will be used in performing the risk assessment. Based on the evaluation, a set of data that to be used in the risk assessment is developed.

Exposure Assessment - Exposure is defined as the contact of a receptor (humans or wildlife) with a chemical or physical agent. An exposure pathway describes a mechanism by which a receptor may be exposed to chemical or physical agents at or originating from a site. The objective of the exposure assessment is to identify and characterize exposure pathways at the site, and determine or estimate the likely magnitude, frequency, duration and route of exposure of receptors that may be exposed.

Efforts under this task will include the identification of human and environmental receptors in and adjacent to the site. Human receptors in the vicinity of the site will be identified by reviewing well records and potable water intakes to determine ground water and surface water use. Environmental receptors to be identified consist of resident terrestrial and aquatic wildlife; state and federal wetlands; and rare, threatened, or endangered plant and animal species or habitats. The wildlife habitat quality of the site will be evaluated to determine potential wildlife inhabitation of the site.

<u>Toxicity Assessment</u> - The purpose of the toxicity assessment is to weigh available evidence regarding the potential for site related chemical residues of potential concern to cause adverse effects in exposed individuals. In order to achieve this, reference toxicologic information which provides an estimate of the relationship between the extent of exposure and the increased likelihood and/or severity of toxic effects is identified for the chemicals of potential concern. The toxicity values are obtained from USEPA databases such as the Integrated Risk Information System database (IRIS).

<u>Risk Characterization</u> - The purpose of the risk characterization step is to quantify the potential risks to receptors that may result from exposures to on-site chemical residues. Non-carcinogenic health effects are evaluated by comparing calculated intakes with chemical specific Reference Doses (RfD's) established by the U.S.EPA for the protection of human health and aquatic life. For carcinogenic human health effects, the incremental cancer risk associated with exposure to chemicals of concern is calculated using EPA-established slope factors.

3.13 Task 13 - Phase II Remedial Investigation Report

Following completion of the site investigation and risk assessment as outlined in Tasks 1 through 12, a Phase II RI Report will be prepared presenting the results of the work efforts. The report will describe the field sampling activities, hydrogeologic data, analytical data and will include the site risk assessment. The following information will be included:

a summary of environmental conditions, including but not limited to: site drainage, land use, soil contamination, hydrogeologic characteristics and ground water quality, along with any maps, tables, figures, graphics, and any other appropriate means of presenting data;

data collected during the investigations and/or used in preparing the report including but not limited to: soil boring logs, well data, and results of chemical analyses. These said data will be presented in tabulated and/or in graphic form where appropriate.

summary tables of previous analytical data collected at the site;

an evaluation of the areal and vertical extent of contamination in the soil and ground water;

a study of the hydrogeologic conditions at the site;

-

an assessment of the results of the investigation and an evaluation of the current or potential impacts of any threat to the environment or public health;

references to scientific or technical literature used in the preparation of the report; and

recommendations for subsequent investigatory and/or remedial work efforts, if necessary.

Figures

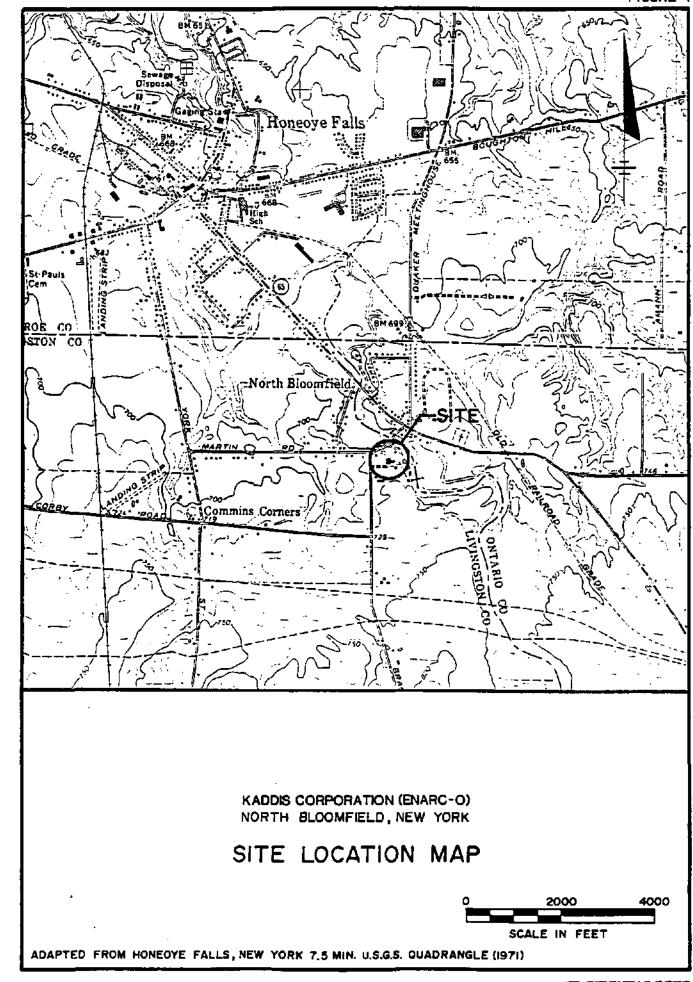
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FIGURE I



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