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NEW YORK STATE SUPERFUND CONTRACT

REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN

Mackenzie Chemical Site

Site No. 152017
Work Assignment No. D002676-30

DATE: September 1998

Prepared for:

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H2M GROUP

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

WORK PLAN

FOR

MACKENZIE CHEMICAL
ONE CORDELLO AVENUE
CENTRAL ISLIP, NEW YORK

NYSDEC SITE NO.: 1-52-017

APPROVED 9/30/98

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1.0 – INTRODUCTION

This work plan outlines the proposed scope of work for the completion of a Remedial Investigation/Feasibility Study (RI/FS) at the Mackenzie Chemical site located at One Cordello Avenue, Central Islip, New York. The Mackenzie Chemical site has been listed by the New York State Department of Environmental Conservation (NYSDEC) in the Registry of Inactive Hazardous Waste Sites in New York State (Site No.: 1-52-017). The site is classified as a Class 2 Site pursuant to the Environmental Conservation Law (ECL) 27-1305.4.b.

The proposed RI will provide data on current site conditions and will identify and delineate potential areas of concerns. Following completion of the RI, the FS will be developed and will recommend remedial measures, where appropriate. The RI/FS process is being conducted by Holzmacher, McLendon & Murrell, P.C. (H2M) under the terms of the New York State Superfund Standby Contract.

1.1 – OBJECTIVES OF THE RI/FS

The overall objectives of the RI/FS are to determine the nature and extent of contaminants on and off of the site. The information gathered during the investigation will be

presented to NYSDEC and used to initiate remedial measures, if an where appropriate. The specific objectives of the RI/FS are as follows:

1. Provide sufficient analytical data on the site so that areas that have been previously identified or suspected as potential source areas of contamination are confirmed or are determined to be either free of contamination or below regulatory levels.

2. If source areas are present, determine the nature, type, physical extent and migratory path of contamination at and/or emanating from the source area(s) so that appropriate remedial measures can be implemented.

3. Determine the impact of contamination quantified on human health and the environment.

4. Document areas that are free of contamination or are already properly remediated.

5. Present and discuss the data necessary to support the development of remedial measures and appropriate Interim Remedial Measures (IRMs).

6. Identification and screening of remedial technologies.

7. Screening and development of remedial alternatives.

Analytical data will be collected to achieve these objectives using methods in accordance with NYSDEC protocols. All soil and groundwater samples will be analyzed by approved methods subject to the December 1991 NYSDOH Analytical Services Protocol (ASP). The investigation will draw upon data acquired in previous investigations conducted at the site as well as the new data acquired during this study to the maximum extent possible.

In addition to this RI/FS Work Plan, IRMs may be proposed upon review of preliminary data collected during the RI. If an IRM is proposed, a concise and clear work plan will be prepared prior to implementation.

The potential pathways of contaminant migration are air, soil and groundwater. This RI/FS will concentrate on the soil and groundwater pathways, which have been shown in previous studies to be potentially the most significant pathways at the site. Groundwater monitoring will be utilized to determine if groundwater contamination exists, as well as determine site-specific groundwater flow direction.

The subsequent RI/FS report will be formatted as outlined in the US Environmental Protection Agency (USEPA) Guidance Document, "Guidance on Remedial Investigations Under CERCLA", EPA 540/G-89/004, October 1988 and the draft "Interim Final Guidance for Conducting RI/FS Under CERCLA", EPA October 1988. Development of this RI/FS Work Plan in conjunction with the site-specific Health and Safety Plan (HASP), Field Activities Plan (FAP) and a Quality Assurance Project Plan (QAPjP) are the initial requirements for RI/FS.

2.0 – BACKGROUND

The Mackenzie Chemical site is located at One Cordello Avenue, Central Islip, New York. The site is located within the Town of Islip, in Suffolk County. See Figure 2.1, Location Map. The property, which contains a manufacturing building, storage warehouse and a warehouse/laboratory, is approximately 1.4 acres in size. The property is owned by Asish and Sarita Sen and Azad and Nutan Amand.

Originally owned by Ian Mackenzie, the site was used for the manufacture of various chemical products by Mackenzie Chemical Works, Inc. (MCW). Over the years of operation (1948-1987) numerous spills, explosions and fires occurred at the site. Three of the documented incidents include a methyl ethyl ketone (MEK) spill in 1977, a nitrous oxide release in 1978 and a MEK fire in 1979. MCW was later fined by the Suffolk County Department of Health Services (SCDHS) for the nitrous oxide release in violation of the air pollution laws.

In 1983, a Potential Hazardous Waste Site Preliminary Assessment was completed by NUS Corporation (under contract with the USEPA). NUS recommended that the ongoing cleanup of the site be completed and the threat to the groundwater defined. In 1986, an attempt by NYSDEC to negotiate a Consent Order for the site was unsuccessful.

In 1991, NYSDEC contracted Lawler, Matusky & Skelly Engineers (LMS) to perform a Phase II investigation of the site. The Phase II was completed by LMS in 1993 and included a literature search, site reconnaissance, geophysical survey, soil gas survey, drilling of soil borings and monitoring wells, site survey and the sampling of the groundwater and shallow soils. The findings and recommendations of the Phase II were documented in LMS's Phase II Investigation Report Dated April 1993.

The results of the 1993 Phase II Investigation completed by LMS indicated the presence of moderate levels of tetrachloroethylene (PCE), polycyclic aromatic hydrocarbons (PAHs), phthalatic acid esters (PAEs), N-nitrosodiphenylamine (NNDPA), mercury and lead in the soils

on the site. Scattered areas of the site are also contaminated with gasoline related compounds, phenol, dichlorobenzenes, trichlorobenzene, diesel fuel compounds, 2-nitroaniline (2NA), fluorenone, cobalt, copper, silver and zinc. LMS provided the following conclusions:

- Most of the compounds found in the soils appear to be related to manufacturing activities that occurred on the site.

- The PAH contamination is probably related to the railroad tracks and/or the asphalt company that operated on the site.

- The gasoline contamination is most likely a result of the auto repair business that also operated on site in the past in the vicinity of the former laboratory.

- The highest amount of contamination, which was found in the area behind the manufacturing building, appears to be the result of illegal dumping of waste materials.

- The four soil borings completed on site indicate that contamination tended to decrease with depth.

As part of the Phase II Investigation, a total of five (5) groundwater monitoring wells were installed and sampled. The groundwater results indicated exceedances of groundwater standards for tetrachloroethylene, gamma-BHC, chromium, zinc, sodium, iron and manganese. The metals contamination in the groundwater appears to be associated with particulate matter, and the iron, manganese and sodium contamination is not associated with the site. An underground storage tank that had been excavated and placed in a debris pile at the site was also sampled and found to contain a fuel-related product. The Phase II analytical data have been tabulated and are included in Tables 2.1 through 2.6. In addition, site maps have been generated showing sampling locations (Appendix A).

In July 1993, the Suffolk County Department of Health Services (SCDHS) completed nine hollow stem auger profile wells downgradient of the Mackenzie Chemical site. The major constituents found in the off-site profile wells were 1,2,3-trichloropropane, tetrachloroethene, and trichloroethene.

The 1,2,3-trichloropropane concentrations ranged from non-detect to 7,600 parts per billion (ppb) in Profile Well No. MW-5, a distance of 600 feet downgradient of the Mackenzie property line. Trichloropropane was also detected in Profile Well Nos. MW-1, MW-2, MW-3 and MW-4 as high as 1,300 ppb. Profile Well Nos. MW-1 through MW-4 are located just downgradient of the Mackenzie site. According to the SCDHS, trichloropropane was used and stored (in three 10,000 gallon tanks) at the site.

Tetrachloroethene was also detected in Profile Well Nos. MW-1, MW-2, MW-3 and MW-4 at concentrations ranging from non-detect to 47 ppb. Trichloroethene was detected at 7 ppb in the upper part of the aquifer in Profile Well Nos. MW-1 through MW-4. However, higher concentrations ranging from 21 to 330 ppb were detected in Profile Well No. MW-8, 50 feet and 110 feet below the water table. Profile Well No. MW-8 is located 2,700 feet downgradient of the Mackenzie Chemical. The SCDHS data has been tabulated and included in Table 2.7.

NYSDEC staff has visited the site on three (3) occasions during the last year. DEC staff visited the site on October 29, 1997 for familiarization purposes. An On-site project scoping meeting was held on February 5, 1998 with DEC's Consultant. DEC requested a tenant performing vehicle maintenance at the site to remove junk vehicles, which had the potential of blocking future investigation activities at the site. On May 5, 1998, DEC staff visited the site and the junk vehicles had been removed.

During DEC visits to the site, various solid waste (abandoned storage tanks, piles of used tires, garbage in building, etc.) was observed. If it can be shown that this solid waste is not contaminated with hazardous waste, its cleanup will be pursued with the owner. To this end,

DEC recommends that, in addition to the current approved sampling plan, the following samples be retrieved; at least one liquid (or sludge) sample from each of the storage tanks located in the C&D fill area; a liquid sample from the pile of used tires; and waste samples from storage area(s) containing debris located in various buildings at the site. These samples should be analyzed for RCRA characteristics hazardous waste.

A project scoping visit was held on February 5, 1998 with representatives from NYSDEC, LMS, H2M, SCDHS and the Town of Islip. A new lock was placed on the entrance gate to facilitate access during field activities. The Town of Islip representative requested that the tenants of the facility, operating the vehicle repair shop, remove the vehicles, boats, etc., since they were in violation of the zoning law. During the initial site visit, a large C & D pile of debris with two large storage tanks and a pile of used tires were noted. Subsequent to this site visit, the NYSDEC staff visited the site on May 5, 1998. Most of the vehicles and boats had been removed. Approximately 100 five gallon pails of asphalt sealer were found in the buildings.

3.0 – TECHNICAL WORK PLAN

3.1 – WORK PLAN APPROACH

The following scope of work has been developed to further characterize and evaluate the environmental conditions in the on- and off-site areas immediately surrounding the site. It will incorporate existing data, publicly available data, and data acquired through the RI field work. The data will be used to evaluate the potential risks to human health, evaluation of potential risk to the environment, and prepare a Feasibility Study (FS). This RI/FS Work Plan outlines field investigation procedures and methodologies; QA/QC; HASP; and the Citizen Participation Plan (CPP).

The RI has been designed using a multi-tasked approach to allow for the collection of data to adequately characterize the site during a single field mobilization. These tasks include:

1. File Review – Review of local regulatory files will allow for the potential identification of previously unidentified source areas.

2. Base-Map Development – A detailed base map showing specific site topography and features will be prepared to allow for the accurate placement of soil borings and groundwater sample points.

3. Surface Soil Samples – Twenty-one (21) surface soil samples will be collected and analyzed to assist in preparation of the human health assessment.

4. Drainage Structure Sampling – To evaluate the chemical and physical nature of the sediments in the bottom of existing and former on-site drainage structures (drywells, cesspools, waste lagoon, etc.), 12 soil borings will be completed through the drainage structures, inside the facility building and on LIRR property.

5. Off-Site Vertical Profile Wells – To determine both the horizontal and vertical extent of groundwater contamination downgradient of the site, 16 vertical profile wells will be completed using a probing unit.

6. Monitoring Well Installation and Sampling – To further assist in delineating the extent of groundwater contamination, two shallow and deep monitoring well couplets will be installed on site, one shallow and deep couplet will be installed upgradient (off-site) and two shallow and deep couplets will be installed downgradient of the site (off-site).

3.2 – DATA QUALITY OBJECTIVES

The Data Quality Objectives (DQOs) for the RI/FS are to collect data of sufficient quality and quantity for site characterization, hydrogeologic evaluation and risk assessment.

The type of information to be developed from the RI include soil and groundwater quality data, groundwater flow data and geologic data. This data will be used to characterize the nature and extent of on- and off-site groundwater contamination and to perform a human exposure assessment (see Section 4.0). Additionally, the data will be used during the preparation of the RI report and to support the development of the FS. The primary users of the data for this project will be the NYSDEC, NYSDOH and the SCDHS.

This project is being conducted under NYSDEC ASP CLP procedures. As part of these procedures, differing levels of work are defined. For this project, it is anticipated that Level I (Screening) will be used during soil sampling or groundwater monitoring well installation and sampling. Level I includes screening for total VOC vapors, using a Flame Ionization Detector (FID). Field screening results will be utilized for determining soil sampling locations and selection of soil samples to be laboratory tested for select parameters. For the majority of the VOC analyses, an on-site mobile laboratory will be utilized. Appropriate laboratory methods for

inorganics and organics will be used in order to achieve parts per billion (ppb) level detection limits.

The analytical data to be obtained for this project will be analyzed by a NYSDOH certified laboratory and will conform to Contract Laboratory Protocols (CLP). The data will be used for risk assessment, site characterization, evaluation of alternatives and engineering design.

3.3 – PRELIMINARY IDENTIFICATION OF ARARs AND TBCs

3.3.1 – Potential Applicable or Relevant and Appropriate Requirements

The National Contingency Plan (NCP) (50 Federal Register 47912, November 20, 1985) and the Superfund Amendments and Reauthorization Act/Comprehensive Environmental Response, Compensation and Liability Act (SARA/CERCLA) Compliance Policy Guidance define applicable requirements as the Federal and State requirements for hazardous substances, which would be binding at the site. Relevant and appropriate requirements, which are defined as applicable, apply to facilities or problems similar to those encountered at this site; therefore, their use is well suited. With respect to the selection of remedial alternatives, relevant and appropriate requirements are to be afforded the same weight and consideration as applicable requirements. The list of Federal and State ARARs for the RI is included as Appendix B.

3.3.2 – Potential "To Be Considered" Material (TBCs)

When ARARs do not exist for a particular chemical or remedial activity or when the existing ARARs are not protective of human health or the environment, other criteria, advisories and guidance may be useful in designing and selecting a remedial alternative. The TBCs for the RI are also listed in Appendix B.

3.4 – POTENTIAL CONTAMINATION MIGRATION PATHWAYS

As discussed in Section 2.0, the chemical compounds present in the soils and groundwater on and off site have been identified by the previous sampling and analysis effort. Therefore, potential contamination migration pathways can be assessed.

Previous investigations performed at the site identified the following principal areas of concern:

- Soil contamination (tetrachloroethylene, PAHs, PAEs, NNPDA, mercury and lead) appears to decrease in concentration with depth.

- The most heavily contaminated area is located in back of the manufacturing building along the railroad tracks where illegal dumping was observed over the years.

- The abandoned lagoons contain contaminated water that may act as a source of contamination to the groundwater.

- The groundwater on and off of the facility. On-site groundwater is impacted with tetrachloroethylene, gamma-BHC, chromium, zinc, iron and manganese. Off-site downgradient groundwater contains 1,2,3-trichloropropane, tetrachloroethene and trichloroethene.

The potential pathway for migration of VOCs is downward movement through the vadose zone in a dissolved-phase, due to recharge from precipitation. VOCs in solution which reach the groundwater will move, generally with the groundwater, in the direction of groundwater flow. The VOC-impacted groundwater in the saturated zone flows in a generally south-southeast direction at a velocity typically consistent with the groundwater pore velocity.

Other factors such as adsorption, degradation, and dispersion affect contaminant transport, but to a lesser degree than the advective flow of groundwater. The groundwater quality data collected from the monitoring wells indicates that the both the on- and off-site groundwater contain various concentration levels of halogenated solvents.

3.5 – ON-SITE REMEDIAL INVESTIGATION

Based upon the history of the site operation and VOC contamination, a RI/FS Program has been developed. This program will focus on areas previously identified as being impacted by VOCs, as well as other potential source areas as identified during the file review. In this manner, an evaluation of the nature and extent of contamination of the property will be completed and the need for remedial measure determined.

A detailed description of the site investigation is presented below. All field work will be conducted in accordance with the HASP (separate cover) under the oversight of a qualified hydrogeologist.

The initial RI tasks will allow for the characterization of the nature and extent of on-site contamination in both soil and groundwater during a single field investigation program. It relies heavily on the use of Geoprobe sampling techniques and an on-site mobile laboratory, which can provide near real-time analytical results. Additionally, this approach depends on close communication and coordination between the Department and H2M/LMS in order to make rapid decisions based upon the data. Off-site groundwater issues will be investigated concurrently with the on-site field work.

3.5.1 – Subtask 2.1 – File Review

This subtask will include a review of all reasonably available historic information (i.e., plans, maps, titles, reports, aerial photographs, etc.) for the site. Although the site has been listed by the NYSDEC as a Class 2 inactive hazardous waste site and the Department has conducted

past site visits, additional information may be available that was not uncovered in earlier work. The purpose of this task is to aid in the identification of potential undocumented on-site source areas, as well as aid in determination of the extent of off-site groundwater contamination. The following agencies will be contacted and their available files reviewed:

- Suffolk County Department of Health Services – SCDHS files often contain information regarding the storage and handling of hazardous waste/materials at a facility. Sketches attached to SCDHS' inspection reports may be helpful in determining potential source areas of contamination. Additionally, SCDHS conducted a groundwater investigation (profile wells) immediately downgradient of the Mackenzie Chemical site. The investigation tracked the plume back to the area of Mackenzie Chemical, and was part of the basis for the listing of the site. A full copy of the report will be obtained and reviewed to determine potential scoping of an off-site groundwater investigation.

- Town of Islip Building Department – Files to be reviewed from this department would include all building permits and plans associated with the site. These permits and plans should show the location of any subsurface wastewater disposal systems which would have been present prior to the building being connected to the municipal sewer system.

A well inventory survey will be conducted in the areas downgradient of the site to evaluate the number and location of potential downgradient receptors. The survey will be conducted using the following methods:

- The Region 2 NYSDEC Water Unit will be contacted and their files reviewed to determine the locations of any wells with permitted flow rates in excess of 45 gpm. NYSDEC database of Long Island well completion reports will be accessed to determine if any non-permitted wells have been installed in the past

three years. Additionally, any maps that the Water Unit has on file showing private wells will be reviewed.

- The water distribution maps for the Water District which supplies water to the area will be inspected to determine if any homes in the area of concern do not have a water service and, by inference, are on a private well.

- The groundwater investigation completed by SCDHS will be reviewed to determine if any private wells were sampled during the study.

3.5.2 – Subtask 2.2 – Base-Map Development

A detailed topographic base map of the site and the immediate vicinity with a scale of 1-inch to 50-feet will be developed prior to the initiation of the field sampling activities. It will be scheduled concurrently with the surface soil sampling event. Relevant site and vicinity features such as property lines, fences, structures, roads, fire hydrants, power poles and lines, subsurface utilities, soil piles, drainage basins, cesspools, nearby stormwater drainage basin, storm drains, existing monitoring wells, industrial process lines, truck loading bays, etc., will be accurately depicted on the map. The top of casing elevations of the existing and newly installed monitoring wells will be surveyed to the nearest 0.01 foot. Should this task indicate the presence of undocumented source areas, field investigation subtasks will be modified as warranted, with the approval of the Department, to adequately address these concerns.

3.5.3 – Subtask 2.3 – Surface Soil Sampling

A total of 21 surface soil samples will be collected to investigate potential source areas at the site and to be used during the human health baseline risk assessment. These surface soil samples will be collected and used to determine the risks associated with dermal contact, inhalation and ingestion. Direct push technology (probing) will be used to collect soil samples (0 to 4 feet bgs) at 17 of the 21 locations. Due to limited space inside the manufacturing building,

the remaining 4 surface soil samples will be collected using a hand auger. To assist in collecting soil samples beneath facility buildings, a concrete drill coring device will be used to remove the flooring. All 21 soil samples will be analyzed for TCL VOCs plus trichloropropane (See Table 3.1) by the on-site mobile lab. The proposed surface soil sampling locations are depicted on Figure 3.5.3.

3.5.4 – Subtask 2.4 – Drainage Structure Sampling

The purpose of this task is to evaluate the chemical and physical nature of the sediments in the bottom of existing and former on-site drainage structures (drywells, cesspools, waste lagoons, etc.). Additionally, data including the thickness of impacted sediments will be collected to allow for the scoping of appropriate IRMs. It is estimated that a total of 12 soil borings will be completed through the drainage structures. Additional soil borings may be completed if additional drainage structures are identified during the file review or to fully delineate (horizontally) any contaminated structures. The proposed initial soil boring locations are shown on Figure 3.5.4.

A probing unit will be utilized to conduct a soil boring through the center of eight targeted drainage structures. At each of the eight locations, a total of three soil samples (bottom of structure, 25' bgs and 40' bgs) will be retained for analysis. Two of the three soil samples will be submitted for TCL VOCs plus trichloropropane analysis by the mobile laboratory and one soil sample from each drainage structure will be sent to the analytical laboratory for TCL/Target Analyte List (TAL) analyses by CLP procedures. The TCL/TAL sample will be collected from the area exhibiting the highest concentrations on the flame ionization detector (FID). The TCL/TAL analyses include TCL VOCs, TCL semi-volatile organics (SVOCs), pesticides/PCBs, and TAL metals plus cyanide.

Four additional drainage structure borings will be completed inside facility building and on LIRR property. At these locations, a hand auger will be utilized to collect soil samples. Each of the four hand auger borings will be completed to a total depth of 10 feet bgs. A total of two

TABLE 3.1

SAMPLING SUMMARY
MacKenzie Chemical NYSDEC I.D. No. 152017

TASK ID	NUMBER OF SAMPLES	SAMPLE MATRIX	SAMPLE DEPTHS (ft. bgs.)	TCL VOCs (mobile lab)	CLP LAB - FULL QA/QC[3]			
					TCL VOCs	TCL SVOCc	TCL PEST/PCBs	TAL METALS & CYANIDE
Surface Soil Sampling	21	Soil	0-4 ft.	X				
Drainage Structure Sampling	20 12	Soil Soil	TBD[1] TBD	X	X	X	X	X
Off-Site Vertical Profile Wells	64 6	GW[2] GW	60', 80', 100' & 120' bgs. TBD	X	X	X	X	X
Groundwater Sampling	15	GW	TBD		X	X	X	X

[1] - TBD - To be determined based upon field observations.

[2] - GW - Groundwater

[3] - Analyses to be conducted by CLP Laboratory following full CLP Procedures.

soil samples (5 and 10 feet bgs) will be retained for analysis. One of the samples will be submitted to the mobile lab and analyzed for TCL VOCs, plus trichloropropane, while the other sample will be submitted to the analytical laboratory for full CLP TCL/TAL analyses.

3.5.5 – Subtask 2.5 – Off-Site Vertical Profile Wells

To determine both the horizontal and vertical extent of groundwater contamination downgradient of the Mackenzie Chemical site, a total of 16 vertical profile wells will be completed using a probing unit. Each profile well will be completed to a total depth of 120 feet bgs., if no confining unit (clay layers) are encountered. If no confining unit is encountered, a total of four groundwater samples will be obtained from each profile well (120′, 100′, 80′ and 60′ bgs.). If a confining unit is encountered prior to reaching 120 feet, the deepest groundwater sample will be collected from atop the confining unit. Each of the groundwater samples will be analyzed for TCL VOCs plus trichloropropane by the on-site mobile laboratory. In addition, approximately 10 percent of the samples will be submitted to the analytical laboratory for full CLP TCL/TAL analyses. Locations for 12 of the 16 profile wells are shown on Figure 3.5.5. The remaining four profile wells will be completed to fully delineate the VOC plume, if necessary.

3.5.6 – Subtask 2.6 – Monitoring Well Installation and Sampling

This task includes the installation of 10 new groundwater monitoring wells and the inspection/redevelopment of the 5 existing wells (MCMW-1 through MCMW-5). As part of the RI, we expect to install the following additional monitoring wells:

- One shallow and deep monitoring well couplet north of the LIRR to evaluate upgradient conditions.

- Two shallow and deep monitoring well couplets along the southern perimeter of the site to "fill the gaps" of the existing monitoring wells.

- Two shallow and deep monitoring well couplets downgradient of the site. These well couplets will be located at the middle and forward edge of any plume identified during the vertical profile wells.

The shallow wells will be constructed of 2" PVC and have an approximate depth of 60' bgs (i.e., 10' into the water table). The deep wells will be constructed of 4" PVC and have an approximate depth of 120' bgs.

All investigative-derived waste (IDW) including drill cuttings, will be containerized in 55-gallon drums and disposed of at an approved disposal/treatment facility. If appropriate, the well purge water and development water will be discharged on site, based upon the VOC results from the on-site mobile lab. Concurrently with the preparation of this Work Plan, H2M will complete a cost analysis to determine the most cost effective method of IDW disposal.

Upon completing the new monitoring well installations, the locations and top of casing elevations for the newly installed wells and existing wells will be surveyed to the nearest reference datum to allow for the preparation of an accurate potentiometric surface map of the shall upper glacial aquifer.

Groundwater Sampling

Approximately one week after well development, the ten newly installed and five existing groundwater monitoring wells will be sampled and analyzed for full CLP TCL/TAL analysis by the analytical laboratory.

4.0 – HUMAN EXPOSURE ASSESSMENT PLAN

A Human Exposure Assessment (HEA) will be conducted consisting of five (5) major steps. These are: (1) Data Collection; (2) Data Evaluation; (3) Exposure Assessment; (4) Toxicity Assessment; and (5) Risk Characterization.

Step 1 includes the collection of soil and groundwater data as outlined in the previous sections of this RI/FS Work Plan, as well as the collection of potential human exposure data. The focus of data collection as it relates to the HEA is the development of a site-specific characterization that will allow the exposure assessor to identify potential contaminant migration pathways and possible routes of exposure. Information obtained under this step includes chemical concentration data, population data, background levels of contaminants, and meteorological data. As part of the exposure point assessment, a community well survey will be performed for the area downgradient of the site in order to identify potential receptors of groundwater. The survey will be performed for an area up to 1/2 mile downgradient of the site.

In Step 2, the data obtained in Step 1 undergoes a thorough quality control/quality assurance review to determine data usability. The data usability screening includes evaluation of analytical methods, quantitation limits, tentatively identified compounds, review of background data, and reduction in the number of compounds to be evaluated in the HEA (i.e., selection of indicator chemicals).

Step 3 is the exposure assessment. The major elements of the exposure assessment include characterization of the exposure setting, identification of exposure pathways, determination of exposure point concentrations, and estimation of chemical intakes. The exposure pathways identified for this project will be limited to those related to contaminated groundwater and on-site surface soils. When possible, exposure-point concentrations will be based on the results of the RI sampling. Each of these elements includes both a qualitative and

quantitative evaluation. Groundwater modeling may be required to estimate concentrations of contaminants at exposure points.

Step 4 is the toxicity assessment. The toxicity assessment includes the review of toxicity data sources (i.e., HEAST, IRIS), evaluation of carcinogenic and non-carcinogenic effects, and in some cases, development of toxicity values.

Step 5 is the risk characterization step. Step 5 will only be completed if requested by NYSDEC or the NYSDOH. This step utilizes the data obtained from the exposure and toxicity assessments to quantify potential risks at exposure points. Sub-chronic and chronic risks are evaluated for carcinogenic and non-carcinogenic effects via the estimation of non-cancer hazard indices and cancer risk factors. In addition, a qualitative discussion will be included for chemicals which have limited, or uncertain, toxicity data available.

Figure 4.1 is a flow chart which outlines the steps to be undertaken for the baseline HRA.

5.0 – INTERIM REMEDIAL MEASURES

Interim Remedial Measures (IRMs) are remedial actions that can be taken quickly using proven technologies to remediate a source area prior to finalizing the RI/FS, PRAP and ROD to minimize risk to public health and the environment. One or more previously unidentified sources areas of contamination may be identified at the site based upon the results of the RI.

Based upon the history of the site and similar sites on Long Island, the expected potential source areas include:

- The sediments present at the bottom of the drainage structure.
- Both on-site and off-site groundwater has been impacted with halogenated VOCs. It should be noted that the source(s) of contamination has not been determined.

The RI has been designed to provide sufficient data to support the design and implementation of IRMs for the above-referenced source area types.

5.1 – IRM SCOPING

The expected IRMs for the two source areas include removal and disposal of sediments from the bottom of drainage structures and the operation of the soil vapor extraction system (SVE), soil vapor extraction alone or in combination with air sparging for the halogenated VOC remediation in the unsaturated zone and/or groundwater. Any IRM will consider recycling and/or removal of other than hazardous waste material (i.e., 2 storage tanks on C & D pile, pile of waste tires, debris in building, 5 gallon pails of sealer, etc.).

6.0 – REMEDIAL ALTERNATIVES

The RI/FS report will follow the latest EPA formats as described in EPA guidance documents such as the 1985 "Guidance on RI under CERCLA", the 1988 draft "Interim Final Guidance for Conducting RI/FS under CERCLA" EPA October, 1988, and NYSDEC TAGM HWR-90-4030, "Selection of Remedial Actions at Inactive Hazardous Waste Sites". The report will include discussion of the data from the previous sampling programs as well as the data and analyses performed as part of this RI/FS.

6.1 – REMEDIAL ALTERNATIVES SCREENING

Based on the established remedial response objectives and the results of the RI, the initial screening of remedial alternatives will be performed according to the procedures recommended in "Guidance on FS under CERCLA", "Interim Guidance on Superfund Selection of Remedy", "Interim Final Guidance for Conducting RI/FS under CERCLA", and "Selection of Remedial Actions at Inactive Hazardous Waste Sites".

H2M will make a presentation to the NYSDEC during which preliminary remedial action objectives shall be identified and the development of remedial alternatives will be summarized. The development of alternatives will be performed concurrent with the RI/FS. The following discussion includes identification of alternatives (although the process of identifying and screening potential alternatives will be ongoing throughout the RI/FS, as new technological and/or site-specific data emerge) including:

1. Development of remedial response actions.
2. Identification and screening of remedial technologies and process options.
3. Development and screening of remedial alternatives.

6.1.1 – Development of Remedial Action Objectives and General Response Actions

Based on the data collected in the RI/FS along with other existing data, the remedial action objectives will be developed. Prior to the development of these objectives, any significant site problems and contaminant pathways will be identified. Considering these problems and pathways, the remedial response objectives that would eliminate or minimize substantial risks to public health or the environment will be developed further. ARARs will be refined by considering site-specific conditions. Based on the response objectives, general response actions will be delineated to address each of the site problem areas. These response actions will form the foundation for the screening of remedial technologies. General response actions considered will include the No Action alternative as a baseline against which all other alternatives will be compared.

6.1.2 – Development and Screening of Alternatives

Based on the remedial action objectives and each identified general response action, potential remedial alternatives and their associated containment or treatment and disposal requirements will be identified. A prescreening of potential treatment technologies for suitability, as part of a remedial alternative, will be conducted. Where several process options exist for a particular technology (e.g., rotary kiln, infrared or circulating bed combustion), the process option for which most data exists and whose capacities/constraints most closely match site conditions will be selected for further detailed evaluation. The final selection of a process option will occur following the completion of the RI/FS.

Technologies that could prove extremely difficult to implement, might not achieve the remedial objective in a reasonable time, or might not be applicable or feasible based on the site-specific conditions will be eliminated from further consideration.

Treatment alternatives may be developed in each of the following categories:

1. Destruction: This type of remedy will irreversibly destroy or detoxify all or most of the hazardous waste, and will result in a permanent remedy.

2. Separation/Treatment: This type of remedy will separate or concentrate hazardous waste from the waste stream. The concentrated waste stream can then be further treated or destroyed off site.

3. Control and Isolation: This type of remedy will reduce the mobility of the hazardous waste, but may not significantly reduce the toxicity or volume of the waste. This remedy utilizes site controls to meet cleanup requirements.

4. Off-site Disposal

5. No Action Alternative

The list of potential remedial alternatives developed above will be screened. The objective of this effort is to reduce the number of technologies and alternatives for further analysis while preserving a range of options. This screening will be accomplished by evaluating alternatives on the basis of compliance with ARARs, effectiveness, implementability, and permanence. These screening criteria are briefly described below.

Compliance with ARARs

The data obtained during the RI will be evaluated and compared against ARARs identified in Section 3.3. Alternatives unable to comply with ARARs will be eliminated from further screening.

Effectiveness Evaluation

The effectiveness evaluation will consider the capability of each remedial alternative to protect human health and the environment. Each alternative will be evaluated as to the protection it would provide, and the reductions in toxicity, mobility or volume of contaminants it would achieve. Both short-term and long-term effectiveness will be evaluated. Short-term effectiveness will focus on the construction and implementation period. Long-term effectiveness will concentrate on the period of time after the remedial action is in place and operational.

Implementability Evaluation

The implementability evaluation of the screening process will be used to measure the technical feasibility of constructing, operating and maintaining a remedial action alternative. In addition, the availability of the technologies involved in a remedial alternative will be considered.

Innovative technologies will be considered throughout the screening process if there is a reasonable belief that they offer potential for better treatment performance or implementability, few or lesser adverse impacts than other available approaches, or lower costs than demonstrated technologies.

Permanence

Technologies which provide a permanent remedy shall be considered the most favorable remedy. However, in many cases, permanent remedies are not practicable and may necessitate non-permanent solutions. The screening process will review the benefits and deficiencies associated with the use of permanent and non-permanent remedies.

6.2 – DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES

The remedial alternatives that pass the initial screening will be further evaluated. During this phase, administrative difficulties and costs will be considered for the remaining alternatives. The evaluation will conform to the requirements of the NCP, in particular Section 300.68 (h) and Subpart F. It will consist of a technical, environmental and cost evaluation, as well as an analysis of other factors, as appropriate (including administrative difficulties of implementation). The detailed evaluation will follow the process specified in the "Guidance on FS under CERCLA" as updated in the December, 1986, the July, 1987 Memoranda and "Interim Guidance for Conducting RI/FS under CERCLA", and the May 1990 "Selection of Remedial Actions at Inactive Hazardous Waste Sites".

6.3 – FEASIBILITY STUDY REPORT

A Feasibility Study (FS) report will be prepared to summarize the activities performed in the RI and to present the results and associated conclusions. The report will include a description of the initial screening study process and the detailed evaluations of the remedial action alternatives. The FS report will be prepared and presented in the format specified in "Interim Final Guidance for Conducting RI/FS under CERCLA".

The FS report will include an executive summary describing a brief overview of the FS and the analysis underlying the remedial actions that were evaluated.

The introduction of the FS report will provide background information regarding site location and facility history and operation. The nature of the problem, as identified through the various studies, will be presented. A summary of regional and local hydrogeology conditions, remedial action objectives, nature and extent of contamination, and human exposure assessment addressed in the RI/FS report will also be provided.

Remedial alternatives will be developed by combining the technologies identified in the previous screening process. The results of the initial screening of remedial alternatives, with respect to effectiveness, implementability and cost, will be described.

A detailed description of the cost and non-cost features of each remedial action alternative passing the initial screening will be presented. A detailed evaluation of each remedial alternative with respect to each of the evaluation criteria will be presented. A comparison of these alternatives will also be presented.

7.0 – PROPOSED GENERIC OUTLINE OF RI/FS REPORT

EXECUTIVE SUMMARY

1. INTRODUCTION
   - 1.1 Purpose of Report
   - 1.2 Site Background
     - 1.2.1 Site Description
     - 1.2.2 Site History
     - 1.2.3 Previous Investigations
   - 1.3 Report Organization

2. STUDY AREA INVESTIGATION
   - 2.1 Surface Features (topographic mapping, etc.) (natural and manmade features)
   - 2.2 Contaminant Source Investigations
   - 2.3 Hydrogeological Investigations
   - 2.4 Soil Investigations
   - 2.5 Groundwater Investigations
   - 2.6 Human Population Surveys
   - 2.7 Water Supply Surveys

3. PHYSICAL CHARACTERISTICS OF THE STUDY AREA
   - 3.1 Surface Features
   - 3.2 Surface Water Hydrology
   - 3.3 Geology
   - 3.4 Soils
   - 3.5 Hydrogeology
   - 3.6 Demography and Land Use

9. FEASIBILITY STUDY REPORT
   - 9.1 Site History and Operation
     - 9.1.1 Summary of Previous Site Investigations
   - 9.2 Regional Hydrogeology
   - 9.3 Local Hydrogeology
   - 9.4 Nature and Extent of Contamination
   - 9.5 Remedial Action Objectives
   - 9.6 Development of Remedial Alternatives
     - 9.6.1 Remedial Alternatives Screening
     - 9.6.2 Detailed Analysis of Remedial Alternatives

APPENDICES

A. Boring Logs
B. Hydrogeological Data
C. Analytical Data QA/QC Evaluation Results
D. Risk Assessment Models
E. Toxicity Profiles

8.0 – HEALTH AND SAFETY PLAN (HASP)

The primary health and safety concerns at the Mackenzie Chemical site are: inhalation or dermal-contact exposure to hazardous materials and physical hazards.

1. Inhalation: Ambient air will be monitored using FID during any ground breaking activities. All work will be performed in Level D. Level C (air-purifying respirators) will be considered if ambient air concentrations of VOCs exceed appropriate guidelines.

2. Dermal Contact: Synthetic gloves with low permeability to liquids and regular Tyvek suits will be used by all field staff in contact with on-site soil or water.

3. Physical Hazards: Hard hats and steel-toed safety boots will be mandatory during excavation or drilling activities. Safety glasses will be used during equipment decontamination.

Personnel will adhere to corporate health and safety guidelines during field activities.

A Health and Safety Plan (HASP) has been developed for the implementation of the work plan by H2M personnel (Separate Cover). The HASP establishes a protocol for protecting field personnel and the public from incidents that may arise while performing field activities at the Mackenzie Chemical site. The plan establishes personnel protection standards, mandatory operation procedures and provides for contingencies that may arise while field work is being conducted at the site. All H2M field crews and all subcontractors will be provided a copy of the HASP. In addition, all subcontractors must provide their own HASP or provide written acceptance of the H2M HASP. Any visitors will be required to abide by the procedures outlined in the HASP.

Should contractors wish to follow their own HASP, it must include safety guidelines, contingency plans, a hospital route map and emergency telephone numbers. The HASP must adhere to Federal OSHA and New York State Department of Labor hazardous materials requirements for hazard communication and health and safety and address measures to protect nearby residents.

9.0 – CITIZEN PARTICIPATION PLAN

9.1 – INTRODUCTION

The following Citizen Participation Plan (CPP), affecting the investigation and remediation of the Mackenzie Chemical site, has been prepared specifically for this site. The Mackenzie Chemical site is an inactive hazardous waste disposal site, with the NYSDEC identification number 1-52-017. This plan has been prepared in order to provide a clear set of opportunities and procedures for citizens to receive information about and provide input on the Remedial Investigation and Feasibility Study (RI/FS) and any associated remedial activities which will take place at this site.

The plan seeks to assure an open process for the interested and possibly affected public. This includes public officials at all levels, citizen interest groups, commercial interests, individuals in the area of the site and the media. These parties need to be a part of the decision-making process for this site, and to be informed about on-site activities. It also identifies community officials, groups and individuals who may be affected by or have interest in these investigations, and identifies locations where these parties can obtain additional information about the remedial program for this site. Specific opportunities for public and community input into the decision-making process are indicated.

The CPP is a working document. It can be enhanced to accommodate major changes either in public attitude or in the nature and scope of technical activities at the site. The activities listed below are not intended to be an all inclusive list, but an outline of the activities anticipated to be conducted in coordination with the site investigation and remediation process.

9.2 – DESCRIPTION OF CITIZEN PARTICIPATION ACTIVITIES FOR THE RI/FS PHASE OF THE REMEDIAL PROGRAM

A local document repository will be established, in addition to the ones established at the Department offices at Stony Brook and Albany. From this point on, a copy of the documents relevant to the RI/FS will be placed in the repositories to allow interested citizens and groups to review these documents.

A copy of the RI/FS Work Plan will be placed in the document repositories established for this site. A fact sheet will be sent out to the identified parties detailing the availability of the plan. This mailing will include information about the document repositories, the name and address of the New York State Department of Environmental Conservatory (NYSDEC) Citizen Participation Specialist, NYSDEC Project Manager and NYS Department of Health contact. The area and groups targeted for this initial mailing are identified in Section 9.4. Parties who express an interest in being placed on or removed from this list will be added or removed as requested.

The fact sheet will also be an invitation to a public meeting to present and discuss the objectives and the intended scope of work for the RI/FS. This meeting will be announced by a public notice that will be sent out to the identified media and the mailing list identified in Section 9.4. This meeting will also be announced by a NYSDEC Press Notice.

Additional activities, such as public meeting after the remedial investigation is completed or a fact sheet for any on-site interim remedial measures taken, will be added as appropriate.

9.3 – DESCRIPTION OF CITIZEN PARTICIPATION ACTIVITIES FOR THE PROPOSED REMEDIAL ACTION PHASE OF THE REMEDIAL PROGRAM

Once the RI/FS Report has been received, the NYSDEC will issue a Proposed Remedial Action Plan (PRAP) for the site. This plan will use the information contained in the RI/FS and

evaluate several alternatives to address the contamination at the site. This plan will then propose a remedial action for the site.

A public meeting will then be held to present the RI/FS and the PRAP to the public. This presentation will be followed by a formal question and answer period. Both this meeting and the PRAP, will include information on any interim remedial measures (IRMs) taken at the site. The PRAP will also have a thirty (30) day comment period, during which written comments and questions can be submitted. This meeting will be announced in the same manner as the meeting held on the RI/FS work plan.

After the comment period, a record of decision (ROD) will be issued by the NYSDEC identifying the remedial program selected for the site and the basis for this selection. As part of the ROD, a responsiveness summary will be prepared. This responsiveness summary will include all of the relevant and significant questions and comments received on the PRAP and the Department responses to this input.

The ROD and the PRAP will also be placed in the document repositories for public review. These documents may be distributed more widely if warranted.

9.4 – MAILING LIST

All residences and businesses in the area of the site will receive notifications. This area is bounded on the north by the Long Island Railroad, on the east by Carleton Avenue, on the west by Wilson Boulevard and on the south by St. Johns.

The following presents a summary of the mailing list. Based upon Suffolk County tax maps, the owners of the properties located in the area indicated on Figure 2.1 were included in the mailing list. The mailing list, with the exception of property owners is presented in Appendix C and includes:

- NYSDEC and NYSDOH
- New York State
- Federal
- Suffolk County
- Town of Islip
- Public/Special Interest Groups
- Public Water Districts
- Schools
- Media
- Interested Public

9.5 – DOCUMENT REPOSITORIES

The public is encouraged to review the documents related to the site which are available for public review at the following locations:

Islip Public Library
71 Monell Avenue
Islip, NY 11751
Phone: (516) 581-5933
Hours: M-T: 9-9
Fri. and Sat. : 9-5
Sun. (Oct. – May); 1-5
Sun. (June – Aug.); closed

NYSDEC Region I Headquarters
SUNY Campus
Loop Road, Building 40
Stony Brook, NY 11790-2356
Attn: Joshua Epstein
Phone: (516) 444-0249
Hours: M-F; 9-5

NYSDEC Central Office
50 Wolf Road, Room 242
Albany, NY 12233-7010
Attn: Joseph Peck
Phone: (518) 457-7921
Hours: By Appointment

9.6 – DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND DEPARTMENT OF HEALTH CONTACTS

Public input is important to this project. To send written comments or request additional information, please contact:

NYSDEC Concerns
Joseph Peck
Project Engineer
NYSDEC – Albany
(518) 457-7921

NYSDEC Concerns
Joshua Epstein, Ph.D.
Citizen Participation Specialist
NYSDEC – Stony Brook
(516) 444-0249

NYSDOH Concerns
Geoff Laccetti and Nina Knapp
NYSDOH – Albany
1-800-458-1158
ext. 6305 and 6402

10.0 – MANAGEMENT APPROACH

10.1 – PROJECT STAFFING

10.1.1 – LMS

Mr. Michael J. Skelly, P.E., Manager of LMS' Hazardous Waste & Geology Group (NSPE Grade 9) will be the program administrator for this work assignment. Mr. Skelly will be directly responsible to the NYSDEC for the conduct of the program and will provide overall supervision and guidance of project personnel. He will ensure staff and resources availability for completion of the project, approve assignments, work scopes, budgets and staffing plans and provide technical advice on the project approach.

Mr. Edward A. Maikish, P.E. (NSPE Grade 7), will be the Project Manager for the Mackenzie Chemical site and will be the primary LMS contact for the NYSDEC. Mr. Maikish's responsibilities will include administrative management of the overall project, coordination and review of H2M work efforts and report, and scheduling, tracking, and management of LMS work tasks.

Dr. Bradley C. Williams (NSPE Grade 5) will be the project Quality Assurance Officer (QAO). In this capacity, Dr. Williams will review the site-specific Quality Assurance Project Plan (QAPP), and provide on-going surveillance of project activities to ensure conformance with the QAPP. Dr. Williams is also responsible for reviewing project sampling and analytical procedures to ensure representative sample collection and performance of analytical methodologies within specified criteria.

10.1.2 – H2M

General direction of the field investigation will be provided by Gary J. Miller, P.E., (NSPE Grade 7) who has over 15 years of engineering and project management experience with State and Federal hazardous waste site remedial investigations. Mr. Miller has extensive experience managing various hazardous/industrial waste investigations and remediation projects and has the authority within the firm to commit and apply additional resources to the project as the need arises.

As Project Director (PD), Mr. Miller has primary responsibility for work plan development and implementations of the field investigations, including coordination of support staff, acquisition of engineering or specialized technical support and all other aspects of the day-to-day activities associated with the project. The PD identifies staff requirements, directs and monitors site progress, ensures implementation of quality procedures and adherence to applicable codes and regulations and is responsible for project performance within the schedule and budget.

Michael N. Gentils, C.G.W.P., (NSPE Grade 4) will be the Field Investigation Leader for H2M. Mr. Gentils has provided project management for hazardous waste and hydrogeologic investigation sites located in New York and New Jersey. Mr. Gentils' past project management experience includes remedial efforts at numerous industrial, state and federally regulated facilities associated with improper discharges to soil and groundwater.

The Field Investigation Leader is responsible for on-site management for the duration of all site operations, including the activities conducted by H2M and the work performed by subcontractors, such as well drilling and surveying. The Field Investigation Leader will be on-site during the initiation of all field investigation activities. He will provide consultation and decide on factors relating to sampling activities and changes to the field sampling program if required by NYSDEC.

The Quality Assurance Officer (QAO) for this project will be Richard J. Baldwin, C.P.G. (NSPE Grade 5) of H2M. Mr. Baldwin will be responsible for overall project quality including development of the project QA/QC plans, review of specific task QA/QC procedures, review of subcontractor plan and procedures and auditing specific tasks at established intervals. Mr. Baldwin will be on-site to audit field investigation activities during the installation of groundwater monitoring wells and drywell sampling. The QAO will report directly to the officers in charge of this project and will work independent of the Project Manager's reporting structure.

Michael P. Engelmann (NSPE Grade 1) will be responsible for implementing the day to day field activities. Mr. Engelmann will be providing the Field Investigation Leader with copies of all field documentation and, in coordination with the Project Director, make the necessary field decisions as they are needed. In addition, Mr. Engelmann will serve as the overall Site Safety Officer for the field investigation. (See Figure 10.1 – Project Organization Chart)

10.2 – PROJECT SCHEDULE

A task-by-task schedule for the field investigation as set forth in the Scoping Plan is provided in the Project Schedule. A Milestone Chart is included as Figure 10.2.

In summary, the first week of field activities includes clearing the facility of surface debris and sampling and analysis of 21 surface soil samples. It is assumed that these activities will be completed in three days. Also included as part of Week 1, a base-map of the site will be developed.

Week 2 will include the sampling and analysis of the drainage structures (drywells, cesspools, waste lagoons, etc.) located throughout the site. Eight drainage structure borings will be completed using the direct push technology. Four additional drainage structure borings will be completed inside the facility buildings and on LIRR property using a hand auger. It is estimated that this task will be completed in five days.

Week Nos. 3, 4 and 5 will include the sampling and analysis of 16 vertical profile wells downgradient of the Mackenzie Chemical facility using a probing unit. It is estimated that this task will be completed in 16 days.

Week Nos. 6, 7 and 8 will include the installation of 10 monitoring wells, inspection of the 5 existing on-site monitoring wells, well redevelopment, elevation survey of all wells and sampling and analysis. The 10 newly installed monitoring wells will be 5 shallow and deep well couplets located both on and off site. It is estimated that this task will be completed in 15 days.

10.3 – PROJECT DELIVERABLES

All analytical data will be submitted to Data Validation Services to be validated. Using the Data Validation Reports, a Data Usability Report will be generated. In addition to the Data Usability Report, an Interim Remedial Measure (IRM) Scoping Report will be generated. H2M will prepare a draft Remedial Investigation Report, including a Human Exposure Assessment, for submission to NYSDEC. Upon approval of the draft report by the NYSDEC, H2M will conduct a focused feasibility study and prepare a final RI/FS Report.

10.4 – SUBCONTRACTORS

A total of five subcontractors will be assisting H2M in the site investigation. American Auger and Ditching Company, located in Constantia, New York will be completing the monitoring well installations. Accredited Labs, located in Carteret, New Jersey will be responsible for analytical testing, along with Severn Trent Envirotest, a mobile lab with offices in Westfield, Massachusetts. YEC, Inc., located in Valley Cottage, New York will complete all site surveys and supply accurate site maps. Data Validation Services, located in North Creek, New York will provide all laboratory validation services.

10.5 – MBE/WBE UTILIZATION

To date, H2M has made a good faith effort to obtain MBE/WBE subcontractors for completion of the Mackenzie Chemical project. American Auger and Ditching Co., Inc. and Data Validation Services are New York State Certified Woman Owned Business Enterprise (WBE) and YEC, Inc. is a State Certified Minority Owned Business Enterprises (MBE).

The WBE participation for this work assignment is estimated to be 17% and the MBE participation, 3%.

FIGURES

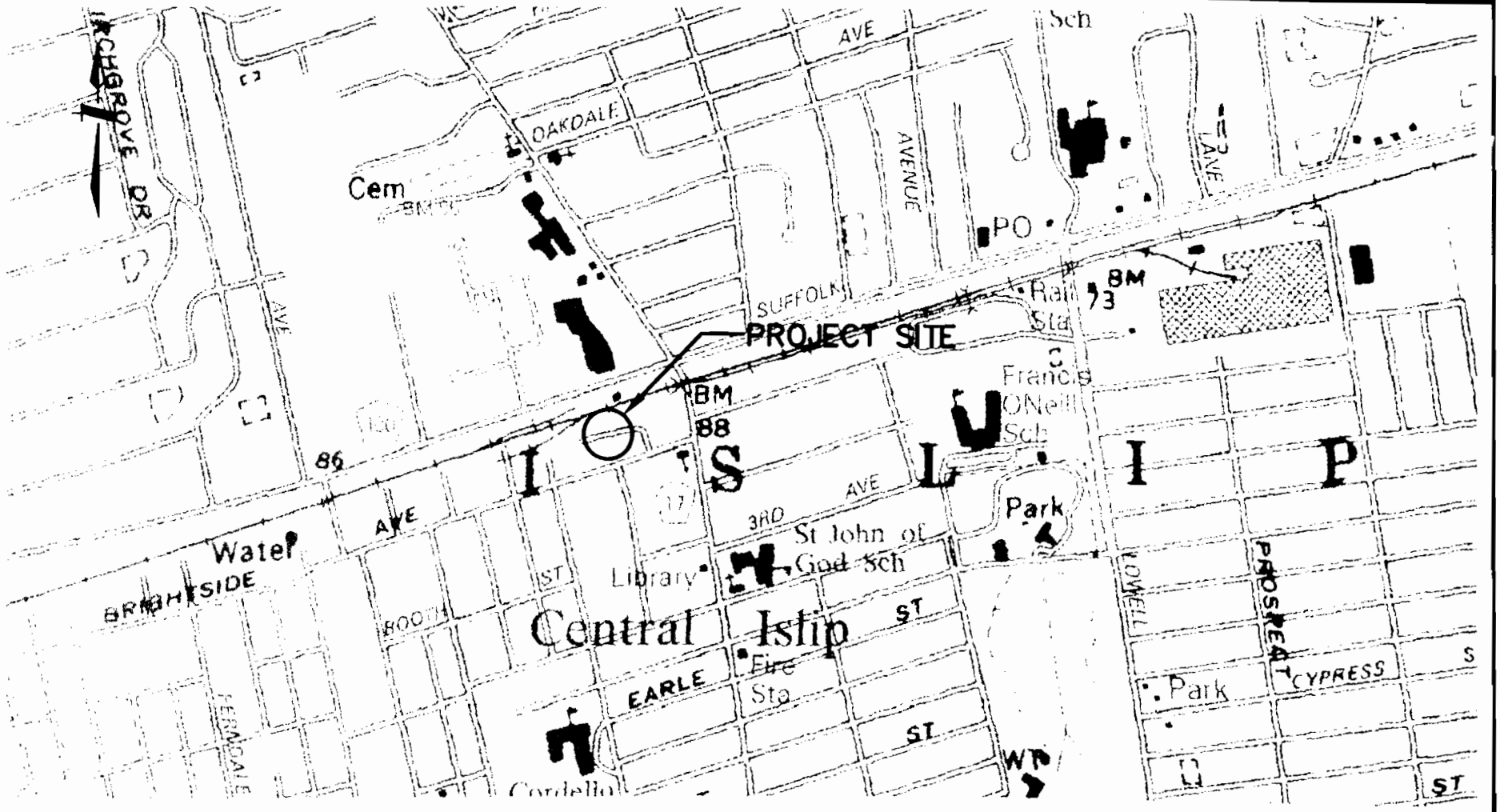

FIGURE 2.1
SITE LOCATION MAP
MACKENZIE CHEMICAL
CENTRAL ISLIP, NEW YORK
NYSDEC SITE No. 1-52-017

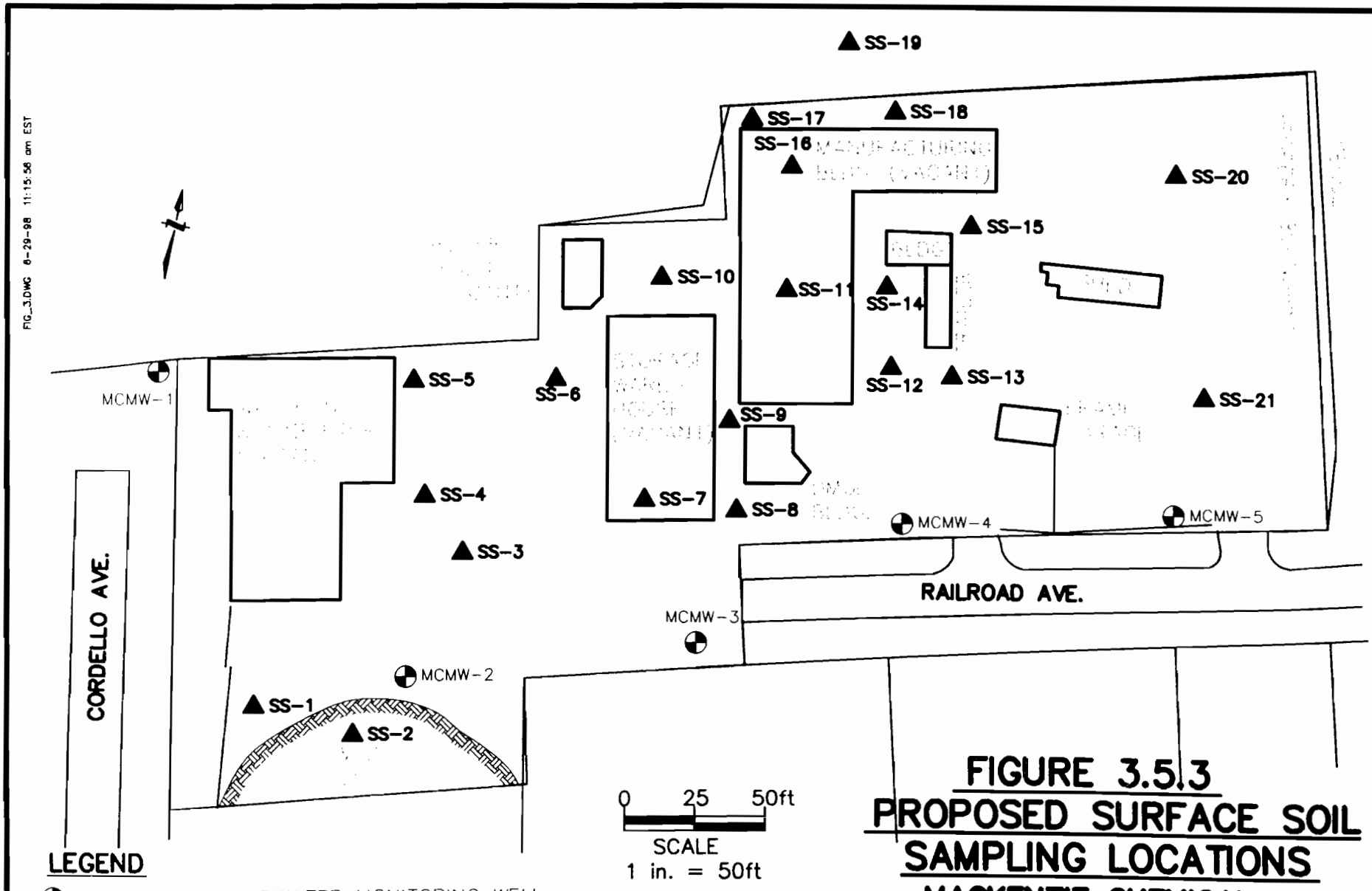

FIGURE 3.5.3
PROPOSED SURFACE SOIL SAMPLING LOCATIONS

MACKENZIE CHEMICAL
CENTRAL ISLIP, NEW YORK
NYSDEC SITE No. 1-52-017

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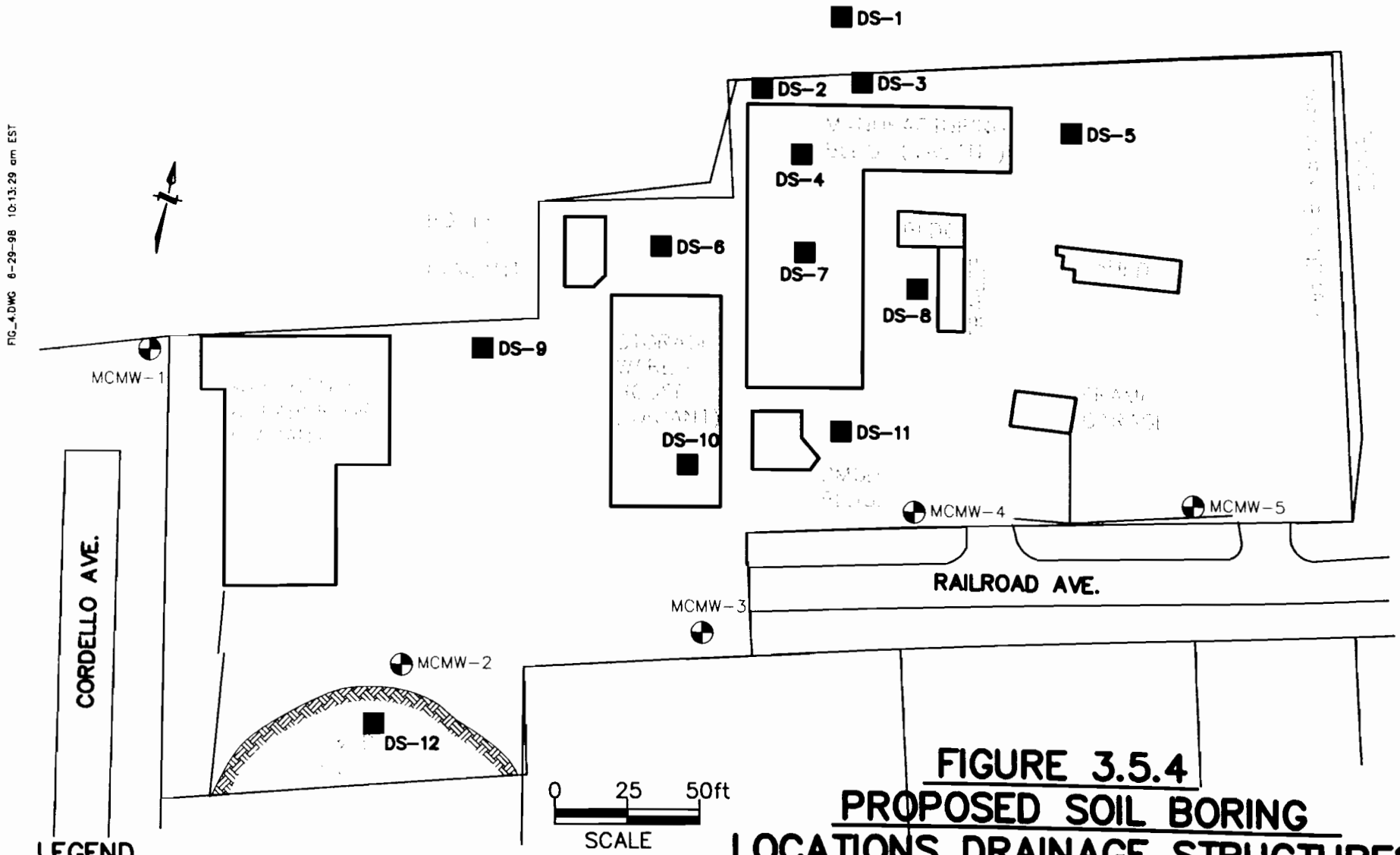
MELVILLE, N.Y. SHELTON, CT. TOTOWA, N.J.



LEGEND

- EXISTING GROUNDWATER MONITORING WELL
- PROPOSED DRAINAGE STRUCTURE SAMPLING LOCATIONS

ADDITIONAL LOCATIONS WILL BE UTILIZED ON ANY ADDITIONAL DRAINAGE STRUCTURE IDENTIFIED AND TO DELINEATE THE EXTENT OF CONTAMINATION.

FIGURE 3.5.4
PROPOSED SOIL BORING LOCATIONS DRAINAGE STRUCTURES

MACKENZIE CHEMICAL
CENTRAL ISLIP, NEW YORK
NYSDEC SITE No. 1-52-017

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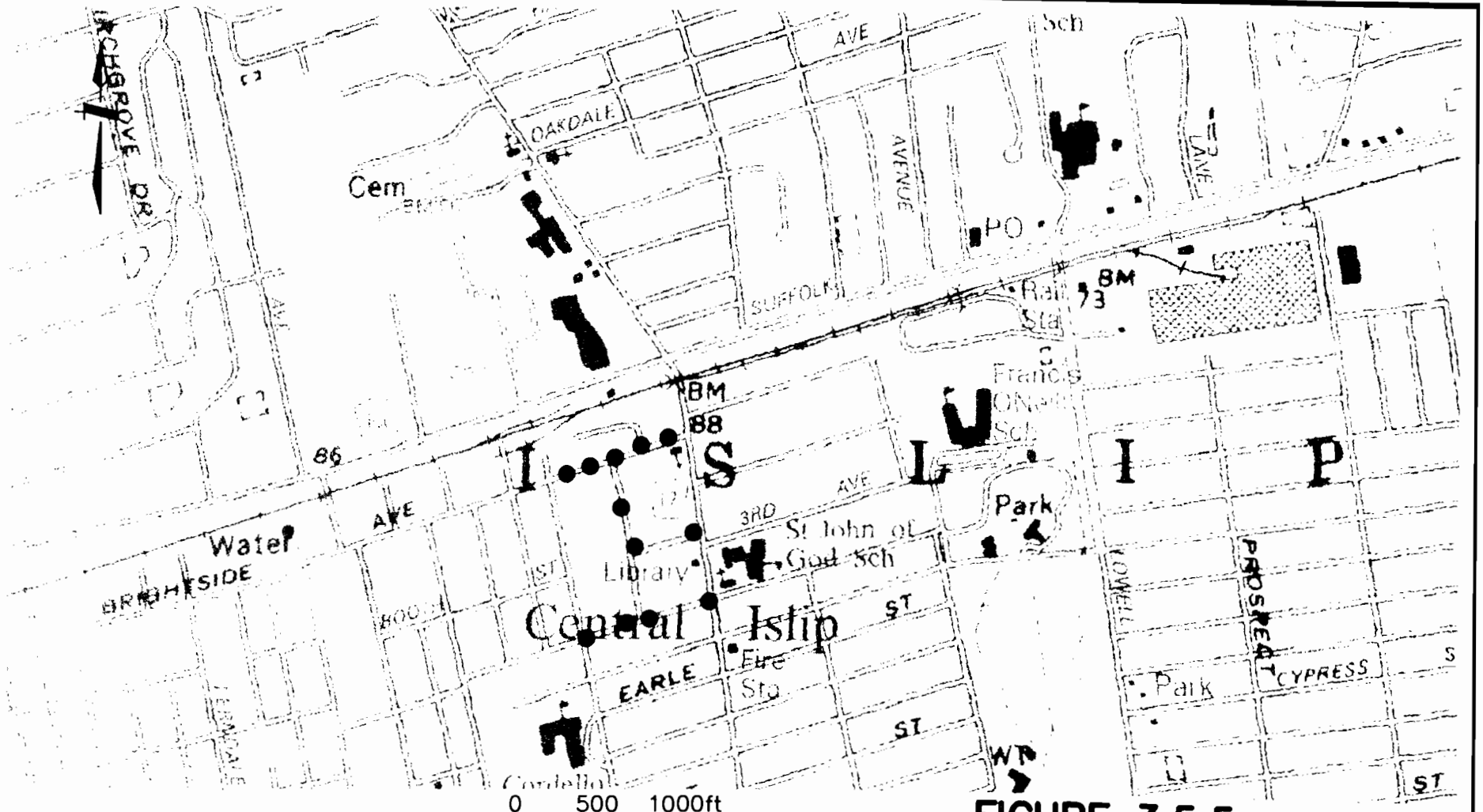

FIGURE 3.5.5
PROPOSED LOCATION OF OFFSITE VERTICAL PROFILE WELLS

MACKENZIE CHEMICAL
CENTRAL ISLIP, NEW YORK
NYSDEC SITE No. 1-52-017

LEGEND

● PROPOSED VERTICAL PROFILE WELL LOCATIONS

NOTE:

AN ADDITIONAL 4 VERTICAL PROFILE WELLS WILL BE COMPLETED TO FULLY DELINEATE ANY VOC PLUME. LOCATIONS WILL BE DETERMINED AFTER COMPLETION.

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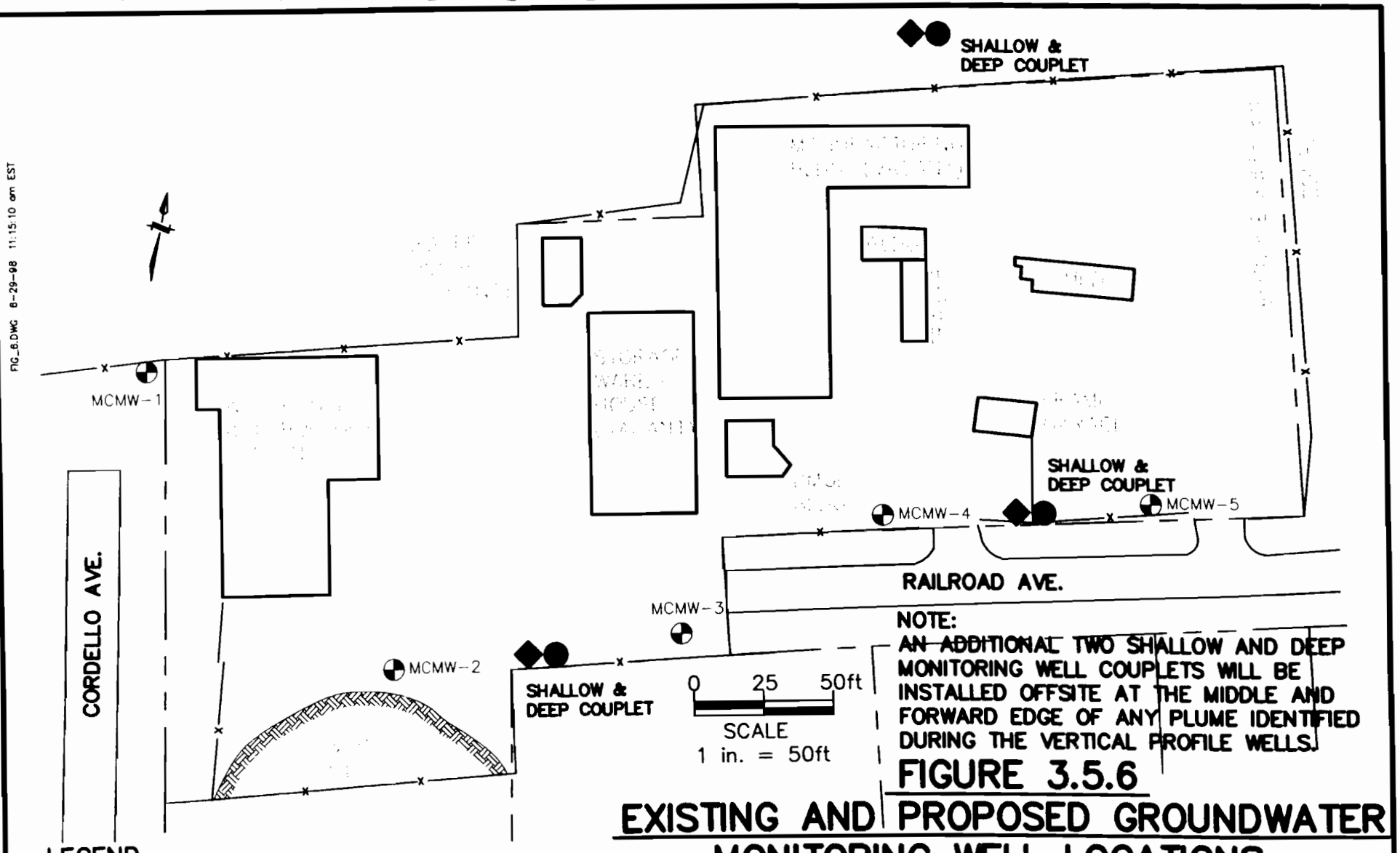

FIG_8.DWG 8-29-98 11:15:10 am EST

NOTE:
AN ADDITIONAL TWO SHALLOW AND DEEP MONITORING WELL COUPLETS WILL BE INSTALLED OFFSITE AT THE MIDDLE AND FORWARD EDGE OF ANY PLUME IDENTIFIED DURING THE VERTICAL PROFILE WELLS.

FIGURE 3.5.6

EXISTING AND PROPOSED GROUNDWATER MONITORING WELL LOCATIONS.

MACKENZIE CHEMICAL
CENTRAL ISLIP, NEW YORK
NYSDEC SITE No. 1-52-017

LEGEND

- EXISTING GROUNDWATER MONITORING WELL
- PROPOSED SHALLOW AND DEEP MONITORING WELL CLUSTER

H2M will also replace any existing on-site monitoring well damaged. Exact cluster locations may be changed pending the results of the drainage structure sampling.

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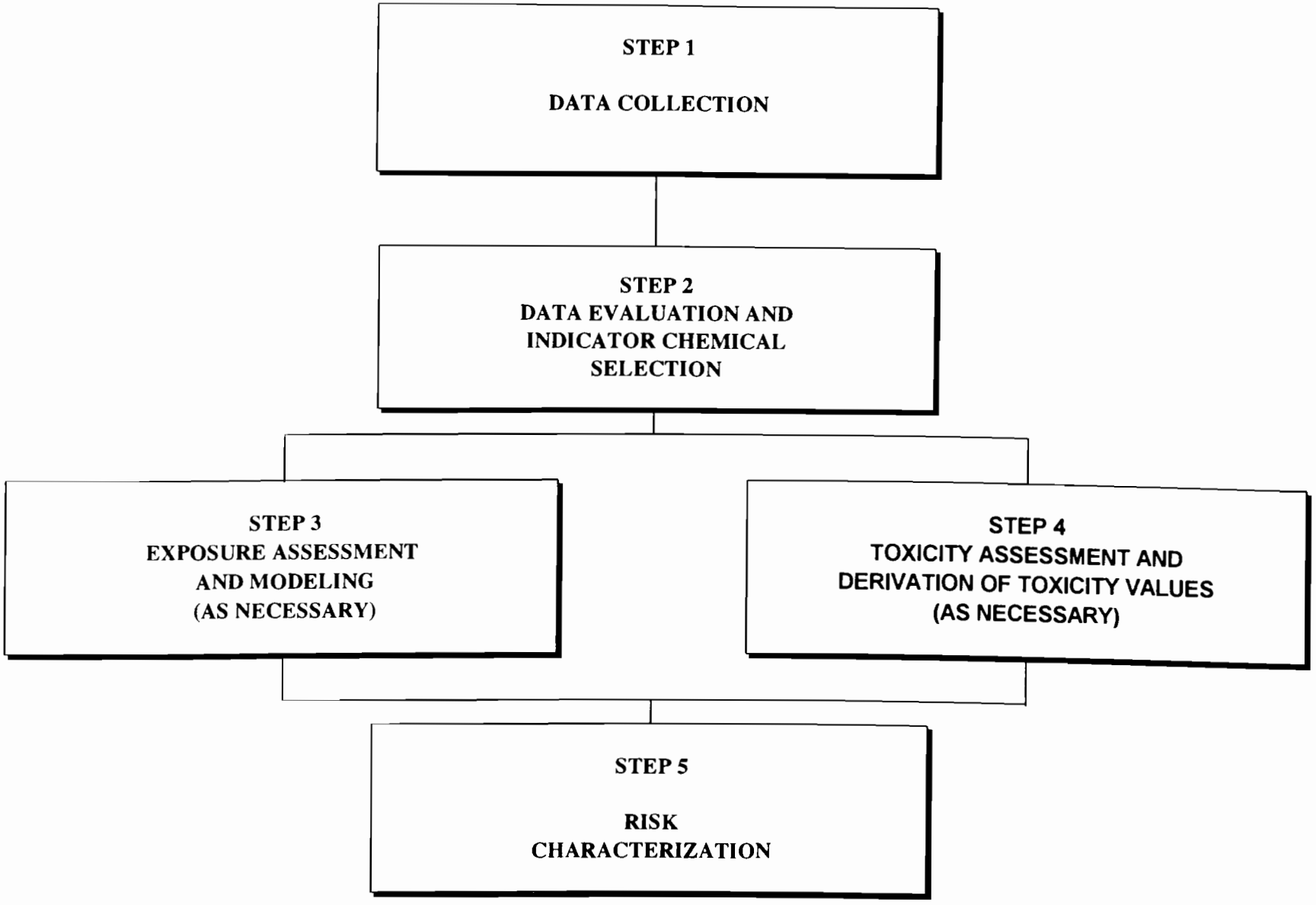


FIGURE 4.1

FLOW CHART FOR HUMAN EXPOSURE ASSESSMENT
MACKENZIE CHEMICAL
CENTRAL ISLIP, NEW YORK

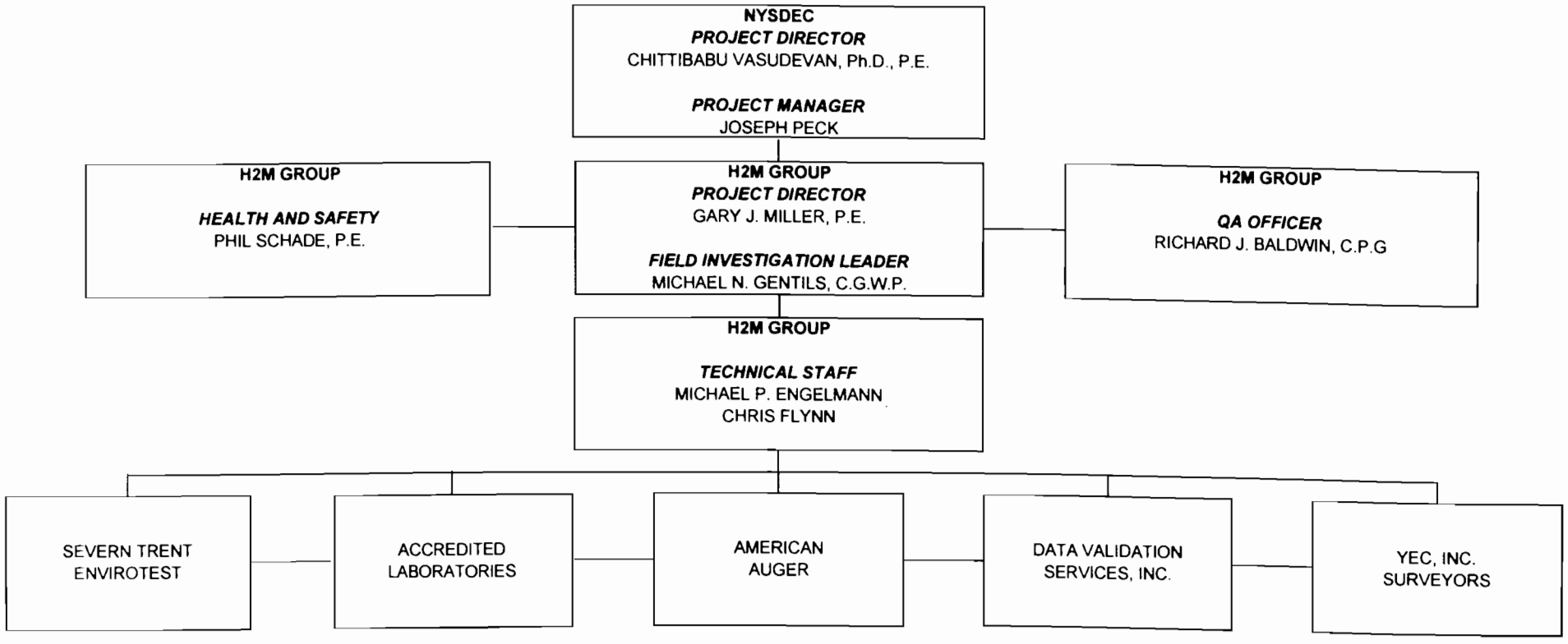


FIGURE 10.1

PROJECT ORGANIZATION CHART
MACKENZIE CHEMICAL
CENTRAL ISLIP, NEW YORK

MILESTONE CHART FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
MACKENZIE CHEMICAL
CENTRAL ISLIP, NEW YORK

ACTIVITY	WEEK STARTING																														
	1 (8-3)	2 (8-10)	3 (8-17)	4 (8-25)	5 (8-31)	6 (9-7)	7 (9-14)	8 (9-21)	9 (9-28)	10 (10-5)	11 (10-12)	12 (10-18)	13 (10-26)	14 (11-2)	15 (11-9)	16 (11-16)	17 (11-23)	18 (11-30)	19 (12-7)	20 (12-14)	21 (12-21)	22 (12-28)	23 (1-4)	24 (1-11)	25 (1-18)	26 (1-25)	27 (2-1)	28 (2-8)	29 (2-15)	30 (2-22)	31 (3-1)
RI/FS Workplan Approved																															
File Review																															
Base Map Development				Field Work Starts 8-17																											
Surface Soil Sampling																															
Drainage Basin Sampling																															
Vertical Profile Wells																															
Installation of Wells																															
Well Sampling																															
Well Surveying																															
Mobile Laboratory																															
Laboratory Analysis																															
Data Validation																															
Usability Report																															
Monthly Progress Reports																															
Execute Citizen Participation Plan		RI/FS Work Plan Public Meeting To Be Determined																							RI Public Meeting - To Be Determinined				PRAP Public Meeting - To Be Determi		
IRM Scoping																				12/11/98											
Draft RI Report																					12/23/98										
Draft Feasibility Study																						01/22/99									
Final RI/FS Report																												02/19/99			

6/30/98,Coshed.xls

TABLES

TABLE 2.1

SOIL GAS DATA SUMMARY (MARCH/MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	SG-19	SG-20	SG-21	SG-22	SG-23	SG-24	SG-25	SG-26	SG-27	SG-28	SG-29
VOLATILE ORGANICS ($\mu g/m^3$)											
Carbon tetrachloride	ND	ND	ND	ND	25	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	520	ND	ND	250	320	380	ND	1,100	1,100	1,300
Trichloroethylene	ND	500	ND	110	260	110	1,100	ND	620	1,100	840
Tetrachloroethylene	ND	6,200	470	900,000	2,800	2,600	28,000	140	1,400	1,300	1,500

ND - Not detected at analytical detection limit (Ref. 6).

TABLE 2.2

MONITORING WELL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCMW-1	RE MCMW-1	MS MCMW-1	MSD MCMW-1	MCMW-2	RE MCMW-2	NYSDEC CLASS GA STANDARDS
VOLATILE ORGANICS (ug/l)							
Methylene chloride	3 b j	2 b j	4 b j	4 b j	3 b j	3 b j	5
Tentatively Identified Compounds	ND	ND	NR	NR	ND	ND	--

PARAMETER	MCMW-3	RE MCMW-3	MCMW-4	MCMW-5	(Blind dup. of MCMW-4) MCMW-6	FIELD BLANK	TRIP BLANK	NYSDEC CLASS GA STANDARDS
VOLATILE ORGANICS (ug/l)								
Methylene chloride	2 b j	3 b j	2 b j	2 b j	2 b j	2 b j	2 b j	5
Tetrachloroethylene	ND	ND	2 j	6 j	2 j	ND	ND	5
Tentatively Identified Compounds								
Propane, 1,2,3-trichloro-	7 j	6 j	ND	ND	ND	ND	ND	50

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

MS - Matrix spike.

MD - Not detected at analytical detection limit (Ref. 76).

NR - Not Run.

RE - Reextracted analysis.

MSD - Matrix spike duplicate.

TABLE 2.2

MONITORING WELL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCMW-1	MS MCMW-1	MSD MCMW-1	MCMW-2	MCMW-3	MCMW-4	MCMW-5	(Blind dup. of MCMW-4) MCMW-6	FIELD BLANK	NYSDEC CLASS GA STANDARDS
SEMI-VOLATILE ORGANICS (ug/l)										
n-Nitrosodiphenylamine*	ND	ND	ND	ND	ND	ND	1 j	ND	ND	50 GV
bis(2-Ethylhexyl)phthalate	ND	ND	ND	1 j	ND	0.6 b j	0.6 b j	0.9 b j	1 b j	50
Tentatively Identified Compounds										
Hexanoic acid, 6-amino-	3 j	NR	NR	ND	11 j	5 j	2 j	7 j	ND	50 GV
Unknown	5 b j	NR	NR	7 b j	12 (2) j	7 (3) b j	166 (8) b j	5 (2) j	8 b j	50 GV
2-Pentanone, 4-7 hydroxy-4-7 met	ND	NR	NR	7 a b j	ND	ND	ND	3 a b j	ND	50 GV
Propane, 1,2,3-trichloro-	ND	NR	NR	8 j	6 j	ND	ND	ND	ND	50 GV
Unknown trichloropropene	ND	NR	NR	3 b j	ND	ND	ND	ND	ND	50 GV
Unknown bromo compound	ND	NR	NR	3 j	ND	ND	ND	ND	ND	50 GV
Dodecanoic acid	ND	NR	NR	ND	4 j	ND	ND	ND	ND	50 GV
Unknown octanethioate	ND	NR	NR	ND	3 j	ND	ND	ND	ND	50 GV

* - Coelution compound; cannot be separated from diphenylamine.

( ) - Number of compounds in total.

a - Suspected aidol condensation product.

b - Found in associated blanks.

j - Estimate concentration; compound present below quantitation limit.

GV - Guidance value

MS - Matrix spike

ND - Not detected at analytical detection limit (Ref. 76).

NR - Not run.

MSD - Matrix spike duplicate.

MONITORING WELL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCMW-1	MS MCMW-1	MSD MCMW-1	MCMW-2	MCMW-3	MCMW-4	MCMW-5	(Blind dup. of MCMW-4) MCMW-6	FIELD BLANK	NYSDEC CLASS GA STANDARDS
PESTICIDES/PCBs (ug/l)										
gamma-BHC (lindane)	ND	*	*	0.029 j	ND	ND	ND	ND	ND	ND
Endrin ketone	ND	0.050 j	ND	ND	ND	ND	ND	ND	ND	NS
gamma-Chlordane	ND	ND	ND	ND	ND	ND	0.029 j p	ND	ND	0.1
CONVENTIONALS										
COD (mg/l)	5.7	NR	NR	6.6	7.2	10.7	12.8	16.8	NR	NS
TDS (mg/l)	281	NR	NR	383	101	17.2	241	192	NR	NS
TSS (mg/l)	330	NR	NR	16	4.2	5.5	80	57	NR	NS

* - Spiking compound, data not representative of actual sample concentration.

j - Estimate concentration; compound present below quantitation limit.

p - Pesticide/Aroclor targe tanalyte has >25% difference for detected concentration between the two GC columns.

MS - Matrix spike

ND - Not detected at analytical detection limit (Ref. 76).

NR - Not run.

NS - No standard.

MSD - Matrix spike duplicate.

TABLE 2.2

MONITORING WELL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCMW-1	MSD MCMW-1	FILTRATE MCMW-1	MCMW-2	NATURAL GW AMBIENT RANGES (n)	NYSDEC CLASS GA STANDARDS
TAL METALS (ug/l)						
Aluminum	14,600	16,300	ND	283	**<5.0 - 1,000**	**NS**
Antimony	ND	ND	ND	ND	**--**	**3.0 GV**
Arsenic	2.9 B N	ND	ND N	ND N	**<1.0 - 30**	**25**
Barium	174 B	183 B	78.3 B	91.1 B	**10 - 500**	**1,000**
Beryllium	0.93 B	0.95 B	ND	ND	**<10**	**3.0 GV**
Cadmium	ND	ND	ND	ND	**<1.0**	**10**
Calcium	30,200	30,200	29,200	34,100	**1,000 - 150,000**	**NS**
Chromium	16	16.5	ND	ND	**<1.0 - 5.0**	**50**
Cobalt	11.8 B	12.4 B	ND	ND	**<10**	**NS**
Copper	21.6 B	22.3 B	ND	3.3 B	**<1.0 - 30**	**200**
Iron	16,500	18,300	ND	1,280	**10 - 10,000**	**300 (m)**
Lead	8	8.5	ND	1.0 B	**<15**	**25**
Magnesium	6,500	6,700	4,600 B	3,430 B	**1,000 - 50,000**	**35,000 GV**
Manganese	1,730	1,850	592.0	1,120	**<1.0 - 1,000**	**300 (m)**
Mercury	ND	0.06	0.07 B	0.07 B	**<1.0**	**2**
Nickel	NU	NU	NU	NU	**<10 - 50**	**NS**
Potassium	13,400	12,000	10,600	11,800	**1,000 - 10,000**	**NS**
Selenium	ND	ND	ND	ND	**<1.0 - 10**	**10**
Silver	ND	ND	ND	ND	**<5.0**	**50**
Sodium	43,800	44,000	43,900	77,900	**500 - 120,000**	**20,000**
Thallium	ND	ND	ND	ND	**--**	**4.0 GV**
Vanadium	20.3 B	21.9 B	ND	ND	**<1.0 - 10**	**NS**
Zinc	74	76.3	49.6	83.2	**<10 - 2,000**	**300**
Cyanide	ND	ND	NR	ND	**--**	**100**

(m) - Iron and manganese not to exceed 500 ug/l

(n) - Ref. 79.

B - Value less than contract-required detection limit but greater than instrument detection limit.

N- Spiked sample recovery not within control limits.

GV - Guidance value.

ND - Not detected at analytical detection limit (Ref. 76).

NR - Not run.

NS - No standard.

NU - Nickel results unreliable as detectable levels were found in field blank (Ref. 78).

MSD - Matrix spike duplicate.

TABLE 2.2

MONITORING WELL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCMW-3	MCMW-4	MCMW-5	(Blind dup. of MCMW-4) MCMW-6	FIELD BLANK 05/15/92	NATURAL GW AMBIENT RANGES (n)	NYSDEC CLASS GA STANDARDS
TAL METALS (ug/l)							
Aluminum	279	1,410	2,410.0	1,440	ND	**<5.0 - 1,000**	**NS**
Antimony	ND	ND	ND	ND	ND	**--**	**3.0 GV**
Arsenic	ND N W	4.2 B N W	2.5 B N	ND N	ND N	**<1.0 - 30**	**25**
Barium	52.7 B	93.6 B	84.3 B	92.3 B	ND	**10 - 500**	**1,000**
Beryllium	ND	ND	ND	ND	ND	**<10**	**3.0 GV**
Cadmium	ND	ND	ND	ND	ND	**<1.0**	**10**
Calcium	7,640	18,600	19,800	18,500	ND	**1,000 - 150,000**	**NS**
Chromium	2.2 B	5.3 B	85.7	5.0 B	ND	**<1.0 - 5.0**	**50**
Cobalt	44.3 B	62.3	159.0	61.4	ND	**<10**	**NS**
Copper	4.8 B	7.8 B	4.3 B	5.5 B	ND	**<1.0 - 30**	**200**
Iron	1,300	1,860	6,330	1,920	ND	**10 - 10,000**	**300 (m)**
Lead	1.2 B	2.3 B	1.8 B	2.1 B W	ND	**<15**	**25**
Magnesium	1,380 B	4,230 B	3,830 B	4,210 B	ND	**1,000 - 50,000**	**35,000 GV**
Manganese	361	434	2,460	431	ND	**<1.0 - 1,000**	**300 (m)**
Mercury	0.06 B	ND	ND	ND	0.06 B	**<1.0**	**2**
Nickel*	35.2 B	32.7 B	66.8	31.3 B	40.6	**<10 - 50**	**NS**
Potassium	3,810 B	4,860 B	3,830 B	5,320	ND	**1,000 - 10,000**	**NS**
Selenium	ND	ND	ND	ND	ND	**<1.0 - 10**	**10**
Silver	ND	ND	ND	ND	ND	**<5.0**	**50**
Sodium	19,500	29,900	46,700	29,700	ND	**500 - 120,000**	**20,000**
Thallium	ND	ND	ND	ND	ND	**--**	**4.0 GV**
Vanadium	ND	4.7 B	4.0 B	4.8 B	ND	**<1.0 - 10**	**NS**
Zinc	472	196.0	1,800	202	30.B	**<10 - 2,000**	**300**
Cyanide	ND	ND	ND	ND	ND	**--**	**100**

* - Nickel results should be interpreted as possibly introduced by field equipment or laboratory instrument carryover as similar levels were detected in field blank.

(m) - Iron and manganese not to exceed 500 ug/l.

(n) - Ref. 79.

B - Value less than contract-required detection limit but greater than instrument detection li nit.

N- Spiked sample recovery not within control limits.

W - Post-digestion spike out of control limits; sample absorbance less than 50% of spike absorbance.

GV - Guidance value.

ND - Not detected at analytical detection limit (Ref. 76).

NS - No standard.

TABLE 2.3

EXISTING MONITORING WELL SAMPLE DATA SUMMARY

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MONITORING WELL DESIGN A 06/23/98	B 06/23/98	C 06/23/98	NYSDEC GROUNDWATER STANDARDS
VOLATILE ORGANICS (ug/l)				
1,1,2-Trichloro-1,2,2-trifluoroethane	2	ND	ND	5
Methylene chloride	ND	34	ND	5
1,1,1-Trichloroethane	5	2	7	5
1,1-Dichloroethane	ND	3	ND	5
1,2-Dichloroethylene	ND	8	ND	5
Trichloroethylene	2	2	5	5
Benzene	ND	1	ND	0.7
Tetrachloroethylene	7	38	17	5
Toluene	ND	650	3	5
Ethylbenzene	ND	30	ND	5
m-Xylene	ND	100	ND	5
o,p-Xylene	ND	43	ND	5

ND - Not detected at analytical detection limit.

TABLE 2.4

EXISTING SOIL DATA
MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	SH-87 152017-1 08/17/87	SH-87 152017-2 09/17/87
VOLATILE ORGANICS mg/kg		
Methylene chloride	0.140 b	0.058 b
Acetone	0.043 b	0.0016 j b
1,1,1-Trichloroethane	0.004 j	0.0014 j
Benzene	0.021 b	0.013 b
Tentatively Identified Compounds		
Methyl ester acetic acid	0.0061 j	ND
1,1,2-Trichloro-1,2,2 trifluoroetha	0.0093 b j	0.0099 b j
Methylcyclopentane	0.0069 j	ND
Hexane	0.034 b j	0.017 b j
Isomer of dichloropropylene	ND	0.0086 j
SEMI-VOLATILE ORGANICS (mg/kg)		
Naphthalene	ND	1.600
2-Methylnaphthalene	ND	0.340
Fluorene	ND	0.400
n-Nitrosodiphenylamine*	29.000	44.000
bis(2-Ethylhexyl)phthalate	ND	0.210 b j
Tentatively Identified Compounds		
4-Hydroxyl -4methy I-2-pentanone	1.469 j	ND
N-phenyl benzamine	7.898 j	ND
Unknown	5.731 (4) b j	28.300 (6) j
Unknown alkane	1.278 j	27.400 (4) j
2,4,7-Trinitro-9H-fluorene-9H-one	21.417 j	ND
Decane	ND	18.000 j
1-Methyl-3-propyl benzene	ND	6.000 j
3 - Methyldecane	ND	14.900 j
1 - Methyl-3-(-1 methylethyl)benzene	ND	8.400 j
Unknown iso.ner of benzene	ND	5.700 j
Undecane	ND	17.000 j
2-Methyl undecane	ND	3.100 j
Dodecane	ND	42.000 j
PESTICIDES/PCBs (mg/kg)		
Endrin	0.0013 j	ND
Endrin ketone	0.012 j	0.160
Endosulfan I	ND	0.029
Endosulfan sulfate	ND	0.120
4,4-DDE	ND	0.140
Methoxylchlor	ND	0.042 j

( ) - Number of compounds in total.

* - Coelution compound; cannot be separated from diphenylamine.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

ND - Not detected in analytical detection limit.

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-1 (3-5 ft)	MCTB-1 (17-19 ft)	MCTB-1 (31-33 ft)	MCTB-1 (49-51 ft)	MCTB-2 (5-7 ft)	MCTB-2 (11-13 ft)	MCTB-2 (19-21 ft)	MCTB-2 (27-29 ft)
VOLATILE ORGANICS (mg/kg)								
Methylene chloride	0.012 b j	0.002 b j	0.002 b j	0.003 b j	0.003 b j	0.003 b j	0.003 b j	0.003 b j
Acetone	0.021 b j	0.006 b j	0.003 b j	0.007 b j	0.004 b j	0.004 b j	0.003 b j	0.004 b j
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	0.024 j	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND
Tentatively Identified Compounds								
Tetrahydrofuran	ND	ND	ND	ND	ND	ND	0.005 j	ND
Propane, 1,2,3-trichloro-	31.000 j x	0.024 j	0.007 j	ND	ND	ND	ND	ND
Unknown tetrachloropropane	0.340 j	ND	ND	ND	ND	ND	ND	ND
Unknown chlorocyclopropane	1.210 (2) j	ND	ND	ND	ND	ND	ND	ND
Unknown dichlorocyclohexane	0.950 j	ND	ND	ND	ND	ND	ND	ND
Unknown octadiene	0.230 j	ND	ND	ND	ND	ND	ND	ND
Unknown polycyclic hydrocarb	0.290 j	ND	ND	ND	ND	ND	ND	ND
Unknown dimethylcyclooctane	0.320 j	ND	ND	ND	ND	ND	ND	ND
Unknown alkene	0.280 j	ND	ND	ND	ND	ND	ND	ND
Unknown decahydronaphthalene	0.500 j	ND	ND	ND	ND	ND	ND	ND

( ) - Number of compounds in total.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

x - Compound detected above instrument saturation level.

ND - Not detected at analytical detection limit (Ref. 76).

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-2 (37-39 ft)	MCTB-3 (3-5 ft)	MCTB-3 (21-23 ft)	MCTB-3 (37-39 ft)	MCTB-3 (45-47 ft)	MCTB-4 (8-10 ft)	MCTB -4 (12-14 ft)	MCTB-4 (24-26 ft)	MCTB-4 (46-48 ft)	MCMW-1 (45-47 ft)
VOLATILE ORGANICS (mg/kg)										
Methylene chloride	0.003 b j	0.003 b j	0.003 b j	0.003 b j	0.003 b j	0.003 b j	0.003 b j	0.003 b j	0.003 b j	0.003 b j
Acetone	0.015 b	0.005 b j	0.005 b j	0.007 b j	0.004 b j	0.011 b	0.011 b	0.011 b	0.003 b j	0.004 b j
2-Butanone	ND	ND	ND	ND	ND	ND	0.004 j	0.004 j	ND	ND
Tetrachloroethylene	ND	ND	ND	ND	ND	0.002 j	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	0.001 j	0.002 j	0.002 j	0.004 j	ND	ND
Tentatively Identified Compounds										
Propane, 1,2,3-trichloro-	0.006 j	ND	ND	ND	ND	0.020 j	0.056 j	0.028 j	ND	ND

( ) - Number of compounds in total.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

x - Compound detected above instrument saturation level.

ND - Not detected at analytical detection limit (Ref. 76).

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)
MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-1 (1-5 ft)	MCTB-1 (15-19 ft)	RE MCTB-1 (15-19 ft)	MCTB-1 (31-35 ft)	MCTB-1 (47-51 ft)	MCTB-2 (5-9 ft)
SEMI-VOLATILE ORGANICS (mg/kg)						
1,2,4-Trichlorobenzene	0.190 j	ND	ND	ND	ND	ND
Pyrene	0.220 j	ND	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	ND	ND	0.023 b j	ND	ND	ND
Indeno(1,2,3-cd)pyrene	0.190 j	ND	ND	ND	ND	ND
dibenzo(a,h)anthracene	0.180 j	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.180 j	ND	ND	ND	ND	ND
Tentatively Identified Compounds						
Unknown	23.000 j	ND	ND	0.170 (2) b j	ND	0.220 b j
2-Pentanone, 4-hydroxy-4-met	ND	1.100 b j	ND	1.300 a b j	1.200 a b j	2.000 a b j
Unknown aliphatic amide	ND	0.150 j	ND	0.130 j	ND	0.069 j
Propane, 1,2,3-trichloro-	4.000 j	ND	ND	ND	ND	ND
Unknown alkane	26.800 (5) j	ND	1.870 (8) j	ND	ND	ND
Unknown C14 alkane	20.300 (2) j	ND	ND	ND	ND	ND
Unknown C15 alkane	21.000 j	ND	ND	ND	ND	ND
Unknown sesquiterpene	11.000 j	ND	0.100 j	ND	ND	ND

( ) - Number of compounds in total.

a - Suspected aldol condensation product.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

ND - Not detected at analytical detection limit (Ref. 76).

RE - Reextracted analysis.

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-1 (1-5 ft)	MCTB-1 (15-19 ft)	RE MCTB-1 (15-19 ft)	MCTB-1 (31-35 ft)	MCTB-1 (47-51 ft)	MCTB-2 (5-9 ft)
SEMI-VOLATILE ORGANICS (mg/kg)						
Tentatively Identified Compounds						
Unknown C16 alkane	24.000 j	ND	ND	ND	ND	ND
Unknown sesquiterpene deriva	12.000 j	ND	ND	ND	ND	ND
Unknown dichlorohydrocarbon	48.100 (2) j	0.580 j	1.710 (2) j	0.150 j	ND	ND
Unknown trichlorohyrocarbon	36.000 j	0.654 (2) j	1.500 j	0.093 j	ND	ND
Unknown C17 alkane	6.100 j	ND	ND	ND	ND	ND
Unknown C18 alkane	21.000 j	0.084 j	ND	ND	ND	ND
Pentadecane, 2,6,10,14-5 etra	35.000 j	0.240 j	ND	0.160 j	ND	ND
Hexadecane, 2,6,10,14-5 etram	24.000 j	0.120 j	0.670 j	0.100 j	ND	ND
Unknown hexanedioate	ND	0.270 b j	ND	ND	ND	ND
Unknown polyhalogenated hydr	ND	ND	0.310 j	ND	ND	ND
Cyclohexane, decyl-	ND	ND	0.120 j	ND	ND	ND
Heptadecane	ND	ND	1.200 j	ND	ND	ND
Cyclohexane, undecyl-	ND	ND	0.093 j	ND	ND	ND
Octadecane	ND	ND	0.130 j	ND	ND	ND
Nonadecane	ND	ND	0.110 j	ND	ND	ND
Eicosane	ND	ND	0.100 j	ND	ND	ND

( ) - Number of compounds in total.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

ND - Not detected at analytical detection limit (Ref. 76).

RE - Reextracted analysis.

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB -2 (11-15 ft)	MCTB-2 (19-23 ft)	MCTB-2 (27-31 ft)	MCTB-2 (37-41 ft)	MCTB-3 (3-5 ft)	MCTB-3* (19-23 ft)	RE MCTB-3 (19-23 ft)
SEMI-VOLATILE ORGANICS (mg/kg)							
bis(2-Ethylhexyl)phthalate	ND	0.037 j	ND	ND	0.850	0.022 j	NU
Tentatively Identified Compounds							
Unknown	1.122 (3) b j	0.530 (2) b j	1.319 (3) b j	1.140 (4) b j	0.320 j	1.690 (3) b j	NU
2-Pentanone, 4-5 hydroxy-4-5 met	1.300 a b j	2.100 a b j	2.500 a b j	1.800 a b j	1.900 a b j	2.500 a b j	NU
Unknown bromocompound	ND	0.076 b j	ND	ND	ND	ND	NU
Unknown hexadecanoate	ND	0.110 j	ND	ND	ND	ND	NU
1-Octadecanol	ND	0.097 j	ND	ND	ND	ND	NU
Unknown aliphatic amide	ND	0.093 j	0.100 j	0.130 j	0.200 j	ND	NU
Octacosane	ND	ND	ND	ND	ND	ND	NU
Unknown decanedioate	ND	ND	ND	ND	0.200 b j	ND	NU
Nonacosane	ND	ND	ND	ND	ND	ND	NU
Triacontane	ND	ND	ND	ND	ND	ND	NU
Unknown C31 alkane	ND	ND	ND	ND	ND	ND	NU
Dotriacontane	ND	ND	ND	ND	ND	ND	NU
Unknown C33 alkane	ND	ND	ND	ND	ND	ND	NU
Tetratriacontane	ND	ND	ND	ND	ND	ND	NU
Benzaldehyde	ND	ND	ND	ND	ND	0.130 b j	NU

( ) - Number of compounds in total.

* - Acid fraction of this sample unusable due to significant surrogate failures.

a - Suspected aldol condensation product.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

ND - Not detected at analytical detection limit (Ref. 76).

NU - Reextraction for this sample performed 27 days outside allowable holding time (Ref. 77).

RE - Reextracted analysis.

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-3 (37-41 ft)	MCTB-3 (45-49 ft)	MCTB-4 (6-10 ft)	MCTB-4 (10-14 ft)	MCTB-4 (24-28 ft)	MCTB-4 (44-58 ft)
SEMI-VOLATILE ORGANICS (mg/kg)						
2-Nitroaniline	ND	ND	0.640 j	0.530 j	ND	ND
n-Nitrosodiphenylamine*	ND	ND	0.430 j	0.280 j	ND	ND
Di-n-butylphthalate	ND	ND	ND	0.027 j	ND	ND
bis(2-Ethylhexyl)phthalate	ND	ND	ND	0.022 j	ND	ND
Tentatively Identified Compounds						
Unknown	3.646 (8) b j	3.940 (4) b j	2.420 (4) a b j	3.867 (11) b j	1.310 (5) j	0.260 (2) b j
2-Pentanone, 4-5 hydroxy-4-5 met	2.400 a b j	2.400 a b j	4.300 a b j	2.400 a b j	1.200 a b j	1.500 a b j
Unknown aliphatic amide	0.090 j	0.340 j	0.490 j	0.110 j	0.230 j	ND
Unknown decanedioate	0.360 b j	0.110 b j	ND	ND	ND	ND
Benzaldehyde, 4-5 diethylamin	ND	ND	ND	0.77 j	ND	ND
Acridine, 9,10-dihydro-9,9-d	ND	ND	ND	0.360 j	ND	ND
Benzenamine, 2-nitro-n-pheny	ND	ND	1.100 j	0.240 j	ND	ND
Benzenamine, 4-5-nitro-n-pheny	ND	ND	0.270 j	0.110 j	ND	ND
Unknown bis(nitrophenyl)amin	ND	ND	5.000 (3) j	2.990 (3) j	0.091 j	ND
9H-fluoren-9-one	ND	ND	0.820 j	ND	ND	ND

( ) - Number of compounds in total.

* - Coelution compound; cannot be separated from diphenylamine.

a - Suspected aldol condensation product.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

ND - Not detected at analytical detection limit (Ref. 76).

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-1© (1-5 ft)	MCTB-1 (15-19 ft)	MCTB-1 (31-35 ft)	MCTB-1 (47-51 ft)	MCTB-2 (5-9 ft)	MCTB-2 (11-15 ft)	MS MCTB-2 (11-15 ft)	MSD MCTB-2 (11-15 ft)	MCTB-2 (19-23 ft)
PESTICIDES/PCBs (mg/kg)									
Aldrin	0.0075 j	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan I	0.015 p	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDE	0.017 j p	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	0.017 j p	ND	ND	ND	ND	ND	*	*	ND
Endosulfan sulfate	0.170 p	ND	ND	ND	ND	ND	ND	ND	ND
gamma-Chlordane	0.0058 j p	ND	ND	ND	ND	ND	ND	ND	ND

* - Spiking compound; data not representative of actual sample concentration.

© - Due to poor correlation between primary and confirmation analyses data, reported concentrations for this sample should be interpreted as estimated.

j - Estimated concentration; compound present below quantitation limit.

p - Pesticide/Aroclor target analyte has > 25% difference for the detected concentrations between the two GC columns.

MS- Matrix spike.

ND - Not detected at analytical detection limit (Ref. 76).

MSD - Matrix spike duplicate.

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)
MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-2 (27-31 ft)	MCTB-2 (37-41 ft)	MCTB-3 (3-5 ft)	MCTB-3 (19-23 ft)	MCTB-3 (37-41 ft)	MCTB-3 (45-49 ft)	MCTB-4© (6-10 ft)	RE MCTB-4© (6-10 ft)	MCTB-4© (10-14 ft)	MCTB-4© (24-58 ft)	MCTB-4 (44-58 ft)
PESTICIDES/PCBs (mg/kg)											
Heptachlor	ND	ND	ND	ND	ND	ND	0.0010 j p	0.0013 j p	ND	ND	ND
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND	ND	ND	0.0070	0.0037 p	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	ND	0.0023 j p	ND	ND	ND	ND
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	0.012 p	0.0029 j p	ND
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	ND	ND	ND	ND	ND	ND	0.0042	ND	0.0045 p	ND	ND
gamma-Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

© - Due to poor correlation between primary and confirmation analyses data, reported concentrations for this sample should be interpreted as estimated.

j - Estimated concentration, compound present below quantitation limit.

p - Pesticide/Aroclor target analyte has > 25% difference for the detected concentrations between the two GC columns.

ND - Not detected at analytical detection limit (Ref. 76).

RE - Reextracted analysis.

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB -1 (1-5 ft)	MCTB-1 (15-19 ft)	MCTB-1 (31-35 ft)	MCTB-1 (47-51 ft)	MCTB-2 (5-9 ft)	MCTB-2 (11-15 ft)	REP MCTB-2 (11-15 ft)	MCTB-2 (19-23 ft)	MCTB-2 (27-31 ft)	NATIVE SOIL CONCENTRATIONS TYPICAL RANGE (n)
TAL METALS (ug/l)										
Aluminum	11,400 R	785 R	1,140 R	992 R	1,200 E	780 E	765	694 E	627 E	10,000 - 300,000
Antimony	ND N	ND N	ND N	ND N	ND	ND	ND	ND	ND	0.6 - 10
Arsenic	4.2	ND	0.34 B	0.50 B	0.75 B	ND	0.29 B	0.55 B	0.45 B	1.0 - 40
Barium	19.9 B	2.2 B	6.5 B	5.7 B	4.4 B	5.3 B	5.1 B	5.5 B	5.5 B	100 - 3,500
Beryllium	0.24 B	0.05 B	0.09 B	0.08 B	0.16 B	ND	ND	ND	ND	0.1 - 40
Cadmium	ND N	ND	ND	ND	ND	ND	ND	ND	ND	0.01 - 7.0
Calcium	328 B R	41.5 B R	43.8 B R	45.8 B R	86.5 B	42.4 B	35.1 B	32.5 B	18.3 B	100 - 400,000
Chromium	39.1 NR	3.0 N R	9.0 N R	1.9 N R	6.3	2.7	2.9	3.9	2.3	5.0 - 3,000
Cobalt	193	1.8 B	1.3 B	2.3 B	1.0 B	1.1 B	1.0 B	0.69 B	0.78 B	1.0 - 40
Copper	34.5 N R	1.9 B N R	2.7 B N R	2.1 B N R	2.8 B	2.3 B	2.1 B	2.1 B	1.5 B	2.0 - 100
Iron	10,900	1,800	2,380	1,850	3,510 E	2,160 E	1,960	2,440 E	1,530 E	7,000 - 550,000
Lead	68.9	1.5 R	0.93 R	1.1 R	1.1 B	1.0	1.0	1.1	0.63	2.0 - 200
Magnesium	1,120	137 B	209 B	202 B	191 B	163 B	181 B	168 B	132 B	600 - 6,000
Manganese	46.3 R	9.9 R	15.9 R	20.8 R	16.5 E	12.0 E	12.1	11.4 E	8.2 E	100 - 4,000
Mercury	0.04 B	0.03 B	0.04 B	0.03 B	ND	0.02 B	ND	0.02 B	ND	0.01 - 0.08
Nickel	9.1 N R	2.3 B N R	1.9 B N R	3.3 B N R	1.4 B	1.2 B	1.2 B	1.1 B	2.2 B	5.0 - 1,000
Potassium	355 B	ND	ND	163 B	440 B	ND	398 B	298 B	376 B	400 - 30,000
Selenium	0.32 B W	ND	ND	ND	ND	ND	ND	ND	ND	0.1 - 2.0
Silver	ND	ND	ND	ND	0.66 B	ND	0.75 B	ND	ND	0.1 - 5.0
Sodium	238 B	ND	ND	ND	ND	ND	ND	ND	ND	750 - 7,500
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1 - 12
Vanadium	24.4	2.1 B	2.9 B	2.6 B	5.2 B	2.7 B	2.6 B	3.5 B	2.2 B	20 - 500
Zinc	26.4 N R	9.2 N R	10.2 N R	7.8 N R	5.4	3.8	3.6	4.4	6.4	10 - 300
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND	-

(n) - Ref. 79.

B - Value less than contract-required detection limit but greater than instrument detection limit.

E - Value estimated due to interference.

N- Spiked sample recovery not within control limits.

R - Duplicate analysis not within control limits.

W - Post-digestion spike out of control limits; sample absorbance less than 50% of spike absorbance.

ND - Not detected at analytical detection limit (Ref. 76).

REP - Replicate sample analysis.

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-2 (37-41 ft)	MCTB -3 (3-5 ft)	MCTB-3 (19-23 ft)	MCTB-3 (37-41 ft)	MCTB-3 (45-49 ft)	MCTB-4 (6-10 ft)	MCTB-4 (10-14 ft)	MCTB-4 (24-28 ft)	MCTB-4 (44-58 ft)	FIELD BLANK* 05/01/82	NATIVE SOIL CONCENTRATIONS TYPICAL RANGE (n)
TAL METALS (ug/l)											
Aluminum	1,140 R	1,710 E	562 E	554 E	876 E	174 R	286 R	176 R	850 R	43.1 B	**10,000 - 300,000**
Antimony	ND N	ND	ND	ND	ND	ND N	ND N	ND N	ND N	ND	**0.6 - 10**
Arsenic	0.58 B	0.81 B	0.39 B	0.29 B W	0.35 B	ND	ND	ND	0.35 B	ND	**1.0 - 40**
Barium	8.6 B	4.1 B	2.5 B	3.5 B	6.8 B	4.3 B	7.7 B	4.1 B	6.2 B	1.9 B	**100 - 3,500**
Beryllium	0.05 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.1 - 40**
Cadmium	ND N	ND	ND	0.27 B	ND	ND	ND	ND	ND	2.4 B	**0.01 - 7.0**
Calcium	182 B R	1,600	76.2 B	32.2 B	34.1 B	202 B R	523 B R	26.4 B R	27.0 B R	197 B	**100 - 400,000**
Chromium	3.1 N R	3.7	4.7	3.7	4.6	7.8 N R	14.2 N R	2.1 N R	2.1 N R	ND	**5.0 - 3,000**
Cobalt	1.4 B	0.87 B	0.66 B	0.84 B	1.8 B	ND	ND	ND	0.52 B	ND	**1.0 - 40**
Copper	3.2 B N R	2.0 B	1.7 B	1.6 B	2.5 B	1.5 B N R	1.0 B N R	0.86 B N R	1.8 B N R	3.7 B	**2.0 - 100**
Iron	1,910	4,070 E	1,740 E	2,630 E	2,560 E	729	910	675.0	1,970	97.5 B	**7,000 - 550,000**
Lead	0.88 R	3.3	6.5	2.5	2.1	1.7 R	1.0 R	1.7 R	1.1 R	ND	**2.0 - 200**
Magnesium	199 B	348 B	162 B	122 B	246 B	30.3 B	62.0 B	27.8 B	215 B	ND	**600 - 6,000**
Manganese	12.1 R	21.0 E	8.2 E	12.4 E	17.3 E	3.5 R	5.2 R	4.1 R	14.0 R	1.5 B	**100 - 4,000**
Mercury	ND	0.07 B	0.04 B	ND	0.02 B	0.03 B	0.02 B	ND	ND	ND	**0.01 - 0.08**
Nickel	2.8 B N R	2.2 B	2.6 B	1.6 B	1.9 B	0.59 B N R	0.73 B N R	0.62 B N R	1.3 B N R	ND	**5.0 - 1,000**
Potassium	318 B	441 B	391 B	378 B	604 B	134 B	ND	ND	165 B	2.240 B	**400 - 30,000**
Selenium	ND	ND W	ND	ND W	ND	ND	ND	ND	ND	ND W	**0.1 - 2.0**
Silver	ND	ND	0.90 B	ND	0.71 B	1.1	1.5 B	ND	ND	ND	**0.1 - 5.0**
Sodium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**750 - 7,500**
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.1 - 12**
Vanadium	2.4 B	6.5 B	3.0 B	3.6 B	4.0 B	1.3	1.4 B	1.0 B	2.4 B	ND	**20 - 500**
Zinc	5.4 N R	11.1	10.1	6.0	8.6	9.7 N R	11.4 N R	1.8 B N R	3.4 N R	20.1	**10 - 300**
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND	NR	-

* - Data reported in ug/l

(n) - Ref. 79

B - Value less than contract-required detection limit but greater than instrument detection limit.

E - Value estimated due to interference.

N- Spiked sample recovery not within control limits.

R - Duplicate analysis not within control limits.

W - Post-digestion spike out of control limits; sample absorbance less than 50% of spike absorbance.

ND - Not detected at analytical detection limit (Ref. 76).

NR - Not run.

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-1 (31-35 ft)	MCTB-2 (19-23 ft)	MCTB-3 (19-23 ft)	MCTB-4 (24-28 ft)	TCLP STANDARDS
TCLP VOLATILE ORGANICS (mg/l)					
Vinyl chloride	ND	ND	ND	ND	**0.2**
1,1-Dichloroethylene	ND	ND	ND	ND	**0.7**
Chloroform	0.003 b j	0.002 b j	0.002 b j	0.002 b j	**6.0**
1,2-Dichloroethane	ND	ND	ND	ND	**0.5**
2-Butanone	ND	ND	ND	ND	**200**
Carbon tetrachloride	ND	ND	ND	ND	**0.5**
Trichloroethylene	ND	ND	ND	ND	**0.5**
Benzene	ND	ND	ND	0.001 j	**0.5**
Tetrachloroethylene	ND	ND	ND	ND	**0.7**
Chlorobenzene	ND	ND	ND	ND	**100**
HAZARDOUS CHARACTERISTICS					
Solids, total (%W/W)	86.1	95.6	95.9	94.3	**-**
Flash point (degrees F)	132	>150	>150	>150	**-**
Corrosivity (by pH)	5.83	5.85	6.30	6.19	**<2.0 or >12.5**
Reacitivty description	*	*	*	*	**-**
Reactive cyanide (mg/kg)	<35	<35	<35	<35	**250**
Reactive sulfide (mg/kg)	<48	<50	<50	<50	**500**

* - Sample did not explode when percussed.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

ND - Not detected at analytical detection limit (Ref. 76).

NR - Not run.

TABLE 2.5

SOIL BORING DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCTB-1 (31-35 ft)	MCTB-2 (19-23 ft)	MCTB-3 (19-23 ft)	MCTB-4 (24-28 ft)	NYSDEC STANDARDS
EP TOX METALS (mg/l)					
Arsenic	<1.000	<1.000	<1.000	<1.000	**5.0**
Barium	<10.000	<10.000	<10.000	<10.000	**100**
Cadmium	<0.100	<0.100	<0.100	<0.100	**1.0**
Chromium	<1.000	<1.000	<1.000	<1.000	**5.0**
Lead	<1.000	<1.000	<1.000	<1.000	**5.0**
Mercury	<0.040	<0.040	<0.040	<0.040	**0.2**
Selenium	<0.100	<0.100	<0.100	<0.100	**1.0**
Silver	<1.000	<1.000	<1.000	<1.000	**5.0**
Solids, total (%W/W)	86.1	96.3	95.9	96.5	-
EP TOX PESTICIDES (mg/l)					
gamma-BHC (lindane)	ND	ND	ND	ND	**0.40**
Endrin	ND	ND	ND	ND	**0.020**
Methoxychlor	ND	ND	ND	ND	**10.0**
Toxaphene	ND	ND	ND	ND	**0.50**
EP TOX HERBICIDES (mg/l)					
2,4,5	ND	ND	ND	ND	**10.0**
2,4,5-TP (silvex)	ND	ND	ND	ND	**1.00**

ND - Not detected at analytical detection limit (Ref. 76).

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)
MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCSS-1 (6-12 in.)	MS MCSS-1 (6-12 in.)	MSD MCSS-1 (6-12 in.)	MCSS-2 (1-1.5 ft)	DL MCSS-2 (1-1.5 ft)	MCSS-3 (1-2 ft.)
VOLATILE ORGANICS (mg/kg)						
Methylene chloride	0.003 b j	0.005 b j	0.005 b j	0.004 b j	0.020 b d j	0.004 b j
Acetone	0.011 b j	0.008 b j	0.006 b j	0.003 b j	0.057 b d j	ND
Trichloroethylene	0.008 j	*	*	0.017	0.030 d j	ND
Tetrachloroethylene	0.019	0.046	0.053	0.280 e	0.520 d	0.012
Toluene	ND	*	*	0.005 j	0.024 d j	ND
Xylene (total)	ND	ND	ND	0.006 j	0.130 d	ND
Tentatively Identified Compounds						
Propane, 1,2,3-trichloro-	ND	NR	NR	5.100 j x	18.000 b d j x	0.078 b j
Unknown alkene	ND	NR	NR	0.350 j	0.800 d j	ND
Unknown polycyclic hydrocarb	ND	NR	NR	0.560 j	1.700 d j	ND
Unknown chlorocyclopropane	ND	NR	NR	0.310 j	1.200 d j	ND
Unknown ethylmethylcyclohexa	ND	NR	NR	0.270 j	ND	ND
Tricyclo[3.3.1.13,7]decane,	ND	NR	NR	0.210 j	1.160 (2) d j	ND
Unknown dimethylcyclooctane	ND	NR	NR	0.830 (2) j	1.000 d j	ND
Unknown hydrocarbons	ND	NR	NR	0.540 j	1.200 d j	ND
Naphthalene, decahydro-	ND	NR	NR	0.190 j	0.530 d j	ND
Unknown chlorocyclohexane	ND	NR	NR	ND	0.590 d j	ND

* - Spiking compound; data not representative of actual sample concentration.

( ) - Number of compounds in total.

b - Found in associated blanks.

d - Concentration recovered from diluted sample.

e - Estimated concentration; exceeds GC/MS calibration range.

j - Estimated concentration; compound present below quantitation limit.

x - Compound detected above instrument saturation level.

DL - Diluted sample analysis (Ref. 76).

MS - Matrix spike.

ND - Not detected at analytical detection limit (Ref. 76).

NR - Not run.

MSD - Matrix spike duplicate.

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCSS-4 (6-12 in.)	MCSS-5 (6-12 in.)	MCSS-6 (1-2 ft)	MS MCSS-6 (1-2 ft)	MSD MCSS-6 (1-2 ft)	MCSS-6A (3 ft)	DL MCSS-6A (3 ft)
VOLATILE ORGANICS (mg/kg)							
Methylene chloride	0.004 b j	0.004 b j	0.004 b j	0.005 b j	0.005 b j	0.018 b j	0.018 b j
Acetone	ND	ND	0.014 b	0.006 b j	0.006 b j	0.010 bj	0.010 b j
Trichloroethylene	(.018	ND	ND	*	*	ND	ND
Tetrachloroethylene	0.032	0.006 j	0.053	0.150	0.110	1.300 e	1.300 e
Tentatively Identified Compounds							
Propane, 1,2,3-trichloro-	0.006 j	0.012 b j	0.006 b j	NR	NR	0.041 j	0.041 j

* - Spiking compound; data not representative of actual sample concentration.

b - Found in associated blanks.

e - Estimated concentration; exceeds GC/MS calibration range.

j - Estimated concentration; compound present below quantitation limit.

DL - Diluted sample analysis.

MS - Matrix spike.

ND - Not detected at analytical detection limit (Ref. 76).

NR - Not run.

MSD - Matrix spike duplicate.

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCSS-1 (6-12 in.)	MS MCSS-1 (6-12 in.)	MSD MCSS-1 (6-12 in.)	MCSS-1A (1-2 ft)	MCSS-2 (1-1.5 ft)	MS MCSS-2 (1-1.5 ft)	MSD MCSS-2 (1.-1.5 ft)
SEMI-VOLATILE ORGANICS (mg/kg)							
Phenanthrene	0.037 j	0.044 j	0.031 j	ND	ND	ND	ND
Di-n-butylphthalate	0.027 j	ND	ND	ND	ND	ND	ND
Fluorantehene	0.071 j	0.082 j	0.057 j	0.045 j	ND	ND	ND
Pyrene	0.073 j	*	*	0.032 j	ND	*	*
Benzo(a)anthracene	0.048 j	0.042 j	0.029 j	0.029 j	ND	ND	ND
Chrysene	0.048 j	0.043 j	0.034 j	0.035 j	ND	ND	ND
bis(2-Ethylhexyl)phthalate	0.150 j	0.200 j	0.210 j	0.210 j	ND	ND	ND
Benzo(b)fluoranthene	0.059 j	0.051 j	0.042 j	0.032 j	ND	ND	ND
Benzo(k)fluoranthene	0.032 j	0.042 j	0.031 j	0.025 j	ND	ND	ND
Benzo(a)pyrene	0.036 j	0.030 j	ND	0.026 j	ND	ND	ND

* - Spiking compound; data not representative of actual sample concentration.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

DL - Diluted sample analysis.

MS - Matrix spike.

ND - Not detected at analytical detection limit (Ref. 76).

MSD - Matrix spike duplicate.

SURFACE SOIL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCSS-1 (6-12 in.)	MS MCSS-1 (6-12 in.)	MSD MCSS-1 (6-12 in.)	MCSS-1A (1-2 ft)	MCSS-2 (1-1.5 ft)	MS MCSS-2 (1-1.5 ft)	MSD MCSS-2 (1-1.5 ft)
SEMI-VOLATILE ORGANICS (mg/kg)							
Tentatively Identified Compounds							
Unknown	1.570 (4) j	NR	NR	1.350 (6) b j	ND	NR	NR
2-Pentanone, 4-hydroxy-4-met	1.500 a b j	NR	NR	2.500 a b j	ND	NR	NR
Unknown trichlorohydrocarbon	0.082 j	NR	NR	ND	ND	NR	NR
Unknown hexanedioate	0.250 b j	NR	NR	4.100 b j	ND	NR	NR
Phosphoric acid, triphenyl e	0.250 j	NR	NR	0.550 j	ND	NR	NR
Pentacosane	0.100 j	NR	NR	ND	ND	NR	NR
Heptacosane	0.140 j	NR	NR	ND	ND	NR	NR
Nonacosane	1.200 j	NR	NR	0.580 j	ND	NR	NR
Unknown androstane deriv	0.250 (2) j	NR	NR	ND	ND	NR	NR
Triacontane	0.180 j	NR	NR	ND	ND	NR	NR
Unknown aliphatic hydrocarbon	0.530 (2) j	NR	NR	ND	ND	NR	NR
Unknown C31 alkane	1.000 j	NR	NR	0.660 j	ND	NR	NR
Unknown polycyclic hydrocarbon	0.840 (3) j	NR	NR	ND	ND	NR	NR
Pentadecane	ND	NR	NR	ND	85.000 j	NR	NR
Hexadecane	ND	NR	NR	ND	110.000 j	NR	NR
Heptadecane	ND	NR	NR	ND	130.000 j	NR	NR
Pentadecane, 2,6,10,14-tetra	ND	NR	NR	ND	140.000 j	NR	NR

( ) - Number of compounds in total.

a - Suspected aldol condensation product.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

DL - Diluted sample analysis (Ref. 76).

MS - Matrix spike

ND - Not detected at analytical detection limit (Ref. 76).

NR - Not run.

MSD - Matrix spike duplicate.

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETERS	MCSS-1 (6-12 in.)	MS MCSS-1 (6-12 in.)	MSD MCSS-1 (6-12 in.)	MCSS-1A (1-2 ft)	MCSS-2 (1-1.5 ft)	MS MCSS-2 (1-1.5 ft)	MSD MCSS-2 (1-1.5 ft)
SEMI-VOLATILE ORGANICS (mg/kg)							
Tentatively Identified Compounds							
Octadecane	ND	NR	NR	ND	130.000 j	NR	NR
Nonadecane	ND	NR	NR	ND	110.000 j	NR	NR
Eicosane	ND	NR	NR	ND	93.000 j	NR	NR
Unknown aliphatic amine	ND	NR	NR	0.089 j	ND	NR	NR
Unknown dichlorohydrocarbon	ND	NR	NR	ND	98.000 (2) j	NR	NR
Unknown polyterpene deriv	ND	NR	NR	0.160 j	ND	NR	NR
Dodecane	ND	NR	NR	ND	64.000 j	NR	NR
Unknown alkane	ND	NR	NR	0.130 j	379.000 (6) j	NR	NR
Tridecane	ND	NR	NR	ND	91.000 j	NR	NR
Tetradecane	ND	NR	NR	ND	100.000 j	NR	NR
Unknown sesquiterpene	ND	NR	NR	ND	60.000 j	NR	NR
Hexadecane, 2,6,10,14-tetram	ND	NR	NR	ND	96.000 j	NR	NR
Heneicosane	ND	NR	NR	ND	58.000 j	NR	NR
1-Tetracosanol	ND	NR	NR	0.610 j	ND	NR	NR
Ethanone, 1-phenyl-	ND	NR	NR	0.130 b j	ND	NR	NR
1-Eicosanol	ND	NR	NR	0.120 j	ND	NR	NR
1-Docosanol	ND	NR	NR	0.410 j	ND	NR	NR
1-Hexacosanol	ND	NR	NR	0.470 j	ND	NR	NR
Unknown aliphatic ketone	ND	NR	NR	0.097 j	ND	NR	NR
Fluorenones (mg/kg)							
9-Fluorenone	ND	NR	NR	NR	ND	NR	NR
2,4,7-Trinitrofluorenone	1.500	NR	NR	NR	ND	NR	NR

( ) - Number of compounds in total.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

MS - Matrix spike.

ND - Not detected at analytical detection limit (Ref. 76).

NR - Not run.

MSD - Matris spike duplicate.

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)
MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETERS	MCSS-3 (1-2 ft)	MCSS-4 (6-12 in.)	MCSS-4A (6-12 in.)	MCSS-5 (6-12 in.)	MCSS-6 (1-2 ft)	MCSS-6A (3 ft)
SEMI-VOLATILE ORGANICS (mg/kg)						
Phenol	0.036 j	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.032 j	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.022 j	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.025 j	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.058 j	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	0.045 j
2-Methylnaphthalene	ND	0.092 j	ND	ND	ND	0.077 j
Diethylphthalate	ND	ND	ND	ND	ND	0.430 j
Fluorene	ND	0.067 j	ND	1.800 j	0.360 j	ND
n-Nitrosodiphenylamine*	0.058 j	5.100	3.200	22.000	8.600	0.069 j
Phenanthrene	ND	0.170 j	0.110 j	ND	ND	0.081 j
Anthracene	ND	0.053 j	ND	ND	ND	ND
Di-n-butylphthalate	0.310 j	ND	ND	ND	ND	0.027 j
Fluoranthene	0.036 j	0.250 j	0.270 j	ND	0.069 j	0.062 j
Pyrene	0.033 j	0.300 j	0.190 j	ND	0.065 j	0.053 j
Benzo(a)anthracene	0.026 j	0.160 j	0.140 j	ND	ND	0.043 j
Chrysene	0.027 j	0.160 j	0.140 j	ND	ND	0.077 j
bis(2-Ethylhexyl)phthalate	0.037 b j	0.570 j	0.310 b j	0.680 b j	0.160 b j	ND
Benzo(b)fluoranthene	0.030 j	0.240 j	0.180 j	ND	0.110 j	0.068 j
Benzo(k)fluoranthene	0.027 j	0.210 j	ND	ND	0.083 j	0.055 j
Benzo(a)pyrene	0.027 j	0.180 j	0.180 j	ND	ND	0.061 j
Indeno(1,2,3-cd)pyrene	0.021 j	0.079 j	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	0.077 j	ND	ND	ND	0.110 j

* - Coelution compound; cannot be separate from diphenylamine.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

ND - Not detected at analytical detection limit (Ref. 76).

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)
MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCSS-3 (1-2 ft)	MCSS-4 (6-12 in.)	MCSS-4A (6-12 in.)	MCSS-5 (6-12 in.)	MCSS-6 (1-2 ft)	MCSS-6A (3 ft)
SEMI-VOLATILE ORGANICS (mg/kg)						
Tentatively Identified Compounds						
Unknown	0.520 (2) j	15.600 (6) j	5.720 (6) j	24.300 (5) j	5.490 (5) j	16.400 (6) j
2-Pentanone, 4-5 hydroxy-4-5 tet	ND	ND	ND	7.100 a b j	4.300 a b j	ND
Unknown trichlorohydrocarbon	1.030 (2) j	ND	ND	ND	0.330 j	ND
Unknown hexanedioate	ND	ND	13.000 b j	ND	ND	2.600 b j
Nonacosane	0.660 j	3.200 j	1.100 j	1.400 j	1.600 j	2.500 j
Unknown C31 alkane	0.920 j	3.100 j	1.300 j	1.400 j	1.700 j	ND
Unknown polycyclic hydrocarbon	ND	ND	1.270 (2) j	ND	1.780 (2) j	ND
Heptadecane	0.140 j	2.100 j	0.360 j	ND	ND	ND
Pentadecane, 2,6,10,14-tetra	ND	1.300 j	0.480 j	ND	ND	ND
Octadecane	0.180 j	1.700 j	0.390 j	ND	ND	ND
Benzenamine, 4,4',4'-methyld	ND	29.000 j	6.800 j	ND	ND	ND
Unknown aromatic amine	ND	8.300 j	1.900 j	ND	ND	ND
9H-Fluoren-9-one	ND	ND	0.370 j	12.000 j	2.600 j	ND
Pentadecane	ND	1.300 j	ND	ND	ND	ND
Hexadecane	ND	1.500 j	ND	ND	ND	ND
Nonadecane	0.170 j	1.600 j	ND	ND	ND	ND
Propane, 1,2,3-trichloro-	1.100 j	ND	ND	ND	ND	ND
Unknown aliphatic amine deriv	2.200 j	ND	ND	ND	ND	ND
1-Hexadecanaminium, n,n,n-tr	0.520 j	ND	ND	ND	ND	ND
Unknown methyl(phenylmethyl	0.200 j	ND	ND	ND	ND	ND
Eicosane	ND	1.300 j	ND	ND	0	ND
Unknown chlorobenzene deriv	ND	4.700 (3) j	ND	ND	ND	ND

( ) - Number of compounds in total.

a - Suspected aldol condensation product.

b - Found in associated blanks.

j - Estimated concentration; compound present below quantitation limit.

ND - Not detected at analytical detection limit (Ref. 76).

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)
MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCSS-3 (1-2 ft)	MCSS-4 (6-12 in.)	MCSS-4A (6-12 in.)	MCSS-5 (6-12 in.)	DL MCSS-5 (6-12 in.)	MCSS-6 (1-2 ft)	DL MCSS-6 (1-2 ft)	MCSS-6A (3 ft)
SEMI-VOLATILE ORGANICS (mg/kg)								
Tentatively Identified Compounds								
9H-Fluoren-9-one, 2,7-dinitr	ND	ND	ND	4.000 j	NR	1.100 j	NR	ND
Unknown dichlorohydrocarbon	3.160 (4) j	ND	ND	ND	NR	0.720 (2) j	NR	ND
Benzaldehyde, 4-6 diethylami	ND	ND	ND	ND	NR	0.310 j	NR	ND
Unknown tocopherol	ND	ND	ND	ND	NR	1.200 j	NR	23.580 (2) j
Unknown polyterpene deriv	0.160 j	ND	ND	ND	NR	1.290 (2) j	NR	2.700 j
Unknown alkane	ND	ND	0.350 j	ND	NR	ND	NR	ND
1-Tetracosanol	ND	ND	ND	ND	NR	ND	NR	0.490 j
Unknown C33 alkane	0.350 j	ND	ND	ND	NR	ND	NR	0.650 j
1-Docosanol	ND	ND	0.350 j	ND	NR	ND	NR	ND
1-Hexacosanol	ND	ND	ND	ND	NR	ND	NR	1.000 j
Propane, 1,2,3-trichloro-	ND	ND	0.420 j	ND	NR	ND	NR	0.640 j
1,3-Benzenediol, 4,4'-thiobi	ND	ND	ND	ND	NR	ND	NR	0.850 j
Unknown C7-alkylbenzene	ND	ND	ND	ND	NR	ND	NR	0.520 j
Hexadecanoic acid	ND	ND	ND	ND	NR	ND	NR	0.500 j
Unknown DDT isomer	ND	ND	ND	ND	NR	ND	NR	0.540 j
Unknown sitosterol	ND	ND	ND	ND	NR	ND	NR	1.000 j
Fluorenones (mg/kg)								
9-Fluorenone	ND	3.10	ND	15.000 c	14.0 c d y	2.300 c	2.60 c d	0.120 y
2,4,7-Trinitrofluorenone	ND	10.0	ND	1.700 c x	1.600 c d	53.0 c x	55.0 c d	ND

( ) - Number of compounds in total.
c - Pesticide/PCB result confirmed by GC/MS analysis.
d - Concentration recovered from diluted sample.
j - Estimated concentration; compound present below quantitation limit.
x - Result derived from instrument response outside calibration range.
y - Reported result below specified reporting limit.
DL - Diluted sample analysis (Ref. 76).
ND - Not detected at analytical detection limit (Ref. 76).
NR - Not run.

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCSS-1[+] (6-12 in.)	MS MCSS-1© (6-12 in.)	MSD MCSS-1© (6-12 in.)	MCSS-2©[+] (1-1.5 ft)	DUP MCSS-2©[+] (1-1.5 ft)	MS MCSS-2©[+] (1-1.5 ft)	MSD MCSS-2© (1-1.5 ft)	MCSS-3© (1-2 ft)	DUP MCSS-3© (1-2 ft)
PESTICIDES/PCBs (mg/kg)									
Alpha-BHC	ND	ND	ND	ND	0.0016 j p	0.018 p	0.0085 p	ND	ND
Heptachlor	ND	*	*	0.0043 p	ND	*	*	0.0015 j	ND
Dieldrin	ND	*	*	ND	0.013 p	*	*	ND	0.0028 j p
4,4'-DDE	0.0038 j	0.0047	0.0038 j	ND	ND	ND	ND	ND	ND
Endrin	ND	*	*	ND	ND	*	*	ND	0.0031 j
Endosulfan II	ND	ND	ND	ND	ND	0.017 p	0.014 p	0.0023 j	0.0027 j p
4,4'-DDD	ND	ND	ND	0.0073 p	0.0073 p	0.030 p	0.025 p	ND	0.0022 j
Endosulfan sulfate	ND	ND	ND	0.0062 p	0.0062 p	0.035 p	0.023 p	ND	ND
4,4'-DDT	0.0073 p	*	*	ND	ND		*	0.0099	0.0099
alpha-Chlordane	0.0033 p	0.0037 p	0.0025	ND	ND	ND	ND	ND	ND
gamma-Chlordane	0.0027	0.0033	0.0017 j p	ND	ND	ND	ND	ND	ND
Aroclor 1260	0.029 j	0.031 j p	0.026 j	ND	ND	ND	ND	ND	ND

[+] - Aldrin data for these samples unusable because MS/MSD produced no Aldrin recovery. Remaining should be considered estimated due to low surroggate recoveries as already discussed.

© - Due to poor correlation between primary and confirmation analyses data, reported concentrations for this sample should be interpreted as estimated.

* - Spiking compound; data not representative of actual sample concentration.

j - Estimated concentration; compound present below quantitation limit.

p - Pesticide/Aroclor target analyte has > 25% difference for the detected concentrations between the two GC columns.

MS - Matris spike

ND - Not detected at analytical detection limit (Ref. 76).

DUP - Duplicate sample analysis.

MSD - Matrix spike duplicate.

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCSS-4© (6-12 in.)	MCSS-5© (6-12 in.)	DUP MCSS-5© (6-12 in.)	MCSS-6© (1-2 ft)	DUP MCSS-6© (1-2 ft)	MCSS-6A© (3 ft)	DUP MCSS-6A© (3 ft)	DL MCSS-6A© (3 ft)
PESTICIDES/PCBs (mg/kg)								
Dieldrin	ND	0.0029 j p	ND	ND	ND	ND	ND	ND
4,4'-DDE	0.025	0.0035 j p	ND	0.0074 p	0.0074 p	0.066	0.066	0.045 d j
Endrin	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	0.0033 jp	ND	ND	ND	ND	ND	ND	ND
4,4'-DDD	ND	ND	0.010 p	ND	0.0032 j p	ND	0.029 p	ND
Endosulfan sulfate	ND	0.020 p	0.026 p	ND	ND	ND	ND	ND
4,4'-DDT	0.0097 p	0.050	0.036 p	0.064	0.050 p	0.250 x	0.690 x	0.530 d
alpha-Chlordane	0.0086	ND	ND	ND	ND	ND	ND	ND
gamma-Chlordane	0.0059 p	0.0015 j p	0.0015 j p	ND	ND	ND	ND	ND
Aroclor 1260	0.220 p	ND	ND	ND	ND	ND	ND	ND

© - Due to poor correlation between primary and confirmation analyses data, reported concentrations for this sample should be interpreted as estimated.

d - Concentration recovered from diluted sample.

j - Estimated concentration; compound present below quantitation limit.

p - Pesticide/Aroclor target analyte has > 25% difference for the detected concentrations between the two GC columns.

x - Compound detected above instrument saturation levels.

DL - Diluted sample analysis (Ref. 76).

ND - Not detected at analytical detection limit (Ref. 76).

DUP - Duplicate sample analysis.

TABLE 2.6

SURFACE SOIL DATA SUMMARY (MAY 1992)

MacKenzie Chemical NYSDEC I.D. No. 152017

PARAMETER	MCSS-1+ (6-12 in.)	DUP MCSS-1 (6-12 in.)	MCSS-2@ (1-1.5 ft)	DUP MCSS-2@ (1-1.5 ft)	MCSS-3@ (1-2 ft)	MCSS4+ (6-12 in.)	MCSS-5@ (6-12 in.)	MCSS-6@ (1-2 ft)	MCSS-6A@ (3 ft)	DL MCSS-6A@ (3 ft)	NATIVE SOIL CONCENTRATIONS TYPICAL RANGE (n)
TAL METALS (ug/l)											
Aluminum	4,340 R	5,750 R	6,250	6,992	8,920	4,310 R	6,270	7,110	17,400	17,400	**10,000 - 300,000**
Antimony	ND N	ND	5.5 B N	ND	ND N	ND N	ND N	3.6 B N	9.3 B N	9.3 B N	**0.6 - 10**
Arsenic	4.9	5.2	8.1	8.0	4.7	3.8	3.7	3.8	12.0	12.0	**1.0 - 40**
Barium	48.6	12.8 B	43.4	52.5	28.1 B	59.9	38.7	25.2 B	373	373	**100 - 3,500**
Beryllium	ND N	ND	0.18	0.12	0.25	ND	ND	ND	0.39	0.39	**0.1 - 40**
Cadmium	0.56 B	0.57 B	ND R	0.6 B	ND R	1.9	1.3 R	ND R	1.6 R	1.6 R	**0.01 - 7.0**
Calcium	2,460 R	1,270 R	12,100 R	8,900 R	5,790 R	9,070 R	534 B R	565 B R	15,900 R	15,900 R	**100 - 400,000**
Chromium	49.4 N R	71.0 R	122 N R	170 R	32.4 N R	39.5 N R	120 N R	14.6 N R	40.0 N R	40.0 N R	**5.0 - 3,000**
Cobalt	7.1 B	5.3 B	428 R	346 R	305 R	32.6	6.7 B R	3.8 B R	18.3 R	18.3 R	**1.0 - 40**
Copper	96.6 N R	50.2 R	108 N R	204 R	28.2 N R	42.2 N R	122 N R	15.8 N R	115 N R	115 N R	**2.0 - 100**
Iron	11,500	11,000	19,100	23,000	9,850	11,100	13,500	9,310	33,500	33,500	**7,000 - 550,000**
Lead	44.3 R	27.6 R	395	470	107	238 R	204	74.7	497	497	**2.0 - 200**
Magnesium	611 B	570 B	1,300	1,100 B	994	1,300	572 B	643 B	1,530	1,530	**600 - 6,000**
Manganese	57.4 R	27.9 R	111	124	68.5	70.7 R	42.4	74.0	392	392	**100 - 4,000**
Mercury	0.18	0.16	0.23 N R	0.52 R	3.6 N R	0.59	18.9 N R	0.71 N R	0.25 N R	0.25 N R	**0.01 - 0.08**
Nickel	8.9 B N R	537.6 R	13.7	13.2	9.3	28.9 N R	8.5	5.1 B	15.2	15.2	**5.0 - 1,000**
Potassium	283 B	352 B	ND	ND	ND	685 B	ND	ND	919 B	919 B	**400 - 30,000**
Selenium	0.27 B W	0.33 B	ND	ND	0.39 B W	ND	0.36 B	0.47 B	0.55 B W	0.55 B W	**0.1 - 2.0**
Silver	1.6 B	2.8	ND	ND	ND	0.94 B	6.8	ND	1.4 B	1.4 B	**0.1 - 5.0**
Sodium	ND	ND	81.7 B	55.2 B	171 B	154 B	42.1 B	27.1 B	590 B	590 B	**750 - 7,500**
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND W	ND W	**0.1 - 12**
Vanadium	10.9 B	11.7	17.2	19.9	16.6	18.1	93.2	16.1	24.0	24.0	**20 - 500**
Zinc	127 N R	1,728 R	212 R	268 R	116 R	360 N R	112 R	75.7 R	825 R	825 R	**10 - 300**
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	1.0	1.0	-

+ - Chromium, Nickel and Zinc CONCENTRATIONS biased high due to elevated MS/MSD recoveries; antimony may be present at twice reported concentrations may actually be 5-6 times higher than reported concentration.

(n) - Ref. 79.

B - Value less than contract-required detection limit but greater than instrument detection limit.

@ - Chromium, copper and mercury concentrations biased high due to elevated MS/MSD recoveries; antimony concentration may be 3 times reported concentration.

N - Spiked sample recovery not within control limits.

R - Duplicate analysis not within control limits.

W - Post-digestion spike out of control limits; sample absorbance less than 50% of spike absorbance.

DL - Diluted sample analysis (Ref. 76).

ND - Not detected at analytical detection limit (Ref. 76).

DUP - Duplicate samply analysis.

TABLE 2.7

SUFFOLK CONTY DEPARTMENT OF HEALTH SERVICES
DOWNGRADIENT GROUNDWATER PROFILE RESULTS
MacKenzie Chemical NYSDEC I.D. No. 152017
July 1993

TRICHLOROPROPANE									
DEPTH*	**M-1**	**M-2**	**M-3**	**M-4**	**M-5**	**M-6**	**M-7**	**M-8**	**M-9**
0-10	1,300	670	120	ND	210	ND	ND	ND	ND
11-20	ND	9	ND	16	7,600	ND	ND	ND	ND
21-30	ND	ND	ND	ND	5,400	ND	ND	ND	ND
31-40	ND	ND	ND	ND	1,600	ND	ND	ND	ND
41-50	ND	ND	ND	ND	100	ND	ND	ND	ND
51-60	ND	ND	ND	ND	6	ND	ND	ND	ND
61-70	--	--	--	--	ND	ND	ND	ND	ND
71-80	--	--	--	--	--	ND	ND	ND	ND
81-90	--	--	--	--	--	ND	ND	ND	ND
91-100	--	--	--	--	--	--	ND	ND	ND
101-110	--	--	--	--	--	--	ND	ND	--
111-120	--	--	--	--	--	--	ND	--	--

TRICHLOROETHENE								
M-1	**M-2**	**M-3**	**M-4**	**M-5**	**M-6**	**M-7**	**M-8**	**M-9**
5	7	6	1	ND	ND	ND	ND	ND
3	ND	ND	3	6	ND	ND	ND	ND
ND	ND	ND	ND	5	ND	ND	ND	ND
ND	ND	ND	ND	0.9	ND	ND	ND	ND
ND	ND	ND	ND	ND	ND	ND	ND	ND
ND	ND	ND	ND	ND	ND	ND	ND	ND
--	--	--	--	ND	ND	ND	ND	ND
--	--	--	--	--	--	ND	ND	ND
--	--	--	--	--	--	ND	ND	ND
--	--	--	--	--	--	ND	ND	ND
--	--	--	--	--	--	ND	ND	--
--	--	--	--	--	--	0.7	--	--

TETRACHLOROETHENE								
DEPTH*	**M-1**	**M-2**	**M-3**	**M-4**	**M-5**	**M-6**	**M-7**	**M-8**	**M-9**
0-10	47	33	35	5	ND	ND	ND	ND	ND
11-20	26	47	ND	0.7	8	ND	ND	ND	ND
21-30	ND	1	ND	ND	4	ND	ND	ND	ND
31-40	ND	ND	ND	ND	0.8	ND	ND	ND	ND
41-50	ND	ND	ND	ND	ND	ND	ND	ND	ND
51-60	ND	ND	ND	ND	ND	ND	ND	ND	ND
61-70	ND	--	--	--	ND	ND	ND	ND	ND
71-80	--	--	--	--	--	ND	ND	ND	ND
81-90	--	--	--	--	--	ND	ND	ND	ND
91-100	--	--	--	--	--	--	ND	ND	ND
101-110	--	--	--	--	--	--	ND	ND	--
111-120	--	--	--	--	--	--	0.7	--	--

NOTES:
All results in ppb
* - Depth of screened auger below static water level
-- - Interval not samples
ND - Not detected above laboratory detection limits

TABLE 3.1

SAMPLING SUMMARY

MacKenzie Chemical NYSDEC I.D. No. 152017

TASK ID	NUMBER OF SAMPLES	SAMPLE MATRIX	SAMPLE DEPTHS (ft. bgs.)	TCL VOCs (mobile lab)	CLP LAB - FULL QA/QC[3]			
					TCL VOCs	TCL SVOCc	TCL PEST/PCBs	TAL METALS & CYANIDE
Surface Soil Sampling	21	Soil	0-4 ft.	X				
Drainage Structure Sampling	20 12	Soil Soil	TBD[1] TBD	X	X	X	X	X
Off-Site Vertical Profile Wells	64 6	GW[2] GW	60', 80', 100' & 120' bgs. TBD	X	X	X	X	X
Groundwater Sampling	15	GW	TBD		X	X	X	X

[1] - TBD - To be determined based upon field observations.

[2] - GW - Groundwater

[3] - Analyses to be conducted by CLP Laboratory following full CLP Procedures.

APPENDIX A

SITE MAPS

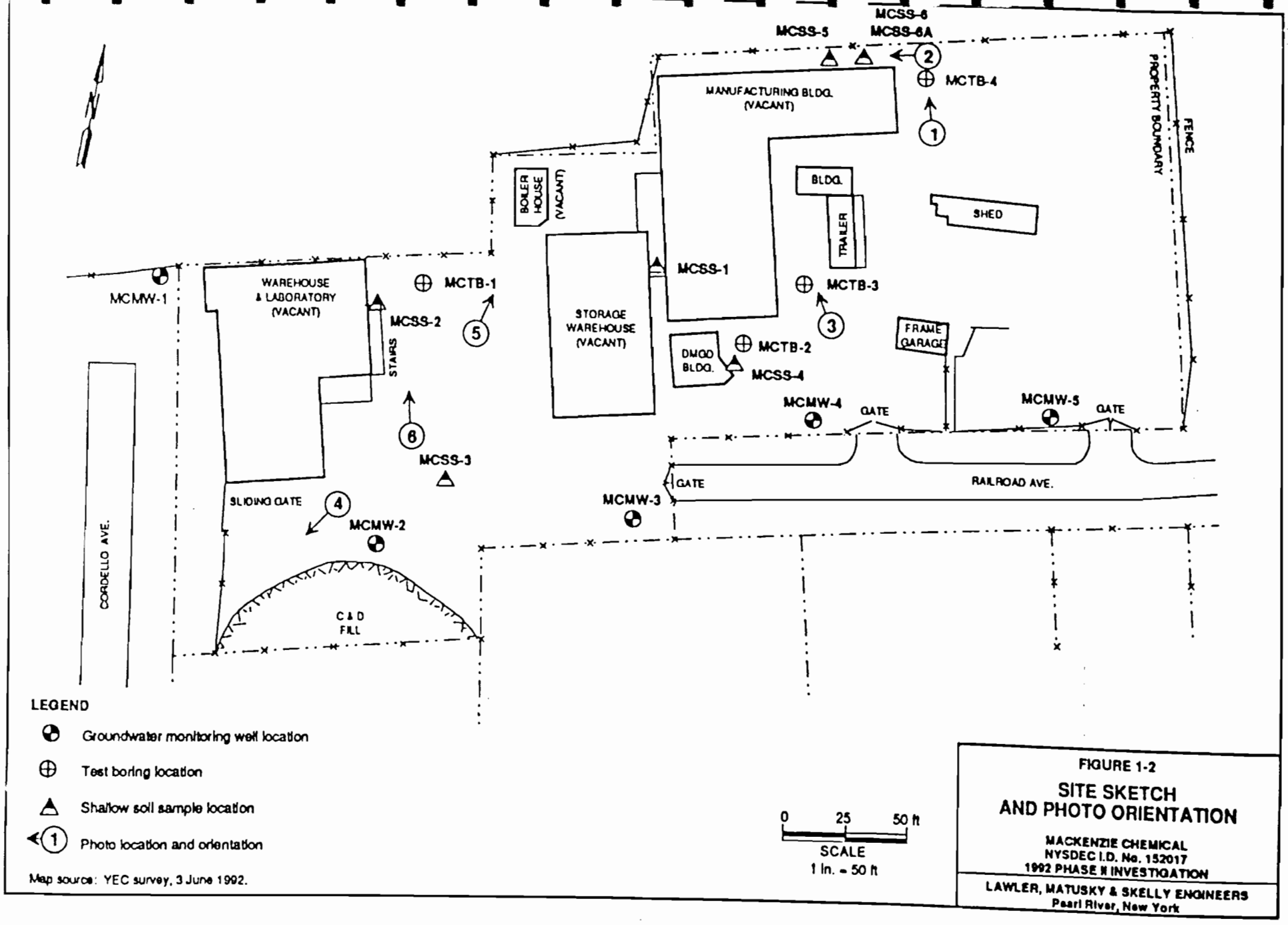
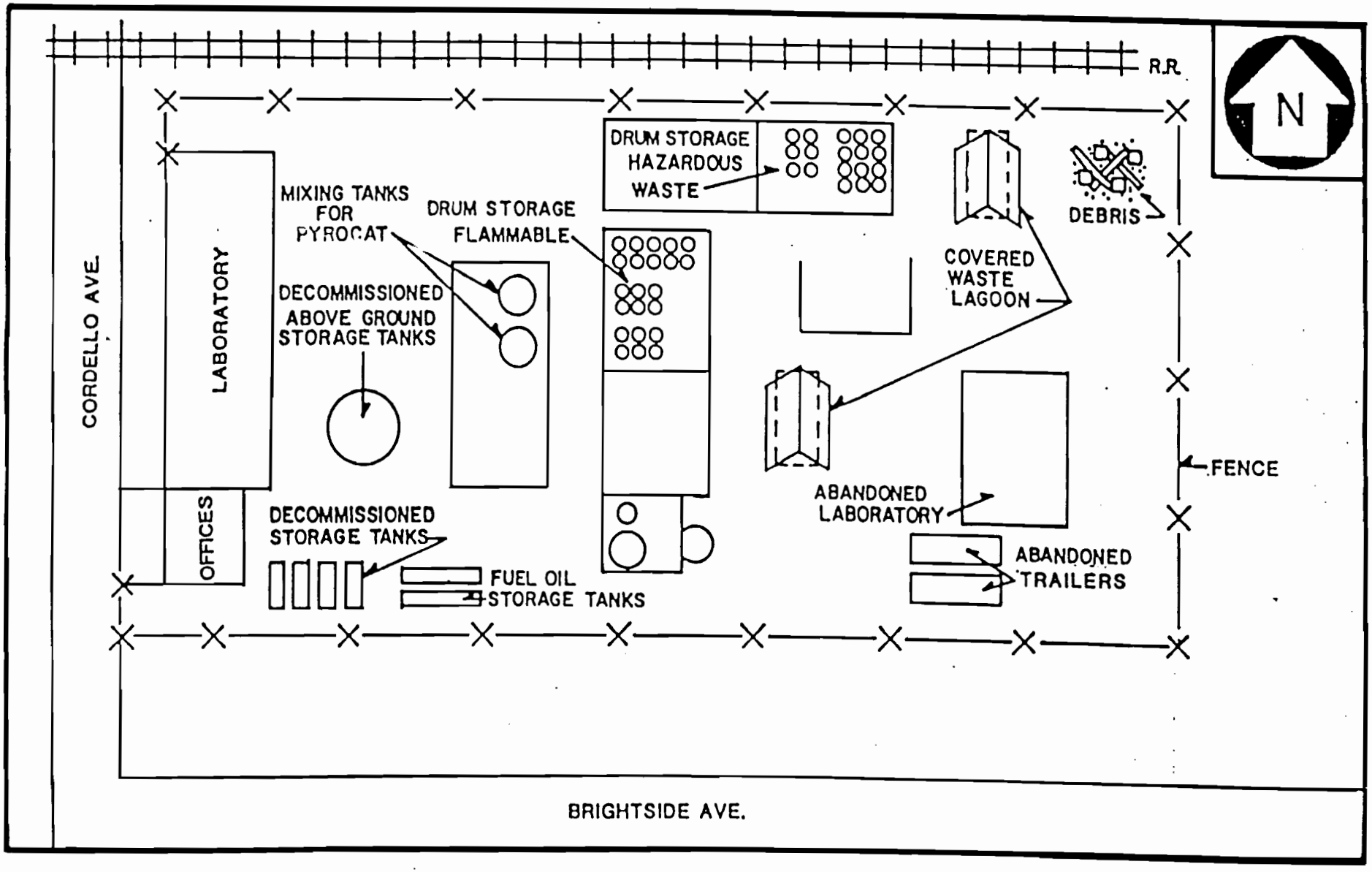


FIGURE 1-2

SITE SKETCH AND PHOTO ORIENTATION

MACKENZIE CHEMICAL
NYSDEC I.D. No. 152017
1992 PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



MACKENZIE CHEMICAL WORKS

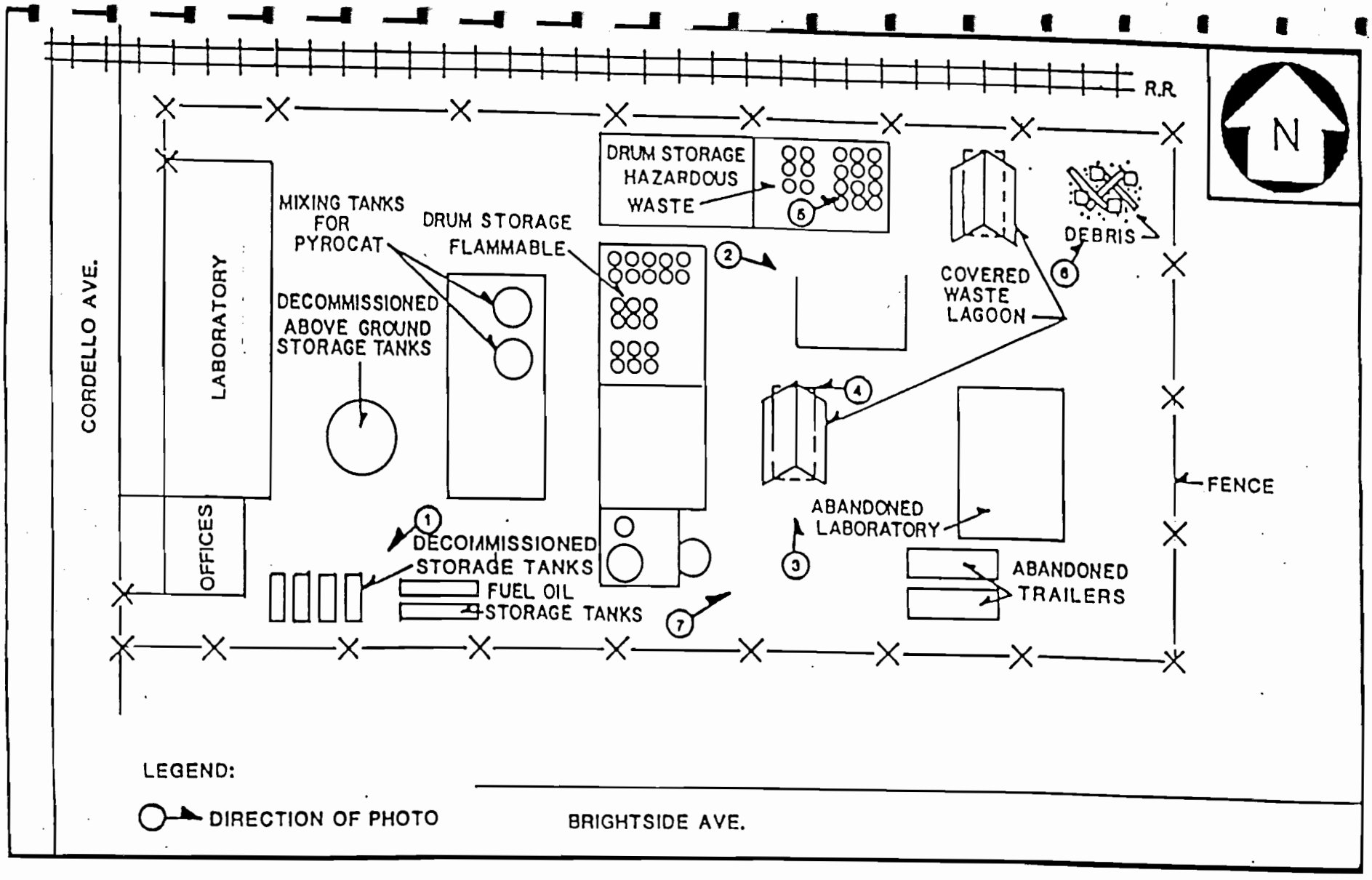
CENTRAL ISLIP, N.Y.

SITE MAP

(NOT TO SCALE)

FIGURE 2

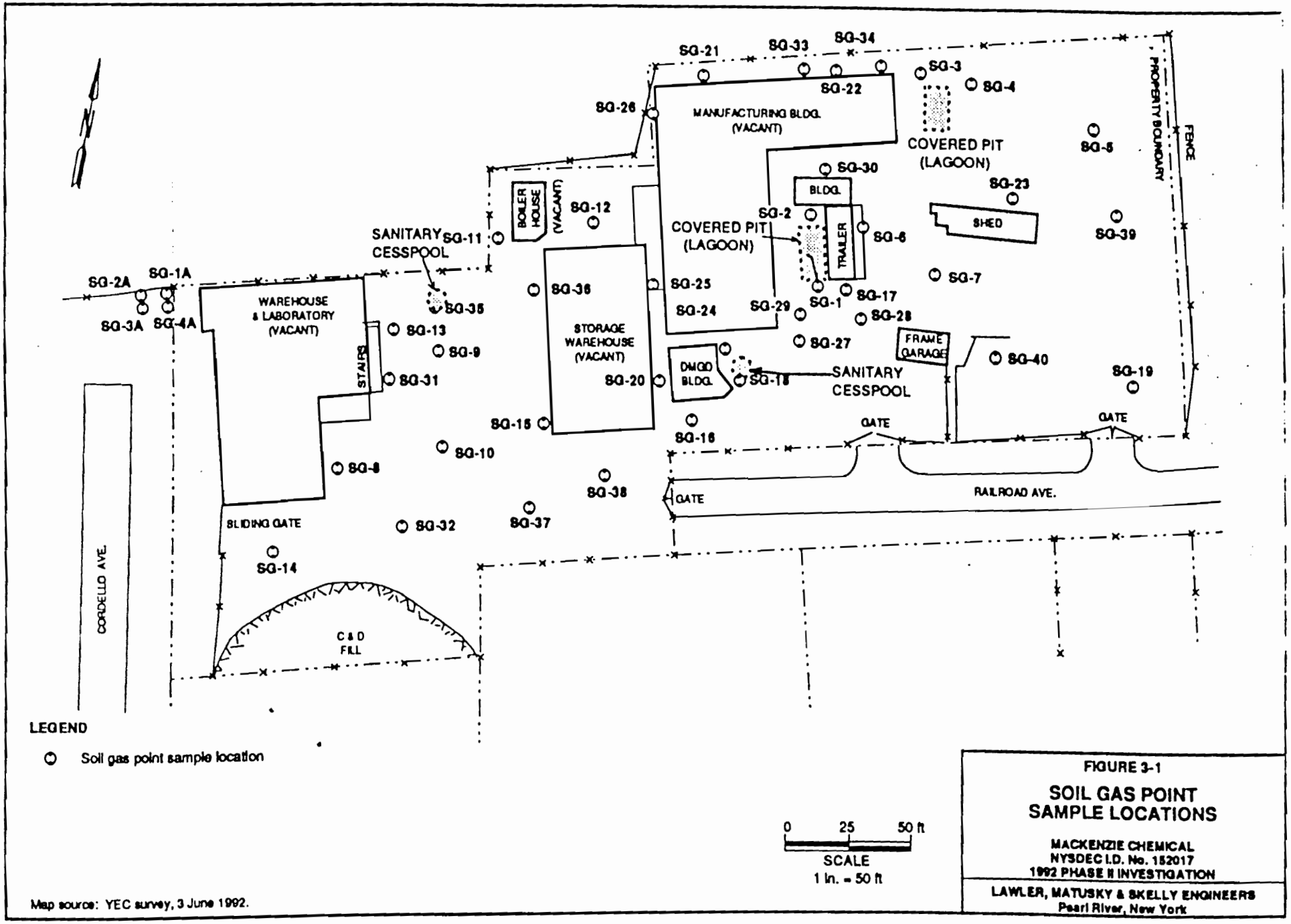
NUS CORPORATION



MACKENZIE CHEMICAL WORKS
CENTRAL ISLIP,N.Y.
PHOTO LOCATION MAP
(NOT TO SCALE)

FIGURE 3

NUS CORPORATION


N
SG-21
SG-33
SG-34
SG-3
SG-4
SG-22
SG-26
MANUFACTURING BLDG.
(VACANT)
COVERED PIT
(LAGOON)
SG-5
PROPERTY BOUNDARY
FENCE
SG-30
BLDG.
SG-23
SHED
SG-39
BOILER HOUSE (VACANT)
SG-12
SG-2
TRAILER
SG-6
COVERED PIT
(LAGOON)
SANITARY CESSPOOL
SG-11
SG-7
SG-2A
SG-1A
SG-36
SG-25
SG-17
SG-1
SG-24
SG-29
SG-28
SG-3A
SG-4A
WAREHOUSE & LABORATORY (VACANT)
SG-35
SG-13
STORAGE WAREHOUSE (VACANT)
SG-27
FRAME GARAGE
SG-40
SG-9
STAIRS
SG-31
SG-20
DMGD BLDG.
SG-18
SANITARY CESSPOOL
SG-19
SG-15
GATE
GATE
SG-16
SG-10
SG-8
SG-38
GATE
RAILROAD AVE.
SLIDING GATE
SG-32
SG-37
SG-14
CORDELLO AVE.
C & D FILL
LEGEND
Soil gas point sample location
0
25
50 ft
SCALE
1 in. = 50 ft
Map source: YEC survey, 3 June 1992.
FIGURE 3-1
SOIL GAS POINT SAMPLE LOCATIONS
MACKENZIE CHEMICAL
NYSDEC I.D. No. 152017
1992 PHASE II INVESTIGATION
LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York

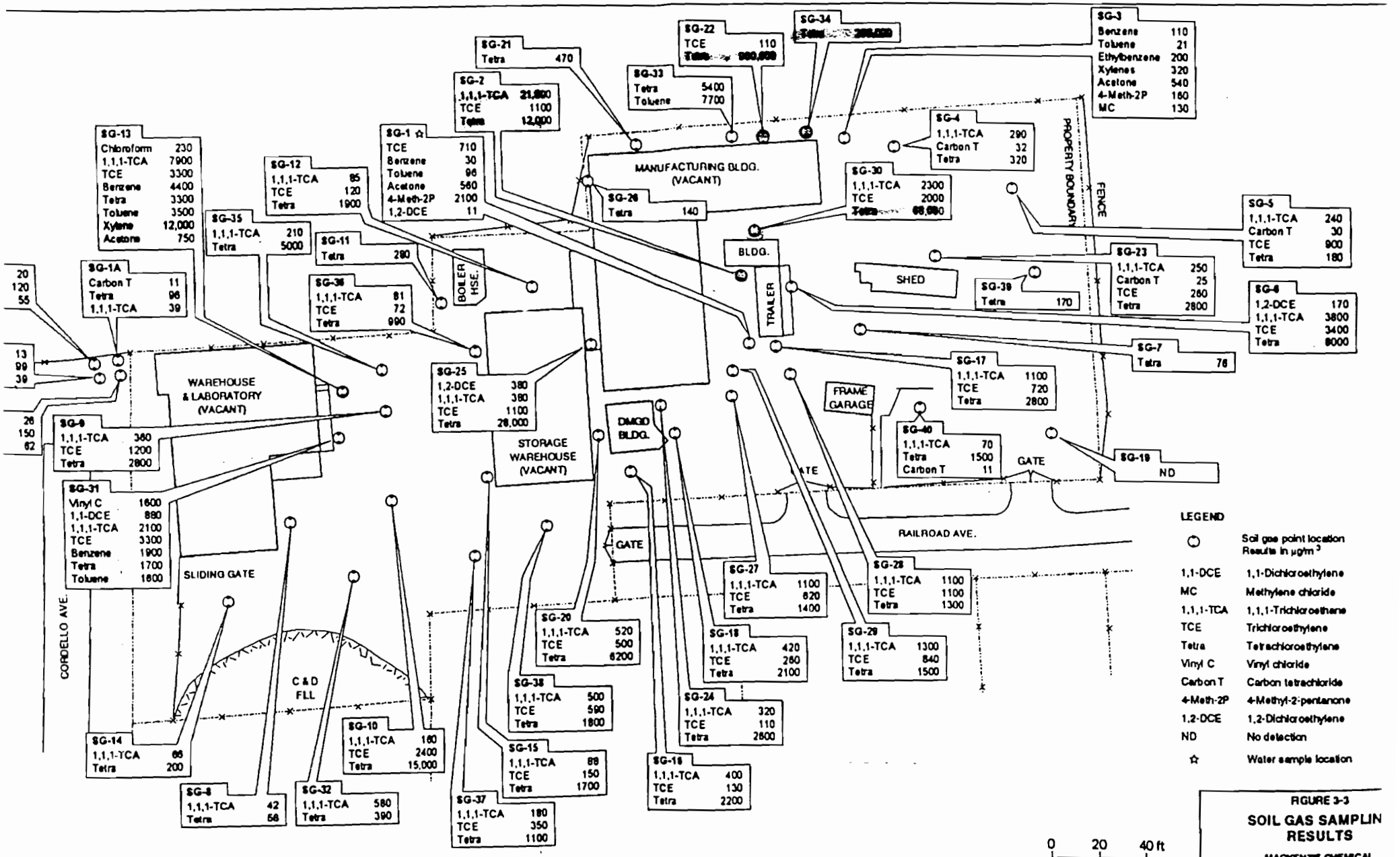
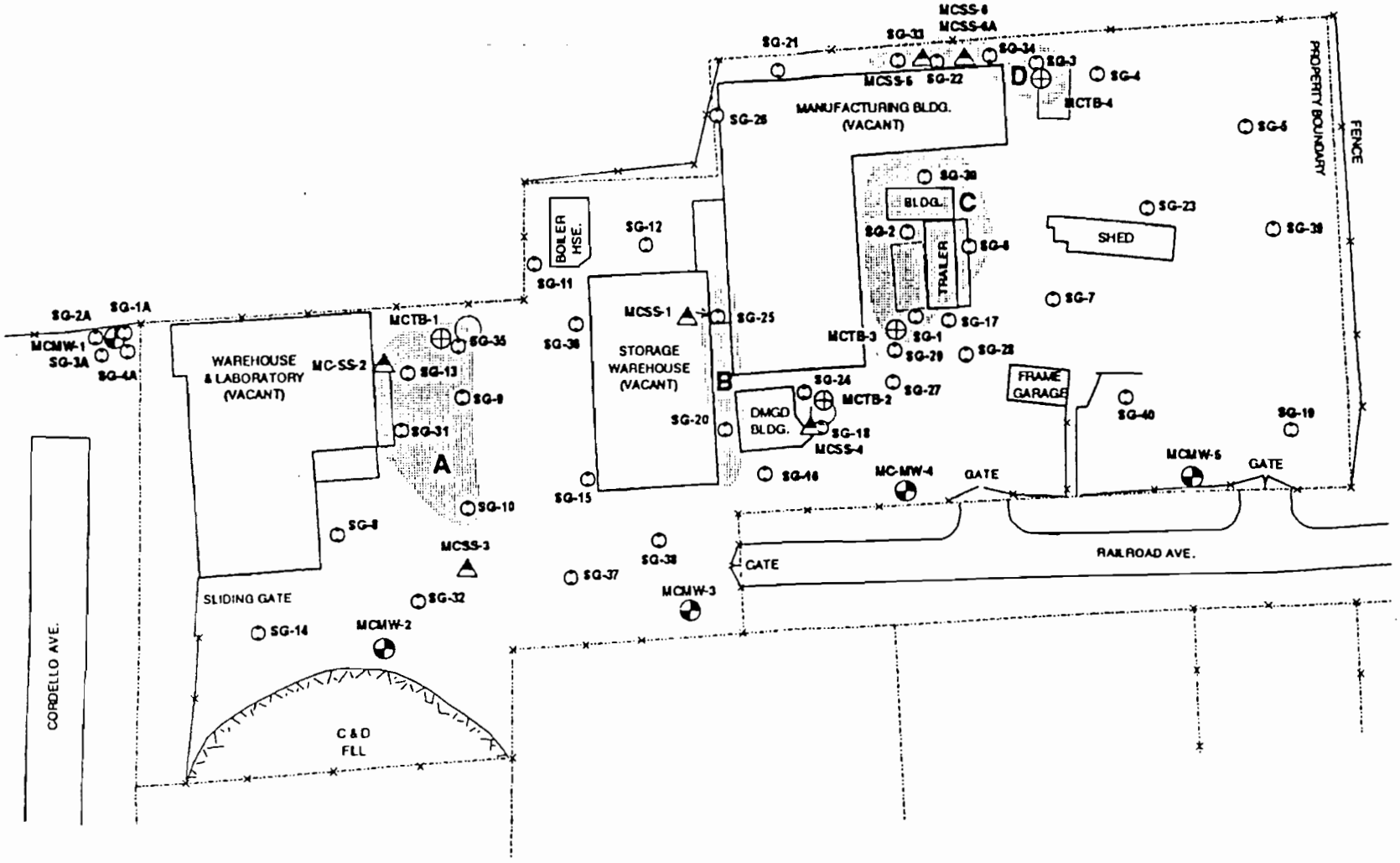


FIGURE 3-3

SOIL GAS SAMPLIN RESULTS

MACKENZIE CHEMICAL
NYSDEC I.D. No. 152017
1992 PHASE II INVESTIGATIC
LAWLER, MATUSKY & SKELLY EN
Pearl River, New York

YEC survey, 3 June 1992.



LEGEND

- Soil gas point location
- Area of high soil gas reading
- Covered pit (lagoon)
- Sanitary cesspool
- Monitoring well location
- Test boring location
- Soil sample location

0 20 40 ft

SCALE
1 in. = 40 ft

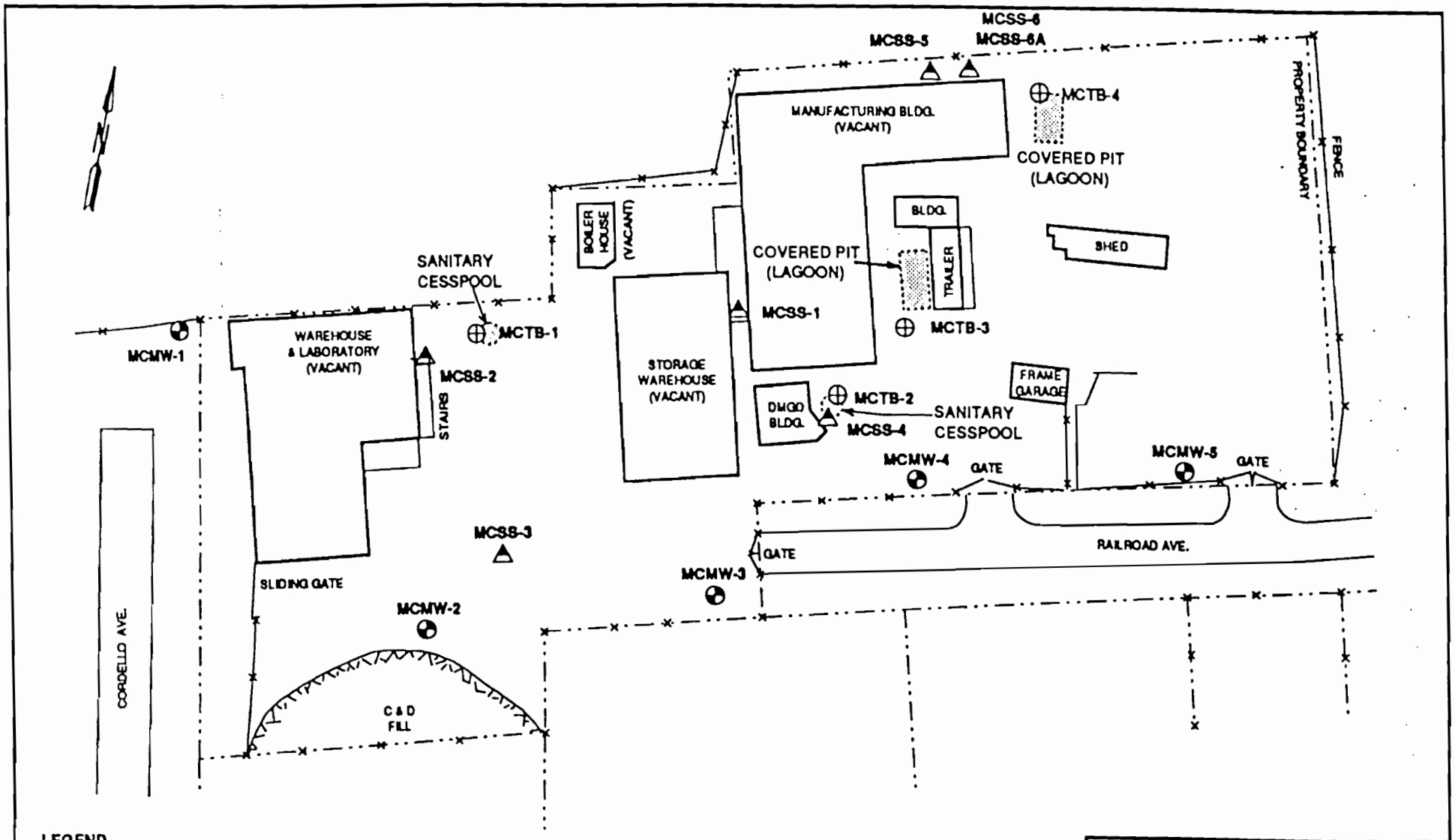
survey, 3 June 1992.

FIGURE 3-4

SOIL GAS DELINEATION RESULT

MACKENZIE CHEMICAL
NYSDEC I.D. No. 152017
1992 PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



LEGEND

- Groundwater monitoring well location
- Test boring location
- Shallow soil sample location

Map source: YEC survey, 3 June 1992.

0 25 50 ft

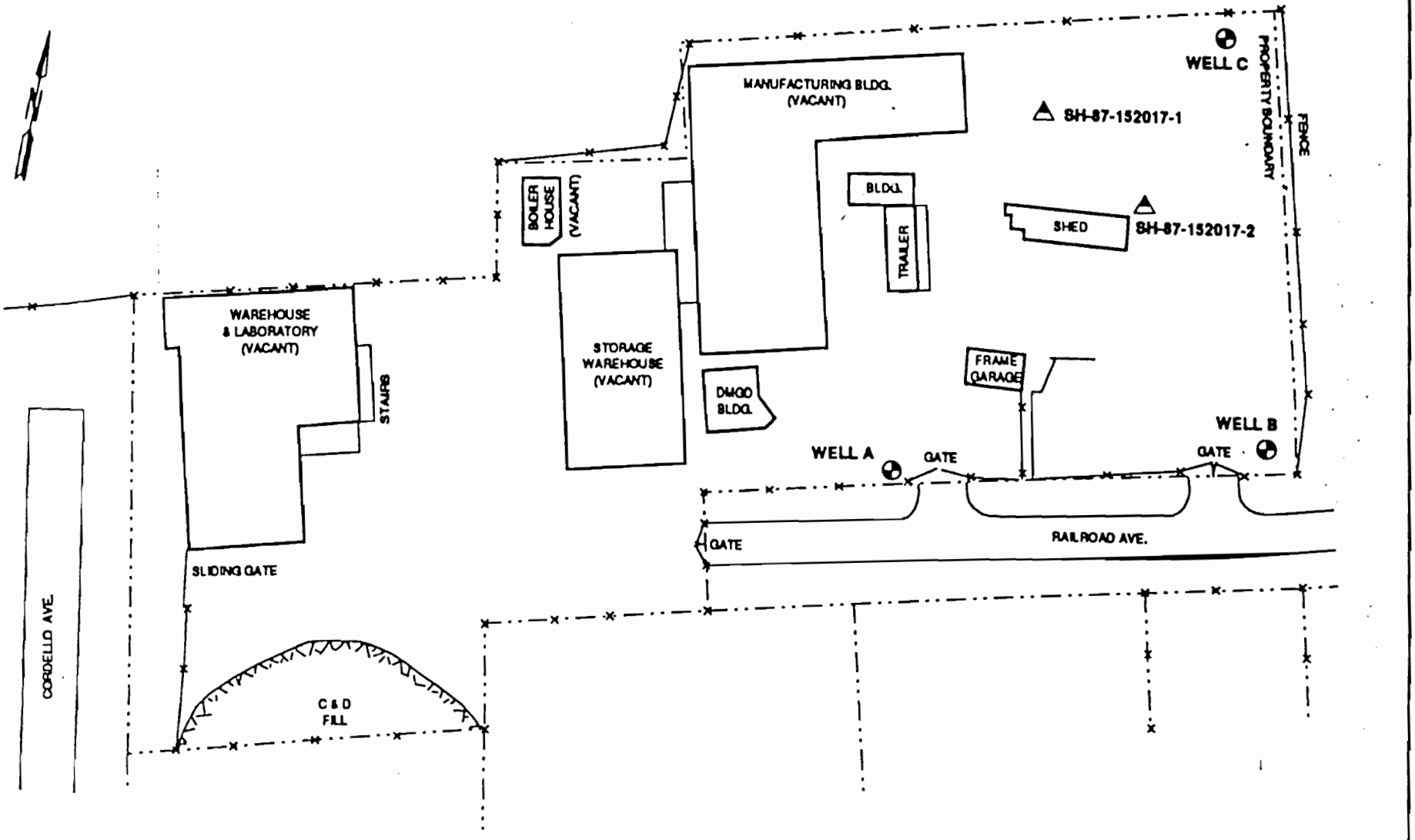
SCALE
1 in. = 50 ft

FIGURE 3-5

MONITORING WELL, TEST BORING, AND SOIL SAMPLING LOCATIONS

MACKENZIE CHEMICAL
NYSDEC I.D. No. 152017
1992 PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



LEGEND

- Existing monitoring well location
- Previous shallow soil sample location

Map source: YEC survey, 3 June 1992.

0 25 50 ft

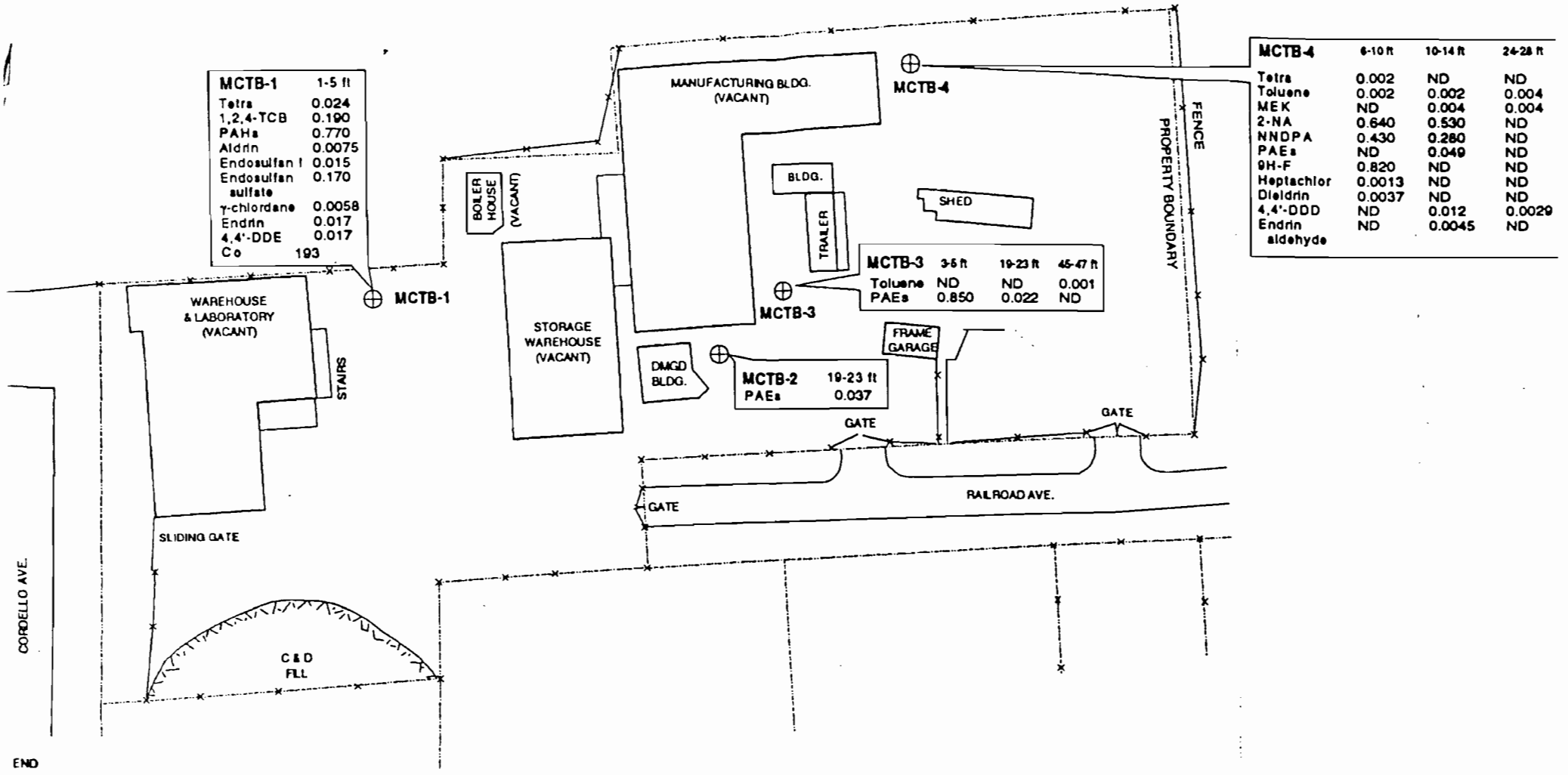
SCALE
1 in. = 50 ft

FIGURE 4-5

APPROXIMATE LOCATIONS OF EXISTING MONITORING WELLS AND PREVIOUS SOIL SAMPLES

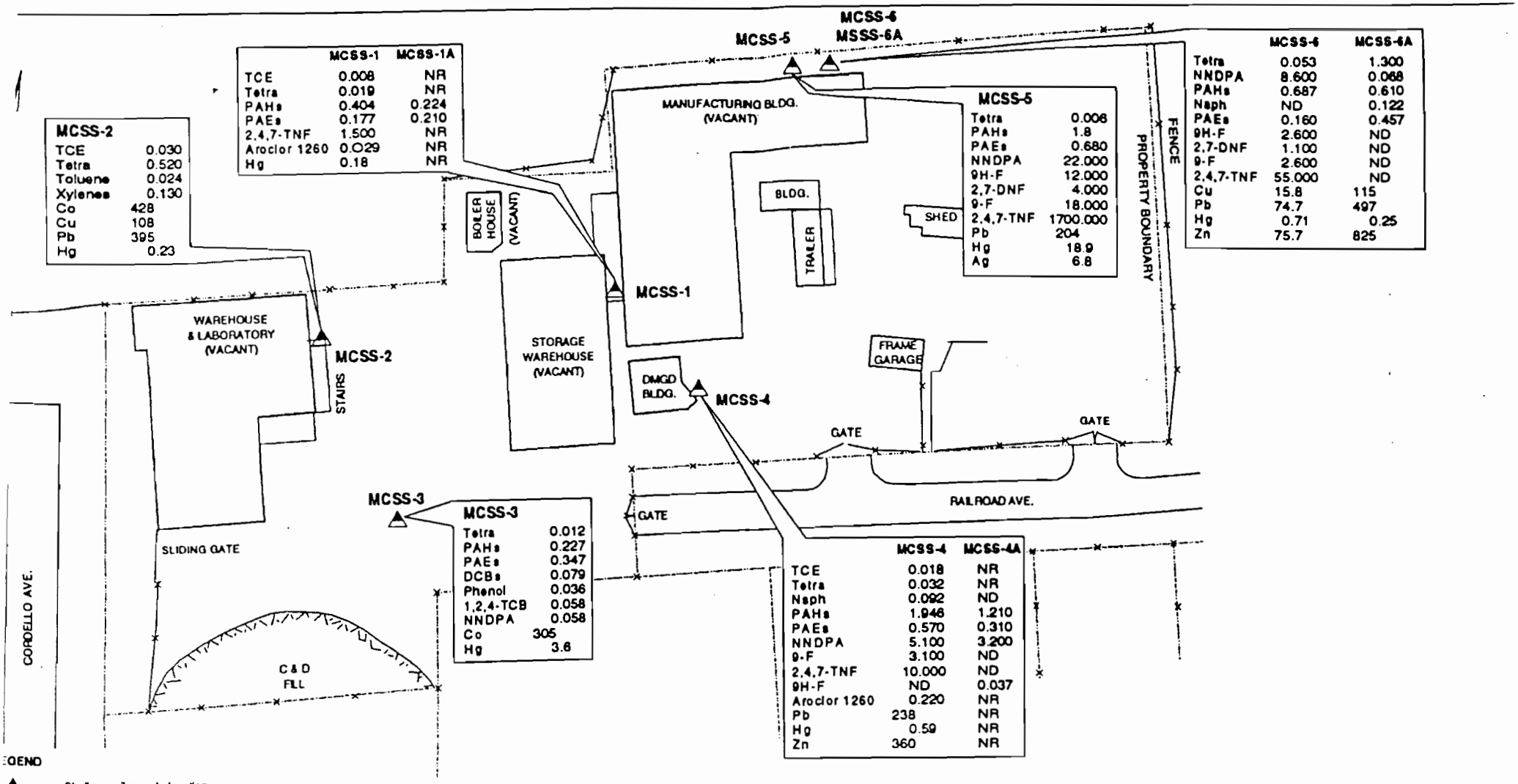
MACKENZIE CHEMICAL
NYSDEC I.D. No. 152017
1992 PHASE II INVESTIGATION

LAWLER, MATUSKY & SKELLY ENGINEERS
Pearl River, New York



Map source: YEC survey, 3 June 1992.

FIGURE 4-6
SELECTED CONTAMINANT CONCENT
IN TEST BORING
HACKENZIE CHEMICA
NYSDEC I.D. No. 16201
1992 PHASE II INVESTIGA
LAWLER, MATUSKY & SKELLY
Pearl River, New Yor



EGEND

△ Shallow soil sample location

(units - mg/kg)

CE	Trichloroethylene	2,4,7-TNF	2,4,7-Trinitrofluorenone
etra	Tetrachloroethylene	9H-F	9-H-Fluoren-9-one
CBs	1,2-, 1,3-, or 1,4-Dichlorobenzene	2,7-DNF	2,7-Dinitro-9H-fluoren-9-one
		Co	Cobalt
AHs	Polynuclear aromatic hydrocarbons	Cu	Copper
AEs	Phthalate acid esters	Pb	Lead
laph	Naphthalene and like substances	Hg	Mercury
,2,4-TCB	1,2,4-Trichlorobenzene	Zn	Zinc
NDPA	N-nitrosodiphenylamine	Ag	Silver
)-F	9-Fluorenone	ND	No detection
		NR	Not run

Map source: YEC survey, 3 June 1992.

0 20 40 ft

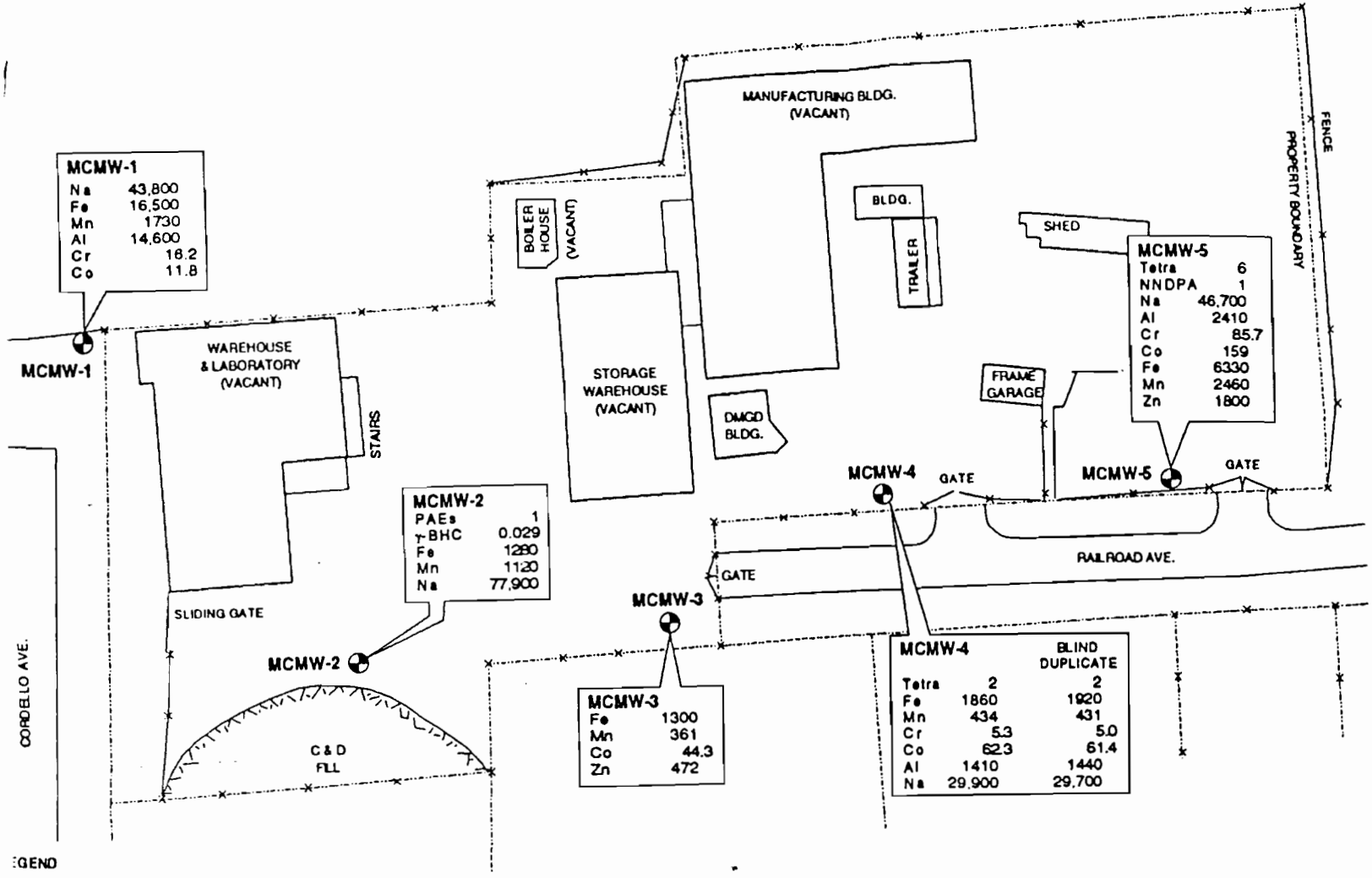
SCALE

1 in. = 40 ft

FIGURE 4-7
SELECTED CONTAMINANT CONCI IN SHALLOW SOIL

MACKENZIE CHE N'TSIDEC LD. No. 1 1992 PHASE II INVEST

LAWLER, MATUSKY & SKE Pearl River, New



EGEND

Groundwater monitoring well location
(units - µg/l)

Sodium
Iron
Manganese
Aluminum
Chromium
Cobalt
Zinc
Es Phthalate acid esters
ra Tetrachloroethylene
IDPA N-nitrosodiphenylamine

Map source: YEC survey, 3 June 1992.

0 20 40 ft
SCALE
1 in. = 40 ft

FIGURE 4-8
SELECTED CONTAMINANT CONCENT
IN GROUNDWATE
MACKENZIE CHEMICA
NYSDEC I.D. No. 152O1
1992 PHASE II INVESTIGA
LAWLER, MATUSKY & SKELLY
Pearl River, New York

APPENDIX B

FEDERAL & STATE ARARs

1.0 Applicable or Relevant and Appropriate Requirements

1.1 ARARs for Groundwater Cleanup Criteria

1.1.1 Federal Regulations

The following sources of ARARs have been identified for site groundwater:

40 CFR	Part 141	National Primary Drinking Water Regulations
	Subpart B	Maximum Contaminant Levels
	Section 141.11	Maximum Contaminant Levels for Inorganic Chemicals
	Section 141.12	Maximum Contaminant Levels for Organic Chemicals
	Subpart F	Maximum Contaminant Level Goals
	Section 141.50	Maximum Contaminant Level Goals for Inorganic Chemicals
	Section 141.51	Maximum Contaminant Level Goals for Inorganic Chemicals
	Subpart G	National Revised Drinking Water Regulations: Maximum Contaminant Levels
	Section 141.61	Maximum contaminant Levels for Organic Contaminants
40 CFR	Part 143	National Secondary Drinking Water Regulations
	Section 143.3	Secondary Maximum Contaminant Levels

1.1.2 New York Regulations

The following sources of ARARs have been identified for site groundwater:

6 NYCRR	Part 701	Classification - Surface Waters and Ground Waters
	Section 701.15	Class GA Fresh Ground Waters
	Part 702	Derivation and Use of Standards and Guidance Values
	Section 702.1	Basis for Derivation of Water Quality Standards and Guidance Values
	Section 702.2	Standards and Guidance Values for Protection of Human Health and Sources of Potable Water Supplies
	Part 703	Surface Water and Ground Water Quality Standards and Ground Water Effluent Standards
	Section 703.5	Water Quality Standards for Taste, Color and Odor-Producing, Toxic and Other Deleterious Substances
10 NYCRR	Part 5	Drinking Water Supplies
	Subpart 5-1	Public Water Systems
	Section 5-1.51	Maximum Contaminant Levels

	Section 5-1.52	Tables; Table 1 - Inorganic Chemicals and Physical Characteristics Maximum Contaminant Level Determination, Table 3 - Organic Chemicals Maximum Contaminant Level Determination

1.1.3 Specific ARARs for Groundwater Cleanup Criteria

The specific ARARs for groundwater cleanup criteria are listed in table 1.1.

1.2 ARARs for Groundwater Discharge Criteria

1.2.1 Federal Regulations

The following sources of ARARs have been identified for site groundwater discharge:

40 CFR	Part 141	National Primary Drinking Water Regulations
	Subpart B	Maximum Contaminant Levels
	Section 141.11	Maximum Contaminant Levels for Inorganic Chemicals
	Section 141.12	Maximum Contaminant Levels for Organic Chemicals
	Subpart F	Maximum Contaminant Level Goals
	Section 141.50	Maximum Contaminant Level Goals for Inorganic Chemicals
	Section 141.51	Maximum Contaminant Level Goals for Inorganic Chemicals
	Subpart G	National Revised Drinking Water Regulations: Maximum Contaminant Levels
	Section 141.61	Maximum Contaminant Levels for Organic Contaminants
40 CFR	Part 143	National Secondary Drinking Water Regulations
	Section 143.3	Secondary Maximum Contaminant Levels

1.2.2 New York Regulations

The following sources of ARARs have been identified for site groundwater discharge:

6 NYCRR	Part 701	Classifications - Surface Waters and Ground Waters
	Section 701.15	Class GA Fresh Ground Waters
	Part 702	Derivation and Use of Standards and Guidance Values
	Section 702.1	Basis for Derivation of Water Quality Standards and Guidance Values

	Section 702.2	Standards and Guidance Values for Protection of Human Health and Sources of Potable Water Supplies
	Section 702.16	Derivation and Implementation of Effluent Limitations
	Part 703	Surface Water and Ground Water Quality Standards and Ground Water Effluent Standards
	Section 703.5	Water Quality Standards for Taste, Color and Odor-Producing, Toxic and Other Deleterious Substances
	Section 703.6	Ground Water Effluent Standards and Limitations for Discharges to Class GA Waters
10 NYCRR	Part 5	Drinking Water Supplies
	Subpart 5-1	Public Water Systems
	Section 5-1.51	Maximum Contaminant Levels
	Section 5-1.52	Tables; Table 1 - Inorganic Chemicals and Physical Characteristics Maximum Contaminant Level Determination, Table 3 - Organic Chemicals Maximum Contaminant Level Determination

1.2.3 Specific ARARs for Groundwater Discharge Criteria

The specific ARARs for groundwater discharge criteria are listed in table 1.2.

1.3 ARARs for Air Emission Discharge Criteria

1.3.1 Federal Regulations

The EPA has established guidance values on the control of air emissions through the Clean Air Act at CERCLA sites for groundwater treatment (EPA, 1989). This guidance indicates that the sources most in need of controls are those with an actual emissions rate in excess of 3 lbs/hr or 15 lbs/day, or a calculated annual rate of 10 tons/year of total VOCs. The calculated annual rate assumes 24-hour operation, 365 days per year.

1.3.2 New York Guidelines

The New York State DEC Division of Air Resources has issued draft guidelines for the control of toxic ambient air contaminants in New York State. These guidelines are presented in the New York State Air Guide-1.

1.4 ARARs for Transport and Disposal Criteria

1.4.1 Federal Regulations

The following sources of ARARs have been identified for treatment, transportation and disposal of hazardous byproducts:

40 CFR	Part 261	Identification and Listing of Hazardous Waste
	Part 262	Standards Applicable to Generators of Hazardous Waste
	Part 263	Standards Applicable to Transporters of Hazardous Waste
	Part 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities
	Subpart B	General Facility Standards
	Subpart E	Manifest System, Record keeping and Reporting
	Subpart N	Landfills
	Subpart O	Incinerators
	Part 265	Interim Status Standards of Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities
	Subpart B	General Facility Standards
	Subpart E	Manifest System, Record keeping and Reporting
	Subpart N	Landfills
	Subpart O	Incinerators
	Subpart P	Thermal Treatment
	Subpart Q	Chemical, Physical and Biological Treatment
	Part 268	Land Disposal Restrictions
49 CFR	Part 172	Hazardous Material Regulations of the Department of Transportation, Hazardous Materials Tables and Hazardous Communications Requirements and Emergency Response Information Requirements
	Part 173	Hazardous Material Regulations of the Department of Transportation, Shippers, General Requirements for Shipping and Packaging
	Part 178	Hazardous Material Regulations of the Department of Transportation's, Shipping Container Specifications
	Part 179	Hazardous Material Regulations of the Department of Transportation, Specifications for Tank Cars

1.4.2 New York Regulations

The following sources of ARARs have been identified for treatment, transportation and disposal of hazardous byproducts:

6 NYCRR	Part 360	Solid Waste Management Facilities
	Part 370	Hazardous Waste Management System - General
	Part 371	Identification and Listing of Hazardous Waste
	Part 372	Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
	Part 373	Hazardous Waste management Facilities
	Subpart 373.1	Hazardous Waste treatment, Storage and Disposal Facility Permitting Requirements
	Subpart 373.2	Final Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities
	Subpart 373.3	Interim Status Standards Regulation for Owners and Operators of Hazardous Waste Facilities
	Part 376	Land Disposal Restrictions

Note:
TBC - To Be Considered

List of ARARs and TBCs

Water	
40 CFR 141.11-16	Maximum Contaminant Levels
40 CFR 141.50-52	Maximum Contaminant Level Goals
40 CFR 144-147	Underground Injection Control Regulations
40 CFR 122-125	National Pollutant Discharge Elimination System
40 CFR 403	Pretreatment Standards
40 CFR 131	Water Quality Criteria
6 NYCRR 701.115	Derivation of Effluent Limitations
6 NYCRR 702	Special Classifications and Standards
6 NYCRR 703	Groundwater Classifications, Quality Standards and Effluent Standards and/or Limitations
6 NYCRR 750-757	Implementation of NPDES Program in NYS
10 NYCRR 5	Public Water Supply MCLs
10 NYCRR 170	Water Supply Sources
Air	
40 CFR 50	National Primary and Secondary Ambient Air Quality Standards
40 CFR 61	National Emissions Standards for Hazardous Air Pollutants
40 CFR 60	New Source Performance Standards
6 NYCRR 257	Air Quality Standards
6 NYCRR 212	General Process Emission Sources
Hazardous Waste	
40 CFR 264	Identification and Listing of Hazardous Wastes
40 CFR 264.90-109	Groundwater Protection and Monitoring
6 NYCRR 371	Identification and Listing of Hazardous Waste
6 NYCRR 372	Hazardous Waste Manifest System and Related Standards
Miscellaneous	
6 NYCRR 182	Endangered Species of Fish and Wildlife
29 CFR 1910	Occupational Safety and Health Act

"Integrated Risk Information System (IRIS)", USEPA 1990
"Guidance for conducting Remedial Investigations and Feasibility Studies Under CERCLA", USEPA
NYSDEC TAGMs
"Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites", NYDEC

Note:
TBC - To Be Considered

APPENDIX C

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  Central Islip, New York 11722

  Mrs. Debbi Chebuske, President, PTA
  ECC
  50 Wheeler Road
  Central Islip, New York 11722

- **Schools (cont'd.)**

Mr. Edward Firkser, Principal
O'Neill Elementary School
545 Clayton Street
Central Islip, New York 11722

Mr. Barbara Bracciodieta, President, PTA
O'Neill Elementary School
545 Clayton Street
Central Islip, New York 11722

- **Media**

Islip Bulletin
23 Candee Avenue
Sayville, New York 11782

David Ambro, Editor
Islip News
P.O. Box 160
Central Islip, New York 11772

Lou Grasso, Editor
Suffolk Life
P.O. Box 167
Riverhead, New York 11901

Maryellen Pcieria
Newsday "Government Watch" Section
235 Pinelawn Road
Melville, New York 11747

- **Water Authorities**

Judith Jakobson
Suffolk County Water Authority
4060 Sunrise Highway
Oakdale, New York 11769

George Goode
Suffolk County Water Authority
P.O. Box 38
Oakdale, New York 11769

- **Water Authorities (cont'd.)**

  Pierre Bernard Delice
  Suffolk County Water Authority
  Watershed Oversight & Protection
  Oakdale, New York 11769

APPENDIX D

BUDGET ESTIMATES
SHEDULE 2.11's

SCHEDULE 2.11 (a)

SUMMARY OF WORK ASSIGNMENT PRICE

Work Assignment Number D002676-30

Mackenzie Chemical Site

LINE ITEM	AMOUNT ($)
1. Direct Salary Costs (Schedules 2.10 (a) and 2.11 (b))	12,525
2. Indirect Costs (Schedule (2.10 (g))	19,414
3. Direct Non-Salary Costs (Schedules 2.10 (d,e,f) and 2.11 (c,d)	18,302

Subcontract Costs:

Name of Subcontractor	Services to be Performed	Subcontract Price
1. H2M	Professional Services	261,297
4. Total Cost-Plus-Fixed Fee Subcontracts		261,297

Unit Price Subcontracts (Schedule 2.10 (f) and 2.11 (f))

Name of Subcontractor	Services to be Performed	Subcontract Price
5. Total Unit Price Subcontracts		0
6. Subcontract Management Fee (Schedule 2.11[f])		0
7. Total Subcontract Costs (lines 4 + 5)		261,297
8. Fixed Fee (Schedule 2.10 (h))		3,194
9. Total Work Assignment Price (lines 1 + 2 + 3 + 6 + 7)		314,731

SCHEDULE 2.11(b)
LABOR COST SUMMARY
Work Assignment Number D002676-30
Mackenzie Chemical Site

LABOR CATEGORY AVERAGE SALARY RATE (1998)	IX $63.86	VIII $49.09	VII $43.07	VI $40.35	V $35.99	IV $28.15	III $25.21	II $24.51	I $18.59	WP $16.55	TOTAL
Task 1	0	0	34	0	0	0	14	0	30	4	82
Task 2	0	0	9	0	0	0	4	15	342	0	370
Task 3	2	0	40	0	2	0	32	0	4	4	84
Subtotal Hours:	2	0	83	0	2	0	50	15	376	8	
TOTAL HOURS:	2	0	83	0	2	0	50	15	376	8	536
Total Direct Labor Costs	127.72	0.00	3,574.81	0.00	71.98	0.00	1,260.50	367.65	6,989.84	132.40	12,524.90

INDIRECT LABOR COSTS:	19,413.60
SUBTOTAL:	31,938.50
FIXED FEE:	3,193.87
TOTAL BUDGETED LABOR COSTS:	35,132.37

ENGINEER/CONTRACT No.: Lawler, Matusky & Skelly Engineers LLP
PROJECT NAME: Mackenzie Chemical Site
WORK ASSIGNMENT No.: D002676-30

DATE PREPARED: 18 Jun 98

SCHEDULE 2.11(b-1)

DIRECT ADMINISTRATIVE LABOR HOURS BUDGETED

NSPE LABOR CLASSIFICATION	IX	VIII	VII	VI	V	IV	III	II	I	WP	TOTAL No. OF DIRECT ADMINISTRATIVE LABOR HOURS BUDGETED
Task 1	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	14.0
Task 2	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	8.0
Task 3	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	8.0
TOTAL HOURS:	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	30.0

Contract/Project administrative hours would include but not necessarily be limited to the following activities:

1. Work Plan Development
   - Conflict of Interest Check
   - Develop of budget schedules and supporting documentation
2. Review work assignment (WA) progress
   - Conduct progress reviews
   - Prepare monthly project report
   - Update WA progress schedule
   - Prepare monthly M/WBE Utilization Report
3. Review work assignment costs
   - Prepare monthly cost control report
   - Cost control reviews
4. CAP Preparation
   - Oversee and prepare monthly CAP
   - Respond to payment issues/disallowances
   - NSPE list updates
   - Equipment Inventory
5. Manage subcontracts
6. Implement and manage program management and staffing plans
7. Conduct Health and Safety Reviews
8. Word processing and graphic artists
9. Report editing

Contract/Project administration hours would NOT include activities such as:

1. QA/Qc reviews
2. Technical oversight by management
3. Develop subcontracts
4. Work plan development
5. Review of deliverables

SCHEDULE 2.11(c) - DIRECT NON-SALARY COSTS
Work Assignment Number D002676-30
Mackenzie Chemical Site

ITEM	MAXIMUM REIMBURSEMENT RATE ($)	UNIT	ESTIMATED NUMBER OF UNITS	TOTAL ESTIMATED COST ($)
A. Material Costs:				
Telephone	1.00	(at cost)	145	145.00
Reproduction	0.07	(per page)	5,150	360.50
General PC usage	1.50	(per hr)	36	54.00
Fax	1.00	(per page)	79	79.00
Disposable Field Items:				
Decon Chemicals	1.00	(at cost)	12	12.00
Decon D.I. Water	0.12	(per gal.)	100	12.00
Stakes/Flagging	3.75	(at cost)	12	45.00
Misc*	1.00	(at cost)	50	50.00
Repair of NYSDEC Meters	125.00	(lump sum)	1	125.00
			SUBTOTAL:	882.50
B. Travel Costs:				
Trailer rental	30.00	(per day)	14	420.00
Personal mileage	0.315	(per mile)	900	283.50
Per diem	240.00	(per day)	28	6,720.00
Tolls	1.00	(at cost)	108	108.00
			SUBTOTAL:	7,531.50
C. Equipment Costs:				
Personal Protective Equipment:				
Level D	12.00	(per day)	28	336.00
Generators - Honda (6,500 watt)	51.00	(per day)	14	714.00
High pressure washer - Landa (110 volt	92.00	(per day)	14	1,288.00
PID - HNu (HW-101) @	0.00	(per day)	14	0.00
Combustible gas indicator - Exotech (4	0.00	(per day)	14	0.00
Probe unit - Concord	374.00	(per day)	14	5,236.00
Soil/Water sample charge	20.00	(each)	105	2,100.00
Mobilization	0.13	(per mile)	200	26.60
Mobilization	46.75	(per hr)	4	187.00
			SUBTOTAL:	9,887.60
			TOTAL DIRECT NON-SALARY COSTS:	18,301.60

SCHEDULE 2.11(e)

COST-PLUS FIXED FEE SUBCONTRACTS

Work Assignment Number D002676-30

Mackenzie Chemical Site

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE
1. H2M	Professional Services	$261,297.37

A. Direct Salary Costs

PROFESSIONAL RESPONSIBILITY LEVEL	LABOR CLASS.	AVERAGE REIMB. RATE ($/hr)	ESTIMATED NUMBER OF HOURS	TOTAL ESTIMATED DIRECT SALARY COST ($)
	IX	58.37	7	$408.59
	VIII	55.81	5	$279.05
	VII	47.91	107	$5,126.37
	VI	35.68	201	$7,171.68
	V	32.75	462.5	$15,146.88
	IV	26.90	66	$1,775.40
	III	22.58	121	$2,732.18
	II	19.26	218	$4,198.68
	I	16.96	669	$11,346.24
	WP	15.68	41	$642.88
			TOTAL DIRECT SALARY COSTS:	$48,827.95

FOOTNOTES:

1 - These rates will be held firm until October 31, 1998.
2 - Reimbursement will be limited to the lesser of either the individuals actual hourly rate or the maximum rate for each labor category.
3 - Reimbursement will be limited to the maximum reimbursement rate for the professional responsibility level of the actual work performed.
4 - Only those labor classifications indicated with an asterix will be entitled to overtime.
5 - Reimbursement for technical time of principals, owners and officers will be limited to the maximum maximum reimbursement rate of that labor category, the actual hourly labor rate paid, or the Federal GS-18 rate, whichever is lower.
6 - The maximium rates in each labor category can be modified only by mutual written agreement and approved by both the Department and the Comptroller.
7 - This footnote applies to Schedules for years 4 thru 7 only. If the U.S. cost-of-living index increases at a rate greater than 6% compounded annually, the maximum salary rates will be subjuect to renegotiation for future years of the contract.

SCHEDULE 2.11(e)

COST-PLUS FIXED FEE SUBCONTRACTS

Work Assignment Number D002676-30

Mackenzie Chemical Site

B. Indirect Costs

Indirect costs shall be paid based on a percentage of direct salary costs incurred which shall not exceed a maximum of 167% or the actual rate calculated in accordance with 48 CFR Federal Acquisition Regulations, whichever is lower.

Amount budgeted for indirect costs: $81,376.67

C. Maximum Reimbursement Rates for Direct Non-Salary Costs

ITEM	$ MAX REIMBURSEMENT RATE (Specify Unit)	EST. NO. OF UNITS	TOTAL EST. COST ($)
Materials			$4,357.50
Travel			$492.00
Equipment			$2,048.00
Subs			$112,890.76
* - See attached scehdules for detailed breakdown.			
		TOTAL DIRECT NON-SALARY COSTS:	$119,788.26

D. Fixed Fee

The fixed fee is:

See Schedule 2.10(h) for how the fixed fee should be claimed:	$6,510.24
Mgmt Fee	$4,794.25
TOTAL:	$261,297.37

SCHEDULE 2.11 (e)-1a

SUMMARY OF WORK ASSIGNMENT PRICE

Work Assignment Number D002676-30

MACKENZIE CHEMICAL

LINE ITEM		AMOUNT ($)
1. Direct Salary Costs (Schedules 2.10 (a) and 2.11 (b))		48,828
2. Indirect Costs (Schedule (2.10 (g))		81,377
3. Direct Non-Salary Costs (Schedules 2.10 (d,e,f) and 2.11 (c,d)		6,898
Subcontract Costs:		
Name of Subcontractor	**Services to be Performed**	**Subcontract Price**
1. YEC, Inc	Surveying	8,741
4. Total Cost-Plus-Fixed Fee Subcontracts		8,741
Unit Price Subcontracts (Schedule 2.10 (f) and 2.11 (f))		
Name of Subcontractor	**Services to be Performed**	**Subcontract Price**
1. American Auger	Well Installations	45,255
2. Accredited Laboratories Inc.	Laboratory Analysis	38,800
3. Data Validation Services	Data Validation	8,265
4. Severn Trent Envirotest	Mobile Lab	11,830
5. Total Unit Price Subcontracts		104,150
6. Subcontract Management Fee (Schedule 2.11[f])		4,794
7. Total Subcontract Costs (lines 4 + 5)		112,891
8. Fixed Fee (Schedule 2.10 (h))		6,510
9. Total Work Assignment Price (lines 1 + 2 + 3 + 6 + 7)		261,297

SCHEDULE 2.11(e)-1b
LABOR COST SUMMARY
Work Assignment Number D002676-30
MACKENZIE CHEMICAL

LABOR CATEGORY	IX	VIII	VII	VI	V	IV	III	II	I	WP	TOTAL	TOTAL
AVERAGE SALARY RATE (1997)	$58.37	$55.81	$47.91	$35.68	$32.75	$26.90	$22.58	$19.26	$16.96	$15.68	HOURS	COST
SALARY RATE (1997)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00		
Task 1	0.0	1.0	25.0	3.0	103.0	30.0	23.0	0.0	24.0	22.0	231.0	6,812.190
Task 2	1.0	0.0	26.0	10.0	152.5	0.0	13.0	64.0	424.0	10.0	700.5	15,529.225
Task 3	6.0	4.0	56.0	188.0	207.0	36.0	85.0	154.0	221.0	9.0	966.0	26,486.530
Subtotal 1997 Hours:	7.0	5.0	107.0	201.0	462.5	66.0	121.0	218.0	669.0	41.0		
Subtotal Hours:	7.0	5.0	107.0	201.0	462.5	66.0	121.0	218.0	669.0	41.0		
TOTAL HOURS:	7.0	5.0	107.0	201.0	462.5	66.0	121.0	218.0	669.0	41.0	1,897.5	
Total Direct Labor Costs	408.59	279.05	5,126.37	7,171.68	15,146.88	1,775.40	2,732.18	4,198.68	11,346.24	642.88	48,827.95	48,827.945

INDIRECT LABOR COSTS:	81,376.67
SUBTOTAL:	130,204.62
FIXED FEE:	6,510.24
TOTAL BUDGETED LABOR COSTS:	136,714.86

ENGINEER/CONTRACT No.: Lawler, Matusky & Skelly Engineers LLP
PROJECT NAME: MACKENZIE CHEMICAL
Work Assignment Number D002 D002676-30

DATE PREPARED: 15 Jun 98

MACKENZIE CHEMICAL
DIRECT ADMINISTRATIVE LABOR HOURS BUDGETED

SALARY RATE (1997) CLASSIFICATION	IX	VIII	VII	VI	V	IV	III	II	I	WP	TOTAL No. OF DIRECT ADMINISTRATIVE LABOR HOURS BUDGETED
Task 1	0.0	0.0	3.0	3.0	5.0	0.0	1.0	0.0	0.0	4.0	16.0
Task 2	1.0	0.0	9.0	10.0	8.5	0.0	3.0	0.0	2.0	10.0	43.5
Task 3	2.0	0.0	6.0	8.0	9.0	0.0	5.0	0.0	1.0	9.0	40.0
TOTAL HOURS:	3.0	0.0	18.0	21.0	22.5	0.0	9.0	0.0	3.0	23.0	99.5

Contract/Project administrative hours would include but not necessarily be limited to the following activities:

1. Work Plan Development
   - Conflict of Interest Check
   - Develop of budget schedules and supporting documentation
2. Review work assignment (WA) progress
   - Conduct progress reviews
   - Prepare monthly project report
   - Update WA progress schedule
   - Prepare monthly M/WBE Utilization Report
3. Review work assignment costs
   - Prepare monthly cost control report
   - Cost control reviews
4. CAP Preparation
   - Oversee and prepare monthly CAP
   - Respond to payment issues/disallowances
   - NSPE list updates
   - Equipment Inventory
5. Manage subcontracts
6. Implement and manage program management and staffing plans
7. Conduct Health and Safety Reviews
8. Word processing and graphic artists
9. Report editing

Contract/Project administration hours would NOT include activities such as:

1. QA/Qc reviews
2. Technical oversight by management
3. Develop subcontracts
4. Work plan development
5. Review of deliverables

SCHEDULE 2.11(e)-1c - DIRECT NON-SALARY COSTS
Work Assignment Number D002676-30
Work Assignment Number D002676-30

MACKENZIE CHEMICAL

ITEM	MAXIMUM REIMBURSEMENT RATE ($)	UNIT	ESTIMATED NUMBER OF UNITS	TOTAL ESTIMATED COST ($)
A. Material Cost:				
Telephone	1.00	(at cost)	321	321.00
Reproduction	0.05	(per page)	11,650	582.50
Auto CADD	6.25	(per hr)	72	450.00
Fax	1.00	(per page)	204	204.00
Overnight shipping	80.00	(at cost)	26	2,080.00
Decon D.I. Water	18.00	(per day)	40	720.00
			SUBTOTAL:	4,357.50
B. Travel Costs:				
Personal mileage	0.30	(per mile)	1,640.0	492.00
			SUBTOTAL:	492.00
C. Equipment Costs:				
Personal Protective Equipment:				
Level D	10.00	(per day)	41	410.00
PID - HNu (HW-101) @	42.00	(per day)	39	1,638.00
			SUBTOTAL:	2,048.00
			TOTAL DIRECT NON-SALARY COSTS:	6,897.50

SCHEDULE 2.11(e)-1e

Work Assignment Number D002676-30
MACKENZIE CHEMICAL
MACKENZIE CHEMICAL

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE
1. YEC, Inc	Surveying	$8,740.75

A. Direct Salary Costs

PROFESSIONAL RESPONSIBILITY LEVEL	LABOR CLASS.	AVERAGE REIMB. RATE ($/hr)	ESTIMATED NUMBER OF HOURS	TOTAL ESTIMATED DIRECT SALARY COST ($)
Principal	VIII	45.64	8	$365.12
Sr Geologist/Scientist/Eng.	V	30.17	60	$1,810.20
Licensed Surveyor/Staff Geo./Sci./Eng.	IV	26.22	0	$0.00
Staff Geo./Sci./ Eng./Sr Draftsperson	III	22.75	12	$273.00
Sr. Tech./Staff Eng./Sci./Geo.	II	16.84	40	$673.60
Technician/Draftsperson	I	15.26	0	$0.00
			TOTAL DIRECT SALARY COSTS:	$3,121.92

FOOTNOTES:

1 - These rates will be held firm until October 31, 1998.
2 - Reimbursement will be limited to the lesser of either the individuals actual hourly rate or the maximum rate for each labor category.
3 - Reimbursement will be limited to the maximum reimbursement rate for the professional responsibility level of the actual work performed.
4 - Only those labor classifications indicated with an asterix will be entitled to overtime.
5 - Reimbursement for technical time of principals, owners and officers will be limited to the maximum maximum reimbursement rate of that labor category, the actual hourly labor rate paid, or the Federal GS-18 rate, whichever is lower.
6 - The maximium rates in each labor category can be modified only by mutual written agreement and approved by both the Department and the Comptroller.
7 - This footnote applies to Schedules for years 4 thru 7 only. If the U.S. cost-of-living index increases at a rate greater than 6% compounded annually, the maximum salary rates will be subjuect to renegotiation for future years of the contract.

SCHEDULE 2.11(e)-1e

Work Assignment Number D002676-30
MACKENZIE CHEMICAL
MACKENZIE CHEMICAL

B. Indirect Costs

Indirect costs shall be paid based on a percentage of direct salary costs incurred which shall not exceed a maximum of 125% or the actual rate calculated in accordance with 48 CFR Federal Acquisition Regulations, whichever is lower.

Amount budgeted for indirect costs: $3,652.65

C. Maximum Reimbursement Rates for Direct Non-Salary Costs

1. ITEM	$ MAX REIMBURSEMENT RATE (Specify Unit)	EST. NO. OF UNITS	TOTAL EST. COST ($)
Travel			
Mileage	$0.25 /mile	1280	$320.00
Gas	$20.00 /day	0	$0.00
Tolls	$10.00 /day	4	$40.00
Expenses			
Survey Equipment Rent.	$65.00 /day	4	$260.00
CADD Computer	$15.00 /hour	12	$180.00
Field Supplies	$50.00 lump	1	$50.00
Mail/tel/phone/repro	$100.00 lump	1	$100.00
	TOTAL DIRECT NON-SALARY COSTS (for all sites):		$950.00
	This Site's Portion of Total level of Effort (%):		0.03
	TOTAL DIRECT NON-SALARY COSTS (for this sites):		$28.50

D. Fixed Fee

The fixed fee is:

See Schedule 2.10(h) for how the fixed fee should be claimed: $1,016.18

TOTAL: $8,740.75

SCHEDULE 2.11(e)-1f

Work Assignment Number D002676-30

MACKENZIE CHEMICAL

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE	MGMT. FEE
1. American Auger	Well Installations	$45,255.00	$2,262.75

ITEM	$ MAX REIMBURSEMENT RATE (Specify Unit)	EST. NO. OF UNITS	TOTAL EST. COST ($)
Subtask 2.3 - Surface Soil Sampling (1 Day)			
Mobilization	$500.00 /ls	1	$500.00
Backhoe with Operator	$700 /day	1	$700.00
Level "D" PPE	$35 /manday	2	$70.00
Subtask 2.4 - Drainage Structure Sampling			
Mobilization	$500.00 /ls	1	$500.00
Backhoe with Operator	$700 /day	3	$2,100.00
Level "D" PPE	$35 /manday	6	$210.00
Subtask 2.6- Well Installations (13 Days)			
Mobilization	$2,500.00 /ls	1	$2,500.00
Level "D" PPE	$35 /manday	26	$910.00
0-50' Boring (4.25 HSA)	$12.00 /ft	250	$3,000.00
50-100' Boring (4.25 HAS)	$13.00 /ft	50	$650.00
0-50' Boring (6.25HSA)	$14.00 /ft	250	$3,500.00
50-100' Boring (6.25 HAS)	$15.00 /ft	250	$3,750.00
>100' Boring (6.25 HAS)	$18.00 /ft	100	$1,800.00
4" PVC Well Screens	$16.00 /ft	20	$320.00
2" PVC Well Screens	$5.00 /ft	50	$250.00
4" PVC Riser	$12.00 /ft	575	$6,900.00
2" PVC Riser	$3.00 /ft	250	$750.00
4" PVC End Caps	$7.00 /ea	5	$35.00
2" PVC End Caps	$5.00 /ea	5	$25.00
4" Filter Pack (>100')	$19.00 /ft	35	$665.00
2" Filter Pack (50-100')	$12.00 /ft	60	$720.00
Bentonite Seal (2 inch <50)	$15.00 /ft	10	$150.00

NOTE: A subcontract management fee of 5% will be allowed on total subcontracts over $10,000 subject to the terms specified in the management fee protocol.

SCHEDULE 2.11(e)-1f

Work Assignment Number D002676-30

MACKENZIE CHEMICAL

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE	MGMT. FEE
1. American Auger	Well Installations	$45,255.00	$2,262.75

ITEM	$ MAX REIMBURSEMENT RATE (Specify Unit)	EST. NO. OF UNITS	TOTAL EST. COST ($)
Subtask 2.6- Well Installations (Con't)			
Bentonite Seal (4 inch <100)	$17.00 /ft	10	$170.00
Grout Seals (2" <50)	$4.00 /ft	230	$920.00
Grout Seals (4" 50-100')	$6.00 /ft	555	$3,330.00
Protective Covers	$180.00 /ea	10	$1,800.00
Decon Pad	$500.00 /ea	1	$500.00
Decon Pad	$85 /hr	30	$2,550.00
Steam Cleaner	$50 /day	13	$650.00
Well Development	$90 /hr	12	$1,080.00
55 Gallon Drums	$40.00 /ea	30	$1,200.00
Water Truck	$100 /day	13	$1,300.00
Drum Handle	$35.00 /ea	50	$1,750.00
		Subcontract Total:	$45,255.00
		Subcontract Management Fee:	$2,262.75

NOTE: A subcontract management fee of 5% will be allowed on total subcontracts over $10,000 subject to the terms specified in the management fee protocol.

SCHEDULE 2.11(e)-1f

Work Assignment Number D002676-30

MACKENZIE CHEMICAL

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE	MGMT. FEE
2. Accredited Laboratories Inc.	Laboratory Analysis	$38,800.00	$1,940.00

ITEM	METHOD	$ MAX REIMBURSEMENT RATE (Specify Unit)	EST. NO. OF UNITS	TOTAL EST. COST ($)
Subtask 2.4 - Drainage Structure Sampling				
TCL VOCs - Soil	(95-1 CLP)	$100 /ea	22	$2,200.00
TCL SVOCs - Soil	(95-2 CLP)	$210 /ea	22	$4,620.00
TCL Pesticides/PCBs - Soil	(95-3 CLP)	$120 /ea	22	$2,640.00
TAL Metals & Cyanide - Soil	(200.7 CLP)	$120 /ea	22	$2,640.00
Subtask 2.5 - Off-site Vertical Profile Wells				
TCL VOCs - Liquids	(95-1 CLP)	$100 /ea	11	$1,100.00
TCL SVOCs - Liquids	(95-2 CLP)	$210 /ea	10	$2,100.00
TCL Pest/PCBs - Liquids	(95-3 CLP)	$120 /ea	10	$1,200.00
TAL Metals + cyanide - Liquids	(200.7 CLP)	$120 /ea	10	$1,200.00
Subtask 2.6 - Monitoring Well Sampling				
TCL VOCs - Liquids	(95-1 CLP)	$100 /ea	40	$4,000.00
TCL SVOCs - Liquids	(95-2 CLP)	$210 /ea	38	$7,980.00
TCL Pest/PCBs - Liquids	(95-3 CLP)	$120 /ea	38	$4,560.00
TAL Metals + cyanide - Liquids	(200.7 CLP)	$120 /ea	38	$4,560.00
			SUBTOTAL:	$38,800.00
			Subcontract Subtotal:	$38,800.00
			Subcontract Management Fee:	$1,940.00

NOTE: A subcontract management fee of 5% will be allowed on total subcontracts over $10,000 subject to the terms specified in the management fee protocol.

SCHEDULE 2.11(e)-1f

Work Assignment Number D002676-30

MACKENZIE CHEMICAL

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE	MGMT. FEE
3. Data Validation Services	Data Validation	$8,265.00	$0.00

ITEM	METHOD	$ MAX REIMBURSEMENT RATE (Specify Unit)	EST. NO. OF UNITS	TOTAL EST. COST ($)
Subtask 2.4 - Drainage Structure Sampling				
TCL VOCs - Soil	(95-1 CLP)	$25 /ea	22	$550.00
TCL SVOCs - Soil	(95-2 CLP)	$28 /ea	22	$616.00
TCL Pesticides/PCBs - Soil	(95-3 CLP)	$32 /ea	22	$704.00
TAL Metals & Cyanide - Soil	(200.7 CLP)	$32 /ea	22	$704.00
Subtask 2.5 - Off-site Vertical Profile Wells				
TCL VOCs - Liquids	(95-1 CLP)	$25 /ea	11	$275.00
TCL SVOCs - Liquids	(95-2 CLP)	$28 /ea	10	$280.00
TCL Pest/PCBs - Liquids	(95-3 CLP)	$32 /ea	10	$320.00
TAL Metals + cyanide - Liquids	(200.7 CLP)	$32 /ea	10	$320.00
Subtask 2.6 - Monitoring Well Sampling				
TCL VOCs - Liquids	(95-1 CLP)	$25 /ea	40	$1,000.00
TCL SVOCs - Liquids	(95-2 CLP)	$28 /ea	38	$1,064.00
TCL Pest/PCBs - Liquids	(95-3 CLP)	$32 /ea	38	$1,216.00
TAL Metals + cyanide - Liquids	(200.7 CLP)	$32 /ea	38	$1,216.00
			Subcontract Total:	$8,265
			Subcontract Management Fee:	$0.00

NOTE: A subcontract management fee of 5% will be allowed on total subcontracts over $10,000 subject to the terms specified in the management fee protocol.

SCHEDULE 2.11(e)-1f

Work Assignment Number D002676-30

MACKENZIE CHEMICAL

NAME OF SUBCONTRACTOR	SERVICES TO BE PERFORMED	SUBCONTRACT PRICE	MGMT. FEE
4. Severn Trent Envirotest	Mobile Lab	$11,830.00	$591.50

ITEM	$ MAX REIMBURSEMENT RATE (Specify Unit)	EST. NO. OF UNITS	TOTAL EST. COST ($)
Mobilization (charged to Subtask 2.3)	$450 /ea	1	$450
Subtask 2.3 - Surface Soil Sampling			
TCL VOCs + Trichloropropane (Soil)	$87.00 /ea	24	$2,088.00
Per Diem	$95 /day	2	$190.00
Subtask 2.4 - Drainage Structure Sampling			
TCL VOCs + Trichloropropane (Soil)	$87.00 /ea	26	$2,262.00
Per Diem	$95 /day	2	$190.00
Subtask 2.5 - Off-site Vertical Profile Wells			
TCL VOCs + Trichloropropane (Soil)	$80.00 /ea	76	$6,080.00
Per Diem	$95 /day	6	$570.00
Soils include percent moisture.		**SUBTOTAL:**	$11,830
		Subcontract Total:	$11,830.00
		Subcontract Management Fee:	$591.50

NOTE: A subcontract management fee of 5% will be allowed on total subcontracts over $10,000 subject to the terms specified in the management fee protocol.

ENGINEER: H2M GROUP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical
WORK ASSIGNMENT No.: D002676-30
TASK No./NAME: Summary
COMPLETE: 0%

SCHEDULE 2.11(e)-1g

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 22 Jun 98
BILLING PERIOD:
INVOICE No.:
CAP No.:

EXPENDITURE CATEGORY	A COST CLAIMED THIS PERIOD	B PAID TO DATE	C TOTAL DISSALLOWED TO DATE	D TOTAL COSTS PAID TO DATE (A+B)	E ESTIMATED COSTS TO COMPLETION	F ESTIMATED TOTAL WORK ASSIGNMENT PRICE (A+B+E)	G APPROVED BUDGET	H ESTIMATED UNDER/OVER (G-F)
1. Direct Salary Costs:	0.00	0.00	0.00	0.00	48,827.95	48,827.95	48,827.95	0.00
2. Indirect Salary Costs (1.55):	0.00	0.00	0.00	0.00	81,376.67	81,376.67	81,376.67	0.00
3. Subtotal Direct Salary and Indirect Costs:	0.00	0.00	0.00	0.00	130,204.62	130,204.62	130,204.62	0.00
4. Travel:	0.00	0.00	0.00	0.00	492.00	492.00	492.00	0.00
5. Other Non-Salary Costs:								
Material Costs:	0.00	0.00	0.00	0.00	4,357.50	4,357.50	4,357.50	0.00
Equipment Costs:	0.00	0.00	0.00	0.00	2,048.00	2,048.00	2,048.00	0.00
6. Subtotal Direct Non-Salary Costs:	0.00	0.00	0.00	0.00	6,897.50	6,897.50	6,897.50	0.00
7. Subs:								
Subconsultants:								
YEC, Inc.	0.00	0.00	0.00	0.00	8,740.76	8,740.76	8,740.76	0.00
Subcontractors:								
American Auger	0.00	0.00	0.00	0.00	45,255.00	45,255.00	45,255.00	0.00
Severn Trent	0.00	0.00	0.00	0.00	11,830.00	11,830.00	11,830.00	0.00
Accredited Labs	0.00	0.00	0.00	0.00	38,800.00	38,800.00	38,800.00	0.00
Data Validation Services	0.00	0.00	0.00	0.00	8,265.00	8,265.00	8,265.00	0.00
8. Total Work Assignment Costs:	0.00	0.00	0.00	0.00	249,992.88	249,992.88	249,992.88	0.00
9. Fees:								
Fixed Fee:	0.00	0.00	0.00	0.00	6,510.24	6,510.24	6,510.24	0.00
Management Fee:	0.00	0.00	0.00	0.00	4,794.25	4,794.25	4,794.25	0.00
10. Total Work Assignment Price:	0.00	0.00	0.00	0.00	261,297.37	261,297.37	261,297.37	0.00

Project Manager (Engineer): _____ Date: _____

ENGINEER: H2M GROUP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical
WORK ASSIGNMENT No.: D002676-30
TASK No./NAME: Task 1
COMPLETE: 0%

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 15 Jun 98
BILLING PERIOD:
INVOICE No.:
CAP No.:

EXPENDITURE CATEGORY	A COST CLAIMED THIS PERIOD	B PAID TO DATE	C TOTAL DISSALLOWED TO DATE	D TOTAL COSTS PAID TO DATE (A+B)	E ESTIMATED COSTS TO COMPLETION	F ESTIMATED TOTAL WORK ASSIGNMENT PRICE (A+B+E)	G APPROVED BUDGET	H ESTIMATED UNDER/OVER (G-F)
1. Direct Salary Costs:	0.00	0.00	0.00	0.00	6,812.19	6,812.19	6,812.19	0.00
2. Indirect Salary Costs (1.5185):	0.00	0.00	0.00	0.00	11,353.20	11,353.20	11,353.20	0.00
3. Subtotal Direct Salary and Indirect Costs:	0.00	0.00	0.00	0.00	18,165.39	18,165.39	18,165.39	0.00
4. Travel:	0.00	0.00	0.00	0.00	48.00	48.00	48.00	0.00
5. Other Non-Salary Costs:								
Material Costs:	0.00	0.00	0.00	0.00	697.50	697.50	697.50	0.00
Equipment Costs:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Subtotal Direct Non-Salary Costs:	0.00	0.00	0.00	0.00	745.50	745.50	745.50	0.00
7. Subs:								
Subconsultants:								
Subcontractors:								
8. Total Work Assignment Costs:	0.00	0.00	0.00	0.00	18,910.89	18,910.89	18,910.89	0.00
9. Fees:								
Fixed Fee:	0.00	0.00	0.00	0.00	908.27	908.27	908.27	0.00
Management Fee:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10. Total Work Assignment Price:	0.00	0.00	0.00	0.00	19,819.16	19,819.16	19,819.16	0.00

Project Manager (Engineer): _____ **Date:** _____

ENGINEER: H2M GROUP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical
WORK ASSIGNMENT No.: D002676-30
TASK No./NAME: Task 2
COMPLETE: 0%

SCHEDULE 2.11(e)-1g

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 22 Jun 98
BILLING PERIOD:
INVOICE No.:
CAP No.:

EXPENDITURE CATEGORY	A COST CLAIMED THIS PERIOD	B PAID TO DATE	C TOTAL DISSALLOWED TO DATE	D TOTAL COSTS PAID TO DATE (A + B)	E ESTIMATED COSTS TO COMPLETION	F ESTIMATED TOTAL WORK ASSIGNMENT PRICE (A + B + E)	G APPROVED BUDGET	H ESTIMATED UNDER/OVER (G-F)
1. Direct Salary Costs:	0.00	0.00	0.00	0.00	15,529.23	15,529.23	15,529.23	0.00
2. Indirect Salary Costs (1.55):	0.00	0.00	0.00	0.00	25,881.01	25,881.01	25,881.01	0.00
3. Subtotal Direct Salary and Indirect Costs:	0.00	0.00	0.00	0.00	41,410.24	41,410.24	41,410.24	0.00
4. Travel:	0.00	0.00	0.00	0.00	444.00	444.00	444.00	0.00
5. Other Non-Salary Costs:								
Material Costs:	0.00	0.00	0.00	0.00	1,910.00	1,910.00	1,910.00	0.00
Equipment Costs:	0.00	0.00	0.00	0.00	2,048.00	2,048.00	2,048.00	0.00
6. Subtotal Direct Non-Salary Costs:	0.00	0.00	0.00	0.00	4,402.00	4,402.00	4,402.00	0.00
7. Subs:								
Subconsultants:								
YEC, Inc.	0.00	0.00		0.00	8,740.76	8,740.76	8,740.76	0.00
Subcontractors:								
American Auger	0.00	0.00	0.00	0.00	45,255.00	45,255.00	45,255.00	0.00
Severn Trent	0.00	0.00	0.00	0.00	11,830.00	11,830.00	11,830.00	0.00
Accredited Labs	0.00	0.00	0.00	0.00	38,800.00	38,800.00	38,800.00	0.00
Data Validation Services	0.00	0.00	0.00	0.00	8,265.00	8,265.00	8,265.00	0.00
8. Total Work Assignment Costs:	0.00	0.00	0.00	0.00	158,703.00	158,703.00	158,703.00	0.00
9. Fees:								
Fixed Fee:	0.00	0.00	0.00	0.00	2,070.51	2,070.51	2,070.51	0.00
Management Fee:	0.00	0.00	0.00	0.00	4,794.25	4,794.25	4,794.25	0.00
10. Total Work Assignment Price:	0.00	0.00	0.00	0.00	165,567.76	165,567.76	165,567.76	0.00

Project Manager (Engineer): _____ Date: _____

ENGINEER: H2M GROUP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical
WORK ASSIGNMENT No.: D002676-30
TASK No./NAME: Task 3
COMPLETE: 0%

SCHEDULE 2.11(e)-1a

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 15 Jun 98
BILLING PERIOD:
INVOICE No.:
CAP No.:

EXPENDITURE CATEGORY	A COST CLAIMED THIS PERIOD	B PAID TO DATE	C TOTAL DISSALLOWED TO DATE	D TOTAL COSTS PAID TO DATE (A + B)	E ESTIMATED COSTS TO COMPLETION	F ESTIMATED TOTAL WORK ASSIGNMENT PRICE (A + B + E)	G APPROVED BUDGET	H ESTIMATED UNDER/OVER (G-F)
1. Direct Salary Costs:	0.00	0.00	0.00	0.00	26,486.53	26,486.53	26,486.53	0.00
2. Indirect Salary Costs (1.5185):	0.00	0.00	0.00	0.00	44,142.46	44,142.46	44,142.46	0.00
3. Subtotal Direct Salary and Indirect Costs:	0.00	0.00	0.00	0.00	70,628.99	70,628.99	70,628.99	0.00
4. Travel:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5. Other Non-Salary Costs:								
Material Costs:	0.00	0.00	0.00	0.00	1,750.00	1,750.00	1,750.00	0.00
Equipment Costs:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Subtotal Direct Non-Salary Costs:	0.00	0.00	0.00	0.00	1,750.00	1,750.00	1,750.00	0.00
7. Subs:								
Subconsultants:								
Subcontractors:								
8. Total Work Assignment Costs:	0.00	0.00	0.00	0.00	72,378.99	72,378.99	72,378.99	0.00
9. Fees:								
Fixed Fee:	0.00	0.00	0.00	0.00	3,531.46	3,531.46	3,531.46	0.00
Management Fee:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10. Total Work Assignment Price:	0.00	0.00	0.00	0.00	75,910.45	75,910.45	75,910.45	0.00

Project Manager (Engineer): _____ **Date:** _____

ENGINEER: H2M GROUP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical
WORK ASSIGNMENT No.: D002676-30

SCHEDULE 2.11(e)-1g - SUPPLEMENTAL

COST CONTROL REPORT
SUBCONTRACTOR

DATE PREPARED: 22 Jun 98
BILLING PERIOD:
INVOICE No.:
CAP No.:

SUBCONTRACT NAME	A SUBCONTRACT COST CLAIMED THIS APPLICATION INCLUDING RESUBMITTALS	B SUBCONTRACT COST APPROVED FOR PAYMENT ON PREVIOUS APPLICATIONS	C TOTAL SUBCONTRACT COSTS TO DATE (A PLUS B)	D SUBCONTRACT APRROVED BUDGET	E MANAGEMENT FEE BUDGET	F MANAGEMENT FEE PAID	G TOTAL COSTS TO DATE (C PLUS F)
1. American Auger	0.00	0.00	0.00	45,255.00	2,262.75	0.00	0.00
2. Severn Trent Envirotest	0.00	0.00	0.00	11,830.00	591.50	0.00	0.00
3. Accredited Labs	0.00	0.00	0.00	38,800.00	1,940.00	0.00	0.00
4. Data Validation Services	0.00	0.00	0.00	8,265.00	0.00	0.00	0.00
TOTALS:	0.00	0.00	0.00	104,150.00	4,794.25	0.00	0.00

Project Manager: _____ **Date:** _____

Notes: (1) Costs listed in columns A, B, C & D do not include any management fee costs.
(2) Management fee is applicable to only properly procured, satisfactorily completed, unit price subcontracts over $10,000.
(3) Total line, column G should equal line 7 (subcontractors), column D of Summary Cost Control Report.

ENGINEER: H2M GROUP | SCHEDULE 2.11(e)-1h | DATE PREPARED: 15 Jun 98

CONTRACT No.: D002676 | BILLING PERIOD:

PROJECT NAME: Mackenzie Chemical | INVOICE No.:

WORK ASSIGN. No.: D002676-30

MONTHLY COST CONTROL REPORT

SUMMARY OF LABOR HOURS

Number of Direct Labor Hours Expended to Date/Estimated Number of Direct Labor Hours to Completion

LABOR CLASSIFICATION / SALARY RATE	IX 58.37		VIII 55.81		VII 47.91		VI 35.68		V 32.75		IV 26.90		III 22.58		II 19.26		I 16.96		WP 15.68		TOTAL NO. OF DIRECT LABOR HRS.	
	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.
Task 1	0.0	0.0	0.0	1.0	0.0	25.0	0.0	3.0	0.0	103.0	0.0	30.0	0.0	23.0	0.0	0.0	0.0	24.0	0.0	22.0	0.0	231.0
Task 2	0.0	7.0	0.0	5.0	0.0	107.0	0.0	201.0	0.0	462.5	0.0	66.0	0.0	121.0	0.0	218.0	0.0	669.0	0.0	41.0	0.0	1,897.5
Task 3	0.0	7.0	0.0	5.0	0.0	107.0	0.0	201.0	0.0	462.5	0.0	66.0	0.0	121.0	0.0	218.0	0.0	669.0	0.0	41.0	0.0	1,897.5
																					0.0	5,692.5
TOTAL HOURS:	0.0	21.0	0.0	15.0	0.0	321.0	0.0	603.0	0.0	1,387.5	0.0	198.0	0.0	363.0	0.0	654.0	0.0	2,007.0	0.0	123.0		5,692.5

NOTES:

ENGINEER: H2M GROUP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical
WORK ASSIGN. No.: D002676-30

SCHEDULE 2.11(e)-1h

DATE PREPARED: 15 Jun 98
BILLING PERIOD:
INVOICE No.:

MONTHLY COST CONTROL REPORT

SUMMARY OF LABOR HOURS

Number of Direct Labor Hours Budgeted/Expended Number of Direct Labor Hours

LABOR CLASSIFICATION / SALARY RATE	IX 58.37		VIII 55.81		VII 47.91		VI 35.68		V 32.75		IV 26.90		III 22.58		II 19.26		I 16.96		WP 15.68		TOTAL NO. OF DIRECT LABOR HRS.	
	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.
Task 1	0.0	0.0	1.0	0.0	25.0	0.0	3.0	0.0	103.0	0.0	30.0	0.0	23.0	0.0	0.0	0.0	24.0	0.0	22.0	0.0	231.0	0.0
Task 2	7.0	0.0	5.0	0.0	107.0	0.0	201.0	0.0	462.5	0.0	66.0	0.0	121.0	0.0	218.0	0.0	669.0	0.0	41.0	0.0	1,897.5	0.0
Task 3	7.0	0.0	5.0	0.0	107.0	0.0	201.0	0.0	462.5	0.0	66.0	0.0	121.0	0.0	218.0	0.0	669.0	0.0	41.0	0.0	1,897.5	0.0
																					5,692.5	0.0
TOTAL HOURS:	21.0	0.0	15.0	0.0	321.0	0.0	603.0	0.0	1,387.5	0.0	198.0	0.0	363.0	0.0	654.0	0.0	2,007.0	0.0	123.0	0.0		

NOTES:

ENGINEER: Lawler, Matusky & Skelly Engineers LLP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical Site
WORK ASSIGNMENT No.: D002676-30
TASK No./NAME: Summary
COMPLETE: 0%

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 22 Jun 98
BILLING PERIOD:
INVOICE No.:
CAP No.:

EXPENDITURE CATEGORY	A COST CLAIMED THIS PERIOD	B PAID TO DATE	C TOTAL DISSALLOWED TO DATE	D TOTAL COSTS PAID TO DATE (A+B)	E ESTIMATED COSTS TO COMPLETION	F ESTIMATED TOTAL WORK ASSIGNMENT PRICE (A+B+E)	G APPROVED BUDGET	H ESTIMATED UNDER/OVER (G-F)
1. Direct Salary Costs:	0.00	0.00	0.00	0.00	12,524.90	12,524.90	12,524.90	0.00
2. Indirect Salary Costs (1.55):	0.00	0.00	0.00	0.00	19,413.60	19,413.60	19,413.60	0.00
3. Subtotal Direct Salary and Indirect Costs:	0.00	0.00	0.00	0.00	31,938.50	31,938.50	31,938.50	0.00
4. Travel:	0.00	0.00	0.00	0.00	7,531.50	7,531.50	7,531.50	0.00
5. Other Non-Salary Costs:								
Material Costs:	0.00	0.00	0.00	0.00	882.50	882.50	882.50	0.00
Equipment Costs:	0.00	0.00	0.00	0.00	9,887.60	9,887.60	9,887.60	0.00
6. Subtotal Direct Non-Salary Costs:	0.00	0.00	0.00	0.00	18,301.60	18,301.60	18,301.60	0.00
7. Subs:								
Subconsultants: H2M	0.00	0.00	0.00	0.00	261,297.37	261,297.37	261,297.37	0.00
Subcontractors:								
8. Total Work Assignment Costs:	0.00	0.00	0.00	0.00	311,537.47	311,537.47	311,537.47	0.00
9. Fees:								
Fixed Fee:	0.00	0.00	0.00	0.00	3,193.87	3,193.87	3,193.87	0.00
Management Fee:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10. Total Work Assignment Price:	0.00	0.00	0.00	0.00	314,731.34	314,731.34	314,731.34	0.00

Project Manager (Engineer): _____ **Date:** _____

ENGINEER: Lawler, Matusky & Skelly Engineers LLP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical Site
WORK ASSIGNMENT No.: D002676-30
TASK No./NAME: Task 1
COMPLETE: 0%

SCHEDULE 2.11(g)

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 18 Jun 98
BILLING PERIOD:
INVOICE No.:
CAP No.:

EXPENDITURE CATEGORY	A COST CLAIMED THIS PERIOD	B PAID TO DATE	C TOTAL DISSALLOWED TO DATE	D TOTAL COSTS PAID TO DATE (A+B)	E ESTIMATED COSTS TO COMPLETION	F ESTIMATED TOTAL WORK ASSIGNMENT PRICE (A+B+E)	G APPROVED BUDGET	H ESTIMATED UNDER/OVER (G-F)
1. Direct Salary Costs:	0.00	0.00	0.00	0.00	2,441.22	2,441.22	2,441.22	0.00
2. Indirect Salary Costs (1.55):	0.00	0.00	0.00	0.00	3,783.90	3,783.90	3,783.90	0.00
3. Subtotal Direct Salary and Indirect Costs:	0.00	0.00	0.00	0.00	6,225.12	6,225.12	6,225.12	0.00
4. Travel:	0.00	0.00	0.00	0.00	78.00	78.00	78.00	0.00
5. Other Non-Salary Costs:								
Material Costs:	0.00	0.00	0.00	0.00	335.00	335.00	335.00	0.00
Equipment Costs:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Subtotal Direct Non-Salary Costs:	0.00	0.00	0.00	0.00	413.00	413.00	413.00	0.00
7. Subs:								
Subconsultants: H2M	0.00	0.00	0.00	0.00	19,819.16	19,819.16	19,819.16	0.00
Subcontractors:								
8. Total Work Assignment Costs:	0.00	0.00	0.00	0.00	26,457.28	26,457.28	26,457.28	0.00
9. Fees:								
Fixed Fee:	0.00	0.00	0.00	0.00	622.51	622.51	622.51	0.00
Management Fee:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10. Total Work Assignment Price:	0.00	0.00	0.00	0.00	27,079.79	27,079.79	27,079.79	0.00

Project Manager (Engineer): _____ **Date:** _____

ENGINEER: Lawler, Matusky & Skelly Engineers
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical Site
WORK ASSIGNMENT No.: D002676-30
TASK No./NAME: Task 2
COMPLETE: 0%

SCHEDULE 2.11(g)

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 22 Jun 98
BILLING PERIOD:
INVOICE No.:
CAP No.:

EXPENDITURE CATEGORY	A COST CLAIMED THIS PERIOD	B PAID TO DATE	C TOTAL DISSALLOWED TO DATE	D TOTAL COSTS PAID TO DATE (A+B)	E ESTIMATED COSTS TO COMPLETION	F ESTIMATED TOTAL WORK ASSIGNMENT PRICE (A+B+E)	G APPROVED BUDGET	H ESTIMATED UNDER/OVER (G-F)
1. Direct Salary Costs:	0.00	0.00	0.00	0.00	7,213.90	7,213.90	7,213.90	0.00
2. Indirect Salary Costs (1.55):	0.00	0.00	0.00	0.00	11,181.54	11,181.54	11,181.54	0.00
3. Subtotal Direct Salary and Indirect Costs:	0.00	0.00	0.00	0.00	18,395.44	18,395.44	18,395.44	0.00
4. Travel:	0.00	0.00	0.00	0.00	7,188.00	7,188.00	7,188.00	0.00
5. Other Non-Salary Costs:								
Material Costs:	0.00	0.00	0.00	0.00	403.50	403.50	403.50	0.00
Equipment Costs:	0.00	0.00	0.00	0.00	9,887.60	9,887.60	9,887.60	0.00
6. Subtotal Direct Non-Salary Costs:	0.00	0.00	0.00	0.00	17,479.10	17,479.10	17,479.10	0.00
7. Subs:								
Subconsultants: H2M	0.00	0.00	0.00	0.00	165,567.76	165,567.76	165,567.76	0.00
Subcontractors:								
8. Total Work Assignment Costs:	0.00	0.00	0.00	0.00	201,442.30	201,442.30	201,442.30	0.00
9. Fees:								
Fixed Fee:	0.00	0.00	0.00	0.00	1,839.55	1,839.55	1,839.55	0.00
Management Fee:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10. Total Work Assignment Price:	0.00	0.00	0.00	0.00	203,281.85	203,281.85	203,281.85	0.00

Project Manager (Engineer): _____ **Date:** _____

ENGINEER:	Lawler, Matusky & Skelly Engineers	**SCHEDULE 2.11(g)**	**PAGE:** 4 of 7
CONTRACT No.:	D002676		**DATE PREPARED:** 18 Jun 98
PROJECT NAME:	Mackenzie Chemical Site	**MONTHLY COST CONTROL REPORT**	**BILLING PERIOD:**
WORK ASSIGNMENT No.:	D002676-30	**SUMMARY OF FISCAL INFORMATION**	**INVOICE No.:**
TASK No./NAME:	Task 3		**CAP No.:**
COMPLETE:	0%		

EXPENDITURE CATEGORY	A COST CLAIMED THIS PERIOD	B PAID TO DATE	C TOTAL DISSALLOWED TO DATE	D TOTAL COSTS PAID TO DATE (A+B)	E ESTIMATED COSTS TO COMPLETION	F ESTIMATED TOTAL WORK ASSIGNMENT PRICE (A+B+E)	G APPROVED BUDGET	H ESTIMATED UNDER/OVER (G-F)
1. Direct Salary Costs:	0.00	0.00	0.00	0.00	2,869.78	2,869.78	2,869.78	0.00
2. Indirect Salary Costs (1.55):	0.00	0.00	0.00	0.00	4,448.16	4,448.16	4,448.16	0.00
3. Subtotal Direct Salary and Indirect Costs:	0.00	0.00	0.00	0.00	7,317.94	7,317.94	7,317.94	0.00
4. Travel:	0.00	0.00	0.00	0.00	265.50	265.50	265.50	0.00
5. Other Non-Salary Costs:								
Material Costs:	0.00	0.00	0.00	0.00	144.00	144.00	144.00	0.00
Equipment Costs:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6. Subtotal Direct Non-Salary Costs:	0.00	0.00	0.00	0.00	409.50	409.50	409.50	0.00
7. Subs:								
Subconsultants:								
H2M	0.00	0.00		0.00	75,910.45	75,910.45	75,910.45	0.00
Subcontractors:								
8. Total Work Assignment Costs:	0.00	0.00	0.00	0.00	83,637.89	83,637.89	83,637.89	0.00
9. Fees:								
Fixed Fee:	0.00	0.00	0.00	0.00	731.81	731.81	731.81	0.00
Management Fee:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10. Total Work Assignment Price:	0.00	0.00	0.00	0.00	84,369.70	84,369.70	84,369.70	0.00

Project Manager (Engineer): _____ **Date:** _____

ENGINEER: Lawler, Matusky & Skelly Engineers LLP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical Site
WORK ASSIGN. No.: D002676-30

SCHEDULE 2.11(h)

DATE PREPARED: 18 Jun 98
BILLING PERIOD:
INVOICE No.:

MONTHLY COST CONTROL REPORT

SUMMARY OF LABOR HOURS

Number of Direct Labor Hours Expended to Date/Estimated Number of Direct Labor Hours to Completion

LABOR CLASSIFICATION / SALARY RATE	IX $48.86		VIII $37.56		VII $32.96		VI $30.87		V $27.54		IV $21.54		III $19.28		II $17.78		I $13.48		WP $12.66		TOTAL NO. OF DIRECT LABOR HRS.	
	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.	EXP.	/EST.
Task 1	0.0	0.0	0.0	0.0	0.0	34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0	30.0	0.0	4.0	0.0	82.0
Task 2	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	15.0	0.0	342.0	0.0	0.0	0.0	370.0
Task 3	0.0	2.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	32.0	0.0	0.0	0.0	4.0	0.0	4.0	0.0	84.0
																					0.0	536.0
TOTAL HOURS:	0.0	2.0	0.0	0.0	0.0	83.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	50.0	0.0	15.0	0.0	376.0	0.0	8.0	[redacted]	536.0

NOTES:

ENGINEER: Lawler, Matusky & Skelly Engineers LLP
CONTRACT No.: D002676
PROJECT NAME: Mackenzie Chemical Site
WORK ASSIGN. No.: D002676-30

SCHEDULE 2.11(h)

MONTHLY COST CONTROL REPORT

SUMMARY OF LABOR HOURS

Number of Direct Labor Hours Budgeted/Expended Number of Direct Labor Hours

DATE PREPARED: 18 Jun 98
BILLING PERIOD:
INVOICE No.:

LABOR CLASSIFICATION / SALARY RATE	IX $48.86		VIII $37.56		VII $32.96		VI $30.87		V $27.54		IV $21.54		III $19.28		II $17.78		I $13.48		WP $12.66		TOTAL NO. OF DIRECT LABOR HRS.	
	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.	BUD	EXP.
Task 1	0.0	0.0	0.0	0.0	34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	0.0	0.0	0.0	30.0	0.0	4.0	0.0	82.0	0.0
Task 2	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	15.0	0.0	342.0	0.0	0.0	0.0	370.0	0.0
Task 3	2.0	0.0	0.0	0.0	40.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	32.0	0.0	0.0	0.0	4.0	0.0	4.0	0.0	84.0	0.0
																					536.0	0.0
TOTAL HOURS:	2.0	0.0	0.0	0.0	83.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	50.0	0.0	15.0	0.0	376.0	0.0	8.0	0.0		

NOTES:

LMS

LABOR HOURS AND COSTS
TASK SUMMARY
Mackenzie Chemical Site

NSPE/ASCE LABOR CLASS	1998 HOURLY RATE ($)	TASK 1: 1997 RATES	TASK 2: 1998 RATES	TASK 3: 1996 RATES	TOTAL HOURS	SUBTOTAL ($)
IX	63.86	0.00	0.00	2.00	2.00	127.72
VIII	49.09	0.00	0.00	0.00	0.00	0.00
VII	43.07	34.00	9.00	40.00	83.00	3,574.81
VI	40.35	0.00	0.00	0.00	0.00	0.00
V	35.99	0.00	0.00	2.00	2.00	71.98
IV	28.15	0.00	0.00	0.00	0.00	0.00
III	25.21	14.00	4.00	32.00	50.00	1,260.50
II	24.51	0.00	15.00	0.00	15.00	367.65
I	18.59	30.00	342.00	4.00	376.00	6,989.84
WP	16.55	4.00	0.00	4.00	8.00	132.40
TOTAL UNITS:		82.00	370.00	84.00	536.00	
DIRECT SALARY COSTS ($):		2,441.22	7,213.90	2,869.78		12,524.90
INDIRECT SALARY COSTS:	1.55	3,783.90	11,181.54	4,448.16		19,413.60
SUBTOTAL ($):		6,225.12	18,395.44	7,317.94		31,938.50
FIXED FEE ($):	0.10	622.51	1,839.55	731.81		3,193.87
MATERIAL COSTS ($):		335.00	403.50	144.00		882.50
TRAVEL COSTS ($):		78.00	7,188.00	265.50		7,531.50
FIELD EQUIPMENT ($):		0.00	9,887.60	0.00		9,887.60
SUBS ($):		19,819.16	165,567.76	75,910.45		261,297.37
MGMT FEE ($):	0.05	0.00	0.00	0.00		0.00
TOTAL ($):		27,079.79	203,281.85	84,369.70		314,731.34

LABOR HOURS AND COSTS
TASK 1: WORK PLAN DEVELOPMENT
Mackenzie Chemical Site

NSPE/ASCE LABOR CLASS	HOURLY RATE ($)	1.1 BACKGROUND REVIEW	1.2 SCOPING SESSION	1.3 DRAFT RI/FS WORK PLAN	1.4 FINAL RI/FS WORK PLAN	1.5 TASK MANAGEMENT	TOTAL HOURS	SUBTOTAL ($)
IX	63.86	0.0	0.0	0.0	0.0	0.0	0.0	0.00
VIII	49.09	0.0	0.0	0.0	0.0	0.0	0.0	0.00
VII	43.07	0.0	10.0	10.0	10.0	4.0	34.0	1,464.38
VI	40.35	0.0	0.0	0.0	0.0	0.0	0.0	0.00
V	35.99	0.0	0.0	0.0	0.0	0.0	0.0	0.00
IV	28.15	0.0	0.0	0.0	0.0	0.0	0.0	0.00
III	25.21	0.0	10.0	2.0	2.0	0.0	14.0	352.94
II	24.51	0.0	0.0	0.0	0.0	0.0	0.0	0.00
I	18.59	0.0	0.0	10.0	10.0	10.0	30.0	557.70
WP	16.55	0.0	0.0	2.0	2.0	0.0	4.0	66.20
TOTAL UNITS:		0.0	20.0	24.0	24.0	14.0	82.0	
DIRECT SALARY COSTS ($):		0.00	682.80	700.12	700.12	358.18		2,441.22
INDIRECT SALARY COSTS ($):	1.55:	0.00	1,058.34	1,085.19	1,085.19	555.18		3,783.90
SUBTOTAL ($):		0.00	1,741.14	1,785.31	1,785.31	913.36		6,225.12
FIXED FEE ($):	0.10:	0.00	174.11	178.53	178.53	91.34		622.51
MATERIAL COSTS ($):		0.00	29.00	105.00	175.00	26.00		335.00
TRAVEL COSTS ($):		0.00	78.00	0.00	0.00	0.00		78.00
FIELD EQUIPMENT ($):		0.00	0.00	0.00	0.00	0.00		0.00
SUBS ($):		1,331.96	4,738.05	8,959.15	3,390.54	1,399.46		19,819.16
MGMT FEE ($):	0.05:	0.00	0.00	0.00	0.00	0.00		0.00
TOTAL ($):		1,331.96	6,760.30	11,027.99	5,529.38	2,430.16		27,079.79

MATERIAL COSTS
TASK 1: WORK PLAN DEVELOPMENT
Mackenzie Chemical Site

ITEM	RATE BASE	ESTIMATED $ PER UNIT	1.1 BACKGROUND REVIEW	1.2 SCOPING SESSION	1.3 DRAFT RI/FS WORK PLAN	1.4 FINAL RI/FS WORK PLAN	1.5 TASK MANAGEMENT	TOTAL ($)
Telephone	(at cost)	1.00	0	20	10	10	10	50.00
Reproduction	(per page)	0.07	0	100	1,000	2,000	100	224.00
General PC usage	(per hr)	1.50	0	0	10	10	6	39.00
Fax	(per page)	1.00	0	2	10	10	0	22.00
	TOTAL UNITS:		0	122	1,030	2,030	116	
	TASK TOTAL ($):		0.00	29.00	105.00	175.00	26.00	335.00

TRAVEL COSTS
TASK 1: WORK PLAN DEVELOPMENT
Mackenzie Chemical Site

ITEM	RATE BASE	ESTIMATED $ PER UNIT	1.1 BACKGROUND REVIEW	1.2 SCOPING SESSION	1.3 DRAFT RI/FS WORK PLAN	1.4 FINAL RI/FS WORK PLAN	1.5 TASK MANAGEMENT	TOTAL ($)
Personal mileage	(per mile)	0.315	0	200	0	0	0	63.00
Tolls	(at cost)	1.00	0	15	0	0	0	15.00
	TOTAL UNITS:		0	215	0	0	0	
	TASK TOTAL ($):		0.00	78.00	0.00	0.00	0.00	78.00

SUBCONSULTANTS/SUBCONTRACTORS COSTS
TASK 1: WORK PLAN DEVELOPMENT
Mackenzie Chemical Site

ITEM	1.1 BACKGROUND REVIEW	1.2 SCOPING SESSION	1.3 DRAFT RI/FS WORK PLAN	1.4 FINAL RI/FS WORK PLAN	1.5 TASK MANAGEMENT	TOTAL ($)
Subconsultants:						
H2M	1,331.96	4,738.05	8,959.15	3,390.54	1,399.46	19,819.16
SUBTOTAL:	1,331.96	4,738.05	8,959.15	3,390.54	1,399.46	19,819.16
Subcontractors:						
SUBTOTAL:	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL:	1,331.96	4,738.05	8,959.15	3,390.54	1,399.46	19,819.16

LABOR HOURS AND COSTS

TASK 2: RI FIELD SAMPLING

Mackenzie Chemical Site

NSPE/ASCE LABOR CLASS	HOURLY RATE ($)	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUCTURE SAMPLING	2.5 OFF-SITE VERTIAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATION	2.7 TASK MANAGEMENT	TOTAL HOURS	SUBTOTAL ($)
IX	63.86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
VIII	49.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
VII	43.07	0.0	0.0	1.0	3.0	3.0	0.0	2.0	9.0	387.63
VI	40.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
V	35.99	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
IV	28.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
III	25.21	0.0	0.0	0.0	2.0	2.0	0.0	0.0	4.0	100.84
II	24.51	0.0	0.0	2.0	5.0	8.0	0.0	0.0	15.0	367.65
I	18.59	0.0	0.0	48.0	96.0	192.0	0.0	6.0	342.0	6,357.78
WP	16.55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
TOTAL UNITS:		0.0	0.0	51.0	106.0	205.0	0.0	8.0	370.0	
DIRECT SALARY COSTS ($):		0.00	0.00	984.41	2,086.82	3,944.99	0.00	197.68		7,213.90
INDIRECT SALARY COSTS ($):	1.55:	0.00	0.00	1,525.84	3,234.57	6,114.73	0.00	306.40		11,181.54
SUBTOTAL ($):		0.00	0.00	2,510.25	5,321.39	10,059.72	0.00	504.08		18,395.44
FIXED FEE ($):	0.10:	0.00	0.00	251.03	532.14	1,005.97	0.00	50.41		1,839.55
MATERIAL COSTS ($):		0.00	0.00	32.40	195.55	70.55	0.00	105.00		403.50
TRAVEL COSTS ($):		0.00	0.00	1,030.00	2,055.00	4,103.00	0.00	0.00		7,188.00
FIELD EQUIPMENT ($):		0.00	0.00	1,448.70	2,698.73	5,740.17	0.00	0.00		9,887.60
SUBS ($):		3,644.76	9,062.60	7,840.87	27,718.37	28,743.53	84,584.77	3,972.86		165,567.76
MGMT FEE ($):	0.05:	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
TOTAL ($):		3,644.76	9,062.60	13,113.25	38,521.18	49,722.94	84,584.77	4,632.35		203,281.85

MATERIAL COSTS
TASK 2: RI FIELD SAMPLING
Mackenzie Chemical Site

ITEM	RATE BASE	ESTIMATED $ PER UNIT	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUCTURE SAMPLING	2.5 OFF-SITE VERTIAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATION	2.7 TASK MANAGEMENT	TOTAL ($)
Telephone	(at cost)	1.00	0	0	5	10	10	0	10	35.00
Reproduction	(per page)	0.07	0	0	50	100	100	0	1,000	87.50
General PC usage	(per hr)	1.50	0	0	0	0	0	0	10	15.00
Fax	(per page)	1.00	0	0	2	5	5	0	10	22.00
Disposable Field Items:										
Decon Chemicals	(at cost)	1.00	0	0	2	5	5	0	0	12.00
Decon D.I. Water	(per gal.)	0.12	0	0	20	40	40	0	0	12.00
Stakes/Flagging	(at cost)	3.75	0	0	2	5	5	0	0	45.00
Misc*	(at cost)	1.00	0	0	10	20	20	0	0	50.00
Repair of NYSDEC Meters	(lump sum)	125.00	0	0	0	1	0	0	0	125.00
	TOTAL UNITS:		0	0	91	186	185	0	1,030	
	TASK TOTAL ($):		0.00	0.00	32.40	195.55	70.55	0.00	105.00	403.50

TRAVEL COSTS

TASK 2: RI FIELD SAMPLING

Mackenzie Chemical Site

ITEM	RATE BASE	ESTIMATED $ PER UNIT	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUCTURE SAMPLING	2.5 OFF-SITE VERTIAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATION	2.7 TASK MANAGEMENT	TOTAL ($)
Trailer rental	(per day)	30.00	0	0	2	4	8	0	0	420.00
Per diem	(per day)	240.00	0	0	4	8	16	0	0	6,720.00
Tolls	(at cost)	1.00	0	0	10	15	23	0	0	48.00
	TOTAL UNITS:		0	0	16	27	47	0	0	
	TASK TOTAL ($):		0.00	0.00	1,030.00	2,055.00	4,103.00	0.00	0.00	7,188.00

FIELD EQUIPMENT COSTS
TASK 2: RI FIELD SAMPLING
Mackenzie Chemical Site

ITEM	RATE BASE	ESTIMATED $ PER UNIT	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUCTURE SAMPLING	2.5 OFF-SITE VERTIAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATION	2.7 TASK MANAGEMENT	TOTAL ($)
Personal Protective Equipment:										
Level D	(per day)	12	0	0	4	8	16	0	0	336.00
Generators - Honda (6,500 watt)	(per day)	51	0	0	2	4	8	0	0	714.00
High pressure washer - Landa (110 volt)	(per day)	92	0	0	2	4	8	0	0	1288.00
PID - HNu (HW-101) @	(per day)	0	0	0	2	4	8	0	0	0.00
Combustible gas indicator - Exotech (40-OFH) @	(per day)	0	0	0	2	4	8	0	0	0.00
Probe unit - Concord	(per day)	374	0	0	2	4	8	0	0	5236.00
Soil/Water sample charge	(each)	20	0	0	17	24	64	0	0	2100.00
Mobilization	(per mile)	0.133	0	0	25	60	115	0	0	26.60
Mobilization	(per hr)	46.75	0	0	0.5	1	2.5	0	0	187.00
	SUBTOTAL:		0.00	0.00	1114.70	2030.73	4404.17	0.00	0.00	
	TOTAL UNITS:		0	0	57	113	238	0	0	
	TASK TOTALS ($):		0.00	0.00	1,448.70	2,698.73	5,740.17	0.00	0.00	9887.60

@ - NYSDEC meters to be used.

SUBCONSULTANTS/SUBCONTRACTORS COSTS

TASK 2: RI FIELD SAMPLING

Mackenzie Chemical Site

ITEM	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUCTURE SAMPLING	2.5 OFF-SITE VERTIAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATION	2.7 TASK MANAGEMENT	TOTAL ($)
Subconsultants:								
H2M	3,644.76	9,062.60	7,840.87	27,718.37	28,743.53	84,584.77	3,972.86	165,567.76
SUBTOTAL:	3,644.76	9,062.60	7,840.87	27,718.37	28,743.53	84,584.77	3,972.86	165,567.76
Subcontractors:								
SUBTOTAL:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL:	3,644.76	9,062.60	7,840.87	27,718.37	28,743.53	84,584.77	3,972.86	165,567.76

LABOR HOURS AND COSTS

TASK 3: REMEDIAL INVESTIGATION AND FEASIBILITY REPORT

Mackenzie Chemical Site

NSPE/ASCE LABOR CLASS	HOURLY RATE ($) 1996	3.1 DRAFT FRI REPORT	3.2 DRAFT F/S REPORT	3.3 FINAL RI/FS REPORT	3.4 PUBLIC PARTICIPATION	3.5 DATA VALIDATION AND USABILITY REPORT	3.6 IRM SCOPING	3.7 TASK MANAGEMENT	TOTAL HOURS	SUBTOTAL ($)
IX	63.86	0.0	0.0	2.0	0.0	0.0	0.0	0.0	2.0	127.72
VIII	49.09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
VII	43.07	4.0	4.0	8.0	8.0	0.0	12.0	4.0	40.0	1,722.80
VI	40.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
V	35.99	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	71.98
IV	28.15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
III	25.21	4.0	4.0	4.0	8.0	0.0	12.0	0.0	32.0	806.72
II	24.51	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00
I	18.59	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0	74.36
WP	16.55	2.0	2.0	0.0	0.0	0.0	0.0	0.0	4.0	66.20
TOTAL UNITS:		10.0	10.0	14.0	16.0	2.0	24.0	8.0	84.0	
DIRECT SALARY COSTS ($):		306 22	306.22	573.12	546.24	71.98	819.36	246.64		2,869.78
INDIRECT SALARY COSTS ($):	1.55	474.64	474.64	888.34	846.67	111.57	1,270.01	382.29		4,448.16
SUBTOTAL ($):		780.86	780.86	1,461.46	1,392.91	183.55	2,089.37	628.93		7,317.94
FIXED FEE ($):	0.10	78.09	78.09	146.15	139.29	18.36	208.94	62.89		731.81
MATERIAL COSTS ($):		5.00	22.00	22.00	15.00	15.00	22.00	43.00		144.00
TRAVEL COSTS ($):		0.00	0.00	78.00	83.00	0.00	104.50	0.00		265.50
FIELD EQUIPMENT ($):		0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
SUBS ($):		28,464.28	23,988.10	7,051.96	8,787.81	2,420.07	1,483.28	3,714.95		75,910.45
MGMT FEE ($):	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
TOTAL ($):		29,328.23	24,869.05	8,759.57	10,418.01	2,636.98	3,908.09	4,449.77		84,369.70

MATERIAL COSTS

TASK 3: REMEDIAL INVESTIGATION AND FEASIBILITY REPORT

Mackenzie Chemical Site

ITEM	RATE BASE	ESTIMATED $ PER UNIT	3.1 DRAFT FRI REPORT	3.2 DRAFT FS REPORT	3.3 FINAL RI/FS REPORT	3.4 PUBLIC PARTICIPATION	3.5 DATA VALIDATION AND USABILITY REPORT	3.6 IRM SCOPING	3.7 TASK MANAGEMENT	TOTAL ($)
Telephone	(at cost)	1.00	0	10	10	10	10	10	10	60.00
Reproduction	(per page)	0.07	0	100	100	0	0	100	400	49.00
Fax	(per page)	1.00	5	5	5	5	5	5	5	35.00
	TOTAL UNITS:		5	115	115	15	15	115	415	
	TASK TOTAL ($):		5.00	22.00	22.00	15.00	15.00	22.00	43.00	144.00

TRAVEL COSTS

TASK 3: REMEDIAL INVESTIGATION AND FEASIBILITY REPORT

Mackenzie Chemical Site

ITEM	RATE BASE	ESTIMATED $ PER UNIT	3.1 DRAFT FRI REPORT	3.2 DRAFT FS REPORT	3.3 FINAL RI/FS REPORT	3.4 PUBLIC PARTICIPATION	3.5 DATA VALIDATION AND USABILITY REPORT	3.6 IRM SCOPING	3.7 TASK MANAGEMENT	TOTAL ($)
Personal mileage	(per mile)	0.315	0	0	200	200	0	300	0	220.50
Tolls	(at cost)	1.00	0	0	15	20	0	10	0	45.00
	TOTAL UNITS:		0	0	215	220	0	310	0	
	TASK TOTAL ($):		0.00	0.00	78.00	83.00	0.00	104.50	0.00	265.50

SUBCONSULTANTS/SUBCONTRACTORS COSTS

TASK 3: REMEDIAL INVESTIGATION AND FEASIBILITY REPORT

Mackenzie Chemical Site

ITEM	3.1 DRAFT FRI REPORT	3.2 DRAFT FS REPORT	3.3 FINAL RI/FS REPORT	3.4 PUBLIC PARTICIPATION	3.5 DATA VALIDATION AND USABILITY REPORT	3.6 IRM SCOPING	3.8 TASK MANAGEMENT	TOTAL ($)
Subconsultants:								
H2M	28,464.28	23,988.10	7,051.96	8,787.81	2,420.07	1,483.28	3,714.95	75,910.45
SUBTOTAL:	28,464.28	23,988.10	7,051.96	8,787.81	2,420.07	1,483.28	3,714.95	75,910.45
Subcontractors:								
SUBTOTAL:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL:	28,464.28	23,988.10	7,051.96	8,787.81	2,420.07	1,483.28	3,714.95	75,910.45

H2M

TABLE A

LABOR HOURS AND COSTS

TASK SUMMARY

MACKENZIE CHEMICAL WA # D002676-30

NSPE/ASCE LABOR CLASS	1996 HOURLY RATE ($)	1997 HOURLY RATE ($)	TASK 1: 1996 RATES	TASK 2: 1997 RATES	TASK 3: 1997 RATES	TOTAL HOURS	SUBTOTAL ($)
IX	58.37	58.37	0.00	1.00	6.00	7.00	408.59
VIII	55.81	55.81	1.00	0.00	4.00	5.00	279.05
VII	47.91	47.91	25.00	26.00	56.00	107.00	5,126.37
VI	35.68	35.68	3.00	10.00	188.00	201.00	7,171.68
V	32.75	32.75	103.00	152.50	207.00	462.50	15,146.88
IV	26.90	26.90	30.00	0.00	36.00	66.00	1,775.40
III	22.58	22.58	23.00	13.00	85.00	121.00	2,732.18
II	19.26	19.26	0.00	64.00	154.00	218.00	4,198.68
I	16.96	16.96	24.00	424.00	221.00	669.00	11,346.24
WP	15.68	15.68	22.00	10.00	9.00	41.00	642.88
TOTAL UNITS:			231.00	700.50	966.00	1,897.50	
DIRECT SALARY COSTS ($):			6,812.19	15,529.23	26,486.53		48,827.95
INDIRECT SALARY							
1.6666			11,353.20	25,881.01	44,142.46		81,376.67
SUBTOTAL ($):			18,165.39	41,410.24	70,628.99		130,204.62
0.05			908.27	2,070.51	3,531.46		6,510.24
MATERIAL COSTS ($):			697.50	1,910.00	1,750.00		4,357.50
TRAVEL COSTS ($):			48.00	444.00	0.00		492.00
FIELD EQUIPMENT ($):			0.00	2,048.00	0.00		2,048.00
SUBS ($):			0.00	112,890.76	0.00		112,890.76
0.05			0.00	4,794.25	0.00		4,794.25
TOTAL ($):			19,819.16	165,567.76	75,910.45		261,297.37

LABOR HOURS AND COSTS

TASK 1: WORK PLAN DEVELOPMENT

MACKENZIE CHEMICAL WA # D002676-30

NSPE/ASCE LABOR CLASS	HOURLY RATE ($)	1.1 BACKGROUND REVIEW	1.2 SCOPING SESSION	1.3 DRAFT RI/FS WORKPLAN	1.4 FINAL RI/FS WORKPLAN	1.5 TASK MANAGEMENT	TOTAL HOURS	SUBTOTAL ($)
IX	58.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VIII	55.81	0.00	1.00	0.00	0.00	0.00	1.00	55.81
VII	47.91	3.00	10.00	6.00	3.00	3.00	25.00	1,197.75
VI	35.68	0.00	0.00	0.00	0.00	3.00	3.00	107.04
V	32.75	6.00	32.00	45.00	15.00	5.00	103.00	3,373.25
IV	26.90	0.00	0.00	30.00	0.00	0.00	30.00	807.00
III	22.58	6.00	0.00	8.00	8.00	1.00	23.00	519.34
II	19.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	16.96	0.00	0.00	12.00	12.00	0.00	24.00	407.04
WP	15.68	0.00	5.00	8.00	5.00	4.00	22.00	344.96
TOTAL UNITS:		15.00	48.00	109.00	43.00	16.00	231.00	
DIRECT SALARY COSTS ($):		475.71	1,661.31	3,077.81	1,097.54	499.82		6,812.19
INDIRECT SALARY COSTS ($):	1.6666:	792.82	2,768.74	5,129.48	1,829.16	833.00		11,353.20
SUBTOTAL ($):		1,268.53	4,430.05	8,207.29	2,926.70	1,332.82		18,165.39
FIXED FEE ($):	0.05:	63.43	221.50	410.36	146.34	66.64		908.27
MATERIAL COSTS ($):		0.00	62.50	317.50	317.50	0.00		697.50
TRAVEL COSTS ($):		0.00	24.00	24.00	0.00	0.00		48.00
FIELD EQUIPMENT ($):		0.00	0.00	0.00	0.00	0.00		0.00
SUBS ($):		0.00	0.00	0.00	0.00	0.00		0.00
MGMT FEE ($):	0.05:	0.00	0.00	0.00	0.00	0.00		0.00
TOTAL ($):		1,331.96	4,738.05	8,959.15	3,390.54	1,399.46		19,819.16

MATERIAL COSTS

TASK 1: WORK PLAN DEVELOPMENT

MACKENZIE CHEMICAL WA # D002676-30

ITEM	RATE BASE	ESTIMATED $ PER UNIT	1.1 BACKGROUND REVIEW	1.2 SCOPING SESSION	1.3 DRAFT RI/FS WORKPLAN	1.4 FINAL RI/FS WORKPLAN	1.5 TASK MANAGEMENT	TOTAL ($)
Telephone	(at cost)	1.00	0	20.00	20.00	20.00	0.00	60.00
Reproduction	(per page)	0.05	0	450.00	1,600.00	1,600.00	0.00	182.50
Auto CADD	(per hr)	6.25	0	0.00	6.00	6.00	0.00	75.00
Fax	(per page)	1.00	0	20.00	20.00	20.00	0.00	60.00
Overnight shipping	(at cost)	80.00	0	0.00	2.00	2.00	0.00	320.00
	TOTAL UNITS:		0	490	1,648	1,648	0	
	TASK TOTAL ($):		0.00	62.500	317.500	317.500	0.000	697.50

TRAVEL COSTS

TASK 1: WORK PLAN DEVELOPMENT

MACKENZIE CHEMICAL WA # D002676-30

ITEM	RATE BASE	ESTIMATED $ PER UNIT	1.1 BACKGROUND REVIEW	1.2 SCOPING SESSION	1.3 DRAFT RI/FS WORKPLAN	1.4 FINAL RI/FS WORKPLAN	1.5 TASK MANAGEMENT	TOTAL ($)
Personal mileage	(per mile)	0.30	0	80	80	0	0	48.00
	TOTAL UNITS:		0	80	80	0	0	
	TASK TOTAL ($):		0.00	24.00	24.00	0.00	0.00	48.00

* - Tolls, Parking.

LABOR HOURS AND COSTS

TASK 2: RI FIELD SAMPLING

MACKENZIE CHEMICAL WA # D002676-30

NSPE/ASCE LABOR CLASS	HOURLY RATE ($)	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUCTURE SAMPLING	2.5 OFF-SITE VERTICAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATIONS	2.7 TASK MANAGEMENT	TOTAL HOURS	SUBTOTAL ($)
IX	58.37	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1	58.37
VIII	55.81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.00
VII	47.91	3.0	0.0	3.0	4.0	3.0	4.0	9.0	26	1,245.66
VI	35.68	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10	356.80
V	32.75	10.0	2.0	12.0	30.0	40.0	50.0	8.5	153	4,994.38
IV	26.90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.00
III	22.58	8.0	2.0	0.0	0.0	0.0	0.0	3.0	13	293.54
II	19.26	0.0	0.0	6.0	8.0	30.0	20.0	0.0	64	1,232.64
I	16.96	32.0	0.0	30.0	50.0	160.0	150.0	2.0	424	7,191.04
WP	15.68	0.0	0.0	0.0	0.0	0.0	0.0	10.0	10	156.80
TOTAL UNITS:		53	4	51	92	233	224	44	701	
DIRECT SALARY COSTS ($):		1,194.59	110.66	1,161.09	2,176.22	4,745.13	4,758.34	1,383.20		15,529.23
INDIRECT SALARY COSTS ($):	1.6666	1,990.90	184.43	1,935.07	3,626.89	7,908.23	7,930.25	2,305.24		25,881.01
SUBTOTAL ($):		3,185.49	295.09	3,096.16	5,803.11	12,653.36	12,688.59	3,688.44		41,410.24
FIXED FEE ($):	0.05	159.27	14.75	154.81	290.16	632.67	634.43	184.42		2,070.51
MATERIAL COSTS ($):		270.00	12.00	218.00	486.00	442.00	442.00	40.00		1,910.00
TRAVEL COSTS ($):		30.00	0.00	18.00	75.00	126.00	135.00	60.00		444.00
FIELD EQUIPMENT ($):		0.00	0.00	156.00	260.00	832.00	800.00	0.00		2,048.00
SUBS ($):		0.00	8,740.76	3,998.00	19,936.00	13,445.00	66,771.00	0.00		112,890.76
MGMT FEE ($):	0.05	0.00	0.00	199.90	868.10	612.50	3,113.75	0.00		4,794.25
TOTAL ($):		3,644.76	9,062.60	7,840.87	27,718.37	28,743.53	84,584.77	3,972.86		165,567.76

MATERIAL COSTS

TASK 2: RI FIELD SAMPLING

MACKENZIE CHEMICAL WA # D002676-30

ITEM	RATE BASE	ESTIMATED $ PER UNIT	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUTURE SAMPLING	2.5 OFF-SITE VERTICAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATIONS	2.7 TASK MANAGEMENT	TOTAL ($)
Telephone	(at cost)	1.00	45.0	10.0	20.0	20.0	10.0	10.0	20.0	135.00
Reproduction	(per page)	0.05	1,200.0	0.0	0.0	0.0	0.0	0.0	0.0	60.00
Fax	(per page)	1.00	5.0	2.0	2.0	2.0	2.0	2.0	20.0	35.00
Overnight shipping	(at cost)	80.00	2.0	0.0	2.0	4.0	2.0	2.0	0.0	960.00
Disposable Field Items:										
Decon D.I. Water	(per day)	18.00	0.0	0.0	2.0	8.0	15.0	15.0	0.0	720.00
	TOTAL UNITS:		1,252.0	12.0	26.0	34.0	29.0	29.0	40.0	
	TASK TOTAL ($):		270.0	12.0	218.0	486.0	442.0	442.0	40.0	1,910.00

TRAVEL COSTS

TASK 2: RI FIELD SAMPLING

MACKENZIE CHEMICAL WA # D002676-30

ITEM	RATE BASE	ESTIMATED $ PER UNIT	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUTURE SAMPLING	2.5 OFF-SITE VERTICAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATIONS	2.7 TASK MANAGEMENT	TOTAL ($)
Personal mileage	(per mile)	0.30	100.00	0.00	60.00	250.00	420.00	450.00	200.00	480.00
TOTAL UNITS:			100.00	0.00	60.00	250.00	420.00	450.00	200.00	
TASK TOTAL ($):			30.00	0.00	18.00	75.00	126.00	135.00	60.00	480.00

FIELD EQUIPMENT COSTS

TASK 2: RI FIELD SAMPLING

MACKENZIE CHEMICAL WA # D002676-30

ITEM	RATE BASE	ESTIMATED $ PER UNIT	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUTURE SAMPLING	2.5 OFF-SITE VERTICAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATIONS	2.7 TASK MANAGEMENT	TOTAL ($)
Personal Protective Equipment:										
Level D	(per day)	10	0	0	3	5	16	17	0	410.00
PID - HNu (HW-101) @	(per day)	42	0	0	3	5	16	15	0	1,638.00
	TOTAL UNITS:		0	0	6	10	32	32	0	
	TASK TOTALS ($):		0.00	0.00	156.00	260.00	832.00	800.00	0.00	2,048.00

SUBCONSULTANTS/SUBCONTRACTORS COSTS

TASK 2: RI FIELD SAMPLING

MACKENZIE CHEMICAL WA # D002676-30

ITEM	2.1 FILE REVIEW	2.2 BASE MAP DEVELOPMENT	2.3 SURFACE SOIL SAMPLING	2.4 DRAINAGE STRUCTURE SAMPLING	2.5 OFF-SITE VERTICAL PROFILE WELLS	2.6 MONITORING WELL INSTALLATIONS	2.7 TASK MANAGEMENT	TOTAL ($)
Subconsultants:								
YEC, INC	0.00	8,740.76	0.00	0.00	0.00	0.00	0.00	8,740.76
SUBTOTAL:	0.00	8,740.76	0.00	0.00	0.00	0.00	0.00	8,740.76
Subcontractors:								
American Auger	0.00	0.00	1,270.00	2,810.00	0.00	41,175.00	0.00	45,255.00
Severn Trent Envro	0.00	0.00	2,728.00	2,452.00	6,650.00	0.00	0.00	11,830.00
Accredited Labs	0.00	0.00	0.00	12,100.00	5,600.00	21,100.00	0.00	38,800.00
Data Validation Services	0.00	0.00	0.00	2,574.00	1,195.00	4,496.00	0.00	8,265.00
SUBTOTAL:	0.00	0.00	3,998.00	19,936.00	13,445.00	66,771.00	0.00	104,150.00
TOTAL:	0.00	8,740.76	3,998.00	19,936.00	13,445.00	66,771.00	0.00	112,890.76

LABOR HOURS AND COSTS

TASK 3: REPORTING AND PUBLIC PARTICIPATION

NSPE/ASCE LABOR CLASS	HOURLY RATE ($)	3.1 DRAFT RI REPORT	3.2 DRAFT FS REPORT	3.3 FINAL RI/FS REPORT	3.4 PUBLIC PARTICIPATION	3.5 DATA VALIDATION USABILITY REPORT	3.6 IRM SCOPING	3.7 TASK MANGEMENT	TOTAL HOURS	SUBTOTAL ($)
IX	58.37	2.0	2.0	0.0	0.0	0.0	0.0	2.0	6	350.22
VIII	55.81	0.0	4.0	0.0	0.0	0.0	0.0	0.0	4	223.24
VII	47.91	8.0	12.0	6.0	20.0	2.0	2.0	6.0	56	2,682.96
VI	35.68	70.0	90.0	20.0	0.0	0.0	0.0	8.0	188	6,707.84
V	32.75	70.0	40.0	20.0	56.0	4.0	8.0	9.0	207	6,779.25
IV	26.90	12.0	0.0	8.0	0.0	16.0	0.0	0.0	36	968.40
III	22.58	30.0	50.0	0.0	0.0	0.0	0.0	5.0	85	1,919.30
II	19.26	90.0	40.0	16.0	0.0	0.0	8.0	0.0	154	2,966.04
I	16.96	120.0	60.0	20.0	12.0	8.0	0.0	1.0	221	3,748.16
WP	15.68	0.0	0.0	0.0	0.0	0.0	0.0	9.0	9	141.12
TOTAL UNITS:		402	298	90	88	30	18	40	966	
DIRECT SALARY COSTS ($):		10,058.92	8,353.10	2,518.62	2,995.72	792.90	511.90	1,255.37		26,486.53
INDIRECT SALARY COSTS ($):	1.6666	16,764.20	13,921.28	4,197.53	4,992.67	1,321.45	853.13	2,092.20		44,142.46
SUBTOTAL ($):		26,823.12	22,274.38	6,716.15	7,988.39	2,114.35	1,365.03	3,347.57		70,628.99
FIXED FEE ($):	0.05	1,341.16	1,113.72	335.81	399.42	105.72	68.25	167.38		3,531.46
MATERIAL COSTS ($):		300.00	600.00	0.00	400.00	200.00	50.00	200.00		1,750.00
TRAVEL COSTS ($):		0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
FIELD EQUIPMENT ($):		0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
SUBS ($):		0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
MGMT FEE ($):	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
TOTAL ($):		28,464.28	23,988.10	7,051.96	8,787.81	2,420.07	1,483.28	3,714.95		75,910.45

MATERIAL COSTS

TASK 3: REPORTING AND PUBLIC PARTICIPATION

ITEM	RATE BASE	ESTIMATED $ PER UNIT	3.1 DRAFT RI REPORT	3.2 DRAFT FS REPORT	3.3 FINAL RI/FS REPORT	3.4 PUBLIC PARTICIPATION	3.5 DATA VALIDATION USABILITY REPORT	3.6 IRM SCOPING	3.7 TASK MANGEMENT	TOTAL ($)
Telephone	(at cost)	1.00	10	30	0	30	7	4	45	126.00
Reproduction	(per page)	0.05	1,400	2,500	0	1,300	500	400	700	340.00
Auto CADD	(per hr)	6.25	8	28	0	20	0	4	0	375.00
Fax	(per page)	1.00	10	30	0	20	8	1	40	109.00
Overnight shipping	(at cost)	80.00	2	3	0	2	2	0	1	800.00
	TOTAL UNITS:		1,430	2,591	0	1,372	517.00	409	786	
	TASK TOTAL ($):		300.00	600.00	0.00	400.00	200.00	50.00	200.00	1,750.00

* - Stakes, graphic supplies, etc.