REMEDIAL INVESTIGATION FOR THE ROCHESTER FIRE ACADEMY SITE

- RESULTS OF PRELIMINARY SURVEYS -

City of Rochester Rochester, New York

February 1990 Project No. 0965-64-1

INTERIM REPORT

REMEDIAL INVESTIGATION FOR THE ROCHESTER FIRE ACADEMY SITE

- RESULTS OF PRELIMINARY SURVEYS -

CITY OF ROCHESTER, NEW YORK

MARCH 1990

MALCOLM PIRNIE, INC. S-3515 Abbott Road P. O. Box 1938 Buffalo, New York 14219



REMEDIAL INVESTIGATION FOR THE ROCHESTER FIRE ACADEMY SITE

- RESULTS OF PRELIMINARY SURVEYS -

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1.0 INTRODUCTION

1.1 BACKGROUND

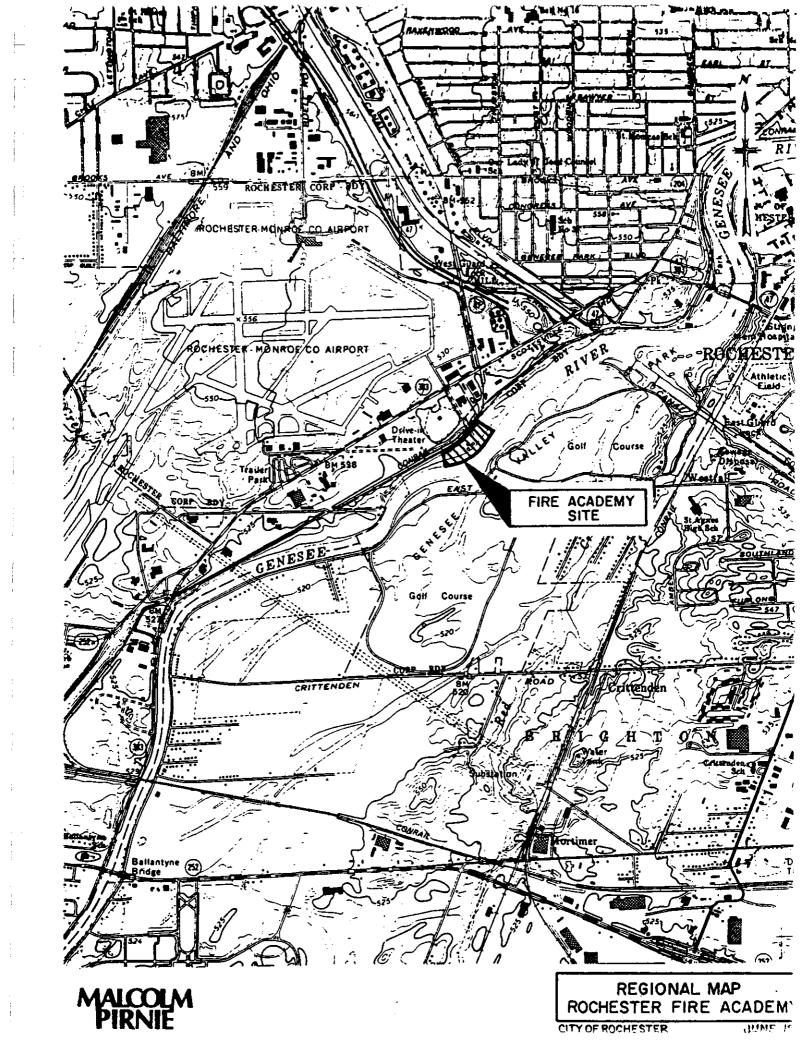
The Rochester Fire Academy site is an 18-acre fireman's training facility located at 1190 Scottsville Road in the City of Rochester, Monroe County, New York (Figure 1-1). The site is currently listed in the New York State Registry of Inactive Hazardous Waste Disposal Sites (Site No. 828015). Flammable liquids (some of which may have contained hazardous substances) were accepted at this facility for use in training activities during the period from 1955 to 1980. Liquid spills, as well as the on-site disposal of residues, drums and excess or unusable materials, have resulted in localized contamination of soils and ground water at the Fire Academy Site.

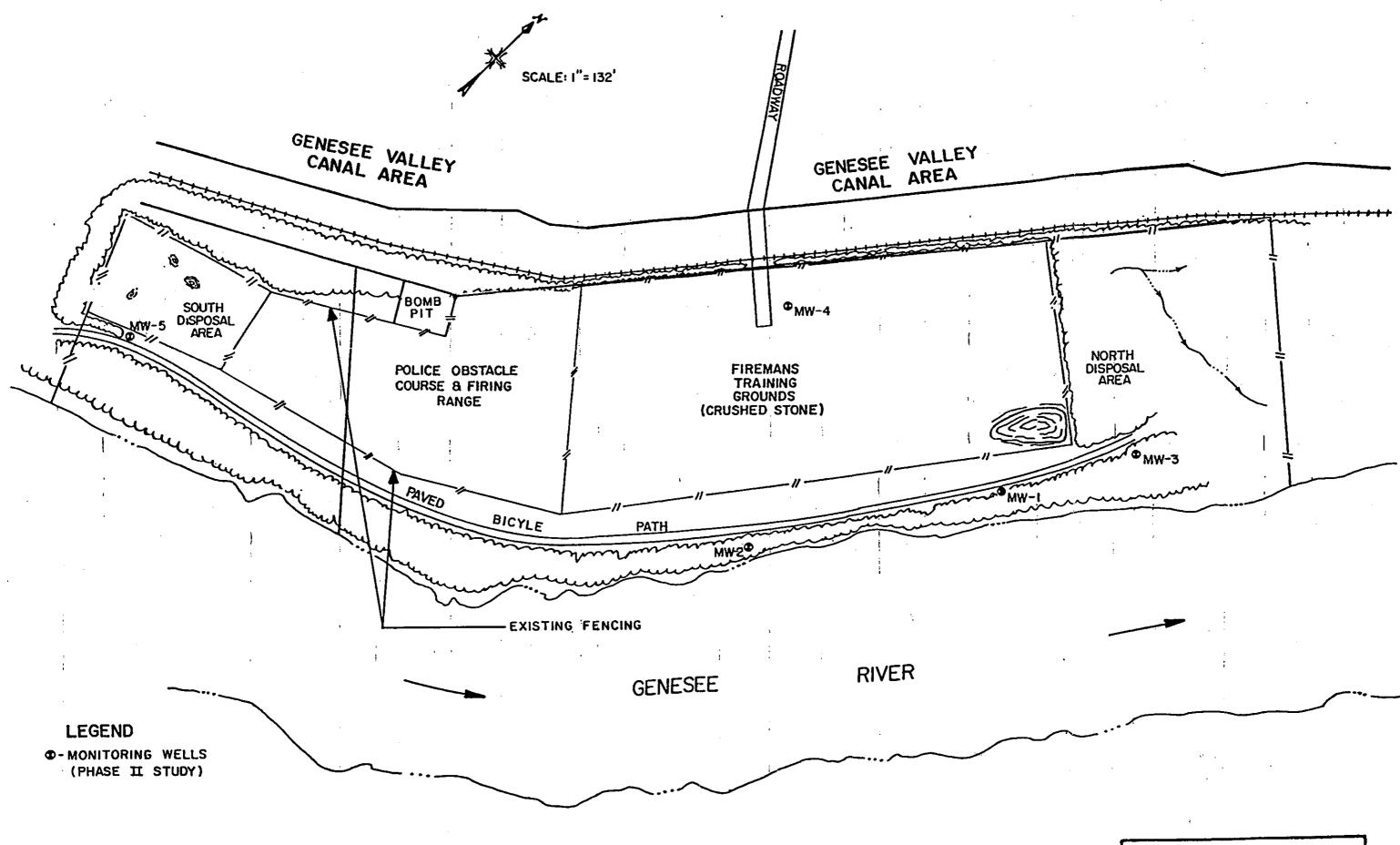
The Fire Academy Site consists of four distinct areas, three of which have been involved with the facility's chemical use and disposal (Figure 1-2). The three areas of concern are identified as the North Disposal Area, the Training Grounds and the South Disposal Area, which are 2.5, 5.4 and 0.8 acres in size, respectively. The fourth area, the Police Obstacle Course and Firing Range, is not believed to have received any potentially hazardous wastes.

A paved bicycle path, which is part of the City of Rochester's Genesee Park, runs along the southeastern edge of the site. The bicycle path crosses a narrow strip of land which provides a buffer area between the Fire Academy Site and the Genesee River.

The northwestern edge of the site is bordered by the former Genesee Valley Canal and Pennsylvania Railroad right-of-way. The route of the former Canal is apparent as a linear depression. The railroad which appears to have run along the southeastern bank of the Canal is represented by a 10-15 ft wide path of slag and cinder materials.

This interim report presents the findings of preliminary, non-intrusive site investigation activities completed at the site. The initial activities included preparation of a site map, a radiological survey, an electromagnetic terrain conductivity survey and a soil gas survey.





ROCHESTER FIRE ACADEMY
SITE PLAN

CITY OF ROCHESTER

MARCH, 1990



Rochester Fire Academy Geophysical Survey Rochester, NY

Prepared by:

Gartner Lee, Inc., 105 Main Street Niagara Falls, NY 14303

Prepared for:

Malcolm Pirnie, Inc. S. 3515 Abbott Road Buffalo, NY 14219

Project No. 89-815

January 24, 1990

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File - 1



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Professional Services in Environmental Management

Gartner Lee, Inc.

January 24, 1990

GLI 89-815M

Malcolm Pirnie, Inc. South 3515 Abbott Road P.O. Box 1938 Buffalo, NY 14219

Attention:

Mr. Gunther Funk

Senior Hydrogeologist

Dear Sirs:

Re: Rochester Fire Academy - Geophysical Survey, Rochester, New York

We are pleased to provide Malcolm Pirnie, Inc. with this report summarizing our observations at the above noted site. On November 17 through 22, 1989 a electromagnetic (EM) terrain conductivity survey was performed at the Rochester Fire Academy site in Rochester, New York. The survey location is divided into six areas, the South Disposal Area, the Berm, the Police Obstacle Course & Firing Range, the Firemans Training Grounds, the Bicycle Path, the Genesee Valley Canal, and the North Disposal Area (Figure 1). The survey area consists of a crushed stone parking lot, buildings, open field, dense brush, chain link fences and wooded areas. Fill material and metallic surface debris were noted within the south and north disposal areas (Figure 1). The Genesee River is located immediately southeast of the site and flows northward. The site is currently used as a training facility for fire and police personnel for the City of Rochester.

As discussed in the request for proposal (RFP) letter, dated December 28, 1988, the site received flammable liquids for the use in fire training activities from 1955 through 1980. Some of the flammable liquids used on site are believed to have contained hazardous materials. Liquid spills as well as on-site disposal of residues and unused materials are believed to have occurred.

1.0 PURPOSE

The purpose of the geophysical survey was to assist in the definition of potential disposal areas and to map buried metals. To accomplish these objectives a high resolution EM survey was performed. This method utilizes interpretative techniques which can be significantly impacted by varying site



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conditions. Therefore, where possible, confirmation of anomalies should be sought through the use of aerial photograph interpretation, test pits and borehole information.

2.0 METHODOLOGY

2.1 Survey Grid

A reference grid measuring approximately 1900 feet by 500 feet was surveyed by Malcolm Pirnie personnel. The grid consisted of reference stakes located at 50 foot intervals along lines spaced 50 feet apart. In addition to this reference, Gartner Lee personnel placed additional flagging at 10 foot intervals along north-south trending lines. At some locations these 10 foot interval lines were variably spaced dependant upon the thickness of brush. The additional flagging helped facilitate accurate line and station location.

2.2 Electromagnetic Survey

The terrain conductivity survey was performed along east-west trending survey lines. Data were collected along 10 foot line spacings in the south disposal area and central training facility. Due to thick brush, data were collected at 25 foot line spacings in the north disposal area.

In addition to data collection in the above three areas, data were also collected along three profile lines designated A-A', B-B', and C-C'. The profile lines were located along a bicycle path paralleling the Genesee River, a steep berm separating the Police Obstacle Course & Firing Range from the South Disposal Area, and along the infilled Genesee Valley Canal respectively (Figure 1). Data were also collected along six short profiles oriented perpendicular to the Genesee Valley Canal profile.

Data were collected across north-south trending tie lines which allows for the examination of any linear conductive material (such as a metal pipe or utility) that trends parallel to the principle survey direction. Readings were recorded at intervals of two to three feet along each survey line at the site. A total of approximately 17,300 data points were collected at the Rochester Fire Academy site.

A Geonics EM-31-DL terrain conductivity meter was used to measure and record the quadrature and the in-phase component of the electromagnetic field at each station. The quadrature component data are a measurement of the ground conductivity (millSiemens per meter (mS/m)) and the in-phase component data are a measurement of the presence of metals (parts per trillion (ppt)). All readings were taken with the



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instrument oriented parallel to the direction of travel, in the vertical dipole mode and with the instrument at waist height.

The EM-31-DL was calibrated daily following procedures specified in the operations manual. Readings were automatically stored in a solid state data logger during the survey. The data logger was interfaced to a portable computer and the data were transferred to a floppy disk for subsequent processing and interpretation.

3.0 RESULTS

3.1 Color Contoured Data

The terrain conductivity data and in-phase data are initially edited, plotted as profiles with the software programs STAKPLOT and GRAPHER, and then contoured with the software program SURFER for analysis and interpretation. The terrain conductivity data collected in the Southern Disposal Area, Police Obstacle Course & Firing Range, Firemans Training Grounds and the Northern Disposal Area are color contoured for final interpretation and presentation (Figure 2). Color contour maps allow for a complete and rapid illustration of detected anomalous areas associated with contaminated soils and buried metallic debris.

Background values of terrain conductivities on the color contour map are shown in colors of light blue, green and yellow. These values range from 10 to 30 mS/m. A color calibrated scale in units of milliSiemens per meter is presented to the right of the color contour data. The background values are generally associated with coarse to fine grained soils, respectively (silty sands to silt and clay soils). In general, conductivity anomalies fall into two distinct types:

- (1) The first type of anomaly is usually an all high or all low response. Typically this response represents subtle changes in the terrain conductivity and covers a large area. These anomalies are typical of buried contaminated soil, contaminated ground water or a change in lithology. These type of responses are usually illustrated by shades of deep red and purple or light to medium shades of blue on EM maps.
- (2) The second type represents a combination or coupling of the high and low conductivities. Typically this response is represented by a narrow negative conductivity trough with high conductivity shoulders. This response is typical of buried metallic material such as a steel drum, metal pipe or other anomalous conductive material and is illustrated by deep blue colors on EM maps.



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Due to the large number of anomalies observed at the site, anomalies have been divided into catagories designated with a letter and number for ease of reference. The letter of the anomaly designates the probable source responsible for the anomaly while the number identifies it from other anomalies of the same letter. The following index defines these letters:

- C Contaminated Soil
- L Lithology
- M Buried Metal
- S Surface Metal
- **U** Utilities

The following terrain conductivity anomalies are shown on Figure 2 and associated comments are as follows:

- (C1, C2, and C3) These anomalies may represent areas of contaminated soils and/or areas of fine grained soils. These anomalies are shown in shades of red and deep purple. Foundry sands or ash was observed at the surface in the vicinity of anomaly A. An in-phase response was noted at anomalies A and C suggesting that buried metals may also be present at these locations.
- (C1, C2, M1 through M16) These anomalies are thought to be due to the presence of buried metals. These anomalies are presented in shades of deep blues and/or purple. It should be noted that 55-gallon drums were observed partially exposed at the surface within the vicinity of locations M2, M3, M4, M17 and M13.
- (L1, L2 and L3) Anomalies L1, L2 and L3 represent terrain conductivity lows and are probably due the presence of coarse soils or fill materials. Anomalies L2 and L3 may represent meander scars of the Genesee River. These anomalies are shown in shades of light to medium blue (Figure 2).
- (S1 through S23) Anomalies S1 through S23 are believed to represent anthropogenic surface features. The following is a discription of each surface anomaly:
- (S1) Anomaly S1 is due to the presence of a steel mailbox.
- (S2) Anomaly S2 is due to the presence of a chain-link fence.

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- (S3) Anomaly S3 is due to a metal drain pipe located beneath an access road.
- (S4) Anomaly S4 is due to the presence of a building.
- (S5) Anomaly S5 is due to a metal trash can.
- (S6) Anomaly S6 is due the presence of two trucks.
- (S7) Anomaly S7 is due to surface metallic debris.
- (S8) Anomaly S8 is due to an above ground metal storage tank.
- (S9) Anomaly S9 is due to the presence of a metal pump.
- (S10) Anomaly S10 is due to the presence of a natural gas meter.
- (S11) Anomaly S11 is due to the presence of a trailer.
- (S12) Anomaly S12 is due to the presence of a metal tank, drums and metallic debris at surface.
- (S13) Anomaly S13 is due to the presence of a chain-link fence.
- (S14) Anomaly S14 is due to an above ground storage tank adjacent to a building.
- (S15) Anomaly S15 is due to the presence of a chain-link fence.
- (S16) Anomaly S16 is due to the presence of a rail road tank car used for training purposes.
- (S17, S18 and S19) Anomalies S17, S18 and S19 are due to the presence of circular concrete and steel fire pits.
- (S20) Anomaly S20 is due to the presence of three above ground storage tanks.
- (S21) Anomaly S21 is due to the presence of a building.
- (S22) Anomaly S22 is due to the presence of a tank truck.



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(S23) Anomaly S23 is due to the presence of a corregated metal culvert that appeared to channel run-off waters to the Genesee River.

(U1 through U13) These linear anomalies are thought to represent buried metal pipes or utilities. These anomalies are shown in shades of deep purple and deep blue. Anomalies U2, U4, U9, U11 and U12 have hydrants associated with them and are probably water lines. Anomalies U5 and U6 are located within the vicinity of a natural gas meter and may represent a natural gas line.

3.2 Profiles

Terrain conductivity and in-phase data collected along the Bicycle Path, the Berm and infilled Genesee Valley Canal is presented as profiles in Figures 4, 6 and 8. Maps showing the location and coordinates of the three profile lines are presented in Figures 3, 5 and 7. Six short profile lines were also traversed perpendicular to the Genesee Valley Canal profile (Figures 9 through 14). These profiles are labelled by their easting location (Figure 7). Interpretations of observed profile anomalies are presented on their respective figures.

4.0 CONCLUSIONS

The EM-31-DL terrain conductivity survey revealed that much of the Firemans Training Grounds area contains buried metal pipes and utilities. The Southern and Northern Disposal Areas contain surface and buried metals and areas of posssible contaminated soils. The western portion of the Police Obstacle Course & Firing Range may contain an area of contaminated and/or clay soils.

Anomalies C1, C2 and C3 may represent areas of contaminated soils. These anomalies are mapped in shades of red to deep purple on the terrain conductivity map (Figure 2). Anomalies C1 and C2 are located in the southern disposal area. Foundry sands or ash was noted on the ground surface in the vicinity of this anomaly C1. Anomaly C3 is located in the Police Obstacle Course & Firing Range. Anomaly C3 may also be due to the presence of clay soils.

Buried metals are thought to be present at Anomalies C1, C2, and M1 through M17. Anomalies C1, C2, M1, M2, and M3 are located in the Southern Disposal Area. Anomalies M11 through M17 are located in the Northern Disposal Area.

Anomalies U1 through U13 probably represent buried utilities or metal pipes. These anomalies are located within the Firemans Training Grounds.



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Anomalies L1, L2, and L3 are probably due to the presence of coarse soils or fill material. Anomalies L2 and L3 may represent meander scars form the Genesee River. Anomaly L1 and L2 are located in the Police Obstacle Course & Firing Range and Anomaly L3 is located in the Northern Disposal Area.

Buried metallic debris is probably present along the profiles A-A', B-B' and C-C' (Figures 4, 6, and 8). Contaminated soils and/or fine grained soils may be present along each of the profile lines.

The erratic response of the quadrature and in-phase component data along the central area of Profile B-B' suggests that buried metals are probably present within the berm (Figure 6). Elevated conductivity readings along the southern end of Profile B-B' may be due to fine grained soils and or contaminated soils.

Contaminated soils and/or fine grained soils may also be present along each of the profile lines. The erratic response of the quadrature component data along Profile C-C', and the perpendicular profile lines, suggests that hetergeneous fill material is probably present in the subsurface in this area. The fill material at this location may contain conductive contaminants (Figure 8).

If there are any questions or comments regarding this report please feel free to contact our office. We would like to take this opportunity to thank Malcolm Pirnie, Inc. for involving us in this most interesting study.

Yours truly,

GARTNER LEE, INC.

Thomas E. Jordan, M.S.

Geologist/Geophysicist

David D. Slaine, C.G.W.P.

Senior Hydrogeologist/Geophysicist

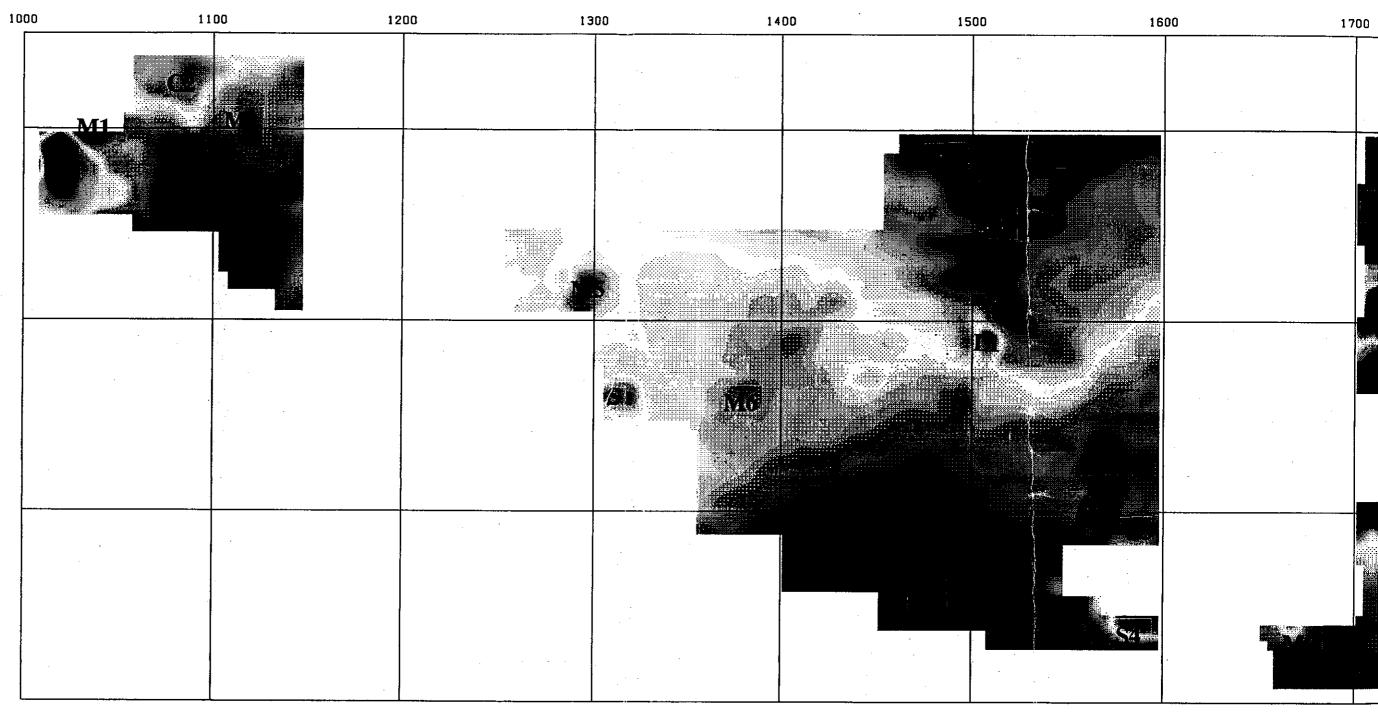
DDS/TEJ:pk



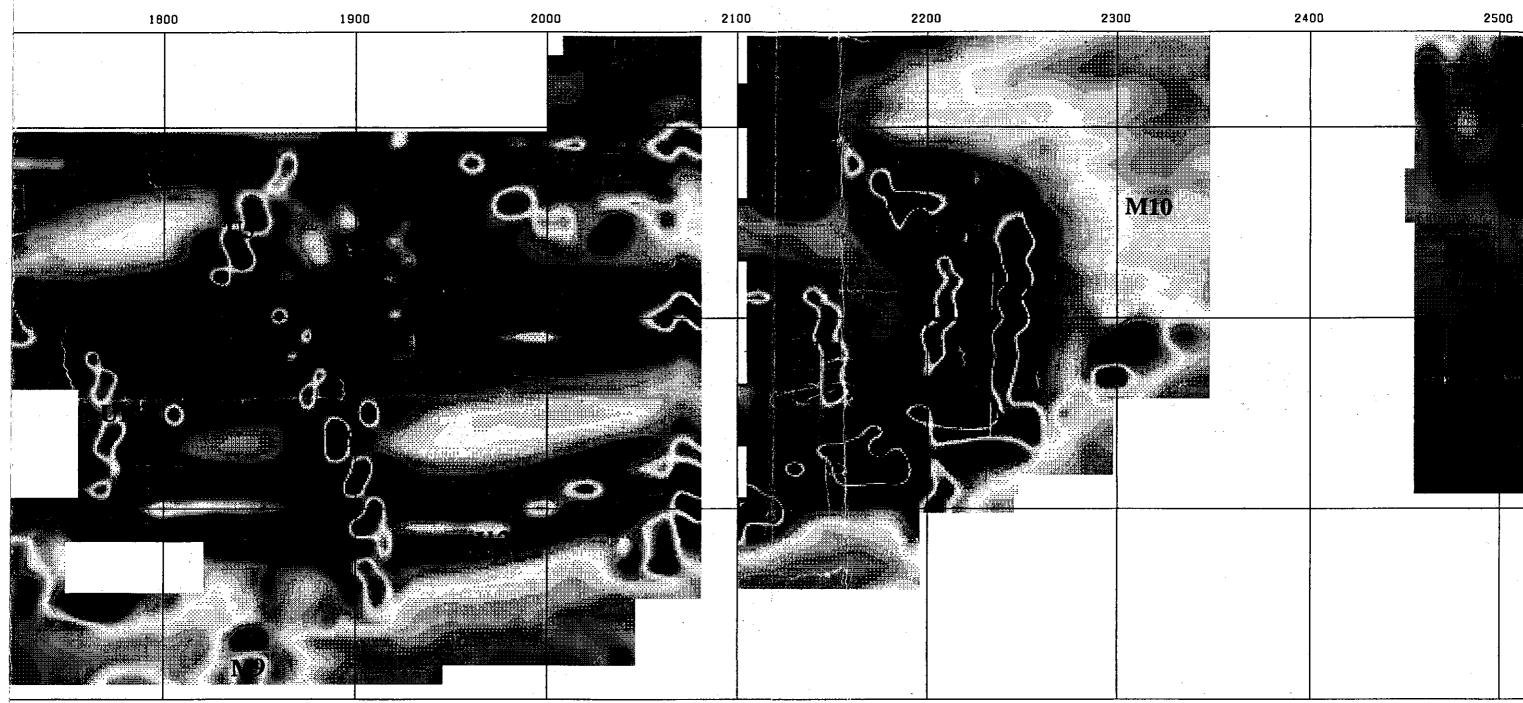
FIGURES

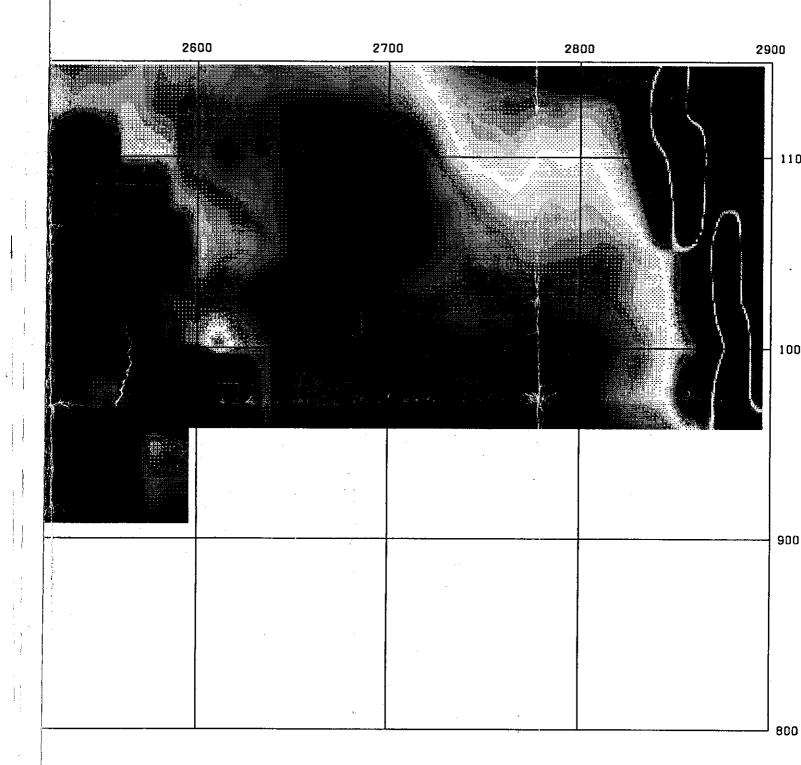
MAP MODIFIED FROM MALCOLM PIRNIE, INC.

ROCHESTER FIRE ACADEMY SITE PLAN



.





A A

100 0 100 FEET

SCALE 1 : 600

FIGURE 2

GEOPHYSICAL SURVEY RESULTS
COLOR CONTOURS
OF

EM31 CONDUCTIVITY DATA (UNITS - MILLISIEMENS PER METER)

ROCHESTER FIRE ACADEMY SITE

ROCHESTER, NEW YORK

GARTNER LEE INC

105 MAIN STREET

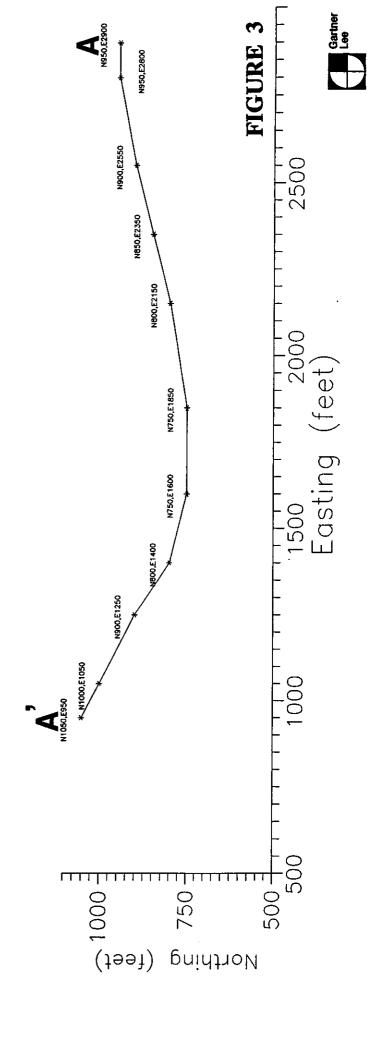
NIAGARA FALLS, NEW YORK, 14303, USA

DATE: DECEMBER, 1989

SCALE: 1"=50 FEET

PRESENTATION BY DATAPLOTTING SERVICES

LOCATION OF BICYCLE TRAIL EM-31 SURVEY PROFILE A-A'



1.2 PURPOSE AND SCOPE OF PRELIMINARY INVESTIGATION

A preliminary investigation was conducted at the Fire Academy Site to (a) better define the areal extent of known disposal areas (North Disposal and South Disposal Areas), (b) identify the occurrence and location of disturbed soil, buried metallic objects, radioactive materials and detectable organic soil gas vapors on-site and in the immediate surrounding area and (c) to provide a basis for final selection of soil boring, test pit, and ground water monitoring well installation locations. The investigation activities included:

- preparation of a site map by areal photogrammetry:
- establishment of a grid coordinate system to be used to orient the non-intrusive surveys;
- completion of a radiological survey to detect presence of any radioactive materials at the ground surface:
- completion of a shallow (vadose zone) soil gas survey using a portable organic vapor analyzer;
- completion of an electromagnetic (EM) terrain conductivity survey to define areas of disturbed soil and to locate buried metallic material/objects; and
- interpretation of the data to identify areas of potential contamination (anomalous field conditions) for further investigation.

The Interim Report is divided into five (5) sections. Section 2 describes the techniques employed during site map preparation and the establishment of grid coordinates on-site. Section 3 presents the approach and results of the radiological, geophysical and soil gas surveys. A detailed discussion of the findings and recommendations for further investigation are presented in Sections 5 and 6, respectively. The Appendices contain all supporting data including the survey reports prepared by the radiological and geophysical subconsultants.

2.0 SITE MAP AND LOCATION GRID

2.1 SITE MAP

A topographic map of the Fire Academy Site and the surrounding area was prepared by Tallamy, Van Kuren, Gertis & Associates (TVGA) of Orchard Park, New York using areal photogrammetry. The areal photography was obtained under acceptable weather conditions with specific flight parameters such as speed, position of the flight line, photographic exposure interval and flight altitude closely coordinated by TVGA's photogrammetrist. Ground control was provided using New York State horizontal/vertical control from the Coordinate Plane System. Survey control was carried to the site from USGS Monument #434 (elevation 537.978 ft. ASL) located on the north side of Scottsville Road, 110 feet ± southwest of the centerline of the Airport entrance. Bench marks established on site include:

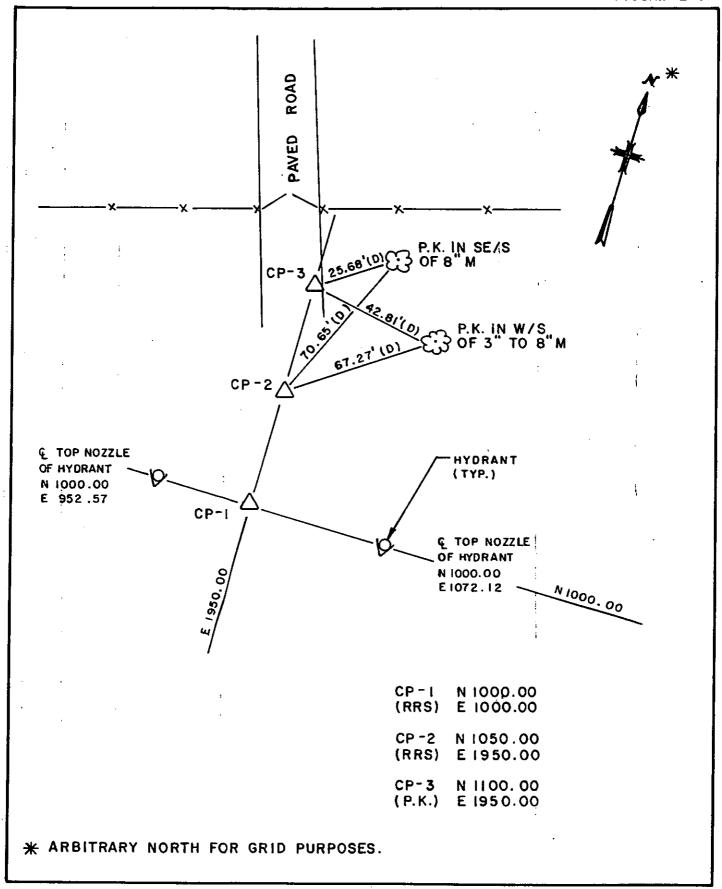
T.B.M. #1 - Square cut @ concrete base of light pole, N11,781.7420 and E12, 216.9138 (elevation 518.88 ft. ASL)

T.B.M. #2 - Railroad spike in utility pole, N11,205.3049 and E12,016.0686 (elevation 520.64 ft. ASL).

The topographic map has a horizontal scale of 1 inch = 50 feet and a contour interval of 2 feet. The map was prepared to national map accuracy standards. Features which are illustrated on this map include buildings, roads, site boundaries, surface water channels and other notable features. A copy of this map is included as Plate 1 (pocket at back of report).

2.2 LOCATION GRID SYSTEM

A grid coordinate system was established across the site to provide locational control for the non-intrusive field surveys. The grid was set up with arbitrary coordinates and was not based on true north as shown on the site map. Grid control points are shown in Figure 2-1. The grid system, shown in Plate 2, consisted of stakes placed at 50-foot centers over an area measuring approximately 1950 feet in length and 700 feet in



REMEDIAL INVESTIGATION FOR THE ROCHESTER FIRE ACADEMY SITE RI/FS
LOCATIONS OF HORIZONAL GRID CONTROL POINTS

width. The long axis of the grid system follows a west to east orientation roughly parallel to the Genesee River. Reference values increase in an easterly and northerly direction with each incremental increase representing one foot.

The radiological and geophysical surveys were, for the most part, conducted along traverses which ran either parallel or perpendicular to the long axis of the grid. In a few areas, the traverses were oriented differently due to physical obstacles. For example, the berm surrounding the Police Firing Ranges was surveyed by following the contours of the berm. All adjustments to either the spacing or orientation of the survey traverses are highlighted in the Radiological Survey and Geophysical Survey study reports presented in their entirety in Appendix A and Appendix B, respectively.

The soil gas survey was, for the most part, completed at locations immediately adjacent to the stakes which denoted the grid nodes. At grid locations underlain by pavement or other obstruction such as ponded water, the test hole was shifted where possible to an alternate location within ten (10) feet of the grid location.



3.0 PRELIMINARY INVESTIGATION APPROACH AND RESULTS

3.1 RADIOLOGICAL SURVEY

3.1.1 <u>Investigative Approach</u>

Hager-Richter GeoScience Inc. of Salem, New Hampshire performed a radiological survey at the Rochester Fire Academy site between November 13 and November 15, 1989. The radiological survey was conducted using Ludlum Model 2 radiation detectors as opposed to a Micro-R meter and Geiger counter as initially proposed in the Addendum to the Work Plan (December 1988). The Ludlum meter is easier to use and is capable of measuring alpha, beta and gamma radiation emitted during radioactive decay. Radiation is measured in milliRems/hour. The survey method is generally limited to the detection of radiation at or near surface and is not suitable for the detection of buried radioactive material. Subsurface radioactivity will be addressed during subsequent investigation.

The survey was initiated by establishing background levels at a base station located near the site entrance gate. The actual survey was conducted by a two person crew walking along traverses 10 feet apart. These traverses were located with respect to the locational grid. The instruments were kept one foot above the ground and were moved slowly from side to side on 5-foot handles, giving nearly complete coverage of the area. Details of methodology, equipment used and results are presented in Hager-Richter Geoscience, Inc.'s report which is included in Appendix A.

3.1.2 Survey Results

For purposes of the survey, elevated radiation levels were defined as any values above two times background. Background was established to be less than 0.02 mR/hr. No area with radioactivity greater than twice that of the natural background level or >0.2 to 0.4 mR/hr, was detected at the Rochester Fire Academy Site. Therefore, it was concluded by Hager-Richter that there is no radioactive waste at ground surface at the site.

3.2 GEOPHYSICAL SURVEY

3.2.1 <u>Investigative Approach</u>

An electromagnetic (EM) terrain conductivity survey was conducted by Gartner Lee Inc. of Niagara Falls, New York to define areas of disturbed soils (potential disposal areas) and to map buried metals. The survey was conducted November 17 through 22, 1989.

The reference grid established at the onset of the survey work was used for locational control for the terrain survey, with additional flagging placed at smaller intervals by Gartner Lee Inc. personnel. Data was collected at approximately 17,300 stations across the site. The study methodology, equipment employed, and results of the survey are contained in Gartner Lee Inc.'s report which is found in its entirety in Appendix B. It should be noted that the geophysical survey was performed using a GEONICS EM-31-DL terrain conductivity meter instead of GEONICS EM-34-3, as initially proposed in the Work Plan. The EM-31-DL measures and records both the quadrature (ground conductivity) and the in-phase (metal detection) components of the electromagnetic field at each station. The EM-34-3, on the other hand, has poor resolution in mapping buried metallic debris due to its wide coil spacing.

3.2.2 Survey Results

The geophysical data are presented in the colored contour plan map of the terrain conductivity and the various cross-sectional profiles which accompanies the Gartner Lee report. Background values are represented by yellow, green and light blue. Shades of deep red or purple or medium shades of blue indicate areas of high or low conductivity which are typically exhibited by disturbed soils, contaminated (highly conductive) ground water or a change in lithology.

Buried metallic objects usually show a coupling of high and low conductivities. These occurrences are indicated by deep blue colors on the terrain (EM) map.

A number of anomalies were observed by Gartner Lee Inc. at the Rochester Fire Academy site. The anomalies are referenced by letter and number. The letter represents the probable source of the anomaly while

the number distinguishes different anomalies with the same letter. The following letters are used:

C - Contaminated Soil

L - Lithology

M - Buried Metal

S - Surface Metal

U - Utilities

The majority of the anomalies represent man-made (anthropogenic) surface metal features (i.e., fences, hydrants, etc.) or buried utilities. Additional anomalies are believed to be caused by fill or coarse soil. The remaining anomalies are either attributed to fine-grained (potentially contaminated) soil or buried metal. It should be noted that fine-grained soil has the same geophysical response as conductive potentially contaminated soil and/or ground water.

The terrain conductivity survey indicates that much of the Fireman's Training Grounds area contains buried metal pipes and utilities. The Northern and Southern Disposal Areas contain surface and buried metals and possible areas of fine-grained (potentially contaminated) soils. The western side of the Police Firing Range and Obstacle Course may contain an area of fine-grained (potentially contaminated) clay soil. A complete list of all geophysical anomalies is presented in the Gartner Lee report (Appendix B).

In addition to the grid points, several profiles (A-A', B-B' and C-C') were surveyed along the bicycle path, the Firing Range berm and the section of infilled Genesee Valley Canal immediately adjacent to the Training Grounds. The profiles are presented in Appendix B. Buried metallic objects/debris or utilities are believed to may be present along all three profiles. Fine-grained (potentially contaminated) soils may also be present.

3.3 SOIL ORGANIC VAPOR SCREENING SURVEY

3.3.1 Investigative Approach

The soil organic vapor survey was performed by Malcolm Pirnie personnel at the staked grid locational control points. The soil vapor survey was conducted with a HNU photoionization organic vapor detector

which measures total volatile organic vapor concentrations in ppm. The survey was performed between November 27 and December 1, 1989.

The soil survey, which was performed in accordance with the procedure presented in the June 1988 RI/FS Work Plan, consisted of the following steps:

- 1. Calibrate the instrument (HNU) to a benzene surrogate standard and zero the instrument at a location upwind from the site (daily activity). The calibration procedure is presented in Appendix C.
- 2. At each sampling point, advance a test hole to a maximum depth of 24 inches by driving in a pointed steel rod.
- 3. Withdraw the steel rod and insert the intake probe connected to the instrument into the hole to a depth of about 16 inches (not to the bottom). Plug the top of the hole with a stopper attached to the intake probe to prevent the escape of soil vapor. Record the highest instrument reading (over a 30 second test interval) in the bound Project Field Book.
- 4. Remove the intake probe from the hole and zero the instrument by flushing with air.

Organic vapor concentrations were monitored at a total of 342 test holes. At grid locations underlain by pavement or other obstructions (ponded water), the test hole was shifted to an alternate location within approximately ten (10) feet of the actual grid point. If it was not possible to establish an alternate location within ten (10) feet of the grid point, soil gas readings were not taken and a special notation was made to this effect.

Organic vapor concentrations in excess of 20 ppm were measured at three grid reference locations: E2000, N800; E2200, N1050; and E2250, N1000. In accordance with the Work Plan, additional readings were taken at additional grid points approximately 25 feet offset from the "hot" location.

Background organic vapor readings were established at a location in the front lawn of the Fire Academy Building. Background for the soil was established to be between 0.0 and 0.2 ppm. The background air concentration was zero ppm.

3.3.2 <u>Survey Results</u>

The soil vapor survey results are summarized in Table C-1 of Appendix C and shown diagrammatically in Plate 2. All organic vapor concentrations are expressed in ppm. Concentrations ranged from 0.0 to 300.0 ppm. A threshold of 0.6 ppm, approximately three times background, was selected as an indication of the presence of organic vapors. A total of 63 points had concentrations above 0.6 ppm. These points are summarized in Table 3-1.

ROCHESTER FIRE ACADEMY SUMMARY OF SOIL GAS SURVEY RESULTS ABOVE 0.6 PPM TABLE 3-1

GRID REFE	PPM	
EAST	NORTH	DETECTED
1000	1000	2.5
1050	1000	1.4
1050	1050	13.0
1050	1100	6.2
1050	1150	5.4
1100	1050	4.4
1250	900	1.2
1550	900	2.0
1600	700	5.0
1600	750	7.0
1650	700	2.0
1700	850	1.1
1700	1050	8.0
1750	750	0.8
1800	850	1.0
1800	900	15.0
1800	1000	, 3.0
1800	1150	0.8
1850	850	17.0
1850	950	22.0
1850	1050	7.0
1900	750	0.8
1900	800	2.0
1950	800	8.0
1950	900	1.0
1950	950	2.8
2000	800	56.0
2000	825	2.0
2000.	1000	5.0
2000	1050	0.8
2050;	850	2.0
2050	900	3.0
2050	1000	1.0

CONT'D		PPM
EAST	NORTH	DETECTED
2100	800	24.0
2100	850	1.0
2100	950	1.1
2100	1000	4.0
2100	1050	2.0
2150	1050	1.0
2175	1050	70.0
2200	850	3.0
2200	900	3.0
2200	1000	4.0
2200	1025	300.0
2200	1050	250.0
2200	1075	2.0
2225	1000	4.0
2225	1050	6.0
2250	800	1.0
2250	900	1.0
2250	950	1.0
2250	1000	90.0
2250	1025	1.0
2250	1050	18.0
2250	1100	0.8
2300	1100	10.0
2300	1150	2.0
2350	1150	2.0
2400	1050	1.4
2500	1000	1.0
2500	1050	5.1
2500	1100	0.9
2550	1000	0.9

4.0 DISCUSSION OF FINDINGS

The findings of the surficial non-intrusive investigations which were conducted at the Rochester Fire Academy Site are briefly summarized in this section. The locations of major unidentified geophysical anomalies and elevated soil vapor concentrations are highlighted in Figure 2 of the geophysical report (presented in Appendix B) and Plate 2 respectively.

<u>North Disposal Area</u> - This area is known to have been used for drum disposal. Based on field observations, the area is blanketed by coarse backfill with fill thicknesses estimated to exceed four (4) feet, locally. Drums/drum fragments are partially exposed at the following grid reference locations:

E2420, N1115 E2545, N1095 E2480, N975 E2580, N1045 E2510, N1120

A number of geophysical (conductive) anomalies typical of buried metallic material were encountered in the North Disposal Area. The majority of these anomalies correlate with known locations of exposed drums. Additional conductive anomalies were encountered at the following grid references: E2460, N1125; E2520, N1080; E2570, N1075; and E2600, N970. Although the sources of these anomalies have not been determined, the conductivity response is similar to that of buried metal (i.e. drums). An area of low terrain conductivity characteristic of coarse soils and/or fill was encountered approximately 100 feet (E2700, N975) north of the metallic anomalies. The source of this anomaly is also unknown.

Soil vapor survey results in the North Disposal Area indicate the presence of low concentrations (to a maximum of 5.1 ppm) of total volatile organic vapors in the shallow soil/fill in an area centered around E2500, N1050.

South Disposal Area - The South Disposal Area is also known to have received drummed and uncontained waste. A number of drums have been removed from this area, resulting in several water-filled, shallow depressions. Visual observations in the area indicate the presence of foundry sands and/or ash fill and a number of partially exposed drums/drum

fragments at grid reference E1075, N1140. Partially exposed drums were also observed at grid reference E1075, N1050; E1115, N1100; and E1120, N1060. Broken laboratory bottles and other metallic debris were also noted in the area.

Several terrain conductivity anomalies, representative of buried metallic material, were observed in this area at the following grid references: E1010, N1075; E1020, N1100; and E1075, N1125. Two of these anomalies (E1010, N1075; E1075, N1125) may also be associated with conductive soils (i.e., contaminated or fine-grained). The source of the anomalies in this area has not been established.

Soil vapor survey results in the South Disposal Area indicate the presence of volatile organic vapors (to 13 ppm) in the shallow soil/fill at locations centered around grid reference E1050, N1050.

<u>Training Grounds</u> - Although this area is not believed to have been used for the disposal of drummed and uncontained waste, accidental spills and releases of combustible chemicals associated with past fire training exercises may have occurred.

Numerous geophysical anomalies were encountered in the Training Grounds area. For the most part, these anomalies are believed to represent anthropogenic surface features (i.e., fences, structures, tanks etc.) or buried metal pipes/utilities which are readily identifiable. Certain high terrain conductivity anomalies, representative of buried metallic material, for which the source has not been established, were encountered at grid references E1660, N820; E1790, N910; E1840, N820; and E2320, N1060.

Volatile organic vapor concentrations are elevated above background over much of the Training Grounds Area with the highest vapor concentrations detected at the following locations:

Grid Reference Location	Soil Gas <u>Concentration (ppm)</u>	Potential Source
E1800, N900	15	open area - unidentified
E1850, N850	17	adjacent to block structure
E1850, N950	22	open area - unidentified

E2175, N1050	70	above-ground storage tank
E2200, N1025	300	above-ground storage tank
E2200, N1050	250	above-ground storage tank
E2250, N1000	90	open area - unidentified
E2250, N1050	18 (kerosene odor)	adjacent to building
E2300, N1100	10	open area - unidentified

These elevated concentrations are likely related to accidental spills/releases associated with past combustible chemical handling practices and fire fighting exercises.

Police Obstacle Course and Firing Range Area - This area is, for the most part, flat and consists mainly of open space with few structures. Topographic relief is provided by the berm which is located along the south end of the firing range. A bomb disposal pit is located at the southwestern corner of the area. There is no record of drummed or uncontained waste having been placed within the fenced-in confines of the area.

Several high terrain conductivity anomalies were encountered within the Obstacle Course and Firing Range. Two of the smaller anomalies located at grid references E1300, N1010 and E1375, N960, may represent buried metallic material. Areas of high terrain conductivity (E1500, N1050) and low conductivity (E1475, N850) representative of fine-textured (or contaminated) soil/fill, and coarse-textured soil/fill, respectively, were also observed. The remaining geophysical anomalies appear to correlate with known anthropogenic features.

A terrain conductivity traverse was performed along the apex of the firing range berm. Based on quadrature and in-phase responses along the survey profiles (see Figure 5, Appendix B), the southcentral portion of the berm appears to contain metallic debris. The source of the anomaly is not known, but may be related to the use of construction debris (concrete with rebar) in constructing the berm. Elevated conductivity (quadrature responses) along the northwestern leg of the berm is attributed to fine-textured fill used in constructing the berm.

The soil vapor survey results within the Obstacle Course/Firing Range were generally within the expected range of background values (0 to 0.6 ppm). Slightly elevated soil organic vapor values were encountered at grid references E1250, N900 (1.2 ppm); E1250, N950 (0.6 ppm); and E1550, N900 (2.0 ppm). The source of these elevated values is not known.

<u>Bicycle Path Area</u> - This area is defined as the land situated between the Genesee River and the fenced Fire Academy Site. The area is relatively flat, heavily overgrown, and traversed by an asphalt path (bicycle path). There is no record of waste disposal having occurred in the area. Visual observation along the path suggests that most of the area is underlain by native soil material.

A terrain conductivity traverse was performed north to south along the bicycle path. Quadrature and in-phase responses were observed at grid reference E2900, N950 (culvert); E2325, N825; E1600, N750; and E1475, N775 (possibly a culvert). The source of the remaining two anomalies is not known. An area of elevated quadrature response, characteristic of fine textured (or contaminated) soil was encountered immediately east (E1350, N850) of the firing range berm. The source of this anomaly is unknown.

Organic vapors were detected in the shallow subsurface adjacent to the bicycle path immediately east of the following locations: the South Disposal Area (E1000, N1000; concentration to 2.5 ppm); the Obstacle Course/Firing Range (E1600, N750; concentration to 7 ppm); and the Training Grounds (E2100, N800; concentration to 24 ppm). These elevated organic vapor analyzer results may be attributed to overland/shallow subsurface movement of contaminated runoff from the Fire Academy facility.

Genesee Valley Canal Area - This area located immediately west of Fire Academy site encompasses both an abandoned railroad corridor and a linear depression associated with the former Genesee Valley Canal.

A series of geophysical traverses were conducted in the area both parallel (north to south) and perpendicular (east to west) with the orientation of the railroad corridor (see Appendix B). The quadrature and in-phase responses recorded during the survey traverses are typical of what would be anticipated from the soil/fill materials in the area (e.g., the cinder/slag used as railroad bedding) and from known utilities. No unexplained geophysical anomalies are present in the area.

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With the exception of a single location, volatile organic vapor concentrations were within the range expected for background. An organic vapor concentration of 0.8 ppm was observed at grid reference E1800, N1150. The source of this positive reading is unknown.

5.0 RECOMMENDATIONS

The preliminary non-intrusive surveys identified several areas with elevated volatile organic vapor concentrations and a number of unidentified geophysical anomalies which are representative of either different soil types (or contamination), and buried metallic materials. Subsequent field investigations will accordingly be directed toward establishing the source(s) of the major volatile organic vapor and geophysical anomalies. The major anomalies are listed, by grid reference location in Table 5-1 along with the preferred exploratory method (i.e. boring or test pit). Based on the results of the preliminary survey, it is recommended that the "detailed" investigatory program outlined in the RI/FS Work Plan (Ref. 1) and Addendum (Ref. 2) be modified as discussed below.

5.1 TEST PIT EXCAVATIONS

A total of six (6) test pits were proposed in the Work Plan to locate the former Genesee Valley Canal (4 test pits) and to investigate the presence of contamination in the bedding materials of the storm sewer which bisects the Training Grounds (2 test pits). The location of the former Canal in the immediate vicinity of the Fire Academy is evident and consequently, additional observation no based upon visual investigations are needed to establish its location. The sewer bedding investigation should be undertaken as initially proposed however, only one (1) test pit will be excavated at a downgradient location (near the sewer outfall).

A number of geophysical anomalies attributable to buried metallic debris were detected at various locations on-site (Table 5-1). It is recommended that all buried metallic anomalies be assessed by test pit excavation. A total of 11 test pits are proposed, with the locations shown in Plate 3.

The excavations should be advanced in shallow, 6-inch to 1-foot lifts by alternately probing the area to be excavated with a steel rod followed by excavation with a backhoe. If the test pit depth exceeds four (4) feet, the walls will be braced or stabilized by terracing and a ladder



TABLE 5-1 ROCHESTER FIRE ACADEMY SITE - RI/FS SUMMARY OF MAJOR SURVEY ANOMALIES

			PROPOSED
	GRID REFERENCE/		INVESTIGATION
AREA	LOCATION	TYPE OF ANOMALY	METHOD
NORTH DISPOSAL AREA	E2460, N1125	Buried metal	test pit
NUKTH DISPUSAL AREA	E2480, N975	Exposed drums	surficial sample
	E2500, N1100	OVs* (0.9 ppm)	surficial sample
	E2520, N1080	Buried metal	test pit
	E2550, N1000	OVs* (0.9 ppm)	surficial sample
	E2575, N1075	Buried metal	test pit
	E2600, N970	Buried metal	test pit
	·	Low conductive soil/fill	test pit
	E2700, N975	OVs* (5.1 ppm)	boring
	E2500, N1050	Ovs. (3:1 ppii)	DOI THIS
SOUTH DISPOSAL AREA	E1010, N1075	Buried metal/	
	•	conductive soil	test pit
	E1030, N1100	Buried metal	test pit
	E1050, N1050	OVs* (13 ppm)	boring
	E1050, N1150	OVs* (5.4 ppm)	boring
	E1075, N1125	Buried metal/	
	27010 7 11712	conductive soil	test pit
	E1100, N1050	OVs* (4.4 ppm)	surficial sample
TRAINING ABOUNDS	P4440 NG20	Buried metal	test pit
TRAINING GROUNDS	E1660, N820	OVs* (8.0 ppm)	boring/monitoring well
	E1700, N1050	the state of the s	review utility mapping
	E1790, N910	Buried metal	surficial sample
	E1800, N900	OVs* (15 ppm)	surficial sample
	E1800, N1000	OVs* (3.0 ppm)	boring
	E1850, N850	0Vs* (17 ppm)	surficial sample
	E1850, N950	OVs* (22 ppm)	surficial sample
	E2100, N950	OVs* (1.1 ppm)	surficial sample
	E2200, N900	OVs* (3.0 ppm)	
	E2320, N1060	Buried metal	test pit
	E2175, N1050	OVs* (70 ppm)	surficial sample boring
	E2200, N1025	0Vs* (300 ppm)	surficial sample boring
	E2200, N1050	OVs* (250 ppm)	surficial sample boring
	E2250, N1000	OVs* (90 ppm)	boring/monitoring well
	E2250, N1050	0Vs* (18 ppm)	boring/monitoring well
	E2300, N1100	0Vs* (10 ppm)	surficial sample
POLICE OBSTACLE COURSE	E1300, N1010	Buried metal	review utility mapping
& FIRING RANGE	E1375, N960	Buried metal	review utility mapping
G I IKING NANGE	E1475, N850	High conductive soil/fill	no further investigation
	E1500, N1050	Low conductive soil/fill	no further investigation
	E1200, N1000 B*	Buried metal	no further investigation
	E1400, N1050 B*	High conductive soil/fill	no further investigation
	E1250, N950	OVs* (0.6 ppm)	surficial sample
	E1550, N900	OVs* (2.0 ppm)	surficial sample
	C1330, 18700	Ato (Fio blan)	



TABLE 5-1 (continued) ROCHESTER FIRE ACADEMY SITE - RI/FS SUMMARY OF MAJOR SURVEY ANOMALIES

	GRID REFERENCE/		PROPOSED INVESTIGATION
AREA	LOCATION	TYPE OF ANOMALY	METHOD
BICYCLE PATH	E1000, N1000	OVs (2.5 ppm)	surficial sample
	E1250, N900	OVs* (1.2 ppm)	surficial sample
	E1350, N850	High conductive soil/fill	boring
	E1475, N775	Buried metal	
	-	(possibly culvert)	review utility mapping
	E1600, N700	OVs* (5.0 ppm)	surficial sample
•	E1600, N750	Buried metal	review utility mapping
	E1600, N750	OVs (7.0 ppm)	monitoring well
	E1750, N750	OVs* (0.8 ppm)	surficial sample
	E1800, N740	Storm sewer bedding	test pit
	E1900, N750	OVs* (0.8 ppm)	surficial sample
	E2025, N775	Surface Staining (elevated OVs)	boring/monitoring well
	E2100, N800	OVs* (24.0 ppm)	boring
	E2325, N850	Buried metal	review utility mapping
	E2650, N950	Downgradient North Area	surficial sample
GENESEE VALLEY CANAL AREA	E1800, N1150	OVs (C.8 ppm)	grab sample

OVs = Organic Vapor in soil/fill measured in ppm concentration by HNu photoionization detector.

B = Firing range berm

NA = Not applicable

NOTES:

will be provided. Relatively undisturbed samples will be collected at the base or sides of the pit. All significant features will be photographed. After inspection, all excavated materials will be returned to the pit and the location of the pit surveyed.

In those areas currently in use (i.e., Training Grounds) the immediate area of the test pit will be cordoned off and all excavated material placed in a roll-off container to minimize surface contamination. The excavated material will subsequently be placed back in the excavation and the surface dressed with "clean" fill material. All activities will be performed in strict accordance with the Health and Safety Plan.

5.2 SOIL BORINGS

The initial program called for the completion of a total of thirteen (13) soil borings to the surface of the uppermost saturated zone encountered. It is recommended that the program be completed as outlined in the Work Plan with the following modifications:

- completion of a total of ten (10) borings at the locations identified in Table 5-1 and shown on Plate 3;
- collection of soil samples for geotechnical analyses will be from the borings advanced for well installation because of the necessity to characterize soils in the saturated zone.

5.3 MONITORING WELL INSTALLATIONS

The Work Plan calls for the installation of monitoring well pairs at seven (7) locations in the study area. Each well pair would consist of a shallow overburden well, screened to straddle the water table of the uppermost saturated zone, and a bedrock well. Three of the well pairs would be installed upgradient of the Fire Academy Site and the remainder downgradient.

Based on the results of the preliminary surveys and a general understanding of site conditions, it is recommended that the well installation program be modified as discussed below.

- 1. Install three (3) well clusters at locations shown on Plate 3 to establish horizontal and vertical hydraulic gradients in the major hydrogeologic units. Each well cluster will include a shallow overburden well screened to straddle the water table of the uppermost saturated zone, an intermediate depth well screened at the overburden/bedrock interface, and a bedrock well. The screened interval of the bedrock well will be determined in the manner described in the Work Plan.
- 2. Install four (4) well pairs at locations shown in Figure 5-1. Each well pair will include a shallow overburden well and intermediate depth (i.e., overburden/bedrock interface) well screened as described above.
- 3. Install single shallow overburden wells (screened as described above) at three (3) additional locations shown in Plate 3. Where possible, boreholes identified in Section 5.2 will be used.

The monitoring wells will be constructed in strict accordance with the installation procedures and well design specifications presented in the RI/FS Work Plan with the following modifications:

- 1) Use of potable water instead of air as a "drilling fluid" Air is a suitable medium for conveying drill cuttings and formation water to the surface and for cooling drill tools, however, special precautions are required to minimize exposure of field personnel to the discharge of a potentially contaminated aerosol. It is recommended that potable water (i.e., from City of Rochester municipal system) be used for drilling. A sample of this water will be collected and submitted for detailed chemical analysis.
- 2) <u>Installation of well screen and riser in the borehole for all bedrock wells rather than "open hole" construction</u> Wells constructed using a properly designed and installed screen and sand pack are easier to develop to a turbidity free state.

Prior to installation of the well casing and screen in the bedrock wells, the open borehole will be packer tested. This will provide hydraulic conductivity information for select bedrock intervals and will facilitate the calculation of ground water flow velocities.

3) Substitution of PVC casing and screen materials for stainless steel materials in overburden monitoring well construction - Recent studies have established that if the monitoring well is properly purged prior to sampling, the performance of PVC casing and screen materials from a sample integrity perspective, is compatible to that of stainless steel.

5.4 ENVIRONMENTAL SAMPLING PROGRAM

The environmental sampling program will be modified as presented in Table 5-2 to accommodate the forementioned recommended changes to the subsurface investigation program.

5.5 OTHER RI INVESTIGATIVE ACTIVITIES

No modifications to the remaining "Detailed Site Investigation Activities" defined in the Work Plan are recommended. These activities are:

- Hydraulic Testing (Subtask 3J)
- Sample Analytical Program (Subtask 3L)



TABLE 5-2 SUMMARY OF SAMPLE COLLECTION AND ANALYTICAL PROGRAM

I. SOIL SAMPLES

- A. <u>Summary of Samples</u>
 - 1. Twenty (20) surficial soil samples
 - 2. Ten (10) soil borings
 - a. Composite samples will be collected at a maximum of three (3) depth intervals at each boring.
 - b. Thirty (30) samples at a maximum.
 - 3. Eleven (11) test pit excavations
 - a. A maximum of one (1) composite sample will be collected at each test pit (11 samples).

B. Analytical Parameters

1. TCL parameters

II. SEWER BEDDING MATERIALS

- A. <u>Summary of Samples</u>
 - 1. One (1) test pit excavation
 - a. One (1) sample

B. Analytical Parameters

1. TCL parameters

III. SEDIMENTS

- A. <u>Summary of Samples</u>
 - 1. Four (4) Genessee River stream sediment core samples.
 - 2. Two (2) core samples from on-site drainage swales.

B. Analytical Parameters

1. TCL parameters



TABLE 5-2 (continued) <u>SUMMARY OF SAMPLE COLLECTION AND ANALYTICAL PROGRAM</u>

IV. GROUND WATER

A. Summary of Samples

- 1. Total of twenty (20) wells will be installed.
- 2. All wells will be sampled on each of two (2) occasions (40 samples).

B. <u>Analytical Parameters</u>

- Initial (first round) ground water samples will be analyzed for NYS CLP TCL parameters.
- 2. Second round ground water samples will be analyzed for "parameters-of-interest" and remediation assessment parameters as identified in the Work Plan (Ref. 1).

V. SURFACE WATER

A. <u>Summary of Samples</u>

- 1. Four (4) sample stations on the Genesee River will be sampled on each of two (2) occasions (8 samples).
- 2. Three (3) grab samples from on-site ponds will be collected on one (1) occasion (3 samples).

B. Analytical Parameters

Same as Item IV.B.1.

6.0 REFERENCES

- 1. RI/FS Work Plan/Quality Assurance Plan for the Rochester Fire Academy Site. Prepared for the City of Rochester. Prepared by Malcolm Pirnie, Inc., Buffalo, New York. Project: 0956-01-1. December 1987. Revised 1988.
- 2. Rochester Fire Academy (#828015) Revised RI/FS Work Plan Addendum. Letter to Edward J. Doherty from Kent L. Bainbridge and Paul H. Werthman, dated October 8, 1988.

APPENDIX A
RADIOLOGICAL SURVEY - HAGER-RICHTER GEOSCIENCE, INC.

RECONNAISSANCE RADIOLOGICAL SURVEY ROCHESTER FIRE ACADEMY SITE ROCHESTER, NEW YORK

Prepared for:

Malcolm Pirnie, Inc. S. 3515 Abbott Road Buffalo, New York 14219

Prepared by:

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November, 1989 File 89D01

O. EXECUTIVE SUMMARY

Hager-Richter Geoscience, Inc. conducted a reconnaissance radiological survey of the Rochester Fire Academy Site, Rochester, New York in November, 1989. The survey was conducted for Malcolm Pirnie, Inc. as part of a larger RI/FS of the Site undertaken on behalf of the City of Rochester.

The Rochester Fire Academy Site consists of an 18-acre strip of land located along the west bank of the Genesee River. The central part of the Site is actively used as a training area for the City's Firemen and Police. Thickly wooded areas at the north and south ends of the Site were formerly used for disposal of drums and other industrial refuse.

The objective of the radiological survey was to identify any radioactive "hot spots," i.e., any area of the Site with elevated levels of radioactivity at the surface. For the purpose of this survey, elevated radioactivity was defined as two times the natural background radiation.

The radiological survey was conducted with Ludlum Model 2 radiation detectors. Local background radiation at a base station was established to be between 25 to <50 cpm (less than 0.02 mR/hr). The base station was occupied three times each day to assure consistent readings of the instruments.

The survey was conducted by a two-person team continuously monitoring the radiation detectors. The Site was surveyed with traverses 10 feet apart on a grid established by Malcolm Pirnie, Inc. The detectors were slowly moved side-to-side on 5-foot handles during the survey to ensure nearly complete coverage of the Site.

Because this survey measured the alpha, beta, and gamma radiation emitted during radioactive decay, and such radiation is absorbed by a few feet of rock or soil, the detection of radioactive waste buried more than a few feet would depend on surface contamination.

No area of radioactivity greater than twice that of the natural background level was detected at the Rochester Fire Academy Site. We conclude that there is no radioactive waste at the ground surface of the Rochester Fire Academy Site.

1. INTRODUCTION

Hager-Richter Geoscience, Inc. conducted a reconnaissance radiological survey at the Rochester Fire Academy Site, Rochester, New York in November, 1989. The survey was conducted for Malcolm Pirnie, Inc. of Buffalo, New York as part of a larger RI/FS undertaken on behalf of the City of Rochester.

Figure 1 shows the general location of the Rochester Fire Academy Site. The Site is located at 1190 Scottsville Road, in an industrial-commercial area southeast of the Rochester Airport. The Site consists of a strip of land approximately 18 acres in size along the west bank of the Genesee River. The Fire Academy reportedly had accepted flammable industrial wastes to fuel training fires in the past and disposed of the containers and unused materials on Site. Some of the wastes are reported to have been radioactive.

The objective of the radiological survey was to identify any radioactive "hot spots," i.e., any area of the Site with elevated levels of radiation. For the purpose of this survey, an elevated level of radiation was defined as two times natural background levels.

Hager-Richter personnel were on Site on November 13 to November 15, 1989. Dorothy Richter and George Fields conducted the field operations. The project work was coordinated with Mr. Gunther Funk and Mr. Kent Bainbridge of Malcolm Pirnie, Inc. Mr. John Hilton and Mr. John Deth of Malcolm Pirnie were on Site during the field work and observed it in part. All field work was conducted under Level D personal protection.

2. DESCRIPTION OF THE SITE

Figure 2 is a sketch map of the Site provided by Malcolm Pirnie, Inc. The major portions of the 18-acre Rochester Fire Academy Site are currently used as training grounds for the City's Firemen and Police. The area used as the Fireman's training grounds is generally level and is covered with crushed stone. At the south end of the area, several structures, including a multi-story training tower, are present. At the north end of the

Fireman's grounds, a snow fence separates an area containing several concrete-lined lagoons, oil tanks, and tanker vehicles from the rest of the Fireman's area. The crushed stone in this area is widely stained with petroleum products and petroleum odors were noted at the time of survey.

The Police training grounds are separated from the Fireman's grounds by a chain link fence. This area is generally covered by lawn. Structures present include a 20-foot high berm around a firing range, several small buildings, and an obstacle course.

The "South Disposal Area" is an 0.8 acre region of very thick brush. The area has mildly hummocky topography, several small areas of swampy vegetation, and open water. Numerous partially buried deteriorated drums are visible throughout the area.

The "North Disposal Area" is wooded. The terrain is generally level and dry. In the south-central part of the area, a broad flat area with sparser vegetation is about 3 feet higher than the surrounding ground and is probably underlain by fill. The western edge of the fill area is defined by a bank of completely exposed deteriorated drums. An open steel culvert crosses the "North Disposal Area" near the northern fence line and drains into the Genesee River.

Between the fenced areas of the Fire Academy grounds and the Genesee River is a strip of land less than 100 feet wide. Within this strip is a paved bicycle path, now closed, and thick woods and brushy vegetation.

3. EQUIPMENT AND PROCEDURES

The radiological survey was conducted with two Ludlum Model 2 Portable Survey Meters. The instruments are equipped with Ludlum Model 44-7 mica end window Geiger-Mueller detectors. According to the manufacturer, the Model 44-7 detector is intended for use in Alpha, Beta, Gamma surveys. The meter has three ranges (1K, 10K, 100K cpm or 0.5, 5, 50 mR/hr full scale). Linearity of the scale is +/- 5% of full scale. The instrument has fast-slow meter response options. In the fast mode, the response time is 4 seconds for 90% of final reading. In the slow mode, the response time is 22 seconds for 90% of final reading. Our Ludlum meters were purchased new in May, 1989 and copies of their certificates of calibration are included in the Appendix.

The radiological survey method is limited to the detection Alpha, Beta, and Gamma of radiation at the ground surface. radiation have very different penetrating powers. Alpha particles travel only a few inches and are easily stopped by a sheet Beta radiation is stopped by a few millimeters of of paper. aluminum, and Gamma radiation requires several inches of lead. Their equivalent range in overburden or rock is thus practically zero for Alpha and Beta radiation and not more than a few feet The detection of overburden or rock for Gamma radiation. radioactive waste buried more than a few feet depends on the surface material having been contaminated by the buried material. If buried, then, radioactive waste is unlikely to have been detected in the current surface survey unless some contamination of the surface had occurred.

The natural background radiation was established at a base station located near the Site trailer by monitoring the station with both meters for 1 hour. With the Ludlum meters in the slow response mode, the needle remained between about 25 to less than 50 cpm, or less than 0.02 mR/hr. These values are essentially at the lower limits of detection of the survey meters. Measurements made at locations completely off-Site were the same.

Background radiation is an average of randomly generated radiation "events" or counts on the radiation meter produced by cosmic radiation and the trace quantities of radioactive materials naturally present everywhere on the earth's surface. The counts or clicks emitted by the built-in speaker of the meter are not uniformly produced. Thus, when the Ludlum meters were monitored at the base station with the response switch in the fast mode (4 second response), the maximum needle deflection was about 125 cpm, when a rapid click-click-click momentarily occurred.

The base station was occupied with both meters three times each day for assurance of consistency of the instrument readings. All base station readings were consistent during the survey. For further quality control, fresh batteries were installed in the meters each day. although battery life was stated by the manufacturer to be 200 hours. The weather conditions were fair and mild $(55-65^{\circ}F)$ throughout the field survey.

The shaded portion of Figure 3 shows the area covered by the radiological survey. All of the areas inside the chain link fencing and between the chain link fence and the Genesee River were surveyed. The radiological survey was conducted by a two-person crew slowly walking along traverses spaced 10 feet apart.

For most of the Site, the traverses were oriented with respect to the 50-foot grid staked by Malcolm Pirnie, Inc. At a few locations, the traverses were oriented differently due to physical obstacles. For example, the steep berm surrounding the firing range in the Police Training Grounds was surveyed by following the contours of the berm. In the narrow strip of land occupied by the bicycle path along the river, traverses were made parallel to the river and bike path because there were too few stakes in that area to remain "on line." The only areas not completely traversed by the survey were the small ponded areas in the "South Disposal Area."

The detectors for the Ludlum meters were kept 1 foot or less above the ground surface and were very slowly moved from side to side on 5-foot long handles during the survey. Coverage of the open areas of the Site, then, was essentially complete by this method. In the thickly wooded and brushy areas of the Site, it was not always possible to sweep the detectors uniformly from side to side, but coverage in those areas is judged to be adequate for the purposes of this survey.

4. RESULTS AND DISCUSSION

For the purpose of this survey, elevated radiation levels were defined measuring two times background. Based on the background readings, we defined two times background as sustained meter readings in the 50 to 100 cpm, >0.02-0.04 mR/hr range. All such areas were to be flagged by the field crew at the time of survey.

The radiation meters were operated in the fast response mode and were monitored continuously during the field survey. At all locations where the meter needle deflected momentarily above about 75 cpm, the surveyors used both meters to collect data for a longer period of time. In no case were the counts/minute sustained at more than background radiation.

No area with radioactivity greater than twice that of the natural background level was detected at the Rochester Fire Academy Site. We conclude that there is no radioactive waste at the ground surface of the Rochester Fire Academy Site.

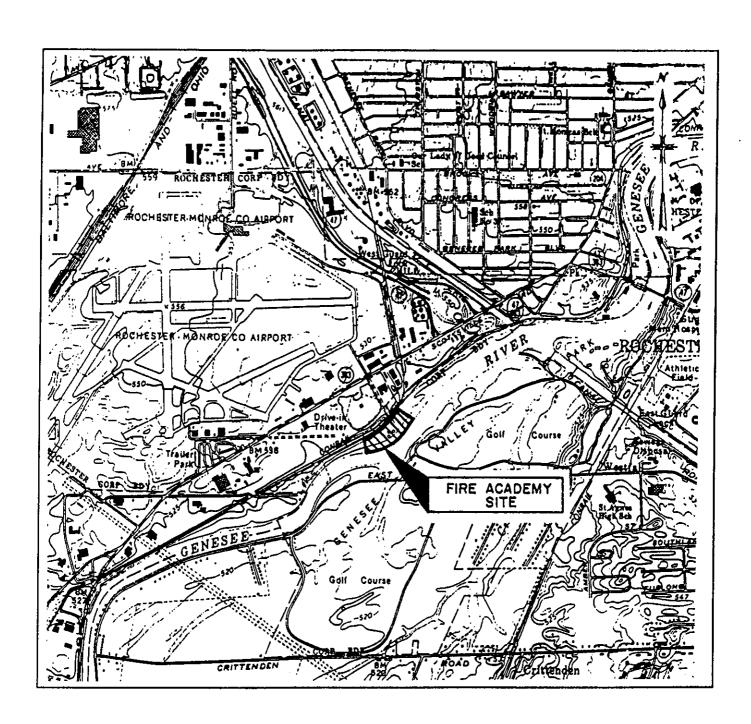


Figure 1. General location of the Rochester Fire Academy Site. Map courtesy of Malcolm Pirnie, Inc. Scale uncertain.

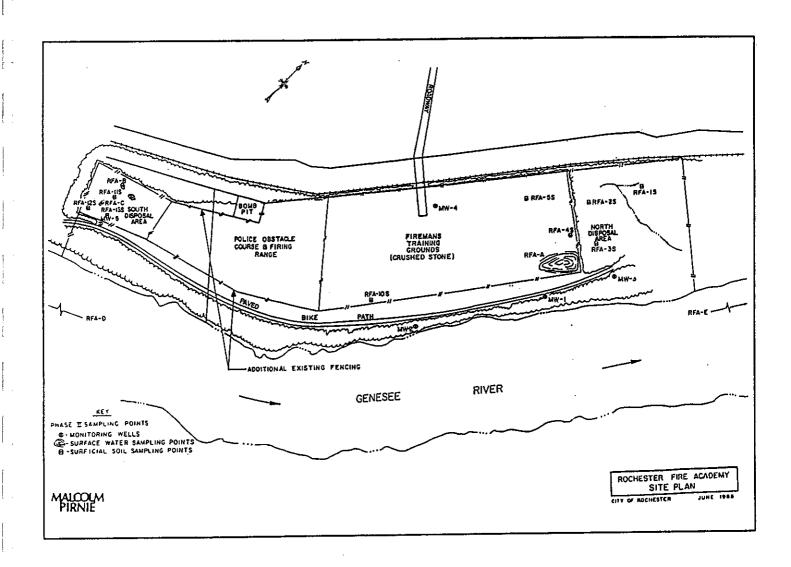


Figure 2. Sketch map of the Rochester Fire Academy Site provided by Malcolm Pirnie, Inc. Scale uncertain.

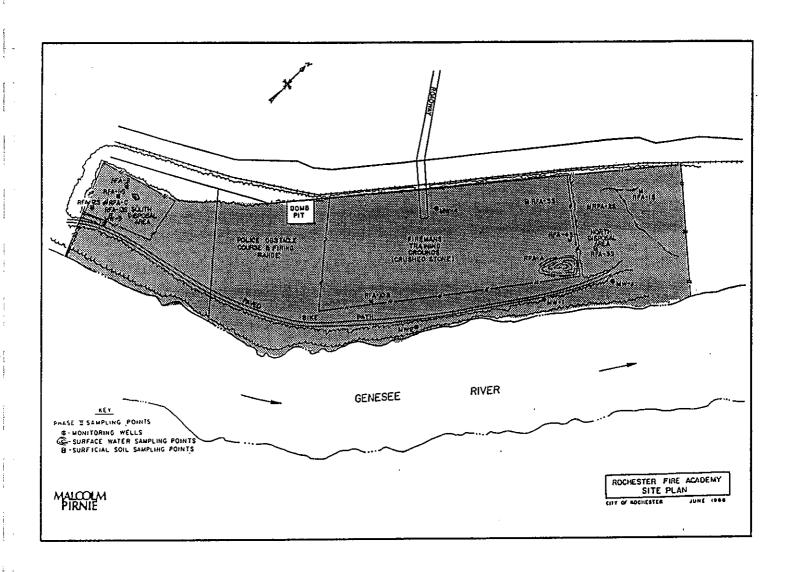


Figure 3. Sketch map of the Rochester Fire Academy Site. The areas covered by the radiological survey are shaded. Base map provided by Malcolm Pirnie, Inc. Scale uncertain.

APPENDIX



CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 FAX NO. (915) 235-4672
501 OAK STREET TELEX No. 486832 UD
SWEETWATER, TEXAS, U. S. A. PH. 915-235-5494

CUSTOMER HOLDER -	Richte	c 6	90.501E	176e.	ORDER		1,292
Mfg. / 110/11/19		Model	<u> </u>		_ Serial No	0437	<u>9</u>
Mig = 11/1/122		Det. Model	0 02	/	_ Serial No	(03/2	T/- 7/n-17-12:35
Cal. Date 5-9-89	Cal. Due Di		7-70	Cal. Inter	/alM	ETEHPAUE.	Instrument
Check mark (-) applies to ap		d/or detector l/ n 🔁 Det. Op		, 8. <u>クク</u> v al	29	11011	MV
Temp. Humldity	C) % D	n ⊵r Det. Op S.Reen ck ⊡r	Zero Reset		ck. Meter	Zeroed	
Temp. Humidity →		Bat. Volt		VDC Instr	ument Volt Set_	700	<u>フv</u>
☐ Threshold Dial	Input Sen	-	<u> </u>				
HV Readout (2 points)	Ref./inst	/	V	Ref./Inst		./	V
☐ Alarm Setting ck. ☐ W	indow Operation	☐ Backgro	und subtract	Mechan	ICBI CK.		
Field Change Status	Tallah L. Talas I	10% F3 10-2	n% □ Out	Toler, I'l Rec	ulring		
Repair Instrument Received:	Within Foler. +	-10% 🔲 10-2		Re	palr		
COMMENTS:							•
Gamma Calibration: Gl			enuros except fo	or M. 44-9 in which	h the back of probe	faces source.	
			INSTRUM		INSTRUM	MENT REC'I	D
RANGE MULTIPLIER	REFERENCI CAL. POINT		METER F	EADING		UND READ	
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-X	824 0	wat		/			
	206	<i>' ' ' ' ' ' ' ' ' '</i>	/			<u></u>	
<u>X</u>		·					
X						<u></u>	
_X				X0.1	Range(s) Cali		
Referen	ce Cal. Point	Instru	ment Meter Read	ling	•	'As Found Read	ng"
Digital	ļ	, ,	, ,	,	1 1	/ /	/
Readout / / /	/_/_		/_/				
Log	, ,	, ,	/ /	/	//.	/ /	/
Scale / Inc. certifies	that the above instru	ment has been cal	librated by stands	ards traceable to t	he National Bureau of natural physical	of Standards, or constants, or has	to the calibra-
Ludium Measurements, Inc. certifies tion facilities of other International St by the ratio type of calibration techni	andards Organization ques. The calibration	members, or have system conforms to	<u> </u>				
Cs137 Gamma s/n		itron Am-241	Be s/n T-	304 State of	Texas Calibration L		•
_		☐ Beta s/r	1		Other	. <u></u>	
Alpha s/n	475	_			Multimeter	(s/n = 30	<u> 2733</u>
M-500 s/n		☐ Oscillosco	pe s/n		7-9-	V9	
Calibrated By:	Chall	/-/a	2600	Date_ <u>~</u>	2 / -	<u> </u>	
- A	11116.	000_		Date	-7-05	<u></u>	
Reviewed By:	and the same						
Form 22 - 3/88							



Form 22 - 3/88

CERTIFICATE OF CALIBRATION

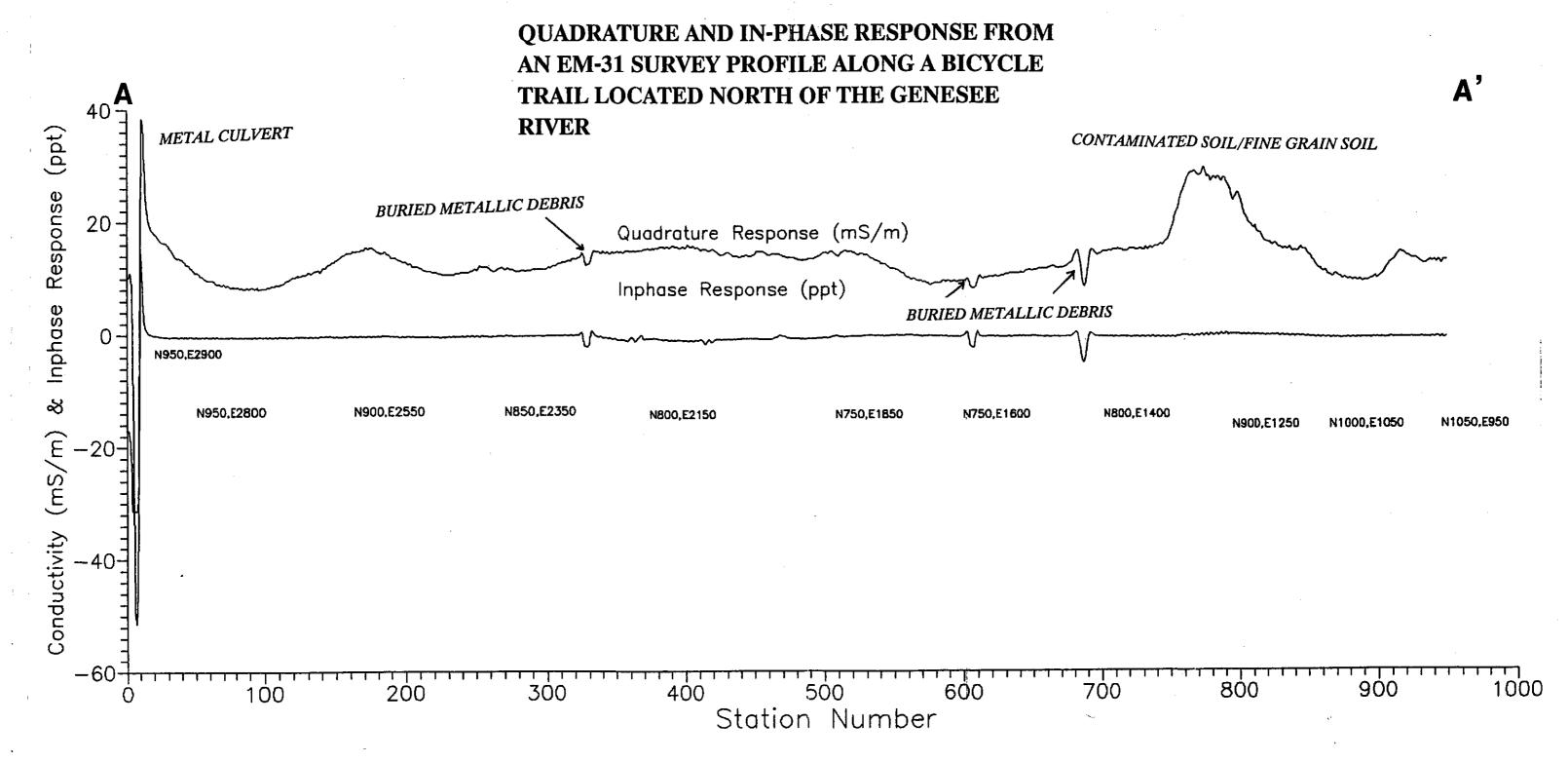
LUDLUM MEASUREMENTS, INC.

POST OFFICE BOX 810 FAX NO. (915) 235-4672
501 OAK STREET TELEX No. 466832 UD

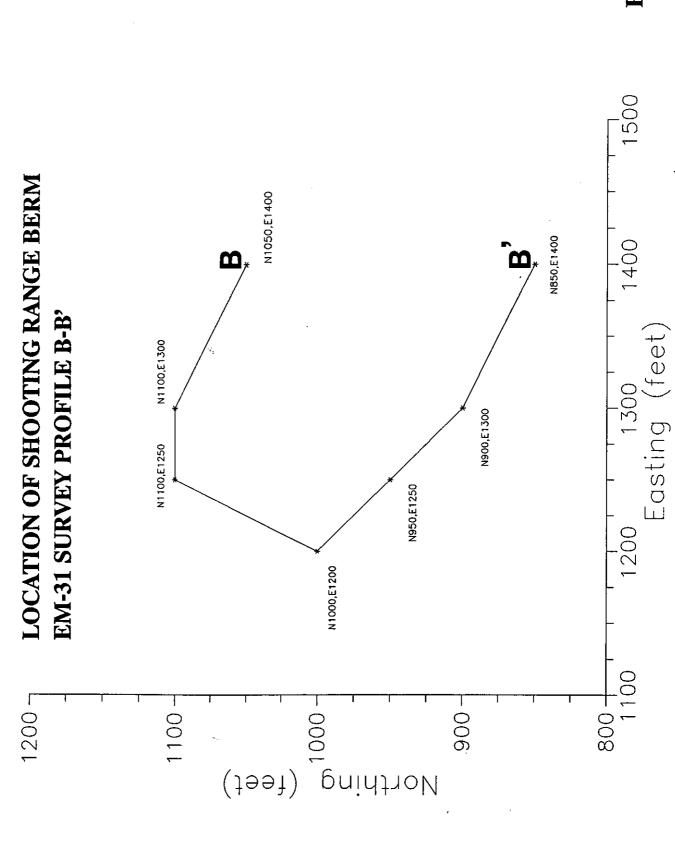
SWEETWATER, TEXAS, U. S. A. PH. 915-235-8494

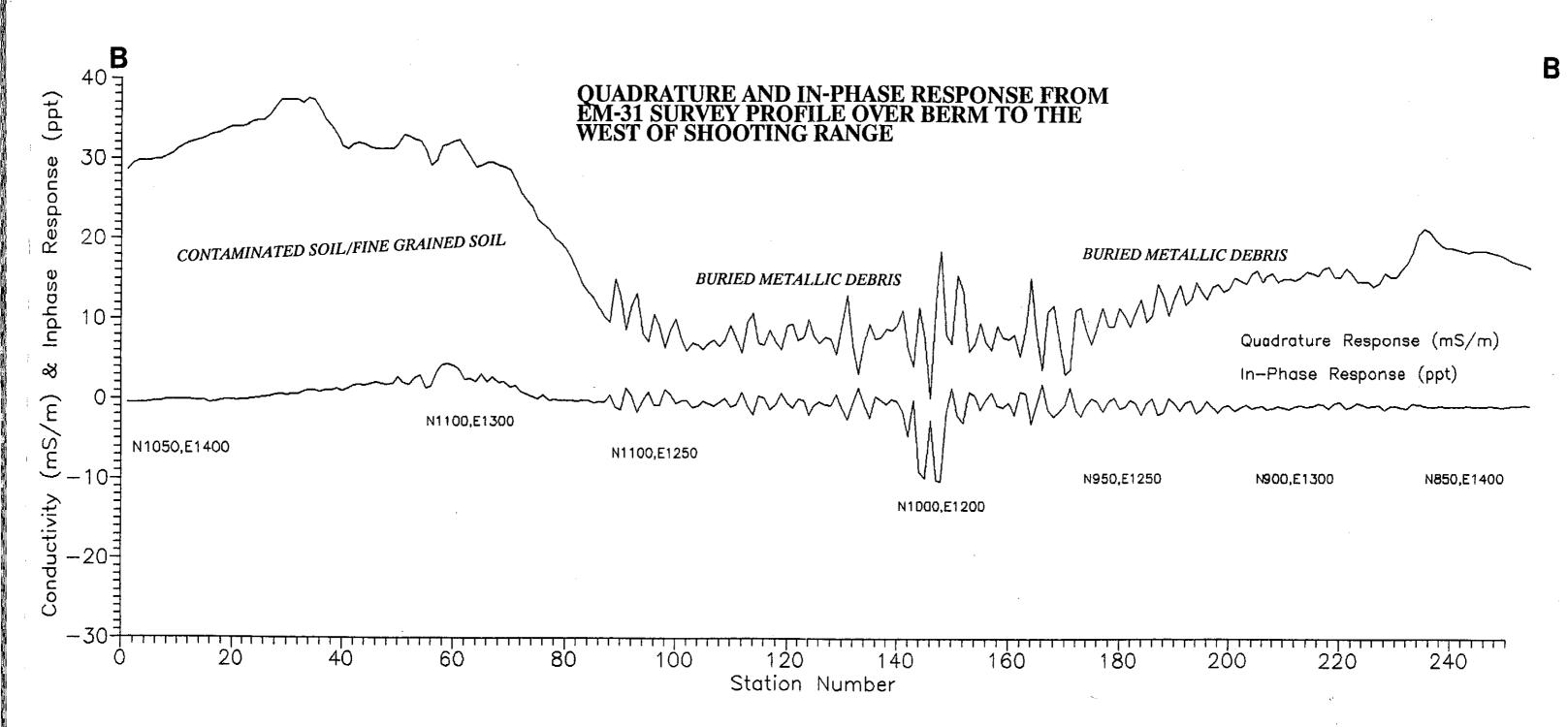
CUSTOMER Hager - Richt	er Geoscien	<u>ce</u> o	RDER NO. 89-1292
Mig Ludlum	Model 2	Serial N	0.64357
Mig Ludlung	Det. Model	Serial N	
Cal. Date 5 - 9 - 8 9 Cal. Due Da		Cal. Interval	METERFACE 20.2 - 3.75
Check mark (Tapplies to applicable instr. and		· 2	New Instrument
□ Det. (Alpha) Bkgnd cpm	Det. Oper. V. 701		
	S Resp. ck Zero Reset ck.	VDC Instrument Vo	th Set
	7 8		
☐ Threshold Diatinput Sen	8V	Ref./Inst	
	☐ Background subtract	Mechanical ck.	
Repair Instrument Received: Within Toler. +	-10% 10-20% Out To	ler. 🖂 Requiring	
		Repair	
COMMENTS:		•	
	to the decrees among the T	er see in which the back	of probe faces source.
Gamma Calibration: GM detectors positioned		IT INS	TRUMENT REC'D
RANGE MULTIPLIER REFERENCE CAL. POINT		• •	S FOUND READING"
	RIbr - 7		
<u> </u>			
× / 4 "	2 8960cpm 4		· · · · · · · · · · · · · · · · · · ·
<u> </u>			
x 0./ 846 C	Pm - 7		
<u>x "</u>	<u></u>		
X			
×			
X		XCL Range(s) Calibrated Electronically
Reference Cal. Point	Instrument Meter Reading	1	"As Found Reading"
			, , , ,
Digital Readout / / / / /	1 1 1	<u>/ </u>	
1.00	_	, i ,	, , , ,
Log Scale / / / /	1 1 1	/ / /	Pursey of Standards, or to the callbra-
Scale Lodium Measurements, Inc. certifies that the above instruction facilities of other International Standards Organization by the ratio type of calibration techniques. The calibration	ment has been calibrated by standards members, or have been derived from	eccepted values of natural : MIL STD-45662A and	physical constants, or have been derived ANSI N323-1978.
by the ratio type of calibration techniques. The calibration	tron Am-241 Be s/n T-30	A State of Texas Calib	ration License No. LO-1963
☐ Cs137 Gamma s/n 1162 ☐ Neu	tron Am-241 Be s/n 1-30	4	
☐ Alpha s/n	☐ Beta s/n	Oth	81
10475		Multi	meter s/n <u>32753</u>
M-500 s/n	Oscilloscope s/n		9-29
Calibrated By: Manager	1/00/1000	Date O	
Louis	000	Date 5-9	- 85
Reviewed By:			

APPENDIX B GEOPHYSICAL REPORT - GARTNER LEE INC.

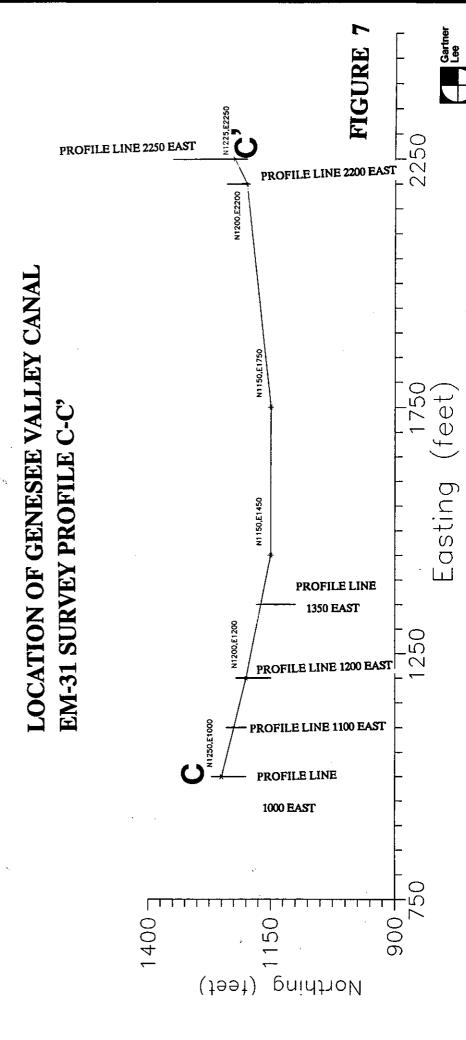


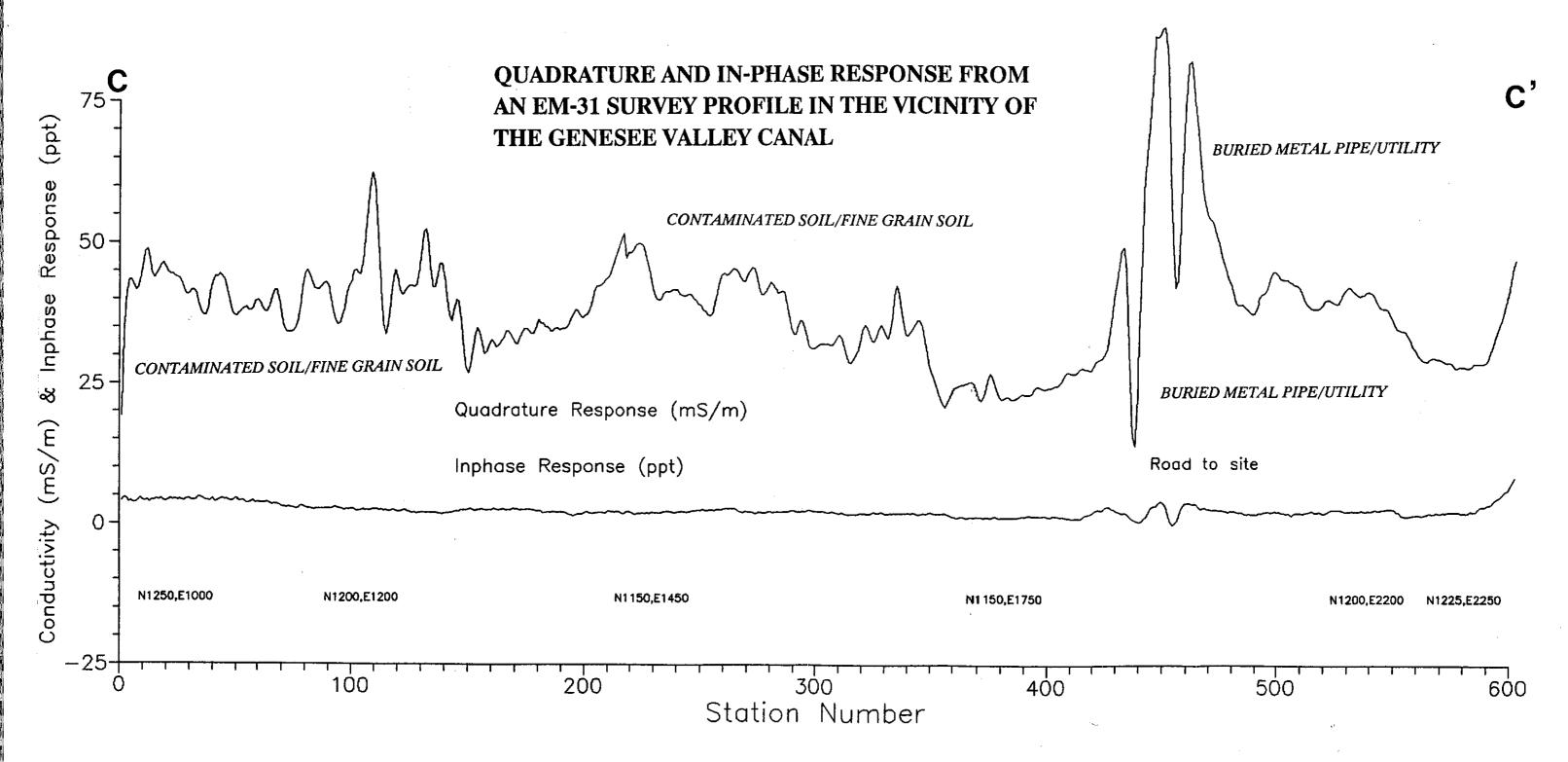




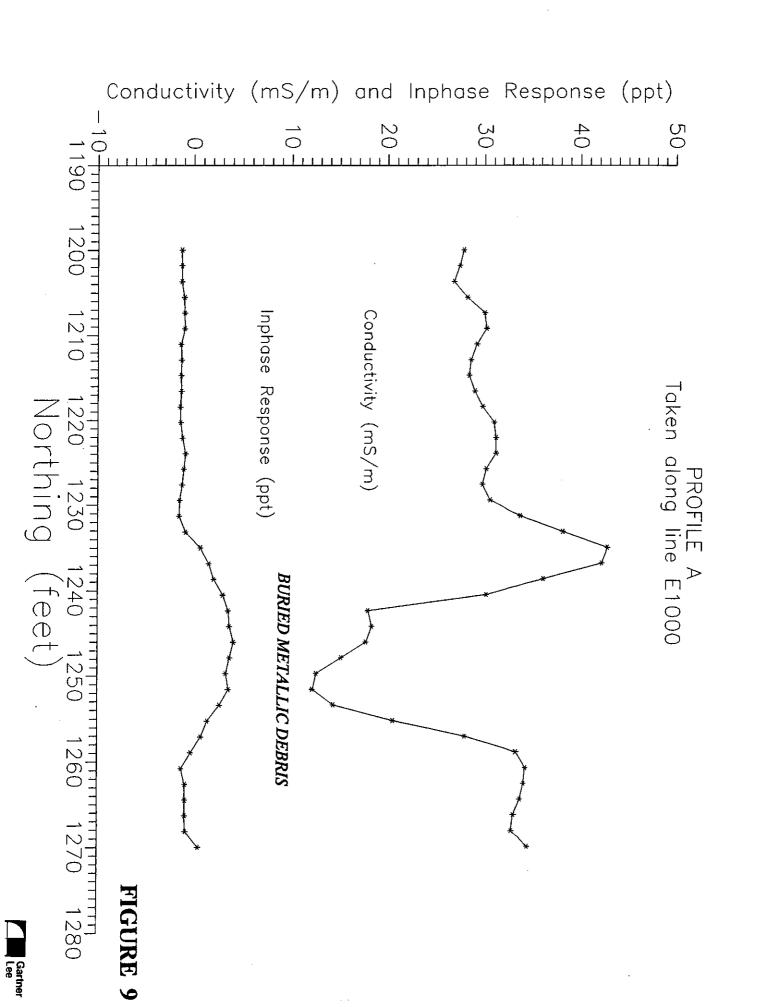


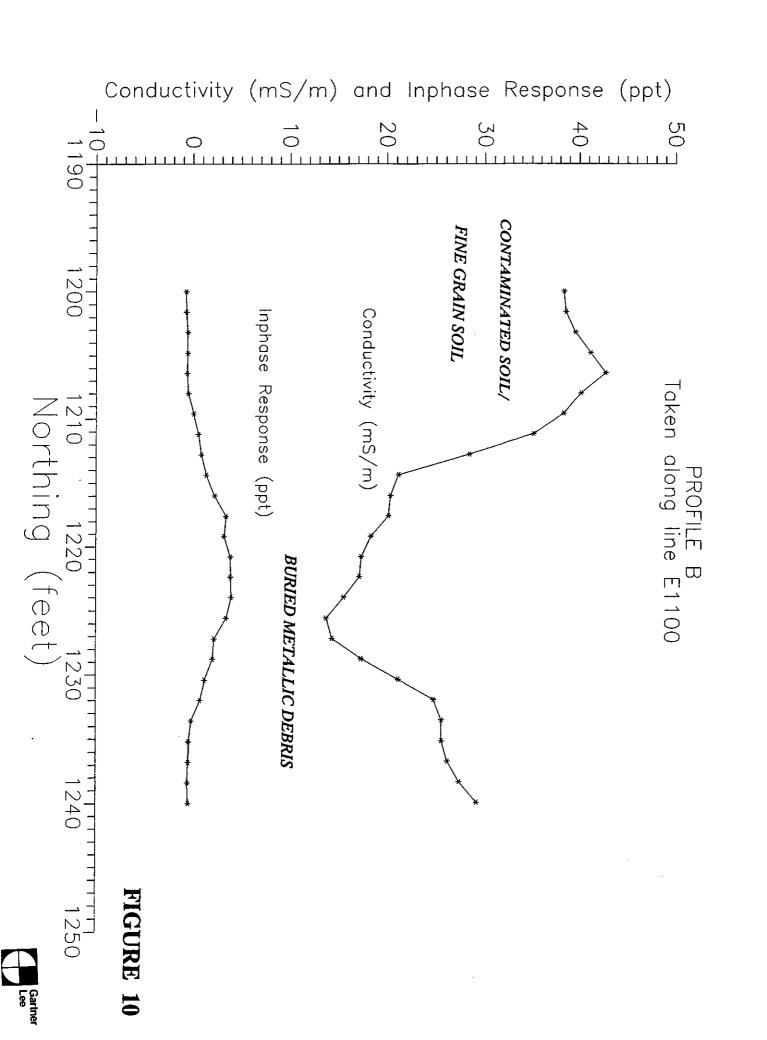


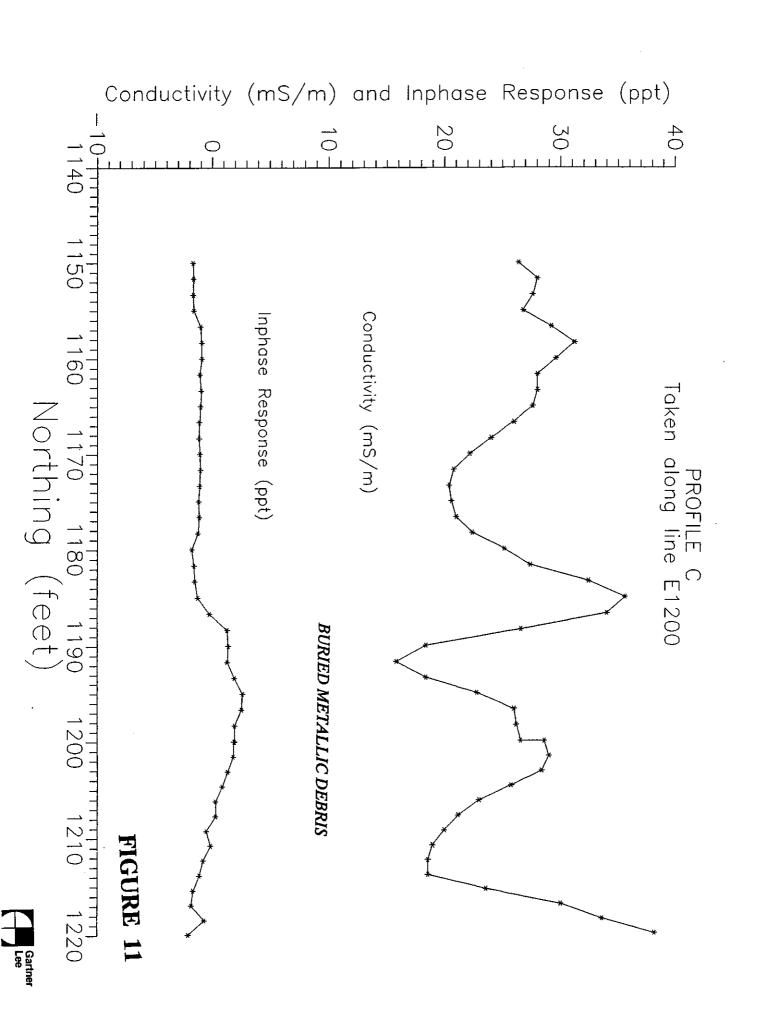


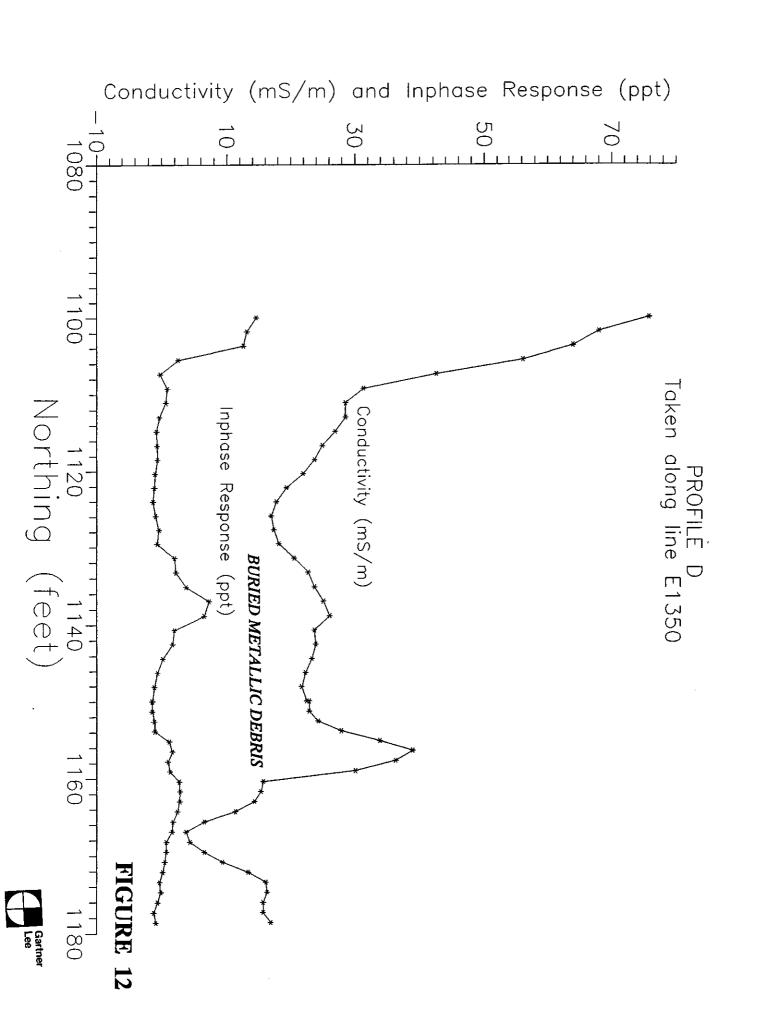


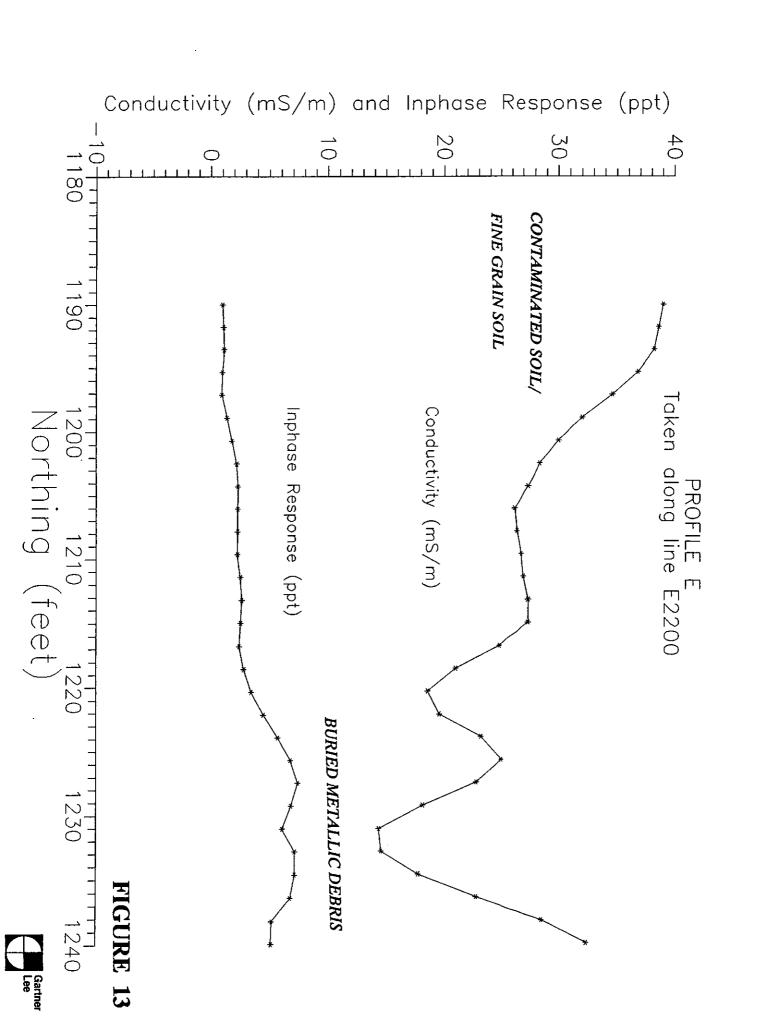


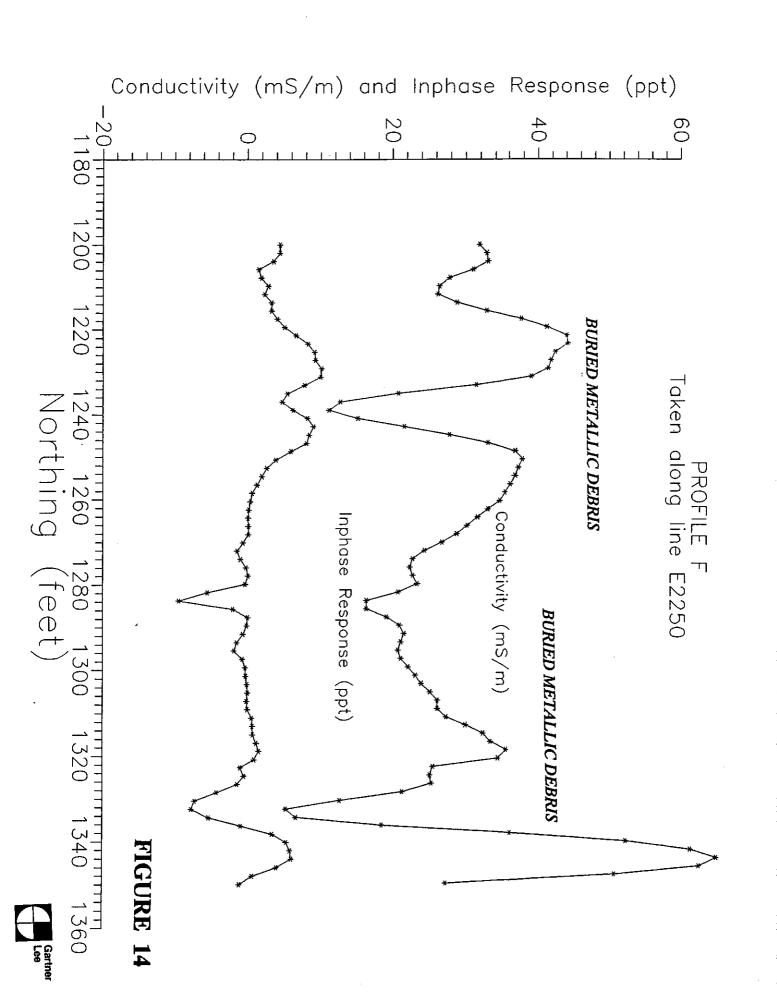












APPENDIX C

SOIL GAS SURVEY RESULTS AND CALIBRATION, MAINTENANCE OF HNU PHOTOIONIZATION ANALYZER

RID REFE	RENCE	PPM
EAST	NORTH	DETECTED
950	1050	0.4
950	1100	0.2
1000	1000	2.5
1000	1050	0.2
1000	1100	SURFACE WATER
1000	1150	0.6
1000	1200	0.0
1000	1250	0.0
1000	1300	0.0
1000	1350	0.0
1050	950	0.0
1050	1000	1.4
1050	1050	13.0
1050	1100	6.2
1050	1150	5.4
1050	1200	0.0
1050	1250	0.0
1050	1300	0.0
1050	1350	0.0
1100	950	0.4
1100	1000	0.0
1100	1050	4.4
1100	1100	SURFACE WATER
1100	1150	0.0
1100	1200	0.0
1100	1250	CREEK
1100	1300	0.0
1100	1350	0.0
1150	900	0.1
1150	950	0.2
1150	1000	0.0
1150	1050	SURFACE WATER
1150	1100	0.2
1150	1150	0.0
1150	1200	0.0
1150	1250	0.0
1150	1300	0.0
1200	900	0.1
1200	950	0.0
1200	1000	0.1
		0.0
1200	1050	0.1
1200	1100	
1200	1150	0.0
1200	1200	0.0
1200	1250	0.0
1200	1300	0.0

GRID REFER	ENCE	PPM
EAST _	NORTH	DETECTED
1250	850	0.0
1250	900	1.2
1250	950	0.6
1250	1000	0.0
1250	1050	0.0
1250	1100	0.1
1250	1150	0.0
1250	1200	0.0
1250	1250	0.0
1250	1300	0.1
1300	800	0.1
1300	850	0.2
1300	900	0.0
1300	950	0.0
1300	1000	0.0
1300	1050	PAVEMENT
1300	1100	0.2
1300	1150	0.0
1300	1200	SURFACE WATER
1300	1250	0.0
1350	800	0.0
1350	850	SURFACE WATER
1350	900	0.0
1350	950	0.0
1350	1000	0.2
1350	1050	PAVEMENT
1350	1100 ~	0.0
1350	1150	0.0
1350	1200	SURFACE WATER
1400	800	0.0
1400	850	0.1
1400	900	0.1
1400	950	PAVEMENT
1400	1000	0.4
1400	1050	0.0
1400	1100	0.4
1400	1150	0.0
1450	800	0.0
1450	850	0.0
1450	900	0.0
1450	950	PAVEMENT
1450	1000	SURFACE WATER
1450	1050	0.0
	1100	0.0
1450 1450	1100 1150	0.0 0.1

RID REFEF	RENCE	PPM
EAST	NORTH	DETECTED
1500	800	0.0
1500	850	0.1
1500	900	0.2
1500	950	0.0
1500	1000	0.0
1500	1050	0.0
1500	1100	0.0
1500	1150	0.0
1550	700	0.2
1550	750	0.0
1550	800	0.0
1550	850	SURFACE WATER
1550	900	2.0
1550	950	0.0
1550	1000	0.0
1550	1050	0.0
1550	1100	0.0
1550	1150	0.0
1600	700	5.0
1600	750	7.0
1600	800	0.0
1600	850	UNDER BUILDING
1600	900	PAVEMENT
1600	950	0.0
1600	1000	0.3
1600	1050	0.0
1600	1100	0.0
1600	1150	0.0
1650	700	2.0
1650	750	PAVEMENT
1650	800	0.0
1650	850	UNDER BUILDING
1650	900	0.1
1650	950	0.6
1650	1000	0.0
1650	1050	0.0
1650	1100	0.0
1650	1150	0.0
1700	700	0.0
1700	750	PAVEMENT
1700	800	0.2
1700	850	1.1
1700	900	CONCRETE SLAB
1700	950	0.0
1700	1000	0.0
1700	1050	8.0
1100	1030	0.0

DREFER	RENCE	PPM
EAST	NORTH	DETECTED
1700	1100	0.0
1700	1150	0.0
1750	700	0.0
1750	750	0.8
1750	800	0.2
1750	850	0.2
1750	900	PAVEMENT
1750	950	PAVEMENT
1750	1000	PAVEMENT
1750	1050	PAVEMENT
1750	1100	0.1
1750	1150	0.0
1800	700	0.0
1800	750	0.0
1800	800	0.0
1800	850	1.0
1800	900	15.0
1800	950	PAVEMENT
1800	1000	3.0
1800	1050	PAVEMENT
1800	1100	0.0
1800	1150	0.8
1850	750	0.6
1850	800	0.0
1850	850	17.0
1850	900	0.2
1850	950	22.0
1850	1000	GRAVEL
1850	1050	7.0
1850	1100	0.0
1850	1150	0.0
1900	750	0.8
1900	800	2.0
1900	850	SURFACE WATER
1900	900	0.4
1900	950	PAVEMENT
1900	1000	0.0
1900	1050	PAVEMENT
1900	1100	0.4
1900	1150	0.4
1950	750	OBSTRUCTION
1950	800	8.0
1950	850	GROUND WATER
1950	900	1.0
1950	950	2.8
1950	1000	

RID REFEF	RENCE	PPM
EAST	NORTH	DETECTED
1950	1050	PAVEMENT
1950	1100	PAVEMENT
1950	1150	0.0
1975	800	0.0 A
2000	750	0.0
2000	775	PAVEMENT A
2000	800	56.0
2000	825	2.0 A
2000	850	GROUND WATER
2000	900	GROUND WATER
2000	950	0.0
2000	1000	5.0
2000	1050	0.8
2000	1100	0.0
2000	1150	0.1
2025	800	PAVEMENT A
2050	750	0.0
2050	800	0.1
2050	850	2.0
2050	900	3.0
2050	950	PAVEMENT
2050	1000	1.0
2050	1050	GROUND WATER
2050	1100	0.0
2050	1150	0.0
2100	800	24.0
2100	850	1.0
2100	900	SURFACE WATER
2100	950	1.1
2100	1000	4.0
2100	1050	2.0
2100	1100	0.0
2100	1150	0.0
2150	800	0.0
2150	850	SURFACE WATER
2150	900	SURFACE WATER
2150	950	SURFACE WATER
2150	1000	GRAVEL
2150	1050	1.0
2150	1100	0.0
2150	1150	0.0
2150	1200	0.1
2175	1050	70.0 B
2200	800	0.0
2200	850	3.0
2200		

RID REFER	RENCE	PPM
EAST	NORTH	DETECTED
2200	950	SURFACE WATER
2200	1000	4.0
2200	1025	300.0 B
2200	1050	250.0
2200	1075	2.0 B
2200	1100	0.2
2200	1150	0.0
2200	1200	0.0
2200	1250	0.1
2225	1000	4.0 C
2225	1050	6.0 B
2250	800	1.0
2250	850	0.2
2250	900	1.0
2250	950	1.0
2250	975	0.2 C
2250	1000	90.0
2250	1025	1.0 C
2250	1050	18.0
2250	1100	0.8
2250	1150	0.1
2250	1200	0.0
2250	1250	0.1
2250	1300	0.0
2250	1350	0.0
2275	1000	0.1 C
2300	850	0.0
2300	900	SURFACE WATER
2300	950	0.4
2300	1000	0.0
2300	1050	0.0
2300	1100	10.0
2300	1150	2.0
2300	1200	0.0
2350	850	0.0
2350	900	SURFACE WATER
2350	950	SURFACE WATER
2350	1000	0.6
2350		0.0
	1050	
2350	1100	0.0
2350	1150	2.0
2350	1200	
2400	850	0.0
2400	900	SURFACE WATER
2400	950	0.4
2400	1000	0.2

ND REFE		PPM
EAST	NORTH	DETECTED
2400	1050	1.4
2400	1100	0.0
2400	1150	0.0
2400	1200	0.0
2450	850	0.0
2450	900	0.0
2450	950	0.0
2450	1000	0.0
2450	1050	0.4
2450	1100	0.0
2450	1150	0.0
2450	1200	0.0
2500	850	0.0
2500	900	0.0
2500	950	0.0
2500	1000	1.0
2500	1050	5.1
2500	1100	0.9
2500	1150	0.0
2500	1200	0.0
2550	900	0.0
2550	950	0.0
2550	1000	0.9
2550	1050	0.4
2550	1100	0.0
2550	1150	0.0
2550	1200	0.0
2600	900	0.0
2600	950	0.0
2600	1000	0.0
2600	1050	0.0
2600	1100	0.0
2600	1150	0.0
2600	1200	0.0
2650	900	0.0
2650	950 950	0.0
		0.0
2650	1000	0.0
2650	1050	
2650	1100	0.0
2650	1150	0.0
2650	1200	0.0
2700	950	0.0
2700	1000	0.0
2700	1050	0.0
2700	1100	0.0
2700	1150	SURFACE WATER

ROCHESTER FIRE ACADEMY SOIL GAS SURVEY TABLE C-1

GRID REFE	RENCE	PPM
EAST	NORTH	DETECTED
2700	1200	0.0
2750	950	0.0
2750	1000	0.0
2750	1050	0.0
2750	-1100	0.0 .
2750	1150	SURFACE WATER
2750	1200	0.0
2800	950	0.4
2800	1000	0.0
2800	1050	0.0
2800	1100	0.0
2800	1150	0.0
2800	1200	0.0
2850	950	0.0
2850	1000	0.0
2850	1050	0.0
2850	1100	0.0
2850	1150	0.0
2850	1200	0.0
2900	950	0.0
2900	1000	0.0
2900	1050	0.0
2900	1100	0.0
2900	1150	0.0
2900	1200	0.0

NOTES: 25' GRID CENTERS

<u>East</u> <u>West</u>

A 2000 800

B 2200 1050

C 2250 1000

Appendix: Item CALIBRATION AND MAINTENANCE OF HNu			
PHOTOIONIZATION ANALYZER			
Applicability: <u>HAZARDOUS</u>	Revision No.:	Date:	
Prepared By: THF Date: 10/31/89	Approved By: <u>KLB</u>	Date: <u>11/1/89</u>	

1.0 INTRODUCTION

This procedure presents a method for calibration of the HNu PI 101 Photoionization Analyzer. The HNu PI 101 is a portable instrument used to detect, measure, and provide a direct reading of a variety of trace gases in the atmosphere. In order to ensure an accurate reading, the HNu must be calibrated prior to use in the field and at regular intervals while in the field.

2.0 ACCURACY

The HNu PI 101 is temperature compensated so that a 20°C change in temperature corresponds to a change in reading of less than two percent full-scale at maximum sensitivity. The useful range of the instrument is from 0.2 to 2000 ppm with an accuracy of 0.1 ppm. Response time is less than three seconds to 90 percent of full-scale.

3.0 CALIBRATION

All field test equipment will be calibrated at the beginning of each sampling day and checked and recalibrated according to the manufacturer's specifications [6NYCRR 360-2.11(a)(12)(v)(a)].

The meter will be calibrated using a cylinder of pressurized gas certified by a reputable supplier. The calibration gas will be in the same matrix in which the measurements will be taken. The span pot will be adjusted so the instrument will read the exact value of the calibration

Page	1	of	_3_	
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Appendix: Item CALIBRATION AND MAINTENANCE OF HNu
PHOTOIONIZATION ANALYZER
Applicability: <u>HAZARDOUS</u> Revision No.: Date:
Prepared By: THF Date: 10/31/89 Approved By: KLB Date: 11/1/89
gas. For a HNu factory-calibrated by benzene, the calibration will be made using bottled "span gas" supplied by HNu.
4.0 MAINTENANCE
 If any of the following conditions occur, consult the trouble- shooting guide provided in the Instruction Manual:
 a. No meter response in any switch position (including BATT CHK). b. Meter response in BATT CHK, but reads zero or near zero for
all others.
 c. Instrument reads correctly in BATT CHK and STBY, but not in measuring mode.
 d. Instrument responds in all positions, but signal is lower than expected.
e. Erratic meter movement occurs.
f. Instrument response slow or irreproducible.
g. Low battery indicator.
 Should the trouble shooting techniques fail to resolve the problem, the Equipment Maintenance Officer will send the instrument to the manufacturer for repair and maintenance.
 Clean the light source window every four weeks during periods of continued use.

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Appendix: Item CALIBRATION AND MAINTENANCE OF HNu			
PHOTOIONIZATION ANALYZER			
Applicability: <u>HAZARDOUS</u>	Revision No.:	Date:	
Prepared By: THF Date: 10/31/89	Approved By: <u>KLB</u>	Date: <u>11/1/89</u>	

4. Check the meter battery at the beginning and end of each day. If the needle is not within or above the green battery arc on the scale-plate, recharge the battery prior to making any measurements.

MKR1108A. SOP