DRAFT

Draft Phase II Remedial Investigation Report for Erdle Perforating Company

Site No. 828072

Prepared For:

Erdle Perforating Company
Town of Gates, New York

Prepared By:

Radian Engineering
155 Corporate Woods
Suite 100
Rochester, New York 14623

December 1996

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION 1

2.0 METHODOLOGY 3

3.0 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES 4

4.0 SUMMARY OF RESULTS 5

- 4.1 Revised Geologic/Hydrogeological Information 5
- 4.2 Analytical Results 6
- 4.3 Comparison with Phase I Results 8
  - 4.3.1 Groundwater 8
  - 4.3.2 Sediment Sample 9
- 4.4 Fish and Wildlife Impact Analysis 9
  - 4.4.1 1,2-DEC 10
  - 4.4.2 Metals 10

5.0 CONCLUSIONS 11

6.0 RESPONSES TO COMMENTS ON PHASE I REPORT 13

REFERENCES 15

APPENDIX A: Comments and Responses to Draft Phase I Report
APPENDIX B: Phase II QA/QC Summary and Data Usability Report
APPENDIX C: Boring Logs
APPENDIX D: Phase II Groundwater Sampling Field Data Sheets
APPENDIX E: Hydraulic Conductivity Results

LIST OF TABLES

1 Definition of Laboratory Flags
2 Definition of Validation Flags
3 Detected VOCs in Groundwater Samples
4 Detected Metals/Inorganics in Surface Water/Sediment Samples
5 Summary of Phase II Detections Above NYSSCGs, by Compound
6 Summary of Phase II Detections Above NYSSCGs, by Media
7 Evaluation of Potential Pathways
8 Evaluation of Detected Concentrations vs. Surface Water/Sediment Criteria
9 Revised Air Results Summary (Formerly Table 4-10 of Phase I RI Report)

LIST OF FIGURES

1 Phase II Monitoring Well and Sample Locations
2 Cross Section Locations
3 Phase II North/South Cross Section
4 Phase II East/West Cross Section
5 Overburden Groundwater Elevation
6 Shallow Bedrock Groundwater Elevation
7 Overburden Groundwater VOC Results
8 Bedrock Groundwater VOC Results

DRAFT

EXECUTIVE SUMMARY

This document reports the results of Phase II of a Remedial Investigation/Feasibility Study (RI/FS) required by the New York State Department of Environmental Conservation (NYSDEC) at the Erdle Perforating Company, Site No. 828072, in the Town of Gates, New York, and integrates these results with the findings of Phase I of the RI. Erdle is conducting this RI/FS in cooperation with the NYSDEC and the New York State Department of Health (NYSDOH). The program to be completed is part of an Administrative Consent Order (#B8-0185-87-05) between Erdle and NYSDEC.

Several environmental studies have been conducted at the site since the discovery of VOCs in the subsurface at the former location of storage tanks for waste solvent and waste oil. Field work for Phase I of this RI was conducted during December 1994, per an approved Work Plan (Radian Corporation, October, 1993). The Phase II field work was conducted from July 22 to August 6, 1996; the results of that investigation are presented in this document, along with an overall assessment of the findings of Phase I and Phase II.

The Phase II investigation has defined the VOC plume and generally confirmed the findings of the Phase I investigation. Notable findings are as follows:

- VOC concentrations at MW-1, located adjacent to the solvent tank (i.e., source area concentrations), have decreased since the time of the Phase I investigation;

- No quantified VOCs were detected in deeper bedrock at the source area (i.e., well MW-1DD); however, trace levels of o-xylene (0.29 μg/L) were reported;

- A TCE concentration of 550,000 μg/L was detected in overburden groundwater at MW-3, a location south of the source area and downgradient; this is the highest concentration of TCE detected to date;

- TCE was detected in shallow bedrock groundwater at a concentration of 1,400 μg/L at MW-6D, located to the south (downgradient) of the source area near the property line; and
- Metals concentrations in the second sediment sample collected at the "old" outfall location (SD-2) were lower than the Phase I concentrations. Also, additional research was performed, and revised criteria developed for cadmium, copper, lead, and zinc. Cadmium, copper, lead, and zinc were below criteria. The "old" and "new" outfalls have been inactive for over 4 years and are not considered sources, based on site data.

These findings are not thought to have any significant bearing on the planned Interim Remedial Measure at the site. The proposed IRM using the 2-PHASE Extraction process, is designed to remove soil and groundwater contamination from the overburden materials at the former source area. Overburden soil and groundwater concentrations will be decreased. It is anticipated that bedrock groundwater concentrations will attenuate when the IRM decreases VOC concentrations in the overburden of the source area. Also, risk-based cleanup objectives are being developed to determine when the IRM has addressed the site.

1.0 INTRODUCTION

This document reports the results for Phase II of a Remedial Investigation/ Feasibility Study (RI/FS) required by the New York State Department of Environmental Conservation (NYSDEC) at the Erdle Perforating Company (Erdle), in the Town of Gates, New York. Erdle is conducting this RI/FS in cooperation with the NYSDEC and the New York State Department of Health (NYSDOH). The program to be completed is part of an Administrative Consent Order (#B8-0185-87-05) between Erdle and NYSDEC.

Field work for Phase I of the RI was conducted during December 1994, per an approved Work Plan (Radian Corporation, October, 1993), and included installation of five new monitoring wells, and sampling and analysis of groundwater, surface and subsurface soil, surface water, sediment, and air. Literature research was conducted in the areas of site and vicinity geology and hydrogeology, land use, and history. In addition, an ecological assessment was performed to identify and preliminarily evaluate the site's effects on ecological resources at the site. The results of the Phase I of the RI were reported in a Draft Remedial Investigation Report (Radian Engineering Inc, June 1995). The Draft report is hereby incorporated into this report by reference.

Based on the Phase I results, and on NYSDEC comments and responses (presented in Appendix A), the Phase II portion of the RI was designed to address issues remaining at the site and provide information for the Feasibility Study (FS). The Draft Phase I Report concluded that, to complete the RI/FS, additional information was needed on the extent of the target compounds in groundwater, both laterally and vertically. The Phase I Report also recommended that this information be obtained by sampling at the following locations:

- Downgradient, in the light woods and marsh south of MW-3, to provide information on the lateral extent of contamination in the overburden and shallow bedrock;

- In the shallow bedrock at the MW-2 location, to provide information on migration vertically and laterally (to the east); and
- In the deep bedrock at the source area, to define the vertical extent of contamination.

An additional round of sampling was also recommended, to provide data on seasonal fluctuation and possible migration of detected compounds. The Phase I data indicated that the contaminants of concern are limited to the VOCs; therefore, the additional monitoring was to focus on these constituents.

The Phase II portion of the RI, designed to address the above-listed issues, was described in the December 1995 document entitled, "Draft Phase II Remedial Investigation Work Plan for Erdle Perforating Company, Site No. 828072 (Work Plan)." This Work Plan was approved by the NYSDEC on January 31, 1996.

The Phase II field work was conducted from July 22 to August 6, 1996; the results of that investigation are presented in this document, along with an overall assessment of the findings of Phase I and Phase II.

2.0 METHODOLOGY

As discussed in the Work Plan, the Phase II investigation included the following elements:

- **Monitoring Well Installation:** Four new monitoring wells were installed at the following locations: MW-1DD; MW-2D; MW-6; and MW-6D. Installation included subsurface geologic sampling, hydraulic conductivity testing of the unweathered glacial till at MW-1DD, and well development.
- **Groundwater Sampling:** Sampling of all newly installed and existing monitoring wells during the second quarter of 1996. Analysis of groundwater samples was performed per EPA Method SW8010/8020 (halogenated and aromatic volatiles) by Recra Environmental of Amherst, New York.
- **Sediment Sampling and Analysis:** A sediment sample from the "old" cooling water outfall (SD-2A) was collected and analyzed for NYSCLP metals.
- **Completion of the Fish and Wildlife Impact Analysis:** The Fish and Wildlife Impact Analysis was completed through Step 2B, Criteria-Specific Analysis, for 1,2-dichloroethene, cadmium, copper, lead, and zinc.

A Phase II sample location map is presented in Figure 1. With the one exception (noted below) all work was conducted per the procedures described in the Work Plan. Although the Work Plan called for a rising head hydraulic conductivity test on the unweathered till, a falling head conductivity test was performed instead, because the borehole did not yield groundwater. Steps 6 and 7 on Page 6 of the Phase II Work Plan were replaced by the following: *1) Fill the casing instantaneously with potable water; and 2) Record the drop in head vs. time for a minimum period of 4 hours.*

3.0 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

As described in the Work Plan, both field and laboratory quality control measures were undertaken to ensure the validity of project data. Field quality control (QC) measures included sample collection by standard methods described in the QAPP, and the collection of field duplicates to measure sample-to-sample variability. The QC samples collected included a field duplicate, a rinsate blank for metals, and trip blanks for volatiles. Additional quality control samples were analyzed, including method blanks, matrix spike blanks, and laboratory control samples.

Results for all analyses were subjected to data validation based on the requirements found in EPA Region II Data Validation SOP, 1/92, revision 8 (for organics); and EPA Region II Evaluation of Metals SOW 3/90 (for organics). The results of these validations are presented in the "Phase II QA/QC Summary and Data Usability Report," Radian Corporation, draft of November 1996, presented as Appendix B. Also included in Appendix B are individual validation packets for each Sample Delivery Group (SDG), containing a narrative detailing any problems identified in the SDG. The validation and laboratory flags associated with the data are defined in Tables 1 and 2.

Overall QC associated with the program indicated that measurement data were acceptable and defensible. The data indicate that the QC mechanisms were effective in ensuring measurement data reliability within the expected limits of sampling and analytical error. Certain concerns identified during the QA/QC review should be noted prior to final interpretation of the analytical results. These are detailed in the Appendix B text, and were related to the halogenated volatile organic results, the aromatic volatile organic results for groundwater samples, and the metals results for a sediment sample.

4.0 SUMMARY OF RESULTS

During the Phase II portion of the RI, groundwater samples were collected and analyzed for halogenated volatile organic compounds, and a sediment sample was collected and analyzed for metals, from the locations shown in Figure 1. In addition, the Fish and Wildlife Impact Analysis was completed through Step 2B for 1,2-dichloroethene, cadmium, copper, lead, and zinc. The results of these activities are detailed below.

4.1 Revised Geologic/Hydrogeologic Information

Phase I geologic findings (presented in detail in Section 4.1 of the Draft Phase I report) were confirmed by the Phase II data. Site soils consist of approximately 4-5 feet of glacial stratified drift, underlain by a layer of weathered glacial till (which ranges from approximately 2 feet thick at MW-1 to approximately 6 feet thick at MW-3). Beneath this is a layer of unweathered glacial till, which extends to bedrock. Boring logs for the Phase II wells are presented in Appendix C.

The weathered and unweathered glacial tills are laterally consistent across the entire area investigated. Geologic cross sections, revised to include Phase II findings, are provided in Figure 2 (orientation of the cross-sections), Figure 3 (revised North-South Cross Section, including new monitoring wells MW-1DD/6/6D), and Figure 4 (revised East-West Cross Section, including new monitoring wells MW-1DD/2D). Bedrock was encountered approximately 14 feet below grade, and consisted of carbonate rocks of the Lockport Dolomite.

Revised overburden and bedrock groundwater contour maps, presented in Figures 5 and 6, are consistent with the groundwater data from the Phase I investigation. Water level data were collected during sampling and are presented on Phase II Groundwater Sampling Field Data Sheets, presented in Appendix D. Groundwater flow in the overburden zone is to the south/southwest and discharges to the ditch along the west property line. Groundwater flow in the shallow bedrock zone in August 1996 was to the south, which is consistent with the December 1994 Phase I data. Groundwater flow patterns do not appear to vary seasonally.

Hydraulic conductivity results (combined from Phase I and Phase II) are presented in Appendix E. The overburden materials, being made up of fine textured sediments, are substantially lower in hydraulic conductivity than the bedrock. Average hydraulic conductivity for the overburden was $3.4X10^{-5}$ cm/sec, ranging from $4.1X10^{-7}$ to $1.4X10^{-4}$ cm/sec. Bedrock hydraulic conductivity averaged $1.7X10^{-1}$ cm/sec and ranges from $7.5X10^{-4}$ to $3.9X10^{-1}$ cm/sec. Overburden wells typically go dry and recover slowly during development and sampling. Bedrock wells, on the other hand, can be pumped at a rate of 20 gallons per minute with approximately 1 foot of drawdown. The only hydraulic conductivity data obtained during Phase II concerned the hydraulic conductivity in the unweathered till [illegible] (measured in well MW-1DD); this value was found to be $6.2x10^{-6}$ cm/sec, substantiating the Phase I conclusion that the unweathered till is a confining layer that inhibits the vertical migration of VOCs.

[illegible]

4.2 Analytical Results

Table 3 shows the VOC analytical groundwater results for both Phase I and Phase II of the RI. Figures 7 and 8 show the overburden and bedrock groundwater VOC results, respectively. Table 4 shows the metals results in surface water/sediment samples for both Phase I and Phase II of the RI. The only "new" data in this table are the Phase II results from sediment sample SD-2A, collected at the old outfall location.

Table 5 shows a revised summary of detections above the New York State Standards Criteria and Guidelines (NYSSCGs) by compound. Table 6 shows a revised summary of detections above NYSSCGs by media.

During Phase II, the VOCs detected above the NYSSCGs in groundwater were confined to 1,2-DCE (in MW-1, adjacent to the solvent tank); TCE (in MW-1, MW-1D, MW-2, MW-2D, MW-3, MW-3D, MW-4D, MW-5D, and MW-6D); and vinyl chloride (MW-1, MW-2, MW-4, MW-6). Only TCE was detected in samples from the shallow bedrock wells. Furthermore, tetracholorethene, toluene, and methylene chloride, each of which was detected during Phase I above NYSSCGs at least one location each, were not detected in groundwater above NYSSCGs during Phase II. No quantified VOCs were detected in the sample from the deep bedrock well (MW-1DD); however, trace levels of o-xylene (0.26 μg/L) were detected. This result was flagged in data validation as estimated and potentially biased high.

For the metals in sediment, additional research was performed to develop revised criteria for cadmium, copper, lead, and zinc. These metals had been detected in sediment at concentrations above NYSSCGs in the Phase I sediment sample SD-2. The revised criteria were developed with reference to guidance provided in the NYSDEC "Technical Guidance for Screening Contaminated Soils" and procedures published by the U.S. Environmental Protection Agency (1980, 1984, 1985, and 1989) and NYS Part 700-705 regulations. The following procedure was used to estimate the revised sediment criteria:

- A review of current published Ambient Water Quality Criteria for species, e.g., minnows and trout, which might inhabit local surface waters was performed.
- Sediment concentrations in equilibrium with the Ambient Water Quality Criteria were computed by use of U.S. EPA published partition coefficients (Kds) for each metal. These modeled sediment concentrations which are in equilibrium with the Water Quality Criteria would, therefore, be protective of sensitive species inhabiting the potentially impacted surface waters.

Table 4 contains the revised criteria developed during Phase II.

A second sediment sample (SD-2A) was collected from the same location as SD-2 during the Phase II investigation to confirm the Phase I results. This sample generally had lower concentrations of metals, and no constituents exceeded criteria.

4.3 Comparison with Phase I Data

4.3.1 Groundwater

During Phase I, 1,2-DCE was detected at concentrations above NYSSCGs in MW-1 at concentrations of 150,000 μg/L (in sample GW-1) and at 170,000 μg/L in the duplicate sample at this location. This compound was also detected at a concentration of 1,300 μg/L in MW-1D (sample GW-7). By contrast, during the Phase II sampling, 1,2-DCE was only detected above the NYSSCG at MW-1 (sample 2-GW-7) and this at a concentration (72 μg/L) considerably below the Phase I concentrations cited above.

During Phase I, TCE was present above its NYSSCG in every groundwater sample but one (sample GW-10, taken at MW-4, the southwest downgradient location). This compound was also detected in groundwater above the NYSSCG at several locations during Phase II (MW-1, MW-1D, MW-2, MW-2D, MW-3, MW-3D, MW-4D, MW-5D, and MW-6D). The detection at MW-3 was the highest seen during either Phase I or Phase II, at 550,000 μg/L. MW-3 is located downgradient and to the south of the source area. TCE was again not present above the NYSSCG at the southwest downgradient location (neither the overburden or bedrock wells). During Phase II, TCE was detected in groundwater at a concentration of 1,400 μg/L in sample 2-GW-6D, taken at monitoring well MW-6D, located near the downgradient property line to the south. This was the only VOC detected above NYSSCG at this monitoring well location.

During Phase I, vinyl chloride was present in groundwater above its NYSSCG in MW-1, MW-2, and MW-4. During Phase II, this compound was present in groundwater above its NYSSCG in MW-1 MW-2, MW-4, and in MW-6 (downgradient sample to the south). As with 1,2-DCE, at the MW-1 location, the concentration of this compound was considerably lower during Phase II (2,200 μg/L during Phase II at MW-1, as opposed to 13,000 μg/L at this location during Phase I).

Because the Phase II groundwater samples were collected during the summer as opposed to the winter, the sampling program allowed the determination of seasonal fluctuations. The results do not suggest seasonal fluctuations in groundwater concentrations occur at the site.

4.3.2 Sediment Sample

During Phase I, the sediment sample at the old outfall (sample SD-2) had concentrations of the following metals above their respective NYSSCGs: cadmium (1.6 mg/kg), copper (104 mg/kg), lead (71.1 mg/kg), and zinc (410 mg/kg). During Phase II, revised criteria were derived for these constituents. Also, an additional sediment sample was taken at the old outfall (sample SD-2A). None of the Phase II metals concentrations were above criteria. Generally, the Phase II metals concentrations at this sample location were lower than the concentrations detected during Phase I.

4.4 Fish and Wildlife Impact Analysis

Table 7 is a revised evaluation of potential exposure pathways. The sediment pathway is now considered "complete," due to the presence of benthic organisms, as requested by NYSDEC comment on the Phase I RI report.

Per NYSDEC comments on the Draft Phase I Report, Radian has completed the Fish and Wildlife Impact Analysis through Step 2B for 1,2-DCE, cadmium, copper, lead, and zinc in sediment. This required developing sediment criteria for these compounds, and evaluating Phase I and Phase II data against the developed criteria. The results of this analysis are shown in Table 8.

4.4.1 1,2-DCE

Based on literature research, a chronic toxicity value for 1,2-dichloroethene of 3,900 µg/L was developed. This toxicity is based on information published by the U.S. Department of Health (1994).

4.4.2 Metals

Cadmium: In no case was cadmium detected in any sediment sample above the developed criteria.

Copper: Copper was detected in sample SD-2 at 104 mg/kg, above the minimum range at the developed criteria (65 mg/kg). The Phase II result from this location (i.e., sample SD-2A, 33.4 mg/kg) was below the developed criteria.

Lead: One sample (SD-2) had a concentration of lead about the criteria; this sample, taken during Phase I at the old outfall, had a lead concentration of 71.1 mg/kg. The lead concentration in SD-2A, taken from the same location, during Phase II, had a lead concentration of 42.9 mg/kg, a value which was below the developed sediment criteria of 61 mg/kg.

Zinc: In no case was zinc detected in the sediment samples above the developed criteria.

5.0 CONCLUSIONS

The results of the Phase II RI are consistent with the findings of the Phase I RI. Notable findings of the Phase II investigation center around the extent of VOCs in overburden and bedrock groundwater, and are as follows:

- No quantified VOCs were detected in groundwater samples from the deep bedrock monitoring well (MW-1DD); however, trace levels of o-xylene (0.29 μg/L) were reported. This well was installed at the source area in the next deeper bedrock groundwater zone. These data indicate the vertical extent of contamination in groundwater is restricted to the shallow bedrock groundwater zone.

- VOC concentrations in the overburden groundwater range up to several orders of magnitude greater than the shallow bedrock groundwater.

- VOC concentrations in the overburden groundwater at the former source (i.e., MW-1), have decreased since the Phase I investigation.

- VOC concentrations ranging up to 550,000 μg/L were detected in overburden groundwater at MW-3, a location approximately 100 feet south of the source area.

- The VOC plume has been defined for both the overburden and shallow bedrock groundwater. The majority of VOCs in groundwater occurs in the area between wells MW-2/2D and MW-4/4D. The southern extent of the overburden VOC plume exists between MW-6 and MW-3, as only trace levels of VOCs were detected in MW-6. A detection of TCE at a concentration of 1,400 in MW-6D indicates that the shallow bedrock groundwater plume extends south (downgradient) to near the Erdle property line.

- Sediment sample SD-2A from the "old" outfall (collected from the same location as Phase I sample SD-2) generally had lower concentrations of metals, and no constituents exceeded criteria. The "old" and "new" outfalls have been inactive for over 4 years and are not considered contaminant sources, based on site data.

These findings are not thought to have any significant bearing on the planned Interim Remedial Measure at the site. The proposed IRM using the 2-PHASE Extraction process is designed to remove soil and groundwater contamination from the overburden at the source area. Overburden soil and groundwater concentrations will be decreased. It is anticipated that VOC concentrations in bedrock will attenuate when the IRM decreases VOC concentrations in the overburden. Also, risk-based cleanup objectives are being developed to determine when the IRM has addressed the site.

6.0 RESPONSES TO COMMENTS ON PHASE I REPORT

In a letter dated November 14, 1995, the NYSDEC provided additional comments on the Phase I RI report and requested that the comments be addressed in the Phase II RI report. The following presents responses to the comments. The comments are summarized in italics (complete comments are presented in Appendix A) and responses are provided below the comment.

1. Radian should abandon the term "nutrient metals" in future reports. All evidence of site contamination, including contamination involving naturally abundant metals such as manganese and aluminum, must be fully explored in the Phase II RI.

A supplemental sediment sample from the "old" outfall location was collected during the Phase II RI to recheck the results of the Phase I RI. In addition, revised guidance levels for cadmium, copper, lead, and zinc were developed using EPA and NYSDEC published methods. Metals concentrations in the Phase II sample were generally lower than the Phase I sample (see Table 4) and no metals exceeded the developed guidance levels. Radian also agrees to abandon the term "nutrient metals" in future reports.

2. The consultant's indentification of aluminum as a "nutrient metal" is incorrect.

NYSDEC's comment that aluminum is not an essential ion in human nutrition is noted and the term "nutrient metal" will not be used to describe this metal. Aluminum is a naturally abundant metal in clayey soils and sediments (such as the sediment at the Erdle site), however, and is not considered a reliable indicator of environmental contamination for this site.

3. *The low recoveries for silver and aluminum suggest that the laboratory analytical results for silver and aluminum in groundwater may have been biased low. The accurate detemination of aluminum concentrations in environmental media is of particular importance at the Erdle property since...aluminum is one of the metals handled at the Erdle facility.*

NYSDEC's comment is noted. While reviewing the Phase I analytical data to address this comment, it was noted that the groundwater aluminum concentration was 110,000 μg/L in Phase I sample GW-3 at the background location for the site. This data was erroneously not transcribed to Table 4-6 of the Phase I RI report. The background aluminum concentration in groundwater is higher than the aluminum concentration in groundwater in Phase I sample GW-1 at the former contaminant source (2,650 μg/L).

4. *Radian should take steps to ensure that laboratory analytical results from the next round of groundwater sampling are more useful.*

Comment noted.

5. *The results of the air analyses, while usable, may be biased low, and therefore should be qualified as "J," estimated data.*

Comment noted. A revised Phase I air results table has been provided as Table 9.

REFERENCES

U.S. Department of Health and Human Services. Toxicological Profile for 1,2-Dichloroethene. Agency for Toxic Substances and Disease Registry. August, 1994.

U.S. Environmental Protection Agency. Chemical, Physical, and Biological Properties for Compounds Present at Hazardous Waste Sites. Clement Associates, Inc. September, 1995.

U.S. Environmental Protection Agency. Ambient Water Criteria for Copper. Office of Water. 1984. (Used to derive sediment criteria).

U.S. Environmental Protection Agency. Ambient Water Criteria for Zinc. Office of Water. 1980. (Used to derive sediment criteria).

New York State Water Quality Regulations, Title 6. Chapter X. Parts 700 to 705 (Used to convert water quality values to sediment criteria).

U.S. Environmental Protection Agency. Determining Soil Response Action Levels Based on Potential Contaminant Migration to Groundwater: A Compendium of Examples. October, 1989.

DRAFT

Table 1

Definition of Laboratory Flags

USEPA-Defined Organic Data Qualifiers:

U	Indicates compound was analyzed for but not detected.
J	Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
C	This flag applies to pesticide results where the identification has been confirmed by GC/MS.
B	This flag is used when the analyte is found in the associated blank as well as in the sample.
E	This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analyte.
D	This flag identifies all compounds identified in an analysis at a secondary dilution factor.
G	The TCLP Matrix Spike recovery was greater than the upper limit of the analytical method.
L	The TCLP Matrix Spike recovery was lower than the lower limit of the analytical method.
T	This flag is used when the analyte is found in the associated TCLP extraction as well as in the samples.
N	Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results.
P	This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on the Form I and flagged with a "P."
A	This flag indicates that a TIC is a suspected aldol-condensation product.

USEPA-Defined Inorganic Data Qualifiers:

B	Indicates a value greater than or equal to the instrument detection limit, but less than the contract required detection limit.
U	Indicates element was analyzed for but not detected. Report with the detection limit value (e.g., 100).
E	Indicates a value estimated or not reported due to the presence of interference.
S	Indicates value determined by Method of Standard Addition.
N	Indicates spike sample recovery is not within control limits.
*	Indicates duplicate analysis is not within control limits.
+	Indicates the correlation coefficient for Method of Standard Addition is less than 0.995.
M	Indicates duplicate injection results exceeded control limits.
W	Post-digestion spike for Furnace AA analysis is out of control limits (85-115%), while sample absorbance is less than 50% of spike absorbance.

DRAFT

Table 2

Definition of Validation Flags

USEPA-Defined Organic Data Qualifiers

J	Estimated value
L	Biased low
H	Biased high
U	Not detected at associated level; uncertain
N	Tentatively identified
UJ	Quantitation limit may be inaccurate
B	Not detected substantially above level in blank
R	Unusable value

USEPA-Defined Inorganic Data Qualifiers

U	Not detected at associated level
J	Estimated value
R	Unusable value
UJ	Element ND, and quantitation limit uncertain

DRAFT

Table 3

Erdle Perforating Company, Remedial Investigation
Detected Volatile Organic Compounds in Groundwater Samples

Sample	Sample Location	Parameter	Result (µg/L)	Laboratory Flags	Validation Flags	Guidance Exceeded?	Guidance Value[a] (µg/L)
		PHASE I RESULTS					
GW-1	Groundwater sample, MW-1, overburden adjacent to solvent tank	**1,2-Dichloroethene (Total)**	**150000**		J	X[b]	5
		Trichloroethene	**6400**	BJ	J	X	5
		Vinyl chloride	**13000**		J	X	2
GW-2	Groundwater sample, field duplicate of GW-1	**1,2-Dichloroethene (Total)**	**170000**			X	5
		Toluene	**10000**	BJ	U	X	5
		Trichloroethene	**8800**	BJ		X	5
		Vinyl chloride	**15000**			X	2
GW-3	Groundwater sample, MW-5 overburden: background (north)	Methylene chloride	0.32	J	U		
GW-4	Groundwater sample, MW-4D shallow bedrock: downgradient (southwest)	1,1,1-Trichloroethane	3.3		J		5
		1,1-Dichloroethane	0.52		J		5
		Methylene chloride	0.31	J	U		
		Trichloroethene	**13**		J	X	5
GW-5	Groundwater sample, MW-3D shallow bedrock: downgradient (south)	**Trichloroethene**	**380**		J	X	5
GW-6	Groundwater sample, MW-5D shallow bedrock: background (north)	1,1,1-Trichloroethane	2	J			5
		Chlorobenzene	**10**	BJ	U	X	5
		Toluene	**10**	BJ	U	X	5
		Trichloroethene	**10**	BJ	U	X	5

(((

DRAFT

Table 3
(Continued)

Sample	Sample Location	Parameter	Result (µg/L)	Laboratory Flags	Validation Flags	Guidance Exceeded?	Guidance Value[a] (µg/L)
GW-7	Groundwater sample, MW-1D shallow bedrock: adjacent to solvent tank	**1,2-Dichloroethene (Total)**	**1300**			**X**	**5**
		Tetrachloroethene	**41**	**J**		**X**	**5**
		Toluene	**20**	**BJ**		**X**	**5**
		Trichloroethene	**6000**	**B**		**X**	**5**
GW-8	Groundwater sample, MW-2 overburden: downgradient (southeast)	**Trichloroethene**	**1600**		**J**	**X**	**5**
		Vinyl chloride	**88**		**J**	**X**	**2**
GW-9	Groundwater sample, MW-3 overburden: downgradient (south)	**Methylene chloride**	**4280**	**J**	**J**	**X**	**5**
		Trichloroethene	**350000**		**J**	**X**	**5**
GW-10	Groundwater sample, MW-4 overburden: downgradient (southwest)	Bromodichloromethane	0.31		J		
		Chloroform	3.6		J		
		Methylene chloride	0.24	J	U		
		Trichloroethene	1.4		J		
		Vinyl chloride	**37**		**J**	**X**	**2**
PHASE II RESULTS							
2-GW-7 (dup of 2-GW-1)	Groundwater sample (duplicate), MW-1, overburden adjacent to solvent tank, Phase II	**1,2-Dichloroethene (Total)**	**72**		**J**	**X**	**5**
		Trichloroethene	**420**		**J**	**X**	**5**
		Vinyl chloride	**2200**		**J**	**X**	**2**
2-GW-1D	Groundwater sample, MW-1D, shallow bedrock adjacent to solvent tank, Phase II	**Trichloroethene**	**9900**	**D**	**J**	**X**	**5**
2-GW-1DD	Groundwater sample, MW-1DD, deep bedrock adjacent to solvent tank, Phase II	O-Xylene	0.26	–	JH		5

DRAFT

Table 3
(Continued)

Sample	Sample Location	Parameter	Result (μg/L)	Laboratory Flags	Validation Flags	Guidance Exceeded?	Guidance Value^a (μg/L)
2-GW-2	Groundwater sample, MW-2, overburden downgradient (southeast), Phase II	**Trichloroethene**	**1000**		J	X	5
		Vinyl Chloride	**98**		J	X	2
2-GW-2D	Groundwater sample, MW-2D, shallow bedrock downgradient (southeast), Phase II	1,1-Dichloroethane	2.4		J		5
		1,2-Dichloroethene (Total)	1.0		J		5
		1,1,1-Trichloroethane	3.9		J		5
		Trichloroethene	**13**		J	X	5
2-GW-3	Groundwater sample, MW-3, overburden downgradient (south), Phase II	**Trichloroethene**	**550000**	D	J	X	5
2-GW-3D	Groundwater sample, MW-3D, shallow bedrock downgradient (south), Phase II	**Trichloroethene**	**850**	D	J	X	5
2-GW-4	Groundwater sample, MW-4, overburden downgradient (southwest), Phase II	1,2-Dichloroethene (Total)	2.6		J		5
		Trichloroethene	2.3		J		5
		Vinyl Chloride	**18**		J	X	2
2-GW-4D	Groundwater sample, MW-4D, shallow bedrock downgradient (southwest), Phase II	1,1-Dichloroethane	0.64		J	X	5
		1,1,1-Trichloroethane	2.5		J	X	5
		Trichloroethene	**29**		J	X	5
2-GW-5	Groundwater sample, MW-5, overburden background well north of site, Phase II	1,1-Dichloroethane	1.7		J	X	5
2-GW-5D	Groundwater sample, MW-5D, shallow bedrock background well north of site, Phase II	1,1-Dichloroethane	0. 43		J	X	5
		1,1,1-Trichloroethane	0.91		J		5
		Trichloroethene	**0.44**		J	X	5

DRAFT

Table 3
(Continued)

Sample	Sample Location	Parameter	Result (μg/L)	Laboratory Flags	Validation Flags	Guidance Exceeded?	Guidance Value[a] (μg/L)
2-GW-6	Groundwater sample MW-6, overburden downgradient (south), Phase II	**Vinyl chloride**	**2.2**		**J**	**X**	**2**
2-GW-6D	Groundwater sample MW-6D, shallow bedrock downgradient (property line to south), Phase II	**Trichloroethene**	**1400**	**D**	**J**	**X**	**5**

[a] NYSDEC TOGS 1.1.1, "Ambient Water Quality Standards and Guidance Values." Revised October 1993.

[b] "X" and bold type indicate guidance exceeded.

DRAFT

Table 4

Erdle Perforating Company, Remedial Investigation
Detected Metals/Inorganics in Surface Water/Sediment Samples

Sample	**Sample Location**	**Parameter**	**Result[a]**	**Laboratory Flags**	**Validation Flags**	**Guidance Exceeded?**	**Guidance Value[b]**
PHASE I RESULTS							
SW-2	Surface water, old outfall	Aluminum - Total	7300				
		Arsenic - Total	3.7	B	J		
		Barium - Total	142	B			
		Calcium - Total	193000	*			
		Copper - Total	21	B			
		Iron - Total	**12900**			**X**	**300**
		Lead - Total	22.6	*			
		Magnesium - Total	**35600**			**X**	**35,000**
		Manganese - Total	**1360**	**N***	**J**	**X**	**300**
		Nickel - Total	28	B			
		Potassium - Total	5820				
		Sodium - Total	29100				
		Vanadium - Total	13	B	J		
		Zinc - Total	**355**	**N**	**J**	**X**	**300**

DRAFT

Table 4
(Continued)

Sample	Sample Location	Parameter	Result[a]	Laboratory Flags	Validation Flags	Guidance Exceeded?	Guidance Value[b]
SD-1	Sediment sample, marsh	Aluminum - Total	6270		J		
		Barium - Total	59.6	B	J		
		Calcium - Total	6220	*	J		
		Chromium - Total	9.3		J		
		Copper - Total	14.9	B	J		
		Iron - Total	10700		J		
		Lead - Total	40.6	*	J		61
		Magnesium - Total	1980	B	J		
		Manganese - Total	96.8	N*	J		
		Potassium - Total	665	B	J		
		Thallium - Total	3.7	B	J		
		Vanadium - Total	11.2	B	J		
		Zinc - Total	198	N	J		700

(((

DRAFT

Table 4
(Continued)

Sample	Sample Location	Parameter	Result[a]	Laboratory Flags	Validation Flags	Guidance Exceeded?	Guidance Value[b]
SD-2	Sediment sample, old outfall	Aluminum - Total	5120				
		Arsenic - Total	2.9	B	J		
		Barium - Total	44.8	B			
		Cadmium - Total	1.6	*	J		31
		Calcium - Total	11900	*			
		Chromium - Total	35.1				
		Cobalt - Total	3.2	B			
		Copper - Total	**104**			**Maybe**	**65-155**
		Iron - Total	8100				
		Lead - Total	**71.1**	*		**X**	**61**
		Magnesium - Total	5350				
		Manganese - Total	89.3	N*	J		
		Nickel - Total	15.9				
		Potassium - Total	432	B			
		Selenium - Total	1.2	BN	J		
		Thallium - Total	3.4		J		
		Vanadium - Total	10.4	B	J		
		Zinc - Total	410	N	J		700
PHASE II RESULTS							
SD-2A	Sediment sample, old outfall, Phase II	Aluminum	6550		JH		
		Antimony	1.4	U			2
		Arsenic	2.3	B			6

DRAFT

Table 4
(Continued)

Sample	Sample Location	Parameter	Result[a]	Laboratory Flags	Validation Flags	Guidance Exceeded?	Guidance Value[b]
SD-2A	Sediment sample, old outfall, Phase II, con't	Barium	39.3	B			
		Beryllium	0.28	B			
		Cadmium	0.05	U			0.6
		Calcium	20200				
		Chromium	18.3				26
		Cobalt	3.7	B			
		Copper	33.4		J		65-155
		Iron	10200				2.0%
		Lead	42.9				61
		Magnesium	9150				
		Manganese	117				460
		Mercury	0.11	U			0.15
		Nickel	12.6				16
		Potassium	583	B			
		Selenium	0.99	U			
		Silver	0.49	U			1
		Sodium	378	B			
		Thallium	1.3	U			
		Vanadium	14.7				

DRAFT

Table 4
(Continued)

Sample	Sample Location	Parameter	Result[a]	Laboratory Flags	Validation Flags	Guidance Exceeded?	Guidance Value[b]
SD-2A	Sediment sample, old outfall, Phase II, con't	Zinc	364				700
		Cyanide	ND				
Total Hardness/Total Organics Detections (Analyzed for Phase I Only)							
SW-2	Surface water, old outfall	Total Hardness	595 mg/L				None
SD-1	Sediment sample, marsh	Leachable Total Organic Carbon	62,600 mg/L				None
SD-2	Sediment sample, old outfall	Leachable Total Organic Carbon	16,900 mg/L				None
SD-3	Sediment sample, background	Leachable Total Organic Carbon	8810 mg/L				None

[a] Results are in units of μg/L (surface water samples) or mg/kg (sediment samples).

[b] Surface Water: NYSDEC TOGS 1.1.1, "Ambient Water Quality Standards and Guidance Values." Revised October 1993.
Sediments: NYSDEC, Division of Fish and Wildlife, Division of Marine Resources: Technical Guidance for Screening Contaminated Sediments, July 1994.

DRAFT

Table 5

Summary of Phase II Detections Above NYSSCGs, by Compound

Compound	Media In Which Detected Above NYSSCG
Volatile Organic Compounds	
1,2-DCE (total)	Groundwater
TCE	Groundwater
Vinyl chloride	Groundwater
Semivolatile Organic Compounds	
(SVOCs not analyzed for during Phase II)	
Metals	
None	Sediment

NOTE: During Phase II, only the following samples were collected/analyzed: groundwater for halogenated VOCs, and sediment for metals.

DRAFT

Table 6

Summary of Phase II Detections Above NYSSCGs, by Media

Media	Contaminants Present Above NYSSCG		
	Volatile Organics	Semivolatile Organics	Metals
Soil	No soil samples collected.	No soil samples collected.	No soil samples collected.
Groundwater	1,2-Dichloroethene Trichloroethene Vinyl chloride	No SVOC analysis conducted on groundwater samples.	No metals analysis conducted on groundwater samples.
Surface Water	No surface water samples collected.	No surface water samples collected.	No surface water samples collected.
Sediment	Sediment samples not analyzed for VOCs.	Sediment samples not analyzed for SVOCs.	None

NOTE: During Phase II, only the following samples were collected/analyzed: groundwater for halogenated VOCs, and sediment for metals.

DRAFT

Table 7

Evaluation of Potential Pathways

Potentially Exposed Media	**Contaminants Detected?**	**Potential Route of Exposure**	**Potential Receptors**	**Pathway Complete?**
Surface Soil	Yes	Dermal absorption, incidental ingestion	Wildlife	Yes
Subsurface Soil	Yes	None	None	No
Surface Water	Yes	Dermal absorption, ingestion	Wildlife, fish, downstream	Yes
Sediment	Yes	Dermal absorption, incidental ingestion	Fish, aquatic plants, benthic organisms	Yes
Groundwater	Yes	None	None	No
Air	Unknown	Inhalation	Wildlife	Unknown

DRAFT

Table 8

Evaluation of Detected Concentrations Vs. Surface Water/Sediment Criteria

Analyte/Media	Criteria	Exceedances
1,2-DCE/Water	3,900 μg/L	None
Cadmium/Sediment	31	None
Copper/Sediment	65 - 155 mg/kg (trout)	SD-2 (104 mg/kg)
Lead/Sediment	61 mg/kg	SD-2 (71.1 mg/kg)
Zinc/Sediment	700 mg/kg (trout)	None

DRAFT

Table 9

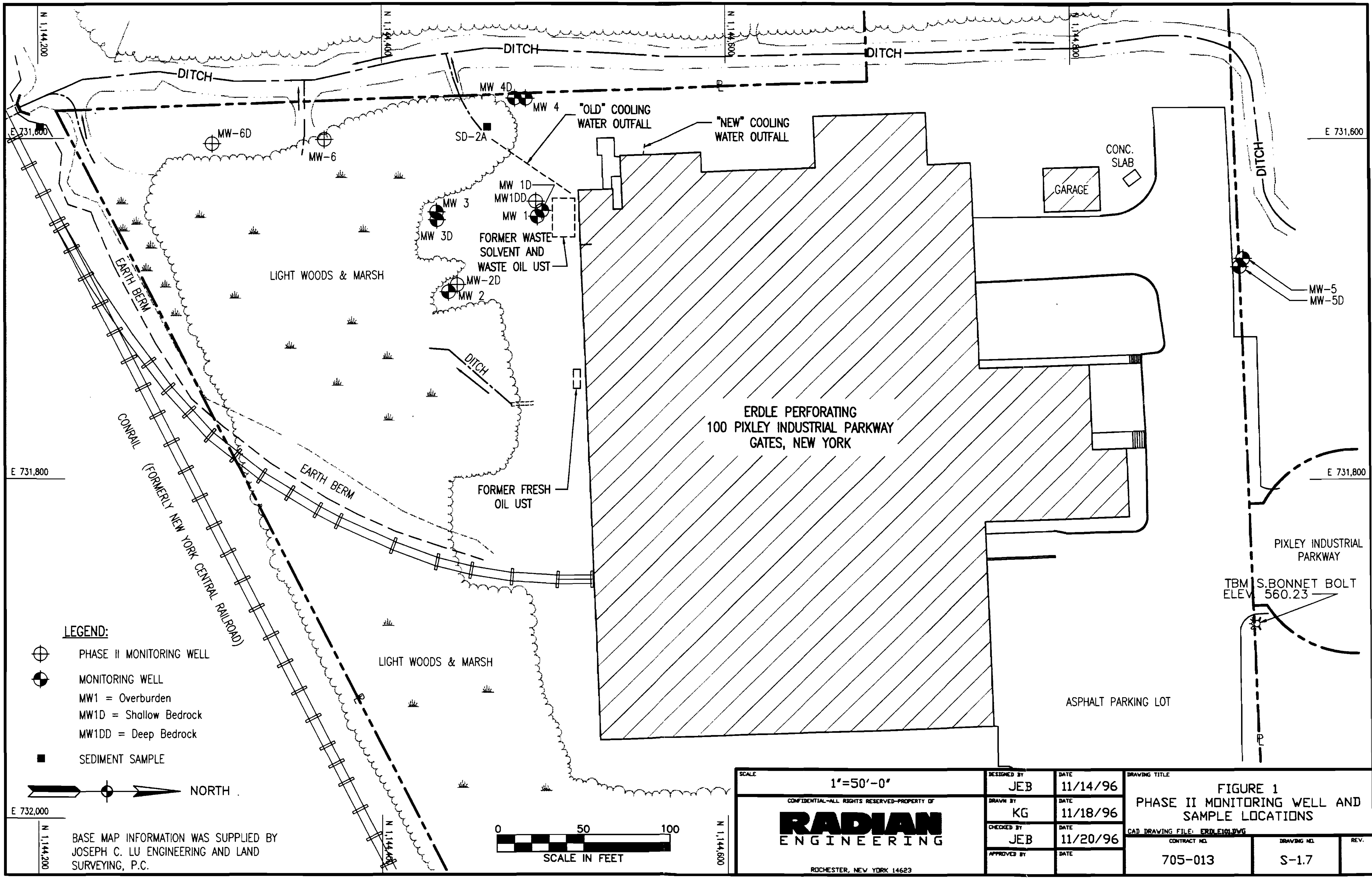
Revised Air Results Summary (Formerly Table 4-10 of Phase I RI Report)

	Laboratory Results (ng)				Ca (ug/m^3)[a]		Cp (ug/m^3)[b]		
	A1-A	A1-B	A1-CS-A	A1-CS-B	Total A1	Total A1-CS	Total A1	Total A1-CS	NYS ACG (ug/m^3)[c]
Chloroethane	3 J	0 J	0 J	0 J	1.41E-11	0	4.14E-04	0	63000
Methylene chloride	550 J	0 J	12000 J	6300 J	2.58E-09	8.45E-08	5.16E-05	2.49E+00	27
Acetone	97 J	0 J	510 J	0 J	4.55E-10	2.36E-09	9.09E-06	6.93E-02	14000
Carbon disulfide	20 J	0 J	3 J	15 J	9.37E-11	8.31E-11	1.87E-06	2.45E-03	7.0
1,2-Dichloroethene	18 J	0 J	16 J	0 J	8.44E-11	7.39E-11	1.69E-06	2.17E-03	360
Chloroform	8 J	0 J	8 J	8 J	3.75E-11	7.39E-11	7.50E-07	2.17E-03	23
1,2-Dichloroethane	0 J	0 J	2 J	0 J	0	9.24E-12	0	2.72E-04	3.9E-02
2-Butanone	0 J	0 J	110 J	0 J	0	8E-10	0	1.49E-02	300
1,1,1-Trichloroethane	7 J	0 J	8 J	7 J	3.28E-11	6.93E-11	6.56E-07	2.04E-03	1000
Vinyl acetate	0 J	3 J	0 J	0 J	1.41E-11	0	2.81E-07	0	NA
Trichloroethene	16 J	0 J	14 J	0 J	7.50E-11	6.46E-11	1.50E-06	1.90E-03	4.5E-01
Chlorobenzene	22 J	0 J	0 J	0 J	1.03E-10	0	2.06E-06	0	20.0
Xylenes	25 J	0 J	31 J	0 J	1.17E-10	1.43E-10	2.34E-06	4.21E-03	300

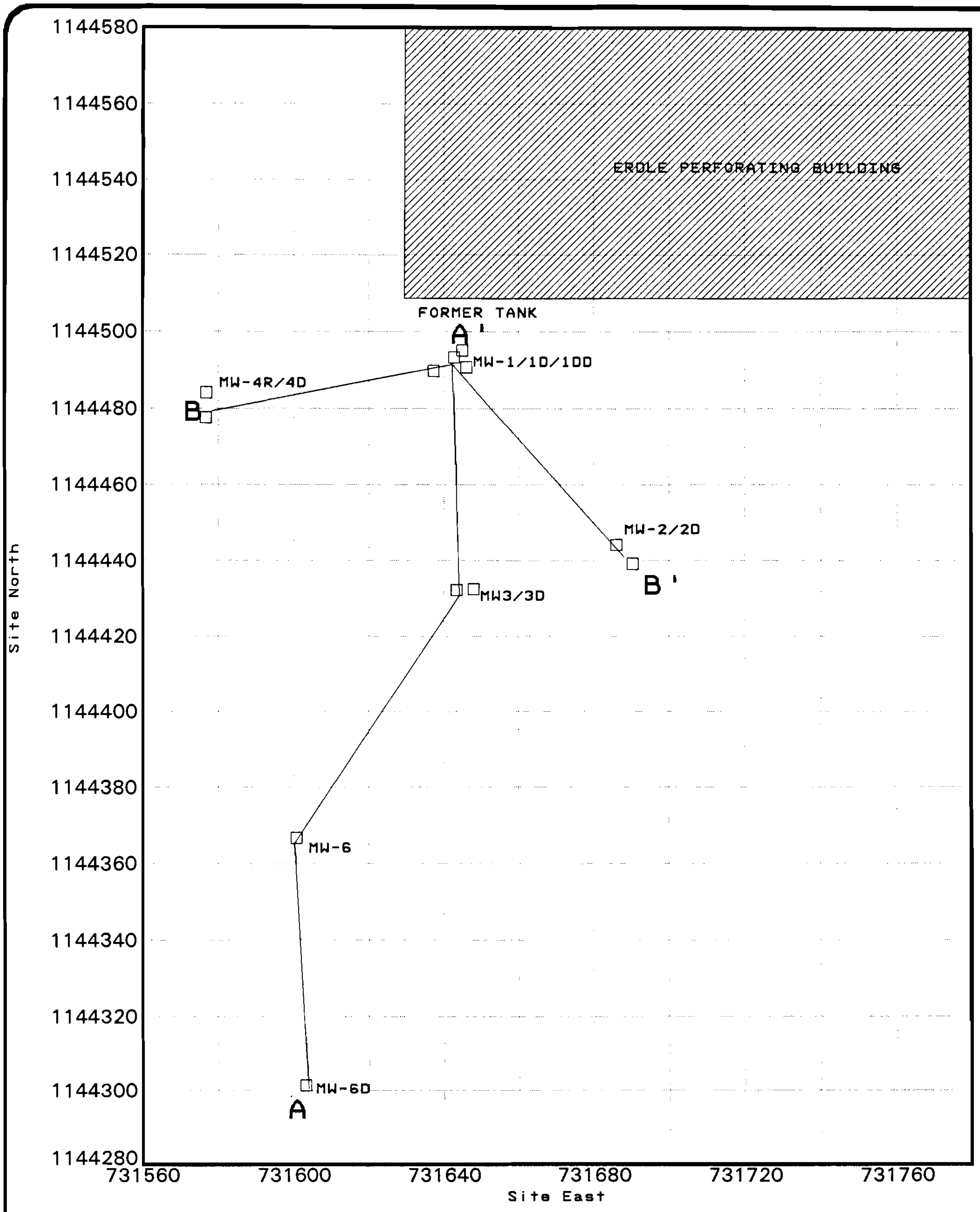
[a] Ca = Concentration directly over waste site.

[b] Cp = Maximum potential annual concentration.

[c] From: New York State Department of Environmental Conservation, Bureau of Toxic Air Sampling, Division of Air Resources, "Air Pathway Analysis Requirements in the Remedial Investigation," April 2, 1991.



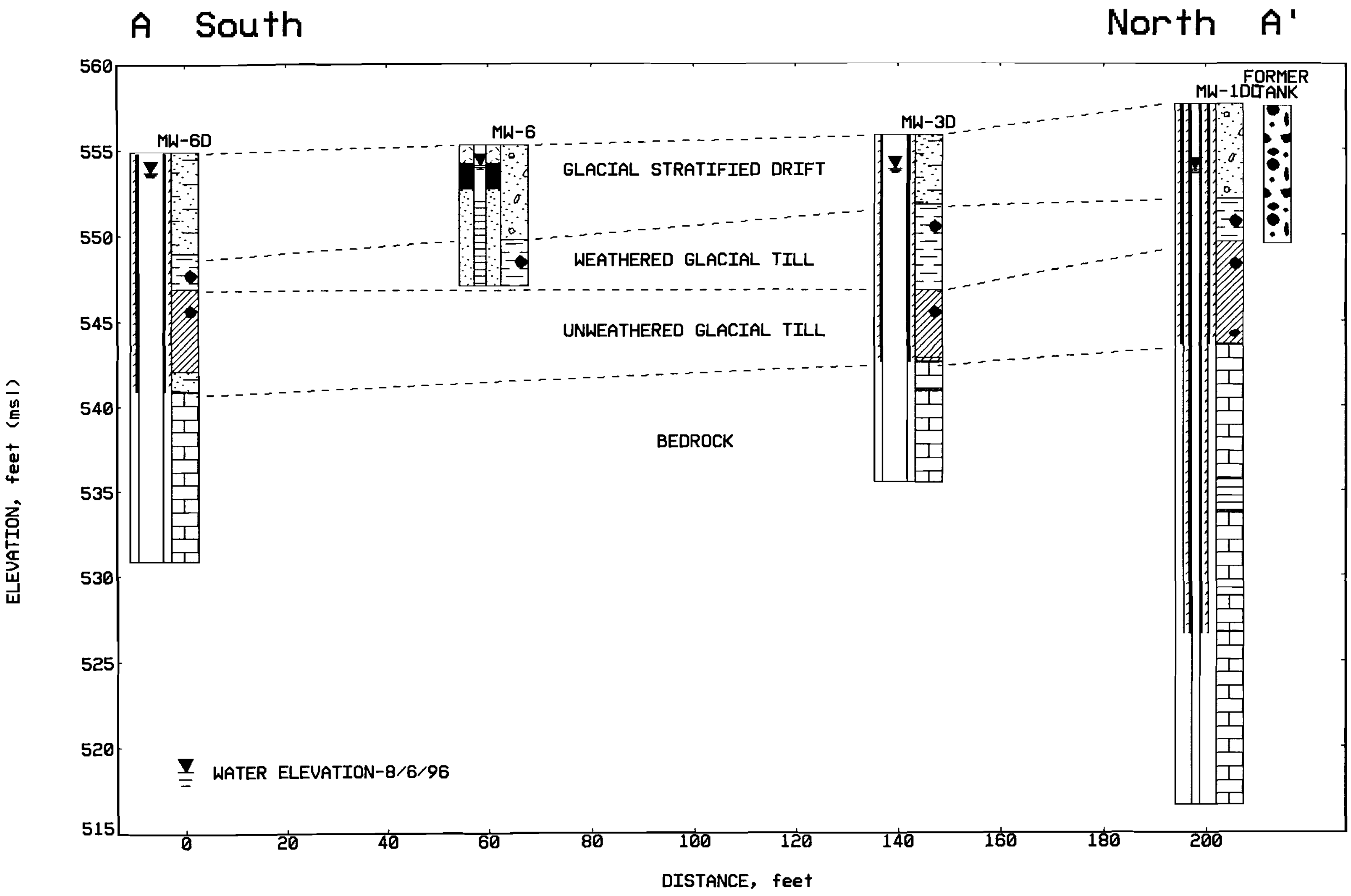
SCALE 1"=50'-0"	DESIGNED BY JEB	DATE 11/14/96	DRAWING TITLE FIGURE 1 PHASE II MONITORING WELL AND SAMPLE LOCATIONS
CONFIDENTIAL-ALL RIGHTS RESERVED-PROPERTY OF RADIAN ENGINEERING ROCHESTER, NEW YORK 14623	DRAWN BY KG	DATE 11/18/96	CAD DRAWING FILE: ERDLE101.DWG
	CHECKED BY JEB	DATE 11/20/96	CONTRACT NO. 705-013
	APPROVED BY	DATE	DRAWING NO. S-1.7
			REV.
]



RADIAN

PROJECT	Phase II Remedial Investigation - Erdle Facility	JOB NO.	705-013
		DATE	11/20/96

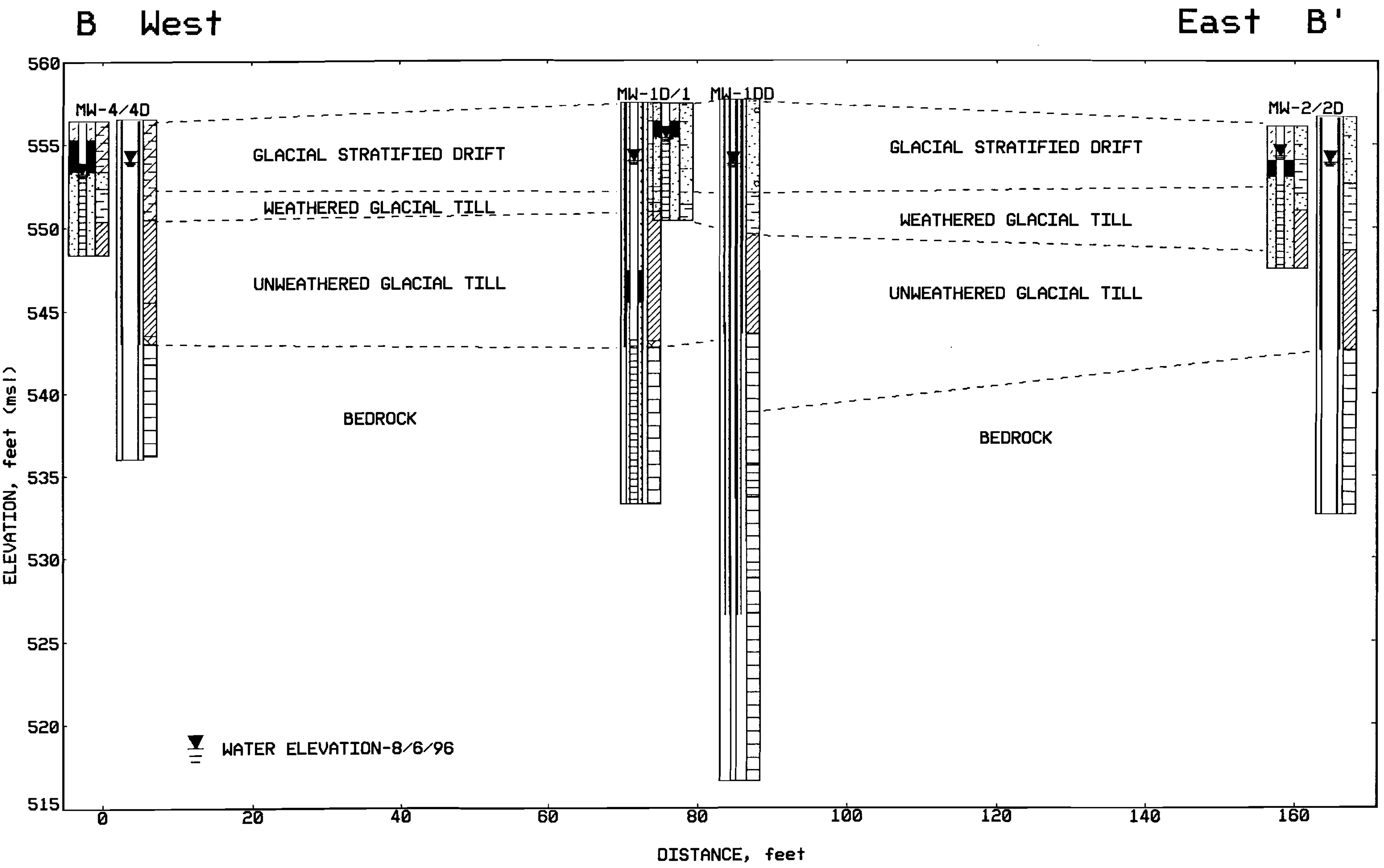
Figure 2. Cross Section Locations



MW-3?

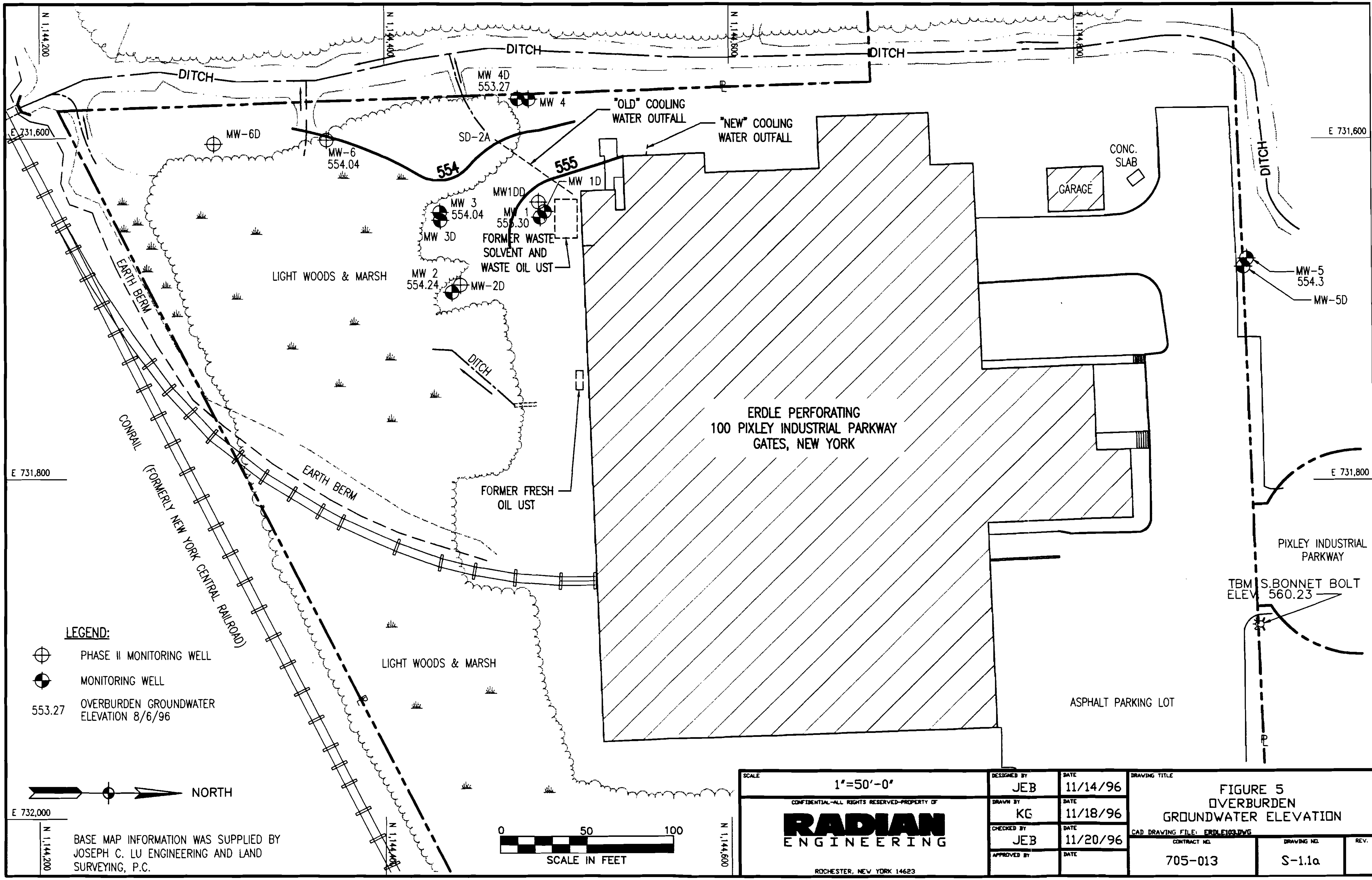
RADIAN

Figure 3 PHASE II N-S CROSS SECTION	
705-013	ERD2DTNS



Fault ?

RADIAN	Figure 4 PHASE II E-W CROSS SECTION	
	705-013	ERD2DTEW

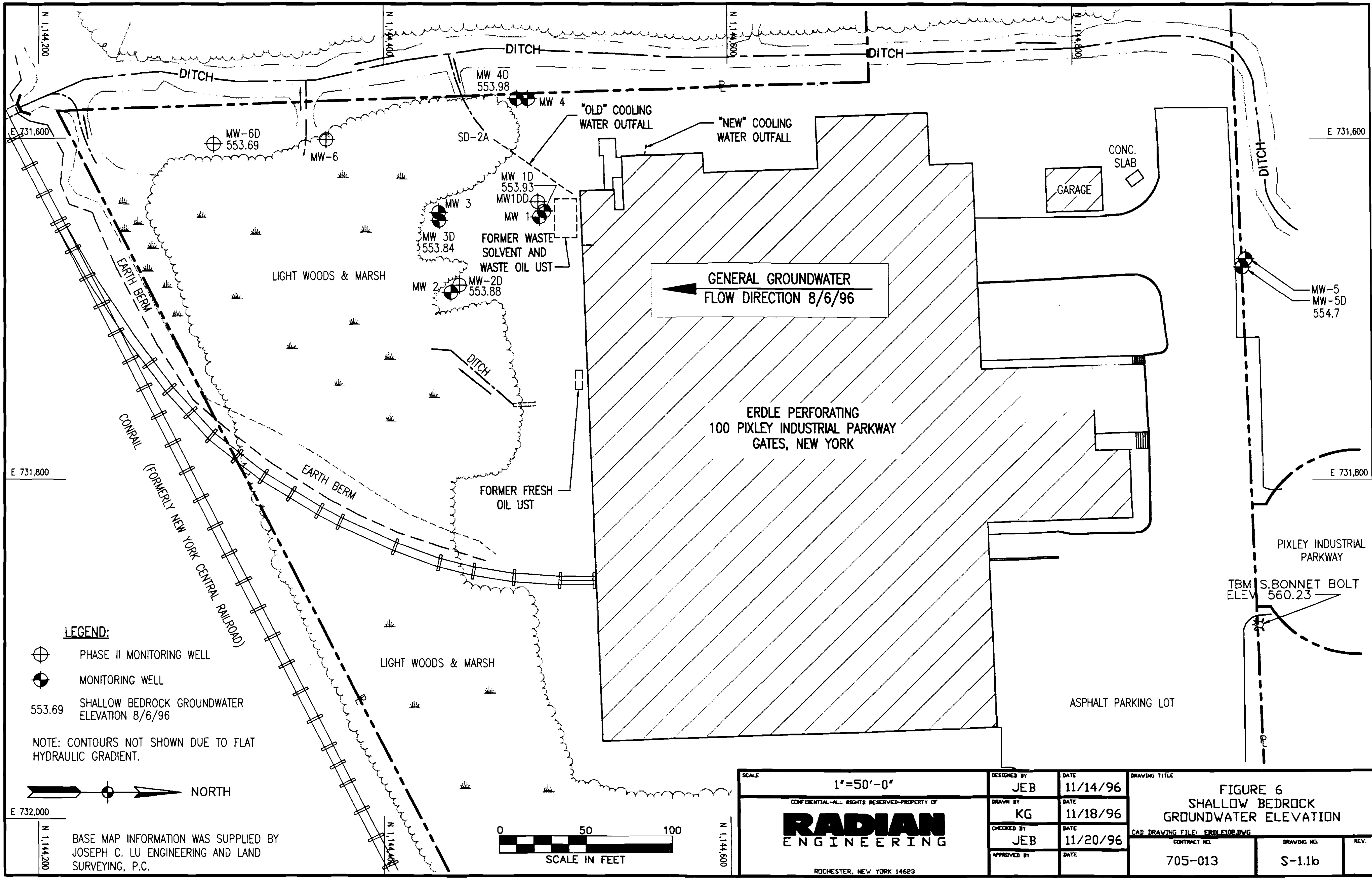


LEGEND:

⊕	PHASE II MONITORING WELL
◐	MONITORING WELL
553.27	OVERBURDEN GROUNDWATER ELEVATION 8/6/96

BASE MAP INFORMATION WAS SUPPLIED BY JOSEPH C. LU ENGINEERING AND LAND SURVEYING, P.C.

SCALE 1"=50'-0"	DESIGNED BY JEB	DATE 11/14/96	DRAWING TITLE FIGURE 5 OVERBURDEN GROUNDWATER ELEVATION
CONFIDENTIAL-ALL RIGHTS RESERVED-PROPERTY OF RADIAN ENGINEERING ROCHESTER, NEW YORK 14623	DRAWN BY KG	DATE 11/18/96	CAD DRAWING FILE: ERDLE103.DWG
	CHECKED BY JEB	DATE 11/20/96	CONTRACT NO. 705-013
	APPROVED BY	DATE	DRAWING NO. S-1.1a
			REV.



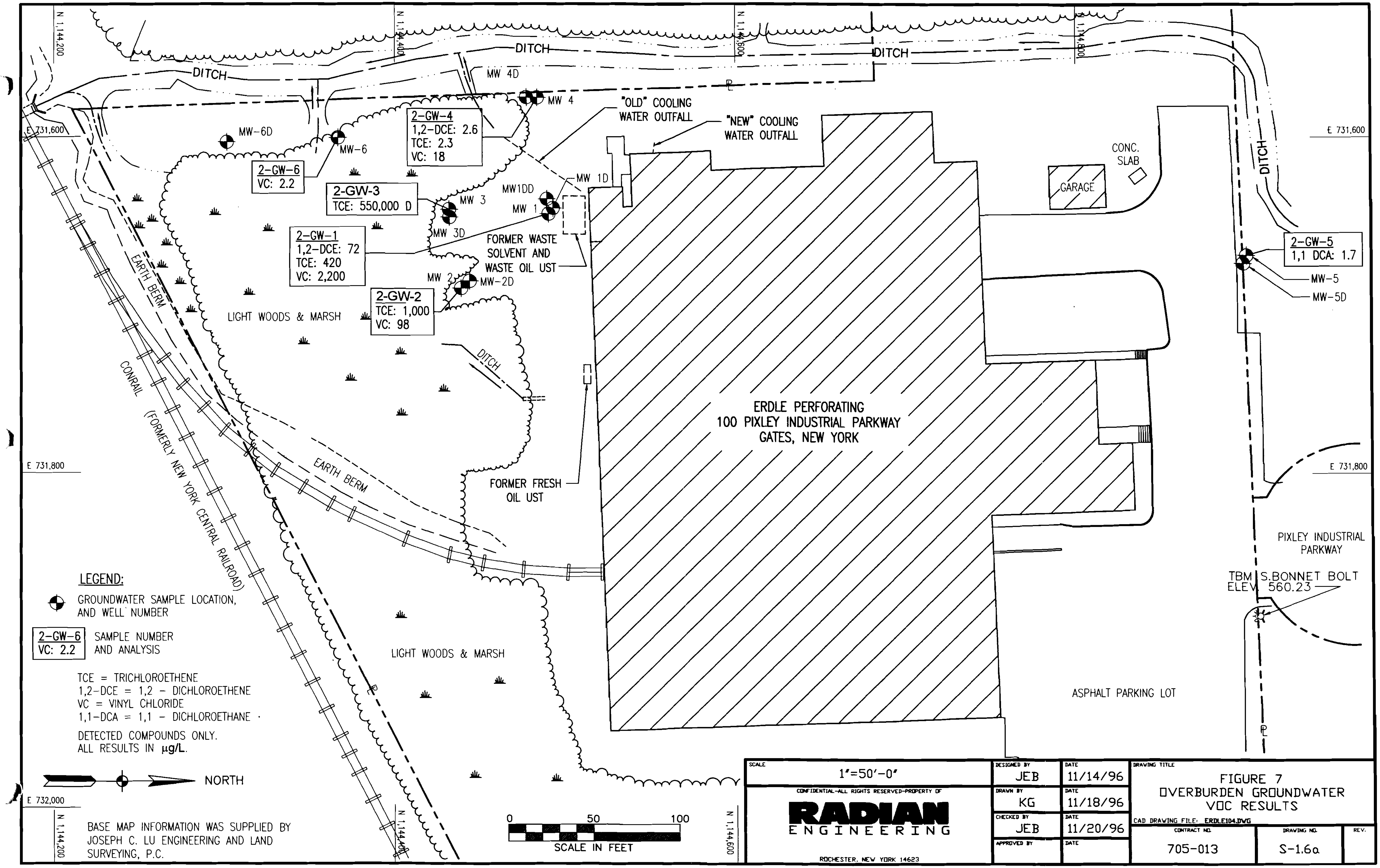
LEGEND:

⊕	PHASE II MONITORING WELL
◕	MONITORING WELL
553.69	SHALLOW BEDROCK GROUNDWATER ELEVATION 8/6/96

NOTE: CONTOURS NOT SHOWN DUE TO FLAT HYDRAULIC GRADIENT.

BASE MAP INFORMATION WAS SUPPLIED BY JOSEPH C. LU ENGINEERING AND LAND SURVEYING, P.C.

SCALE 1"=50'-0"	DESIGNED BY JEB	DATE 11/14/96	DRAWING TITLE FIGURE 6 SHALLOW BEDROCK GROUNDWATER ELEVATION
CONFIDENTIAL-ALL RIGHTS RESERVED-PROPERTY OF RADIAN ENGINEERING ROCHESTER, NEW YORK 14623	DRAWN BY KG	DATE 11/18/96	CAD DRAWING FILE: ERDLE102.DWG
	CHECKED BY JEB	DATE 11/20/96	CONTRACT NO. 705-013
	APPROVED BY	DATE	DRAWING NO. S-1.1b REV.



LEGEND:

GROUNDWATER SAMPLE LOCATION, AND WELL NUMBER

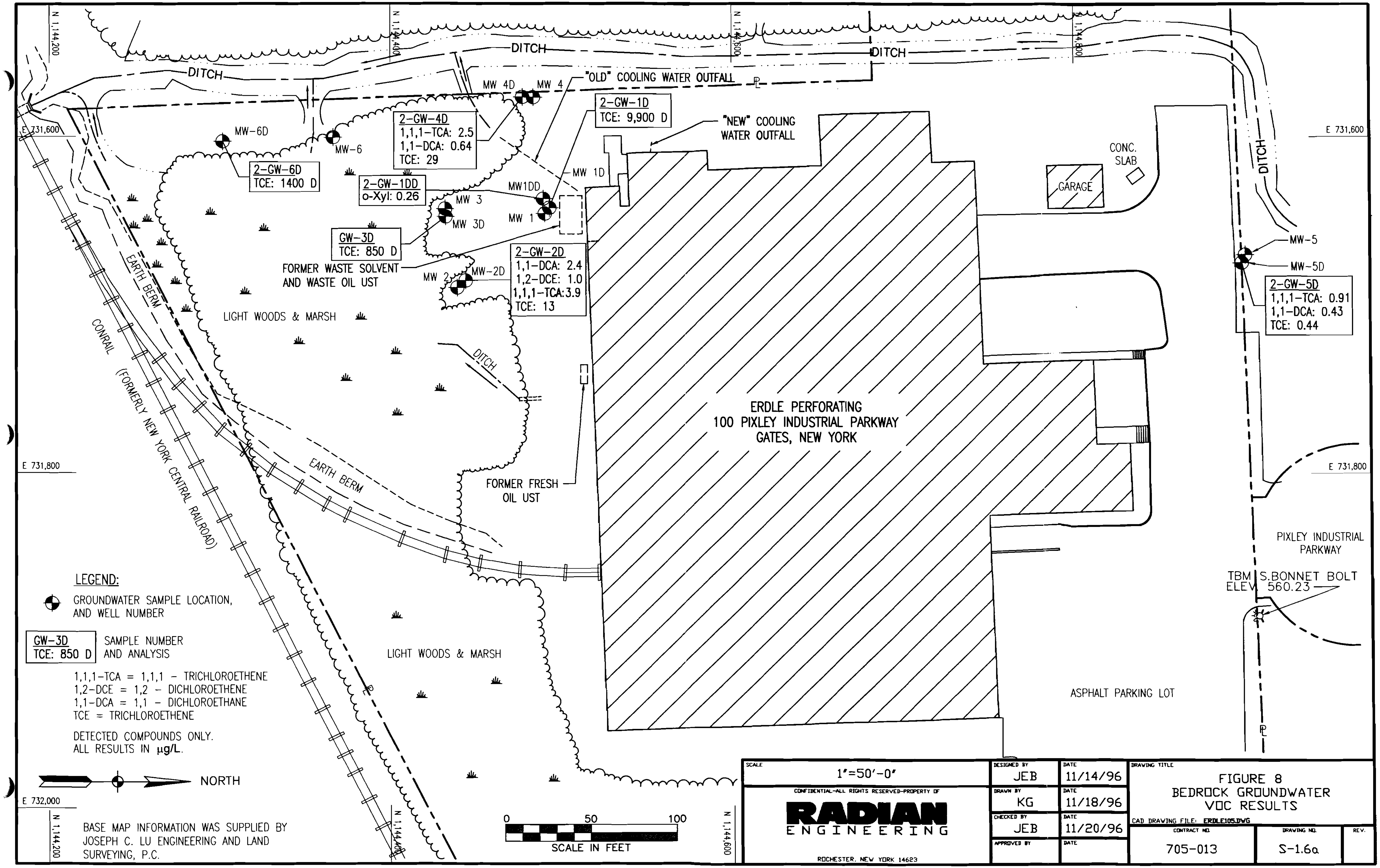
2-GW-6 VC: 2.2	SAMPLE NUMBER AND ANALYSIS

TCE = TRICHLOROETHENE
1,2-DCE = 1,2 - DICHLOROETHENE
VC = VINYL CHLORIDE
1,1-DCA = 1,1 - DICHLOROETHANE

DETECTED COMPOUNDS ONLY.
ALL RESULTS IN µg/L.

BASE MAP INFORMATION WAS SUPPLIED BY JOSEPH C. LU ENGINEERING AND LAND SURVEYING, P.C.

SCALE 1"=50'-0"	DESIGNED BY JEB	DATE 11/14/96	DRAWING TITLE FIGURE 7 OVERBURDEN GROUNDWATER VOC RESULTS
CONFIDENTIAL-ALL RIGHTS RESERVED-PROPERTY OF RADIAN ENGINEERING ROCHESTER, NEW YORK 14623	DRAWN BY KG	DATE 11/18/96	CAD DRAWING FILE: ERDLE104.DWG
	CHECKED BY JEB	DATE 11/20/96	CONTRACT NO. 705-013
	APPROVED BY	DATE	DRAWING NO. S-1.6a REV.



LEGEND:

GROUNDWATER SAMPLE LOCATION, AND WELL NUMBER

GW-3D TCE: 850 D	SAMPLE NUMBER AND ANALYSIS

1,1,1-TCA = 1,1,1 - TRICHLOROETHENE
1,2-DCE = 1,2 - DICHLOROETHENE
1,1-DCA = 1,1 - DICHLOROETHANE
TCE = TRICHLOROETHENE

DETECTED COMPOUNDS ONLY.
ALL RESULTS IN µg/L.

BASE MAP INFORMATION WAS SUPPLIED BY JOSEPH C. LU ENGINEERING AND LAND SURVEYING, P.C.

SCALE 1'=50'-0'

CONFIDENTIAL-ALL RIGHTS RESERVED-PROPERTY OF

RADIAN ENGINEERING
ROCHESTER, NEW YORK 14623

DESIGNED BY	JEB	DATE	11/14/96
DRAWN BY	KG	DATE	11/18/96
CHECKED BY	JEB	DATE	11/20/96
APPROVED BY		DATE	

DRAWING TITLE
FIGURE 8
BEDROCK GROUNDWATER
VOC RESULTS

CAD DRAWING FILE: ERDLE105.DWG

CONTRACT NO.	DRAWING NO.	REV.
705-013	S-1.6a	

EXECUTIVE SUMMARY

Radian International LLC (Radian) has been contracted by Erdle Perforating Company to conduct a Phase II Remedial Investigation as part of a Remedial Investigation/Feasibility Study (RI/FS) for Erdle Perforating Company, Town of Gates, New York. This Phase II RI focuses on sediment sampling, monitoring well installation and sampling, and completion of the Fish and Wildlife Impact Analysis. This Quality Assurance/Quality Control (QA/QC) Summary provides information regarding the data useability of the sediment sampling and monitoring well sampling.

Quality Control Review

A review of the quality control (QC) data for the analytical measurements was performed to determine the usability and defensibility of the chemical measurement data. The review focused on field and laboratory blanks, matrix spikes, surrogate recoveries, and laboratory control samples. Overall, QC associated with this program indicates that measurement data are acceptable and defensible according to the requirements established by EPA Region II guidance. The data indicate that the QC mechanisms were effective in ensuring measurement data reliability within the expected limits of sampling and analytical error.

There were concerns identified during the quality assurance/quality control (QA/QC) review that should be noted prior to final interpretation of the analytical results. These concerns were related to the halogenated volatile organic results, aromatic volatile organic results, and the metals inorganic results.

A halogenated volatile organic concern related to the initial calibration verifications of the instruments. The percent relative standard deviations (%RSD) for all of the SW8010 compounds (except chloroform and bromochloromethane) were very high. EPA criteria require that %RSD from the initial calibration must be less than or equal to 30.0% for all compounds. All of the halogenated volatile compounds except two exceeded 30.0%. However, these high %RSD values were less than 90%, which falls within acceptable criteria for data usability and, therefore, do not need to be rejected. These data indicate a bias in the analytical systems and potential improper calibration techniques; therefore the data are considered estimated.

Another concern with the SW8010 samples is the missed holding times for most of the samples. Nine of the samples missed holding times by one day, and three of the samples missed holding times by two days. These missed holding times may potentially bias the volatile results low. All of the halogenated volatile compounds for these field samples are considered estimated and potentially biased low.

A concern with the surrogate bromochloromethane (BCM) exceeding the calibration curve in the ending continuing calibration verification (CCV) was noted. Method SW8010 recommends that three surrogate halocarbons are spiked into each sample, standard, and reagent water blank to monitor the performance of the analytical system and the effectiveness of the methodology regarding sample matrix. Since BCM was the only surrogate spiked into the sample, and this surrogate exceeded the calibration curve in the ending CCV, the data is considered estimated and is potentially biased high.

The main concern noted for the aromatic volatile organic samples is the missed holding times. Eight of the samples missed holding times by one day, and two of the samples missed holding times by two days. These missed holding times may potentially bias these aromatic volatile results low. All of the aromatic volatile compounds for these samples are considered estimated and potentially biased low.

Another concern noted in the SW8020 samples involves the surrogate a,a,a-trifluorotoluene (TFT). The %RSD for TFT was 57% which is above the criteria limit of 30.0%. This high % RSD indicates a possible improper initial calibration for TFT and therefore, the data associated with this initial calibration is considered estimated. Additionally, the surrogate recovery for TFT was above the quality control (QC) limits of 66%-137% in two of the samples; therefore, all positive results in these two samples are considered estimated and potentially biased high.

A concern with the CLP-ICP metals data was noted for the analyte aluminum. The percent recovery for aluminum was below the lower QC limit in the solid laboratory control sample (LCS). A second solid LCS was analyzed but was not spiked with aluminum, therefore, the only recovery value for aluminum in a solid sample is 54.6%. Aluminum is considered to be estimated and potentially biased low in the sediment sample.

Any discrepancies and associated flags for these methods are listed in the report. It should be noted that for those samples where both a low bias and a high bias exist due to separate analytical discrepancies, the data are flagged as estimated with a (J) flag since it is difficult to determine which bias has altered the results to a greater degree.

1.0 INTRODUCTION

Phase II of a Remedial Investigation/Feasibility Study (RI/FS) was undertaken at the Erdle Perforating site, Rochester, New York, in August, 1996. Selected groundwater samples were analyzed for halogenated volatiles by SW8010 and aromatic volatiles by SW8020. These samples were analyzed according to the methods found in SW-846, Physical Methods for the Analysis of Solids and Wastes, 3rd. ed. In addition to the groundwater samples, one sediment sample was analyzed for total metals by Inductively Coupled Plasma (ICP) according to Contract Laboratory Program protocols (CLP).

Quality control procedures and activities implemented during this program provided the basis for estimating data precision and accuracy. This section presents a summary of analytical results for quality control (QC) samples, estimates of measurement precision and accuracy on the basis of analysis of QC samples, and potential limitations in the data.

Overall, the quality assurance/quality control (QA/QC) data associated with the Erdle Perforating project indicate that measurement data are acceptable and usable. The QA/QC data indicate that the QC mechanisms were effective in ensuring measurement data reliability within the expected limits of sampling and analytical error according to the criteria established by EPA Region II guidelines for data acceptance.

QC data provide information for identifying and defining qualitative limitations associated with measurement data. The following key types of QC procedures provide the primary basis for quantitatively evaluating data quality:

- Holding time requirements;
- Laboratory and field blank samples:
- Matrix and surrogate spiked samples; and
- Laboratory control samples.

The QC samples that were collected for this project include a field duplicate for volatile organics, a rinsate blank for metals, and trip blanks for volatiles. Additional quality control samples were analyzed including method blanks, matrix spike blanks, surrogates, and laboratory control samples.

Recra Environmental, Inc., of Amherst, New York, performed the analyses of groundwater and sediment samples. Results for all analyses were subjected to data validation based on the requirements found in EPA Region II Data Validation SOP, 1/92, revision 8, for organics; and EPA Region II Evaluation of Metals SOW 3/90 for inorganics. Individual validation packets for each Sample Delivery Group (SDG) are found in Appendix A of this document.

Each validation packet contains a narrative detailing problems found in the SDG. Also included is a table listing validation flags required and the data validation checklist. Flags have been applied to the results listed on Form I in the Recra laboratory reports. This document summarizes the major issues found in the data validation process.

2.0 DATA VALIDATION

Two SDGs were analyzed and reported by Recra. The groundwater results for organics were reported in SDG 2-GW-1 and the sediment results for inorganics were reported in SDG 2-RB-1.

The laboratory's QC limits, such as spike recovery limits, surrogate recovery limits, and RPD limits, were sometimes different from those in the QAPP. In most cases, both sets of limits were satisfied, and the data were found to be acceptable. Any deviations from QC limits are specified in this report.

Analytical results were flagged according to the guidelines found in the EPA Region II validation SOP and SOW, when specified quality control results fell outside prescribed limits. Results flagged (J) are to be regarded as estimated values due to problems with the associated QC data or hold time exceedences. In instances where appropriate, bias is indicated with the estimation flag (J) by also adding an (L) flag to indicate that the data is biased low and an (H) flag to indicate that the data is biased high. In those instances where data would be biased low for one particular analytical discrepancy and also biased high for a separate analytical discrepancy, the flag does not reflect any bias at all since it is difficult to determine which discrepancy affected the data more. These data are simply flagged as estimated with a (J). At times, detection limits are flagged as estimated (UJ). Serious deviation from the prescribed QC specifications require rejection of associated data and should be flagged with an (R). No data were rejected in Phase II.

2.1 Halogenated Volatile Organics - SW8010

Calibration--A halogenated volatile organic concern related to the initial calibration verifications of the instruments. The percent relative standard deviations (%RSD) for all of the SW8010 compounds (except chloroform and bromochloromethane) were very high. The %RSD range for these compounds was 62.0% to 88.7%. Due to the evidence of the non-linearity of the calibration curve, the high point on the curve was eliminated and the %RSDs for all compounds recalculated. The range was still high at 33.9% to 79.6%. These high %RSD values were less than 90%, which fall within acceptable criteria for data usability and, therefore, do not need to be rejected. These data indicate a bias in the analytical systems and potential improper calibration techniques; therefore, the data is considered estimated and all SW8010 compounds except chloroform and bromochloromethane are flagged (J).

An additional concern regarding calibration was noted with the surrogate bromochloromethane (BCM). The wrong surrogate mix was used in the ending continuing calibration standard on August 16, 1996. The surrogate BCM exceeded the calibration curve in the ending CCV. Method SW8010 recommends that three surrogate halocarbons are spiked into each sample, standard, and reagent water blank to monitor the performance of the analytical system and the effectiveness of the methodology regarding sample matrix. Since BCM was the only surrogate spiked into the samples and this surrogate exceeded the calibration curve in the ending CCV, the data are considered estimated and potentially biased high. All associated compounds would be flagged (JH) except in those instances where the holding time was exceeded. The low bias from the potential degradation of the volatiles in the exceeded holding time samples may have altered the high bias from the BCM CCV exceedence. Therefore, these samples have been flagged as estimated with a (J).

Holding Time--There were several instances of missed holding times with the SW8010 samples. The holding time requirement for groundwater samples for the Erdle project is seven days. The following samples missed holding time by one day:

2-GW-1D
2-GW-1DD
2-GW-2D
2-GW-3-DL
2-GW-3D
2-GW-4D
2-GW-5D
2-GW-6D
2-TB-1

The following samples required dilutions and were analyzed one day later than the original analyses. These samples missed holding time by two days:

2-GW-1D-DL
2-GW-3D-DL
2-GW-6D-DL

It is possible that the halogenated volatile results are potentially biased low due to the expired holding time for the above referenced samples. However, due to the short time that these samples exceeded the holding time before analyses, these data are acceptable and need not be rejected. All affected samples are flagged as estimated (J) according to EPA guidelines and each sample is flagged (L) to indicate the data is potentially biased low. In samples where a high bias exists for additional analytical discrepancies simultaneously with the low bias from the exceeded holding time , a (J) flag is applied since it is difficult to determine which bias (low or high) has affected the samples to a greater degree.

The preservation requirement of 4° C for the SW8010 samples was met in all cases.

Method Blank Results--Method blanks were analyzed with each analytical batch to assess potential background contamination in the laboratory. Both of the method blanks that apply to SDG 2-GW-1 reported the presence of one common laboratory contaminant (methylene chloride). Methylene chloride was reported in both of these method blanks at a low concentration (0.25 μg/L) near the sample-specific detection limit. However, the concentration reported for this analyte was within acceptance criteria specified in the EPA Region II Guidelines and required no corrective action by the laboratory. It should be noted that samples analyzed on August 15, 1996, were diluted due to the high concentrations of compounds of interest. These diluted samples exhibited levels of methylene chloride that were higher than the original analyses. This effects samples 2-GW-1D DL and 2-GW-3D DL. Overall, the results of these analyses indicate that no significant contaminant contribution from handling, preparation, or analyses occurred in the laboratory.

Trip Blank Results--One trip blank was collected and analyzed for each sampling day. The trip blanks accompanied the samples shipped to the laboratory so that the samples could be monitored for potential contamination during sampling, storage, or transport of the samples.

There were two trip blanks analyzed for SW8010. Both trip blanks had methylene chloride reported at concentrations similar to the levels reported in the method blanks. One trip blank (2-TB-1) reported methylene chloride at a concentration of 0.94 μg/L and the other trip blank (2-TB-2) reported methylene chloride at a concentration of 1.5 μg/L. Overall, the methylene chloride results may be attributed to laboratory contamination and do not indicate significant contamination of samples from sampling, storage, or transport of the field samples.

Equipment Blank Results--Equipment blanks were not collected for halogenated volatile organics as specified in the Draft Phase II Remedial Investigation Work Plan for the Erdle Perforating Company, December 28, 1995.

Surrogate Recoveries--One surrogate standard, Bromochloromethane (BCM), was added to every sample analyzed for halogenated volatiles. The surrogate was added to provide an estimate of analytical measurement accuracy. All of the surrogate recoveries for the field samples were within laboratory control limits (70-127%) for BCM. The surrogate recoveries indicate that the analytical systems were in control at the time of analysis.

Matrix Spike Results--A matrix spike for SW8010 was not analyzed to assess matrix effects on analyte recovery. There was no field sample labeled for matrix spike/matrix spike duplicate (MS/MSD) analyses, and there was no additional volume sent to the laboratory for the MS/MSD. Therefore, matrix effects on analyte recoveries and method precision can not be assessed.

Laboratory Control Sample Results--A laboratory control sample (LCS) was analyzed in the same analytical batch as the field samples. This sample was processed through the same sample handling procedures as those for the field samples. The results of the LCS analysis estimate method accuracy in a clean matrix. All of the target analytes were recovered within the laboratory control limits for the LCS. A review of these data indicates acceptable method accuracy. An LCS duplicate sample was not performed for halogenated volatile organics. The LCS duplicate analysis estimates method precision in a clean matrix and indicates if potential bias has occurred due to improper calibration of the analytical systems. Since the LCS duplicate was not analyzed, method precision and any potential bias of the SW8010 analytical systems can not be assessed.

Field Duplicate Analysis--One field sample was collected in duplicate and submitted to the laboratory for analysis. Trichloroethene was the only analyte detected in both the parent sample (2-GW-1) and the field duplicate sample (2-GW-7). The concentrations of trichloroethene detected in each of these samples were high and initial dilutions were required. The normal sample was diluted 500 times and the field duplicate sample was diluted 200 times. The variance in the dilutions could potentially affect the results. The relative percent difference (RPD) for the field duplicate pair was 67.5%, which is elevated. This elevated RPD may indicate the possibility of poor sampling technique or poor analytical precision. However, the high concentrations of trichloroethene in these samples potentially caused matrix effects and the differences in the dilutions may have affected the results.

2.2 Aromatic Volatile Organics - SW8020

Calibration--The benzene, toluene, ethylbenzene, and xylene (BTEX) compounds were left out of the middle CCV standard A6C0002008 on the August 14, 1996, calibration. The remaining CCVs were prepared correctly and these compounds were present and within criteria. These compounds were not detected in any of the field samples.

Holding Time--There were several instances of missed holding times with the SW8020 samples. The holding time requirement for groundwater samples for the Erdle project is seven days. The following samples missed the holding time by one day:

2-GW-1D
2-GW-1DD
2-GW-2D
2-GW-3D

2-GW-4D
2-GW-5D
2-GW-6D
2-TB-1

The following samples required dilutions and were analyzed one day later than the original analyses. These samples missed the holding time by two days:

2-GW-1D-DL
2-GW-3D-DL

It is possible that results are potentially biased low due to the exceeded holding time for the above referenced samples. However, due to the short time that these samples exceeded the holding times before analyses, these data are acceptable and need not be rejected. All affected samples are flagged as estimated (J) according to EPA guidelines and each sample is flagged (L) to indicate that the data is potentially biased low.

The preservation requirement of 4° C for the SW8020 samples was met in all cases. For this project acid preservation of these samples was not required.

Method Blank Results--One method blank was analyzed with the SW8020 analytical batch to assess potential background contamination in the laboratory. This method blank did not have any aromatic volatile compounds reported at or below the stated detection limits. These data indicate that no contribution of contaminants from handling, preparation, or analyses occurred in the laboratory.

Trip Blank Results--One trip blank was collected and analyzed for each sampling day. The trip blanks accompanied the samples shipped to the laboratory so that the samples could be monitored for potential contamination during sampling, storage, or transport of the samples.

There were two trip blanks (2-TB-1 and 2-TB-2) analyzed for SW8020. The trip blanks did not have any aromatic volatile compounds reported at or below the stated detection limits. These data indicate that no contamination of samples from sampling, storage, or transport of field samples occurred.

Equipment Blank Results--Equipment blanks were not collected for aromatic volatile organics as specified in the Draft Phase II Remedial Investigation Work Plan for the Erdle Perforating Company, December 28, 1995.

Surrogate Recoveries--One surrogate standard, a,a,a-Trifluorotoluene (TFT), was added to every sample analyzed for aromatic volatiles. The surrogate was added to provide an estimate of analytical measurement accuracy. The surrogate recoveries were within the laboratory control limits (66-131%) except for the following exceptions. Both sample 2-GW-1D and 2-GW-3D reported TFT above the control limit at 188% and 160%, respectively. It is important to note that samples 2-GW-1D and 2-GW-3D were diluted due to the presence of high concentrations of trichloroethene. These dilutions may have elevated the surrogate recoveries. These samples were reanalyzed at higher dilutions and exhibited compliant surrogate recoveries. Overall, the surrogate recoveries indicate that the analytical systems were in control at the time of analysis.

Matrix Spike Results--A matrix spike was not analyzed to assess matrix effects on analyte recovery. There was no field sample labeled for matrix spike/matrix spike duplicate (MS/MSD) analyses, and there was no additional volume sent to the laboratory for the MS/MSD. Therefore, matrix effects on analyte recoveries and method precision can not be assessed.

Laboratory Control Sample Results--A laboratory control sample (LCS) was analyzed in the same analytical batch as the field samples. This sample was processed through the same sample handling procedures as those for the field samples. The results of the LCS analysis estimate method accuracy in a clean matrix. All of the target analytes were recovered within the laboratory control limits for the LCS. A review of these data indicates acceptable method accuracy. An LCS duplicate sample was not performed for aromatic volatile organics. The LCS duplicate analysis estimates method precision in a clean matrix and indicates if potential bias has occurred due to improper calibration of the analytical systems. Since the LCS duplicate was not analyzed, method precision and any potential bias of the SW8020 analytical systems cannot be assessed.

Field Duplicate Analysis--One field sample was collected in duplicate and submitted to the laboratory for analysis. The field sample pair (2-GW-1 and 2-GW-7) did not have any target aromatic volatile compounds detected. Consequently, sampling and analytical precision cannot be estimated from these data.

2.3 Total Metals - ICP-CLP

One sediment sample was collected and analyzed for aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc by Inductively Coupled Plasma according to Contract Laboratory Program (ICP-CLP) protocols.

Holding Time--All sample preparation and analyses were performed within the EPA and project QAPP-specified maximum holding time requirements of 180 days. The sediment sample, SD-2A met the 4 °C preservation requirement and the associated equipment blank, 2-RB-1, met the pH < 2 with Nitric Acid (HNO_3), 4 °C preservation requirements.

Method Blank Results--Two Method blanks were analyzed with the ICP-CLP analytical batch to assess potential background contamination in the laboratory. The method blanks reported had low-levels of target analytes detected above the stated detection limits. The measurement values were within acceptance criteria specified in the EPA Region II Guidelines and required no corrective action by the laboratory. These data indicate that no significant contribution of contaminants from handling, preparation, or analyses occurred in the laboratory.

Equipment Blank Results--One equipment blank was collected and analyzed for the target ICP-CLP analytes as specified in the Draft Phase II Remedial Investigation Work Plan for the Erdle Perforating Company, December 28, 1995. Equipment blank 2-RB-1 reported target analytes similar to the method blank analytical measurement results. Consequently, these analyses indicate that the cleaning process in the field was adequate and did not artificially introduce contaminants to the field samples.

Matrix Spike Results--A matrix spike was performed on the equipment blank sample 2-RB-1. The spike results in this sample were acceptable and the percent recoveries for all analytes were within QAPP control limits. These results indicate good analytical accuracy. An MSD was not performed on sample 2-RB-1; consequently, analytical precision for this sample cannot be assessed. A matrix spike was not analyzed to assess matrix effects on analyte recovery in soil. Field sample 2-SD-2 was not labeled for matrix spike/matrix spike duplicate (MS/MSD) analysis. Therefore, matrix effects in soil on analyte recoveries and method precision can not be assessed.

Laboratory Control Sample Results--A laboratory control sample and a duplicate (LCS/LCSD) were analyzed in the same analytical batch as the field samples. These samples were processed through the same sample handling procedures as those for the field samples. The results of the LCS/LCSD analyses estimate method accuracy and precision in a clean matrix. All of the target analytes were recovered within the laboratory control limits for the aqueous LCS and LCSD samples with the following exceptions. The recovery of barium (72%), chromium (72.5%) and vanadium (73.3%) fell outside of QC limits (80%-125%) in the aqueous LCS. The recovery of these compounds was acceptable in the LCSD. The recovery of zinc (154.0%) fell outside of the QC limits in the soil LCS (80%-125%). All spike recoveries were acceptable in the soil LCSD. All of the RPDs for the LCS and LCSD samples were within the laboratory control limits. In addition to these LCS/LCSD pairs, the laboratory analyzed a separate LCS for aqueous and solid samples. These additional LCS's were analyzed with a slightly different mixture of inorganic analytes. These LCS inorganic mixtures were stock preparations from a manufacturer. All of the target analytes were recovered within the manufacturer's established control limits except for aluminum which was recovered below the lower QC limit in the solid LCS. An LCSD was not analyzed with these additional LCS samples. The other solid LCS that was analyzed was not spiked with aluminum; therefore, the only recovery value for aluminum in a solid sample is 54.6%. The aluminum result in sample SD-2A is considered estimated and potentially biased low and is flagged (JL). Overall, a review of these data indicates both acceptable method accuracy and no significant bias because of improper calibration of the analytical systems.

Field Duplicate Analysis--Sediment sample SD-2A was not collected in duplicate. Consequently, sampling and analytical precision cannot be estimated from these data.

Data Validation Narrative
Erdle Perforating Project

Method: Halogenated Volatile Organics by SW8010

SDG Number: 2-GW-1

Holding Times: There were several instances of missed holding times for SW8010 samples. Sample holding time for groundwater is seven days. Nine samples missed holding times by one day. Three samples were diluted and reanalyzed. These samples missed holding time by two days. Samples are flagged as estimated (J) and potentially biased low (L).

Samples Selected for Full Validation: 2-GW-1; 2-GW-7 (duplicate of 2-GW-1); 2-GW-4; 2-GW-4D

Flagging requirements are listed in the table below. Other discrepancies are noted as follows:

- No calculation sheets were included in the data package. Quantitation of results were confirmed for 10% of the samples. No problems with quantitation of compounds were found.

- Percent Relative Standard Deviation (%RSD) was only reported for two compounds - chloroform and bromochloromethane. Calculations of %RSD for the remaining twenty three halogenated volatile organic compounds indicates a problem with the initial calibrations for all of these compounds. The criteria requires that %RSD must be less than or equal to 30.0% for all volatile compounds. All compounds in this data set were above 30% with a range of 33.9% to 88.7%. These compounds are flagged (J) to indicate that these data are estimated.

- The wrong surrogate mix was used in the ending continuing calibration standard on August 16, 1996. The surrogate bromochloromethane (BCM) exceeded the calibration curve in the ending continuing calibration verification (CCV). No other surrogates were used. Flag any hits as estimated (J) and potentially biased high (H).

- A matrix spike and matrix spike duplicate pair were not analyzed to assess matrix effects on analyte recovery.

- A laboratory control sample duplicate was not analyzed to assess method precision.

- The compounds trans-1,2-dichloroethene and chloroform were outside the retention time window in the CCV standard A6C0001973 on August 14, 1996. Affected samples were elevated for the shift and a second confirmation performed for all results.

- The compound bromoform was below QC limits in the ending CCV standard on August 16, 1996. Bromoform was not detected in any samples.

The flagging notes in the table below have been applied to the data contained in the Sample Data Summary Package. In cases where one result has been selected over another, the de-selected values have been crossed out in red, per EPA Region II guidance.

Flagging Requirements			
Basis for Qualification	**Compound**	**Sample ID**	**Action**
Missed holding times by 1 day	all	2-GW-1D 2-GW-1DD 2-GW-2D 2-GW-3-DL 2-GW-3D 2-GW-4D 2-GW-5D 2-GW-6D 2-TB-1	Flag: JL Technical holding time criteria as stated in 40 CFR Part 136 is 7 days for SW8010. Flag all samples as estimated and potentially biased low.
Missed holding times by 2 days	all	2-GW-1D-DL 2-GW-3D-DL 2-GW-6D-DL	Flag: JL (See action above)
Percent Relative Standard Deviation (%RSD) > 30%	all detected compounds except: chloroform and bromochloromethane.	All samples	Flag: J If %RSD > 30% < 90%, qualify positive results as estimated.
Surrogate bromochloromethane exceeded ending CCV	all detected compounds	All samples	Flag: JH All positive results are qualified as estimated and potentially biased high.

ERDLE PERFORATING PROJECT: Hold Times - Volatiles

Sample Field ID	Sample Lab ID	Matrix	Analyte Method	Collection Date	Analysis Date	Hold Time (days)	Hold Time Met? (Y,N)	Sample Properly Preserved? (Y,N)
2-GW-1	A6374501	Water	8010	8/7/96	8/14/96	7	Y	Y
2-GW-1D	A6374511	Water	8010	8/6/96	8/14/96	8	N	Y
2-GW-1D-DL	A6374511DL	Water	8010	8/6/96	8/15/96	9	N	Y
2-GW-1DD	A6374512	Water	8010	8/6/96	8/14/96	8	N	Y
2-GW-2	A6374502	Water	8010	8/7/96	8/14/96	7	Y	Y
2-GW-2D	A6374513	Water	8010	8/6/96	8/14/96	8	N	Y
2-GW-3	A6374503	Water	8010	8/7/96	8/14/96	7	Y	Y
2-GW-3-DL	A6374503DL	Water	8010	8/7/96	8/15/96	8	N	Y
2-GW-3D	A6374514	Water	8010	8/6/96	8/14/96	8	N	Y
2-GW-3D DL	A6374514DL	Water	8010	8/6/96	8/15/96	9	N	Y
2-GW-4	A6374504	Water	8010	8/7/96	8/14/96	7	Y	Y
2-GW-4D	A6374515	Water	8010	8/6/96	8/14/96	8	N	Y

Hold times for ~~soil and~~ water samples: Erdle - 7 days

Preservation : Erdle - 4 °C

•If hold time exceeds criteria, qualify results > IDL as estimated and biasd low (JL) and sample quantitation limits as (UJ). If HT > 14 days, NDs may be unusable, (R); use professional judgement. If HT > 28 days, all NDs are (R).

ERDLE PERFORATING PROJECT: Hold Times - Volatiles

Sample Field ID	Sample Lab ID	Matrix	Analyte Method	Collection Date	Analysis Date	Hold Time (days)	Hold Time Met? (Y,N)	Sample Properly Preserved? (Y,N)
2-GW-5	A6374505	Water	8010	8/7/96	8/14/96	7	Y	Y
2-GW-5D	A6374516	Water	8010	8/6/96	8/14/96	8	N	Y
2-GW-6	A6374506	Water	8010	8/7/96	8/14/96	7	Y	Y
2-GW-6D	A6374517	Water	8010	8/6/96	8/14/96	8	N	Y
2-GW-6D DL	A6374517DL	Water	8010	8/6/96	8/15/96	9	N	Y
2-GW-7	A6374507	Water	8010	8/7/96	8/14/96	7	Y	Y
2-TB-2	A6374508	Water	8010	8/7/96	8/14/96	7	Y	Y
2-TB-1	A6374518	Water	8010	8/6/96	8/14/96	8	~~Y~~ N QJK	Y

Hold times for ~~soil and~~ water samples: Erdle - 7 days

Preservation : Erdle - 4 °C

•If hold time exceeds criteria, qualify results > IDL as estimated and biasd low (JL) and sample quantitation limits as (UJ). If HT > 14 days, NDs may be unusable, (R); use professional judgement. If HT > 28 days, all NDs are (R).

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples Affected/Comments
1.0	Calibration				
1.1	Was the instrument calibrated initially before blanks and samples were analyzed?	✓			ICB Form 6L (8/6/96)
1.2	Were at least five initial standard concentrations run, including a standard near, but above, the method detection limit?	✓			Concentrations of standards: 5, 20, 40, 60, 80, 100 (μg/L) (6 stds)
1.3	Did the remaining calibration standard concentrations correspond to the expected range of the concentrations found in Phase I Normal samples? If not, did they define the working range of the GC?	✓			
1.4	Were all initial calibration $(\overline{RRF})$ values ≥ 0.05? • If $(\overline{RRF}) < 0.05$, qualify positive results as biased low (L) and ND as unusable (R) for the affected compound.			✓	No RRF values given.
1.5	Did all initial % RSD values meet those listed in Table 2? • If % RSD > 30%, qualify positive results as estimated (J) for the affected compound; qualify NDs using professional judgment. • If % RSD > 90%, flag all NDs (R). (Allowance is made for any two volatile compounds; for these, % RSD must be ≤ 40% with minimum RRFs ≥ 0.010 for the initial calibration to be acceptable.) • Analytes "U" flagged due to blank contamination are still considered hits when flagging fro calibration problems.		✓		All % RSD > 30% except chloroform and bromochloromethane. chloroform % RSD = 7.2% bromochloromethane % RSD = 5.4% Range for % RSD for all other compounds ⇒ 33.9% → 88.7% → Flag these "J"
1.6	Were all continuing calibration RRF values ≥ Table 2 values? (Check 10%, for one curve per pkg.) • If RRF < 0.05, qualify positive results as estimated, biased low (JL) and NDs as unusable (R) for the affected compound.			✓	No RRF values given. Recra Lab does not use internal standards for SW8010.

$$RRF = \frac{A_x}{A_{IS}} \times \frac{C_{IS}}{C_x}$$

where A = EICP
C = [analyte]
IS = Internal Standard
X = analyte of

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples Affected/Comments
1.7	Did all continuing calibration % Differences meet the values listed in Table 2? • If not, qualify positive results as estimated (J) for the affected compound; qualify NDs using professional judgement. • If % RSD > 90%, flag all NDs (R).			✓	% Ds cannot be calculated. No I.S. method of calibration used in this data set.
1.8	Does recalculation of the ($\overline{\text{RRF}}$) and RRF for one or more TCL compounds verify the reported value? • If RRFs were incorrectly generated from misidentified peaks, the laboratory should recalculate the RRFs and associated sample results. (See Functional Guidelines)			✓	Not calculated ⇒ not enough information in data set.
1.9	Does recalculation of the initial calibration % RSD for one or more TCL compounds verify the reported value?	✓			chloroform: % RSD = 6.9% Reported 7.2% Calculated bromochloroform: % RSD = 5.4% Reported & Calculated
1.10	Does recalculation of the % Difference (% D) between RRF and RRF verify the reported value?			✓	See 1.7 above 5.3 ok 5.4
General Comments	chloroform and bromochloromethane are the only compounds with % RSD reported in the data set. The other compounds did not have % RSD reported. Calculations of these compounds indicated the data is estimated since % RSD > 30% < 90% in these cases. Flag "J".				
2.0	**Blanks**				
2.1	Were results presented using Form I for all method blanks and matrix spike blanks? Was the Method Blank summary Form IV provided? • If blank data is not available, qualify all positive data (R) Field and trip blank data may be substituted using professional judgement.	✓ ✓			
2.2	Has a method blank been reported for each matrix and each GC System?	✓			

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples Affected/Comments
2.3	Do the method blanks contain ≤ 10x CRQL for methylene chloride? • Qualify results < CRQL and < 10x the blank concentrations for methylene chloride by elevating the limit of detection. (Report CRQL and flag U). Qualify results > CRQL and < 10x the blank concentration as (U). Compare equivalent data (see Functional Guidelines). • Qualify results attributable to carry-over as unreliable (R).	✓			$MeCl_2$ in all blanks but < 10 x CRQL MBlk A6B0684401 = 0.25 µg/L (ok) MBlk A6374520 = 0.25 µg/L (ok) Matrix Spike Blk = 4.6 µg/L (ok) (A6B0684402)
2.4	Do the method blanks contain ≤ 5x CRQL for other volatile target compounds? • Qualify results < CRQL and < 5x the blank concentrations for other volatile target compounds by elevating the limit of detection. (Report CRQL and flag U). Qualify results > CRQL and < 5x the blank concentration as (U). Compare equivalent data (see Functional Guidelines). • Qualify results attributable to carry-over as unreliable (R).	✓			No volatile target compounds found in blks. ⇒ Only $MeCl_2$ ⇒ lab contamination ⇒ see 2.3 above
2.5	Were field blanks collected for the sample set according to the Phase II Remedial Investigation Work Plan?			✓	Field Blanks not required according to Phase II Work Plan.
2.6	Do field blanks contain compounds above the levels specified for method blanks?			✓	No field blanks
2.7	Did a trip blank accompany each cooler containing VOA samples?**	✓			
2.8	Was an equipment blank (rinsate) collected collected according to the Phase II Remedial Investigation Work Plan?			✓	Equipment Blanks not required for SW8010 samples. See Phase II Work Plan.
General Comments					
3.0	Surrogates				

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples Affected/Comments
3.1	Was Form II included in the analytical report? Are all samples and surrogate recoveries listed on the form? (Check for transcription and calculation errors).	✓ ✓			
3.2	Were surrogates added to all standards, samples, and blanks?	✓			⊛ Ending continuing cal std (8/16/96) The wrong surrogated mix was used. See General Comment
3.3	Are surrogate recoveries for samples within the limits in table 6 of D-II, Section IV? Are outliers marked with an asterisk? • If surrogate is low or high, or 2 to 3 surrogates are mixed low to high, qualify results > IDL as estimated (J) and quantitation limits as estimated (UJ). • If 1 surrogate < 10% R, qualify results > IDL as estimated, and biased low (JL) and quantitation limits as unreliable (R). • If 2 to 3 surrogates are all low, qualify results > IDL as biased low (L) and quantitation limits as biased low (UL). • If 2 to 3 surrogates are all high, qualify results > IDL as estimated, and biased high (JH); do not qualify NDs. •Ensure the samples were reanalyzed. For soils: the methanol extract is reanalyzed before the sample is reextracted. If the reanalysis is acceptable, only the reanalyzed data need be submitted. If it is not, data from both anallyses are submitted. • If dilution prevents surrogate detection, state in the narrative that method accuracy cannot be verified.	✓			
3.4	Are surrogate recoveries for blanks within these same limits? • If not, the blanks and all associated samples must be reanalyzed.	✓			

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples Affected/Comments
General Comments	The surrogate Bromochloromethane exceeded the cal. curve. Data considered to be estimated (J) for this compound and possibly biased high (H). Flag any hits (JH).				
4.0	Matrix Spike/Matrix Spike Duplicate				
4.1	Was Form III included in the analytical report? Check for transcription and calculation errors.	✓			Matrix Spike Blank info. ⇒ Lab calls this an LCS.
4.2	Was an MS/MSD analyzed at the prescribed frequency? (Paragraph 10.10, D-II, Section IV)?		✓		MS/MSD not analyzed for SW8010. Field crew did not label sample as MS/MSD No extra volume available
4.3	Do the % Recoveries (%R) fall within the limits listed in Table 7?			✓	No MS/MSD analyzed
4.4	Do the RPD values fall within the limits listed in the SOW?			✓	No RPD → not calculable.
4.5	Does recalculation of the % R and RPD values verify the reported values? (Recalculate 1 per pkg, for 10% of the target volatiles.)			✓	No %R ⇒ No RPD
	• Use results in conjuction with other QC criteria and qualify data according to professional judgment, if needed.				Cannot assess matrix effects on analyte recoveries in field samples.
General Comments					
5.0	Field Duplicates				
5.1	Were field duplicates analyzed with the sample set, according to the Phase II Remedial Investigation Work Plan?	✓			Field dup = 2-GW-7. (Dup of MW-1 ⇒ ID = 2-GW-1.

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples ~~Affected~~/Comments
Normal = 2-GW-1 Dup = 2-GW-7					
General Comments RPD = Trichloroethene $\frac{\lvert 1.04-2.1 \rvert}{1.57} \times 100 = 67.5 \Rightarrow$ high Both samples diluted to 500 µg/L and 200 µg/L respectively due to ↑ Trichloroethene					
6.0	Internal Standards Performance				
6.1	Was Form VIII included in the analytical report?		✓		Recra does not perform I.S. method of calibration for SW8010 → Not req'd
6.2	Was an internal standard added to all standards, samples and blanks?		✓		by method. Recra used linear regression on calibrations.
6.3	Was the internal standard concentration 50 µg/L for each compound?			✓	See 6.1
6.4	Are sample IS retention times within 30 sec of the continuing cal std IS retention time? (Check one per pkg.) • If sample IS retention times are not within 30 sec, determine if false positives or negatives exist. Large shifts may require total or partial data rejection.			✓	See 6.1
6.5	Are sample IS areas within a factor of 2 of the continuing cal std IS area? • If sample IS areas are outside this range, qualify results for compounds using those IS as estimated (J) for that sample fraction; qualify NDs as estimated (UJ). If a severe loss of sensitivity is seen, qualify NDs as unusable (R).			✓	See 6.1
General Comments					
7.0	Target Compound Verification				
7.1	Were Form I, chromatograms, and data printouts provided for each sample?	✓			

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples Affected/Comments
7.2	Are sample RRTs within 0.06 units of the standard RRT? Check 10% of target volatiles of the samples selected for full validation..	✓			
7.3	Are standard chroms similar to sample chroms?	✓			
7.4	Are sample chroms free of carry-over effects, esp. if low concentration samples are preceded by high-concentration samples? • If incorrect compound identifications were made, flag all affected data as not detected (U) or unusable (R). • If raw data suggests presence of a target compound, but the chromatogram contains inadequacies, report the compound as not confirmed and therefore not detected (U). • If a compound with acceptable matching characteristics is not reported, add it to the sample data summary. If > CRQL, the lab should examine and re-submit the result.	✓			Samples 2-GW-1, 2-GW-1D, 2-GW-1D-DL all exhibit ↑ concent. Samples following ⇒ 2-GW-1-DD, 2-GW-2D no carryover effects.
7.5	Are the standard chromatographic ions present > 10% also seen in the sample chromatograms? Do sample and standard relative intensities agree within 20% • The lab must provide the three best chrom matches for non-TCL analytes.	✓			
General Comments					
8.0	Compound Quantitation, Dilution and Reported Detection Limits				
8.1	Did dilutions keep the largest analyte peak response for a target compound in the upper half of the initial calibration range?	✓			
8.2	Verify that data was submitted for no more than two analyses (ie. the original and one dilution, or the more concentrated dilution and one further dilution).	✓	~~✓~~ DIK		Data reported for original and one dilution.

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples Affected/Comments
8.3	Verify that MS/MSD analyses were not diluted for the purpose of bringing either spiked or non-spiked analytes within calibration range. • If a MS/MSD sample contains high indigenous levels of spiking analytes, the concentration and recovery should be calculated from the undiluted analysis; the problem should be noted with the SDG narrative.			✓	Matrix spike blank used as LCS. No MS/MSD analyzed → Field crew did not designate MS/MSD sample and did not send extra volume.
8.4	Verify the the m/p-xylene and the o-xylene peaks were quantitated, and if necessary diluted separately. • Areas of both peaks and the single isomer RRF should be used to quantitate results.			✓	SW 8020 only ⇒ does not apply to SW8010
8.5	Were the sample RRFs calculated based on the correct internal standard for that compound?			✓	No I.S. method of calibration used. Not required by method SW8010.
8.6	Does recalculation of the compound quantitations verify the reported results? (Recalculate 10% of the samples, for 10% of the target volatiles.) • If errors > 10% are found, they should be identified and corrected on the sample data summary, and noted in the narrative, and support documentation. • If an ion used for quantitation is saturated, qualify result as biased low (L). • If an ion used for quantitation is not saturated but exceeds the highest standard, qualify results as estimated (J).	✓			(See Attached Recalculation Sheet.)
8.7	Are the reported sample results, and quant reports free of transcription errors from the quant sheets, chromatograms, and sample prep logs?	✓			
8.8	Have the CRQLs been adjusted for sample dilution, splits, clean-up activities and dry weight factors?	✓			

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples Affected/Comments
General Comments					
9.0	Tentatively Identified Compounds (TICs)				
9.1	Were up to 10 TICs reported for each sample and blank which have area/height greater than 10% of the size of the nearest internal standard? • If the library search identified a target compound not reported in the data summary, have the lab recalculate the target compound result; determine whether the false negative is an isolated occurrence.			✓	TIC's not performed by GC.
9.2	Are any TCLs erroneously listed as TICs?			✓	No TIC's for SW8010 ⇒ GC.
9.3	Are TICs present in sample absent in the blanks? (Check TICs for the samples selected for validation.) • If TICs present in a sample are present within 5x the concentration of a blank qualify the TIC (R) and draw a line through the data. • If common lab contaminants are present > 10x levels in the blanks, qualify results (R). • If a TIC tentative identification is unacceptable, the identification should be changed to "unknown". TICs not sufficiently above blank levels should not be reported. • All similar isomers should be reported as a total.			✓	No TIC's for SW8010 ⇒ GC.
General Comments					
10.0	System Performance				
10.1	Were abrupt, discrete shifts in the chromatograms found?		✓		chromo ok

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8010

		Yes	No	N/A	Samples Affected/Comments
10.2	Were shifts in absolute internal standard retention times found?			✓	No I.S. method of calibration used ⇒ linear regression w/cal curve.
10.3	Was an excessive baseline rise of elevated temperature noted?		✓		
10.4	Were extraneous peaks noted for calibration standards?		✓		
General Comments					
11.0	Sample Integrity				
11.1	Did the laboratory narratives state problems with sample receipt or conditions that would affect quality? • If the VOA vials analyzed contained air bubbles, flag all positive results (J) and all NDs (R). • If sample temperature was not 2-4°C upon receipt, flag positive results (J) and NDs (UJ).		✓		Sample Integrity good.
General Comments					

Erdle Perforating Project

Recalculation Sheet
Volatiles SW 8010

1. Initial Calibration % Relative Standard Deviation (% RSD)

$\% RSD = \frac{\sigma}{+} x 100$

where σ = std dev. of 5 RF

and + = mean of 5 RFs

ICAL 8/6/96 Instrument HP 5890-3 B

Trichloroethene

[Stds]	area
5	1.77
20	7.23
40	1.46
60	2.06
80	2.91

$\bar{x} = 3.086$

$\sigma_{n-1} = 2.379$

$\% RSD = \left(\frac{2.379}{3.086}\right) \times 100 = \boxed{77.1\%}$ high: flag "J" ⇒ estimated

2. % Difference (% D) Cannot Calculate % D

$\% D = \frac{\overline{RRFI} - RRF_c}{RRF_i} x 100$

where $\overline{RRFI}$ = average RRF

and RRF_c = RRF continuin

Reesa Lab does not use internal standards for SW8010.

Lab did not report an RRF.

$RRF = \frac{A_x}{A_{I.S.}} \times \frac{C_{I.S.}}{C_x}$

$\overline{RRF} = \frac{\sum_{i=1}^{5} RRF_i}{5}$

Where: RRF_i = "i"th Relative Response Facto

A = EICP

C = [analyte] Concentration of analyte & I.S.

I.S. = Internal Std.

X = analyte of interest.

Matrix Spike/Matrix Spike Duplicates (MS/MSD) % Recovery Not Calculated.

$$\%R = \frac{spiked\ sample\ result\ -\ sample\ result}{spike\ added} x\ 100$$

Ricra lab did not analyze MS/MSD ⇒ Field Crew did not label field sample as MS/MSD.

4. MSD Relative Percent Difference (RPD) Not Calculated.

$$D = \frac{X_1 - X_2}{(\frac{X_1 + X_2}{2})} x\ 1$$

No MSD analyzed.
Can not calculate RPD.

Sample Quantitation

~~*of the target volatile characteristic ion(EICP) (ng int std*~~
~~*of the EICP for the specific int std) (cal std RRF) (mL*~~

~~*(Area of the target volatile (EICP) (ng int std. added)*~~
~~*(Area of the EICP for the specific int std) (cal std RRF) (g sample)*~~

~~*(Area of the target volatile EICP) (ng int std. added)* (1000) (*DF*) (*total mL methanol ex*~~

~~*of the EICP for the specific int std) (cal std RRF) (µL methanol extract added to reagent purge water)*~~
~~*(g soil extr*~~

Recra did not use internal stds.

(Linear regression from cal curve.)
Calculation uses mean response. ($\overline{RF}$)

Trichloroethene → Dilution = 500

conc.	area
5	35,480
20	36,150
40	36,500
60	34,330
80	36,375
100	33,100

$\overline{RF}$ = 35,322

$$\frac{183633.20}{35{,}322.} = 5.19\ \mu g/L \checkmark$$

ok

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-1

Lab Name: Recra LabNet   Contract: ______

Lab Code: RECNY   Case No.: ______   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374501

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3B02291.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 500.00

Soil Extract Volume: ______(uL)   Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	100	U J
75-25-2	Bromoform	500	U
74-83-9	Bromomethane	500	U
56-23-5	Carbon Tetrachloride	100	U
108-90-7	Chlorobenzene	200	U
75-00-3	Chloroethane	500	U
110-75-8	2-Chloroethylvinyl ether	500	U
67-66-3	Chloroform	100	U
74-87-3	Chloromethane	400	U J
124-48-1	Dibromochloromethane	100	U
95-50-1	1,2-Dichlorobenzene	200	U
541-73-1	1,3-Dichlorobenzene	200	U
106-46-7	1,4-Dichlorobenzene	200	U
75-34-3	1,1-Dichloroethane	100	U
107-06-2	1,2-Dichloroethane	100	U
75-35-4	1,1-Dichloroethene	100	U
156-60-5	trans-1,2-Dichloroethene	100	U
78-87-5	1,2-Dichloropropane	100	U
10061-01-5	cis-1,3-Dichloropropene	100	U
10061-02-6	trans-1,3-Dichloropropene	100	U
75-09-2	Methylene chloride	1500	B
79-34-5	1,1,2,2-Tetrachloroethane	100	U
127-18-4	Tetrachloroethene	100	U
71-55-6	1,1,1-Trichloroethane	100	U
79-00-5	1,1,2-Trichloroethane	100	U
79-01-6	Trichloroethene	520	
75-69-4	Trichlorofluoromethane	500	U
75-01-4	Vinyl chloride	2600	

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-1D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374511

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02283.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 200.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	40	U J
75-25-2	Bromoform	200	U
74-83-9	Bromomethane	200	U
56-23-5	Carbon Tetrachloride	40	U
108-90-7	Chlorobenzene	80	U
5-00-3	Chloroethane	200	U
110-75-8	2-Chloroethylvinyl ether	200	U
67-66-3	Chloroform	40	U
74-87-3	Chloromethane	160	U
124-48-1	Dibromochloromethane	40	U
95-50-1	1,2-Dichlorobenzene	80	U
541-73-1	1,3-Dichlorobenzene	80	U
106-46-7	1,4-Dichlorobenzene	80	U
75-34-3	1,1-Dichloroethane	40	U
107-06-2	1,2-Dichloroethane	40	U
75-35-4	1,1-Dichloroethene	40	U
156-60-5	trans-1,2-Dichloroethene	40	U
78-87-5	1,2-Dichloropropane	40	U
10061-01-5	cis-1,3-Dichloropropene	40	U
10061-02-6	trans-1,3-Dichloropropene	40	U
75-09-2	Methylene chloride	170	B
79-34-5	1,1,2,2-Tetrachloroethane	40	U
127-18-4	Tetrachloroethene	40	U
71-55-6	1,1,1-Trichloroethane	40	U
79-00-5	1,1,2-Trichloroethane	40	U
79-01-6	Trichloroethene	8400	E
75-69-4	Trichlorofluoromethane	200	U
75-01-4	Vinyl chloride	200	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

C00077

Client No.

2-GW-1D DL

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374511DL

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02296.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 500.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
75-27-4	Bromodichloromethane	100	U J
75-25-2	Bromoform	500	U
74-83-9	Bromomethane	500	U
56-23-5	Carbon Tetrachloride	100	U
108-90-7	Chlorobenzene	200	U
75-00-3	Chloroethane	500	U
110-75-8	2-Chloroethylvinyl ether	500	U
67-66-3	Chloroform	100	U
74-87-3	Chloromethane	400	U
124-48-1	Dibromochloromethane	100	U
95-50-1	1,2-Dichlorobenzene	200	U
541-73-1	1,3-Dichlorobenzene	200	U
106-46-7	1,4-Dichlorobenzene	200	U
75-34-3	1,1-Dichloroethane	100	U
107-06-2	1,2-Dichloroethane	100	U
75-35-4	1,1-Dichloroethene	100	U
156-60-5	trans-1,2-Dichloroethene	100	U
78-87-5	1,2-Dichloropropane	100	U
10061-01-5	cis-1,3-Dichloropropene	100	U
10061-02-6	trans-1,3-Dichloropropene	100	U
75-09-2	Methylene chloride	4000	BD
79-34-5	1,1,2,2-Tetrachloroethane	100	U
127-18-4	Tetrachloroethene	100	U
71-55-6	1,1,1-Trichloroethane	100	U
79-00-5	1,1,2-Trichloroethane	100	U
79-01-6	Trichloroethene	9900	D
75-69-4	Trichlorofluoromethane	500	U
75-01-4	Vinyl chloride	500	U

FORM I - GC VOA

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-1DD

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374512

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02276.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U J
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U ↓

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-2

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374502

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02292.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 50.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	10	U J
75-25-2	Bromoform	50	U
74-83-9	Bromomethane	50	U
56-23-5	Carbon Tetrachloride	10	U
08-90-7	Chlorobenzene	20	U
5-00-3	Chloroethane	50	U
110-75-8	2-Chloroethylvinyl ether	50	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	40	U J
124-48-1	Dibromochloromethane	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
75-34-3	1,1-Dichloroethane	10	U
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-09-2	Methylene chloride	160	B
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	10	U
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	1000	
75-69-4	Trichlorofluoromethane	50	U
75-01-4	Vinyl chloride	98	

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.: 2-GW-2D

Lab Name: Recra LabNet   Contract: ______

Lab Code: RECNY   Case No.: ______   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374513

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3B02282.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 4.00

Soil Extract Volume: ______(uL)   Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-27-4	Bromodichloromethane	0.80	U	J
75-25-2	Bromoform	4.0	U	
74-83-9	Bromomethane	4.0	U	
56-23-5	Carbon Tetrachloride	0.80	U	
08-90-7	Chlorobenzene	1.6	U	
5-00-3	Chloroethane	4.0	U	
110-75-8	2-Chloroethylvinyl ether	4.0	U	
67-66-3	Chloroform	0.80	U	
74-87-3	Chloromethane	3.2	U	
124-48-1	Dibromochloromethane	0.80	U	
95-50-1	1,2-Dichlorobenzene	1.6	U	
541-73-1	1,3-Dichlorobenzene	1.6	U	
106-46-7	1,4-Dichlorobenzene	1.6	U	
75-34-3	1,1-Dichloroethane	2.4		
107-06-2	1,2-Dichloroethane	0.80	U	
75-35-4	1,1-Dichloroethene	0.80	U	
156-60-5	trans-1,2-Dichloroethene	1.0		
78-87-5	1,2-Dichloropropane	0.80	U	
10061-01-5	cis-1,3-Dichloropropene	0.80	U	
10061-02-6	trans-1,3-Dichloropropene	0.80	U	
75-09-2	Methylene chloride	4.1	B	
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U	
127-18-4	Tetrachloroethene	0.80	U	
71-55-6	1,1,1-Trichloroethane	3.9		
79-00-5	1,1,2-Trichloroethane	0.80	U	
79-01-6	Trichloroethene	13		
75-69-4	Trichlorofluoromethane	4.0	U	
75-01-4	Vinyl chloride	4.0	U	↓

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-3

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374503

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02293.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 25000.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
75-27-4	Bromodichloromethane	5000	U J
75-25-2	Bromoform	25000	U
74-83-9	Bromomethane	25000	U
56-23-5	Carbon Tetrachloride	5000	U
108-90-7	Chlorobenzene	10000	U
5-00-3	Chloroethane	25000	U
110-75-8	2-Chloroethylvinyl ether	25000	U
67-66-3	Chloroform	5000	U
74-87-3	Chloromethane	20000	U J
124-48-1	Dibromochloromethane	5000	U
95-50-1	1,2-Dichlorobenzene	10000	U
541-73-1	1,3-Dichlorobenzene	10000	U
106-46-7	1,4-Dichlorobenzene	10000	U
75-34-3	1,1-Dichloroethane	5000	U
107-06-2	1,2-Dichloroethane	5000	U
75-35-4	1,1-Dichloroethene	5000	U
156-60-5	trans-1,2-Dichloroethene	5000	U
78-87-5	1,2-Dichloropropane	5000	U
10061-01-5	cis-1,3-Dichloropropene	5000	U
10061-02-6	trans-1,3-Dichloropropene	5000	U
75-09-2	Methylene chloride	140000	B
79-34-5	1,1,2,2-Tetrachloroethane	5000	U
127-18-4	Tetrachloroethene	5000	U
71-55-6	1,1,1-Trichloroethane	5000	U
79-00-5	1,1,2-Trichloroethane	5000	U
79-01-6	Trichloroethene	660000	E
75-69-4	Trichlorofluoromethane	25000	U
75-01-4	Vinyl chloride	25000	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

C00102

Client No.

2-GW-3 DL

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374503DL

Sample wt/vol: 0.50 (g/mL) ML Lab File ID: 3B02303.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 10000.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-27-4	Bromodichloromethane	20000	U	J
75-25-2	Bromoform	100000	U	
74-83-9	Bromomethane	100000	U	
56-23-5	Carbon Tetrachloride	20000	U	
108-90-7	Chlorobenzene	40000	U	
5-00-3	Chloroethane	100000	U	
110-75-8	2-Chloroethylvinyl ether	100000	U	
67-66-3	Chloroform	20000	U	
74-87-3	Chloromethane	80000	U	
124-48-1	Dibromochloromethane	20000	U	
95-50-1	1,2-Dichlorobenzene	40000	U	
541-73-1	1,3-Dichlorobenzene	40000	U	
106-46-7	1,4-Dichlorobenzene	40000	U	
75-34-3	1,1-Dichloroethane	20000	U	
107-06-2	1,2-Dichloroethane	20000	U	
75-35-4	1,1-Dichloroethene	20000	U	
156-60-5	trans-1,2-Dichloroethene	20000	U	
78-87-5	1,2-Dichloropropane	20000	U	
10061-01-5	cis-1,3-Dichloropropene	20000	U	
10061-02-6	trans-1,3-Dichloropropene	20000	U	
75-09-2	Methylene chloride	77000	BD	
79-34-5	1,1,2,2-Tetrachloroethane	20000	U	
127-18-4	Tetrachloroethene	20000	U	
71-55-6	1,1,1-Trichloroethane	20000	U	
79-00-5	1,1,2-Trichloroethane	20000	U	
79-01-6	Trichloroethene	550000	D	
75-69-4	Trichlorofluoromethane	100000	U	
75-01-4	Vinyl chloride	100000	U	↓

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-3D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374514

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02281.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 25.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
75-27-4	Bromodichloromethane	5.0	U	J
75-25-2	Bromoform	25	U	
74-83-9	Bromomethane	25	U	
56-23-5	Carbon Tetrachloride	5.0	U	
108-90-7	Chlorobenzene	10	U	
75-00-3	Chloroethane	25	U	
110-75-8	2-Chloroethylvinyl ether	25	U	
67-66-3	Chloroform	5.0	U	
74-87-3	Chloromethane	20	U	
124-48-1	Dibromochloromethane	5.0	U	
95-50-1	1,2-Dichlorobenzene	10	U	
541-73-1	1,3-Dichlorobenzene	10	U	
106-46-7	1,4-Dichlorobenzene	10	U	
75-34-3	1,1-Dichloroethane	5.0	U	
107-06-2	1,2-Dichloroethane	5.0	U	
75-35-4	1,1-Dichloroethene	5.0	U	
156-60-5	trans-1,2-Dichloroethene	5.0	U	
78-87-5	1,2-Dichloropropane	5.0	U	
10061-01-5	cis-1,3-Dichloropropene	5.0	U	
10061-02-6	trans-1,3-Dichloropropene	5.0	U	
75-09-2	Methylene chloride	25	B	
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U	
127-18-4	Tetrachloroethene	5.0	U	
71-55-6	1,1,1-Trichloroethane	5.0	U	
79-00-5	1,1,2-Trichloroethane	5.0	U	
79-01-6	Trichloroethene	930	E	
75-69-4	Trichlorofluoromethane	25	U	
75-01-4	Vinyl chloride	25	U	↓

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

C00110

Client No.

2-GW-3D DL

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374514DL

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02297.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 50.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	10	U J
75-25-2	Bromoform	50	U
74-83-9	Bromomethane	50	U
56-23-5	Carbon Tetrachloride	10	U
08-90-7	Chlorobenzene	20	U
75-00-3	Chloroethane	50	U
110-75-8	2-Chloroethylvinyl ether	50	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	40	U
124-48-1	Dibromochloromethane	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
75-34-3	1,1-Dichloroethane	10	U
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-09-2	Methylene chloride	450	BD
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	10	U
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	850	D
75-69-4	Trichlorofluoromethane	50	U
75-01-4	Vinyl chloride	50	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-4

Lab Name: Recra LabNet   Contract: ____

Lab Code: RECNY   Case No.: ____   SAS No.: ____   SDG No.: ____

Matrix: (soil/water) WATER   Lab Sample ID: A6374504

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3B02274.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ____   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 5.00

Soil Extract Volume: ____(uL)   Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	1.0	U J
75-25-2	Bromoform	5.0	U
74-83-9	Bromomethane	5.0	U
56-23-5	Carbon Tetrachloride	1.0	U
08-90-7	Chlorobenzene	2.0	U
5-00-3	Chloroethane	5.0	U
110-75-8	2-Chloroethylvinyl ether	5.0	U ↓
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	4.0	U J
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	2.0	U
541-73-1	1,3-Dichlorobenzene	2.0	U
106-46-7	1,4-Dichlorobenzene	2.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	2.6	
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride	2.6	B
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	2.3	
75-69-4	Trichlorofluoromethane	5.0	U
75-01-4	Vinyl chloride	18	↓

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-4D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374515

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02286.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 2.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.40	U J
75-25-2	Bromoform	2.0	U
74-83-9	Bromomethane	2.0	U
56-23-5	Carbon Tetrachloride	0.40	U
108-90-7	Chlorobenzene	0.80	U
75-00-3	Chloroethane	2.0	U
110-75-8	2-Chloroethylvinyl ether	2.0	U
67-66-3	Chloroform	0.40	U
74-87-3	Chloromethane	1.6	U
124-48-1	Dibromochloromethane	0.40	U
95-50-1	1,2-Dichlorobenzene	0.80	U
541-73-1	1,3-Dichlorobenzene	0.80	U
106-46-7	1,4-Dichlorobenzene	0.80	U
75-34-3	1,1-Dichloroethane	0.64	
107-06-2	1,2-Dichloroethane	0.40	U
75-35-4	1,1-Dichloroethene	0.40	U
156-60-5	trans-1,2-Dichloroethene	0.40	U
78-87-5	1,2-Dichloropropane	0.40	U
10061-01-5	cis-1,3-Dichloropropene	0.40	U
10061-02-6	trans-1,3-Dichloropropene	0.40	U
75-09-2	Methylene chloride	1.5	B
79-34-5	1,1,2,2-Tetrachloroethane	0.40	U
127-18-4	Tetrachloroethene	0.40	U
71-55-6	1,1,1-Trichloroethane	2.5	
79-00-5	1,1,2-Trichloroethane	0.40	U
79-01-6	Trichloroethene	29	
75-69-4	Trichlorofluoromethane	2.0	U
75-01-4	Vinyl chloride	2.0	U ↓

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-5

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374505

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02275.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U J
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
08-90-7	Chlorobenzene	0.40	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U J
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	1.7	
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-5D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374516

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02287.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4-------	Bromodichloromethane	0.20	U J
75-25-2-------	Bromoform	1.0	U
74-83-9-------	Bromomethane	1.0	U
56-23-5-------	Carbon Tetrachloride	0.20	U
08-90-7------	Chlorobenzene	0.40	U
5-00-3-------	Chloroethane	1.0	U
110-75-8------	2-Chloroethylvinyl ether	1.0	U
67-66-3-------	Chloroform	0.20	U
74-87-3-------	Chloromethane	1.0	U
124-48-1------	Dibromochloromethane	0.20	U
95-50-1-------	1,2-Dichlorobenzene	0.40	U
541-73-1------	1,3-Dichlorobenzene	0.40	U
106-46-7------	1,4-Dichlorobenzene	0.40	U
75-34-3-------	1,1-Dichloroethane	0.43	
107-06-2------	1,2-Dichloroethane	0.20	U
75-35-4-------	1,1-Dichloroethene	0.20	U
156-60-5------	trans-1,2-Dichloroethene	0.20	U
78-87-5-------	1,2-Dichloropropane	0.20	U
10061-01-5----	cis-1,3-Dichloropropene	0.20	U
10061-02-6----	trans-1,3-Dichloropropene	0.20	U
75-09-2-------	Methylene chloride	0.20	U
79-34-5-------	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4------	Tetrachloroethene	0.20	U
71-55-6-------	1,1,1-Trichloroethane	0.91	
79-00-5-------	1,1,2-Trichloroethane	0.20	U
79-01-6-------	Trichloroethene	0.44	
75-69-4-------	Trichlorofluoromethane	1.0	U
75-01-4-------	Vinyl chloride	1.0	U ↓

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-6

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374506

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02277.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U J
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
5-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U J
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	0.26	B
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	2.2	

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-6D

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374517

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02288.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 50.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
75-27-4	Bromodichloromethane	10	U J
75-25-2	Bromoform	50	U
74-83-9	Bromomethane	50	U
56-23-5	Carbon Tetrachloride	10	U
108-90-7	Chlorobenzene	20	U
75-00-3	Chloroethane	50	U
110-75-8	2-Chloroethylvinyl ether	50	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	40	U
124-48-1	Dibromochloromethane	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
75-34-3	1,1-Dichloroethane	10	U
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-09-2	Methylene chloride	91	B
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	10	U
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	1100	E
75-69-4	Trichlorofluoromethane	50	U
75-01-4	Vinyl chloride	50	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No. 2-GW-6D DL

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374517DL

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02304.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 100.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	20	U J
75-25-2	Bromoform	100	U
74-83-9	Bromomethane	100	U
56-23-5	Carbon Tetrachloride	20	U
108-90-7	Chlorobenzene	40	U
5-00-3	Chloroethane	100	U
110-75-8	2-Chloroethylvinyl ether	100	U
67-66-3	Chloroform	20	U
74-87-3	Chloromethane	80	U
124-48-1	Dibromochloromethane	20	U
95-50-1	1,2-Dichlorobenzene	40	U
541-73-1	1,3-Dichlorobenzene	40	U
106-46-7	1,4-Dichlorobenzene	40	U
75-34-3	1,1-Dichloroethane	20	U
107-06-2	1,2-Dichloroethane	20	U
75-35-4	1,1-Dichloroethene	20	U
156-60-5	trans-1,2-Dichloroethene	20	U
78-87-5	1,2-Dichloropropane	20	U
10061-01-5	cis-1,3-Dichloropropene	20	U
10061-02-6	trans-1,3-Dichloropropene	20	U
75-09-2	Methylene chloride	110	BD
79-34-5	1,1,2,2-Tetrachloroethane	20	U
127-18-4	Tetrachloroethene	20	U
71-55-6	1,1,1-Trichloroethane	20	U
79-00-5	1,1,2-Trichloroethane	20	U
79-01-6	Trichloroethene	1400	D
75-69-4	Trichlorofluoromethane	100	U
75-01-4	Vinyl chloride	100	U ↓

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

000148

Client No

2-GW-7

Lab Name: Recra LabNet Contract: ____

Lab Code: RECNY Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: A6374507

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02278.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ____ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 200.00

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	40	U J
75-25-2	Bromoform	200	U
74-83-9	Bromomethane	200	U
56-23-5	Carbon Tetrachloride	40	U
108-90-7	Chlorobenzene	80	U
75-00-3	Chloroethane	200	U
110-75-8	2-Chloroethylvinyl ether	200	U
67-66-3	Chloroform	40	U
74-87-3	Chloromethane	160	U J
124-48-1	Dibromochloromethane	40	U
95-50-1	1,2-Dichlorobenzene	80	U
541-73-1	1,3-Dichlorobenzene	80	U
106-46-7	1,4-Dichlorobenzene	80	U
75-34-3	1,1-Dichloroethane	40	U
107-06-2	1,2-Dichloroethane	40	U
75-35-4	1,1-Dichloroethene	40	U
156-60-5	trans-1,2-Dichloroethene	72	
78-87-5	1,2-Dichloropropane	40	U
10061-01-5	cis-1,3-Dichloropropene	40	U
10061-02-6	trans-1,3-Dichloropropene	40	U
75-09-2	Methylene chloride	130	B
79-34-5	1,1,2,2-Tetrachloroethane	40	U
127-18-4	Tetrachloroethene	40	U
71-55-6	1,1,1-Trichloroethane	40	U
79-00-5	1,1,2-Trichloroethane	40	U
79-01-6	Trichloroethene	420	
75-69-4	Trichlorofluoromethane	200	U
75-01-4	Vinyl chloride	2200	

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-TB-2

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374508

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02289.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U J
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
5-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U J
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	1.5	B
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-TB1-1

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374518

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02290.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U J
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	0.94	B
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U ↓

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-1

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374501

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02291.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 500.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	100	U
75-25-2	Bromoform	500	U
74-83-9	Bromomethane	500	U
56-23-5	Carbon Tetrachloride	100	U
108-90-7	Chlorobenzene	200	U
5-00-3	Chloroethane	500	U
110-75-8	2-Chloroethylvinyl ether	500	U
67-66-3	Chloroform	100	U
74-87-3	Chloromethane	400	U
124-48-1	Dibromochloromethane	100	U
95-50-1	1,2-Dichlorobenzene	200	U
541-73-1	1,3-Dichlorobenzene	200	U
106-46-7	1,4-Dichlorobenzene	200	U
75-34-3	1,1-Dichloroethane	100	U
107-06-2	1,2-Dichloroethane	100	U
75-35-4	1,1-Dichloroethene	100	U
156-60-5	trans-1,2-Dichloroethene	100	U
78-87-5	1,2-Dichloropropane	100	U
10061-01-5	cis-1,3-Dichloropropene	100	U
10061-02-6	trans-1,3-Dichloropropene	100	U
75-09-2	Methylene chloride	1500	B
79-34-5	1,1,2,2-Tetrachloroethane	100	U
127-18-4	Tetrachloroethene	100	U
71-55-6	1,1,1-Trichloroethane	100	U
79-00-5	1,1,2-Trichloroethane	100	U
79-01-6	Trichloroethene	520	
75-69-4	Trichlorofluoromethane	500	U
75-01-4	Vinyl chloride	2600	

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-1D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374511

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02283.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 200.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	40	U
75-25-2	Bromoform	200	U
74-83-9	Bromomethane	200	U
56-23-5	Carbon Tetrachloride	40	U
108-90-7	Chlorobenzene	80	U
75-00-3	Chloroethane	200	U
110-75-8	2-Chloroethylvinyl ether	200	U
67-66-3	Chloroform	40	U
74-87-3	Chloromethane	160	U
124-48-1	Dibromochloromethane	40	U
95-50-1	1,2-Dichlorobenzene	80	U
541-73-1	1,3-Dichlorobenzene	80	U
106-46-7	1,4-Dichlorobenzene	80	U
75-34-3	1,1-Dichloroethane	40	U
107-06-2	1,2-Dichloroethane	40	U
75-35-4	1,1-Dichloroethene	40	U
156-60-5	trans-1,2-Dichloroethene	40	U
78-87-5	1,2-Dichloropropane	40	U
10061-01-5	cis-1,3-Dichloropropene	40	U
10061-02-6	trans-1,3-Dichloropropene	40	U
75-09-2	Methylene chloride	170	B
79-34-5	1,1,2,2-Tetrachloroethane	40	U
127-18-4	Tetrachloroethene	40	U
71-55-6	1,1,1-Trichloroethane	40	U
79-00-5	1,1,2-Trichloroethane	40	U
79-01-6	Trichloroethene	8400	E
75-69-4	Trichlorofluoromethane	200	U
75-01-4	Vinyl chloride	200	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-1D DL

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: A6374511DL

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: 3B02296.TX0

Level: (low/med) Low

Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______

Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm)

Dilution Factor: 500.00

Soil Extract Volume: ______(uL)

Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	100	U
75-25-2	Bromoform	500	U
74-83-9	Bromomethane	500	U
56-23-5	Carbon Tetrachloride	100	U
108-90-7	Chlorobenzene	200	U
75-00-3	Chloroethane	500	U
110-75-8	2-Chloroethylvinyl ether	500	U
67-66-3	Chloroform	100	U
74-87-3	Chloromethane	400	U
124-48-1	Dibromochloromethane	100	U
95-50-1	1,2-Dichlorobenzene	200	U
541-73-1	1,3-Dichlorobenzene	200	U
106-46-7	1,4-Dichlorobenzene	200	U
75-34-3	1,1-Dichloroethane	100	U
107-06-2	1,2-Dichloroethane	100	U
75-35-4	1,1-Dichloroethene	100	U
156-60-5	trans-1,2-Dichloroethene	100	U
78-87-5	1,2-Dichloropropane	100	U
10061-01-5	cis-1,3-Dichloropropene	100	U
10061-02-6	trans-1,3-Dichloropropene	100	U
75-09-2	Methylene chloride	4000	BD
79-34-5	1,1,2,2-Tetrachloroethane	100	U
127-18-4	Tetrachloroethene	100	U
71-55-6	1,1,1-Trichloroethane	100	U
79-00-5	1,1,2-Trichloroethane	100	U
79-01-6	Trichloroethene	9900	D
75-69-4	Trichlorofluoromethane	500	U
75-01-4	Vinyl chloride	500	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-1DD

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: A6374512

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: 3B02276.TX0

Level: (low/med) Low

Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______

Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm)

Dilution Factor: 1.00

Soil Extract Volume: _____(uL)

Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-2

Lab Name: Recra LabNet Contract: ________

Lab Code: RECNY Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: A6374502

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02292.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. _____ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 50.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	50	U
74-83-9	Bromomethane	50	U
56-23-5	Carbon Tetrachloride	10	U
08-90-7	Chlorobenzene	20	U
75-00-3	Chloroethane	50	U
110-75-8	2-Chloroethylvinyl ether	50	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	40	U
124-48-1	Dibromochloromethane	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
75-34-3	1,1-Dichloroethane	10	U
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-09-2	Methylene chloride	160	B
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	10	U
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	1000	
75-69-4	Trichlorofluoromethane	50	U
75-01-4	Vinyl chloride	98	

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-2D

Lab Name: Recra LabNet   Contract: ______

Lab Code: RECNY   Case No.: ______   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374513

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3B02282.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 4.00

Soil Extract Volume: ______(uL)   Soil Aliquot Volume: ______(uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
75-27-4	Bromodichloromethane	0.80	U
75-25-2	Bromoform	4.0	U
74-83-9	Bromomethane	4.0	U
56-23-5	Carbon Tetrachloride	0.80	U
08-90-7	Chlorobenzene	1.6	U
5-00-3	Chloroethane	4.0	U
110-75-8	2-Chloroethylvinyl ether	4.0	U
67-66-3	Chloroform	0.80	U
74-87-3	Chloromethane	3.2	U
124-48-1	Dibromochloromethane	0.80	U
95-50-1	1,2-Dichlorobenzene	1.6	U
541-73-1	1,3-Dichlorobenzene	1.6	U
106-46-7	1,4-Dichlorobenzene	1.6	U
75-34-3	1,1-Dichloroethane	2.4	
107-06-2	1,2-Dichloroethane	0.80	U
75-35-4	1,1-Dichloroethene	0.80	U
156-60-5	trans-1,2-Dichloroethene	1.0	
78-87-5	1,2-Dichloropropane	0.80	U
10061-01-5	cis-1,3-Dichloropropene	0.80	U
10061-02-6	trans-1,3-Dichloropropene	0.80	U
75-09-2	Methylene chloride	4.1	B
79-34-5	1,1,2,2-Tetrachloroethane	0.80	U
127-18-4	Tetrachloroethene	0.80	U
71-55-6	1,1,1-Trichloroethane	3.9	
79-00-5	1,1,2-Trichloroethane	0.80	U
79-01-6	Trichloroethene	13	
75-69-4	Trichlorofluoromethane	4.0	U
75-01-4	Vinyl chloride	4.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-3

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374503

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02293.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 25000.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	5000	U
75-25-2	Bromoform	25000	U
74-83-9	Bromomethane	25000	U
56-23-5	Carbon Tetrachloride	5000	U
108-90-7	Chlorobenzene	10000	U
75-00-3	Chloroethane	25000	U
110-75-8	2-Chloroethylvinyl ether	25000	U
67-66-3	Chloroform	5000	U
74-87-3	Chloromethane	20000	U
124-48-1	Dibromochloromethane	5000	U
95-50-1	1,2-Dichlorobenzene	10000	U
541-73-1	1,3-Dichlorobenzene	10000	U
106-46-7	1,4-Dichlorobenzene	10000	U
75-34-3	1,1-Dichloroethane	5000	U
107-06-2	1,2-Dichloroethane	5000	U
75-35-4	1,1-Dichloroethene	5000	U
156-60-5	trans-1,2-Dichloroethene	5000	U
78-87-5	1,2-Dichloropropane	5000	U
10061-01-5	cis-1,3-Dichloropropene	5000	U
10061-02-6	trans-1,3-Dichloropropene	5000	U
75-09-2	Methylene chloride	140000	B
79-34-5	1,1,2,2-Tetrachloroethane	5000	U
127-18-4	Tetrachloroethene	5000	U
71-55-6	1,1,1-Trichloroethane	5000	U
79-00-5	1,1,2-Trichloroethane	5000	U
79-01-6	Trichloroethene	660000	E
75-69-4	Trichlorofluoromethane	25000	U
75-01-4	Vinyl chloride	25000	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

C00102

Client No.

2-GW-3 DL

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: A6374503DL

Sample wt/vol: 0.50 (g/mL) ML

Lab File ID: 3B02303.TX0

Level: (low/med) Low

Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______

Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm)

Dilution Factor: 10000.00

Soil Extract Volume: ______(uL)

Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	20000	U
75-25-2	Bromoform	100000	U
74-83-9	Bromomethane	100000	U
56-23-5	Carbon Tetrachloride	20000	U
108-90-7	Chlorobenzene	40000	U
75-00-3	Chloroethane	100000	U
110-75-8	2-Chloroethylvinyl ether	100000	U
67-66-3	Chloroform	20000	U
74-87-3	Chloromethane	80000	U
124-48-1	Dibromochloromethane	20000	U
95-50-1	1,2-Dichlorobenzene	40000	U
541-73-1	1,3-Dichlorobenzene	40000	U
106-46-7	1,4-Dichlorobenzene	40000	U
75-34-3	1,1-Dichloroethane	20000	U
107-06-2	1,2-Dichloroethane	20000	U
75-35-4	1,1-Dichloroethene	20000	U
156-60-5	trans-1,2-Dichloroethene	20000	U
78-87-5	1,2-Dichloropropane	20000	U
10061-01-5	cis-1,3-Dichloropropene	20000	U
10061-02-6	trans-1,3-Dichloropropene	20000	U
75-09-2	Methylene chloride	77000	BD
79-34-5	1,1,2,2-Tetrachloroethane	20000	U
127-18-4	Tetrachloroethene	20000	U
71-55-6	1,1,1-Trichloroethane	20000	U
79-00-5	1,1,2-Trichloroethane	20000	U
79-01-6	Trichloroethene	550000	D
75-69-4	Trichlorofluoromethane	100000	U
75-01-4	Vinyl chloride	100000	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-3D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374514

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02281.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 25.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	5.0	U
75-25-2	Bromoform	25	U
74-83-9	Bromomethane	25	U
56-23-5	Carbon Tetrachloride	5.0	U
108-90-7	Chlorobenzene	10	U
75-00-3	Chloroethane	25	U
110-75-8	2-Chloroethylvinyl ether	25	U
67-66-3	Chloroform	5.0	U
74-87-3	Chloromethane	20	U
124-48-1	Dibromochloromethane	5.0	U
95-50-1	1,2-Dichlorobenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
75-34-3	1,1-Dichloroethane	5.0	U
107-06-2	1,2-Dichloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
156-60-5	trans-1,2-Dichloroethene	5.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	cis-1,3-Dichloropropene	5.0	U
10061-02-6	trans-1,3-Dichloropropene	5.0	U
75-09-2	Methylene chloride	25	B
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
127-18-4	Tetrachloroethene	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
79-01-6	Trichloroethene	930	E
75-69-4	Trichlorofluoromethane	25	U
75-01-4	Vinyl chloride	25	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-3D DL

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: A6374514DL

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: 3B02297.TX0

Level: (low/med) Low

Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______

Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm)

Dilution Factor: 50.00

Soil Extract Volume: ______(uL)

Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	50	U
74-83-9	Bromomethane	50	U
56-23-5	Carbon Tetrachloride	10	U
108-90-7	Chlorobenzene	20	U
75-00-3	Chloroethane	50	U
110-75-8	2-Chloroethylvinyl ether	50	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	40	U
124-48-1	Dibromochloromethane	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
75-34-3	1,1-Dichloroethane	10	U
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-09-2	Methylene chloride	450	BD
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	10	U
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	850	D
75-69-4	Trichlorofluoromethane	50	U
75-01-4	Vinyl chloride	50	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-4

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374504

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02274.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 5.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	5.0	U
74-83-9	Bromomethane	5.0	U
56-23-5	Carbon Tetrachloride	1.0	U
108-90-7	Chlorobenzene	2.0	U
5-00-3	Chloroethane	5.0	U
110-75-8	2-Chloroethylvinyl ether	5.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	4.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	2.0	U
541-73-1	1,3-Dichlorobenzene	2.0	U
106-46-7	1,4-Dichlorobenzene	2.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	2.6	
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride	2.6	B
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	2.3	
75-69-4	Trichlorofluoromethane	5.0	U
75-01-4	Vinyl chloride	18	

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-4D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374515

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02286.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 2.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.40	U
75-25-2	Bromoform	2.0	U
74-83-9	Bromomethane	2.0	U
56-23-5	Carbon Tetrachloride	0.40	U
108-90-7	Chlorobenzene	0.80	U
75-00-3	Chloroethane	2.0	U
110-75-8	2-Chloroethylvinyl ether	2.0	U
67-66-3	Chloroform	0.40	U
74-87-3	Chloromethane	1.6	U
124-48-1	Dibromochloromethane	0.40	U
95-50-1	1,2-Dichlorobenzene	0.80	U
541-73-1	1,3-Dichlorobenzene	0.80	U
106-46-7	1,4-Dichlorobenzene	0.80	U
75-34-3	1,1-Dichloroethane	0.64	
107-06-2	1,2-Dichloroethane	0.40	U
75-35-4	1,1-Dichloroethene	0.40	U
156-60-5	trans-1,2-Dichloroethene	0.40	U
78-87-5	1,2-Dichloropropane	0.40	U
10061-01-5	cis-1,3-Dichloropropene	0.40	U
10061-02-6	trans-1,3-Dichloropropene	0.40	U
75-09-2	Methylene chloride	1.5	B
79-34-5	1,1,2,2-Tetrachloroethane	0.40	U
127-18-4	Tetrachloroethene	0.40	U
71-55-6	1,1,1-Trichloroethane	2.5	
79-00-5	1,1,2-Trichloroethane	0.40	U
79-01-6	Trichloroethene	29	
75-69-4	Trichlorofluoromethane	2.0	U
75-01-4	Vinyl chloride	2.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

C00125

Client Nc

2-GW-5

Lab Name: Recra LabNet Contract: ____

Lab Code: RECNY Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER

Lab Sample ID: A6374505

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: 3B02275.TX0

Level: (low/med) Low

Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ____

Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm)

Dilution Factor: 1.00

Soil Extract Volume: ____(uL)

Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	1.7	
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-5D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374516

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02287.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
5-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	0.43	
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.91	
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.44	
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-6

Lab Name: Recra LabNet Contract: ____

Lab Code: RECNY Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: A6374506

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02277.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ____ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
5-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	0.26	B
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	2.2	

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client Nc

2-GW-6D

Lab Name: Recra LabNet   Contract: ______

Lab Code: RECNY   Case No.: ______   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374517

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3B02288.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm)   Dilution Factor: 50.00

Soil Extract Volume: ______(uL)   Soil Aliquot Volume: ______(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	10	U
75-25-2	Bromoform	50	U
74-83-9	Bromomethane	50	U
56-23-5	Carbon Tetrachloride	10	U
108-90-7	Chlorobenzene	20	U
75-00-3	Chloroethane	50	U
110-75-8	2-Chloroethylvinyl ether	50	U
67-66-3	Chloroform	10	U
74-87-3	Chloromethane	40	U
124-48-1	Dibromochloromethane	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
75-34-3	1,1-Dichloroethane	10	U
107-06-2	1,2-Dichloroethane	10	U
75-35-4	1,1-Dichloroethene	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-09-2	Methylene chloride	91	B
79-34-5	1,1,2,2-Tetrachloroethane	10	U
127-18-4	Tetrachloroethene	10	U
71-55-6	1,1,1-Trichloroethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
79-01-6	Trichloroethene	1100	E
75-69-4	Trichlorofluoromethane	50	U
75-01-4	Vinyl chloride	50	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No

2-GW-6D DL

Lab Name: Recra LabNet   Contract: ____________

Lab Code: RECNY   Case No.: _____   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374517DL

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3B02304.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______   Date Analyzed: 08/15/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 100.00

Soil Extract Volume: _____(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	20	U
75-25-2	Bromoform	100	U
74-83-9	Bromomethane	100	U
56-23-5	Carbon Tetrachloride	20	U
108-90-7	Chlorobenzene	40	U
75-00-3	Chloroethane	100	U
110-75-8	2-Chloroethylvinyl ether	100	U
67-66-3	Chloroform	20	U
74-87-3	Chloromethane	80	U
124-48-1	Dibromochloromethane	20	U
95-50-1	1,2-Dichlorobenzene	40	U
541-73-1	1,3-Dichlorobenzene	40	U
106-46-7	1,4-Dichlorobenzene	40	U
75-34-3	1,1-Dichloroethane	20	U
107-06-2	1,2-Dichloroethane	20	U
75-35-4	1,1-Dichloroethene	20	U
156-60-5	trans-1,2-Dichloroethene	20	U
78-87-5	1,2-Dichloropropane	20	U
10061-01-5	cis-1,3-Dichloropropene	20	U
10061-02-6	trans-1,3-Dichloropropene	20	U
75-09-2	Methylene chloride	110	BD
79-34-5	1,1,2,2-Tetrachloroethane	20	U
127-18-4	Tetrachloroethene	20	U
71-55-6	1,1,1-Trichloroethane	20	U
79-00-5	1,1,2-Trichloroethane	20	U
79-01-6	Trichloroethene	1400	D
75-69-4	Trichlorofluoromethane	100	U
75-01-4	Vinyl chloride	100	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

00014
Client N

2-GW-7

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: A6374507

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02278.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/

% Moisture: not dec. ____ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 200.00

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ______(uL

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	40	U
75-25-2	Bromoform	200	U
74-83-9	Bromomethane	200	U
56-23-5	Carbon Tetrachloride	40	U
108-90-7	Chlorobenzene	80	U
75-00-3	Chloroethane	200	U
110-75-8	2-Chloroethylvinyl ether	200	U
67-66-3	Chloroform	40	U
74-87-3	Chloromethane	160	U
124-48-1	Dibromochloromethane	40	U
95-50-1	1,2-Dichlorobenzene	80	U
541-73-1	1,3-Dichlorobenzene	80	U
106-46-7	1,4-Dichlorobenzene	80	U
75-34-3	1,1-Dichloroethane	40	U
107-06-2	1,2-Dichloroethane	40	U
75-35-4	1,1-Dichloroethene	40	U
156-60-5	trans-1,2-Dichloroethene	72	
78-87-5	1,2-Dichloropropane	40	U
10061-01-5	cis-1,3-Dichloropropene	40	U
10061-02-6	trans-1,3-Dichloropropene	40	U
75-09-2	Methylene chloride	130	B
79-34-5	1,1,2,2-Tetrachloroethane	40	U
127-18-4	Tetrachloroethene	40	U
71-55-6	1,1,1-Trichloroethane	40	U
79-00-5	1,1,2-Trichloroethane	40	U
79-01-6	Trichloroethene	420	
75-69-4	Trichlorofluoromethane	200	U
75-01-4	Vinyl chloride	2200	

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-TB-2

Lab Name: Recra LabNet Contract: ____

Lab Code: RECNY Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: A6374508

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02289.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ____ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
5-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	1.5	B
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

FORM I - GC VOA

RADIAN CORPORATION
ERDLE SITE
METHOD 8010 - HALOGENATED VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-TB1-1

Lab Name: Recra LabNet Contract: ____

Lab Code: RECNY Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: A6374518

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3B02290.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ____ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-27-4	Bromodichloromethane	0.20	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon Tetrachloride	0.20	U
108-90-7	Chlorobenzene	0.40	U
5-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethylvinyl ether	1.0	U
67-66-3	Chloroform	0.20	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
75-34-3	1,1-Dichloroethane	0.20	U
107-06-2	1,2-Dichloroethane	0.20	U
75-35-4	1,1-Dichloroethene	0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	U
78-87-5	1,2-Dichloropropane	0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	U
75-09-2	Methylene chloride	0.94	B
79-34-5	1,1,2,2-Tetrachloroethane	0.20	U
127-18-4	Tetrachloroethene	0.20	U
71-55-6	1,1,1-Trichloroethane	0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	U
79-01-6	Trichloroethene	0.20	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

Data Validation Narrative
Erdle Perforating Project

Method: Aromatic Volatile Organics by SW8020

SDG Number: 2-GW-1

Holding Times: There were several instances of missed holding times for SW8020 samples. Sample holding time for groundwater is seven days. Eight samples missed holding times by one day. Two samples were diluted and reanalyzed. These samples missed holding time by two days. Samples are flagged as estimated (J) and potentially biased low (L).

Samples Selected for Full Validation: 2-GW-1; 2-GW-7 (duplicate of 2-GW-1); 2-GW-4; 2-GW-4D

Flagging requirements are listed in the table below. Other discrepancies are noted as follows:

- No calculation sheets were included in the data package. Quantitation of results were confirmed for 10% of the samples. No problems with quantitation of compounds was found.

- Percent Relative Standard Deviation (%RSD) was greater than 30% for a,a,a-Trifluorotoluene (TFT). The TFT %RSD was not reported in the data set. Calculation of the TFT %RSD at 57% indicates that the calibration for this compound is estimated. This compound is a surrogate used as a system monitoring compound. Calculations of %RSD for the remaining aromatic volatile organic compounds indicates acceptable calibrations since the %RSD for all compounds were < 30.0%.

- The recovery for surrogate TFT was above QC limits in samples 2-GW-1D and 2-GW-3D. The laboratory reports high surrogate recoveries due to matrix effects from excessive amounts of trichloroethylene. Trichloroethylene was reported in these same groundwater samples in the SW8010 analyses. Flag results as estimated (J) and biased high (H).

- A matrix spike and matrix spike duplicate pair were not analyzed to assess matrix effects on analyte recovery.

- A laboratory control sample duplicate was not analyzed to assess method precision.

- The BTEX compounds were left out of the middle CCV standard A6C0002008 on August 14, 1996. The remaining

CCVs were prepared correctly and these compounds were present and within criteria. These compounds were not detected in any of the field samples.

The flagging notes in the table below have been applied to the data contained in the Sample Data Summary Package. In cases where one result has been selected over another, the de-selected values have been crossed out in red, per EPA Region II guidance.

Flagging Requirements for SW8020			
Basis for Qualification	**Compound**	**Sample ID**	**Action**
Missed holding times by 1 day	all	2-GW-1D 2-GW-1DD 2-GW-2D 2-GW-3D 2-GW-4D 2-GW-5D 2-GW-6D 2-TB-1	Flag: JL Technical holding time criteria as stated in 40 CFR Part 136 is 7 days for SW8020. Flag all samples as estimated and potentially biased low.
Missed holding times by 2 days	all	2-GW-1D-DL 2-GW-3D-DL	Flag: JL (See action above)
Percent Relative Standard Deviation (%RSD) > 30%	TFT	All samples	Flag: J If %RSD > 30% < 90%, qualify positive results as estimated.
Surrogate recoveries for TFT above QC limits of 66%-137%	all detected compounds	2-GW-1D 2-GW-3D	Flag: JH All positive results are qualified as estimated and potentially biased high.

ERDLE PERFORATING PROJECT: Hold Times - Volatiles

Sample Field ID	Sample Lab ID	Matrix	Analyte Method	Collection Date	Analysis Date	Hold Time (days)	Hold Time Met? (Y,N)	Sample Properly Preserved? (Y,N)
2-GW-1	A6374501	Water	8020	8/7/96	8/14/96	7	Y	Y
2-GW-1D	A6374511	Water	8020	8/6/96	8/14/96	8	N	Y
2-GW-1D DL	A6374511 DL	Water	8020	8/6/96	8/15/96	9	N	Y
2-GW-1DD	A6374512	Water	8020	8/6/96	8/14/96	8	N	Y
2-GW-2	A6374502	Water	8020	8/7/96	8/14/96	7	Y	Y
2-GW-2D	A6374513	Water	8020	8/6/96	8/14/96	8	N	Y
2-GW-3	A6374503	Water	8020	8/7/96	8/14/96	7	Y	Y
2-GW-3D	A6374514	Water	8020	8/6/96	8/14/96	8	N	Y
2-GW-3D DL	A6374514 DL	Water	8020	8/6/96	8/15/96	9	N	Y
2-GW-4	A6374504	Water	8020	8/7/96	8/14/96	7	Y	Y
2-GW-4D	A6374515	Water	8020	8/6/96	8/14/96	8	N	Y
2-GW-5	A6374505	Water	8020	8/7/96	8/14/96	7	Y	Y

Hold times for ~~soil and~~ water samples: Erdle - 7 days

Preservation : Erdle - 4 °C

•If hold time exceeds criteria, qualify results > IDL as estimated and biasd low (JL) and sample quantitation limits as (UJ). If HT > 14 days, NDs may be unusable, (R); use professional judgement. If HT > 28 days, all NDs are (R).

ERDLE PERFORATING PROJECT: Hold Times - Volatiles

Sample Field ID	Sample Lab ID	Matrix	Analyte Method	Collection Date	Analysis Date	Hold Time (days)	Hold Time Met? (Y,N)	Sample Properly Preserved? (Y,N)
2-GW-5D	A6374516	Water	8020	8/6/96	8/14/96	8	N	Y
2-GW-6	A6374506	Water	8020	8/7/96	8/14/96	7	Y	Y
2-GW-6D	A6374517	Water	8020	8/6/96	8/14/96	8	N	Y
2-GW-7	A6374507	Water	8020	8/7/96	8/14/96	7	Y	Y
2-TB-2	A6374508	Water	8020	8/7/96	8/14/96	7	Y	Y
2-TB-1	A6374518	Water	8020	8/6/96	8/14/96	8	N	Y

Hold times for ~~soil and~~ water samples: Erdle - 7 days

Preservation : Erdle - 4 °C

•If hold time exceeds criteria, qualify results > IDL as estimated and biasd low (JL) and sample quantitation limits as (UJ). If HT > 14 days, NDs may be unusable, (R); use professional judgement. If HT > 28 days, all NDs are (R).

(((

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
1.0	Calibration				
1.1	Was the instrument calibrated initially before blanks and samples were analyzed?	✓			ICAL Form 6K 8/2/96
1.2	Were at least five initial standard concentrations run, including a standard near, but above, the method detection limit?	✓			Concentrations of standards: 5, 20, 40, 60, 80, 100 (µg/L) ⇒ Raw Data Form shows 5 stds.
1.3	Did the remaining calibration standard concentrations correspond to the expected range of the concentrations found in Phase I Normal samples? If not, did they define the working range of the GC?	✓			
1.4	Were all initial calibration $(\overline{RRF})$ values ≥ 0.05? • If $(\overline{RRF}) < 0.05$, qualify positive results as biased low (L) and ND as unusable (R) for the affected compound.			✓	RRF values not calculable ⇒ no Internal Stds used
1.5	Did all initial % RSD values meet those listed in Table 2? • If % RSD > 30%, qualify positive results as estimated (J) for the affected compound; qualify NDs using professional judgment. • If % RSD > 90%, flag all NDs (R). (Allowance is made for any two volatile compounds; for these, % RSD must be ≤ 40% with minimum RRFs ≥ 0.010 for the initial calibration to be acceptable.) • Analytes "U" flagged due to blank contamination are still considered hits when flagging fro calibration problems.	✓			% RSD < 30% for all compounds except a, a, a, -Trifluorotoluene ⇒ % RSD = 57% ⇒ flag "J" → estimated
1.6	Were all continuing calibration RRF values ≥ Table 2 values? (Check 10%, for one curve per pkg.) • If RRF < 0.05, qualify positive results as estimated, biased low (JL) and NDs as unusable (R) for the affected compound.			✓	RRF values not calculable ⇒ no Internal Stds used.

$$RRF = \frac{A_X}{A_{IS}} \times \frac{C_{IS}}{C_X}$$

where: A = EICP

C = Concentration

IS = Internal Std.

x = analyte of Interest

(((

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
1.7	Did all continuing calibration % Differences meet the values listed in Table 2? • If not, qualify positive results as estimated (J) for the affected compound; qualify NDs using professional judgement. • If % RSD > 90%, flag all NDs (R).			✓	% @ not calculable ⇒ No I. Stds used → no RRF values.
1.8	Does recalculation of the $(\overline{RRF})$ and RRF for one or more TCL compounds verify the reported value? • If RRFs were incorrectly generated from misidentified peaks, the laboratory should recalculate the RRFs and associated sample results. (See Functional Guidelines)			✓	(See ~~1.8~~ 1.7 above) CJK
1.9	Does recalculation of the initial calibration % RSD for one or more TCL compounds verify the reported value?	✓			Except a, a, a,-Trifluorotoluene % RSD = 57% Flag "J"
1.10	Does recalculation of the % Difference (% D) between RRF and RRF verify the reported value?			✓	(See 1.7 above) No I.S. → no RRF
General Comments	a, a, a - Trifluorotoluene	stds 60 90 150 180 210		area 5.91 1.10 2.28 2.86 3.55	$\bar{x}$ = 3.14 σ_{n-1} = 1.79 %RSD = $\left(\frac{1.79}{3.14}\right)$ x100 = 57% high >30%
2.0	**Blanks**				
2.1	Were results presented using Form I for all method blanks and matrix spike blanks? Was the Method Blank summary Form IV provided? • If blank data is not available, qualify all positive data (R) Field and trip blank data may be substituted using professional judgement.	✓ ✓			
2.2	Has a method blank been reported for each matrix and each GC System?	✓			1 per batch

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
2.3	Do the method blanks contain ≤ 5x CRQL for volatile target compounds? • Qualify results < CRQL and <5x the blank concentrations for volatile target compounds by elevating the limit of detection. (Report CRQL and flag U). Qualify results > CRQL and < 5x the blank concentration as (U). Compare equivalent data (see Functional Guidelines). • Qualify results attributable to carry-over as unreliable (R).	✓			
2.4	Were field blanks collected for the sample set according to the Phase II Remedial Investigation Work Plan?			✓	Not required for Phase II.
2.5	Do field blanks contain compounds above the levels specified for method blanks?			✓	
2.6	Did a trip blank accompany each cooler containing VOA samples?**	✓			
2.7	Was an equipment blank (rinsate) collected collected according to the Phase II Remedial Investigation Work Plan?			✓	Not required for volatiles by SW8020 for Phase II → See Work Plan.
General Comments					
3.0	Surrogates				
3.1	Was Form II included in the analytical report? Are all samples and surrogate recoveries listed on the form? (Check for transcription and calculation errors).	✓ ✓			
3.2	Were surrogates added to all standards, samples, and blanks?	✓			

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
3.3	Are surrogate recoveries for samples within the limits in table 6 of D-II, Section IV? Are outliers marked with an asterisk? • If surrogate is low or high, or 2 to 3 surrogates are mixed low to high, qualify results > IDL as estimated (J) and quantitation limits as estimated (UJ). • If 1 surrogate < 10% R, qualify results > IDL as estimated, and biased low (JL) and quantitation limits as unreliable (R). • If 2 to 3 surrogates are all low, qualify results > IDL as biased low (L) and quantitation limits as biased low (UL). • If 2 to 3 surrogates are all high, qualify results > IDL as estimated, and biased high (JH); do not qualify NDs. •Ensure the samples were reanalyzed. For soils: the methanol extract is reanalyzed before the sample is reextracted. If the reanalysis is acceptable, only the reanalyzed data need be submitted. If it is not, data from both anallyses are submitted. • If dilution prevents surrogate detection, state in the narrative that method accuracy cannot be verified.		✓		2-GW-1D ⇒ TFT outside upper QC limit (66-131%) TFT=188% 2-GW-3D ⇒ TFT outside upper limit. (66-131%) TFT=160% Flag estimated "J" & potentially biased High "H".
3.4	Are surrogate recoveries for blanks within these same limits? • If not, the blanks and all associated samples must be reanalyzed.	✓			
General Comments	TFT = a,a,a-Trifluorotoluene				
4.0	Matrix Spike/Matrix Spike Duplicate				
4.1	Was Form III included in the analytical report? Check for transcription and calculation errors.	✓			
4.2	Was an MS/MSD analyzed at the prescribed frequency? (Paragraph 10.10, D-II, Section IV)?		✓		No MSD ⇒ MS run on blank ⇒ Field Crew did not submit extra volume.
4.3	Do the % Recoveries (%R) fall within the limits listed in Table 7?	✓			

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
4.4	Do the RPD values fall within the limits listed in the SOW?			✓	Can not calculate RPD → No MS/MSD analyzed.
4.5	Does recalculation of the % R and RPD values verify the reported values? (Recalculate 1 per pkg, for 10% of the target volatiles.)			✓	No MS/MSD (See Comments ⇒ below)
	• Use results in conjuction with other QC criteria and qualify data according to professional judgment, if needed.				
General Comments	Matrix Spike Blank analyzed ⇒ replaces Laboratory Control Sample ⇒ Checks instrument performance ⇒ all % Recoveries good.				
5.0	Field Duplicates				
5.1	Were field duplicates analyzed with the sample set, according to the Phase II Remedial Investigation Work Plan?	✓			Field Duplicate = 2-GW-7 Normal = 2-GW-1
General Comments	RPD can not be calculated ⇒ both samples nondetect. Field sampling and precision and analytical precision with this pair cannot be assessed.				
6.0	Internal Standards Performance				
6.1	Was Form VIII included in the analytical report?			✓	I.S. method of calib. not performed.
6.2	Was an internal standard added to all standards, samples and blanks?			✓	See 6.1 ⇒ method SW8020 does not require I.S. cal.
6.3	Was the internal standard concentration 50 µg/L for each compound?			✓	See 6.1 ⇒ SW 8010 does not require I.S. cal.

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
6.4	Are sample IS retention times within 30 sec of the continuing cal std IS retention time? (Check one per pkg.) • If sample IS retention times are not within 30 sec, determine if false positives or negatives exist. Large shifts may require total or partial data rejection.			✓	(See 6.1)
6.5	Are sample IS areas within a factor of 2 of the continuing cal std IS area? • If sample IS areas are outside this range, qualify results for compounds using those IS as estimated (J) for that sample fraction; qualify NDs as estimated (UJ). If a severe loss of sensitivity is seen, qualify NDs as unusable (R).			✓	(See 6.1)
General Comments	Recra does not perform I.S. method of calibration → use linear regression.				
7.0	Target Compound Verification				
7.1	Were Form I, chromatograms, and data printouts provided for each sample?	✓			
7.2	Are sample RRTs within 0.06 units of the standard RRT? Check 10% of target volatiles of the samples selected for full validation..	✓			
7.3	Are standard chroms similar to sample chroms?	✓			

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
7.4	Are sample chroms free of carry-over effects, esp. if low concentration samples are preceded by high-concentration samples? • If incorrect compound identifications were made, flag all affected data as not detected (U) or unusable (R). • If raw data suggests presence of a target compound, but the chromatogram contains inadequacies, report the compound as not confirmed and therefore not detected (U). • If a compound with acceptable matching characteristics is not reported, add it to the sample data summary. If > CRQL, the lab should examine and re-submit the result.	✓			
7.5	Are the standard chromatographic ions present > 10% also seen in the sample chromatograms? Do sample and standard relative intensities agree within 20% • The lab must provide the three best chrom matches for non-TCL analytes.	✓			
General Comments					
8.0	Compound Quantitation, Dilution and Reported Detection Limits				
8.1	Did dilutions keep the largest analyte peak response for a target compound in the upper half of the initial calibration range?	✓			
8.2	Verify that data was submitted for no more than two analyses (ie. the original and one dilution, or the more concentrated dilution and one further dilution).	✓			

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
8.3	Verify that MS/MSD analyses were not diluted for the purpose of bringing either spiked or non-spiked analytes within calibration range. • If a MS/MSD sample contains high indigenous levels of spiking analytes, the concentration and recovery should be calculated from the undiluted analysis; the problem should be noted with the SDG narrative.			✓	No MS/MSD available.
8.4	Verify that the m/p-xylene and the o-xylene peaks were quantitated, and if necessary diluted separately. • Areas of both peaks and the single isomer RRF should be used to quantitate results.	✓			
8.5	Were the sample RRFs calculated based on the correct internal standard for that compound?			✓	No I.S. method of calib.
8.6	Does recalculation of the compound quantitations verify the reported results? (Recalculate 10% of the samples, for 10% of the target volatiles.) • If errors > 10% are found, they should be identified and corrected on the sample data summary, and noted in the narrative, and support documentation. • If an ion used for quantitation is saturated, qualify result as biased low (L). • If an ion used for quantitation is not saturated but exceeds the highest standard, qualify results as estimated (J).	✓			
8.7	Are the reported sample results, and quant reports free of transcription errors from the quant sheets, chromatograms, and sample prep logs?	✓			
8.8	Have the CRQLs been adjusted for sample dilution, splits, clean-up activities and dry weight factors?	✓			

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
General Comments					
9.0	Tentatively Identified Compounds (TICs)				
9.1	Were up to 10 TICs reported for each sample and blank which have area/height greater than 10% of the size of the nearest internal standard? • If the library search identified a target compound not reported in the data summary, have the lab recalculate the target compound result; determine whether the false negative is an isolated occurrence.			✓	No TIC's for SW8020 ⇒ GC method
9.2	Are any TCLs erroneously listed as TICs?			✓	
9.3	Are TICs present in sample absent in the blanks? (Check TICs for the samples selected for validation.) • If TICs present in a sample are present within 5x the concentration of a blank qualify the TIC (R) and draw a line through the data. • If common lab contaminants are present > 10x levels in the blanks, qualify results (R). • If a TIC tentative identification is unacceptable, the identification should be changed to "unknown". TICs not sufficiently above blank levels should not be reported. • All similar isomers should be reported as a total.			✓	
General Comments					
10.0	System Performance				
10.1	Were abrupt, discrete shifts in the chromatograms found?		✓		

Erdle Perforating Project
Audit of Data Quality - Volatiles by Method SW 8020

		Yes	No	N/A	Samples Affected/Comments
10.2	Were shifts in absolute internal standard retention times found?			✓	No I.S. calib.
10.3	Was an excessive baseline rise of elevated temperature noted?		✓		
10.4	Were extraneous peaks noted for calibration standards?		✓		
General Comments					
11.0	Sample Integrity				
11.1	Did the laboratory narratives state problems with sample receipt or conditions that would affect quality? • If the VOA vials analyzed contained air bubbles, flag all positive results (J) and all NDs (R). • If sample temperature was not 2-4°C upon receipt, flag positive results (J) and NDs (UJ).			✓	No problems with sample integrity.
General Comments					

Erdle Perforating Project

Recalculation Sheet
Volatiles SW 8020

1. Initial Calibration % Relative Standard Deviation (% RSD)

% RSD = σ/+ x 100

where σ = std dev. of 5 RF

and + = mean of 5 RFs

ICAL 8/2/96 Instrument HP5890-3 A

Benzene

(sts)	area
5	2.66
20	2.44
40	2.68
60	2.63
80	2.60

$\bar{x}$ = 2.602

σ_{n-1} = 0.096

$\% RSD = \left(\frac{0.096}{2.602}\right) \times 100 = 3.67 \Rightarrow 3.7\%$ Reported on Form 6K = 4.2%

ok acceptable

2. % Difference (% D) Cannot Calculate %D

$$\% D = \frac{\overline{RRFI} - RRF_c}{RRF_i} \times 100$$

where $\overline{RRFI}$ = average RRF

and RRF_c = RRF continuin

Recra lab does not use internal standards for SW8020.

Lab did not report an RRF.

$$RRF = \frac{A_x}{A_{I.S.}} \times \frac{C_{I.S.}}{C_x}$$

where: RRF_i = "i"th Relative Response Fact

A = EICP

C = Concentration

I.S. = Internal Std.

X = analyte of interest.

$$\overline{RRF} = \frac{\sum_{i=1}^{5} RRF_i}{5}$$

3. Matrix Spike/Matrix Spike Duplicates (MS/MSD) % Recovery Not Calculated

$$\%R = \frac{spiked\ sample\ result\ -\ sample\ result}{spike\ added} x\ 100$$

Recra lab did not analyze an MS/MSD pair. Field crew did not designate ms/msD on field sample ⇒ no extra volume.

4. MSD Relative Percent Difference (RPD) Not Calculated.

$$D = \frac{X_1 - X_2}{(\frac{X_1 + X_2}{2})} x\ 1$$

No MSD analyzed.
Can not calculate RPD.

Sample Quantitation

~~*of the target volatile characteristic ion(EICP) (ng int std*~~

~~*of the EICP for the specific int std) (cal std RRF) (mL*~~

~~*(Area of the target volatile (EICP) (ng int std. added)*~~

~~*(Area of the EICP for the specific int std) (cal std RRF) (g sample)*~~

~~*(Area of the target volatile EICP) (ng int std. added) (1000) (DF) (total mL methanol ex*~~

~~*of the EICP for the specific int std) (cal std RRF) (µL methanol extract added to reagent purge water)*~~
~~*(g soil extr*~~

Recra did not use internal std.
(linear regression from cal. curve.)

Calculation uses mean response → $\overline{RF}$.

O-Xylene ⇒ (Dilution = 1.0)

conc.	area
5	20800
20	18800
40	20000
60	19700
80	20100

$\overline{RF} = 19880$

$\frac{26510.40}{19880} = 1.33$ ok

quant Report states 1.32

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-1

Lab Name: Recra LabNet Contract: ____

Lab Code: RECNY Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: A6374501

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02279.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ____ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 100.00

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2-------Benzene	20	U
108-90-7------Chlorobenzene	20	U
95-50-1-------1,2-Dichlorobenzene	40	U
541-73-1------1,3-Dichlorobenzene	40	U
06-46-7------1,4-Dichlorobenzene	40	U
0-41-4------Ethylbenzene	20	U
108-88-3------Toluene	20	U
108-38-3------m-Xylene	20	U
95-47-6-------o-Xylene	20	U
106-42-3------p-Xylene	20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-1D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374511

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02283.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 200.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	40	U
108-90-7	Chlorobenzene	40	U
95-50-1	1,2-Dichlorobenzene	80	U
541-73-1	1,3-Dichlorobenzene	80	U
106-46-7	1,4-Dichlorobenzene	80	U
[illegible]0-41-4	Ethylbenzene	40	U
[illegible]08-88-3	Toluene	40	U
108-38-3	m-Xylene	40	U
95-47-6	o-Xylene	40	U
106-42-3	p-Xylene	40	U

FORM I - GC VOA

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-1D DL

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374511DL

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02296.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 500.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	100	U
108-90-7	Chlorobenzene	100	U
95-50-1	1,2-Dichlorobenzene	200	U
541-73-1	1,3-Dichlorobenzene	200	U
106-46-7	1,4-Dichlorobenzene	200	U
00-41-4	Ethylbenzene	100	U
08-88-3	Toluene	100	U
108-38-3	m-Xylene	100	U
95-47-6	o-Xylene	100	U
106-42-3	p-Xylene	100	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-1DD

Lab Name: Recra LabNet   Contract: ______

Lab Code: RECNY   Case No.: ______   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374512

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02276.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 1.00

Soil Extract Volume: ______(uL)   Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
100-41-4	Ethylbenzene	0.20	U
08-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.26	JH
106-42-3	p-Xylene	0.20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

C0025

Client No.

2-GW-2

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374502

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02292.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 50.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	10	U
108-90-7	Chlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
00-41-4	Ethylbenzene	10	U
08-88-3	Toluene	10	U
108-38-3	m-Xylene	10	U
95-47-6	o-Xylene	10	U
106-42-3	p-Xylene	10	U

FORM I - GC VOA

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-2D

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374513

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02282.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 4.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2-------Benzene	0.80	U
108-90-7------Chlorobenzene	0.80	U
95-50-1-------1,2-Dichlorobenzene	1.6	U
541-73-1------1,3-Dichlorobenzene	1.6	U
6-46-7------1,4-Dichlorobenzene	1.6	U
0-41-4------Ethylbenzene	0.80	U
108-88-3------Toluene	0.80	U
108-38-3------m-Xylene	0.80	U
95-47-6-------o-Xylene	0.80	U
106-42-3------p-Xylene	0.80	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-3

Lab Name: Recra LabNet

Contract: ____________

Lab Code: RECNY

Case No.: _____

SAS No.: ______

SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: A6374503

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: 3A02293.TX0

Level: (low/med) Low

Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______

Date Analyzed: 08/14/96

GC Column: RTX502.2

Dia: 0.53 (mm)

Dilution Factor: 25000.00

Soil Extract Volume: _____(uL)

Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	5000	U
108-90-7	Chlorobenzene	5000	U
95-50-1	1,2-Dichlorobenzene	10000	U
541-73-1	1,3-Dichlorobenzene	10000	U
106-46-7	1,4-Dichlorobenzene	10000	U
100-41-4	Ethylbenzene	5000	U
08-88-3	Toluene	5000	U
108-38-3	m-Xylene	5000	U
95-47-6	o-Xylene	5000	U
106-42-3	p-Xylene	5000	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-3D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374514

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02281.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 25.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	5.0	U
108-90-7	Chlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
[illegible]06-46-7	1,4-Dichlorobenzene	10	U
[illegible]00-41-4	Ethylbenzene	5.0	U
108-88-3	Toluene	5.0	U
108-38-3	m-Xylene	5.0	U
95-47-6	o-Xylene	5.0	U
106-42-3	p-Xylene	5.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-3D DL

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374514DL

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02297.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 50.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	10	U
108-90-7	Chlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
[illegible]06-46-7	1,4-Dichlorobenzene	20	U
[illegible]0-41-4	Ethylbenzene	10	U
108-88-3	Toluene	10	U
108-38-3	m-Xylene	10	U
95-47-6	o-Xylene	10	U
106-42-3	p-Xylene	10	U

000274

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-4

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374504

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02274.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 5.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	1.0	U
108-90-7	Chlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	2.0	U
541-73-1	1,3-Dichlorobenzene	2.0	U
106-46-7	1,4-Dichlorobenzene	2.0	U
00-41-4	Ethylbenzene	1.0	U
08-88-3	Toluene	1.0	U
108-38-3	m-Xylene	1.0	U
95-47-6	o-Xylene	1.0	U
106-42-3	p-Xylene	1.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-4D

Lab Name: Recra LabNet   Contract: ____________

Lab Code: RECNY   Case No.: _____   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374515

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02286.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 2.00

Soil Extract Volume: _____(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.40	U
108-90-7	Chlorobenzene	0.40	U
95-50-1	1,2-Dichlorobenzene	0.80	U
541-73-1	1,3-Dichlorobenzene	0.80	U
106-46-7	1,4-Dichlorobenzene	0.80	U
0-41-4	Ethylbenzene	0.40	U
8-88-3	Toluene	0.40	U
108-38-3	m-Xylene	0.40	U
95-47-6	o-Xylene	0.40	U
106-42-3	p-Xylene	0.40	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No. 2-GW-5

Lab Name: Recra LabNet   Contract: ______

Lab Code: RECNY   Case No.: ______   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374505

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02275.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 1.00

Soil Extract Volume: ______(uL)   Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
100-41-4	Ethylbenzene	0.20	U
108-88-3	Toluene	0.20	U
08-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

FORM I - GC VOA

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-5D

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: A6374516

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: 3A02287.TX0

Level: (low/med) Low

Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______

Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm)

Dilution Factor: 1.00

Soil Extract Volume: _____(uL)

Soil Aliquot Volume: ________(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	UG/L	Q
71-43-2	Benzene	0.20	U
103-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
0-41-4	Ethylbenzene	0.20	U
108-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-6

Lab Name: Recra LabNet   Contract: ____________

Lab Code: RECNY   Case No.: _____   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374506

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02277.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 1.00

Soil Extract Volume: _____(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
00-41-4	Ethylbenzene	0.20	U
08-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

000295

Client No.

2-GW-6D

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374517

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02288.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 50.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	10	U
108-90-7	Chlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
00-41-4	Ethylbenzene	10	U
08-88-3	Toluene	10	U
108-38-3	m-Xylene	10	U
95-47-6	o-Xylene	10	U
106-42-3	p-Xylene	10	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-7

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374507

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02278.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 200.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	40	U
108-90-7	Chlorobenzene	40	U
95-50-1	1,2-Dichlorobenzene	80	U
541-73-1	1,3-Dichlorobenzene	80	U
106-46-7	1,4-Dichlorobenzene	80	U
100-41-4	Ethylbenzene	40	U
[illegible]8-88-3	Toluene	40	U
108-38-3	m-Xylene	40	U
95-47-6	o-Xylene	40	U
106-42-3	p-Xylene	40	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-TB-2

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374508

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02289.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/9

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
00-41-4	Ethylbenzene	0.20	U
08-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-TB1-1

Lab Name: Recra LabNet   Contract: ______

Lab Code: RECNY   Case No.: ______   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374518

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02290.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 1.00

Soil Extract Volume: ______(uL)   Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
00-41-4	Ethylbenzene	0.20	U
108-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-1

Lab Name: Recra LabNet   Contract: ______

Lab Code: RECNY   Case No.: ______   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374501

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02279.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 100.00

Soil Extract Volume: ______(uL)   Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	20	U
108-90-7	Chlorobenzene	20	U
95-50-1	1,2-Dichlorobenzene	40	U
541-73-1	1,3-Dichlorobenzene	40	U
06-46-7	1,4-Dichlorobenzene	40	U
00-41-4	Ethylbenzene	20	U
108-88-3	Toluene	20	U
108-38-3	m-Xylene	20	U
95-47-6	o-Xylene	20	U
106-42-3	p-Xylene	20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-1D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374511

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02283.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 200.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	40	U
108-90-7	Chlorobenzene	40	U
95-50-1	1,2-Dichlorobenzene	80	U
541-73-1	1,3-Dichlorobenzene	80	U
106-46-7	1,4-Dichlorobenzene	80	U
0-41-4	Ethylbenzene	40	U
08-88-3	Toluene	40	U
108-38-3	m-Xylene	40	U
95-47-6	o-Xylene	40	U
106-42-3	p-Xylene	40	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-1D DL

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374511DL

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02296.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/15/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 500.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	100	U
108-90-7	Chlorobenzene	100	U
95-50-1	1,2-Dichlorobenzene	200	U
541-73-1	1,3-Dichlorobenzene	200	U
106-46-7	1,4-Dichlorobenzene	200	U
0-41-4	Ethylbenzene	100	U
08-88-3	Toluene	100	U
108-38-3	m-Xylene	100	U
95-47-6	o-Xylene	100	U
106-42-3	p-Xylene	100	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

C00250

Client No.

2-GW-1DD

Lab Name: Recra LabNet   Contract: ____________

Lab Code: RECNY   Case No.: _____   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374512

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02276.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 1.00

Soil Extract Volume: _____(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
100-41-4	Ethylbenzene	0.20	U
108-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.26	
106-42-3	p-Xylene	0.20	U

FORM I - GC VOA

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-2

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374502

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02292.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 50.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	10	U
108-90-7	Chlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	20	U
541-73-1	1,3-Dichlorobenzene	20	U
106-46-7	1,4-Dichlorobenzene	20	U
00-41-4	Ethylbenzene	10	U
08-88-3	Toluene	10	U
108-38-3	m-Xylene	10	U
95-47-6	o-Xylene	10	U
106-42-3	p-Xylene	10	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

C00260
Client No.

2-GW-2D

Lab Name: Recra LabNet   Contract: ____________

Lab Code: RECNY   Case No.: _____   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374513

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02282.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 4.00

Soil Extract Volume: _____(uL)   Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.80	U
108-90-7	Chlorobenzene	0.80	U
95-50-1	1,2-Dichlorobenzene	1.6	U
541-73-1	1,3-Dichlorobenzene	1.6	U
106-46-7	1,4-Dichlorobenzene	1.6	U
00-41-4	Ethylbenzene	0.80	U
108-88-3	Toluene	0.80	U
108-38-3	m-Xylene	0.80	U
95-47-6	o-Xylene	0.80	U
106-42-3	p-Xylene	0.80	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-3

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374503

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02293.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 25000.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	5000	U
108-90-7	Chlorobenzene	5000	U
95-50-1	1,2-Dichlorobenzene	10000	U
541-73-1	1,3-Dichlorobenzene	10000	U
106-46-7	1,4-Dichlorobenzene	10000	U
100-41-4	Ethylbenzene	5000	U
08-88-3	Toluene	5000	U
108-38-3	m-Xylene	5000	U
95-47-6	o-Xylene	5000	U
106-42-3	p-Xylene	5000	U

FORM I - GC VOA

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-3D

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374514

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02281.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 25.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	5.0	U
108-90-7	Chlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
00-41-4	Ethylbenzene	5.0	U
08-88-3	Toluene	5.0	U
108-38-3	m-Xylene	5.0	U
95-47-6	o-Xylene	5.0	U
106-42-3	p-Xylene	5.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

C00271

Client No.

2-GW-3D DL

Lab Name: Recra LabNet   Contract: ____

Lab Code: RECNY   Case No.: ____   SAS No.: ____   SDG No.: ____

Matrix: (soil/water) WATER   Lab Sample ID: A6374514DL

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02297.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ____   Date Analyzed: 08/15/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 50.00

Soil Extract Volume: ____(uL)   Soil Aliquot Volume: ____(uL)

CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2-------Benzene	10	U
108-90-7------Chlorobenzene	10	U
95-50-1-------1,2-Dichlorobenzene	20	U
541-73-1------1,3-Dichlorobenzene	20	U
106-46-7------1,4-Dichlorobenzene	20	U
0-41-4------Ethylbenzene	10	U
108-88-3------Toluene	10	U
108-38-3------m-Xylene	10	U
95-47-6-------o-Xylene	10	U
106-42-3------p-Xylene	10	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No. 2-GW-4

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374504

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02274.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 5.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	1.0	U
108-90-7	Chlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	2.0	U
541-73-1	1,3-Dichlorobenzene	2.0	U
106-46-7	1,4-Dichlorobenzene	2.0	U
0-41-4	Ethylbenzene	1.0	U
08-88-3	Toluene	1.0	U
108-38-3	m-Xylene	1.0	U
95-47-6	o-Xylene	1.0	U
106-42-3	p-Xylene	1.0	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.
2-GW-4D

Lab Name: Recra LabNet Contract: ____

Lab Code: RECNY Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: A6374515

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02286.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ____ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 2.00

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.40	U
108-90-7	Chlorobenzene	0.40	U
95-50-1	1,2-Dichlorobenzene	0.80	U
541-73-1	1,3-Dichlorobenzene	0.80	U
106-46-7	1,4-Dichlorobenzene	0.80	U
00-41-4	Ethylbenzene	0.40	U
08-88-3	Toluene	0.40	U
108-38-3	m-Xylene	0.40	U
95-47-6	o-Xylene	0.40	U
106-42-3	p-Xylene	0.40	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No. 2-GW-5

Lab Name: Recra LabNet　Contract: ______

Lab Code: RECNY　Case No.: ______　SAS No.: ______　SDG No.: ______

Matrix: (soil/water) WATER　Lab Sample ID: A6374505

Sample wt/vol: 5.00 (g/mL) ML　Lab File ID: 3A02275.TX0

Level: (low/med) Low　Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______　Date Analyzed: 08/14/96

GC Column: RTX502.2　Dia: 0.53 (mm)　Dilution Factor: 1.00

Soil Extract Volume: ______(uL)　Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
100-41-4	Ethylbenzene	0.20	U
108-88-3	Toluene	0.20	U
08-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

FORM I - GC VOA

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-5D

Lab Name: Recra LabNet Contract: ________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374516

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02287.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
103-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
00-41-4	Ethylbenzene	0.20	U
108-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-6

Lab Name: Recra LabNet   Contract: ______

Lab Code: RECNY   Case No.: ______   SAS No.: ______   SDG No.: ______

Matrix: (soil/water) WATER   Lab Sample ID: A6374506

Sample wt/vol: 5.00 (g/mL) ML   Lab File ID: 3A02277.TX0

Level: (low/med) Low   Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______   Date Analyzed: 08/14/96

GC Column: RTX502.2   Dia: 0.53 (mm)   Dilution Factor: 1.00

Soil Extract Volume: ______(uL)   Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
100-41-4	Ethylbenzene	0.20	U
[illegible]08-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-6D

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374517

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02288.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 50.00

Soil Extract Volume: ______(uL) Soil Aliquot Volume: ______(uL)

CAS NO. COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2-------Benzene	10	U
108-90-7------Chlorobenzene	10	U
95-50-1-------1,2-Dichlorobenzene	20	U
541-73-1------1,3-Dichlorobenzene	20	U
106-46-7------1,4-Dichlorobenzene	20	U
100-41-4------Ethylbenzene	10	U
08-88-3------Toluene	10	U
108-38-3------m-Xylene	10	U
95-47-6-------o-Xylene	10	U
106-42-3------p-Xylene	10	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-GW-7

Lab Name: Recra LabNet Contract: ____________

Lab Code: RECNY Case No.: _____ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER Lab Sample ID: A6374507

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02278.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 200.00

Soil Extract Volume: _____(uL) Soil Aliquot Volume: ________(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	40	U
108-90-7	Chlorobenzene	40	U
95-50-1	1,2-Dichlorobenzene	80	U
541-73-1	1,3-Dichlorobenzene	80	U
106-46-7	1,4-Dichlorobenzene	80	U
100-41-4	Ethylbenzene	40	U
08-88-3	Toluene	40	U
108-38-3	m-Xylene	40	U
95-47-6	o-Xylene	40	U
106-42-3	p-Xylene	40	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No. 2-TB-2

Lab Name: Recra LabNet Contract: ______

Lab Code: RECNY Case No.: ______ SAS No.: ______ SDG No.: ______

Matrix: (soil/water) WATER

Lab Sample ID: A6374508

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: 3A02289.TX0

Level: (low/med) Low

Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ______

Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm)

Dilution Factor: 1.00

Soil Extract Volume: ______(uL)

Soil Aliquot Volume: ______(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
100-41-4	Ethylbenzene	0.20	U
08-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

RADIAN CORPORATION
ERDLE SITE
METHOD 8020 - AROMATIC VOLATILE ORGANICS
ANALYSIS DATA SHEET

Client No.

2-TB1-1

Lab Name: Recra LabNet Contract: ____

Lab Code: RECNY Case No.: ____ SAS No.: ____ SDG No.: ____

Matrix: (soil/water) WATER Lab Sample ID: A6374518

Sample wt/vol: 5.00 (g/mL) ML Lab File ID: 3A02290.TX0

Level: (low/med) Low Date Samp/Recv: 08/07/96 08/07/96

% Moisture: not dec. ____ Date Analyzed: 08/14/96

GC Column: RTX502.2 Dia: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: ____(uL) Soil Aliquot Volume: ____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
71-43-2	Benzene	0.20	U
108-90-7	Chlorobenzene	0.20	U
95-50-1	1,2-Dichlorobenzene	0.40	U
541-73-1	1,3-Dichlorobenzene	0.40	U
106-46-7	1,4-Dichlorobenzene	0.40	U
00-41-4	Ethylbenzene	0.20	U
08-88-3	Toluene	0.20	U
108-38-3	m-Xylene	0.20	U
95-47-6	o-Xylene	0.20	U
106-42-3	p-Xylene	0.20	U

Data Validation Narrative
Erdle Perforating Project

Method: ICP-CLP Total Metals

SDG Number: 2-RB-1

Holding Times: All sample preparation and analyses were performed within specified maximum holding time requirements.

Samples Selected for Full Validation: 2-SD-2A and 2-RB-1

Flagging requirements are listed in the table below. Other discrepancies are noted as follows:

- The digestion logs do not list pH values for 2-RB-1. Sample 2-RB-1 was preserved in the field with HNO_3 to pH < 2 according to EPA and QAPP specifications for metals. The digestion logs do not indicate that pH was checked prior to preparation and analysis..

- The recovery of barium, chromium and vanadium were below the quality control (QC) limits (80%-120%) in the aqueous matrix spike blank (MSB). The MSB is Recra's Laboratory Control Sample (LCS). The recovery of all spiking compounds were acceptable in the matrix spike blank duplicate (LCSD equivalent) and the pre-digestion spike of sample 2-RB-1.

- The recovery of zinc was above the upper QC limit in the soil matrix spike blank (LCS equivalent). All spike recoveries were acceptable in the soil matrix spike blank duplicate (LCSD equivalent).

- The recovery of aluminum was below the lower QC limit in the solid LCS. A second solid LCS was not spiked with aluminum, therefore, the only recovery value for aluminum in solid is 54.6%. The aluminum result in sample SD-2A is flagged JL since this low percent recovery indicates that the aluminum results are estimated (J) and potentially biased low (L).

The flagging notes in the table below have been applied to the data contained in the Sample Data Summary Package. In cases where one result has been selected over another, the de-selected values have been crossed out in red, per EPA Region II guidance.

Flagging Requirements			
Basis for Qualification	**Compound**	**Sample ID**	**Action**
Low solid LCS % recovery for aluminum (54.6%)	Al	SD-2A	Flag: JL If LCS %R falls below EPA QC limits of 80%-120%, qualify results > IDL as estimated and potentially biased low.
ICP Serial Dilution for copper does not agree within 10% for high-level sample. Cu = 12.3%	Cu	SD-2A	Flag: J If ICP Serial Dilution does not agree within 10% for high-level samples (50 X IDL), qualify results as estimated.

NYSDEC ASP

1

INORGANIC ANALYSES DATA SHEET

NYSDEC SAMPLE NO.

SD-2A

Lab Name: RECRA_ENVIRONMENTAL_INC._ Contract: NY95-008__

Lab Code: RECNY_ Case No.: 5205_ SAS No.: ______ SDG No.: 3745__

Matrix (soil/water): SOIL_ Lab Sample ID: AD621319

Level (low/med): LOW__ Date Received: 08/07/96

% Solids: _70.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6550			P	JL
7440-36-0	Antimony	1.4	U		P	
7440-38-2	Arsenic	2.3	B		P	
7440-39-3	Barium	39.3	B	E	P	
7440-41-7	Beryllium	0.28	B		P	
7440-43-9	Cadmium	0.05	U		P	
7440-70-2	Calcium	20200			P	
7440-47-3	Chromium	18.3			P	
7440-48-4	Cobalt	3.7	B		P	
7440-50-8	Copper	33.4		E	P	J
7439-89-6	Iron	10200			P	
7439-92-1	Lead	42.9			P	
7439-95-4	Magnesium	9150			P	
7439-96-5	Manganese	117			P	
7439-97-6	Mercury	0.11	U		CV	
7440-02-0	Nickel	12.6			P	
7440-09-7	Potassium	583	B		P	
7782-49-2	Selenium	0.99	U		P	
7440-22-4	Silver	0.49	U		P	
7440-23-5	Sodium	378	B		P	
7440-28-0	Thallium	1.3	U		P	
7440-62-2	Vanadium	14.7			P	
7440-66-6	Zinc	364		N	P	
	Cyanide				NR	

Color Before: BROWN____ Clarity Before: _______ Texture: COARSE

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: ___

Comments:
LAB_SAMPLE_ID:_A6374510-SG000010
CLIENT_SAMPLE_ID:_2-SD-2A

NYSDEC ASP

1

INORGANIC ANALYSES DATA SHEET

NYSDEC SAMPLE NO.

2-RB-1

Lab Name: RECRA_ENVIRONMENTAL_INC._ Contract: NY95-008__

Lab Code: RECNY_ Case No.: 5205_ SAS No.: _______ SDG No.: 3745__

Matrix (soil/water): WATER Lab Sample ID: AD620981

Level (low/med): LOW__ Date Received: 08/07/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	69.7	B		P
7440-36-0	Antimony	5.1	U		P
7440-38-2	Arsenic	2.8	U		P
7440-39-3	Barium	3.4	B	N	P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	394	B	E	P
7440-47-3	Chromium	2.0	U	N	P
7440-48-4	Cobalt	1.0	U		P
7440-50-8	Copper	1.3	U		P
7439-89-6	Iron	21.3	U		P
7439-92-1	Lead	0.90	U		P
7439-95-4	Magnesium	37.3	B		P
7439-96-5	Manganese	0.88	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	1.8	U		P
7440-09-7	Potassium	116	B		P
7782-49-2	Selenium	3.6	U		P
7440-22-4	Silver	1.8	U		P
7440-23-5	Sodium	1220	B		P
7440-28-0	Thallium	4.9	U		P
7440-62-2	Vanadium	0.90	U	N	P
7440-66-6	Zinc	5.2	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _______

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: ___

Comments:
LAB_SAMPLE_ID:_A6374509-SG000008

NYSDEC ASP

1
INORGANIC ANALYSES DATA SHEET

NYSDEC SAMPLE NO.

SD-2A

Lab Name: RECRA_ENVIRONMENTAL_INC._ Contract: NY95-008__

Lab Code: RECNY_ Case No.: 5205_ SAS No.: _______ SDG No.: 3745__

Matrix (soil/water): SOIL_ Lab Sample ID: AD621319

Level (low/med): LOW__ Date Received: 08/07/96

% Solids: . _70.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6550			P
7440-36-0	Antimony	1.4	U		P
7440-38-2	Arsenic	2.3	B		P
7440-39-3	Barium	39.3	B	E	P
7440-41-7	Beryllium	0.28	B		P
7440-43-9	Cadmium	0.05	U		P
7440-70-2	Calcium	20200			P
7440-47-3	Chromium	18.3			P
7440-48-4	Cobalt	3.7	B		P
7440-50-8	Copper	33.4		E	P
7439-89-6	Iron	10200			P
7439-92-1	Lead	42.9			P
7439-95-4	Magnesium	9150			P
7439-96-5	Manganese	117			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	12.6			P
7440-09-7	Potassium	583	B		P
7782-49-2	Selenium	0.99	U		P
7440-22-4	Silver	0.49	U		P
7440-23-5	Sodium	378	B		P
7440-28-0	Thallium	1.3	U		P
7440-62-2	Vanadium	14.7			P
7440-66-6	Zinc	364		N	P
	Cyanide				NR

Color Before: BROWN_____ Clarity Before: _______ Texture: COARSE

Color After: YELLOW___ Clarity After: CLEAR_ Artifacts: ___

Comments:
LAB_SAMPLE_ID:_A6374510-SG000010
CLIENT_SAMPLE_ID:_2-SD-2A

FORM I - IN

12/91

NYSDEC ASP

1
INORGANIC ANALYSES DATA SHEET

NYSDEC SAMPLE NO.

2-RB-1

Lab Name: RECRA_ENVIRONMENTAL_INC._ Contract: NY95-008__

Lab Code: RECNY_ Case No.: 5205_ SAS No.: _______ SDG No.: 3745__

Matrix (soil/water): WATER Lab Sample ID: AD620981

Level (low/med): LOW__ Date Received: 08/07/96

% Solids: __0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	69.7	B		P
7440-36-0	Antimony	5.1	U		P
7440-38-2	Arsenic	2.8	U		P
7440-39-3	Barium	3.4	B	N	P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium	0.20	U		P
7440-70-2	Calcium	394	B	E	P
7440-47-3	Chromium	2.0	U	N	P
7440-48-4	Cobalt	1.0	U		P
7440-50-8	Copper	1.3	U		P
7439-89-6	Iron	21.3	U		P
7439-92-1	Lead	0.90	U		P
7439-95-4	Magnesium	37.3	B		P
7439-96-5	Manganese	0.88	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	1.8	U		P
7440-09-7	Potassium	116	B		P
7782-49-2	Selenium	3.6	U		P
7440-22-4	Silver	1.8	U		P
7440-23-5	Sodium	1220	B		P
7440-28-0	Thallium	4.9	U		P
7440-62-2	Vanadium	0.90	U	N	P
7440-66-6	Zinc	5.2	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _______

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: ___

Comments:
LAB_SAMPLE_ID:_A6374509-SG000008

ERDLE PERFORATING PROJECT: Hold Times - Metals CLP

Sample Field ID	Sample Lab ID	Matrix	Analyte Method	Collection Date	Digestion Date	Analysis Date	Hold Time (days)	Hold Time Met? (Y,N)	Sample Properly Preserved? (Y,N)
2-RB-1	A6374509	Water	CLP-ICP Total Metals	8/7/96	8/12/96 8/14/96	8/15/96 8/17/96	8 10	Y	Y
2-SD-2A	A6374510	Soil	CLP-ICP Total Metals	8/7/96	8/19/96	8/20 → 8/23, 8/29/96	13 → 16 22	Y	Y

Hold times for soil and water samples: CLP Metals - 6 months (180 days)

Preservation : Water - pH<2 HNO_3, 4° C
Soil - 4° C

•If hold time exceeds criteria, qualify results > IDL as biased Low (L) and results < IDL as biased low (UL).

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

Samples 2-SD-2A & 2-RB-1		Yes	No	N/A	Sample Affected/Comments
1.0	Calibration				
1.1	Was Form IIA included in analytical report?	✓			ICV & CCV
1.2	Were a blank and ≥ 1 standards used for calibration? • If the number of standards is less than < specified, qualify as unusable (R).	✓			Stds: Sb, As, Be, Cd, Cr, Co, Cu, Pb, Mn, (Hg by AA); Ni, Ag, Tl, Vn, Zn.
1.3	Was the instrument calibrated daily? • If instrument was not calibrated daily, qualify data as unusable.	✓			
1.4	Is the correlation coefficient (r) ≥0.995? • If r < 0.995, qualify as unusable (R).	✓			
1.5	Was a CRDL standard run after the ICV/ICB at 2 x CRDL, or at 2 x IDL, whichever is greater? (Form IIB) • Not required by EPA Region II for Al, Ba, Ca, Fe, Mg, Mn, Na, or K • If not, flag all data between the CRDL standard value ± 2 CRDL as estimated.	✓			
1.6	Are the initial calibration verification (ICV) and continuing calibration verification (CCV) results within 90-110% recovery (%R) of the true value? • If ICV or CCV % R falls outside the acceptance windows but within the ranges of 75-89% , qualify results > IDL as estimated and biased low ,(JL) , results < IDL as estimated (UJ). • If ICV or CCV %R falls within the range of 111-125%, qualify results > IDL as estimated and biased high (JH); results < IDL are acceptable. • If ICV or CCV % R < 75%, qualify all positive results as unusable (R). • If ICV or CCV %R > 125%, qualify results > IDL as unusable (R), results < IDL are acceptable.	✓			

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

		Yes	No	N/A	Sample Affected/Comments
1.7	Were CCV standards run at a frequency of 10%, or every 2 hours?	✓			
1.8	Did recalculations of the ICV and CCV %R verify the reported results? (Recalculate one ICV and One CCV per package).	✓			See: #1 ICV/CCV % Recovery, Erdle Recalculation Sheet Metals (attached).
General Comments					
2.0	Blanks				
2.1	Was Form III included in the analytical reports?	✓			ICB, CCB, Prep Blk.
2.1	Were blank results accurately reported from the raw data? (Check blanks associated with the field samples being validated; check 10% of the target metals.)	✓			
2.2	Was a calibration blank run after each ICV and CCV?	✓			
2.3	Was the calibration blank run after the last analytical sample?	✓			
2.4	Was a (method) reagent blank run with the sample batch? (1 per digestion batch ≤ 20 samples).	✓			

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

		Yes	No	N/A	Sample Affected/Comments
2.5	Was the concentration in the calibration and reagent blanks ≤ CRDL if CRDL > IDL? If CRDL < IDL, are the calibration blanks < 2 x IDL? • If analytes are detected in a blank, qualify sample results > IDL and < 5x the blank concentration as (B). When more than one blank is run, use the highest concentration for assessments. (It may be necessary to compare the raw data from both blank and sample.) • If blanks <0, and the absolute value of the blank > CRDL, qualify results <5x CRDL as biased low (L) and results <IDL as biased low (UL). • Do not qualify field blanks based on the results of other field blanks.	✓			low levels of target analytes slightly above or below stated detection limits. Values reported are within QAPP criteria. CRDL > IDL for all analytes. Data is acceptable.
2.6	Was an equipment blank (rinsate) collected per equipment type (for non-dedicated equipment) as per Table 4 of the Phase II Work Plan?	✓			Samp ID = 2-RB-1
General Comments					
3.0	Interference Check Sample (ICS)				
3.1	Was Form IV included with analytical report?	✓			
3.2	Was an ICS run before and after each sample run (or at least twice per 8 hour working shift)? • If not, flag sample results where Al, Ca, Fe or Mg are higher than in the ICS as estimated.	✓			

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

		Yes	No	N/A	Sample Affected/Comments
3.3	Do ICS results fall within 20% of the true value for solution AB (contains interferents & analytes)? (Check one per pkg. Not required by EPA Region II for Ca, Mg, K, Na). • If sample concentrations of Al, Ca, Fe, and Mg are ≤ the ICS concentrations for these metals, sample data is generally acceptable. If other elements are present >10 mg/L consult Table 2, SOW for interference effects. If an interference produces an estimated analyte concentration >2x CRDL and >10% of the reported concentration in a sample, qualify the affected result as biased high (JH). • For samples with Al, Ca, Fe, or Mg results ≥ ICS levels for these metals: • If ICS recovery > 120% and sample results < IDL, data is acceptable. • If ICS recovery > 120% and sample results >IDL, qualify as biased high (JH). • If ICS recovery is between 120-150% and sample results > IDL, qualify as estimated and biased high (JH). • If ICS recovery > 150%, reject positive results as unusable (R). • If ICS recovery is between 50-79% and sample results >IDL, qualify as estimated and biased low (JL). • If ICS recovery is between 50-79% and sample results are ND, qualify as estimated and biased low (UL). • If ICS recovery <50%, reject results >IDL and < IDL as unusable (R). • Indicate the bias for estimated results in the written review. • Circle values > 20%	✓			
3.4	Was the ICS run after the ICV standard?	✓			
3.5	Were analytes not contained in the ICS AB solution detected > IDL? • If elements not present in the ICS are detected >IDL, qualify sample results >IDL, which approximate levels in the ICS, as estimated and biased high (JH). • If elements not present in the ICS are detected < negative IDL, and the absolute value of the negative results is >IDL, qualify results for samples with comparable or higher levels of interferents as estimated and biased low (JL), if affected analytes are reported as <IDL.		✓		Data acceptable all analytes in ICS AB ✓

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

		Yes	No	N/A	Sample Affected/Comments
3.6	Did recalculation of the ICS recoveries verify the reported recoveries? (Check one per pkg.)	✓			ICS %R (Al) = $\frac{502289.9}{500000.} \times 100 = 100.46$ ✓ 100.5 (See Attached Recalculation Sheet)
General Comments					
4.0	Laboratory Control Sample (LCS)				
4.1	Was Form VII included in the analytical report?	✓			
4.2	Was one LCS analyzed per 20 samples for the sample delivery group (or digestate batch)? • If not, flag associated samples as estimated. If LCS applies to more than 20 samples, the first 20 samples do not require a flag.	✓			
4.3	Were all aqueous LCS results within 80-120% R (except for Sb and Ag, which have no control limits)? (Check one per pkg.) • If LCS %R falls between 50-79%, qualify results > IDL as estimated and biased low (JL); sample results < IDL as unusable (R). • If LCS %R falls between 121-150%, qualify results > IDL as estimated and biased high (JH), sample results < IDL are acceptable. • If LCS %R are < 50%, reject all results as unusable (R). • If LCS %R are > 150%, reject results > IDL as unusable (R).	~~✓~~	✓		Barium 72.1% Chromium 72.5% Vanadium 73.3% } below lower control limit. Flag aqueous sample for these analytes as estimated ⇒ "J" & potentially biased low ⇒ "L".

No flags ⇒ Matrix Spike Blank Dup. is o.k.

LCSD %R all within limits ⇒ no flags.

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

		Yes	No	N/A	Sample Affected/Comments
4.4	Were all solid LCS results within the form VII control limits? (Check one per pkg.) • If the LCS is rejectable due to duplicate injections or analytical spike recoveries, flag associated data as estimated, (J), regardless of LCS recoveries. • If the LCS true value < IDL, data is acceptable. • If LCS %R falls below or above EPA control limits, qualify results > IDL as estimated (J). • If LCS %R > control limits, sample results < IDL are acceptable. • If LCS %R < control limits, qualify sample results <IDL as estimated (UJ).		✓		% Rec Al = 54.6% ⇒ JL → (See Comments) % Rec Zn = 154.% ⇒ J~~H~~ → LCSD %R Calk are o.k. ⇒ no % flag Solid LCS Results not established in QAPP. Laboratory limits ⇒ (80-125) %
4.5	Do LCS % recoveries listed in reports match the raw data? (Check 10% of the target metals).	✓			
4.6	Does recalculation of the LCS recoveries verify the reported recoveries? (Recalculate one per pkg.)	✓			(See Attached Recalculation Sheet)
General Comments	Al was not spiked into the laboratory prepared solid LCS/LCSD. Therefore, the only recovery value for Al in solid is 54.6% ⇒ JL				
5.0	Duplicate Analysis				
5.1	Was Form VI included in the analytical report?	✓			
5.2	Was a duplicate analysis performed per 20 samples for each matrix? • If not, flag associated results > CRDL (or IDL, if CRDL < IDL) as estimated. If the duplicate is applied to more than 20 samples, do not flag the first 20.		✓		Duplicate on 2-RB-1D ⇒ aqueous No Duplicate on 2-SD-2A ⇒ solid
5.3	Was the sample selected for duplicate analysis a sample other than a field blank? • If a field blank was used, flag associated data ≥ CRDL (or IDL, if CRDL < IDL) as estimated (J).		✓		Duplicate = 2-RB-1D ⇒ aqueous (Duplicate performed on equipment blank) No flags ⇒ data results < CRDL.

		Yes	No	N/A	Sample Affected/Comments
5.4	Did the % solids differ by < 1%? • If difference > 1%, a separate Form VI is required for each sample. Report the concentration in µg/L on wet weight basis and calculate RPD or %D for each analyte.	✓			% Solids o.k.
5.4	Were the RPD values for results >5x CRDL ± 20% (±35% for soil)? • If RPD values fall outside the above control limits, qualify results for samples of the same matrix as estimated (J).		✓		Diplicate = Aqueous 2-RB-1D RPD's good.
5.5	When one or both results is ≤ 5x CRDL, were the RPD values within ± CRDL (± 2 CRDL for soil)? • If RPD values fall outside the above control limits, qualify results for samples of the same matrix as estimated (J).	✓			
5.6	When one or both results is ≤ 5x CRDL, was the RPD value within ± CRDL? • If RPD > ± 20% (aqueous) or ±35% (soil), qualify results for samples of the same matrix as estimated, (J). • If both results are < IDL, no RPD is calculated. • Exceedances should be marked on Forms I and VI.	✓			
5.7	Does recalculation of the RPD values verify the reported values? (Recalculate one per pkg.)	✓			$\frac{\lvert 293.82\rvert}{541.36} \times 100 = 54.27 +$ (See Attached Recalculation Sheet).
General Comments					
6.0	Matrix Spike (MS) Sample				
6.1	Was Form V included in analytical report?	✓			

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

		Yes	No	N/A	Sample Affected/Comments
6.2	Was a matrix spike sample performed per 20 samples on each group of samples of similar matrix and concentration (or for each Sample Delivery Group)? • If not, flag results < 4x the SWO specified spike levels as extimated, (J). Of one MS/MSD applies to more than 20 samples, the first 20 need not be flagged. • Not required for Ca, Mg, K, Na, Al (soil) or Fe (soil)	✓ MS only	✓		2-RB-1S ⇒ No MSD performed → 2-SD-2 ⇒ Solid sample has no MS/MSD ⇒ Field Crew did not send extra volume & designated sample as MS/MSD on label.
6.3	Was the sample selected for spiking analysis a sample other than a field blank? • If a field blank was spiked, flag associated results < 4x spike levels as estimated, (J).		✓		Matrix Spike performed on equipment blk. 2-RB-1S ⇒ All spike results good. Data acceptable ⇒ no flags %R = good
6.4	Were the spike amounts equal to the concentrations listed in Table 3, Exhibit E, of the ASP?	✓			
6.5	If the spiked sample was the same as that used for duplicate sample analysis, were spike calculations based on the "original" unspiked sample results?	✓			
6.6	Are the recovery results within 75 - 125%? (unless the sample concentration exceeds spike concentration by a factor of 4) Water: • If a spike recovery is 125-150%, qualify results >IDL as estimated, biased high (JH); results <IDL are acceptable. • If a spike recovery is >150%, qualify results >IDL as unusable, (R). • If a spike recovery falls between 30-74%, qualify results <IDL as estimated, biased low (J, UL). • If a spike recovery is < 30%, qualify results as unusable, (R). Soil • If a recovery is between 126-200%, qualify results > IDL as estimated, biased high, (JH); results < IDL are acceptable. • if a recovery is 10-74%, qualify all results as estimated, biased low, (JL). • If a recovery is < 10%, qualify results as unusable, (R). • If a recovery is > 200%, qualify results > IDL as unusable, (R). Verify that exceedances are flaged as "N" on Forms I and V-A.	✓			2-RB-1S ⇒ % Rec all within 75-125%.

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

		Yes	No	N/A	Sample Affected/Comments
6.7	If the recovery failed and the result is flagged "N", was a post-digestion spike performed for the failed analytes (excluding Ag)? (Form V-2)			✓	All recoveries acceptable.
6.8	Does recalculation of the %R results verify the reported recoveries? (Recalculate one per pkg)	✓			$\frac{1673.83}{2000} \times 100 = 83.69$% See: (Attached Recalculation Sheet)
General Comments					
7.0	ICP Serial Dilution				
7.1	Was Form IX included in the analytical report?	✓			
7.2	Were serial dilutions (five-fold dilutions) run per 20 samples on a sample for each group of samples of similar matrix and concentration (or each Sample Delivery Group)? (Required only if initial concentration > 10x IDL). • If not, flag associated results ≥ 10x IDL (or ≥ CRDL if CRDL ≥ 10x IDL) as estimated.	✓			
7.3	Was the sample selected for serial dilution a sample other than a field blank? • If not, flag associated results ≥ 10x IDL (or ≥ CRDL if CRDL ≥ 10x IDL) as estimated.	✓			Samp ID = SD-2Ah + (Note ⇒ Serial Dilution also performed on 2-RB-1h ⇒ Equipment Blank).
7.4	Did results agree within 10% for high-level samples (50 x >IDL)? (Check one per pkg.) • If criteria are not met, qualify data as estimated (J).				Copper ⇒ 12.37% ⇒ >50 x IDL flag J
7.5	Does recalculation of serial dilution % Difference (%D) verify the reported %D? (Recalculate one per pkg)	~~✓~~ DIK	✓		Not all agree. As = 67.97% Data Form = 100% (See Recalculation Sheet). Na = 55.17 Data Form 100%

Be = OK) As & Na were not >50 x IDL ⇒ no flags

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

		Yes	No	N/A	Sample Affected/Comments
General Comments	Calcium interference ⇒ ICP serial dilution indicates estimated value as interference → %D Initial & Serial is 10.37% ⇒ data acceptable.				
8.0	Sample Result Verification				
8.1	Was Form I included in the analytical report for each sample?	✓			
8.2	Were soil results corrected for % solids?			✓	
8.3	Were results < IDLs coded "U?"	✓			(See General Comments)
8.4	Is raw data provided, and is it legible? • If not, lab must resubmit data.	✓			
8.5	Are sample results from raw data within the ICP linear range (Form XII)?	✓			
8.6	Are sample results >5 x ICP IDL, if ICP results are used for As, Tl, Se or Pb?		✓		Sample results > IDL & < CRDL NYSDEC deems acceptable if < CRDL.
8.7	Does the raw data contain base line shifts, negative absorbances, omissions, or other anomalies?		✓		
8.8	Were the CRQLs listed in Exhibit C met?	✓			
8.9	Are transcription or reduction errors present?		✓		
General Comments	Results > IDL < CRDL flag B according to NYSDEC ASP.				
9.0	General Reporting				

Erdle Perforating Project
Audit of Data Quality - CLP ICP Total Metals

		Yes	No	N/A	Sample Affected/Comments
9.1	Were Forms I-IX present, and properly labelled with lab name, case number, client sample ID, SDG number, contract number and correct units?	✓			
9.2	Was the digestion log (Form XIII) present? (Did form list pH values, % solids, and preparation dates)?	Form XIII ✓	✓		→ pH not listed on Form XIII or on Metals Digestion Log in raw data.
9.3	Was Form X present for quarterly IDLs? Confirm that the CRDL > IDL for each analyte. • If not, flag results < 5x IDL as estimated for analytes where CRDL < IDL.	Form X ✓	✓		→ IDL's semiannual for Recra All CRDL's > IDL's for analytes.
9.4	Was Form XI present for ICP Interelement Correction Factors?	✓			
9.5	Was Form XII present for quarterly IDL linear ranges? Confirm that sample results are lower than the highest calibration standard. • If not, flag results as estimated.	Form XII ✓	✓		→ Form XII states Semiannual Linear ranges. Sample Results < ↑ Cal. Std's.
10.0	Field Duplicates				
10.1	Were field duplicates collected with the field sample set, according to the Phase II Remedial Investigation Work Plan?		✓		No field duplicate collected ⇒ This complies with Phase II Remedial Investigation Work Plan.

General Comments

Erdle Perforating Project

Recalculation Sheet
Metals

	1.	ICV/CCV % Recovery
ICV's		$\% R = \frac{Found}{True} x\ 100$ $Al = \frac{49744.04}{50000.0} \times 100 = 99.5$ ✓ ; $Pb = \frac{500.70}{500.0} \times 100 = 100.1$ ✓ $As = \frac{508.24}{500.0} \times 100 = 101.6$ ✓ ; $Hg = \frac{8.40}{8.0} \times 100 = 105$ ✓
CCV's		$Cd = \frac{505.39}{500} \times 100 = 101.1$ ✓ ; $Mg = \frac{51844.95}{50500.0} \times 100 = 103$ ✓ $Cu = \frac{514.89}{500.0} \times 100 = 103.0$ ✓ ; $Se = \frac{523.19}{500.0} \times 100 = 104.6$ ✓
	2.	ICPES ICS % Recovery
ICS	AB	$\% R = \frac{Found\ sol'n\ A}{True\ sol'n\ A}$ $\%R = \frac{528640.6}{500000.} \times 100 = 105.73$ ✓ (Mg) $\boxed{105.7}$
ICS	AB	$\%R = \frac{188985.5}{200000.0} \times 100 = 94.49$ ✓ ak ~~190172.0~~ ak ~~1912~~ $\boxed{94.5}$

Inorganics

(Continued)

3. LCS % Recovery

$$\%R = \frac{LCS\ Found}{LCS\ True} x\ 100(\mu g/L\ aqueous\ results,\ mg/kg\ solid\ results)$$

Solid

$$Pb = \frac{44.3\ mg/kg}{52.4\ mg/kg} x100 = 84.57° ✓$$

Aqueous

$$As = \frac{1013.9\ \mu g/L}{1000.0\ \mu g/L} x100 = 101.39 ✓ \quad = 101.4 ✓$$

4. Duplicate Sample Analysis

X_1 = Original Sample ; X_2 = Duplicate Sample.

$$RPD = \frac{|X_1-X_2|}{(\frac{X_1+X_2}{2})} x\ 100 \qquad \frac{|394.45 - 688.27|}{\frac{394.45 + 688.27}{2}} x100 = 54.27 \quad = 54.3 ✓$$

Inorganics

(Continued)

5. Matrix Spike (MS) Sample

$$\%R = \frac{\textit{Spiked Sample Result} - \textit{Original Sample Result}}{\textit{Spike Added}} x\ 100$$

$$Al\ \%R = \frac{1743.52 - 69.69}{2000} \times 100 = 83.69 = \boxed{83.7}$$ ✓

$$Pb\ \%R = \frac{448.62 - .9000}{500.0} \times 100 = 89.54 = 89.5\%$$

Form 5A Pb = 89.7%
o.k.

6. ICP Serial Dilution

$$\%D = \frac{|\textit{Initial Sample Result} - \textit{Serial Dilution Result}|}{\textit{Initial Sample Result}} x\ 100$$

$$As\ \%D = \frac{|8.34 - 14.00|}{8.34} \times 100 = 67.866 = 67.9\%$$

Data Form 9 = 100% } Does not match

$$Zn\ \%D = \frac{|1326.92 - 1419.20|}{1326.92} \times 100 = 6.95\%$$

data form = 7.0 ✓ o.k.

Be ~~Na~~ DHC
$$\%D = \frac{|1.02 - 2.05|}{1.02} \times 100 = 100.9\% = 101\%$$ ✓

$$Na\ \%D = \frac{1379.60 - 2140.00}{1379.60} \times 100 = 55.1\%$$

; Form 9 = 100.%
Does not m