Environmental Restoration Program

24-02 -10 -02 -02 -9407140005

Operable Unit 4

Special Canal Sampling Report
Miami-Erie Canal

Mound Plant
Miamisburg, Ohio

Final
(Revision 1)

Prepared For:
EG&G Mound Applied Technologies
and
The U.S. Department Of Energy

Prepared By:

SAIC®
An Employee-Owned Company

Science Applications International Corporation
1321 Research Park Drive
Dayton, Ohio 45432

July 1993

ENVIRONMENTAL RESTORATION PROGRAM

SPECIAL CANAL SAMPLING REPORT
MIAMI-ERIE CANAL
OPERABLE UNIT 4

MOUND PLANT
MIAMISBURG, OHIO

FINAL, Revision 1

PREPARED FOR:
EG&G MOUND APPLIED TECHNOLOGIES
AND
THE U.S. DEPARTMENT OF ENERGY

PREPARED BY:
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
1321 RESEARCH PARK DRIVE
DAYTON, OHIO 45432

JULY 1993

TABLE OF CONTENTS

ACKNOWLEDGEMENTS ACK-1

EXECUTIVE SUMMARY ES-1

1. INTRODUCTION 1-1
   1.1. PURPOSE OF REPORT 1-6
      1.1.1. Objectives 1-6
      1.1.2. Scope 1-7
      1.1.3. Historical Releases 1-7
         1.1.3.1. NPDES Outfall 001 1-10
         1.1.3.2. NPDES Outfall 002 1-11

2. FIELD SAMPLING PLANNING 2-1
   2.1. DATA NEEDS 2-1
   2.2. SURVEY 2-2
   2.3. SAMPLING STRATEGY 2-2
      2.3.1. Trip Blanks 2-3
      2.3.2. Rinsate Blanks 2-3
      2.3.3. Ambient Blanks 2-3
      2.3.4. Co-located Samples 2-5

3. DISCUSSION OF FIELD SAMPLING 3-1
   3.1. SAMPLING ACTIVITY 3-3
   3.2. FIELD QUALITY ASSURANCE/QUALITY CONTROL 3-5
   3.3. HEALTH AND SAFETY PLAN 3-5

4. SAMPLE ANALYSIS 4-1
   4.1. HISTORICAL DATA 4-1
   4.2. CHEMICAL ANALYSIS 4-6
   4.3. RADIOLOGICAL ANALYSIS 4-9

5. DATA QUALITY ASSESSMENT 5-1
   5.1. DATA QUALITY OBJECTIVES 5-1
      5.1.1. Precision 5-1
      5.1.2. Accuracy 5-3
      5.1.3. Representativeness 5-5
      5.1.4. Comparability 5-5
      5.1.5. Completeness 5-6
   5.2. DATA VALIDATION 5-7
      5.2.1. Inorganic Analysis 5-15
      5.2.2. Organic Analysis 5-15
      5.2.3. Radiological Analysis 5-16
      5.2.4. Field Quality Assurance 5-17
   5.3. DATA USEABILITY 5-18
      5.3.1. Volatile Organics 5-19
      5.3.2. Semivolatile Organic Compounds 5-19
      5.3.3. Pesticides/PCB Organics 5-19

TABLE OF CONTENTS
(continued)

5.3.4. Inorganic Analysis 5-20
5.3.5. Radiological Analysis 5-20

6. DISCUSSION OF RESULTS 6-1
6.1. CHEMICAL CONTAMINATION 6-1
6.1.1. PCBs 6-1
6.1.2. SVOCs 6-15
6.1.3. Inorganics 6-15
6.2. RADIOLOGICAL CONTAMINATION 6-15
6.2.1. Plutonium 6-20
6.2.2. Thorium 6-20
6.2.3. Tritium 6-24
6.2.4. Uranium 6-29
6.3. SOURCES OF CONTAMINATION 6-29

7. CONCLUSIONS 7-1
7.1. COMPARISON TO REGULATORY CRITERIA 7-1
7.2. CHEMICAL CONTAMINATION 7-5
7.3. RADIOLOGICAL CONTAMINATION 7-5
7.4. MIXED WASTE DETERMINATION 7-6

8. REFERENCES 8-1

APPENDIX A Field Sample Description
APPENDIX B Data Results Tables
APPENDIX C Sample Analysis Summary
APPENDIX D Data Validation and Field Quality Assurance

FIGURES

ES.1 Special Sampling Locations at Miami-Erie Canal (northern half) ES-2
ES.2 Special Sampling Locations at Miami-Erie Canal (southern half) ES-3
1.1 Mound Plant Location 1-2
1.2 Location of Operable Unit 4: Miami-Erie Canal 1-4
1.3 Special Sampling Locations at Miami-Erie Canal (northern half) 1-8
1.4 Special Sampling Locations at Miami-Erie Canal (southern half) 1-9
6.1 Aroclor-1248 Concentrations Along the Miami-Erie Canal 6-14
6.2 Fluoranthene Concentrations Along the Miami-Erie Canal 6-16
6.3 Maximum Concentration of Lead Along Miami-Erie Canal Centerline 6-18
6.4 Concentration of Lead Across the Miami-Erie Canal 6-19
6.5 Plutonium-238 Concentration Along Miami-Erie Canal 6-23
6.6 Thorium-230 Concentration Along Miami-Erie Canal 6-26
6.7 Tritium Concentration Profile Along Miami-Erie Canal 6-28
6.8 Uranium Concentration Along Miami-Erie Canal 6-30

TABLE OF CONTENTS
(continued)

TABLES

ES.1 Maximum Radiological and Chemical Concentration by Location, Miami-Erie Canal (1992 Study) ES-4
II.1 Mound Plant, ER Program Sampling Procedures 2-4
III.1 Special Canal Samples 3-2
IV.1 Analytical Methods and Total Numbers of Soil/Sediment Samples 4-2
IV.2 Sample Delivery Group Summary 4-3
IV.3 Maximum Plutonium-238 Concentrations in Sediments of Waterways Associated with the Miami-Erie Canal (1974 Study) 4-4
IV.4 Maximum Plutonium-238 Concentration in Sediments in Selected Miami-Erie Canal Locations (1974 Study) 4-5
IV.5 Detection Limits by Chemical Type 4-7
IV.6 Summary of Organic Compounds Detected in Mound NPDES Outfall 002 in 1991 4-8
V.1 List of Rejected Data 5-8
VI.1 Miami Erie Canal Special Sampling Results by Parameter 6-2
VI.2 Maximum Concentration of Inorganic Contamination Having Toxicity Characteristics Detected in the Miami-Erie Canal 6-17
VI.3 Background Concentrations of Radionuclides for Mound Plant in 1991 6-21
VI.4 Average Background Concentrations of Selected Radionuclides in Soils 6-22
VI.5 Highest Thorium-230 Concentrations in Miami-Erie Canal Sediments (1992 Study) . . . 6-25
VI.6 Highest Tritium Concentrations in Miami-Erie Canal Sediments (1992 Study) 6-27
VII.1 Hazardous Constituents Identified in the Miami-Erie Canal 7-3

ACRONYMS

AEC	Atomic Energy Commission
bls	Below Land Surface
BOA	Basic Order Agreement
CCAL	Continuing Calibration
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratory Program
CRDL	Contract Required Detection Limits
DOE	U.S. Department of Energy
DQO	Data Quality Objectives
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
FFA	Federal Facility Agreement
FS	Feasibility Study
gpd	Gallons Per Day
HSP	Health and Safety Plan
ICAL	Initial Calibration
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MSDS	Material Safety Data Sheet
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
OVA	Organic Vapor Analyzer
PAH	Polynuclear Aromatic Hydrocarbon
PARCC	Precision, Accuracy, Representativeness, Comparability and Completeness
PCB	Polychlorinated Biphenyl
QA	Quality Assurance
AC	Quality Control
QAPjP	Quality Assurance Project Plan
RI	Remedial Investigation
RPD	Relative Percent Difference
SDG	Sample Delivery Group
SEIMS	SAIC Environmental Information Management System
SOP	Standard Operating Procedure
SOW	Statement of Work
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TIC	Tentatively Identified Compounds
TSCA	Toxic Substances Control Act
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound

ACKNOWLEDGEMENTS

This report was prepared by Science Applications International Corporation, Dayton, Ohio, under prime contract DE-AC04-88DP43495, issued to EG&G Mound Applied Technologies, Inc., by the United States Department of Energy, and pursuant to Basic Ordering Agreement No. 52264. The contributors to this report include D. Korns, W. Wilson, P. Ferron, D. Palmieri, K. Johnson and M. Balmert.

EXECUTIVE SUMMARY

As part of the Mound Plant Environmental Restoration (ER) program, field activities associated with the Special Canal Sampling project were conducted during 1992. The overall objective of the Special Canal Sampling project is to provide qualified data to support the determination of whether mixed waste (radioactive and hazardous waste) contamination is present in the canal. Borehole soil samples in 1 foot intervals down to 3 feet below land surface (bls) were collected and composited (for each 1 foot interval) from the locations shown in Figures ES.1 and ES.2 in the Miami-Erie Canal, listed below from north to south. With the exception of locations XXX and DL1, the sample locations are identical to some of the locations sampled in the previous canal study (Rogers 1975).

The samples were excavated, handled, packaged, labeled, and shipped in accordance with Mound Plant ER Standard Operating Procedures (SOPs) (DOE 1991a). Quality control activities associated with the field sampling include the collecting of co-located and matrix spike samples, maintaining a field log record of samples with their unique identifiers, mixing soil into representative interval samples, labeling and packaging of the samples into bottles, collecting and preparing archive samples, decontaminating equipment after each use, and certifying that approved procedures were followed using qualified personnel. Chain-of-custody forms accompanied each sample. Samples were shipped to the analytical laboratories only after they were screened at the Mound Plant Soil Screening Facility.

The samples were analyzed in accordance with United States Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) procedures to evaluate the potential for organic and inorganic chemical (non-radioactive) contamination as well as for radiological contamination in accordance with EPA and U.S. Department of Energy (DOE) analytical standards. The field samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), inorganics (metals and cyanide) and selected radionuclides, per the project Statement of Work (SOW) (EG&G 1992a).

Results of the chemical and radiological data analyses from the laboratory were validated using EPA (EPA 1988, EPA 1991) and SAIC (SAIC 1991) guidelines. The data are usable, with some qualifications, for the evaluation of the concentration of chemical and radioactive constituents in the canal sediments. Table ES.1 summarizes the maximum contaminant concentrations observed by type and location in the Miami Erie Canal.

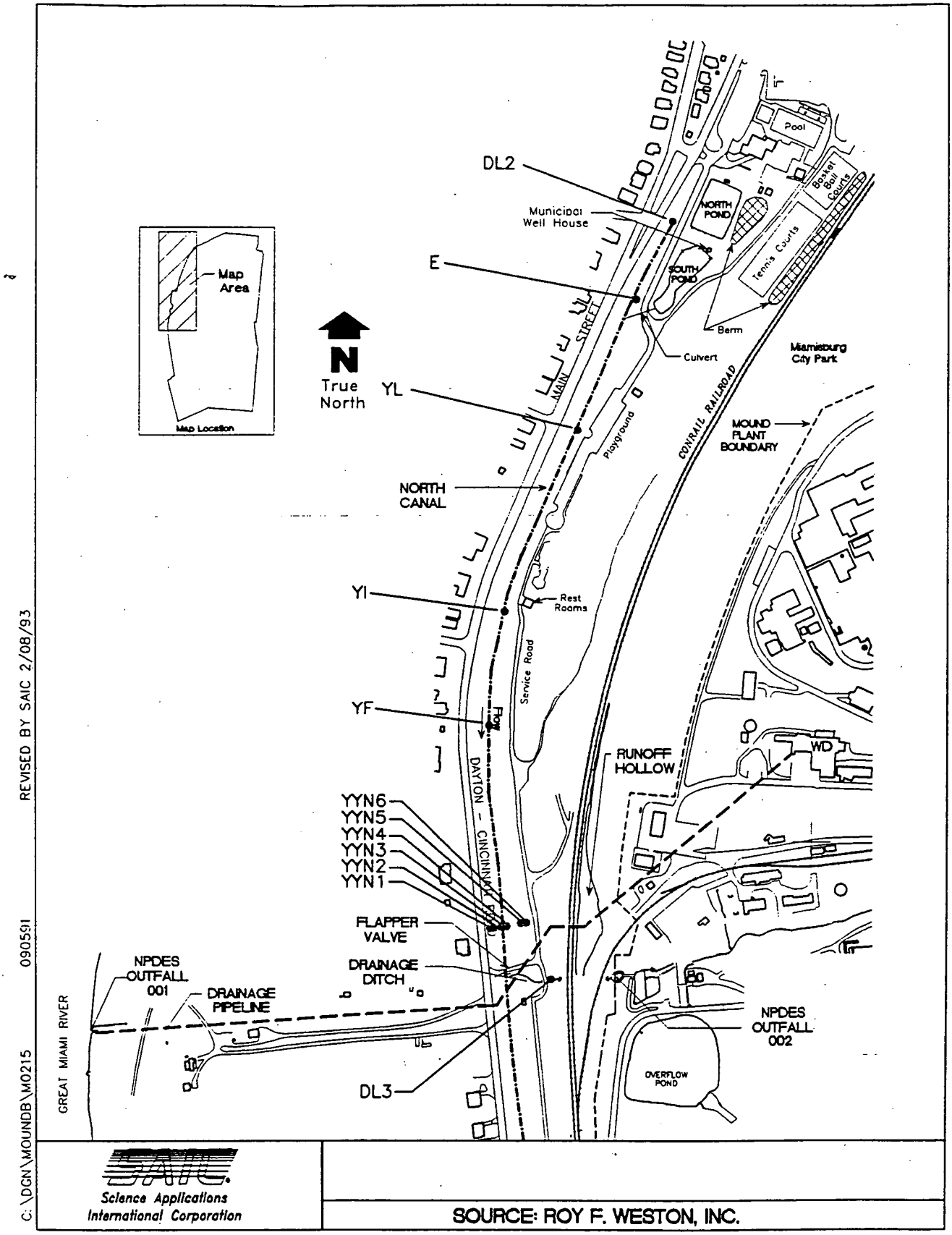

Figure ES.1 Special Sampling Locations at Miami-Erie Canal (northern half)

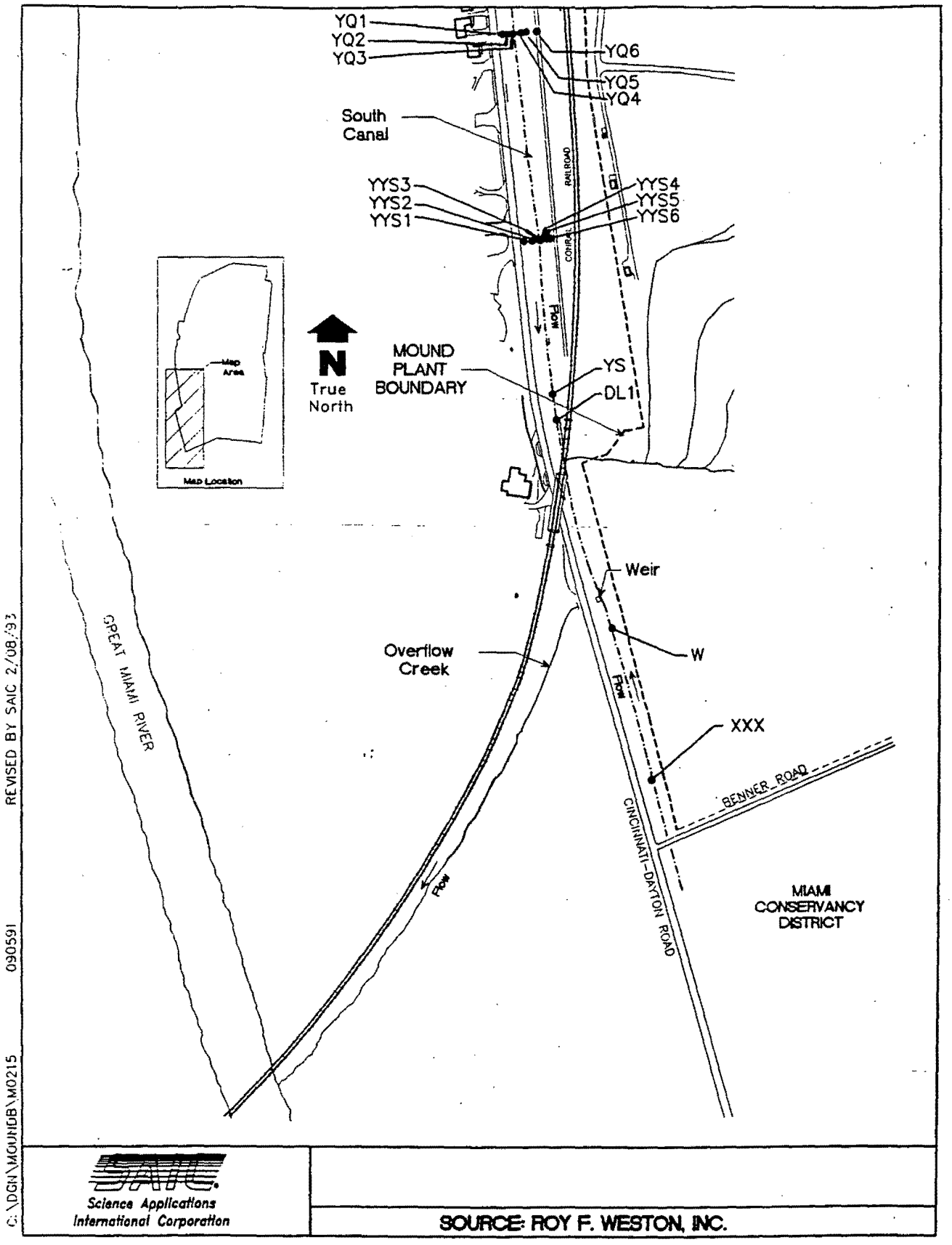

Figure ES.2 Special Sampling Locations at Miami-Erie Canal (southern half)

Table ES.1. Maximum Radiological and Chemical Concentration by Location, Miami-Erie Canal (1992 Study)
Page 1 of 2

	Maximum Concentration [a]				
Location	Radiological (pCi/g)	SVOC (ug/kg)	Toxic Inorganic (mg/kg)	Pesticide/PCB (ug/kg)	Remarks
North Canal					
DL2	20 (Pu-238)	55000 (Pyrene)	82 (Pb)	19000 (Aroclor-1248)	Highest PCB, PAH
E	170 (Pu-238)	1700 (Fluoranthene)	53 (Cr)	2400 (Aroclor-1248)	
YL	390 (Pu-238) 180 (H-3)	180 (Pyrene)	74 (Pb)	6.5 (DDT)	Highest Tritium
YI	530 (Pu-238) 77 (H-3)	1900 (Fluoranthene)	116 (Ba)	170 (Aroclor-1248)	
YF	520 (Pu-238) 130 (H-3)	870 (Fluoranthene)	122 (Cr)	150 (Aroclor-1248)	
YYN	530 (Pu-238) 38 (Th-230)	7200 (Fluoroanthene)	127 (As) 0.76 (Hg) 248 (Pb)	840 (Aroclor-1248)	Highest Arsenic, Mercury Highest Thorium[b]
Drainage Ditch					
DL3	2.6 (Pu-238)	ND	90 (Ba)	ND	
South Canal					
YQ	$1x10^3$ (Pu-238)	5900 (Fluoranthene)	579 (Pb)	360 (Aroclor-1254)	Highest Pu-238 Highest Lead [c]
YYS	520 (Pu-238) 87 (Th-228)	6100 (Pyrene)	406 (Pb) 178 (Ba) 334 (Cr)	260 (Aroclor-1248 & 1254)	Highest Chromium, Barium
	Maximum Concentration[a]				

Table ES.1. Maximum Radiological and Chemical Concentration by Location, Miami-Erie Canal (1992 Study)
Page 2 of 2

Location	Radiological (pCi/g)	SVOC (ug/kg)	Toxic Inorganic (mg/kg)	Pesticide/PCB (ug/kg)	Remarks
South Canal (Cont'd)					
YS	760 (Pu-238) 100 (H-3) 11 (Th-230)	6800 (Pyrene)	101 (Ba)	340 (Aroclor-1254)	
DL1	600 (Pu-238) 70 (H-3) 5.7 (Th-230)	7000 (Fluoranthene)	104 (Cr)	260 (Aroclor-1254)	
W	96 (Pu-238) 43 (U-234)	210 (Pyrene)	115 (Ba)	1.1 (Endril)	Highest Uranium
XXX	0.95 (Pu-238)	180 (Fluoranthene)	90 (Ba)	3.5 (DDT)	

a No VOCs were detected in the canal

b DOE Order 5400.5 guideline is 5 pCi/g for Thorium

c Proposed Action Level (background) for lead is 53 ppm (Table VII.3)

ND Not Detected

The results have been compared whenever possible to known regulatory standards, background concentrations and DOE guidelines. However, there are no Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or Resource Recovery and Conservation Act (RCRA) action levels for Mound Plant soils at this time. Further, since the non-radiological hazardous constituents do not appear to be the result of Mound Plant releases, a comparison to a clean-up standard based on site-specific background is required to document the presence of non-naturally occurring substances or contaminants significantly above site-specific background levels.

Based on the available standards, it is concluded that the chemical contamination in the canal soils sampled is limited to trace amounts of PCBs, polynuclear aromatic hydrocarbons (PAHs), and lead. Further, it is not probable that Mound Plant is the source of this contamination. The results of the radiological analyses, in general, are consistent with the results of earlier studies (Robinson et al. 1974; Kershner and Rhinehammer 1978). In addition to plutonium, thorium, and tritium, trace amounts of uranium, cesium, and potassium were detected in the canal. The distribution of plutonium contamination observed in the canal is consistent with the earlier (Rogers 1975) results.

The results of the Special Canal Sampling indicate that hazardous constituents were detected in the canal, but since the sources of these constituents are inconclusive, it is not possible at this time to determine if these constituents are hazardous waste. In addition, the amounts of hazardous constituents are not significant. Additional testing may be needed for removal or remedial actions to support treatment/disposal requirements. Consequently, a specific determination of mixed waste will be made on a case-by-case basis.

SECTION 1

1. INTRODUCTION

Mound Plant was formed as a technical organization in 1943 as part of the Manhattan Engineering District (DOE 1986). In 1946, 182 acres adjacent to the city of Miamisburg, Ohio, were purchased for the permanent Mound Plant site (Figure 1.1). This was later expanded to 305 acres by the acquisition of an adjacent 123 acres located south of the original property; however, there is no development on this property.

Mound Plant is currently an integrated research, development, and production facility that operates in support of the United States Department of Energy (DOE) weapons and energy programs (DOE 1986). Mound Plant manufactures non-nuclear components and tritium-containing components for nuclear weapons. In addition, the plant tests small plutonium-fueled heat sources for the space and defense programs.

Mound Plant is operated by EG&G Mound Applied Technologies for DOE. It is one of seven DOE Albuquerque Operations Office installations currently being evaluated by the DOE Environmental Restoration (ER) Program. The ER Program was established in 1984 to identify, assess, and remediate environmental contamination associated with release sites that resulted from spills or inadequate management of materials and waste management.

Mound Plant was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (also known as Superfund) National Priorities List on November 21, 1989 (54 Federal Register 48184). Pursuant to its placement on the National Priority List, DOE signed a CERCLA Section 120 Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) on August 6, 1990 (EPA Docket No. V-W-90-C-075). A tri-party agreement has been negotiated (July 15, 1993) to include the Ohio EPA.

The FFA directs DOE to conduct remedial investigations and feasibility studies (RI/FS) to determine the nature and extent of environmental contamination associated with Mound Plant and to evaluate the feasibility of remedial alternatives. Because of the number of potential release sites and the overall complexity of the RI/FS at Mound Plant, the RI/FS effort has been divided into six active operable units to facilitate management of the program. A portion of the Miami-Erie canal, offsite from Mound Plant, is designated as Operable Unit 4 (OU4). Specifically, OU4 encompasses the canal immediately west of Mound Plant (from a point west of the Miamisburg City Park north pond, south to Benner Road), the

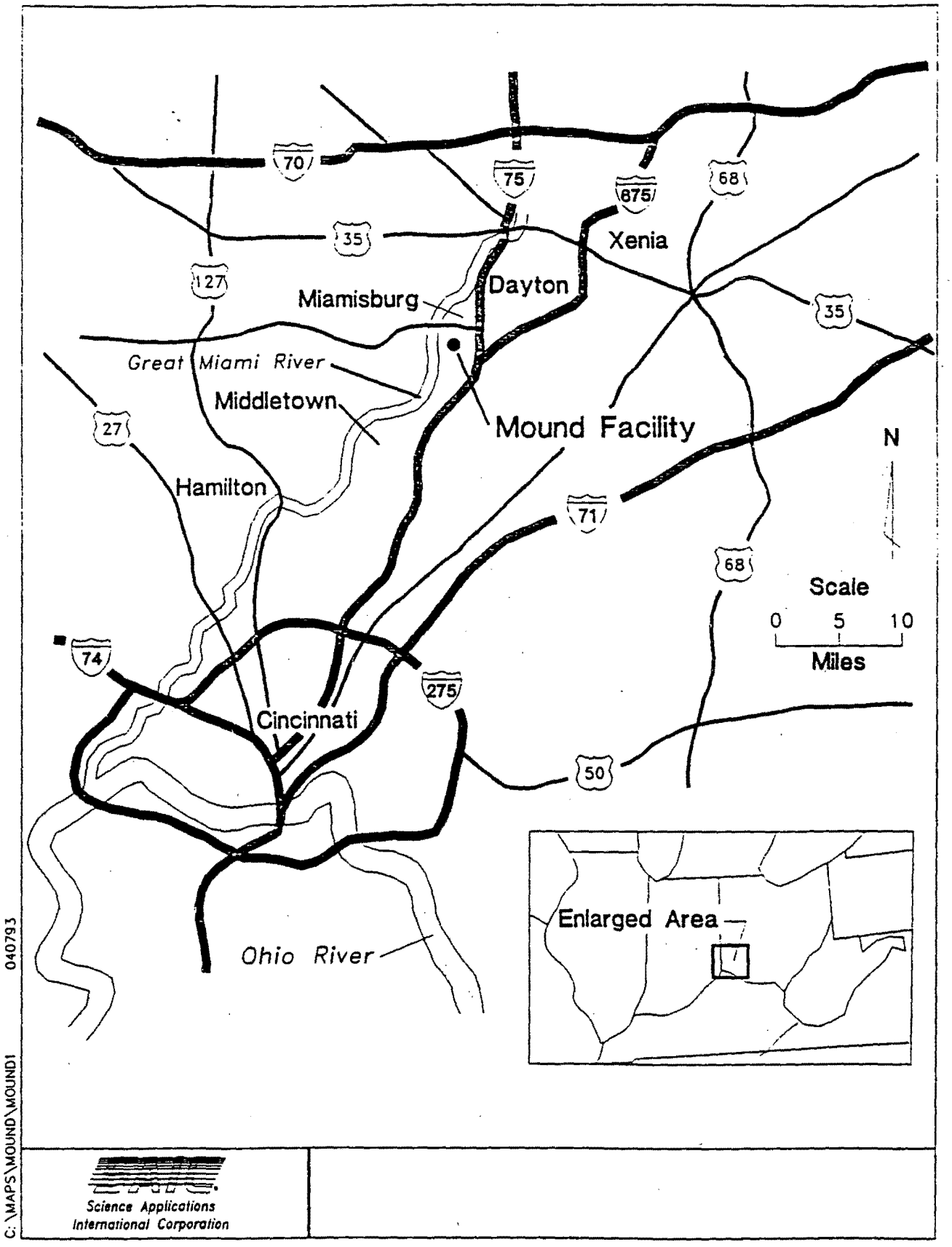

Figure 1.1. Mound Plant Location

city park north and south ponds, the overflow creek (from the canal to the Great Miami River), and the drainage ditch (from Mound Plant west property line to the canal). The location of the Miami-Erie Canal in OU4 is shown in Figure 1.2. DOE does not own the canal or its associated waterways, and the canal is accessible to the general public. The canal serves as a drainage pathway for surface water flowing from the Mound Plant drainage ditch via the overflow creek directly into the Great Miami River, as well as through percolation into the buried valley aquifer that lies below the river and canal.

Historically, water from the Mound Plant drainage ditch flowed from Mound Plant to remnants of the Miami-Erie Canal. The water was diverted by gravity into the northern and southern portions of the canal. Water entering the north canal was diverted into the north and south ponds, which drains into the Miamisburg storm sewer system and finally into the Great Miami River. Water entering the south canal flowed down the canal, under the railroad, to a weir connecting with a culvert under the Dayton-Cincinnati Road. The culvert then carried the water to an overflow creek that drains into the Great Miami River (DOE 1990).

Since 1974, several changes have been made to the surface water system adjacent to Mound Plant. A drainage control system, consisting of three interconnected retention basins for sediment settling and an overflow pond, was installed. Water is released from the retention ponds to an abandoned section of the Miami-Erie Canal at the National Pollutant Discharge Elimination System (NPDES) Outfall 002. Continuous controlled releases occur from this pond to the drainage ditch and the south canal. Water entering the Miami-Erie Canal at this outfall must flow south because the north canal section has been blocked to flow from the south canal. The water flows through the south canal under the railroad to a weir, connecting a culvert under the Dayton-Cincinnati Road (DOE 1990).

Both the north and south ponds have been altered by the city of Miamisburg. The north pond was initially converted into a lined solar heating pond for the municipal park swimming pool, while the south pond was enlarged to create a fishing pond for the same park (DOE 1990). The north pond is no longer used for solar heating, and is in the process of being backfilled by the city.

Because of the drainage control system installed by Mound Plant, very little water currently enters the canal system. The north canal is totally dry and heavily vegetated with grass, and the south canal contains a meandering channel with 4 to 8 inches of water. This flow greatly increases after heavy rains. The banks of the south canal are also heavily vegetated. Soil was removed from the north and south

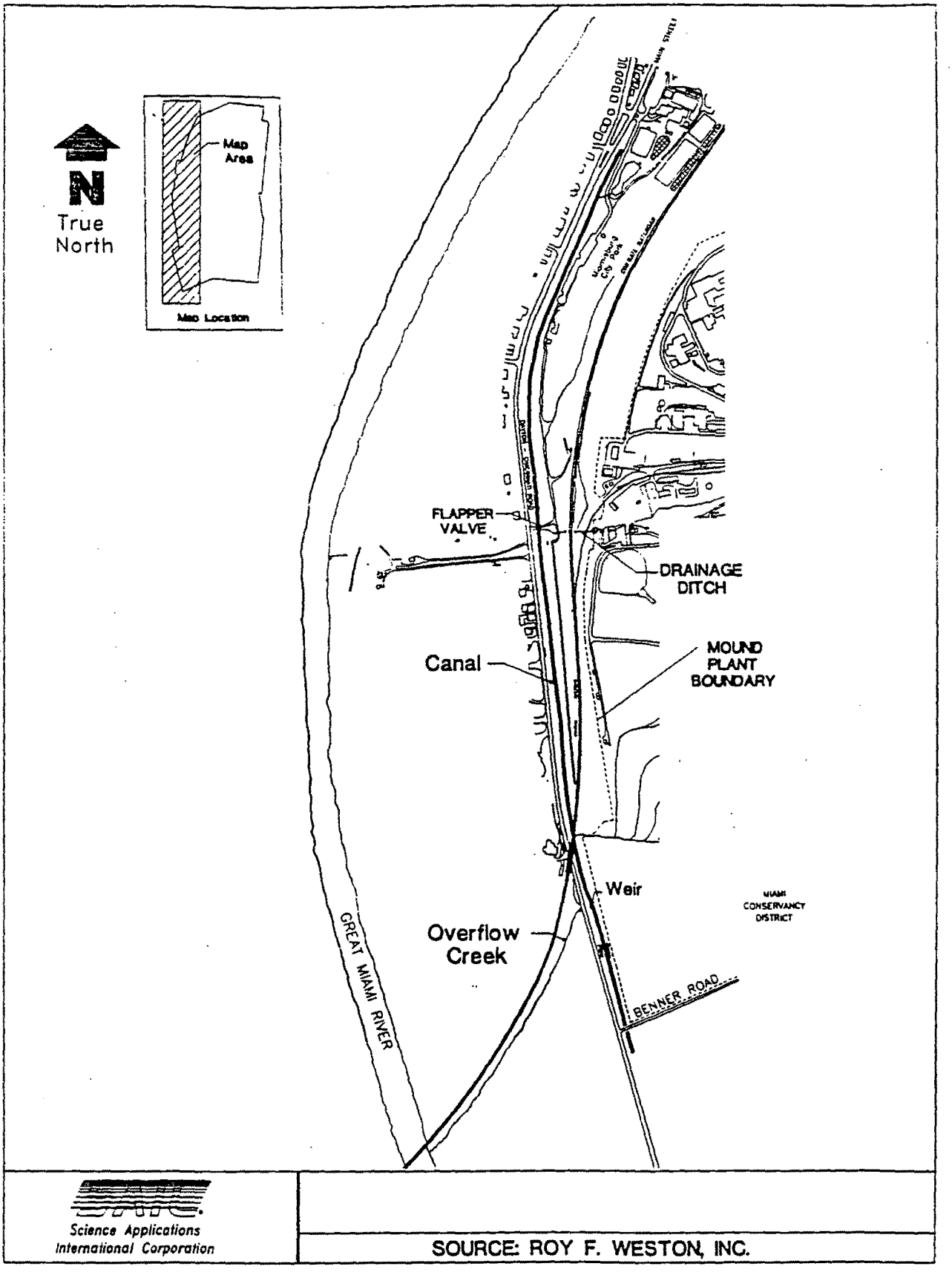

Figure 1.2. Location of Operable Unit 4: Miami-Erie Canal

ponds in the park development and was used as fill underneath the tennis courts and to construct a berm into the park (DOE 1990).

Historically, portions of the Miami-Erie Canal have been impacted by past releases from various Mound Plant operations. In January 1969, an underground pipeline leading from the plutonium processing building to the waste disposal building ruptured, releasing a plutonium nitrate solution to the surrounding soils. An intense storm, which occurred during the excavation of the contaminated soils, produced sufficient surface water runoff and overland flow to erode plutonium contaminated soil from the excavated areas to the Mound Plant drainage ditch. From there, the soil flowed off Mound Plant property and discharged into the Miami-Erie Canal, resulting in deposition into the soils of the canal, the north and south ponds, and overflow creek, prior to flowing into the Great Miami River. Subsequent erosion of lesser-contaminated and uncontaminated soils from Mound Plant followed the same pathways, covering portions of the plutonium-contaminated canal soils with additional sediment. Although there are no records or means to ascertain the actual build-up of sediment in the canal since the 1969 release, there is, however, are one known location where sedimentation build-up is up to four feet: location D which is located approximately half-way between sample location YYN and the intersection of the drainage ditch and the canal. In general, very little sediment has accumulated in most areas of the canal. The extent of plutonium contamination in the canal and associated waterways was reported by Rogers (1975).

Tritium is also a known contaminant in the Miami-Erie Canal (Kershner and Rhinehammer 1978). Prior to 1967, liquid waste from Mound Plant tritium operations was consolidated in collection sumps. After dilution (the accepted practice of the time), part of this liquid was discharged to the Mound Plant drainage ditch which conveyed it offsite and into the Miami-Erie Canal. In 1967, this practice was discontinued after a waste disposal facility was constructed to process the tritiated liquid waste. Other possible sources of tritium contamination in the canal include Mound Plant's stack emissions and releases from the hillside seeps.

According to previous information, no chemical contamination was expected to be present in the canal area. However, prior to 1992, the Miami-Erie Canal had not been sampled for chemical contamination. Sediment and water samples from the south pond were collected and analyzed in 1990 for plutonium-238 and chemical contamination (Halford 1990). (See Section 4.1 for a detailed discussion of the results of the south pond study.) Mound has regularly monitored the environment onsite and offsite from Mound Plant, including OU4 (EG&G 1992b), in compliance with the Mound Environmental Monitoring Plan, per DOE Order 5400.1.

1.1. PURPOSE OF REPORT

The Miami-Erie Canal historically has received discharges of liquid effluents from the Mound Plant drainage ditch, and because previous studies have identified plutonium and tritium contamination within the canal, a Special Canal Sampling project was initiated to determine whether other contamination is present in the Miami-Erie Canal. This report describes the objectives, scope, and results of the special canal sampling project.

1.1.1. Objectives

The overall objective of the Special Canal Sampling project is to provide qualified data to support the determination of whether there is mixed waste contamination in the canal portion of OU4. Mixed waste is defined by the FFA as "waste that contains both hazardous waste and source, special nuclear, or by-product material subject to the Atomic Energy Act of 1954 [FFA, Section 105(c)(2)]. Hazardous waste is defined as "waste that either (1) contains a hazardous waste listed in Subpart D of Title 40, the Code of Federal Regulations (CFR) part 261 or (2) exhibits any of the hazardous waste characteristics identified in Subpart C of 40 CFR part 261". The presence of mixed waste will affect the identification and analysis of proposed removal alternatives and will impact Mound Plant's ability to proceed with a removal action to address radioactive contamination in the canal, if such action is necessary.

The specific objectives of the special canal sampling project are to determine (EG&G 1992a):

- whether there are hazardous chemical contaminants in the canal, and
- the nature of radionuclide contamination in the canal.

Based on an evaluation of the Special Canal Sampling results, the DOE will make a determination of whether there is mixed waste contamination in the canal.

The data quality objectives for this sampling project are defined in Section 5.1.

1.1.2. Scope

The scope of the Special Canal Sampling project is: (1) to collect and analyze soil samples from various locations in the canal defined in the Statement of Work (SOW) (EG&G 1992a); (2) to identify possible chemical (non-radiological) contamination; and (3) to confirm the presence of radiological contamination. In order to meet the project objectives (Section 1.1.1), sampling locations were selected to coincide with representative locations used in the 1974 investigation (Rogers 1975). The intent is to sample the canal for chemical contamination at locations where the maximum plutonium concentrations were found, as well as to sample at sufficient locations to be representative of the canal condition. The sampling locations for this Special Canal Sampling project are identified in Figures 1.3 and 1.4

1.1.3. Historical Releases

This section provides a summary of all known discharges released into the Miami-Erie Canal or the Great Miami River from Mound Plant. Tritium discharges into the site drainage ditch prior to 1970 and a plutonium-contaminated waste pipeline break in 1969 (see Section 4.1) are believed to be the primary sources of Operable Unit 4 contamination thus far identified.

Before 1967, five sumps were used to collect and dispose liquid waste discharges from tritium operations at Mound Plant. If concentrations exceeded the radioactivity concentration guide of 1,000 nCi/L [1×10^6 pCi/L] (FRC 1959), the sump water was metered into a stream of raw supply water and, once diluted, was discharged through the storm sewer runoff ditches, to the site drainage ditch, to the Miami-Erie Canal, and finally to the Great Miami River. A waste disposal facility was built in 1967, providing a centralized system for processing tritiated liquid waste. The combined waste stream was collected in holding tanks for assay and then discharged in batches with dilution water to the site drainage ditch, the Miami-Erie Canal, and the river. In 1970, an automated monitoring system was installed. In 1971, a similar monitoring system was installed in the NPDES effluent pipeline (Outfall 001) that leads directly to the river (Styron and Meyer 1981).

In 1970, Mound Plant discontinued the discharge of all tritium process waste liquids in favor of collection, solidification, packaging, and shipment to an off-plant burial ground approved by the Atomic Energy Commission (AEC) (now DOE). Mound Plant was able to reduce its liquid tritium releases from 2,330 Ci in 1969 to 58 Ci in 1975 and 3.2 Ci in 1991 (EG&G 1992b).

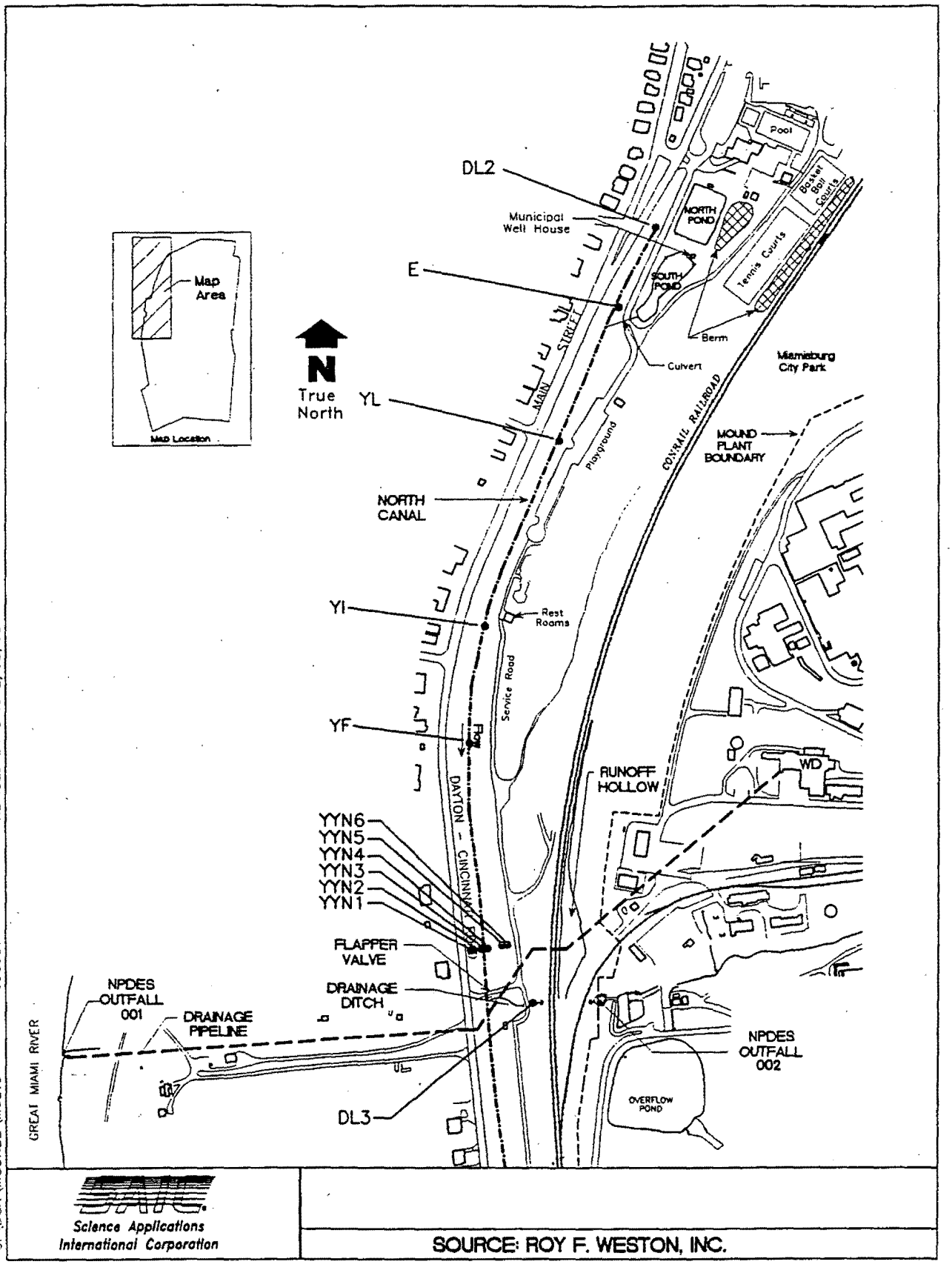

Figure 1.3. Special Sampling Locations at Miami-Erie Canal (northern half)

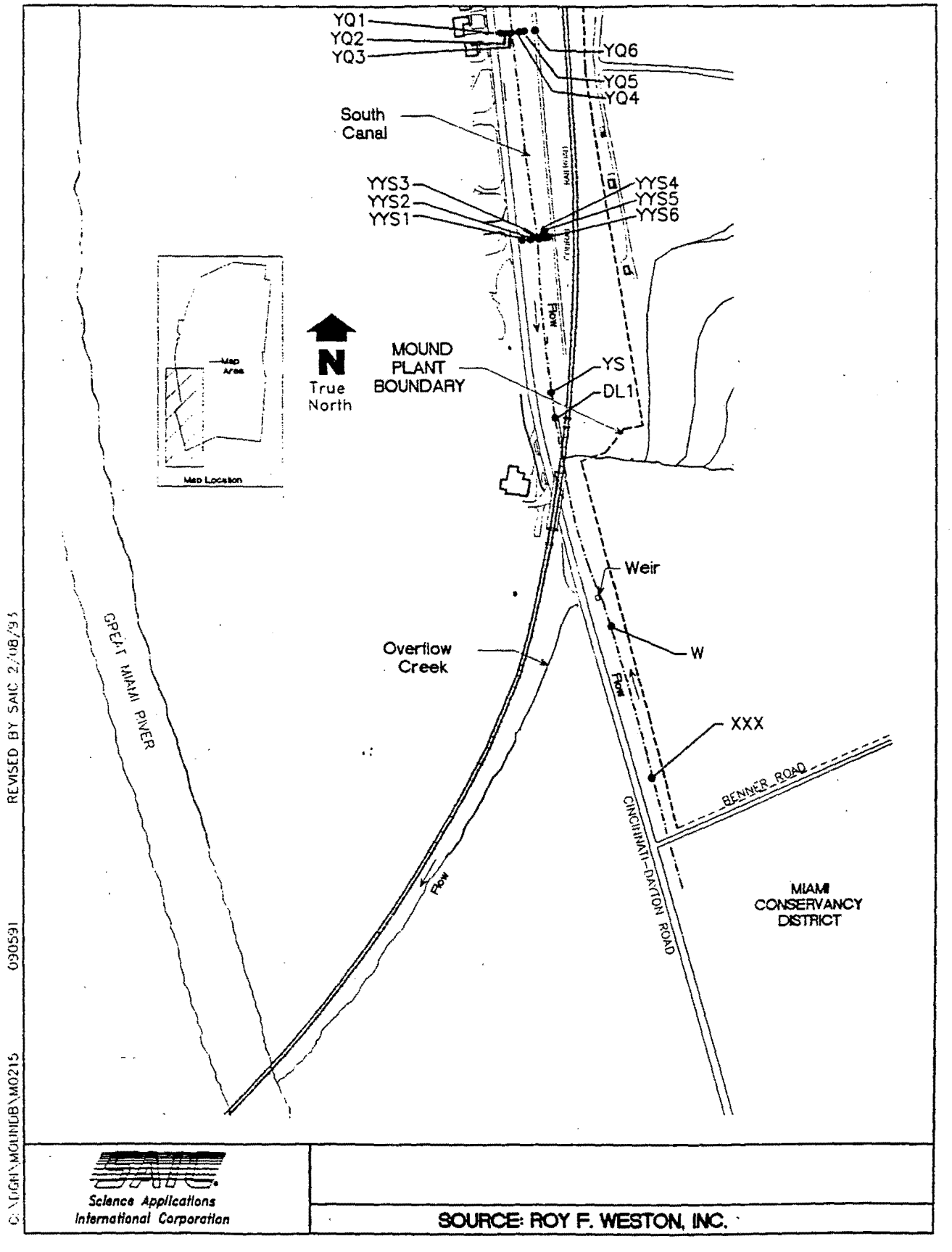

Figure 1.4. Special Sampling Locations at Miami-Erie Canal (southern half)

Tritium in the Miami-Erie Canal is also a result of air emissions from Mound Plant. Concurrent with tritium reduction in liquid effluents, releases of tritium to the atmosphere were greatly reduced. Stack emissions were reduced from 0.315 Ci in 1969 to less than 0.009 Ci in 1975, although the tritium inventory at Mound Plant remained constant during this period. The effluent release of tritium to the atmosphere in 1991 was 0.0012 Ci (EG&G 1992b).

In order to comply with the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251), and the Ohio Water Pollution Control Act (Ohio Revised Code, Sec. 6111), Mound Plant has maintained a wastewater discharge permit under the NPDES. The permit was originally issued by the EPA Region V and was first renewed on January 15, 1981. The Ohio EPA renewed the permit for a five-year period on September 30, 1985, and renewed it again on September 28, 1990 (No 11000005*CD). Each of these renewals has contained additional sampling requirements, and specified limitations for pollutants in the two effluent streams (001 and 002) from the plant that discharge to the Great Miami River (Figure 1.3). The permitted limitations and the annual data summaries are included in the Environmental Monitoring Reports (EG&G 1992b).

1.1.3.1. NPDES Outfall 001

Effluents from NPDES Outfall 001 are discharged through a 10- to 12-inch-inside diameter sanitary sewer installed in 1946 when the plant was built. The buried pipeline runs westward from the approximate position of the plant drainage ditch to the Great Miami River and is composed of four segments: from the WD Building to just off-plant, the pipe is vitrified clay; beneath the railroad, the pipe consists of mild steel; from the railroad to just west of the highway, the pipe is cast-iron; and to the river from the highway, the pipe again is constructed of vitrified clay. In 1981, partly in response to the Potable Water Standards Project (Styron and Meyer 1981), a 10-inch plastic liner was installed along the length of the pipe to preclude leaks. The Dames and Moore (1976) study demonstrated tritium-contaminated soils along the entire length of the NPDES Outfall 001 sanitary sewer pipeline.

Outfall 001 carries discharges from the sanitary waste treatment plant, the radioactive waste disposal facility, and the electroplating facility. This effluent also contains single-pass noncontact cooling water, zeolite softener backwash, boiler plant blowdown, minor storm water runoff (EG&G 1992b), and groundwater from well 0912 (old Miamisburg #2) when it is used from groundwater pumping in conjunction with the Potable Water Standards Project (Styron and Meyer 1981). The sanitary treatment system, electroplating system, and radioactive waste inlets to Outfall 001 are sampled individually.

Collectively, effluent is sampled for nonfilterable residues, oil, grease, ammonia, cadmium, chromium, copper, lead, nickel, zinc, fecal coliform, mercury, biological oxygen demand, flow rate, and in the summer, E. coli and chlorine. No records indicate that the effluent from these facilities has ever been discharged via Outfall 002.

1.1.3.2. NPDES Outfall 002

NPDES Outfall 002 carries single-pass cooling water, cooling tower blowdown, zeolite softener backwash, and most of the plant storm runoff (EG&G 1992b). Prior to 1976, a small stream gauging station on the lower reach of the plant drainage ditch served to monitor stream flow. In 1976, the storm water retention and discharge system was built. Effluents are monitored on a weekly basis for total nonfilterable residues and daily for flow rates. Samples are collected automatically, are composited over 24 hours, and are proportional to flow volume. The effluents are released to the southern portion of the canal and under the Dayton-Cincinnati Road to an overflow creek that outfalls to the Great Miami River.

The storm water retention and discharge system consists of low-flow retention basins and the overflow pond which were constructed on the lower reach of the plant drainage ditch to control surface water discharge from the plant and to provide settling for suspended sediment in the plant runoff water. Surface water is retained in the ponds to reduce peak runoff volume and velocity. The retention basins and overflow pond were designed to retain 95 percent of the silt and sand particles and typically receive about 410,000 gallons per day (gpd) of water from the plant drainage ditch. Retention basin effluent is discharged through a standpipe in the western basin, through NPDES Outfall 002. Two underground concrete culverts direct discharge from the lower weir basin, to the southern portion of the Miami-Erie Canal, to the Great Miami River. As required by the NPDES permit, Outfall 002 is monitored for pH, suspended solids, and hazardous organics (EG&G 1992b). Mound Plant also monitors Outfall 002 for plutonium, tritium, and uranium.

During periods of high flow, water is diverted through a channel to the overflow pond, which is designed to hold 5,000,000 gallons. This volume is designed to retain all facility effluents for five days in the event of a spill. Pond effluent is discharged through a standpipe to the NPDES Outfall 002 at a rate of approximately 600,000 gpd.

SECTION 2

2. FIELD SAMPLING PLANNING

The Special Canal Sampling project is based on the draft Sampling and Analysis Plan in the SOW (EG&G 1992a), which specifies: sampling objectives; locations, depths, and quantity of samples; sample identification; sampling procedures and equipment; and sample handling and analysis. Additional sampling requirements are specified in the OU9 Quality Assurance Project Plan (QAPjP) and the OU9 Health and Safety Plan (HSP) (DOE 1992). Based on these requirements, the project data needs and sampling strategy were defined. A land survey of the Miami-Erie Canal was performed to identify sampling locations (see Section 2.2). Field materials and equipment necessary for conducting field sampling were procured, and members of the field team were verified as being qualified to perform their assignments in normal and adverse conditions.

2.1. DATA NEEDS

The data needs for this Special Canal Sampling project include information to satisfy the sampling objectives, to support the evaluation of potential removal action alternatives, to identify monitoring requirements during potential removal action implementation, and to support planning of the OU4 RI/FS. The Special Canal Sampling project SOW (EG&G 1992a) specified the following data needs:

1. Analytical results will be compared to background levels from existing data in the area. (This requirement determines minimum analytical detection thresholds for constituents with known background.) At this time, site-specific background levels are not available.

2. Samples will be analyzed for the following radionuclides:

   - gamma-emitting isotopes, including cesium-137, cobalt-60, americium-241, bismuth-207, bismuth-210, potassium-40, radium-226, and actinium-227;

   - alpha emitting isotopes of thorium, uranium, and plutonium;

   - strontium-90; and

   - free and bound tritium.

3. Samples will be analyzed for the following hazardous chemicals:

   -volatile organic compounds (VOCs);

   - pesticides/polychlorinated biphenyl (PCBs);

- semivolatile organic compounds (SVOCs); and

- inorganics (metals and cyanide).

4. Sample locations shall be as shown in Figures 1.3 and 1.4.

5. The precision, accuracy, completeness, representativeness, and comparability objectives for the sampling and analysis data are discussed in Section 5.1, Data Quality Objectives.

No action levels, other than available background and DOE cleanup guidelines, are specified for this investigation.

2.2. SURVEY

A land survey was conducted by a registered, professional surveyor prior to the initiation of field sampling activities to identify sampling locations. The purpose of the survey was to locate the metal pins used to mark the previous sampling locations (Rogers 1975).

The previous sampling locations were identified by locating iron pins with a metal detector for all locations for which EG&G Mound provided drawings. The detailed drawings provided by EG&G Mound did not specify locations YYN and YYS. Consequently, information provided by unscaled drawings was used to determine the approximate location of the metal pins marking YYN and YYS. In this way, locations YYN and YYS were established once the metal pins that best fit the representative locations were found.

After completion of sampling, the actual sample locations were re-surveyed, using the 1983 Ohio State Plane Coordinate System. The level of control was ± 0.1 foot for horizontal control and ± 0.01 foot for vertical control.

2.3. SAMPLING STRATEGY

The sampling strategy is based on the project SOW (EG&G 1992a). The intent of the strategy is to sample the canal at locations that would yield representative results compared to the original canal sampling study (Rogers 1975). Since one of the objectives of the study is to determine the presence of chemical as well as radiological contamination, it was decided to sample in locations having known

radiological contamination, i.e., plutonium -238 contaminated soil. By choosing several locations, the intent is to examine soils exhibiting a range of plutonium levels. Also, the rationale for selecting sampling locations is based on the assumption that hazardous constituents (from Mound Plant, at least) would be expected to deposit in similar locations as the radiological deposits in the canal. Although the behavior and distribution of chemical contaminants may not be the same as that of plutonium or tritium, the intent of the sampling study is to determine if the chemical contamination co-exists in locations with known plutonium contamination.

The field sampling procedures used are in accordance with the Mound Plant ER Program Sampling Procedures in effect at the time of the sampling activities (Table II.1). See Section 3 for discussion of the implementation of this field sampling strategy. The types of field samples described in the following subsections were planned to be taken in order to assess field quality control.

2.3.1. Trip Blanks

Trip blanks (two 40 milliliter (mL) vials of deionized/distilled water) are used to evaluate contamination that could be introduced into the liquid samples during shipment. Two vials prepared by the lab are placed in each shipping container with the liquid samples sent to the lab and analyzed for EPA Target Compound List (TCL) VOCs.

2.3.2. Rinsate Blanks

Rinsate blanks are used to evaluate the success of the equipment decontamination process. After decontamination, the sampling equipment is rinsed a final time with deionized/distilled water. The rinsate is collected and analyzed for the same parameters as the soil samples collected. One rinsate blank is collected for every 10 or fewer samples.

2.3.3. Ambient Blanks

Ambient blanks (two 40 mL vials of deionized/distilled water) are used to evaluate the volatile organic contamination that may be introduced to the soil samples from the ambient work area. Blanks are prepared by placing the open vials of deionized/distilled water in the work area during the time that the

Table II.1 Mound Plant, ER Program Sampling Procedures

SOP		Effective Date	Revision	Purpose
1.1	General instructions for Field Personnel	May 1991	1	To provide field personnel with instructions regarding activities to be performed before during, and after field investigations.
1.3	Sample Control and Documentation	January 1991	0	To define the steps necessary for sample control and identification, data recording, and chain-of-custody documentation.
1.4	Sample Containers and Preservation	May 1991	1	To provide guidance in the selection of suitable containers for samples, container cleaning, required sample volumes, sample collection, holding times, and the recommended preservation techniques for water, wastes, sediments, sludges, and soils samples.
1.5	Guide to the Handling, Packaging, and Shipping of Samples	May 1991	1	To provide a general guide for packaging and shipping samples of environmental and hazardous materials to the laboratory.
1.6	General Equipment Decontamination	May 1991	1	To describe methods for the decontamination of field equipment potentially contaminated during sample collection.
4.1	Soil Boring	January 1991	0	To ensure acceptable, consistent soil-boring procedures for all pertinent aspects of environmental investigations.
5.1	Soil and Rock Borehole Logging and Sampling	January 1991	0	To describe the physical nature of consolidated or unconsolidated subsurface earthen materials encountered during auger, rotary, or other drilling activities and to collect samples of the earthen materials for further evaluation.
5.2	Soil Sampling with a Spade and Scoop	May 1991	1	To describe the method for collecting a soil sample less than 4 feet below land surface.
5.3	Subsurface Solid Sampling with Hand Auger and Thin-Wall Sampler	January 1991	0	To define a method for collecting subsurface solid samples with a hand auger and thin-wall tube sampler.
5.8	Soil Sampling with a Stainless Steel Surface Soil Sampler	January 1991	0	To define procedures for collecting surface soil samples to determine the chemical and physical soil properties.

Reference: DOE 1991a

soil is exposed to the ambient air. The ambient blanks are shipped separately to the laboratory for analysis. One ambient blank is collected for every 20 or fewer samples.

2.3.4. Co-located Samples

Co-located samples are prepared to evaluate sample variability and sampling technique precision. True duplicate soil samples are not possible, because soil is not homogeneous. However, when there is sufficient volume for two sets of analyses, thorough mixing of the soil will ensure a more homogeneous sample. Samples for VOCs are taken before soils are homogenized due to the potential loss of these compounds during mixing. Co-located samples can be collected "side by side" with regular samples. The original and co-located samples are analyzed by the laboratory for the same parameters.

SECTION 3

3. DISCUSSION OF FIELD SAMPLING

The original Sampling and Analysis Plan in the SOW (EG&G 1992a) describes nine sampling locations in the canal which match locations sampled in the previous investigation (Rogers 1975). Because water surges may have transported contaminated soil south of the overflow creek junction in the south canal, one additional sample location, XXX (not sampled in 1974), was added. These 10 locations were to be sampled at 1-foot intervals to a depth of 3 feet (see Section 2.3).

In addition to the sampling locations specified above, the Sampling and Analysis Plan called for three 1-foot samples to be taken where stained or discolored soils were noted. Because no stained or discolored soils were found, EG&G Mound selected three discretionary locations in the canal and drainage ditch areas, DL1, DL2, and DL3. Sampling location DL1 was selected because it was a highly sedimented area with potential for contamination. Also, recent work on the railroad trestle revealed elevated concentrations of radionuclides during screening. Sampling location DL2 was selected because it is the lowest point in the North Canal, in front of the storm sewer catch basin for the City of Miamisburg, and because it is the most likely site for sedimentation of any contamination that may have been washed into the storm drain. Sampling location DL3 was selected because any water-borne contamination from Mound Plant (except for the extreme northern and southern portion of the site) would flow over this area. A cross section of six borings was taken at three of the pre-determined locations, and five of the predetermined locations were extended to a depth of 5 feet rather than 3 feet (EG&G 1992a). Table III.1 lists the number of samples taken at each sampling location.

EG&G Mound selected locations YYN, YQ, and YYS for the cross-section sampling. The sample locations were identified as "1" through "6" from west to east: YYN1 was the low point beyond the west bank, YYN2 the high point on the west bank, YYN3 in the canal bed on the west side, YYN4 in the canal bed on the east side, YYN5 the high point on the east bank, and YYN6 the low point beyond the east bank. Sample locations YQ and YYS were numbered in the same way starting with "1" in the west and progressing to "6" in the east.

EG&G Mound selected locations YYN3, YYS4, YF, YL, and YQ3 to be extended to the 5 foot depth. These locations were selected based on the results of the 1974 study (Rogers 1975). The nine-digit sample designation from the Sampling and Analysis Plan was changed to a six-digit identifier which is consistent with the Contract Laboratory Program (CLP) reporting requirements for analyses.

Table III.1 Special Canal Samples

Canal Location	No. of Cross Section Locations	No. of Samples (1 ft. Intervals)	Total Samples
DL-2	1	1	1
E	1	3	3
YL	1	5	5
YI	1	3	3
YF	1	5	5
YYN	6	5 @ 3 1 @ 5	20
DL-3[a]	1	1	1
YQ	6	5 @ 3 1 @ 5	20
YYS	6	5 @ 3 1 @ 5	20
YS	1	3	3
DL-1	1	1	1
W	1	3	3
XXX	1	3	3
		Total	88

[a] Drainage Ditch location

3.1. SAMPLING ACTIVITY

The soil samples were taken with a split spoon sampler driven into the ground by dropping a weight from a tripod onto the top of the split spoon. A minimum of two split spoons for each 1 foot interval were necessary to obtain a sufficient volume of soil for the laboratory and screening analyses. A summary table showing the sample location, identification, depth, and description is located in Appendix A.

In the southern portion of the canal, the soil and sediment were softer than in the northern portion. Occasionally, the sediment fell back or was pulled back into the hole when the split spoon was removed from the ground. In order to obtain a sample in these cases, the split spoon was driven to a depth of 2 feet. The deeper sediments were usually more compact and were retained in the sampler. The core was then divided into two samples after the split spoon was opened at the surface. The following samples were taken over 2 foot intervals:

Location	From	To
YQ3	3-4 ft	4-5 ft
YQ4	1-2 ft	2-3 ft
W	1-2 ft	2-3 ft
YS	0-1 ft	1-2 ft

At some sampling locations, only enough soil/sediment was collected for either the volatile organic analysis (VOA) or the laboratory analysis. In these cases, there was insufficient sample volume for Mound's screening sample. The reason for this problem is that the soil/sediment sample was not dense enough to be pushed into the spilt spoon. As the split spoon was driven into the ground, the soil/sediment sample was compacted ahead of the split spoon and pushed to the sides. Consequently, additional samples were collected at the following sampling locations using a slightly-larger hand-operated 3.25-inch diameter stainless steel bucket auger:

Location	From	To	Purpose
YYN1	0 ft	1 ft	Mound Screening Sample
YYN5	2 ft	3 ft	Mound Screening Sample
YF	2 ft	3 ft	all samples but VOA
YQ	0 ft	1 ft	all samples but VOA
YYS3	1 ft	2 ft	all samples but VOA
W	0 ft	1 ft	all samples

Locations W, YS, DL1, DL2, DL3, and all the co-located samples did not require the tripod or the drop weight. The split spoon was pushed into the ground or driven with a sledge hammer or a slide hammer.

The co-located and the original samples were not taken at the same time. However, both were obtained using the same sampling procedures, at "side by side" locations. Table IV.1 lists the number of co-located samples, trip blanks, ambient blanks, and rinsate blanks taken for this project. During sampling activities several materials were found in the following cores:

Location	Depth	Material
YQ5	at the bottom of the 1 to 2 foot core	asphalt-like layer
YQ5	at the top 4 to 5 inches of the 2 to 3 foot core	cinder-like material
YYS3	in the 0 to 1 foot core	asphalt-like material
YYN2	1 to 2 foot core	small clam shells
YYN4	in the middle of the 0 to 1 foot core	sandy/cinder-like material
YQ6	top 1 to 2 inches of 0 to 1 foot core	sand and gravel
YQ6	1 to 2 foot core	sand and gravel
YQ6	2 to 3 foot core	sand and gravel
YYS4	3 to 4 foot core	gravel
W	2 to 3 foot core	rocks
XXX	0 to 1 foot core	sand and stones

The presence of these non-sedimentary materials, especially the asphalt and cinder specimens, may impact the laboratory results. During sample preparation, no attempt was made to screen or separate these materials from the regular soils and sediments. It is assumed that samples with cinder and asphalt-type materials would have higher polynuclear aromatic hydrocarbons (PAH) concentrations, due to the composition of these materials. However, the samples taken in the canal which contained asphalt-type materials had low concentrations of PAHs. See Section 6 for additional information.

3.2. FIELD QUALITY ASSURANCE/QUALITY CONTROL

The SOW (EG&G 1992a) specified that trip blanks, ambient blanks, rinsate blanks and field duplicate samples be taken to satisfy field quality assurance requirements. (See Section 2.3 for a description of each of these sample types.) The field duplicate samples taken at Mound Plant are more appropriately called "co-located" samples. The soil cores were taken side-by-side at the same locations; however, there is a one to two month gap between the time that the first samples and the co-located samples were taken. Co-located samples, as stated in Data Quality Objectives for Remedial Response Activities (USEPA 540/G-87/003), "...when collected, processed, and analyzed by the same organization, provide interlaboratory precision information for the entire measurement system including sample acquisition, homogeneity, handling, shipping, storage, preparation, and analysis." Co-located samples provide better data on the spatial variation of the parameters analyzed for the remedial objective of this project.

Chain-of-custody control was maintained in the field for all samples. Only after EG&G Mound screened the samples were they shipped to the laboratory for analysis. The screening results were included on the chain-of-custody form for each sample. Samples were packaged and shipped to the laboratory by an air carrier in accordance with Mound Plant procedures (see Table II.1).

The Sampling and Analysis Plan, SOW (EG&G 1992a) specified that 88 archive samples be collected during field sampling. After sampling began, EG&G Mound requested that archive sample collection be discontinued. Five of the scheduled 88 archive samples had been collected but were not analyzed.

3.3. HEALTH AND SAFETY PLAN

The Special Canal Sampling was conducted in accordance with the OU9 Site-Wide HSP (DOE 1992), with addenda to address specific canal sampling requirements. The revised HSP required that all field members be trained and certified to work in Occupational Safety and Health Administration (OSHA) level

D and, if necessary, level C conditions. Records of member training, material safety data sheets (MSDSs), field sampling procedures, communications and emergency equipment were available during all sampling activities. In accordance with the HSP, audits were conducted to verify compliance to the HSP. Implementation of the HSP was supported by health physics personnel from EG&G Mound, who performed real-time ambient and sample monitoring for radiological contamination. Monitoring of non-radiological ambient conditions was performed using an Organic Vapor Analyzer (OVA) monitor operated by members of the field team.

SECTION 4

4. SAMPLE ANALYSIS

The soil/sediment samples were analyzed for plutonium-238 and thorium-232 by the Mound Plant Soil Screening Facility. The samples were shipped to either a chemical analysis laboratory or to a radiochemical analysis laboratory, as appropriate. The samples were shipped in accordance with the OU9 Site-Wide Work Plan, QAPjP (DOE 1991b) and Mound SOP 1.3, "Sample Control and Documentation," which identifies the chain-of-custody form, and SOP 1.5, "Guide to Handling, Packaging, and Shipping of Samples" (DOE 1991a). The number of samples and analytical methods specified by the OU4 Miami-Erie Canal Sampling and Analysis Plan for this sampling project are listed in Table IV.1. Analytical results were received in sample delivery groups (SDGs) from the laboratories. Table IV.2 summarizes the SDGs for this project.

4.1. HISTORICAL DATA

Historically, the Miami-Erie Canal and associated waterways have been affected by contaminants from various Mound Plant activities. Studies have identified plutonium-238 and tritium contamination in the canal, north and south ponds, drainage ditch, and the overflow creek. The following is a summary of the results of past investigations of contamination in the soils and sediment in the Miami-Erie Canal area in the vicinity of Mound Plant.

Mound Plant was extensively sampled for plutonium-238 (Rogers 1975). Approximately 1,750 samples of soil, sediment, water, air, vegetation, fish, and suspended solids in the canal water were collected. Sediment was sampled in profile from "the very surface" to depths as great as 5 feet. Maximum concentrations of plutonium-238 in sediments ranged from 450 pCi/g for "the very surface" samples to 4,560 pCi/g for one sample at the 2- to 3-foot depth at location D. (Location D, which was not sampled as part of the Special Canal Sampling study, is located approximately half-way between location YYN and the intersection of the drainage ditch and the canal.) A listing of maximum plutonium-238 concentrations found in the sediments of waterways and their respective locations are summarized in Table IV.3. A listing of the concentration of plutonium-238 in the sediments of the canal at locations nearest to those sampled in 1992 is presented in Table IV.4. Halford (1990) measured a maximum concentration of plutonium-238 of 2.05 pCi/g in sediments in the south pond.

Although not associated with the 1969 pipeline break, tritium is also considered a contaminant in the Miami-Erie Canal. Numerous test borings in the area of the canal showed elevated tritium levels

Table IV.1. Analytical Methods and Total Numbers of Soil/Sediment Samples

Parameter	Analytical Method	Soil/ Sediment Samples	Co-located Samples	Trip Blanks	Ambient Blanks	Rinsate Blanks	Total Number of Analyses
Volatile Organic Compounds	CLP SOW[a]	88	9	7	5	9	118
Semivolatile Organic Compounds	CLP SOW[a]	88	9	-	-	9	106
Pesticide/PCB	CLP SOW[a]	88	9	-	-	9	106
TAL Metals & cyanide	CLP SOW[b]	88	9	-	-	9	106
Isotopic Plutonium	E-PU-06[c]	88	9	-	-	9	106
Isotopic Thorium	EERF 00-07[c]	88	9	-	-	9	106
Isotopic Uranium	EPA 908.0[c]	88	9	-	-	9	106
Strontium-90	ANL Eichrom[c]	88	9	-	-	9	106
Tritium (free and bound)	EPA 906.0[d]	88	9	-	-	9	106
Gamma Spectroscopy (^{137}Cs, ^{60}Co, ^{241}Am, ^{207}Bi, ^{210m}Bi, ^{40}K, ^{226}Ra by equilibrium with ^{214}Bi, ^{227}Ac by equilibrium with ^{227}Th)	EPA 901.1[d]	88	9	-	-	9	106

[a] U.S. EPA Contract Laboratory Program Statement of Work for Organic Analysis, No. OLM01.8, August, 1991.

[b] U.S. EPA Contract Laboratory Program Statement of Work for Inorganic Analysis, No. ILM01.0, March, 1990.

[c] Isotopic uranium, plutonium, thorium will be analyzed by approved laboratory developed SOPs. These SOPs will based on National Academy of Sciences (NAS) literature, U.S. DOE procedures, U.S. EPA procedures, ASTM methods, or other established literature references.

[d] "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," U.S. EPA, EPA-600/4-80-032, latest version.

ANL=Argonne National Laboratory
CLP=Contract Laboratory Program
EPA=Environmental Protection Agency
PCB=polychlorinated biphenyl
SOW=Statement of Work
TAL=Target Analyte List

TABLE IV.2 Sample Delivery Group Summary

Sample Delivery Group	Sample Analysis Type	Number Of Samples	Number Of Field QC Samples	Sample Locations
SAIM01	INORGANIC	11	1	YI,YF,XXX
SAIM02	INORGANIC	18	1	E,YYN,YQ
SAIM03	INORGANIC	14	2	YL,YQ,YYS
SAIM04	INORGANIC	20	-	YQ,YYS
SAIM05	INORGANIC	12	2	YYN,YS,W
SAIM06	INORGANIC	11	3	YYS,DL1,DL2,DL3
SAIM07	INORGANIC	2	0	YS
SAIM08	INORGANIC	9	-	YI,YF,YYN,YQ,YYS
SAIV01	VOCs	11	2	YI,YF,XXX
SAIV02	VOCs	18	2	E,YYN,YQ
SAIV03	VOCs	14	3	YL,YQ,YYS
SAIV04	VOCs	20	-	YQ,YYS
SAIV05	VOCs	12	4	YYN,YS,W
SAIV06	VOCs	11	9	YYS,DL1,DL2,DL3
SAIV07	VOCs	2	-	YS
SAIV08	VOCs	9	-	YI,YF,YYN,YQ,YYS
SAIS01	SVOCs	11	1	YI,YF,XXX
SAIS02	SVOCs	18	1	E,YYN,YQ
SAIS03	SVOCs	14	2	YL,YQ,YYS
SAIS04	SVOCs	20	-	YQ,YYS
SAIS05	SVOCs	12	2	YYN,YS,W
SAIS06	SVOCs	11	3	YYS,DL1,DL2,DL3
SAIO07	SVOCs	2	-	YS
SAIS08	SVOCs	9	-	YI,YF,YYN,YQ,YYS
SAIP01	Pest/PCB	11	1	YI,YF,XXX
SAIP02	Pest/PCB	18	1	E,YYN,YQ
SAIP03	Pest/PCB	14	2	YL,YQ,YYS
SAIP04	Pest/PCB	20	-	YQ,YYS
SAIP05	Pest/PCB	12	2	YYN,YS,W
SAIO06	Pest/PCB	11	3	YYS,DL1,DL2,DL3
SAIO07	Pest/PCB	2	-	YS
SAIO08	Pest/PCB	9	-	YI,YF,YYN,YQ,YYS
D20724505	RAD	11	-	YI,YF,XXX
D20727503	RAD	12	-	YYN
D20729501	RAD	20	-	E,YL,YQ,YYS
D22031502	RAD	20	-	YQ,YYS
D20803507	RAD	3	-	W
D20805057	RAD	9	-	YYN,YS
D20806503	RAD	11	-	YYS,DL1,DL2,DL3
D20810506	RAD	2	-	YS
D20917502	RAD	9	-	YI,YF,YYN,YQ,YYS
SAIC Water	RAD	-	9	-

Pest/PCB = Pesticide/Polychlorinated Biphenyl
RAD = Radiological
SVOCs = Semivolatile Organic Compounds
VOCs = Volatile Organic Compounds

Table IV.3 Maximum Plutonium-238 Concentrations in Sediments of Waterways Associated with the Miami-Erie Canal (1974 Study)

Waterways	Depth (m)	Maximum Any-Depth Concentration (nCi/g±2σ)	(pCi/g±2σ)
Runoff hollow	0.30	0.0314 ± 0.0066	31.4 ± 6.6
North pond	0.0	0.0223 ± 0.0051	22.3 ± 5.1
South pond			
North basin	0.0	0.0653 ± 0.0114	65.3 ± 11.4
South basin	0.0	0.208 ± 0.028	208 ± 28
North canal	0.91	4.56 ± 0.20	4,560 ± 200
Drainage ditch	0.30	0.749 ± 0.13	749 ± 130
South canal	0.30	3.8 ± 0.25	3,800 ± 250
Overflow creek	0.0	0.0270 ± 0.034[a]	27.0 ± 34[a]
River			
East bank near canal outfall	0.61	0.0415 ± 0.0081	41.5 ± 8.1
East bank downstream	2.13	0.0037 ± 0.0013	3.7 ± 1.3
Away from east east bank	1.21	0.0006 ± 0.0002	0.6 ± 0.2

[a] This was incorrectly listed as 0.270 in Rogers, 1975. Value shown is from Robinson et al, 1974.

REFERENCE: Rogers 1975

Table IV.4. Maximum Plutonium-238 Concentration in Sediments in Selected Miami-Erie Canal Locations (1975 Study)

Location	Interval (ft.)	Maximum Plutonium-238 Concentration	
		(nCi/g ± 2δ)	(pCi/g ± 2δ)
F (near DL2)	1-2	0.0349 ± 0.0050	34.9 ± 5.0
E	0-1	1.03 ± 0.05	1,030 ± 50
YL	1-2	2.54 ± 0.18	2,540 ± 180
YI	0-1	1.14 ± 0.10	1,140 ± 100
YF	1-2	0.176 ± 0.024	176 ± 24
YYN	1-2	3.33 ± 0.23	3,330 ± 230
B (near DL3)	0-1	0.147 ± 0.021	147 ± 21
YQ	0-1	2.15 ± 0.16	2,150 ± 160
YYS	0-1	3.80 ± 0.25	3,800 ± 250
YS	0-1	0.836 ± 0.079	836 ± 79
W	0-1	0.0735 ± 0.0125	73.5 ± 12.5

REFERENCE: Robinson et al. 1974

(2.1×10^6 to 25.4×10^6 pCi/L in soil distillate) in locations that centered around the confluence of the plant drainage ditch and the canal (Dames and Moore 1976). Although elevated concentrations were detected 20 to 30 feet below land surface (bls), they were reported to be highest at a depth of 4 feet in the north canal (1.89×10^8 pCi/L) at sample location SB-6 (approximately 150 feet north of the drainage ditch inlet); and at a depth of 2 to 3 feet in the south canal (10.3×10^6 pCi/L) at sample location SB-3 (approximately 100 feet south of the drainage ditch inlet). Approximately 90 percent of the tritium in the canal is bound up with the soil (Kershner and Rhinehammer 1978). The highest concentration of tritium in canal soil samples taken during the Rogers (1975) study was 700,000 pCi/g. In an investigation made during 1976-1977, a maximum tritium concentration of 110,000 pCi/g was found in the canal immediately north of where the drainage ditch enters the canal (Kershner and Rhinehammer 1978). For the near-surface (less than 5 feet) depth distribution profiles, the tritium contamination was found to resemble those of the plutonium contamination.

Halford (1990) conducted a study to determine the presence of chemical contamination in the south pond. A total of ten sediment samples were collected from the pond and analyzed for VOCs, SVOCs, pesticides, PCBs and inorganics. The results of these analyses were reported to be below the detection limit for chemical analytes. The detection limits are listed by chemical type in Table IV.5.

Any chemicals released from Mound Plant as liquids that could flow into the Miami-Erie Canal would have been released through the NPDES Outfall 002, which discharges into the Mound Plant drainage ditch. For monitoring purposes, flow proportional, 24-hour composite samples and grab samples are collected from 4 onsite locations, including Outfall 002. Discharges from 002 consist of softener backwash and most of Mound Plant storm water runoff. Mound Plant monitors Outfall 002 for toxic organics on a quarterly basis. The results of the 1991 monitoring program are listed in Table IV.6 (EG&G 1992b). No VOCs were detected in the samples collected as part of the Special Canal Sampling study.

4.2. CHEMICAL ANALYSIS

Thirty-two SDGs were received from the chemical analysis laboratory in both CLP hard copy and electronic media with results for TCL VOCs, SVOCs, pesticide/PCBs, and Target Analyte List (TAL) inorganics. The electronic data were loaded into SAIC's Environmental Information Management System (SEIMS) for data validation. Chemical data above the detection limits are presented in Appendix B, along with associated data qualifiers.

Table IV.5. Detection Limits by Chemical Type

Analyte	Detection Limit
VOC	6-13 μg/kg
SVOC	820-4100 μg/kg
pesticides/PCBs	10-100 μg/kg
Inorganics	0.02-12 mg/kg 20-12,000 μg/kg

REFERENCE: Halford 1990

Table IV.6. Summary of Organic Compounds Detected in Mound NPDES Outfall 002 in 1991.

Parameter	Concentration, $\mu g/L$				
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Method Detection Limit
Methylene chloride	ND	4.36	3.36	ND	2.8
Acetone	ND	15.7	21.6	ND	10
2-Ethylhexyl phthalate	ND	<MDL	ND	ND	10

ND = Not Detected
MDL = Method Detection Limit
Reference: EG&G 1992b

Rinsate, trip blanks and ambient blanks were analyzed with the soil samples and included in the SDGs. A summary table showing the sample identifier, sample location name with coordinates, sample date, laboratory, and SDG number is located in Appendix C.

The TCL VOCs, TCL SVOCs, and TCL pesticide/PCBs were analyzed by gas chromatography/mass spectroscopy under EPA CLP March 1990 SOW.

4.3. RADIOLOGICAL ANALYSIS

Ten SDGs were received from the radiochemical analysis laboratory in both hard copy and electronic media for analysis of isotopic uranium, thorium, and plutonium, bound and free tritium, and isotopic gamma emitters. The electronic data were loaded into SEIMS for data validation. Radiological data are presented in Appendix B along with the chemical data. The radiochemical SDG data are listed in Appendix C along with the chemical samples.

The radiochemical isotopes were analyzed using the techniques prescribed in the OU9 QAPjP (DOE 1991b). The analysis techniques include alpha spectrometry for plutonium, uranium, and thorium; liquid scintillation counting for tritium; and gamma spectroscopy for cesium-137, cobalt-60, americium-241, bismuth-207, bismuth-210, potassium-40, radium-226 and actinium-227. Initially, EPA Method 905.0 was utilized for strontium-90 analysis, based on a fusion-precipitation preparation technique. However, the analytical laboratory was not able to demonstrate acceptable method performance on the samples collected from the canal. Therefore, proportional counting was used for strontium-90 in accordance with the Argonne National Laboratory (Eichrom) method. This method substituted a strontium-specific ion column exchange separation incorporated into EPA Method 905.0. Alpha spectrometry was used to detect alpha emissions for isotopes of plutonium, uranium, and thorium employing the HASL-300 Method E-Pu-06, EPA Method 908.0, and EERF-00-07 methods, respectively. Liquid scintillation counting was used for detecting beta emissions for tritium according to EPA Method 906.0. Gamma spectroscopy was used to determine the gamma radiation levels of several isotopes over a spectrum of energy levels using EPA Method 901.1.

SECTION 5

5. DATA QUALITY ASSESSMENT

A standardized quality assurance and quality control (QA/QC) program was followed during the Special Canal Sampling study to ensure that analytical results were representative of the environmental conditions in the Miami-Erie Canal. The objectives of the Special Canal Sampling study were to confirm the nature of hazardous chemical and radionuclide contamination in the canal and to determine whether there is mixed waste in the canal by collecting and analyzing sufficient numbers of samples. These data would then be used to support recommendations for further evaluation of remedial action alternatives and process options. The Special Canal Sampling study was conducted using EPA Levels IV and V (EPA 1987) for analysis of chemical and radiological constituents for soil samples and the guidelines and specifications described in the OU9 QAPjP (DOE 1991b). Table IV.1 lists the number of soil/sediment samples collected during the Special Canal Sampling study, the methods of analysis, and the numbers of field QC samples collected. The objectives and results of the data validation process are described, below.

5.1. DATA QUALITY OBJECTIVES

The following sections summarize the data quality objectives (DQOs) for precision, accuracy, representativeness, comparability, and completeness (PARCC) obtained during the Special Canal Sampling study in the Miami-Erie Canal. The PARCC parameters are addressed for both the chemical and radiological analyses.

5.1.1. Precision

Precision is defined as the reproducibility, or degree of agreement, among replicate measurements of the same property. The closer the numerical values of the measurements are to each other, the more precise the measurement. Analytical precision was expressed as the percentage of the difference between results of duplicate samples for a given compound or element. Relative percent difference (RPD) was calculated using the following equation:

$$RPD = \frac{C1 - C2}{(C1 + C2)/2} \times 100\%$$

where:
C1 = Concentration of analyte in the primary sample
C2 = Concentration of analyte in the duplicate sample

Precision was determined using matrix spike/matrix spike duplicate (MS/MSD) sample analyses conducted on samples collected for VOC, SVOC, pesticide/PCB, and duplicate pair samples for the inorganic analyses during the Special Canal Sampling study. The analytical laboratory selected one sample in 20 (or one sample per SDG if less than 20) and split the sample into two additional aliquots. MS/MSD samples were prepared by analyzing the first aliquot for the parameters of interest, while the remaining two aliquots were spiked with known quantities of the parameters of interest before analysis. The RPD between the spiked results was calculated and used as an indication of the analytical precision for the VOC, SVOC, pesticide/PCB, and inorganic analyses performed. Precision for radiological analyses was determined by duplicate analysis on the matrix.

Seven RPD values (of 40 total values) calculated from the VOC MS/MSD analyses, 28 RPD values (of 88 total values) calculated from the SVOC MS/MSD analyses, and 1 RPD value (of 48 total values) calculated from the pesticide/PCB MS/MSD analyses were outside the EPA CLP advisory control limits for analytical precision. Duplicate samples for the inorganic analytes were prepared by subdividing 1 sample of every 20 and analyzing both samples of the duplicate pair. The RPD between the two detected concentrations was calculated and used as an indication of the analytical precision for the analyses. Two RPD values (of 168 total values) calculated from the inorganic duplicate analyses were outside the EPA CLP advisory control limits for analytical precision. At least 1 duplicate was analyzed per SDG of samples for radiological analysis or for every 20 samples. The duplicate analyses for radiological results were in agreement when the counting uncertainties were considered. Twelve duplicate results (of 90) for the radiological analyses were outside of the limits.

Because each analysis was evaluated according to the required QC criteria, and because all of these criteria were met for the environmental samples analyzed, these RPD values are considered to be representative of the variability of the environmental condition in the Miami-Erie Canal. As a result, the DQOs of precision for the VOC, SVOC, pesticide/PCB, inorganic, and radiological analyses have been achieved.

Sample collection reproducibility and media variability were measured in the laboratory by the analysis of co-located samples. Co-located samples and regular samples were collected using the same technique. Nine samples were collected for sample collection reproducibility and media variability for evaluation based upon the RPD values between two co-located samples.

Since all regular and co-located soil samples were collected using the same technique, the co-located concentrations reflect the matrix variability, which is inherent in the sediment/soils in the Miami-Erie Canal, and were not used to assess sample collection precision. Field RPD values were calculated only for compounds, elements, and isotopes detected in concentrations greater than the contract required detection limits (CRDLs) in both co-located and regular samples.

5.1.2. Accuracy

Accuracy is defined as the degree of difference between measured or calculated values and the true value. The closer the numerical value of the measurement approaches the true value, the more accurate the measurement. Analytical accuracy is expressed as the percent recovery of a compound or element that has been added to the environmental sample at a known concentration before analysis. The percent recovery values were calculated with the following equation:

$$\textit{Percent Recovery} = \frac{A_r - A_o}{A_f} \times 100\%$$

where:
A_r = Total analyte concentration detected in the spiked sample
A_o = Concentration of the analyte detected in the unspiked sample
A_f = Concentration of the analyte added to the sample

Laboratory accuracy was also qualitatively assessed by evaluating laboratory QC information. A comprehensive discussion of this information is presented in Section 5.2.

Three (of 80 values) and 26 (of 176 values) percent recovery values for VOCs and SVOCs, respectively, and none of the 96 pesticide/PCBs values were outside the applicable EPA CLP control limits for

analytical accuracy. All of the qualitative information cited in Appendix D were evaluated along with the analytical accuracy DQO. As a result, selected data validation qualifiers were applied accordingly.

Thirty-eight (of 144) percent recovery values for TAL metals were outside the applicable EPA CLP control limits. As a result, data validation qualifiers were applied to 34 antimony and 10 selenium analytes to indicate that these values were rejected due to unacceptable (less than 30 percent recovery) matrix spike recoveries.

Fourteen (of 45) percent recovery values for radiological isotopes were outside of applicable limits. As a result, analytical results for these analyses were qualified as estimated with the exception of strontium. All nine of the strontium matrix spike analyses were outside of acceptable limits for percent recovery. All strontium recoveries results were qualified as rejected.

Based on the evaluation of the MS/MSD results and the associated laboratory QC results summarized in Appendix D, the laboratory accuracy is acceptable, except where noted, and the DQO for accuracy was met.

Sampling accuracy in the field was maximized by adherence to Mound Plant sampling procedures. Mound Plant Standard Operating Procedures (SOPs) (soil boring, soil collection, equipment decontamination, and health monitoring equipment calibration and operation) were used during the Special Canal Sampling study. Preparation of Field QC blanks (trip blanks, rinsate blanks, and ambient blanks) is discussed in Section 5.2.4 (Field Quality Assurance) and Appendix D.

Based on the evaluation of the compounds detected in the field QC blanks, the overall field accuracy is acceptable, except where noted. As a result, the field DQO for accuracy has been met.

5.1.3. Representativeness

Representativeness expresses the degree to which the data accurately and precisely represents a characteristic of a population, parameter, variation at a sampling point, process condition, or environmental condition. Sampling representativeness for this project was accomplished by collecting sufficient samples of the population medium, properly distributed with respect to location and depth. These sampling points were based primarily on the 1974 study sampling points. Representativeness was assessed by reviewing the drilling techniques and equipment, the sample collection method, equipment, and sample containers used during the Special Canal Sampling study. Representativeness was also assessed by evaluating the RPD values calculated from the co-located samples. The reproducibility of a representative set of samples reflects the degree of heterogeneity of the sampled medium, as well as the effectiveness of the sample collection technique. All soil samples (regular and co-located) were collected from borings using a split spoon, similar to the core sampler used in the 1974 Rogers study, up to depths of 5-feet bls.

Based upon the factors evaluated above, the samples collected during the Special Canal Sampling study are considered to be representative of the environmental condition in the Miami-Erie Canal. As a result, the field DQO for representativeness was met.

5.1.4. Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability for this project was obtained through the implementation of the specific methods and protocols for sampling and analysis of samples specified in the Sampling and Analysis Plan. By using consistent sampling and analysis procedures, the data generated in this project are comparable to other data collected and analyzed following the OU9 QAPjP (DOE 1991b). This ensures that remedial action decisions and process options are based upon a consistent data base. All results for the data sets were expressed in comparable concentration units. The use of EPA reference documents also ensured comparability by establishing that the analytical procedures generated consistent data.

All samples analyzed for TCL VOC, SVOC, pesticide/PCB, and TAL metals and cyanide were analyzed using the March 1990 EPA CLP SOW. All samples collected for isotopic uranium, isotopic plutonium, and isotopic thorium were analyzed using the following alpha spectrometry methods: EPA Method 908.0, HASL-300 Method E-PU-06, and EERF-00-07, respectively. Free and bound tritium were analyzed using liquid scintillation EPA Method 906.0; radiation from gamma-emitting radionuclides was analyzed using gamma spectrometry EPA Method 901.1; strontium-90 was analyzed by proportional counting using the Argonne National Laboratory (Eichrom) separation method.

Based upon the above assessment and the precision and accuracy assessments, the data collected during the Special Canal Sampling study are considered to be comparable with other data collected using the protocols specified above. As a result, the field DQO for comparability was met.

5.1.5. Completeness

Completeness is a measure of the percentage of valid data obtained from a measurement system that achieves the project goals. Data are considered valid if they meet all acceptance criteria, including accuracy and precision, as well as other required criteria specified by the analytical method. The completeness goal for sample collection is 90 percent. The completeness goal for laboratory analysis is 95 percent for each laboratory analysis. If the field completeness goal is not met, resampling may be required. The following equations were used for calculating completeness.

Sample Collection:

$$Completeness = \frac{Number\ of\ sample\ points\ collected}{Number\ of\ sample\ points\ planned} \times 100\%$$

Laboratory Analysis:

$$Completeness = \frac{Number\ of\ valid\ data\ points}{Number\ of\ data\ points\ collected} \times 100\%$$

Based upon the evaluation of the samples collected, 100 percent of the total environmental sampling points planned during the Special Canal Sampling were collected.

Analytical data considered usable to support recommendations for further evaluation of remedial action alternatives and process options must be satisfactorily validated. Rejected values for concentrations (i.e., due to blank interference, surrogate or internal standard recoveries) reported for chemical analyses were not reported for remediation recommendations. As a result, 2 (of 3204) VOC, 60 (of 6208) SVOC, 46 (of 2328) TAL metals and 145 (of 1746) radioisotope data points were not used for conclusions in this data report. A complete list of rejected data is presented in Table V.1.

Based upon the evaluation of the laboratory analysis and subsequent data validation, 98.0 percent of the TAL metals, 99.9 percent of the VOCs, and 99.0 percent of the SVOCs, 100 percent of the pesticide/PCB, and 91.6 percent of the radiological data are valid data. Based on the above assessment, the data collection completeness DQO has been met. The laboratory analysis completeness DQO was met for the VOC, SVOC, pesticides/PCB, and TAL metals. The completeness goal for the radioisotope analyses was not met.

5.2. DATA VALIDATION

The environmental samples (soil/sediment) and field quality control samples (equipment, trip, ambient, co-located) collected in response to the Special Canal Sampling investigation were analyzed using the CLP SOW March 1990 for TCL organics (VOCs, SVOCs, pesticides/PCB), TAL inorganics (metals) and radionuclides using EPA-type procedures. The associated data were validated and qualified using the guidelines listed below:

USEPA CLP National Functional Guidelines for Organic Data Review
Multi-Media, Multi-Concentration, [Draft], June 1991.

Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analysis
July 1, 1988.

Laboratory Data Validation Guidelines for Evaluating Radionuclide Analysis
Science Applications International Corporation, [Revision 3], November 7, 1991.

Table V.1 List of Rejected Data
Page 1 of 6

Sample Identifier	Analysis Type	Compound/Element/Isotope Impacted	Cause for Rejection[a]
242003	VOCs	Methylene chloride	Spectral
242003	VOCs	Acetone	Spectral
MC0032001	SVOCs	Dibenz(a,h)anthracene	Spectral
MC0032002	SVOCs	Dibenz(a,h)anthracene	Spectral
MC0032003	SVOCs	Carbazole	Spectral
MC0032003	SVOCs	Benzo(k)fluoranthene	Spectral
MC0032003	SVOCs	Indeno(1,2,3-cd)pyrene	Spectral
MC0032003	SVOCs	Dibenz(a,h)anthracene	Spectral
MC0032003	SVOCs	Benzo(g,h,i)perylene	Spectral
MC0042001	SVOCs	Benzo(a)anthracene	Spectral
MC0042001	SVOCs	Dibenz(a,h)anthracene	Spectral
MC0042002	SVOCs	Pyrene	Spectral
MC0042002	SVOCs	Chrysene	Spectral
MC0042003	SVOCs	Anthracene	Spectral
MC0042003	SVOCs	Chrysene	Spectral
MC0042004	SVOCs	Benzo(a)anthracene	Spectral
MC0042004	SVOCs	Chrysene	Spectral
MC0042004	SVOCs	Benzo(k)fluoranthene	Spectral
MC0042005	SVOCs	Dibenz(a,h)anthracene	Spectral
MC0252001	SVOCs	Pyrene	Spectral
MC0252001	SVOCs	Benzo(a)anthracene	Spectral
MC0252001	SVOCs	Benzo(k)fluoranthene	Spectral
102001	SVOCs	Benzo(b)fluoranthene	Spectral
102001	SVOCs	Benzo(k)fluoranthene	Spectral
102001	SVOCs	Benzo(a)pyrene	Spectral
102001	SVOCs	Indeno(1,2,3-cd)pyrene	Spectral
102001	SVOCs	Dibenz(a,h)anthracene	Spectral
102001	SVOCs	Benzo(g,h,i)perylene	Spectral
072001	SVOCs	Anthracene	Spectral
072001	SVOCs	Benzo(g,h,i)perylene	Spectral

Table V.1 List of Rejected Data
Page 2 of 6

Sample Identifier	Analysis Type	Compound/Element/Isotope Impacted	Cause for Rejection[a]
072002	SVOCs	Benzo(a)anthracene	Spectral
072002	SVOCs	Chrysene	Spectral
072003	SVOCs	Chrysene	Spectral
072003	SVOCs	Benzo(a)pyrene	Spectral
072004	SVOCs	Benzo(b)fluoranthene	Spectral
072004	SVOCs	Benzo(a)pyrene	Spectral
072005	SVOCs	bis(2-Ethylhexyl)phthalate	Spectral
082002	SVOCs	Pyrene	Spectral
082002	SVOCs	bis(2-Ethylhexyl)phthalate	Spectral
082002	SVOCs	Indeno(1,2,3-cd)pyrene	Spectral
082002	SVOCs	Benzo(g,h,i)perylene	Spectral
082003	SVOCs	Benzo(a)anthracene	Spectral
082003	SVOCs	bis(2-Ethylhexyl)phthalate	Spectral
082003	SVOCs	Benzo(k)fluoranthene	Spectral
082003	SVOCs	Indeno(1,2,3-cd)pyrene	Spectral
232001	SVOCs	bis(2-Ethylhexyl)phthalate	Spectral
232001	SVOCs	Benzo(g,h,i)perylene	Spectral
242001	SVOCs	1,4-Dichlorobenzene	Spectral
192002	SVOCs	Indeno(1,2,3-cd)pyrene	Spectral
202002	SVOCs	Benzo(k)fluoranthene	Spectral
202003	SVOCs	Benzo(a)pyrene	Spectral
202005	SVOCs	Chrysene	Spectral
262001	SVOCs	Fluorene	Spectral
262001	SVOCs	Benzo(b)fluoranthene	Spectral
262001	SVOCs	Benzo(a)pyrene	Spectral
262001	SVOCs	Indeno(1,2,3-cd)pyrene	Spectral
272001	SVOCs	Indeno(1,2,3-cd)pyrene	Spectral
272001	SVOCs	Benzo(g,h,i)perylene	Spectral
382101	SVOCs	Benzo(a)anthracene	Spectral
392101	SVOCs	Benzo(a)anthracene	Spectral
392101	SVOCs	Benzo(a)pyrene	Spectral

Table V.1 List of Rejected Data
Page 3 of 6

Sample Identifier	Analysis Type	Compound/Element/Isotope Impacted	Cause for Rejection[a]
362101	SVOCs	Dibenz(a,h)anthracene	Spectral
MC0032001	ICP Metals	Antimony	Matrix Spike
MC0032002	ICP Metals	Antimony	Matrix Spike
MC0032003	ICP Metals	Antimony	Matrix Spike
MC0042001	ICP Metals	Antimony	Matrix Spike
MC0042002	ICP Metals	Antimony	Matrix Spike
MC0042003	ICP Metals	Antimony	Matrix Spike
MC0042004	ICP Metals	Antimony	Matrix Spike
MC0042005	ICP Metals	Antimony	Matrix Spike
MC0252001	ICP Metals	Antimony	Matrix Spike
MC0252002	ICP Metals	Antimony	Matrix Spike
MC0252003	ICP Metals	Antimony	Matrix Spike
102001	ICP Metals	Antimony	Matrix Spike
102002	ICP Metals	Antimony	Matrix Spike
102003	ICP Metals	Antimony	Matrix Spike
092001	ICP Metals	Antimony	Matrix Spike
092002	ICP Metals	Antimony	Matrix Spike
092003	ICP Metals	Antimony	Matrix Spike
052001	ICP Metals	Antimony	Matrix Spike
052002	ICP Metals	Antimony	Matrix Spike
052003	ICP Metals	Antimony	Matrix Spike
062001	ICP Metals	Antimony	Matrix Spike
062002	ICP Metals	Antimony	Matrix Spike
062003	ICP Metals	Antimony	Matrix Spike
012001	ICP Metals	Antimony	Matrix Spike
012002	ICP Metals	Antimony	Matrix Spike
112001	ICP Metals	Antimony	Matrix Spike
112002	ICP Metals	Antimony	Matrix Spike
112003	ICP Metals	Antimony	Matrix Spike
182001	ICP Metals	Antimony	Matrix Spike
182003	ICP Metals	Antimony	Matrix Spike

Table V.1 List of Rejected Data
Page 4 of 6

Sample Identifier	Analysis Type	Compound/Element/Isotope Impacted	Cause for Rejection[a]
022001	ICP Metals	Antimony	Matrix Spike
022002	ICP Metals	Antimony	Matrix Spike
022005	ICP Metals	Antimony	Matrix Spike
122002	ICP Metals	Antimony	Matrix Spike
232002	ICP Metals	Mercury	Calculated Incorrectly
272001	ICP Metals	Selenium	Matrix Spike
202002	ICP Metals	Selenium	Matrix Spike
282001	ICP Metals	Selenium	Matrix Spike
202004	ICP Metals	Selenium	Matrix Spike
192001	ICP Metals	Selenium	Matrix Spike
192002	ICP Metals	Selenium	Matrix Spike
192003	ICP Metals	Selenium	Matrix Spike
202001	ICP Metals	Selenium	Matrix Spike
202005	ICP Metals	Selenium	Matrix Spike
262001	ICP Metals	Selenium	Matrix Spike
302002	ICP Metals	Thallium	Blank
292001	RADs	H-3	Damaged Bottle
072001	RADs	Pu-239/240	Chemical Separation
082001	RADs	Pu-239/240	Chemical Separation
All	RADs	Sr-90	Matrix Spike/Chemical Recovery
322101	RADs	Th-228	Chemical Separation
332101	RADs	Th-228	Chemical Separation
342101	RADs	Th-228	Chemical Separation
352101	RADs	Th-228	Chemical Separation
372101	RADs	Th-228	Chemical Separation
MC0042004	RADs	Th-232	Chemical Separation
022002	RADs	U-234	Chemical Separation
MC0032001	RADs	U-234	Chemical Recovery
MC0032002	RADs	U-234	Chemical Recovery
MC0032003	RADs	U-234	Chemical Separation

Table V.1 List of Rejected Data
Page 5 of 6

Sample Identifier	Analysis Type	Compound/Element/Isotope Impacted	Cause for Rejection[a]
MC0042001	RADs	U-234	Chemical Separation
MC0042002	RADs	U-234	Chemical Separation
MC0042003	RADs	U-234	Chemical Separation
MC0042004	RADs	U-234	Chemical Separation
MC0042005	RADs	U-234	Chemical Separation
132001	RADs	U-234	Chemical Separation
132002	RADs	U-234	Chemical Separation
132003	RADs	U-234	Chemical Separation
132004	RADs	U-234	Chemical Separation
132005	RADs	U-234	Chemical Separation
142001	RADs	U-234	Chemical Separation
142002	RADs	U-234	Chemical Separation
142003	RADs	U-234	Chemical Separation
152001	RADs	U-234	Chemical Separation
152002	RADs	U-234	Chemical Separation
152003	RADs	U-234	Chemical Separation
162001	RADs	U-234	Chemical Separation
162003	RADs	U-234	Chemical Separation
212001	RADs	U-234	Chemical Separation
212002	RADs	U-234	Chemical Separation
212003	RADs	U-234	Chemical Separation
222001	RADs	U-234	Chemical Separation
222002	RADs	U-234	Chemical Separation
222003	RADs	U-234	Chemical Separation
292001	RADs	U-234	Chemical Separation
302002	RADs	U-234	Chemical Separation
MC0252001	RADs	U-234	Chemical Separation
MC0252002	RADs	U-234	Chemical Separation
MC0252003	RADs	U-234	Chemical Separation
MC0032001	RADs	U-235	Chemical Recovery
MC0032002	RADs	U-235	Chemical Recovery

Table V.1 List of Rejected Data
Page 6 of 6

Sample Identifier	Analysis Type	Compound/Element/Isotope Impacted	Cause for Rejection[a]
172002	RADs	U-235	Chemical Separation
MC0032001	RADs	U-238	Chemical Recovery
MC0032002	RADs	U-238	Chemical Recovery
172002	RADs	U-238	Chemical Separation

[a] Spectral - Did not match standard spectra
Matrix Spike - Exceeded QC criteria for recoveries
Blank - Blank data less than zero
Chemical Separation - Interfering peaks
Chemical Recovery - Exceeded QC criteria for recoveries

All descriptive data validation qualifiers applied to the concentrations are listed below:

U The analyte was analyzed for but not detected. The reported concentration is the sample quantitation limit.

UJ The analyte was analyzed for but not detected. The reported concentration is an estimated value.

J The reported value is an estimated quantity.

R The data are unusable. The analyte may or may not be present.

E The associated sample requires dilution to evaluate the contaminants.

D The associated sample was diluted to determine the concentrations of contaminants. The concentrations have been corrected by a dilution factor.

P The compound is presumed to be detected, but the qualitative result lacks confidence due to other interfering peaks close to the peak of interest or due to QC problems.

X The compound is qualified presumably present because the retention time falls within the retention time range of a multiple peak compound (i.e., Aroclors) that has been detected and could be mistaken for an Aroclor or other multiple peak compound isomer.

N The compound is a Tentatively Identified Compound (TIC).

Radionuclide Qualifiers

U Radionuclide may or may not be present. Positive identification not made. Less than value is an estimated upper limit.

DL Detection limit not met.

J Estimated value.

R Data are unusable. Radionuclide may or may not be present.

N Radionuclide presumed to be present. Not positively identified.

Each data point was reviewed and assessed to determine whether the value was considered usable (no qualifiers), usable but estimated (qualified J) or not usable (qualified R). Laboratory and data validation qualifiers were applied to all data, detected and non-detected, as necessary.

For the purpose of the Special Canal Sampling study, VOC and SVOC TICs were used to indicate additional contamination present that was not included on the TCL list.

5.2.1. Inorganic Analysis

Cyanide results for only the aqueous QC blanks were qualified as unusable (R) due to the pH of the blanks being less than 12. The cyanide aqueous blank analysis did not affect the cyanide results for soil. Antimony has been qualified as unusable (R) due to the matrix spike results exceeding the prescribed lower QC limits. Other metals (selenium, thallium, arsenic, manganese, chromium, zinc, lead, mercury, silver, and copper) at one time or another slightly exceeded the prescribed matrix spike criteria and were qualified J, where required. The vast majority of J qualified compounds were due to minor deviations of QC criteria. Refer to Appendix D for expanded explanations concerning inorganic analysis.

5.2.2. Organic Analysis

Deviations occurred for VOCs in initial and continuing calibrations with acetone in SAIV05, SAIV07 and SAIV08 initial calibration (ICAL), and styrene, 2-hexanone, acetone, vinyl chloride, 2-butanone and 4-methyl-2-pentanone in SAIV04, SAIV05 and SAIV06 exceeding the control limits for continuing calibration (CCAL). This did not affect the data since no VOCs were detected at the Miami-Erie Canal site. Internal standards chlorobenzene and difluorobenzene for certain samples SAIV04, SAIV05, and SAIV06 exceeded the QC criteria. However, no sample data were affected since no VOCs were detected. Refer to Appendix D for expanded explanations concerning VOA.

One holding time deviation occurred for SVOCs in 362101RE which was analyzed after the 14-day holding time. The ICAL and CCAL analysis deviations generally involved compounds that behave poorly, chromatographically. Most method blanks contained phthalates. Some SVOC blanks also contained aldol condensation products, all of which were qualified as unusable (R). The most significant deviations concerned mass spectral criteria. Some compounds, namely some of the PAH, did not meet the EPA criteria for matching sample spectra with standard spectra. However, spectral similarity to PAH standards suggests that closely related structures may be present (i.e., biotransformational products). Refer to Appendix D for expanded explanations concerning SVOC analysis.

Deviations for pesticide/PCB analysis occurred in the calibration analysis, where a surrogate (decachlorobiphenyl) and endrin ketone were out of limits, possibly due to carryover from a previous run.

Methoxychlor was detected in virtually every method blank. Decachlorobiphenyl was out of limits on a number of surrogate recoveries. Endrin was out of limits on the MS/MSD, possibly due to a shared peak in the retention time range of detectable amounts of Aroclor-1254. Both Aroclor-1248 and Aroclor-1254 were detected on site, but not confirmed by gas chromatography/mass spectroscopy. Refer to Appendix D for expanded explanations concerning pesticide/PCB analysis.

5.2.3. Radiological Analysis

Tritium results may have been affected by sample storage since the samples were not sealed in glass, resulting in a hydrogen exchange with the environment. Therefore, all tritium results were qualified as estimated (J). Data for initial and continuing calibration were not included in the data packages. Efficiency calibration for gamma spectroscopy was performed with standards larger than the samples. This geometry difference was significant, and all gamma spectroscopy results were qualified as estimated (J). Tritium background values for liquid scintillation counting were determined with a factory standard blank of a different geometry. Therefore, all tritium results were qualified as estimated (J) due to improper background subtraction.

Tritium, thorium-228, thorium-230, uranium-234, and uranium-235 had blank results greater than their associated uncertainty, indicating possible contamination or bias due to improper blank subtraction. In such cases, sample results less than 10 times the blank result were qualified as estimated (J).

Sample-specific chemical recovery was performed for all isotopic uranium, plutonium, and thorium analyses. Acceptable recoveries were found in all but seventeen samples. All of these samples were qualified as estimated (J) with the exception of two uranium samples which were qualified as rejected (R).

Most of the laboratory control samples (LCS) were within the control limits of the standard value. All samples with LCS results out of limits were qualified as estimated (J). MS samples were analyzed for nine SDGs. Five MS results were out of limits and respective results were qualified as estimated (J). All nine of the strontium MS results were very poor. As a result, all strontium-90 results were qualified as rejected (R). Laboratory duplicate analysis samples were analyzed for nine SDGs. Twelve duplicate analysis results were outside of the limits. All respective results were qualified as estimated (J).

All analytical results were examined for any anomalies (i.e., omissions, legibility, etc.). Quantified results were recalculated for determination of errors. For alpha spectroscopy (uranium, plutonium,

thorium), the uncertainties were not calculated to include the background uncertainty. As a result, all actinide data was qualified as estimated (J). Values reported as less than values that had no uncertainties associated with them were qualified as undetected (U). Some of the plutonium, thorium, and uranium analyses were performed using less than 1 gram sample aliquot size. There was also no indication that these aliquots were taken from a homogenized sample. Therefore, the results of these analyses have been qualified as estimated (J).

The chemical separation specificity was verified for alpha spectroscopy by observation of the alpha energy spectrum. Checks were made on observed peaks to see if it is within 40 keV of the energy for the radionuclide of interest. Checks were also made for any energy spectra peaks that overlap or that have associated peaks that may interfere with the peak of the radionuclide of interest. Interference from thorium in the uranium spectra was found in several analyses. The most significant was thorium-230 interfering with uranium-234. This was due to poor chemical separation between thorium and uranium. Some uranium-234 results were qualified as rejected (R). Other results for thorium were qualified as rejected (R) due to severe interference of an extraneous peak or tailing effects from other peaks. In other samples of the same SDG, the thorium-229 tracer peak overlapped with the thorium-230 peak causing more than a 10 percent error in thorium-230. Therefore, the thorium-230 results were qualified as estimated (J) for these samples.

5.2.4. Field Quality Assurance

Trip blanks were used in shipments with rinsate samples. Nine rinsate samples were sent in seven shipments to the laboratory along with soil samples for analysis. Nine trip blank bottles were prepared by the laboratory. Since two trip blank bottles were used for each shipment, five bottles were prepared using ASTM II water in the field away from the sampling area but near a roadway. In addition, the laboratory trip blanks required "topping off" with ASTM II water to remove air bubbles that were observed in the field. Because some of the trip blanks were topped off in the field and some were prepared in the field, the trip blanks may be referred to as field blanks. A number of the trip blanks displayed detectable quantities of toluene, ethylbenzene, and xylene, which are being contributed by the highway traffic exhaust. Other blank contaminants include methylene chloride and acetone, which are not attributable to the canal site. These deviations, however, did not affect sample data since no VOCs were detected. Refer to Appendix D for an expanded evaluation concerning VOCs in trip blanks.

Seven trip blanks, five ambient blanks, nine rinsate blanks, and nine co-located samples were collected and shipped to the chemical laboratory for analysis using the same procedures as with the previous samples collected. The analytical results obtained from the field blanks were used to assess the effectiveness and efficiency of the collection procedure and equipment decontamination.

Of the five ambient blanks analyzed for volatiles, only one (AA2301) contained volatile compounds, namely chloroform. The source of the chloroform is unknown, because it was not used in the field for any purpose nor was it detected in any laboratory method blanks.

Nine rinsate blanks were collected. Acetone was detected in two of the rinsate blanks, and is probably a laboratory contaminant. Two phthalates, bis(2-ethylhexyl) phthalate and di-N-butyl phthalate were detected in four of the rinsate blanks. Five of the rinsate blanks contained very low levels of beta-BHC, heptachlor, endrin, dieldrin and endosulfan sulfate, which were also detected in some of the laboratory method blanks. Refer to Appendix D for an expanded evaluation of contaminants in rinsate blanks.

As stated in Section 3.2, a total of nine co-located samples were collected approximately one to two months after the initial sampling investigation. Styrene and methylene chloride were detected in 5 of co-located samples, with a RPD ranging from 0 percent to 142 percent. Numerous SVOC compounds were detected with about 40 percent of the compounds having less than 50 percent RPDs. The majority of the pesticide/PCB hits had RPDs greater than 50 percent. Refer to Appendix D for an expanded evaluation of the co-located sample results.

5.3. DATA USEABILITY

Rigorous data validation and data quality guidelines were applied to all of the data. The data reported are suitable for the project's objectives. However, the usefulness of the data generated from this project for the other purposes will have to be evaluated during future planning activities. Any uncertainties associated with the data can be covered by describing the analytical methods and data validation effort for this project. The organic and inorganic data were generated under EPA's CLP and validated using referenced EPA guidelines. The radiological data were generated under approved and known methodologies. Data are considered valid if they meet all acceptance criteria, including accuracy and precision, as well as other required criteria specified by the analytical method. Analytical data considered usable to support recommendations for further evaluation of remedial action alternatives and process options must be satisfactorily validated. As a result of the validation process for this project, only 62 (of

12128) organic, 46 (of 2328) inorganic, and 145 (of 1746) radiological data points were not reported for remediation recommendations. Based upon the evaluation of the laboratory analysis and subsequent data validation, 98.4 percent of the data generated for this project are usable as qualified.

The usability of the analytical data is summarized by analysis type in the following sections.

5.3.1. Volatile Organics

No VOC contamination was detected on the Miami-Erie Canal site. The compounds that were detected in certain environmental samples and in laboratory method blanks appear to have originated from the laboratory, or at least off-site. The trip blanks that contained toluene, xylenes, and other volatiles probably originated from where they were prepared in the field. There were no major problems with the lab QA/QC samples (MS/MSD, blanks, tuning, etc.). These data appear to be accurate representations of the conditions at the site and are usable with assigned qualifiers.

5.3.2. Semivolatile Organic Compounds

There were numerous SVOCs detected in the environmental samples. SVOCs were detected in the laboratory method blanks (phthalates) but are considered either laboratory contaminants or contaminants that originated from the plastic barrel that was used to store the ASTM Type II water at the site.

All data were reviewed for correctness. Compounds out of calibration were primarily those which perform poorly under those conditions. The compounds that failed to meet the CLP mass spectrometry criteria for identification were qualified (R), however, spectral similarity to standards suggest that closely related compounds may be present. Other anomalies outside of QC criteria have been appropriately qualified. These data are accurate representations of site conditions and can be used with assigned qualifiers.

5.3.3. Pesticides/PCB Organics

There were few pesticides detected in the environmental samples. Aroclor-1248 and Aroclor-1254 were positively identified in certain environmental samples. The lab detected methoxychlor in their method blanks and some samples. The methoxychlor detected in the samples was evaluated using the five times rule. No concentrations of methoxychlor were found that exceeded the five times rule limit. In most

cases where pesticides were detected, those environmental samples also contained Aroclor compounds. Those pesticides were qualified with a (P) or (X) to signify interference by single or multi-component compounds. These data appear to accurately describe the site and can be used with the assigned qualifiers.

5.3.4. Inorganic Analysis

The overall assessment of the inorganic analyses is that some antimony concentrations were determined to be unusable due to matrix spike deviations. However, these were not serious deviations. All metal concentrations that were not flagged or flagged (J) are usable as qualified.

5.3.5. Radiological Analysis

The subcontract radiological laboratory selected for this project was chosen from prequalified laboratories who participate in a Basic Ordering Agreement (BOA) with the contractor. Each laboratory was qualified under the BOA by passing rigorous acceptance criteria. The rigorous data quality requirements applied to the radiological data generated 91.6 percent valid data. Most of the rejected radiological data were due to the strontium-90 analyses. All of the results that were not qualified below detection (U) and not qualified as rejected (R) were qualified as estimated (J) for one reason or another. Data can be used as reported with qualifiers. The rejected strontium-90 results were attributed to the failure of multiple QC results to fall within acceptable control limits. However, the use of the data as a qualitative indicator of the presence of strontium-90, but not its absence, in the samples may be appropriate.

SECTION 6

6. DISCUSSION OF RESULTS

The results of the laboratory analyses of the canal samples are evaluated for chemical and radiological contaminants. The trends of the concentration distribution in the canal are evaluated for evidence of the source of a contaminant and the coincidence of chemical and radiological contamination.

6.1. CHEMICAL CONTAMINATION

The analysis of the results of this sampling study indicate that concentrations of PCBs, SVOCs and inorganics are present in the canal. No VOCs were detected in the canal. Table VI.1 lists the chemical substances detected, maximum and minimum results, standard error, and the general location where the samples were collected in the canal. (See Appendix A for a complete listing of all sampling results.) For reference, the canal is divided at the Mound Plant drainage ditch intersection into north (dry) and south (wet) sections. The chemical concentrations are generally higher in the north canal. The significance of the concentrations of these constituents is discussed in the following section. Other than calculating the standard error, no statistical analyses were performed on any of the sampling results.

6.1.1. PCBs

The sampling locations that contained PCBs have relatively low concentrations, except at the northern end of the north canal. Of the PCBs detected, Aroclor-1248 exhibited the highest overall concentrations. The maximum concentration (19 ppm) occurred at location DL2 (north canal), in the 0-1 foot interval. The concentration decreased to below 1 ppm at all locations south of location E (Figure 6.1). To accommodate the range of Aroclor-1248 concentrations detected along the Miami-Erie Canal, the Y axis (concentration) on Figure 6.1 is a logarithmic scale. At many locations, PCBs were not detected.

Since no PCBs were detected on the sides of the canal, no cross-sectional distribution of contamination can be evaluated. This trend indicates that the deposition was localized, probably carried in surface water runoff along the canal. Trends in the concentration of Aroclor-1248 with depth of canal soil also indicate surface deposition, since the concentration decreases with depth.

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 1 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
2-Methylnapthalene	North Canal (Dry)	8/41	ppm	0.062	1.9	0.2282	0.2668
	South Canal (Wet)	22/66	ppm	0.017	0.8	0.1857	0.1488
Acenaphthene	North Canal (Dry)	10/41	ppm	0.029	3.7	0.2838	0.5476
	South Canal (Wet)	26/66	ppm	0.028	1	0.2359	0.1795
Acenaphthylene	North Canal (Dry)	19/41	ppm	0.026	4.3	0.2868	0.6511
	South Canal (Wet)	30/66	ppm	0.019	0.8	0.1874	0.1458
Acetone	South Canal (Wet)	12/57	ppm	0.004	0.14	0.011	0.0203
Anthracene	North Canal (Dry)	23/41	ppm	0.039	9.3	0.465	1.4309
	South Canal (Wet)	38/66	ppm	0.023	0.81	0.2525	0.1975
Benzo(a)anthracene	North Canal (Dry)	35/41	ppm	0.033	25	1.0811	3.8449
	South Canal (Wet)	56/66	ppm	0.037	2.8	0.6631	0.7863
Benzo(a)pyrene	North Canal (Dry)	35/41	ppm	0.038	22	0.9597	3.3782
	South Canal (Wet)	54/66	ppm	0.037	2	0.5506	0.6189

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 2 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Benzo(b)fluoranthene	North Canal (Dry)	36/41	ppm	0.063	25	1.1189	3.8253
	South Canal (Wet)	54/66	ppm	0.046	2.6	0.6747	0.7378
Benzo(g,h,i)perylene	North Canal (Dry)	23/41	ppm	0.12	17	0.8937	2.6085
	South Canal (Wet)	36/66	ppm	0.081	2.2	0.5389	0.5633
Benzo(k)fluoranthene	North Canal (Dry)	35/41	ppm	0.047	19	0.9119	2.9178
	South Canal (Wet)	53/66	ppm	0.043	2.2	0.6215	0.6436
Carbazole	North Canal (Dry)	12/41	ppm	0.081	2.2	0.3546	0.4881
	South Canal (Wet)	26/66	ppm	0.065	1.2	0.2852	0.217
Chrysene	North Canal (Dry)	36/41	ppm	0.035	24	1.0854	3.691
	South Canal (Wet)	56/66	ppm	0.044	2.5	0.6527	0.7591
Di-n-butylphthalate	North Canal (Dry)	26/41	ppm	0.027	4.1	0.2503	0.6231
	South Canal (Wet)	52/66	ppm	0.024	0.8	0.1875	0.1904
Dibenz(a,h)anthracene	North Canal (Dry)	15/41	ppm	0.075	4.8	0.3462	0.7186
	South Canal (Wet)	20/66	ppm	0.065	0.66	0.2553	0.13

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 3 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Dibenzofuran	North Canal (Dry)	7/41	ppm	0.015	3.9	0.3041	0.5771
	South Canal (Wet)	18/66	ppm	0.018	0.8	0.2152	0.1496
Fluoranthene	North Canal (Dry)	38/41	ppm	0.067	53	2.3179	8.1699
	South Canal (Wet)	61/66	ppm	0.027	7	1.4758	1.9058
Fluorene	North Canal (Dry)	16/41	ppm	0.027	7.8	0.4115	1.1942
	South Canal (Wet)	25/66	ppm	0.03	1.4	0.2335	0.1852
Indeno(1,2,3-cd)pyrene	North Canal (Dry)	24/41	ppm	0.063	16	0.8085	2.4494
	South Canal (Wet)	39/66	ppm	0.051	1.8	0.4801	0.4731
Isophorone	South Canal (Wet)	4/66	ppm	0.012	0.8	0.234	0.1332
Methylene chloride	South Canal (Wet)	10/57	ppm	0.001	0.013	0.0059	0.0018
Naphthalene	North Canal (Dry)	11/41	ppm	0.007	4	0.2872	0.595
	South Canal (Wet)	25/66	ppm	0.016	0.8	0.1844	0.1502

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 4 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Phenanthrene	North Canal (Dry)	33/41	ppm	0.035	43	1.8383	6.6961
	South Canal (Wet)	57/66	ppm	0.029	6.3	1.0604	1.523
Pyrene	North Canal (Dry)	38/41	ppm	0.059	55	2.134	8.4426
	South Canal (Wet)	61/66	ppm	0.028	6.8	1.321	1.7178
Styrene	North Canal (Dry)	11/41	ppm	0.003	0.012	0.0061	0.0019
	South Canal (Wet)	3/57	ppm	0.002	0.0095	0.0061	0.0012
bis(2-Ethylhexyl)phthalate	North Canal (Dry)	34/41	ppm	0.089	4.1	0.4796	0.6627
	South Canal (Wet)	50/66	ppm	0.052	1.1	0.2915	0.2558
4,4'-DDT	South Canal (Wet)	11/80	ppm	0.0015	0.013	0.0024	0.0014
Aldrin	North Canal (Dry)	11/44	ppm	0.001	0.105	0.0067	0.0217
	South Canal (Wet)	3/79	ppm	0.0009	0.0069	0.0012	0.0007
Aroclor-1248	North Canal (Dry)	26/44	ppm	0.018	19	1.4001	4.1642
	South Canal (Wet)	9/80	ppm	0.0175	0.32	0.0385	0.056

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 5 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Aroclor-1254	North Canal (Dry)	4/44	ppm	0.019	2.1	0.1432	0.4384
	South Canal (Wet)	13/80	ppm	0.0175	0.34	0.0508	0.0756
Dieldrin	North Canal (Dry)	22/44	ppm	0.0005	0.21	0.0124	0.0432
	South Canal (Wet)	46/80	ppm	0.0006	0.011	0.0044	0.0032
Endosulfan I	South Canal (Wet)	5/80	ppm	0.0008	0.0029	0.0011	0.0004
Endosulfan II	North Canal (Dry)	3/44	ppm	0.0011	0.21	0.0115	0.0433
Endrin	North Canal (Dry)	23/44	ppm	0.0016	0.22	0.0224	0.0492
	South Canal (Wet)	44/80	ppm	0.0008	0.034	0.0078	0.0099
Endrin ketone	North Canal (Dry)	5/44	ppm	0.0019	0.21	0.012	0.0433
	South Canal (Wet)	3/80	ppm	0.0018	0.015	0.0023	0.0014
Heptachlor	North Canal (Dry)	6/44	ppm	0.001	0.105	0.006	0.0216
	South Canal (Wet)	3/80	ppm	0.0006	0.0019	0.0011	0.0002

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 6 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Heptachlor epoxide	South Canal (Wet)	3/80	ppm	0.0008	0.005	0.0012	0.0006
Methoxychlor	North Canal (Dry)	10/44	ppm	0.0027	1.05	0.0599	0.2163
	South Canal (Wet)	29/80	ppm	0.0012	0.27	0.0209	0.0482
alpha-BHC	South Canal (Wet)	5/80	ppm	0.0009	0.0041	0.0011	0.0005
alpha-Chlordane	North Canal (Dry)	4/44	ppm	0.001	0.105	0.0069	0.0218
	South Canal (Wet)	33/80	ppm	0.0006	0.021	0.0029	0.0039
beta-BHC	North Canal (Dry)	11/44	ppm	0.001	0.105	0.0091	0.0229
gamma-Chlordane	North Canal (Dry)	14/44	ppm	0.001	6.8	0.3138	1.4155
	South Canal (Wet)	18/80	ppm	0.0005	0.019	0.0015	0.0021
Aluminum	North Canal (Dry)	41/41	ppm	4920	20500	11800.24	3377.989
	South Canal (Wet)	56/56	ppm	2680	27000	12812.86	5308.377
Antimony	North Canal (Dry)	10/16	ppm	4.35	19.7	10.92	4.4752
	South Canal (Wet)	25/47	ppm	4.15	37.3	11.97	6.9422

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 7 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Arsenic	North Canal (Dry)	41/41	ppm	2.3	127	10.67	19.5251
	South Canal (Wet)	56/56	ppm	2.5	12	6.22	1.5602
Barium	North Canal (Dry)	41/41	ppm	32.9	126	89.32	18.894
	South Canal (Wet)	56/56	ppm	13	178	93.59	31.5546
Beryllium	North Canal (Dry)	9/41	ppm	0.12	1.2	0.39	0.2403
	South Canal (Wet)	25/56	ppm	0.11	1.4	0.46	0.291
Cadmium	North Canal (Dry)	7/41	ppm	0.34	2.4	0.57	0.4579
	South Canal (Wet)	11/56	ppm	0.31	1.8	0.57	0.3871
Calcium	North Canal (Dry)	41/41	ppm	8060	104000	43601.46	22389
	South Canal (Wet)	56/56	ppm	4920	133000	54205	33403.51
Chromium	North Canal (Dry)	41/41	ppm	10.4	145	31.01	33.7092
	South Canal (Wet)	55/56	ppm	3.1	334	41.12	48.8225
Cobalt	North Canal (Dry)	41/41	ppm	4.5	14.3	9.72	2.1117
	South Canal (Wet)	56/56	ppm	2.7	14.4	9.34	2.5782

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 8 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Copper	North Canal (Dry)	40/41	ppm	13.3	143	45.59	34.4006
	South Canal (Wet)	50/56	ppm	4.7	225	38.15	34.0584
Iron	North Canal (Dry)	41/41	ppm	7770	30100	19930.98	4694.775
	South Canal (Wet)	56/56	ppm	5990	36600	20621.25	6765.403
Lead	North Canal (Dry)	41/41	ppm	13.5	248	43.83	37.9327
	South Canal (Wet)	56/56	ppm	5.1	579	59.19	90.2875
Magnesium	North Canal (Dry)	41/41	ppm	4160	32000	14400	6252.736
	South Canal (Wet)	56/56	ppm	3050	49800	18078.75	10797.41
Manganese	North Canal (Dry)	41/41	ppm	187	928	501.22	200.1175
	South Canal (Wet)	56/56	ppm	232	1430	567.64	225.9574
Mercury	North Canal (Dry)	22/41	ppm	0.06	0.76	0.24	0.2223
	South Canal (Wet)	34/55	ppm	0.05	0.74	0.22	0.1738
Nickel	North Canal (Dry)	37/41	ppm	8.6	31.2	18.13	5.6345
	South Canal (Wet)	48/56	ppm	5.7	33.9	19.1	7.2294

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 9 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Potassium	North Canal (Dry)	41/41	ppm	833	4000	1907.02	785.749
	South Canal (Wet)	55/56	ppm	203	5150	1983.91	928.6431
Silver	North Canal (Dry)	9/41	ppm	0.34	11.8	1.59	2.7961
	South Canal (Wet)	14/56	ppm	0.31	16.9	1.7	3.5023
Sodium	North Canal (Dry)	39/41	ppm	44.4	226	108.7	36.5898
	South Canal (Wet)	53/56	ppm	45.5	754	293.21	221.2939
Thallium	North Canal (Dry)	22/41	ppm	0.06	0.6	0.22	0.1375
	South Canal (Wet)	33/56	ppm	0.06	1.4	0.25	0.2056
Vanadium	North Canal (Dry)	41/41	ppm	11.7	33.1	23.89	5.4405
	South Canal (Wet)	56/56	ppm	8.8	48.9	26.35	8.5852
Zinc	North Canal (Dry)	41/41	ppm	42.4	323	108.63	73.7384
	South Canal (Wet)	56/56	ppm	22.5	255	100.04	48.1526
Ac-227	North Canal (Dry)	0/41	pCi/g	-	-	-	-
	South Canal (Wet)	0/56	pCi/g	-	-	-	-

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 10 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Am-241	North Canal (Dry)	0/41	pCi/g	-	-	-	-
	South Canal (Wet)	0/55	pCi/g	-	-	-	-
Bi-207	North Canal (Dry)	0/41	pCi/g	-	-	-	-
	South Canal (Wet)	1/56	pCi/g	0	0.58	0.0104	0
Bi-210	North Canal (Dry)	0/41	pCi/g	-	-	-	-
	South Canal (Wet)	0/56	pCi/g	-	-	-	-
Co-60	North Canal (Dry)	0/41	pCi/g	-	-	-	-
	South Canal (Wet)	0/56	pCi/g	-	-	-	-
Cs-137	North Canal (Dry)	2/41	pCi/g	0	0.45	0.021	0.1733
	South Canal (Wet)	4/56	pCi/g	0	0.52	0.0296	0.1181
H-3	North Canal (Dry)	41/41	pCi/g	1.4	180	27.6341	0.1505
	South Canal (Wet)	55/55	pCi/g	0.26	100	6.9522	0.0836
K-40	North Canal (Dry)	41/41	pCi/g	7.2	23	14.9634	0.72
	South Canal (Wet)	56/56	pCi/g	3.4	28	14.7607	0.6424

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 11 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
Pu-238	North Canal (Dry)	40/44	pCi/g	0	530	105.732	0.6961
	South Canal (Wet)	56/56	pCi/g	0.22	1000	129.5611	0.8227
Pu-239/240	North Canal (Dry)	26/40	pCi/g	0	7.9	1.1906	0.1027
	South Canal (Wet)	38/56	pCi/g	0	22	1.8476	0.1338
Ra-226	North Canal (Dry)	0/41	pCi/g	-	-	-	-
	South Canal (Wet)	0/56	pCi/g	-	-	-	-
Th-228	North Canal (Dry)	38/38	pCi/g	0.49	4.8	1.4039	0.0519
	South Canal (Wet)	54/54	pCi/g	0.19	8.7	1.6007	0.0468
Th-230	North Canal (Dry)	41/41	pCi/g	0.87	38	6.8724	0.0978
	South Canal (Wet)	56/56	pCi/g	0.84	11	2.6255	0.0627
Th-232	North Canal (Dry)	40/40	pCi/g	0.23	3.2	1.0915	0.0446
	South Canal (Wet)	56/56	pCi/g	0.26	2.7	1.087	0.0386
U-234	North Canal (Dry)	32/32	pCi/g	0	1.8	0.9784	0.0695
	South Canal (Wet)	31/31	pCi/g	0	43	2.6332	0.0942

Table VI.1. Miami Erie Canal Special Sampling Results by Parameter
Page 12 of 12

Parameter	Location	MEC Proportion Detected	Measurement Units	Minimum Result	Maximum Result	Average Result	STD ERR
U-235	North Canal (Dry)	20/39	pCi/g	0	0.34	0.0739	0.0255
	South Canal (Wet)	17/53	pCi/g	0	1.7	0.0752	0.0362
U-238	North Canal (Dry)	39/39	pCi/g	0.48	2.4	0.9087	0.0564
	South Canal (Wet)	53/53	pCi/g	0.33	39	1.6585	0.0525

MEC = Miami-Erie Canal (no. of samples reported/no. of valid samples taken)
STDERR = Standard Error (standard deviation from the Mean for compounds and analytes)

$$STDERR = \frac{\sqrt{\sum (Uncertainty)^2}}{N}$$ for radionuclides

Results less than detect were set to 1/2 detection limit except for radionuclides

Organic parameters were not listed unless detected in two or more samples

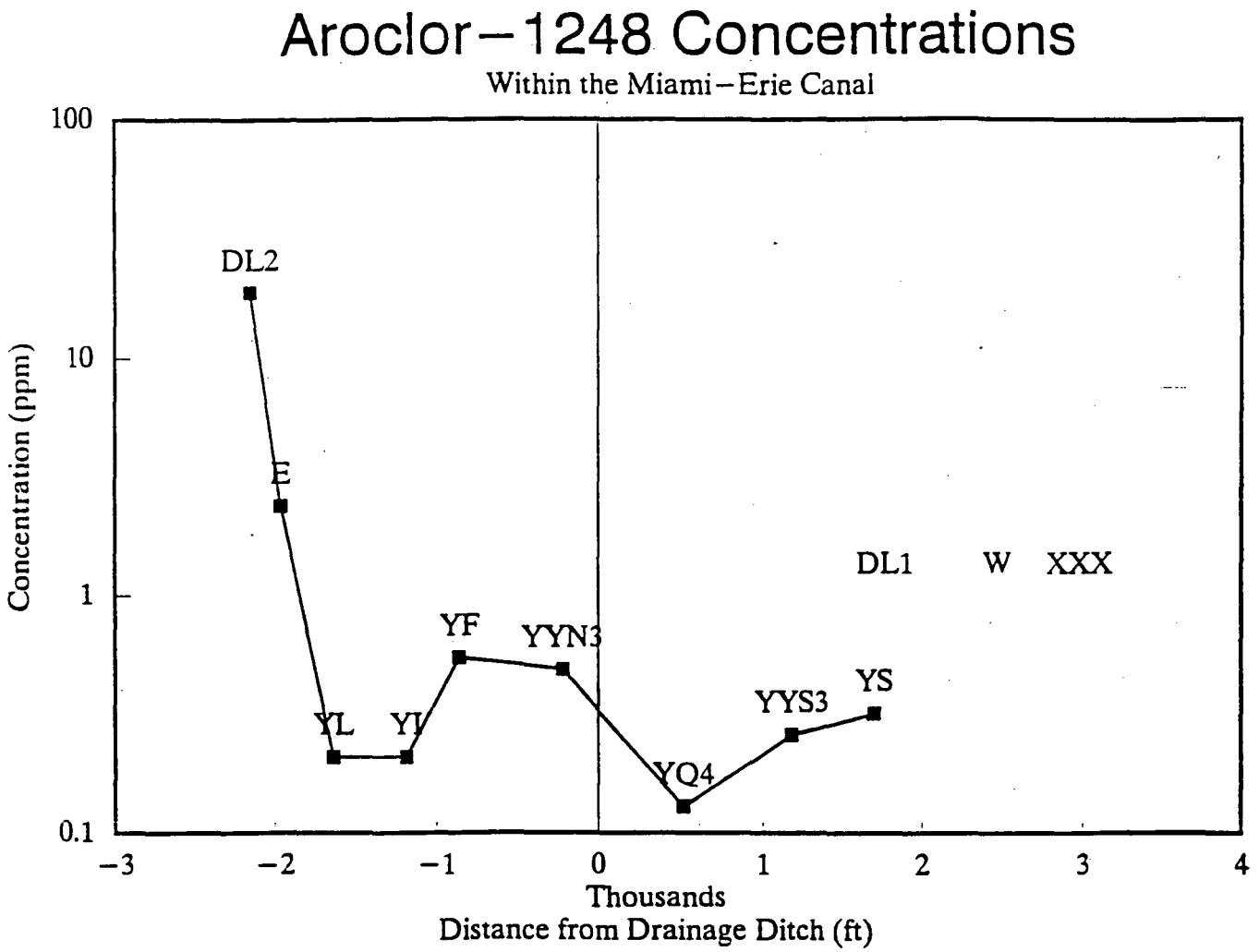

Figure 6.1 Aroclor-1248 Concentration Along the Miami-Erie Canal

6.1.2. SVOCs

The highest concentration of SVOCs measured in the canal were PAHs: fluoranthene, phenanthrene, benzo(a)pyrene, and pyrene. The concentration of PAHs at many locations were below 1 ppm. The maximum concentrations occurred at the northern end of the north canal: 53 ppm (fluoranthene), 43 ppm (phenanthrene), 22 ppm (benzo(a)pyrene), and 55 ppm (pyrene), all in the 0 to 1 foot interval. The distribution of PAH concentration along the canal was similar to that of the PCBs, decreasing to low levels (less than 10 ppm) at all locations south of location DL2 (see Figure 6.2). Most of the PAH levels were below 1 ppm. The distribution in PAH concentrations across the canal typically showed no variation. With the exception of location YF, PAH concentrations were slightly higher near the surface than at lower depths. At location YF, the concentration of PAHs were highest (up to 6.1 ppm) at the 4 to 5 foot interval. These distribution trends indicate a pattern similar to that for the PCB concentrations.

6.1.3. Inorganics

The highest concentrations of inorganics found in the canal soils were calcium, iron, aluminum, magnesium, and potassium, which is typical for soils in the region. Of the inorganics detected in the canal that are listed in EPA toxicity characteristic tables (OAC 3745-51-24), the maximum concentrations are shown in Table VI.2. The results indicate that arsenic and lead exceed the preliminary limits. "Preliminary limits" is a term used in the sampling report to denote either the EPA's 40 CFR 264, Subpart S (proposed) regulatory limits or the known regional background limits developed by Shacklette and Boerngen (1984). Arsenic exceeds the limit at only one location in the north canal (YYN), which is at the 1 to 2 foot depth on the east bank of the canal. Lead exceeds the limit at several locations along the north and south canal centerline (see Figure 6.3). The lead concentration generally decreases with depth in the canal soils. The concentration is highest on the west side of the canal, decreasing across the canal to the east side (Figure 6.4). These distributions indicate that lead was deposited in a consistent fashion along the length of the canal from sources on the west side.

6.2. RADIOLOGICAL CONTAMINATION

The analysis of the results of this sampling study indicate that concentrations of plutonium-238, thorium (-228, -230, and -232), tritium, and uranium (-234, -235, and -238) are present in the canal. Table VI.1 lists the radiological elements detected, maximum and minimum results, standard error, and the general

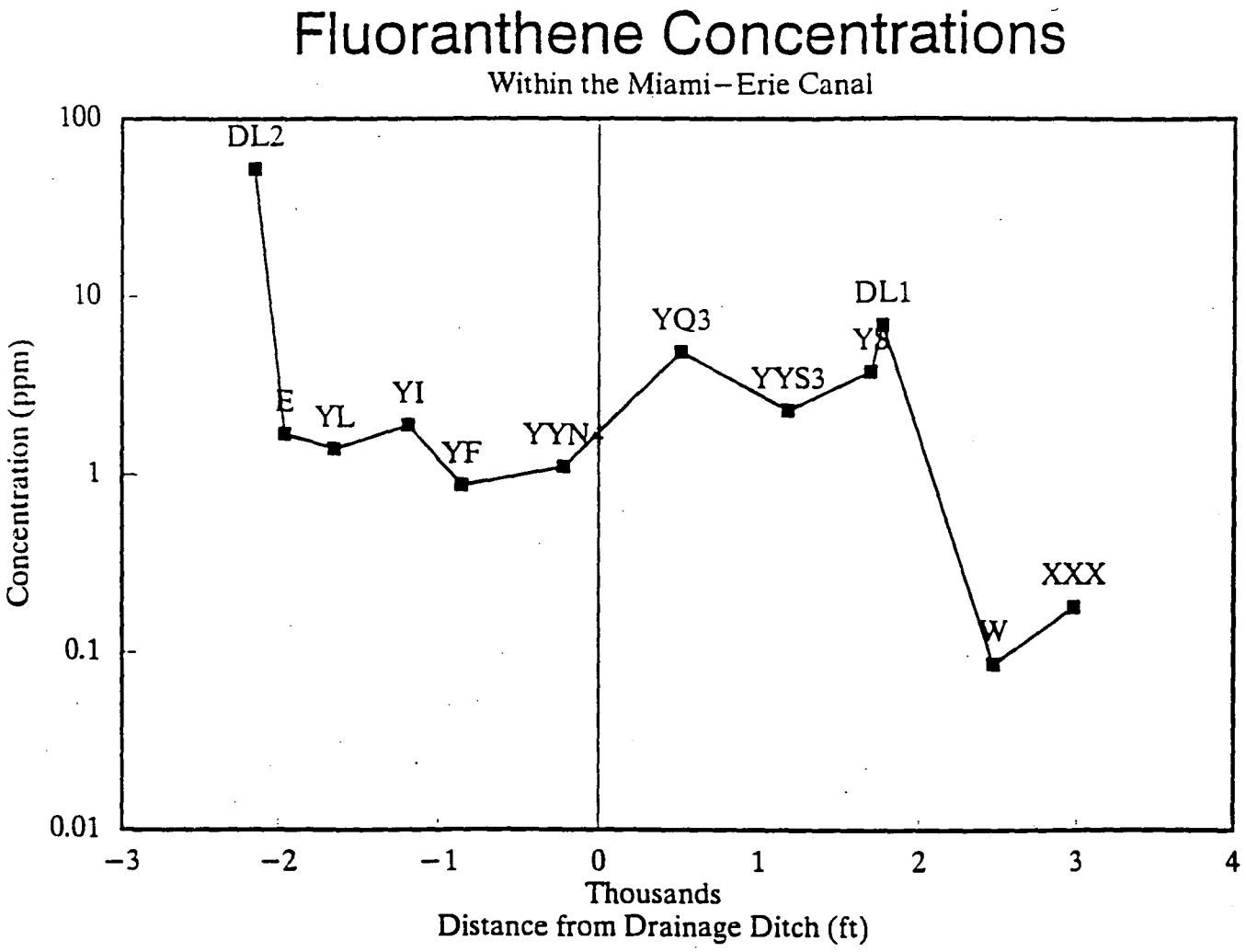

Figure 6.2 Fluoranthene Concentrations Along the Miami-Erie Canal

Table VI.2 Maximum Concentration of Inorganic Contamination Having Toxicity Characteristics Detected in the Miami-Erie Canal

Inorganics	Location	Interval Depth (feet)	Concentration (ppm)	Preliminary Limit[a]	EP Toxicity Limit (mg/kg)[b]
Arsenic	YYN1	1-2	127	80	5.0
Barium	YYS6	1-2	178	400	100.0
Chromium	YYS2	1-2	334	400	5.0
Lead	YQ1	0-1	579	53	5.0
Mercury	YYN3	0-1	0.76	20	0.2

a Taken from 40 CFR 261.24, Table 1

b Taken from Table VII.1

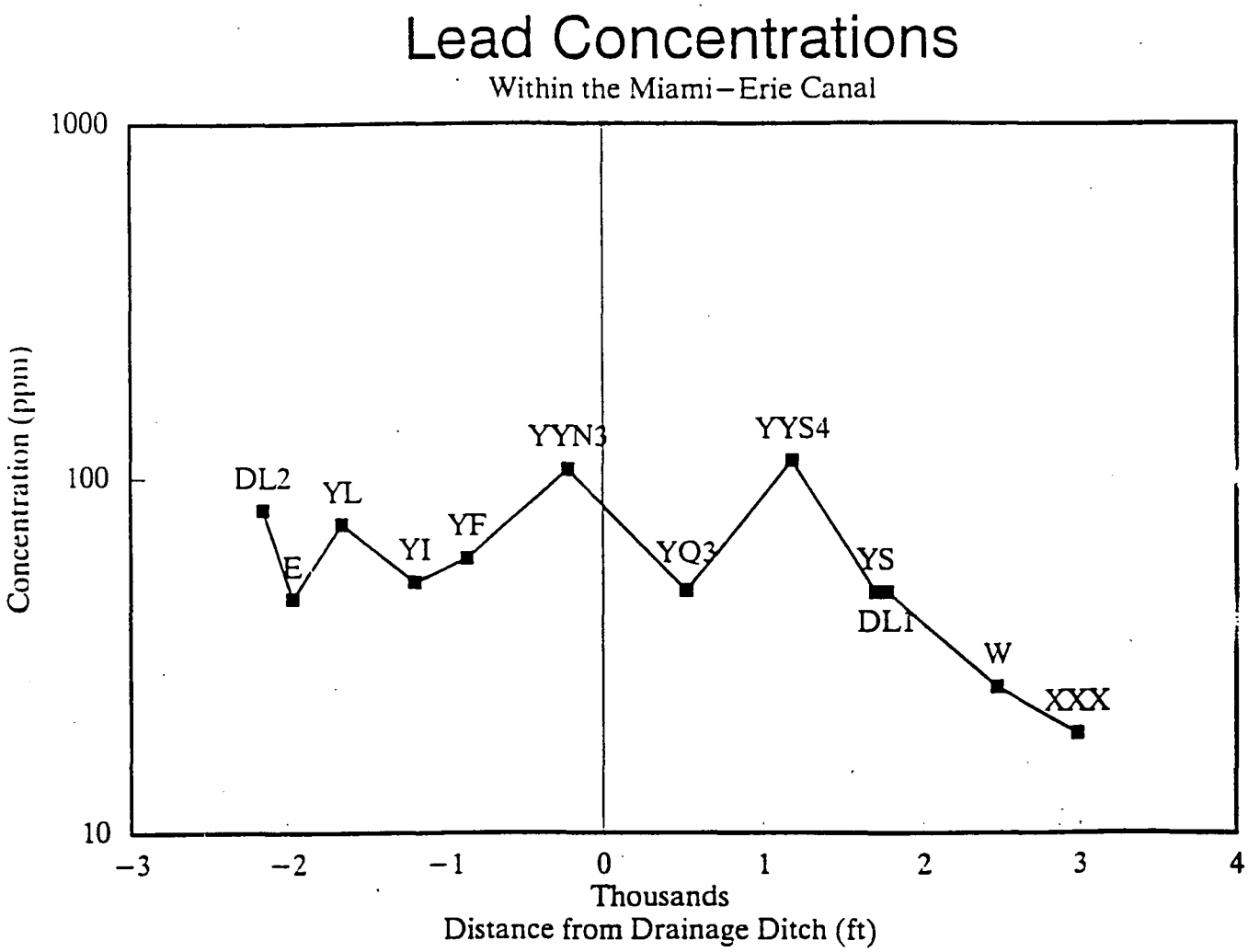

Figure 6.3 Maximum Concentration of Lead Along Miami-Erie Canal Centerline

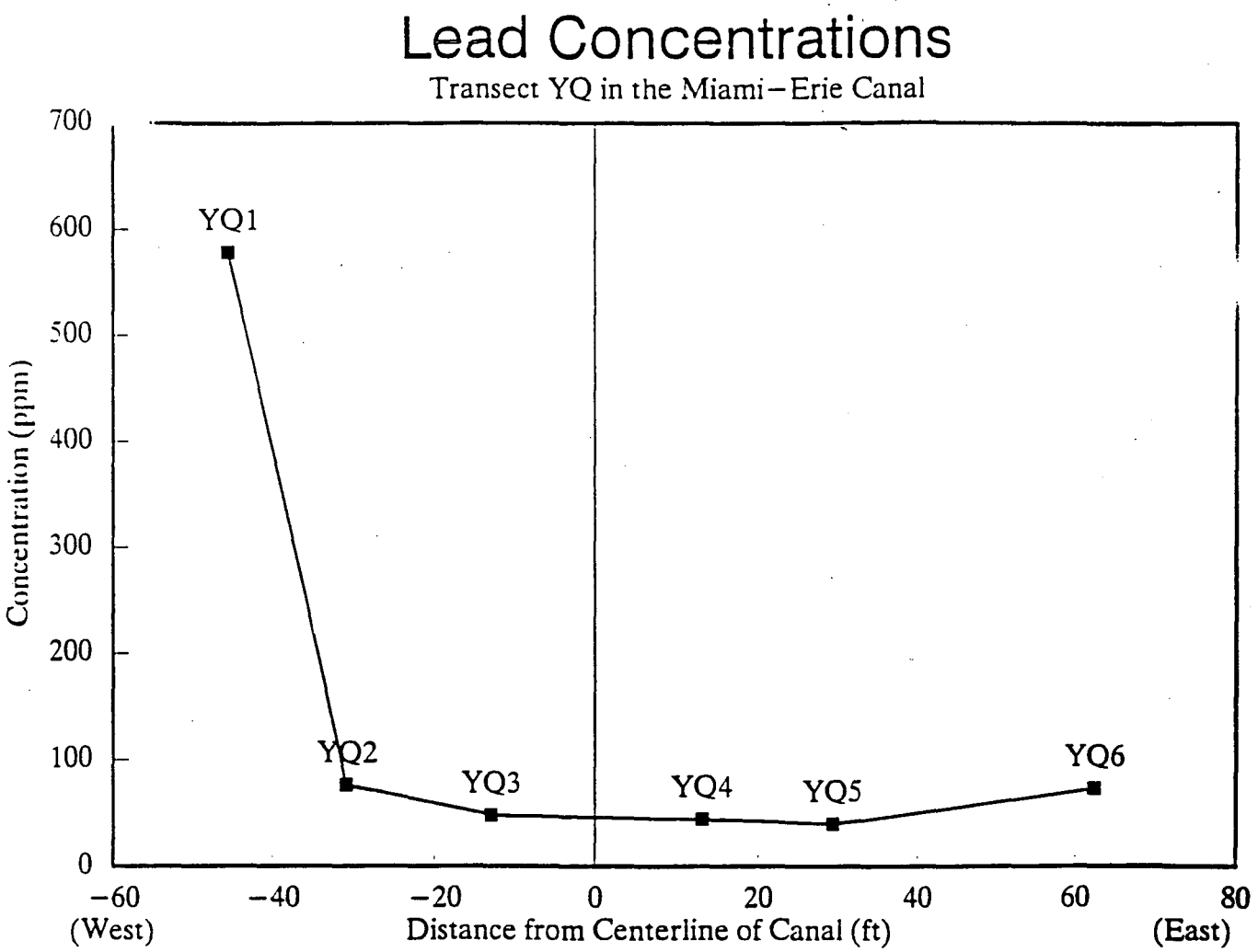

Figure 6.4 Concentration of Lead Across the Miami-Erie Canal

location where the samples were collected in the canal. Trace amounts of cesium-137 were also detected. The samples were also analyzed for cobalt-60, actinium -227, radium-226, and bismuth (-207 and -210m). Only one of these latter isotopes was detected: one sample showed a trace amount of bismuth-207. Potassium-40, which is naturally occurring, was detected in the canal soils at an average concentration of 15 pCi/g. Distribution in the canal was uniform. National background concentrations of potassium-40 is 11 pCi/g. Background for potassium-40 near Mound Plant is 15.4 pCi/g (range is 10.7 to 18.4) (UC 1990). Strontium-90 was detected in trace amounts; however, all of the strontium data were rejected as unusable (Section 5.3.5). The significance of the concentrations of plutonium, thorium, tritium, and uranium is discussed in the following sections. The background concentrations of plutonium, tritium, and uranium near Mound Plant are shown in Table VI.3. The background concentrations of potassium-40, thorium-232, and uranium-238 in North American and Mound Plant vicinity soils are shown in Table VI.4. No statistical analyses, other than standard error, were performed on the radiological results.

6.2.1. Plutonium

The samples collected in the Special Canal Sampling study were analyzed for plutonium-238 and -239/-240. The plutonium-238 concentrations are uniformly approximately 100 times greater than the plutonium-239/-240 values. This is consistent with their relative isotopic compositions.

The plutonium-238 concentration distribution in the 0 to 1 foot intervals starts at 20 pCi/g at canal location DL2, increases to a range of 500 to 1000 pCi/g in the canal region bounding the drainage ditch intersection, and drops to 0.95 pCi/g by location XXX (Figure 6.5). This distribution is consistent with the trends shown in the Rogers (1975) study results. The maximum concentration of plutonium-238 was 1000 pCi/g at location YQ3 (south canal) in the 0 to 1 foot interval. The maximum concentrations tend to be in the 0 to 1 foot interval at most locations sampled. The distribution of plutonium-238 contamination decreases at locations away from the drainage ditch intersection. Cross-section results of the plutonium concentrations at 0 to 1 foot intervals at canal locations YYN, YQ, and YYS all show distributions having higher concentrations in the center of the canal than at the sides. This distribution and spatial variability is similar to the one observed in the Rogers (1975) canal study.

6.2.2. Thorium

The Special Canal Sampling study included analysis of soil samples for thorium-228, -230, and -232. The initial maximum concentration of thorium was 160 pCi/g for thorium-230 at location YF (north

Table VI.3. Background Concentrations of Radionuclides for Mound Plant in 1991

Medium	Location	Radionuclide	Concentration
Air	Station 119, 28 miles NW of plant	Plutonium-238 Tritium oxide	$0.24 \pm 0.39 \times 10^{-18}$ µCi/mL $1.85 \pm 1.21 \times 10^{-10}$ µCi/mL
River water	20 miles upstream of plant on Great Miami River	Plutonium-238 Tritium Uranium-233, 234 Uranium-238	n.d. n.d. $0.73 \pm 0.09 \times 10^{-9}$ µCi/mL $0.67 \pm 0.08 \times 10^{-9}$ µCi/mL
Surface water	Pond, 38 miles SE of plant	Plutonium-238 Tritium	n.d. n.d.
Groundwater	Well, 22 miles SE of plant	Plutonium-238 Tritium Uranium-233, 234 Uranium-238	n.d. n.d. $0.3 \pm 0.02 \times 10^{-9}$ µCi/mL $0.21 \pm 0.21 \times 10^{-9}$ µCi/mL
River silt	20 miles upstream of plant on Great Miami River	Plutonium-238	$0.99 \pm 1.12 \times 10^{-9}$ µCi/g
Pond silt (surface water location)	Pond, 38 miles SE of plant	Plutonium-238	$0.89 \pm 1.4 \times 10^{-9}$ µCi/g
Vegetation (grass)	40 miles W of Plant	Plutonium-238	$0.07 \pm 0.34 \times 10^{-9}$ µCi/g
Fish	40 miles W of Plant	Plutonium-238	$0.01 \pm 0.08 \times 10^{-9}$ µCi/g

n.d. = not detected

Reference: EG&G 1992b

Table VI.4 Average Background Concentrations of Selected Radionuclides in Soils

Radionuclide	Concentration	
	North American Soils[a]	Mound Plant Vicinity Soils[b]
Potassium-40	1.1	15.4
Thorium-232	1.0	0.94
Uranium-238	1.8	1.49
Radium-226	5.4	1.42

References:

a NCRP 1987

b University of Cincinnati 1990

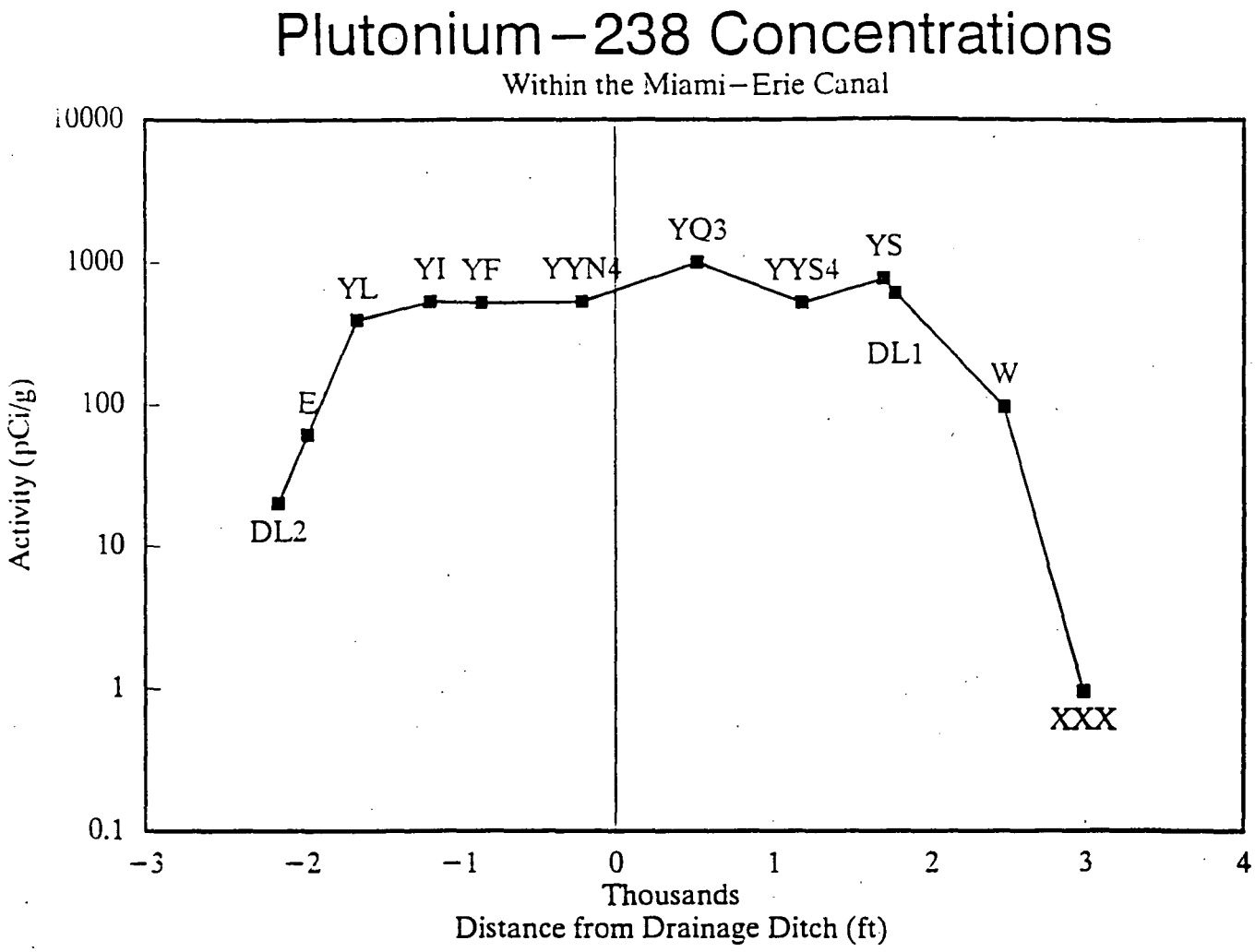

Figure 6.5 Plutonium-238 Concentration Along Miami-Erie Canal

canal) in the 3-4 foot interval depth. A reanalysis of the sample revealed a concentration of 1.3 pCi/g for thorium-230 at this same location and depth. The initial and reanalyzed results for thorium are shown in Appendix B. Both samples are considered to be representative of the soil at this sample location, since similar laboratory techniques were used for the drying, pulverizing, extraction, and isotopic counting. However, only the reanalyzed results for this location are reported in Table VI.5. The revised maximum concentration of thorium is 38 pCi/g at location YYNS (north canal) in the 1-2 foot interval depth. Table VI.5 shows the highest concentration of thorium measured in the canal sediments. Thorium-230 concentration is generally higher than either thorium-228 or -232. The thorium concentration is slightly higher in the north canal than in the south canal (Figure 6.6). The higher thorium concentrations tend to be at the 2 to 3 foot depth and in the center of the canal rather than near the sides. The distribution is similar but not as pronounced as for plutonium-238.

DOE Order 5400.5 (DOE 1988) specifies that thorium concentrations in soil comply with EPA's regulations in 40 CFR Part 192. According to the regulations, thorium must be less than 5 pCi/g near the surface, and less than 15 pCi/g at depths 15 cm bls. (Per Table VI.4, the national background concentration of thorium-232 in soils is approximately 1.0 pCi/g. The maximum concentration of thorium-232 found in the canal soils was 3.2 pCi/g with an average concentration of 1.1 pCi/g.) The EPA limits for thorium are exceeded at locations YYN, YYS, and DL1. However, maximum results at locations YYS and DL1 are only slightly above the EPA limit, and the maximum at location YYN is an isolated point (i.e., it is not surrounded by other samples with elevated activity levels).

6.2.3. Tritium

The canal soils were analyzed for tritium. Table VI.6 is a list of the highest concentrations of tritium measured in the canal sediments. The tritium concentrations are generally higher in the north canal than in the south canal. Except for one sample, the higher tritium concentrations are near the surface.

The maximum concentration of tritium found in the canal was 180 pCi/g at location YL (north canal) at the 0 to 1 foot interval. The maximum tritium concentration across the canal tends to occur in the center of the canal. The distribution of tritium concentration along the canal shows a broad maximum near the mid-way location in the north canal, decreasing steadily in the southward direction, then increasing to a maximum in the southern end of the south canal (see Figure 6.7). This distribution is not similar to the heavy metal or non-radiological contamination profiles observed in the canal. The tritium distribution is indicative of deposition, and is probably a result of complex interaction between liquid discharge from

Table VI.5 Highest Thorium-230 Concentrations in Miami-Erie Canal Sediments (1992 Study)

Location	Sampling Interval (feet)	Thorium-230 Concentration (nCi/g)	40 CFR 192 Limit[a] (nCi/g)
North Canal			
YYN5	1-2	0.038	0.015
South Canal			
YYS4	0-1	0.0057	0.005
YS	1-2	0.011	0.015
DL1	0-1	0.0057	0.005

[a]40 CFR 192 criteria for residual thorium soil concentrations are 0.005 nCi/g (surface) and 0.015 nCi/g (more than 15 cm below land surface).

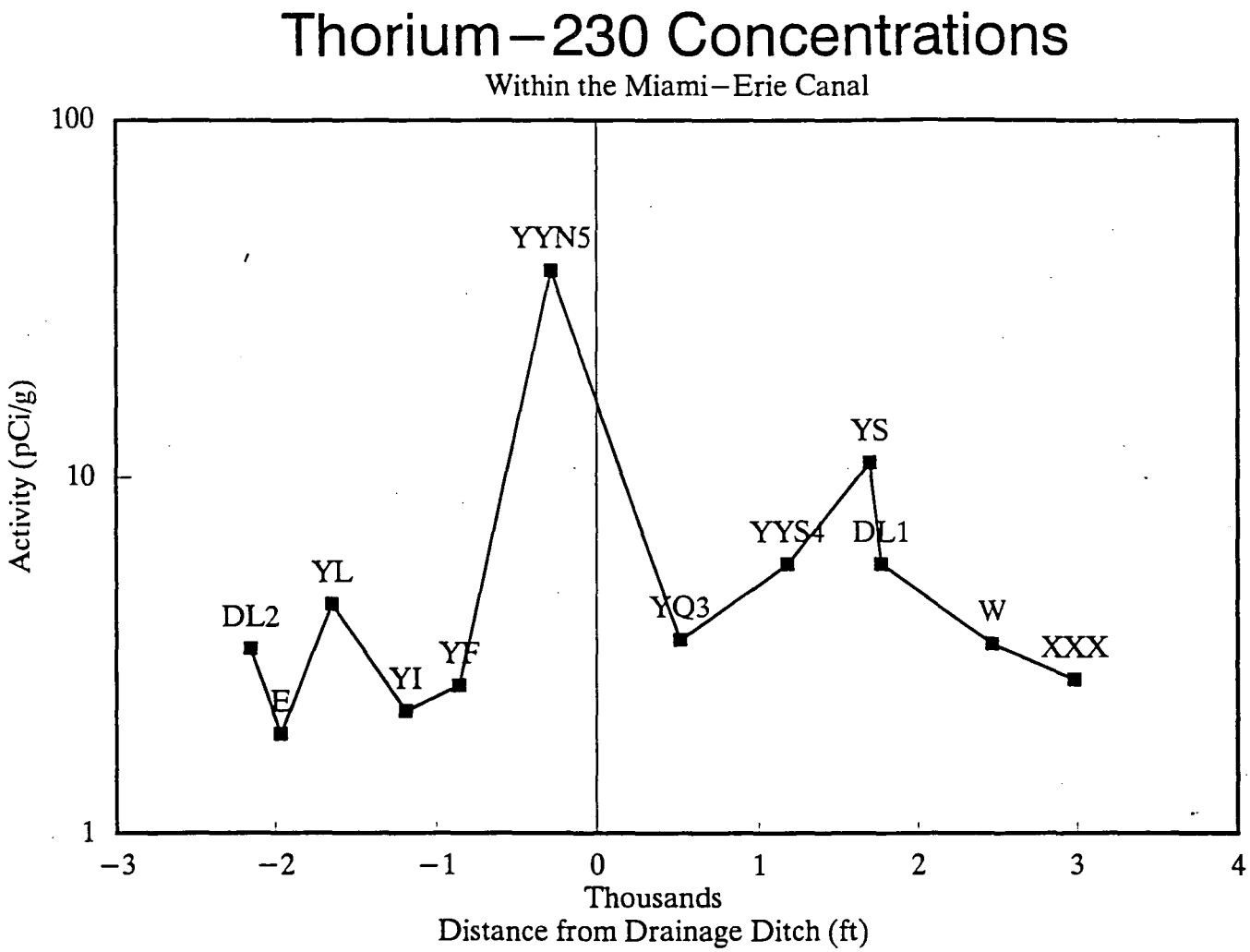

Figure 6.6 Thorium-230 Concentration Along Miami-Erie Canal

Table VI.6 Highest Tritium Concentrations in Miami-Erie Canal Sediments (1992 Study)[a]

Location	Sampling Interval (feet)	Tritium Concentration (pCi/g)
North Canal		
YL	0-1	180 ± 2.0
YI	0-1	110 ± 3.4
YF	0-1	130 ± 1.6
South Canal		
YS	1-2	100 ± 3.5
DL1	1-2	70 ± 1.2

[a] Highest concentration of tritium measured in 1975 Canal Study is 700 nCi/g (Kershner and Rhinehammer 1978).

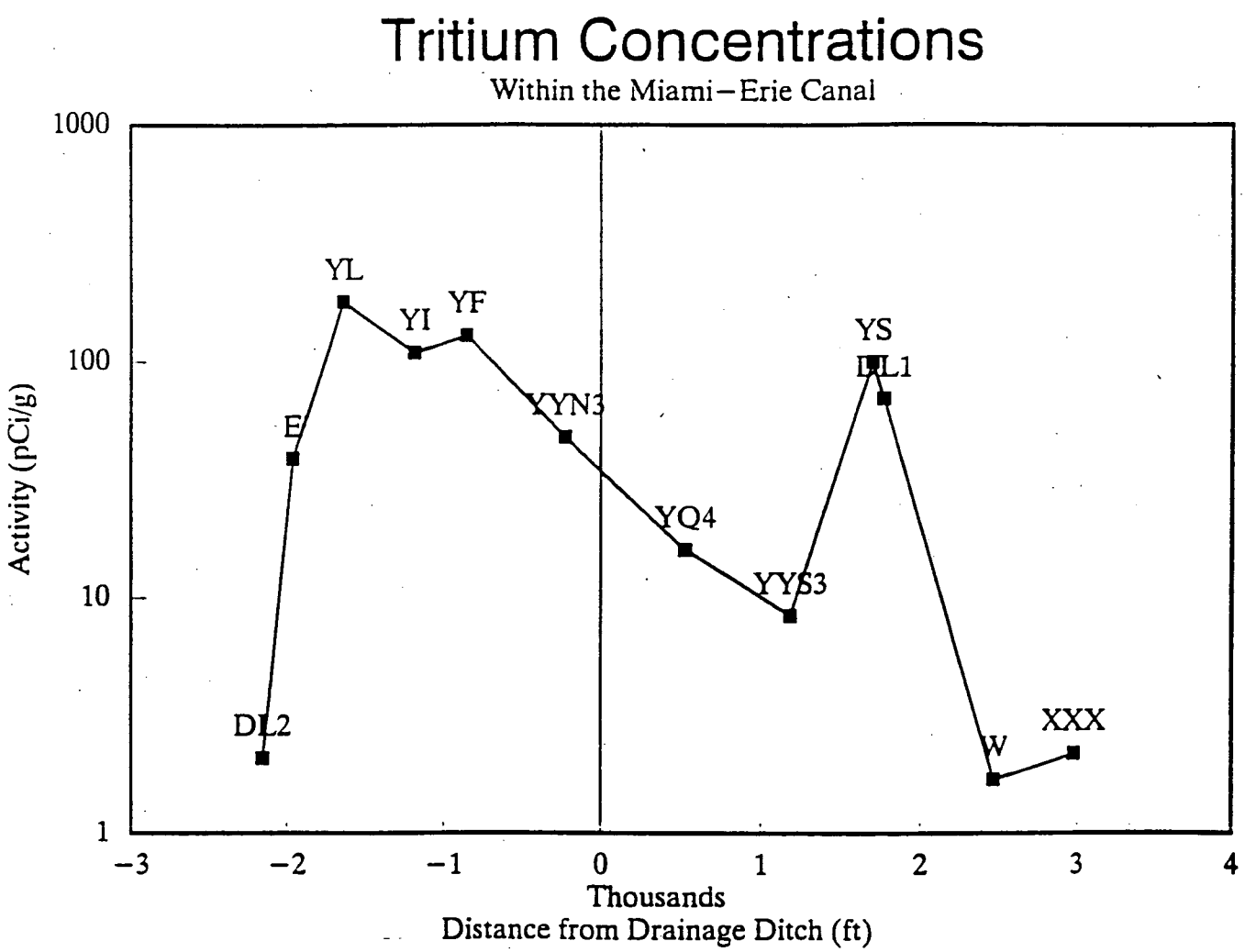

Figure 6.7 Tritium Concentration Profile Along Miami-Erie Canal

the Mound Plant drainage ditch (and airborne tritium releases) coupled with different patterns of deposition in the north and south canal. The higher deposition in the north canal is likely a result of the relatively drier conditions there as opposed to the south canal, where the almost continual presence of flowing water has resulted in more transport of tritium out of the canal and less deposition into the soils of the south canal. Like thorium, the maximum concentrations in the vicinity of locations YS and DL1 are isolated points. In addition, the maximum tritium concentration at location YS does not occur at the same elevation as location DL1.

Because of tritium's short half-life (12.5 years) and the unknown time span of deposition, it is not possible to compare the results with the historical data. Kershner and Rhinehammer (1978) estimated that the highest concentration of tritium in the canal soils in 1978 was 110,000 pCi/g. Analysis of canal soil samples taken in 1975 shows a maximum tritium concentration of 700,000 pCi/g. The 1974 and 1978 samples were not taken from the same location. There are currently no DOE or EPA concentration limits for tritium in soils.

6.2.4. Uranium

The canal soils were analyzed for uranium-234, -235, and -238. The uranium concentrations occur below the 1 pCi/g level, with one exception: the maximum concentrations of uranium-234, -235, and -238 are 43, 1.7, and 39 pCi/g, respectively, at location W, interval 1 to 2 foot depth (see Figure 6.8). These results are isolated points since they are not surrounded by other samples with elevated activity levels. In addition, the results are not consistent with Mound Plant as the source of uranium. There are currently no DOE or EPA concentration limits for uranium in soils.

Uranium-238, which occurs naturally, has a national background concentration in soil of 1.8 pCi/g, and is the vicinity of Mound Plant, 1.49 pCi/g (Table VI.4). The average concentration of uranium-238 found in the canal was 1.3 pCi/g.

6.3. SOURCES OF CONTAMINATION

Trends in chemical and radiological concentrations were compared to determine the potential sources of contamination. The reason for discussing potential sources of chemical contamination is to aid in the determination of whether the detected materials constitute hazardous waste, per the EPA regulations (40 CFR 261). For example, the regulations identify hazardous wastes from specific (40 CFR 261.32) and

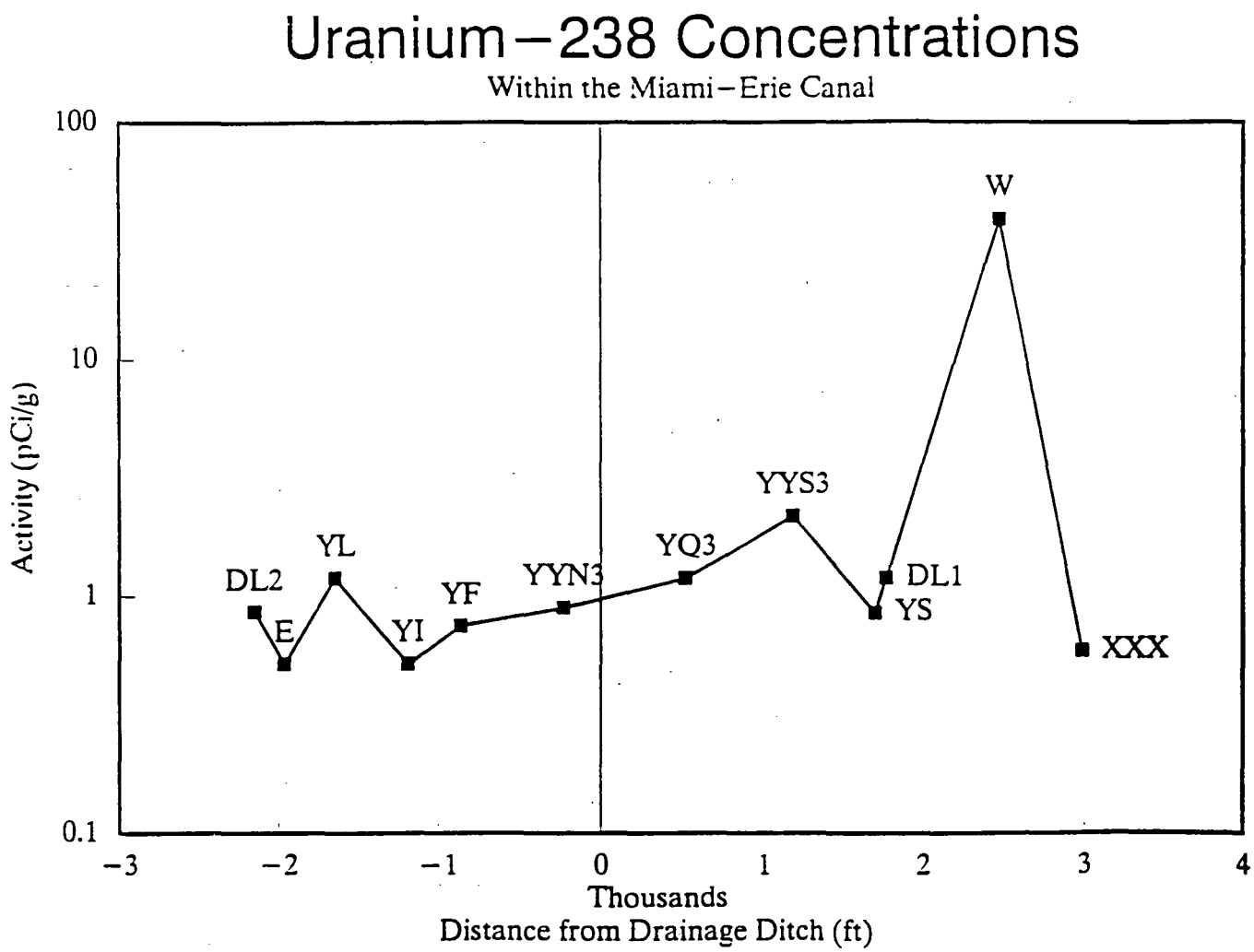

Figure 6.8 Uranium Concentration Along Miami-Erie Canal

non-specific sources ((40 CFR 261.31). For completeness, a brief discussion on potential sources of radiological contamination is included in this section as well.

The results of the canal soil sampling reported in this study do not necessarily constitute a detailed, quantitative investigation of the entire canal and related waterways, but are intended to address the "nature and extent" of the potential contamination. If the DOE determines that a removal action in the canal is appropriate, additional sampling may be necessary to satisfy treatment/disposal requirements.

Those constituents found in higher concentrations in the canal region near the drainage ditch and in decreasing concentrations in either direction away from the drainage ditch locations are assumed to originate from Mound Plant and to have entered the canal through the drainage ditch. An example of this trend is plutonium-238. Figure 6.5 shows the profile of plutonium-238 centerline concentrations in the canal. Of the detected chemical constituents in the canal, none mimics the plutonium-238 trend.

The locations of the chemicals that were detected in the canal were reviewed to determine other entry routes from Mound Plant to the canal. Other transport routes include general surface water runoff, air transport, and specific dumping or waste line breaks. No trends would suggest that any illegal dumping or waste line breaks to the canal were observed.

Based on the results of the sampling data, it appears that PCB Aroclor-1248 and Aroclor-1254 were present in low levels (<1 ppm) in many of the samples taken in both the north and south canal. The concentration is highest in the vicinity of the northern portion of the north canal, with 19 ppm for Aroclor-1248 found at location DL2 (see Figure 6.1), and 2.4 ppm for Aroclor-1254 at location E. Since the PCB profile is a maximum at the north end of the canal and rapidly decreases to nominal levels in the southern portion, this distribution indicates that a potential source is located at the north end of the canal rather than the Mound Plant drainage ditch. Because no liquid waste streams from Mound Plant enter the north canal from the north end, it is concluded that the source of the PCBs is not Mound Plant.

The location of the former electric (coal-fired) power plant, which was demolished in the 1960s, was near the north end of the north canal area. The power plant represents a potential source of the PCBs, because Aroclor-1248 and Aroclor-1254 were typically used in electrical transformers and capacitors at electric power plants. The PCBs could have originated from transformer/capacitor leaks or spills. Oil containing PCBs may also have been used for spraying as a means of dust control on gravel roads or as a weed control agent. All practices were common historically. Although Mound Plant does have transformers

and capacitors that may utilize both PCB Aroclor-1248 and Aroclor-1254, the trend of the PCB contamination in the canal is that the highest concentrations occur in the north with decreasing concentrations toward the south canal. This trend indicates the source was from the northern end of the north canal, such as the location of the former power plant, and not from Mound Plant releases.

Based on the results of the sampling data, it appears that PAHs such as fluoranthene, phenanthrene, benzo(a)pyrene, and pyrene were present in low levels (< 1 ppm) in many of the samples taken in the north and south canal. The concentration of PAHs is highest in the vicinity of the northern portion of the north canal, with 53 ppm (fluoranthene), 43 ppm (phenanthrene), 22 ppm (benzo(a)pyrene), and 55 ppm (pyrene) found at location DL2. The trend for PAHs is similar to that for PCBs -- maximum concentration at the north end of the north canal, decreasing rapidly to lower levels (from less than 1 ppm up to 7 ppm) along the remainder of the canal. PAHs exhibit slightly higher concentrations near the surface than at deeper elevations. As with PCBs, PAHs may have resulted from the operation of the former electric (coal-fired) power plant. PAHs typically result from the combustion of coal products. The distribution profiles for PAHs and pesticides follow the same trend as for the PCBs (see Figure 6.2). This trend supports the assumption that the PAHs in the canal did not originate from Mound Plant.

Based on the results of the sampling data, it appears that inorganics such as lead, copper, aluminum, barium, calcium, and chromium are present in non-negligible concentrations in the north and south canal. Deposits of calcium, iron, aluminum, magnesium, and potassium, which are the highest concentrations of inorganics found in the canal, are naturally occurring in the regional soils. Consequently, they are not a result of releases from Mound Plant. Distribution profiles along the canal for other detected inorganics, including those exhibiting toxic characteristics (lead, arsenic, chromium, barium, and mercury) indicate little variability along the length of the canal. The distribution profiles of inorganic concentrations across the width of the canal were not consistent. The profiles were flat, decreasing from west to east, or peaked in the center of the canal. The distribution profiles of cobalt and manganese are flat, while those for lead, arsenic, and barium decrease from west to east. Inorganics (chromium, mercury, and copper) exhibited profiles that are peaked in the center of the canal. No records indicate that the inorganics detected in the canal are due to Mound Plant operations (i.e., the electroplating facility). See Section 1.1.3 for a discussion of Mound Plant historical discharges to the canal.

The concentration of lead in the canal exhibits a uniform concentration from north to south, with slightly lower levels in the southernmost portion (see Figure 6.3). The distribution of lead across the canal indicates higher concentrations are found in the west bank (adjacent to Dayton-Cincinnati Road),

decreasing toward the east bank (Figure 6.4). The higher lead concentrations occur near the surface of the canal soils, decreasing with depth. This distribution trend suggests that lead was deposited on the surface, with the source likely to be from the western side of the canal. Because lead is a byproduct from internal combustion engines, it is assumed that the canal contamination is a result of automobile emissions from Dayton-Cincinnati Road traffic.

Based on the results of the sampling data, the source of non-naturally occurring radionuclides in the canal is Mound Plant. The distribution of these radionuclides in the canal is the result of releases from the drainage ditch and deposition into the canal. The naturally occurring radionuclides in the canal, however, cannot be solely attributed to past activities at Mound Plant.

With the exception of chromium, mercury, and copper, the maximum concentrations of chemical contamination generally does not coincide with the location of the radiological contamination. The chemical contamination is higher near the north end of the canal (PCBs and PAHs) and along the west bank (lead, arsenic, barium). The radiological contamination generally occurs in the center of the canal, with maximums near the drainage ditch location. Consequently, significant amounts of mixed waste are not expected to be found during any remedial action.

SECTION 7

7. CONCLUSIONS

The following conclusions are based on the discussion of results in Section 6:

- VOCs, cobalt, americium, bismuth (except for one sample), radium, and actinium were not detected in the collected samples.
- The distribution of non-naturally occurring radionuclides indicates the origin to be Mound Plant.
- The distribution of plutonium concentration is similar to that found in earlier studies.
- The only significant concentrations of contaminants found consistently throughout the canal area were radionuclides.
- The distribution of chemical contaminants in the canal indicate there are no significant amounts of mixed waste in the canal.

The bases for these conclusions are presented in the following sections.

7.1. COMPARISON TO REGULATORY CRITERIA

One objective of the special canal sampling project was to determine whether hazardous chemical contaminants are present in the Miami-Erie Canal. At issue is whether the detected chemical constituents are classified as hazardous wastes under RCRA regulations.

With some exclusions under 40 CFR 261.3 of RCRA hazardous waste is defined as solid waste that: 1) exhibits the characteristics of hazardous waste (ignitability, corrosivity, reactivity, and toxicity); or 2) is listed as a hazardous waste in Subpart D, 40 CFR Part 261. Several pieces of information are needed to determine if hazardous wastes are present in the canal: the list of constituents, the concentration of each constituent at each sampling point, potential sources of contamination, and the applicable regulations. The Special Canal Sampling investigation identified the constituents and concentrations, while interviews, visual assessments, and document searches were used to identify potential sources and applicable regulations.

Listed wastes include wastes that have been determined by the EPA to be ignitable, corrosive, reactive, toxic, acutely hazardous or exhibiting toxicity characteristics. Listed wastes require knowledge of the source or process that is generating the waste. Because none of the chemical constituents detected in the

canal are associated with a source at Mound Plant, the conclusion is that the chemical constituents are not a RCRA listed hazardous waste.

Constituents which are listed or have hazardous characteristics but are not associated with a source are defined as "hazardous constituents" in 40 CFR Part 261, Appendix VIII. The procedure used to determine whether a sample has RCRA hazardous characteristics is the Toxicity Leaching Characteristic Procedure (TCLP). The TCLP analysis was not applied to samples collected in the Special Canal Sampling study, but may be necessary to satisfy treatment/disposal requirements for any removal or remedial actions. The definition of hazardous constituent under CERCLA (Section 101) is broader than the RCRA term "hazardous waste". However, for purposes of this sampling report, it is a moot point. As discussed in Section 6.3, the source of the chemical constituents that are present in significant amounts in the canal is inconclusive at this time. Consequently, it cannot be determined whether they are hazardous or non-hazardous constituents. Those contaminants identified as hazardous constituents (per RCRA) are listed in Table VII.1.

Metals in soils may satisfy the standard for hazardous wastes by exhibiting toxicity characteristics, as defined in the Ohio Administrative Code, if the leachate concentrations exceed regulatory extraction levels. An alternative to these levels is proposed in Table VII.1, Preliminary Limits for Compounds Detected in Soils and Sediments at Concentrations Above Method Detection Limits, based on EPA 40 CFR Part 264 Subpart S proposed rule. The limits for inorganics not included in EPA 40 CFR Part 264 Subpart S are based upon published data on background inorganic compound concentrations for soils in the eastern United States (Shacklette and Boerngen 1984). According to Shacklett and Boerngen, a background lead concentration of 53 ppm is representative of the eastern United States. As a comparison, an average background level of 19 ppm was measured for lead in Ohio soils (Logan and Miller 1983). However, it is important to note that these values are not site specific and are included in this report to show the variability in lead background levels. Background metals concentrations are being developed for Mound Plant under other projects, and may be used as site-specific comparison levels at a later date.

PCBs by definition are not hazardous wastes, but they are hazardous constituents regulated under the Toxic Substances Control Act (TSCA). PCBs are considered as hazardous constituents in this report. Remediation of PCBs usually depends on the initial source of the PCBs, when the contamination occurred, and the concentration found in the environment. For example, EPA's PCB Spill Cleanup Policy (40 CFR Part 761.125) apply to spills of PCBs at concentrations greater than 50 ppm. The canal situation is not characterized as a spill condition and no sample had a PCB concentration greater than 19

Table VII.1 Hazardous Constituents Identified in the Miami-Erie Canal
page 1 of 2

Parameter	Maximum Concentration (ppm)[a]	TCLP Level (mg/L)[b]	Preliminary Limit (mg/kg)[c]
4,4'-DDD	0.0048	NA	NA
4,4'-DDE	0.0036	NA	NA
4,4'-DDT	0.013	NA	NA
Aldrin	0.105	NA	NA
Benzo(a)pyrene	22.0	NA	NA
Benzo(b)fluoranthene	25.0	NA	NA
Benzo(k)fluoranthene	19.0	NA	NA
Butylbenzylphthalate	0.22	NA	NA
Chrysene	24.0	NA	NA
Di-n-butylphthalate	4.1	NA	NA
Dibenz(a,h)anthracene	4.8	NA	NA
Dieldrin	0.21	NA	NA
Endosulfan I	0.0029	NA	NA
Endosulfan II	0.21	NA	NA
Endrin	0.22	0.2	NA
Endrin ketone	0.21	NA	NA
Fluoranthene	53.0	NA	NA
Heptachlor	0.105	0.008	NA
Heptachlor epoxide	0.005	0.008	NA
Indeno(1,2,3-cd)pyrene	16.0	NA	NA
Methoxychlor	1.05	10.0	NA
Methylene Chloride	0.013	NA	NA
Naphthalene	4.0	NA	NA
Aluminum	27,000	NA	NA
Antimony	37.3	NA	30[d]
Arsenic	127	5.0	80[d]
Barium	178	100.0	400[d]
Beryllium	1.4	NA	0.2[e]

Table VII.1 Hazardous Constituents Identified in the Miami-Erie Canal
page 2 of 2

Parameter	Maximum Concentration (ppm)[a]	TCLP Level (mg/L)[b]	Preliminary Limit (mg/kg)[c]
Cadmium	2.4	NA	40[d]
Calcium	133,000	NA	NA
Chromium	334	5.0	400[d]
Cobalt	14.4	NA	39[e]
Copper	225	NA	102[e]
Cyanide	NA	NA	200[d]
Iron	36,600	NA	NA
Lead	579	5.0	53[e]
Magnesium	49,800	NA	NA
Manganese	1,430	NA	3,790[e]
Mercury	0.76	0.2	20[d]
Molybdenum	NA	NA	NA
Nickel	33.9	NA	2,000[d]
Potassium	5,150	NA	NA
Selenium	NA	NA	1.8[e]
Silicon	NA	NA	NA
Silver	16.9	NA	200[d]
Sodium	754	NA	NA
Thallium	1.4	NA	6.0[d]
Vanadium	48.9	NA	271[e]
Zinc	323	NA	178[e]

a Maximum concentration taken from Table VI.1
b Taken from 40 CFR 261.24, Table I, Maximum Concentration of Contaminants from the Toxicity Characteristic
c Preliminary limits for compounds detected in Miami-Erie Canal soils and sediments at concentrations above method detection limits
d 40 CFR 264, Subpart S (Proposed Rule)
e Regional Background (Shacklette and Boerngen, 1984)
NA Not Available

ppm (see Section 7.2). The majority of the canal sampling locations that contain PCBs have relatively low concentrations (less than 1 ppm).

7.2. CHEMICAL CONTAMINATION

The following conclusions are based on the discussion of results (Section 6.1) and the applicable regulatory criteria (Section 7.1). The maximum concentration of PCBs and PAHs found in the canal was 19 ppm (Aroclor-1248) and 53 ppm (fluoranthene), respectively. No VOCs were detected.

For inorganics detected in the canal soils, concentrations for antimony, arsenic, beryllium, copper, lead, and zinc were found to exceed preliminary limits. Lead exceeded the preliminary limit (53 ppm, Table VII.1) at several locations along the north and south canal, with a maximum concentration of 579 ppm. This maximum result is suspected to be anomalous. Only one sample exceeded the arsenic preliminary limit (80 ppm, Table VII.1), with a value of 127 ppm.

Measurable concentrations of SVOCs are in the canal, but without a regulatory or other standard (e.g., background), it is not known whether this qualifies as hazardous waste. The highest concentrations of PCBs and PAHs were detected in the northern portion of the north canal. Conversely, the radiological concentration is lowest at this location. This combination of contamination lends support to a determination that the canal may not be contaminated with mixed waste.

Evidence suggests there is metal contamination, primarily lead, at levels above a "national" background standard in the canal. In addition, it is likely that the highest levels of lead contamination would still be above a site-specific background. This lead contamination is highest on the west bank of the canal (i.e., nearest the Dayton-Cincinnati Road and associated automobile emissions) and may be typical of near-road soils samples. These lead levels will be compared to background levels, when available, in order to evaluate whether the levels represent anthropogenic sources or potential contamination. Conversely, the radiological concentration is low along the canal banks. Consequently, the combination of lead and radiological contamination is similar to the trend indicated by the PCB and PAH contamination, i.e., the maximum highest chemical and radiological contamination is not coincidental.

7.3. RADIOLOGICAL CONTAMINATION

Plutonium-238 is present in the north and south canal soils at concentrations up to 1000 pCi/g. The distribution of the contamination is similar to that observed in previous studies (Rogers 1975), and is the result of a release from Mound Plant.

Thorium-228, -230, and -232 were detected in the north and south canal soils. As discussed in Section 6.2, there are few samples that exceed the EPA limits (40 CFR 192). The distribution of the thorium concentrations is similar to that for plutonium-238 and is therefore a result of releases from Mound Plant.

Tritium was detected in the north and south canal at concentrations up to 180 pCi/g. Although the distribution profile is not similar to those of plutonium-238 and thorium concentrations, it is, nevertheless, indicative of releases from Mound Plant.

Uranium-234, -235, and -238 isotopes are present in the north and south canal soils in low concentrations. The distribution profile is not a sufficient indication of the source of the uranium concentration.

In summary, the results of the radiological survey show that there is plutonium-238 and tritium contamination in the canal, along with low levels of thorium and uranium.

7.4. MIXED WASTE DETERMINATION

This Special Canal Sampling study confirmed the presence of radiological material in the canal, similar to the findings of the Rogers 1975 study. The study also found evidence of only low levels of hazardous constituents in isolated locations in the canal. Consequently, it appears likely that no significant amount of waste material generated from the cleanup of the canal would be classified as mixed waste.

SECTION 8

8. REFERENCES

Dames and Moore. 1976. "Evaluation of the Buried Valley Aquifer Adjacent to Mound Laboratory." Report prepared for Monsanto Research Corporation. Cincinnati, Ohio. December 1976.

DOE. 1986. "Phase I: Installation Assessment Mound [DRAFT]." Comprehensive Environmental Assessment and Response Program. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico. April 1986.

DOE. 1990. Focused Risk Assessment, Mound Plant Operable Unit 4, Miami-Erie Canal. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico. [Working Draft]. January 1990.

DOE. 1991a. "Standard Operating Procedures." Mound Plant Environmental Restoration Program, U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico, January 1991.

DOE. 1991b. "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Quality Assurance Project Plan (QAPP)." Draft, Rev. 3, U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico. October 1991.

DOE. 1992. "Remedial Investigation/Feasibility Study, Operable Unit 9, Site-Wide Health and Safety Work Plan, Draft Final." U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico. October 1992.

EG&G. 1992a. "Statement of Work for Special Canal Sampling in Miami-Erie Canal OU4." EG&G Mound Applied Technologies, Inc., March 10, 1992.

EG&G. 1992b. "Mound Site Environmental Report for Calendar Year 1991" EG&G Mound Applied Technologies Report Number MLM-3740. Prepared for the U.S. Department of Energy, Miamisburg, Ohio. June 1992.

EPA. 1987. "Data Quality Objectives for Remedial Response Activities." U.S. Environmental Protection Agency, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement. Report No. EPA-5401/G-87/003.

EPA. 1988. "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analysis." July 1, 1988.

EPA. 1991. "CLP National Functional Guideline for Organic Data Review." Multi-Media, Multi-Concentration, Draft, June, 1991.

FRC. 1959. "Radiation Protection and Guidance for Federal Agencies, Federal Radiation Council Memorandum for the President, Federal Register, 1960.

8. REFERENCES
(continued)

Halford. 1990. "Results of South Pond Sampling" (letter to Dwain Farley, Mound ER Program Technical Support Office), Los Alamos National Laboratory, Los Alamos, New Mexico. June 1990.

Kershner and Rhinehammer. 1978. "Mound Laboratory Tritium Environmental Study: 1976-1973", Monsanto Research Corporation Report Number MLM-2495, prepared for the U.S. Department of Energy, April 1978.

Logan and Miller. 1983. "Background Levels of Heavy Metals in Ohio Farm Soils." Research Circular 275, The Ohio State University, Ohio Agricultural Research and Development Center, Wooster, Ohio.

NCRP. 1987. "Exposure of the Population in the United States and Canada from Natural Background Radiation" National Council on Radiation Protection and Measurements, Report No. 94, Bethesda, MD, December, 1987.

Robinson, Rogers, Westendorf, and Black. 1974. "Mound Laboratory Plutonium -238 Study, Off-Site Analytical Data, May-December, 1974." Monsanto Research Corporation Report Number MLM-MU-74-72-0001, prepared for the U.S. Atomic Energy Commission, 1974.

Rogers. 1975. "Mound Laboratory Environmental Plutonium Study - 1974." Monsanto Research Corporation, Report Number MLM-2249, prepared for the U.S. Energy Research and Development Administration, Miamisburg, Ohio. September 1975.

SAIC. 1991. "Laboratory Data Validation Guidelines for Evaluating Radionuclide and Inorganic Analysis." Science Applications International Corporation, November 1991.

Shacklette and Boerngen. 1984. "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States." U.S. Geological Survey, 1984.

Styron and Meyer. 1981. "Potable Water Standards Project: Final Report" Monsanto Research Corporation, Report No. MLM-2819. Prepared for the U.S. Department of Energy, Miamisburg, Ohio, April, 1981.

UC. 1990. Gamma Spectroscopy Analysis of the Surface Soil for Background Radionuclide Content in the Vicinity of the EG&G Mound Plant. University of Cincinnati, Department of Mecahnical, Industrial and Nuclear Engineering. [FINAL REPORT]. May 1990.

APPENDIX A

APPENDIX A

Field Sample Description

Appendix A Field Sample Description
Page 1 of 10

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
E	012001	27-Jul-92	1057	1.0	1st core taken at 10:57 ~ 10 inches of recovery. 2nd core taken at 11:05 ~ 10-12 inches of recovery. Mound Screen 60 ±12 pCi/g Pu-238. Brown soil.
	012002	27-Jul-92	1111	2.0	1st core taken at 11:11 only 3 inch recovery. 2nd core taken at 11:20 ~ 8 inch recovery. 3rd core taken at 11:38 ~ 8 inch recovery. Mound screen 165 ± 33 pCi/g Pu-238. Brown soil.
	012003	27-Jul-92	1145	3.0	1st core taken at 11:45 ~ 8 inch recovery. 2nd core taken at 12:00 ~ 9 inch recovery. Mound screen <25 pCi/g Pu-238. Brown soil.
YL	022001	28-Jul-92	848	1.0	Radiation background for this site 300 and 5000 cpm. 1st spoon pulled at 0848 ~ 10 inches recovery. 2nd spoon pulled at 0902. Brown soil.
	022002	28-Jul-92	907	2.0	1st spoon pulled at 0907 ~ 6 inch recovery. 2nd spoon pulled at 0920 ~ 6 inch recovery. Brown soil.
	022003	28-Jul-92	926	3.0	1st spoon pulled at 0926 ~ 6 inches recovery. 2nd spoon pulled at 0940 ~ 6 inches recovery. Brown soil.
	022004	28-Jul-92	950	4.0	1st spoon pulled at 0950 ~ 10 inches recovery. 2nd spoon pulled at 1005 ~ 10 inches recovery. Brown soil.
	022005	28-Jul-92	1013	5.0	1st spoon pulled at 1013 ~ 12 inches recovery. 2nd spoon pulled at 1028 ~ 10 inches recovery. Brown soil.
YI	MC0032001	21-Jul-92	1605	1.0	Tried first split spoon (SS) only recovered about 6 inches with core catcher in. Will try without core catcher 1550. Took second SS without core catcher at 1605. Brown soil. Mound screen 317 ± 63 pCi/g Pu-238, 1.2 pCi/g Th-232.
	MC0032002	21-Jul-92	1625	2.0	First SS taken at 1625, good recovery. Second SS taken at 1645. Brown soil. Screening results 165 ± 33 pCi/g Pu-238, 1.0 pCi/g Th-232.
	MC0032003	21-Jul-92	1650	3.0	First SS taken at 1650. Brown soil. Screening results <25 pCi/g Pu-238, 1.2 pCi/g Th-232.
YF	MC0042001	22-Jul-92	935	1.0	First core taken at 0935 screened. 637 pCi/g Pu-238 and 1.3 pCi/g Yh-232. Second core taken at 1310. Three cores were needed for sufficient sample. First and third core good recoveries. Second core poor, hit a tree root. Brown soil.

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
YF (Cont'd)	MC0042002	22-Jul-92	1325	2.0	1st core for 1-2' depth at 1325. Good recovery on 1st core. Screen results <100 pCi/g Pu 238 (verbal). Screen 29 ± 6 pCi/g Pu 238. Brown soil.
	MC0042003	22-Jul-92	1400	3.0	Difficulties in recovering enough sample on holes 1 & 2 at the 2-3' level. Tried several times. Will use a bucket auger to drill to 2'. There were split spoon to recover the 2-3' sample. Drilling new encountering tree roots and stones at the 1' levels with the 3rd and 4th holes. Well use bucket auger, holes 1 and 2 to retrieve the 2-3' samples. They were successful in retrieving the sample. Mound Screen <100 pCi/g Pu 238 (verbal). Mound Screen 68 ± 14 pCi/g Pu 238. Dark brown soil.
	MC0042004	22-Jul-92	1505	4.0	Using split spoon to recover 3-4 samples from same hole that was used to collect 2-3' sample using bucket auger. Mound Screen <100 pCi/g Pu 238 (verbal). Mound Screen 39 ± 8 pCi/g Pu 238. Dark brown soil.
	MC0042005	22-Jul-92	1530	5.0	1st core had about 5" of recovery. Volatiles taken from this core at 1530. 2nd core taken at 1555 with about 10" of recovery. Mound Screen <100 pCi/g Pu 238 (verbal). Mound Screen <25 pCi/g Pu 238. Dark brown soil.
YYN1	052001	24-Jul-92	1000	1.0	10:00 retrieve 1st core (0-1')-10" of recovery ~ 10:10 2nd core retrieved 4-5 inches. The bucket auger was used to get a sample for Mound screening. Mound Screen <25 pCi/g Pu 238. Dark brown soil.
	052002	24-Jul-92	1025	2.0	1st core taken at 10:25 ~ 10" of recovery. Gravel layer near top of 2nd SS. 2nd core taken at 10:40 ~ 7" of recovery. Mound Screen <25 pCi/g Pu 238. Dark brown soil.
	052003	24-Jul-92	1045	3.0	1st SS taken at 10:45 ~ 12 inches recovery. 2nd SS taken at 10:55 ~ 8 inches recovery. Mound Screening <25 pCi/g Pu 238. Dark brown soil.
YYN2	062001	24-Jul-92	1120	1.0	1st core taken at 11:20 ~ 10 inches of recovery. 2nd core taken at 11:25 ~ 10 inches recovery. Mound Screen <25 pCi/g Pu 238. Dark brown soil.
	062002	24-Jul-92	1130	2.0	1st core at 11:30 ~ 10 inches recovery. 2nd core at 11:45 ~ 5 inches recovery. Some small shells in this sample. Mound Screen <25 pCi/g Pu 238. Dark brown soil.
	062003	24-Jul-92	1150	3.0	1st core taken at 11:50 ~ 10 inches of recovery. 2nd core taken at 12:00 ~ 5 inches at recovery. Mound Screen <25 pCi/g Pu 238. Dark brown soil.

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
YYN3	072001	04-Aug-92	1315	1.0	1st core taken 1315 hrs. by tripod/falling weight. Recovered 10" for VOA. 2nd core taken 1325 hrs. Recovered 12". Homogenized 1st and 2nd core for S.V., pcb/pest, rads. Samples taken by tripod/falling weight using a split spoon. Dark brown soil.
	072002	04-Aug-92	1330	2.0	1st core taken @ 1330. Recovered 10" for VOA. 2nd core taken @ 1345. Recovered 6". Homogenized cores 1 and 2 for S.V., pcb/pest. No problems. Samples taken by tripod/falling weight using split spoon. Mound Screen 072002 48 ± 10 pCi/g Pu 238. Dark brown soil.
	072003	04-Aug-92	1350	3.0	1st core taken @ 1350 hrs. for VOA. Recovered 4". 2nd core taken @ 1410. Recovered 7". Homogenized 1st and 2nd core for S.U. pest/pcb. No problems. Samples taken by tripod/falling weight, driving a split spoon into ground.
	072004	04-Aug-92	1415	4.0	1st core taken @ 1415 for VOA. 2nd core taken @ 1425. Homogenized 1st & 2nd core for S.V. pcb/pest. No problems. Samples taken with tripod/falling weight, during a split spoon sampler into the ground.
	072005	04-Aug-92	1435	5.0	1st core taken @ 1435 for VOA. Recovered 6 ". 2nd core taken @ 1450. Homogenized 1st & 2nd core for S.V., pcb/pest. No problems. Samples taken by tripod/falling weight, during split spoon sampler into ground.
YYN4	082001	04-Aug-92	905	1.0	1st borehole driven by tripod/falling weight. Taken @ 0905. Recovered 12". Sandy cinder type soil/backfield over by clay @ top & bottom. 2nd borehole driven same as 1st. Recovered 12 ". Taken @ 9010.
	082002	04-Aug-92	920	2.0	1st borehole driven by falling weight/tripod. Taken @ 0920. Recovered 10". 2nd borehole same as 1st. Homogenized 1st & 2nd core for S.V. metals, pcb/pest taken @ 0935. Recovered 8". Brown soil. Mound Screen 082002 26 ± pCi/g Pu 238.
	082003	04-Aug-92	945	3.0	1st core taken by tripod/falling weight @ 0945. Recovered 8" for VOA. 2nd core taken @ 0955. Homogenized 1st & 2nd core for S.V. pcb/pest, metals. Recovered 8". Brown soil. Mound Screen 082003 54 ± 11 pCi/g Pu 238.
YYN5	092001	24-Jul-92	755	1.0	1st core taken @ 7:55 ~ 12" recovery. 2nd core taken @ 8:05 ~ 10" recovery about 2" of blacktop in core. Mound Screen <25 pCi/g Pu 238. Brown soil.

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
YYN5 (Cont'd)	092002	24-Jul-92	800	2.0	1st core at 8:00. Poor recovery ~ 6". 2nd core at 8:10. Poor recovery ~ 6". 3rd core needed for sufficient sample. 3rd core at 8:30. Poor recovery ~ 6". Mound Screen < 25 pCi/g Pu 238. Brown soil.
	092003	24-Sep-92	835	3.0	1st core taken @ 8:35, only 2-3" recovered. Saved the 2-3" for homogenizing with other cores & did not take volatile samples from this core. 2nd core taken @ 8:45, no recovery. 3rd core taken @ 9:00 ~ 10" of recovery.
YYN6	102001	23-Jul-92	1550	1.0	1st core was taken @ 15:50, good recovery ~ 10-12". 2nd core taken @ 1605 ~ 9" recovery. Mound Screen <25 pCi/g Pu 238. Brown soil.
	102002	23-Jul-92	1615	2.0	1st core taken @ 1615 ~ 12" of recovery. 2nd core taken @ 1630 ~ 8" of recovery. Mound Screen <25 pCi/g Pu 238. Brown soil.
	102003	23-Jul-92	1640	3.0	1st core taken @ 1640, good recovery. 2nd core taken @ 1655, good recovery. Started raining hard when the 2nd core was being taken. Mound Screen <25 pCi/g Pu 238. Brown soil.
YQ1	112001	27-Jul-92	1420	1.0	1420 first split spoon taken (0-1') ~ 6" of recovery. 2nd core taken @ 1435. Brown soil. Bobby Taylor getting a replacement water tank. Mound Screen <25 pCi/g Pu 238.
	112002	27-Jul-92	1440	2.0	1st core taken at 1440 ~ 8" of recovery. 2nd core taken @ 1448 ~ 8" of recovery. Mound Screen <25 pCi/g Pu 238. Brown soil.
	112003	27-Jul-92	1455	3.0	1st core taken at 1445 ~ 9" of recovery. 2nd core taken at 1505 ~ 9" of recovery. Mound Screen <25 pCi/g Pu 238. Brown soil.
YQ2	122001	27-Jul-92	1715	1.0	1st core taken at 1715 ~ 6" of recovery. 2nd core taken at 1725 ~ 6" of recovery. Mound Screen 39 ± 8 pCi/g Pu 238. Brown soil.
	122002	27-Jul-92	1730	2.0	1st core taken at 1730 ~ 8-9" recovery. 2nd core taken at 1740 ~ 8-9" of recovery. Mound Screen <25 pCi/g Pu 238. Brown soil.
	122003	27-Jul-92	1750	3.0	1st core taken at 1750 ~ 8-9" recovery. A lot of rocks (50-75%). 2nd core taken at 1800 ~ 5-6" recovery. Mound Screen <25 pCi/g Pu 238. Brown soil/soil and rocks.

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
YQ3	132001	30-Jul-92	1035	1.0	Sample taken from surface was below less than results of all our other samples 142 ± 28 pCi/g Pu 238. 1st core taken @ 10:35 ~ 6-7" of recovery. Mucky dark grey - weight of hammer pushed to 1 ft. 2nd core taken at 10:50 ~ 2-3" of recovery. No hammering needed. 3rd core taken @ 10:55 ~ 8-9" of recovery. Mound Screen 236 ± 47 pCi/g Pu 238. Dark grey sediment.
	132002	30-Jul-92	1057	2.0	1st core taken @ 1057 ~ 8" recovery. 2nd core taken @ 1120 ~ 8" of recovery. 1st core mucky dayey dark grey sediment. 3rd split spoon @ 1128 ~ 5" of recovery. Mound Screen 805 ± 161 pCi/g Pu 238.
	132003	30-Jul-92	1140	3.0	1st core taken @ 11:40 ~ 10" of recovery. Top portion of sample fell out onto logbook. 2nd core taken @ 12:00 ~ 10" of recovery. Holes started collapsing. Mound Screen 80 ± 16 pCi/g Pu 238. Dark grey sediment.
	132004	30-Jul-92	1205	4.0	1st core taken @ 1205 ~ 20" of recovery. 2nd core taken @ 12:40 ~ 20" of recovery. Holes caving in at the upper 0-2'. It was decided that we should minimize the number of times in the hole. Split spoon 3-5', 2 samples at one time.
	132005	30-Jul-92	1205	5.0	1st core taken @ 1205 ~ 20" of recovery. 2nd core taken @ 1240 ~ 0" of recovery. To minimize the number of times on the hole due to the hole caving in the upper 0-2'. Split spoon 3-5' samples taken @ same time.
YQ4	142001	30-Jul-92	1440	1.0	Sample taken @ surface and screened before start of sampling. 64 ± 13 pCi/g Pu 238. 1st core yielded poor recovery. Decided to continue with 2' coring. 2nd attempt also very poor recovery. 1st foot will be collected using the auger.
	142002	30-Jul-92	1540	2.0	Sample was collected and separated from 1-3' core. 1st core taken @ 1510 ~ 20" of recovery. 2nd core taken @ 1528 ~ 10" of recovery. Mound Screen 63 ± 13 pCi/g Pu 238. Dark grey sediment.
	142003	30-Jul-92	1540	3.0	Sample was collected & separated from 1-3' core. 1st core @ 1510 ~ 20" of recovery. 2nd attempt failed to recover enough for 2-3' sample, therefore an auger will be used to remove 0-1' & a split spoon will be driven to 3' to obtain sample.
YQ5	152001	29-Jul-92	1545	1.0	1st core taken @ 1545 ~ 8-9" recovery. 2nd core taken @ 1555 ~ 5-6" recovery. Mound Screen <25 pCi/g Pu 238.

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
YQ5 (Cont'd)	152002	29-Jul-92	1600	2.0	1st core taken @ 1600 ~ 10" of recovery. 2nd core taken @ 1615 ~ 10" of recovery, Looks like a layer of asphalt was hit towards the bottom of the core. Mound Screen <25 pCi/g Pu 238.
	152003	29-Jul-92	1620	3.0	1st core taken @ 1620 ~ 6-7" recovery, ~ 4-5" of cinder-like material at top. 2nd core taken @ 1630 ~ 6" recovery. Mound Screen 25 ± 5 pCi/g Pu 238.
YQ6	162001	30-Jul-92	840	1.0	1st core taken @ 8:40 ~ 8-9" recovery. 2nd core taken @ 8:50 ~ 4-5" recovery. 1st, sandy gravely last, 1-2" upper layer rocky. Mound Screen <25 pCi/g Pu 238.
	162002	30-Jul-92	900	2.0	1st core taken @ 9:00 ~ 8-9" recovery. A lot of sand and gravel. 2nd core @ 9:10 ~ 3-4" recovery. A lot of sand and gravel. 3rd split spoon 925 ~ 5-6" recovery. Tripod fell over. No one was hurt during 3rd split spoon.
	162003	30-Jul-92	935	3.0	1st core taken @ 9:35 ~ 10" recovery. A lot of sand & gravel. 2nd core taken @ 9:50 ~ 8-9" recovery. Mostly sand & gravel. Mound Screen 525 pCi/g Pu 238.
YYS1	172001	28-Jul-92	1144	1.0	Background 100 and 5000. 1st spoon pulled @ 1144 ~ 7 " recovery. 2nd spoon pulled @ 1151 ~ 7" recovery. Mound Screen 38 ± 8 pCi/g Pu 238.
	172002	28-Jul-92	1157	2.0	1st spoon pulled 1157 ~ 6" recovery. 2nd spoon pulled @ 1208 ~ 4" recovery. 3rd spoon pulled @ 1216 ~ 3" recovery. Mound Screen <25 pCi/g Pu 238.
	172003	28-Jul-92	1225	3.0	1st spoon pulled @ 1225 ~ 9" recovery. 2nd spoon pulled @ 1235 ~ 7" recovery. Mound Screen <25 pCi/g Pu 238.
YYS2	182001	28-Jul-92	1310	1.0	1st spoon pulled @ 1310 with 6" recovery. Background is 100 and 5000. 2nd spoon pulled @ 1320 with 9" recovery. Mound Screen 25 MDA pCi/g Pu 238.
	182002	28-Jul-92	1325	2.0	1st spoon pulled @ 1325 with 5" recovery. 2nd spoon pulled @ 1336 with 3 inches recovery. Mound Screen <25 pCi/g Pu 238.
	182003	28-Jul-92	1341	3.0	1st spoon pulled @ 1341 with 10" recovery. 2nd spoon pulled @ 1351 with 6" recovery. Mound Screen <25 pCi/g Pu 238.
YYS3	192001	05-Aug-92	750	1.0	1st core taken @ 0750 using split spoon & hammer. Recovered 6" from sediment in stream. 2nd core @ 0750. Recovered 3". 3rd core @ 0810. Nothing recovered. With change to using the hand auger to recover more samples from the 0-1' area.

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
YYS3 (Cont'd)	192002	05-Aug-92	815	2.0	1st core taken @ 0815 for VOA's. Recovered 6". 2nd core taken @ 0830. Recovered 6". Used hand auger to collect additional samples. Homogenized cores for semi vol., metals analysis.
	192003	05-Aug-92	835	3.0	1st core taken 0835 for VOA's. Recovered 10". 2nd core taken @ 0855. Recovered 12". Homogenized cores for semi vol. metal analysis.
YYS4	202001	05-Aug-92	945	1.0	1st core taken @ 0945 for VOA's. Recovered 8". 2nd core taken @ 1000. Recovered 6". Homogenized cores to sample for semi vol., metals, rads. Sampled by split spoon driven by falling wt. corresponding ambient blank AAA005.
	202002	05-Aug-92	1005	2.0	1st core taken @ 1005 for VOA's. Recovered 8". 2nd core taken @ 1015. Recovered 6". Homogenized cores for semi vol., metal, rad analyses. Samples taken by split spoon driven by falling weight.
	202003	05-Aug-92	1020	3.0	1st core taken @ 1020 for VOA's. Recovered 8". 2nd core taken @ 1040. Recovered 6". Homogenized cores for semi vol., metals analysis. Samples collected by split spoon driven by falling weight.
	202004	05-Aug-92	1045	4.0	1st core taken @ 1045 for VOA's. Recovered 10". 2nd core @ 1100. Recovered 10". Recovered 10". Homogenized cores for semi vol., metals, cy, rad samples, small layer of gravel @ 4' (~2") samples collected by split spoon driven by falling weight.
	202005	05-Aug-92	1105	5.0	1st core taken @ 1105 for VOA's. Recovered 10". 2nd core taken @ 1125. Recovered 12". Cores homogenized for semi vol., cy, rad samples. Samples collected by split spoon driven by falling weight.
YYS5	212001	29-Jul-92	850	1.0	1st core taken @ 8:50 ~ 8" of recovery. 2nd core taken @ 9:00 ~ 5" of recovery. No stones. Mound Screen 51 ± 10 pCi/g Pu 238.
	212002	29-Jul-92	905	2.0	1st core taken @ 9:05 ~ 7" recovery. 2nd core taken @ 9:15 ~ 8" recovery. Mound Screen 276 pCi/g Pu 238.
	212003	29-Jul-92	920	3.0	1st core taken @ 9:20 ~ 8" recovery. 2nd core taken @ 9:35 ~ 9" recovery. Mound Screen 192 ± 38 pCi/g Pu 238.
YYS6	222001	29-Jul-92	955	1.0	1st core taken @ 9:55 ~ 8" of recovery. 2nd core taken @ 10:05 ~ 4-5" of recovery. Mound Screen 27 ± 5 pCi/g Pu 238.

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
YYS6 (Cont'd)	222002	29-Jul-92	1010	2.0	1st core taken @ 1010 ~ 10-11" of recovery. 2nd core taken @ 1025 ~ 5-6" of recovery. Mound Screen <25 pCi/g Pu 238.
	222003	29-Jul-92	1030	3.0	1st core taken @ 1030 ~ 8-9" of recovery. 2nd core taken @ 1045 ~ 8" of recovery. Mound Screen <25 pCi/g Pu 238.
YS	292001	07-Aug-92	0	1.0	Location YS old sample #232001. Resample at the 0-1 foot core. Previously sampled a 0-2 foot core.. Sample taken by hand driving a 4" placed S.S. well casing (3' long) in the sediment to a depth of 2'.
	302002	07-Aug-92	0	2.0	Location YS old sample #232001. Resample at the 1-2 foot core. Previously sampled a 0-2 foot core. Sample taken by hand driving a 4" placed S.S. well casing (3' long) in the sediment to a depth of 2'.
	232002	03-Aug-92	1450	3.0	Sample taken by pushing split spoon in by hand. Recovered 12-15". Sample taken @ 1450 hrs. 2nd core then 2-3' taken @ 1500. Mound Screen 168 ± 34 pCi/g Pu 238.
W	242001	31-Jul-92	825	1.0	1st core by bucket auger taken @ 8:25. The bucket auger was augered down to 1' depth then a shovel was used to dig out soil around the auger about 6" (otherwise when auger is pulled out the sand & gravel would cave in).
	242002	31-Mar-92	835	2.0	1st core taken @ 8:35 driven 2' core from 1-3 ft. ~ 18" of recovery. Split spoon driven by sledge hammer due to soft soils & and the tripod legs sinking into soil. 2nd core taken @ 9:05 ~ 18" of recovery. Mound Screen 26±5 pCi/g Pu 238.
	242003	31-Jul-92	835	3.0	1st core taken @ 8:35 driven 2' core from 1-3' ~ 18" recovery . Split spoon driven by sledge hammer due to soft soils & the tripod legs sinking into soil. 2nd core @ 9:05 ~ 18" of recovery. 3rd core needed for 2-3' interval only.
XXX	MC0252001	23-Jul-92	854	1.0	1st core taken at 8:54. About 6" recovered - mostly sand. 2nd core taken at 9:05. About 8" recovered. Few small stones and the rest sandy. Need a 3rd core for sufficient sample for screening flow in the canal is from south to north in this area. Several fallen trees and log jams are north of xxx. Mound Screening <25 pCi/g Pu 238 and 0.5 pCi/g Th 232.
	MC0252002	23-Jul-92	915	2.0	Took the first sample core at 9:15 top 3" sandy 6" of silty clay. Second core taken at 9:35 about 10" of recovery. Mound Screening <25 pCi/g Pu 238; 0.8 pCi/g Th 232.

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
XXX (Cont'd)	MC0252003	23-Jul-92	945	3.0	1st core taken at 9:45. Recovery at about 10". 2nd core taken at 10:10 ~ 8" of recovery. Mound Screening <25 pCi/g Pu 238; 0.7 pCi/g Th 232.
DL1	262001	05-Aug-92	1405	1.0	1st core taken @ 1405 for VOA's recovered 12". 1st core taken on bank, not in water. 2nd core taken @ 1410, recovered 4". Cores homogenized & sampled for S.V., metals, pcbs/pest. Samples collected by split spoon driven by sledge hammer.
DL2	272001	05-Aug-92	0	1.0	1st core taken @ 1445 for VOA's. Recovered 10". 1st core taken 3' south of drainage grate. 2nd core taken @ 1455. Recovered 10". Cores homogenized from S.V., metals, cy & pcb/pest/rad samples.
DL3	282001	05-Aug-92	1535	1.0	Trouble finding suitable spot free of grooves in stream bed to collect sample. 1st core taken @ 1535 for VOA's, recovered 8". 2nd sample taken @ 1540, recovered.10". Cores homogenized for S.V., metals, pcb/pest, cy & rad samples.
YI	312101	16-Sep-92	1205	1.0	Started coring @ 12:00 @ Area YI for collocated sample about 1' south of original sample location. About 8" of recovery, a few stones at the top. 2nd core taken at 1220 about 8" of recovery. Collocated sample for MC0032001.
YF	322101	16-Sep-92	1300	1.0	Started coring @ 1258, pulled first core @ 1300 ~ 10" of recovery. 2nd core taken @ 1310 ~ 8" of recovery. Collocated sample MC0042001.
YYN3	332101	16-Sep-92	1346	1.0	Started coring @ 1345. Pulled the first core @ 1346 ~ 10" of recovery. 2nd core taken @ 1355 ~ 10" of recovery. Collocated sample for MC0072001.
YYN4	342101	16-Sep-92	1410	1.0	1st core taken @ 1410 ~ 10-12" recovery. 2nd core taken @ 1420 ~ 10-12" recovery. A lot of cinder type material ~ 8" each. Collocated sample for MC0082001.
YQ3	352101	16-Sep-92	1455	1.0	1st core taken @ 1455 ~ 6-8" recovery. 2nd core taken @ 1505 ~ 6-8" recovery. Collocated sample for 132001.
YQ5	362101	16-Sep-92	1525	1.0	1st core taken @ 1525 ~ 10-12" of recovery. 2nd core taken @ 1535 ~ 10-12" of recovery. Collocated sample for MCO152001.
YYS4	372101	16-Sep-92	1605	1.0	1st core taken @ 1605 ~ 8-10" recovery. Collocated sample for MCO202001. 2nd core taken @ 1620 ~ 8-10" recovery.

Station	Sample ID	Date Collected	Time Collected	Sample Depth (ft)	Field Observation
YYS5	382101	16-Sep-92	1635	1.0	1st core taken @ 1635 ~ 8-10" recovery. 2nd core taken @ 1643 ~ 8-10" recovery. Collocated sample for MCO212001.
YYS6	392101	16-Sep-92	1655	1.0	1st core taken at 1655 ~ 10-12" recovery. 2nd core taken at 1700 ~ 10-12" recovery. Collocated sample for MC0222001.

APPENDIX B

APPENDIX B

Data Results Tables

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
CANAL DISCRETION POINT 2	272001	599642.8093	1465978.8072	694.80

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	6810.00	MG/KG	
	Arsenic	6.50	MG/KG	J
	Barium	60.40	MG/KG	
	Calcium	87100.00	MG/KG	
	Chromium	14.40	MG/KG	
	Cobalt	4.80	MG/KG	
	Copper	37.30	MG/KG	
	Iron	10600.00	MG/KG	
	Lead	81.80	MG/KG	
	Magnesium	28100.00	MG/KG	
	Manganese	256.00	MG/KG	J
	Mercury	0.31	MG/KG	J
	Nickel	10.60	MG/KG	
	Potassium	1050.00	MG/KG	
	Sodium	127.00	MG/KG	
	Thallium	0.16	MG/KG	J
	Vanadium	15.70	MG/KG	
	Zinc	79.80	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	1900	UG/KG	J
	Acenaphthene	3700	UG/KG	J
	Acenaphthylene	4300	UG/KG	J
	Anthracene	9300	UG/KG	
	Benzo(a)anthracene	25000	UG/KG	
	Benzo(a)pyrene	22000	UG/KG	
	Benzo(b)fluoranthene	25000	UG/KG	
	Benzo(k)fluoranthene	19000	UG/KG	
	Carbazole	2100	UG/KG	J
	Chrysene	24000	UG/KG	
	Dibenz(a,h)anthracene	4800	UG/KG	J
	Dibenzofuran	3900	UG/KG	J
	Fluoranthene	53000	UG/KG	
	Fluorene	7800	UG/KG	J
	Naphthalene	4000	UG/KG	J
	Phenanthrene	43000	UG/KG	
	Pyrene	55000	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	19000. **	UG/KG	D
Radiological				
	Ac-227	<1.4	PCI/G	U
	Am-241	<0.79	PCI/G	U
	Bi-207	<1.1	PCI/G	U
	Bi-210	<0.61	PCI/G	U
	Co-60	<0.28	PCI/G	U
	Cs-137	<0.26	PCI/G	U
	H-3	2.1	PCI/G	J
	K-40	11	PCI/G	J
	Pu-238	20	PCI/G	J
	Pu-239/240	<0.15	PCI/G	U
	Ra-226	<2.3	PCI/G	U
	Sr-90	<0.52	PCI/G	R
	Th-228	1.5	PCI/G	J
	Th-230	3.3	PCI/G	J
	Th-232	0.90	PCI/G	J
	U-234	1.6	PCI/G	J
	U-235	<0.13	PCI/G	U
	U-238	0.86	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
E CANAL POINT	012001	599456.3586	1465761.8306	695.30

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	5200.00	MG/KG	
	Arsenic	9.00	MG/KG	
	Barium	47.70	MG/KG	
	Calcium	94200.00	MG/KG	J
	Chromium	19.20	MG/KG	
	Cobalt	4.50	MG/KG	
	Copper	26.70	MG/KG	
	Iron	10200.00	MG/KG	
	Lead	45.70	MG/KG	
	Magnesium	32000.00	MG/KG	J
	Manganese	324.00	MG/KG	
	Mercury	0.15	MG/KG	
	Nickel	10.10	MG/KG	
	Potassium	943.00	MG/KG	
	Sodium	129.00	MG/KG	
	Vanadium	12.60	MG/KG	
	Zinc	74.60	MG/KG	J
Semivolatile				
	Acenaphthene	56	UG/KG	J
	Acenaphthylene	160	UG/KG	J
	Anthracene	230	UG/KG	J
	Benzo(a)anthracene	850	UG/KG	
	Benzo(a)pyrene	830	UG/KG	
	Benzo(b)fluoranthene	1000	UG/KG	
	Benzo(g,h,i)perylene	630	UG/KG	
	Benzo(k)fluoranthene	770	UG/KG	
	Chrysene	890	UG/KG	
	Dibenz(a,h)anthracene	280	UG/KG	J
	Fluoranthene	1700	UG/KG	
	Fluorene	89	UG/KG	J
	Indeno(1,2,3-cd)pyrene	680	UG/KG	
	Phenanthrene	850	UG/KG	
	Pyrene	1300	UG/KG	
Pesticide/PCBs				
	Aroclor-1248	2400.	UG/KG	
	Endosulfan sulfate	4.4	UG/KG	P
	Endrin	44.	UG/KG	XP
	Methoxychlor	18.	UG/KG	JP
	beta-BHC	21.	UG/KG	XP
Radiological				
	Ac-227	<1.3	PCI/G	U
	Am-241	<0.64	PCI/G	U
	Bi-207	<0.49	PCI/G	U
	Bi-210	<0.34	PCI/G	U
	Co-60	<0.20	PCI/G	U
	Cs-137	<0.40	PCI/G	U
	H-3	9.0	PCI/G	J
	K-40	7.2	PCI/G	J
	Pu-238	61	PCI/G	J
	Pu-239/240	0.98	PCI/G	J
	Ra-226	<3.1	PCI/G	U
	Sr-90	<0.85	PCI/G	R
	Th-228	3.7	PCI/G	J
	Th-230	1.9	PCI/G	J
	Th-232	0.50	PCI/G	J
	U-234	<0.11	PCI/G	U
	U-235	<0.083	PCI/G	U
	U-238	0.52	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
E CANAL POINT	012002	599456.3586	1465761.8306	695.30

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	5890.00	MG/KG	
	Arsenic	2.30	MG/KG	
	Barium	52.60	MG/KG	
	Calcium	104000.00	MG/KG	J
	Chromium	53.30	MG/KG	
	Cobalt	5.90	MG/KG	
	Copper	32.80	MG/KG	
	Iron	10700.00	MG/KG	
	Lead	32.10	MG/KG	
	Magnesium	29000.00	MG/KG	J
	Manganese	302.00	MG/KG	
	Nickel	10.50	MG/KG	
	Potassium	1030.00	MG/KG	
	Sodium	140.00	MG/KG	
	Vanadium	12.60	MG/KG	
	Zinc	85.30	MG/KG	J
Semivolatile				
	Acenaphthylene	58	UG/KG	J
	Acetone	4	UG/KG	J
	Anthracene	140	UG/KG	J
	Benzo(a)anthracene	420	UG/KG	
	Benzo(a)pyrene	440	UG/KG	
	Benzo(b)fluoranthene	500	UG/KG	
	Benzo(g,h,i)perylene	360	UG/KG	J
	Benzo(k)fluoranthene	430	UG/KG	
	Chrysene	540	UG/KG	
	Dibenz(a,h)anthracene	130	UG/KG	J
	Fluoranthene	1300	UG/KG	
	Fluorene	46	UG/KG	J
	Indeno(1,2,3-cd)pyrene	420	UG/KG	
	Phenanthrene	560	UG/KG	
	Pyrene	810	UG/KG	
	bis(2-Ethylhexyl)phthalate	120	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	520.	UG/KG	JP
	Endrin	12.	UG/KG	XPJ
	beta-BHC	4.3	UG/KG	XPJ
Radiological				
	Ac-227	<1.1	PCI/G	U
	Am-241	<0.76	PCI/G	U
	Bi-207	<0.89	PCI/G	U
	Bi-210	<0.28	PCI/G	U
	Co-60	<0.22	PCI/G	U
	Cs-137	<0.23	PCI/G	U
	H-3	39	PCI/G	J
	K-40	7.5	PCI/G	J
	Pu-238	170	PCI/G	J
	Pu-239/240	1.8	PCI/G	J
	Ra-226	<2.6	PCI/G	U
	Sr-90	<0.67	PCI/G	R
	Th-228	0.62	PCI/G	J
	Th-230	1.4	PCI/G	J
	Th-232	0.23	PCI/G	J
	U-234	<0.41	PCI/G	U
	U-235	<0.31	PCI/G	U
	U-238	0.52	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
E CANAL POINT	012003	599456.3586	1465761.8306	695.30

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	4920.00	MG/KG	
	Antimony	13.70	MG/KG	J
	Arsenic	4.60	MG/KG	
	Barium	32.90	MG/KG	
	Calcium	88600.00	MG/KG	J
	Chromium	10.50	MG/KG	
	Cobalt	6.20	MG/KG	
	Copper	16.20	MG/KG	
	Iron	10200.00	MG/KG	
	Lead	19.70	MG/KG	
	Magnesium	31800.00	MG/KG	J
	Manganese	304.00	MG/KG	
	Nickel	11.70	MG/KG	
	Potassium	833.00	MG/KG	
	Sodium	127.00	MG/KG	
	Vanadium	11.70	MG/KG	
	Zinc	42.40	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	120	UG/KG	J
	Benzo(a)pyrene	140	UG/KG	J
	Benzo(b)fluoranthene	130	UG/KG	J
	Benzo(k)fluoranthene	180	UG/KG	J
	Chrysene	140	UG/KG	J
	Fluoranthene	340	UG/KG	J
	Phenanthrene	150	UG/KG	J
	Pyrene	230	UG/KG	J
	bis(2-Ethylhexyl)phthalate	180	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	290.	UG/KG	
	Dieldrin	4.3	UG/KG	XP
	Endrin	5.1	UG/KG	XP
Radiological				
	Ac-227	<1.4	PCI/G	U
	Am-241	<0.62	PCI/G	U
	Bi-207	<0.58	PCI/G	U
	Bi-210	<0.29	PCI/G	U
	Co-60	<0.19	PCI/G	U
	Cs-137	<0.34	PCI/G	U
	H-3	9.2	PCI/G	J
	K-40	10	PCI/G	J
	Pu-238	7.4	PCI/G	J
	Pu-239/240	0.11	PCI/G	J
	Ra-226	<1.8	PCI/G	U
	Sr-90	<1.1	PCI/G	R
	Th-228	0.93	PCI/G	J
	Th-230	0.87	PCI/G	J
	Th-232	0.41	PCI/G	J
	U-234	<0.10	PCI/G	U
	U-235	<0.076	PCI/G	U
	U-238	0.55	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YL CANAL POINT	022001	599136.8714	1465402.9749	694.00

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	20500.00	MG/KG	
	Arsenic	4.60	MG/KG	J
	Barium	97.70	MG/KG	
	Calcium	53700.00	MG/KG	
	Chromium	31.10	MG/KG	
	Cobalt	14.30	MG/KG	
	Copper	24.90	MG/KG	
	Iron	30100.00	MG/KG	
	Lead	42.80	MG/KG	J
	Magnesium	13200.00	MG/KG	
	Manganese	488.00	MG/KG	
	Mercury	0.57	MG/KG	J
	Nickel	26.70	MG/KG	
	Potassium	4000.00	MG/KG	
	Sodium	130.00	MG/KG	
	Thallium	0.28	MG/KG	J
	Vanadium	33.10	MG/KG	
	Zinc	93.80	MG/KG	
Semivolatile				
	Acenaphthylene	150	UG/KG	J
	Anthracene	130	UG/KG	J
	Benzo(a)anthracene	650	UG/KG	
	Benzo(a)pyrene	670	UG/KG	
	Benzo(b)fluoranthene	1300	UG/KG	
	Benzo(g,h,i)perylene	700	UG/KG	
	Carbazole	94	UG/KG	J
	Chrysene	620	UG/KG	
	Di-n-butylphthalate	50	UG/KG	J
	Dibenz(a,h)anthracene	210	UG/KG	J
	Fluoranthene	1400	UG/KG	
	Fluorene	32	UG/KG	J
	Indeno(1,2,3-cd)pyrene	590	UG/KG	
	Phenanthrene	500	UG/KG	
	Pyrene	1200	UG/KG	
Pesticide/PCBs				
	Aldrin	1.1	UG/KG	JXP
	Aroclor-1248	210.	UG/KG	
	Dieldrin	9.8	UG/KG	JXP
	Endrin	20.	UG/KG	XYPB
	beta-BHC	10.	UG/KG	JXP
	gamma-Chlordane	5.8	UG/KG	JXP
Radiological				
	Ac-227	<3.3	PCI/G	U
	Am-241	<1.7	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.49	PCI/G	U
	Co-60	<0.58	PCI/G	U
	Cs-137	<0.44	PCI/G	U
	H-3	180	PCI/G	J
	K-40	17	PCI/G	J
	Pu-238	390	PCI/G	J
	Pu-239/240	4.2	PCI/G	J
	Ra-226	<4.7	PCI/G	U
	Sr-90	<0.73	PCI/G	R
	Th-228	4.8	PCI/G	J
	Th-230	2.0	PCI/G	J
	Th-232	0.96	PCI/G	J
	U-234	1.4	PCI/G	J
	U-235	0.34	PCI/G	J
	U-238	1.2	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YL CANAL POINT	022002	599136.8714	1465402.9749	694.00

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	15500.00	MG/KG	
	Arsenic	5.50	MG/KG	J
	Barium	94.50	MG/KG	
	Calcium	29900.00	MG/KG	
	Chromium	21.90	MG/KG	
	Cobalt	11.40	MG/KG	
	Copper	31.10	MG/KG	
	Iron	24100.00	MG/KG	
	Lead	74.30	MG/KG	J
	Magnesium	12900.00	MG/KG	
	Manganese	387.00	MG/KG	
	Potassium	2140.00	MG/KG	
	Sodium	86.50	MG/KG	
	Thallium	0.31	MG/KG	J
	Vanadium	31.80	MG/KG	
	Zinc	83.30	MG/KG	
Semivolatile				
	Benzo(a)anthracene	67	UG/KG	J
	Benzo(a)pyrene	66	UG/KG	J
	Benzo(b)fluoranthene	270	UG/KG	J
	Benzo(g,h,i)perylene	120	UG/KG	J
	Benzo(k)fluoranthene	220	UG/KG	J
	Chrysene	86	UG/KG	J
	Fluoranthene	150	UG/KG	J
	Indeno(1,2,3-cd)pyrene	84	UG/KG	J
	Phenanthrene	67	UG/KG	J
	Pyrene	130	UG/KG	J
Pesticide/PCBs				
	Dieldrin	2.9	UG/KG	JP
	Endrin	1.6	UG/KG	YB
Radiological				
	Ac-227	<2.3	PCI/G	U
	Am-241	<0.83	PCI/G	U
	Bi-207	<0.83	PCI/G	U
	Bi-210	<0.43	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.29	PCI/G	U
	H-3	37	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	5.0	PCI/G	J
	Pu-239/240	0.056	PCI/G	J
	Ra-226	<4.4	PCI/G	U
	Sr-90	<0.54	PCI/G	R
	Th-228	1.3	PCI/G	J
	Th-230	1.7	PCI/G	J
	Th-232	1.0	PCI/G	J
	U-234	0.68	PCI/G	R
	U-235	<0.059	PCI/G	U
	U-238	0.86	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YL CANAL POINT	022003	599136.8714	1465402.9749	694.00

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	13300.00	MG/KG	
	Antimony	13.00	MG/KG	J
	Arsenic	6.50	MG/KG	J
	Barium	85.10	MG/KG	
	Calcium	30900.00	MG/KG	
	Chromium	18.60	MG/KG	
	Cobalt	10.80	MG/KG	
	Copper	35.30	MG/KG	
	Iron	21400.00	MG/KG	
	Lead	31.90	MG/KG	J
	Magnesium	13700.00	MG/KG	
	Manganese	381.00	MG/KG	
	Potassium	2030.00	MG/KG	
	Sodium	94.10	MG/KG	
	Thallium	0.23	MG/KG	
	Vanadium	27.60	MG/KG	
	Zinc	82.40	MG/KG	
Semivolatile				
	Benzo(a)anthracene	50	UG/KG	J
	Benzo(a)pyrene	59	UG/KG	J
	Benzo(b)fluoranthene	110	UG/KG	J
	Benzo(k)fluoranthene	63	UG/KG	J
	Chrysene	64	UG/KG	J
	Di-n-butylphthalate	39	UG/KG	J
	Fluoranthene	100	UG/KG	J
	Phenanthrene	43	UG/KG	J
	Pyrene	90	UG/KG	J
Pesticide/PCBs				
	4,4'-DDD	2.5	UG/KG	J
	4,4'-DDT	6.5	UG/KG	P
	Dieldrin	0.87	UG/KG	JP
	Endosulfan II	1.1	UG/KG	PB
Radiological				
	Ac-227	<2.6	PCI/G	U
	Am-241	<0.87	PCI/G	U
	Bi-207	<1.2	PCI/G	U
	Bi-210	<0.43	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.29	PCI/G	U
	H-3	25	PCI/G	J
	K-40	13	PCI/G	J
	Pu-238	6.8	PCI/G	J
	Pu-239/240	0.15	PCI/G	J
	Ra-226	<2.8	PCI/G	U
	Sr-90	<0.57	PCI/G	R
	Th-228	1.5	PCI/G	J
	Th-230	2.0	PCI/G	J
	Th-232	0.90	PCI/G	J
	U-234	0.38	PCI/G	J
	U-235	<0.066	PCI/G	U
	U-238	0.76	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YL CANAL POINT	022004	599136.8714	1465402.9749	694.00

Depth: 3.0 TO 4.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	15600.00	MG/KG	
	Antimony	9.70	MG/KG	J
	Arsenic	5.90	MG/KG	J
	Barium	98.80	MG/KG	
	Calcium	24800.00	MG/KG	
	Chromium	20.40	MG/KG	
	Cobalt	12.00	MG/KG	
	Copper	23.90	MG/KG	
	Iron	26100.00	MG/KG	
	Lead	29.20	MG/KG	J
	Magnesium	11500.00	MG/KG	
	Manganese	490.00	MG/KG	
	Potassium	2600.00	MG/KG	
	Sodium	87.50	MG/KG	
	Thallium	0.33	MG/KG	
	Vanadium	30.60	MG/KG	
	Zinc	75.80	MG/KG	
Semivolatile				
	Benzo(a)anthracene	33	UG/KG	J
	Benzo(a)pyrene	38	UG/KG	J
	Benzo(b)fluoranthene	63	UG/KG	J
	Benzo(k)fluoranthene	47	UG/KG	J
	Chrysene	35	UG/KG	J
	Di-n-butylphthalate	55	UG/KG	J
	Fluoranthene	67	UG/KG	J
	Phenanthrene	35	UG/KG	J
	Pyrene	59	UG/KG	J
Pesticide/PCBs				
	Dieldrin	2.2	UG/KG	JP
Radiological				
	Ac-227	<2.1	PCI/G	U
	Am-241	<0.89	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.91	PCI/G	U
	Co-60	<0.29	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	25	PCI/G	J
	K-40	23	PCI/G	J
	Pu-238	4.3	PCI/G	J
	Pu-239/240	<0.036	PCI/G	U
	Ra-226	<4.7	PCI/G	U
	Sr-90	<0.53	PCI/G	R
	Th-228	1.7	PCI/G	J
	Th-230	4.4	PCI/G	J
	Th-232	0.86	PCI/G	J
	U-234	0.64	PCI/G	J
	U-235	<0.072	PCI/G	U
	U-238	0.73	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YL CANAL POINT	022005	599136.8714	1465402.9749	694.00

Depth: 4.0 TO 5.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	12000.00	MG/KG	
	Arsenic	7.30	MG/KG	J
	Barium	86.60	MG/KG	
	Calcium	25500.00	MG/KG	
	Chromium	16.20	MG/KG	
	Cobalt	10.00	MG/KG	
	Copper	25.40	MG/KG	
	Iron	22000.00	MG/KG	
	Lead	20.70	MG/KG	J
	Magnesium	10800.00	MG/KG	
	Manganese	392.00	MG/KG	
	Potassium	1810.00	MG/KG	
	Sodium	86.20	MG/KG	
	Thallium	0.31	MG/KG	
	Vanadium	26.10	MG/KG	
	Zinc	68.70	MG/KG	
Semivolatile				
	Benzo(a)anthracene	68	UG/KG	J
	Benzo(a)pyrene	62	UG/KG	J
	Benzo(b)fluoranthene	110	UG/KG	J
	Benzo(k)fluoranthene	83	UG/KG	J
	Chrysene	82	UG/KG	J
	Di-n-butylphthalate	59	UG/KG	J
	Fluoranthene	150	UG/KG	J
	Phenanthrene	110	UG/KG	J
	Pyrene	180	UG/KG	J
Pesticide/PCBs				
	Dieldrin	1.6	UG/KG	JP
Radiological				
	Ac-227	<2.1	PCI/G	U
	Am-241	<0.83	PCI/G	U
	Bi-207	<1.4	PCI/G	U
	Bi-210	<0.48	PCI/G	U
	Co-60	<0.38	PCI/G	U
	Cs-137	<0.23	PCI/G	U
	H-3	20	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	8.7	PCI/G	J
	Pu-239/240	<0.042	PCI/G	U
	Ra-226	<3.2	PCI/G	U
	Sr-90	<0.56	PCI/G	R
	Th-228	1.9	PCI/G	J
	Th-230	2.1	PCI/G	J
	Th-232	0.92	PCI/G	J
	U-234	<0.10	PCI/G	J
	U-235	<0.076	PCI/G	U
	U-238	0.70	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YI CANAL POINT	312101	598680.4642	1464931.6430	695.30

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	15100.00	MG/KG	
	Arsenic	5.70	MG/KG	
	Barium	108.00	MG/KG	
	Beryllium	0.85	MG/KG	
	Cadmium	2.20	MG/KG	
	Calcium	44600.00	MG/KG	
	Chromium	142.00	MG/KG	J
	Cobalt	8.90	MG/KG	
	Copper	98.00	MG/KG	J
	Iron	21700.00	MG/KG	J
	Lead	50.80	MG/KG	
	Magnesium	12800.00	MG/KG	
	Manganese	363.00	MG/KG	
	Mercury	0.68	MG/KG	J
	Nickel	26.20	MG/KG	
	Potassium	3190.00	MG/KG	
	Silver	5.20	MG/KG	
	Vanadium	28.50	MG/KG	
	Zinc	262.00	MG/KG	J
Semivolatile				
	Acenaphthene	29	UG/KG	J
	Acenaphthylene	53	UG/KG	J
	Anthracene	67	UG/KG	J
	Benzo(a)anthracene	370	UG/KG	J
	Benzo(a)pyrene	320	UG/KG	J
	Benzo(b)fluoranthene	530	UG/KG	
	Benzo(g,h,i)perylene	350	UG/KG	J
	Benzo(k)fluoranthene	350	UG/KG	J
	Butylbenzylphthalate	33	UG/KG	J
	Carbazole	130	UG/KG	J
	Chrysene	410	UG/KG	
	Dibenz(a,h)anthracene	100	UG/KG	J
	Dibenzofuran	15	UG/KG	J
	Fluoranthene	880	UG/KG	
	Fluorene	39	UG/KG	J
	Indeno(1,2,3-cd)pyrene	300	UG/KG	J
	Naphthalene	7	UG/KG	J
	Phenanthrene	480	UG/KG	
	Pyrene	730	UG/KG	
Pesticide/PCBs				
	Aldrin	0.96	UG/KG	JXP
	Aroclor-1248	210.	UG/KG	P
	Aroclor-1254	180.	UG/KG	
	Dieldrin	5.1	UG/KG	JXP
	Endrin	15.	UG/KG	JXP
	alpha-Chlordane	7.2	UG/KG	JXP
	beta-BHC	7.8	UG/KG	JXP
Radiological				
	Ac-227	<1.7	PCI/G	U
	Am-241	<1.4	PCI/G	U
	Bi-207	<1.7	PCI/G	U
	Bi-210	<0.62	PCI/G	U
	Co-60	<0.25	PCI/G	U
	Cs-137	<0.28	PCI/G	U
	H-3	110	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	530	PCI/G	J
	Pu-239/240	5.1	PCI/G	J
	Ra-226	<3.8	PCI/G	U
	Sr-90	2.6	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	2.2	PCI/G	J
	Th-232	1.2	PCI/G	J
	U-234	0.67	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YI CANAL POINT	312101	598680.4642	1464931.6430	695.30

Depth:, 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Radiological				
	U-235	<0.24	PCI/G	U
	U-238	0.67	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YI CANAL POINT	MC0032001	598680.4642	1464931.6430	695.30

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	12200.00	MG/KG	
	Arsenic	4.70	MG/KG	
	Barium	97.00	MG/KG	
	Calcium	44000.00	MG/KG	
	Chromium	104.00	MG/KG	J
	Cobalt	8.30	MG/KG	
	Copper	83.20	MG/KG	J
	Iron	18400.00	MG/KG	
	Lead	47.10	MG/KG	
	Magnesium	11000.00	MG/KG	
	Manganese	328.00	MG/KG	
	Mercury	0.59	MG/KG	
	Nickel	17.00	MG/KG	
	Potassium	2120.00	MG/KG	
	Silver	3.80	MG/KG	
	Sodium	113.00	MG/KG	
	Thallium	0.40	MG/KG	
	Vanadium	23.60	MG/KG	
	Zinc	206.00	MG/KG	J
Semivolatile				
	Acenaphthene	95	UG/KG	J
	Acenaphthylene	84	UG/KG	J
	Anthracene	120	UG/KG	J
	Benzo(a)anthracene	880	UG/KG	
	Benzo(a)pyrene	650	UG/KG	
	Benzo(b)fluoranthene	1100	UG/KG	
	Benzo(g,h,i)perylene	880	UG/KG	
	Benzo(k)fluoranthene	810	UG/KG	
	Carbazole	170	UG/KG	J
	Chrysene	880	UG/KG	
	Di-n-butylphthalate	66	UG/KG	J
	Dibenzofuran	40	UG/KG	J
	Fluoranthene	1900	UG/KG	
	Fluorene	92	UG/KG	J
	Indeno(1,2,3-cd)pyrene	780	UG/KG	
	Phenanthrene	900	UG/KG	
	Pyrene	1500	UG/KG	
Pesticide/PCBs				
	Aldrin	1.5	UG/KG	JXP
	Aroclor-1248	170.	UG/KG	J
	Dieldrin	5.7	UG/KG	JXP
	Endrin	15.	UG/KG	JXP
	beta-BHC	5.1	UG/KG	JXP
	gamma-Chlordane	6.0	UG/KG	JXP
Radiological				
	Ac-227	<1.7	PCI/G	U
	Am-241	<0.74	PCI/G	U
	Bi-207	<1.2	PCI/G	U
	Bi-210	<0.47	PCI/G	U
	Co-60	<0.31	PCI/G	U
	Cs-137	<0.46	PCI/G	U
	H-3	77	PCI/G	J
	K-40	14	PCI/G	J
	Pu-238	360	PCI/G	J
	Pu-239/240	4.5	PCI/G	J
	Ra-226	<3.2	PCI/G	U
	Sr-90	0.99	PCI/G	R
	Th-228	1.9	PCI/G	J
	Th-230	1.6	PCI/G	J
	Th-232	0.83	PCI/G	J
	U-234	0.68	PCI/G	R
	U-235	0.26	PCI/G	R
	U-238	0.40	PCI/G	R

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YI CANAL POINT	MC0032002	598680.4642	1464931.6430	695.30

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	14200.00	MG/KG	
	Arsenic	4.40	MG/KG	
	Barium	93.10	MG/KG	
	Calcium	37700.00	MG/KG	
	Chromium	33.40	MG/KG	J
	Cobalt	10.00	MG/KG	
	Copper	37.30	MG/KG	
	Iron	20800.00	MG/KG	
	Lead	48.80	MG/KG	
	Magnesium	12400.00	MG/KG	
	Manganese	395.00	MG/KG	
	Mercury	0.28	MG/KG	
	Nickel	19.00	MG/KG	
	Potassium	2370.00	MG/KG	
	Sodium	103.00	MG/KG	
	Thallium	0.34	MG/KG	
	Vanadium	28.10	MG/KG	
	Zinc	99.40	MG/KG	J
Semivolatile				
	Acenaphthylene	53	UG/KG	J
	Anthracene	63	UG/KG	J
	Benzo(a)anthracene	430	UG/KG	
	Benzo(a)pyrene	270	UG/KG	J
	Benzo(b)fluoranthene	530	UG/KG	
	Benzo(g,h,i)perylene	200	UG/KG	J
	Benzo(k)fluoranthene	580	UG/KG	
	Carbazole	130	UG/KG	J
	Chrysene	470	UG/KG	
	Di-n-butylphthalate	77	UG/KG	J
	Fluoranthene	970	UG/KG	
	Fluorene	34	UG/KG	J
	Indeno(1,2,3-cd)pyrene	430	UG/KG	
	Phenanthrene	500	UG/KG	
	Pyrene	760	UG/KG	
Pesticide/PCBs				
	Aroclor-1248	32.	UG/KG	JP
Radiological				
	Ac-227	<1.7	PCI/G	U
	Am-241	<1.0	PCI/G	U
	Bi-207	<0.68	PCI/G	U
	Bi-210	<0.48	PCI/G	U
	Co-60	<0.31	PCI/G	U
	Cs-137	<0.34	PCI/G	U
	H-3	61	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	250	PCI/G	J
	Pu-239/240	3.2	PCI/G	J
	Ra-226	<2.8	PCI/G	U
	Sr-90	1.6	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	1.6	PCI/G	J
	Th-232	1.3	PCI/G	J
	U-234	<0.40	PCI/G	R
	U-235	<0.30	PCI/G	R
	U-238	0.52	PCI/G	R

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YI CANAL POINT	MC0032003	598680.4642	1464931.6430	695.30

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	16000.00	MG/KG	
	Arsenic	5.90	MG/KG	
	Barium	116.00	MG/KG	
	Calcium	24400.00	MG/KG	
	Chromium	23.40	MG/KG	J
	Cobalt	10.30	MG/KG	
	Copper	54.70	MG/KG	J
	Iron	22600.00	MG/KG	
	Lead	47.50	MG/KG	
	Magnesium	10400.00	MG/KG	
	Manganese	299.00	MG/KG	
	Mercury	0.51	MG/KG	
	Nickel	23.10	MG/KG	
	Potassium	2360.00	MG/KG	
	Sodium	90.40	MG/KG	
	Thallium	0.35	MG/KG	
	Vanadium	31.00	MG/KG	
	Zinc	106.00	MG/KG	J
Semivolatile				
	Acenaphthylene	45	UG/KG	J
	Anthracene	53	UG/KG	J
	Benzo(a)anthracene	190	UG/KG	J
	Benzo(a)pyrene	150	UG/KG	J
	Benzo(b)fluoranthene	260	UG/KG	J
	Chrysene	240	UG/KG	J
	Di-n-butylphthalate	60	UG/KG	J
	Fluoranthene	510	UG/KG	
	Fluorene	31	UG/KG	J
	Phenanthrene	340	UG/KG	J
	Pyrene	360	UG/KG	J
Radiological				
	Ac-227	<3.2	PCI/G	U
	Am-241	<0.92	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.66	PCI/G	U
	Co-60	<0.36	PCI/G	U
	Cs-137	<0.33	PCI/G	U
	H-3	54	PCI/G	J
	K-40	12	PCI/G	J
	Pu-238	7.3	PCI/G	J
	Pu-239/240	0.13	PCI/G	J
	Ra-226	<4.5	PCI/G	U
	Sr-90	<0.33	PCI/G	R
	Th-228	1.1	PCI/G	J
	Th-230	2.0	PCI/G	J
	Th-232	1.1	PCI/G	J
	U-234	0.57	PCI/G	R
	U-235	<0.074	PCI/G	U
	U-238	0.70	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YF CANAL POINT	322101	598352.0303	1464728.0154	695.20

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	17000.00	MG/KG	
	Arsenic	5.60	MG/KG	
	Barium	104.00	MG/KG	
	Beryllium	1.00	MG/KG	
	Cadmium	1.40	MG/KG	
	Calcium	49600.00	MG/KG	
	Chromium	145.00	MG/KG	J
	Cobalt	10.60	MG/KG	
	Copper	129.00	MG/KG	J
	Iron	24900.00	MG/KG	J
	Lead	59.50	MG/KG	
	Magnesium	12900.00	MG/KG	
	Manganese	396.00	MG/KG	
	Mercury	0.58	MG/KG	J
	Nickel	31.20	MG/KG	
	Potassium	3350.00	MG/KG	
	Silver	8.10	MG/KG	
	Sodium	186.00	MG/KG	
	Vanadium	31.00	MG/KG	
	Zinc	323.00	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	140	UG/KG	J
	Benzo(a)pyrene	130	UG/KG	J
	Benzo(b)fluoranthene	180	UG/KG	J
	Benzo(k)fluoranthene	180	UG/KG	J
	Chrysene	180	UG/KG	J
	Fluoranthene	310	UG/KG	J
	Phenanthrene	160	UG/KG	J
	Pyrene	260	UG/KG	J
Pesticide/PCBs				
	Aldrin	9.9	UG/KG	XP
	Aroclor-1248	550.	UG/KG	
	Aroclor-1254	260.	UG/KG	
	Dieldrin	5.7	UG/KG	XP
	Endrin	16.	UG/KG	JXP
	Endrin ketone	2.1	UG/KG	JP
	alpha-Chlordane	11.	UG/KG	XP
Radiological				
	Ac-227	<5.3	PCI/G	U
	Am-241	<0.91	PCI/G	U
	Bi-207	<1.9	PCI/G	U
	Bi-210	<0.52	PCI/G	U
	Co-60	<0.41	PCI/G	U
	Cs-137	<0.64	PCI/G	U
	H-3	92	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	520	PCI/G	J
	Pu-239/240	4.1	PCI/G	J
	Ra-226	<3.9	PCI/G	U
	Sr-90	2.8	PCI/G	R
	Th-228	3.0	PCI/G	R
	Th-230	2.6	PCI/G	J
	Th-232	0.97	PCI/G	J
	U-234	1.3	PCI/G	J
	U-235	<0.17	PCI/G	U
	U-238	0.48	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YF CANAL POINT	MC0042001	598352.0303	1464728.0154	695.20

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	11400.00	MG/KG	
	Arsenic	5.60	MG/KG	
	Barium	83.70	MG/KG	
	Calcium	40000.00	MG/KG	
	Chromium	122.00	MG/KG	J
	Cobalt	9.10	MG/KG	
	Copper	114.00	MG/KG	J
	Iron	18600.00	MG/KG	
	Lead	54.20	MG/KG	
	Magnesium	10400.00	MG/KG	
	Manganese	312.00	MG/KG	
	Mercury	0.58	MG/KG	
	Nickel	22.80	MG/KG	
	Potassium	1860.00	MG/KG	
	Silver	8.40	MG/KG	
	Sodium	116.00	MG/KG	
	Thallium	0.35	MG/KG	
	Vanadium	20.90	MG/KG	
	Zinc	295.00	MG/KG	J
Semivolatile				
	Acenaphthylene	49	UG/KG	J
	Anthracene	69	UG/KG	J
	Benzo(a)pyrene	350	UG/KG	J
	Benzo(b)fluoranthene	470	UG/KG	
	Benzo(g,h,i)perylene	410	UG/KG	J
	Benzo(k)fluoranthene	400	UG/KG	J
	Carbazole	130	UG/KG	J
	Chrysene	400	UG/KG	J
	Di-n-butylphthalate	77	UG/KG	J
	Fluoranthene	870	UG/KG	
	Fluorene	39	UG/KG	J
	Indeno(1,2,3-cd)pyrene	400	UG/KG	J
	Phenanthrene	470	UG/KG	
	Pyrene	660	UG/KG	
Pesticide/PCBs				
	Aldrin	1.1	UG/KG	JXP
	Aroclor-1248	150.	UG/KG	
	Dieldrin	4.3	UG/KG	JXP
	Endosulfan sulfate	1.2	UG/KG	JP
	Endrin	24.	UG/KG	XP
	Endrin ketone	6.0	UG/KG	JP
Radiological				
	Ac-227	<3.7	PCI/G	U
	Am-241	<1.3	PCI/G	U
	Bi-207	<0.73	PCI/G	U
	Bi-210	<0.44	PCI/G	U
	Co-60	<0.31	PCI/G	U
	Cs-137	<0.57	PCI/G	U
	H-3	130	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	520	PCI/G	J
	Pu-239/240	7.9	PCI/G	J
	Ra-226	<3.5	PCI/G	U
	Sr-90	0.49	PCI/G	R
	Th-228	3.2	PCI/G	J
	Th-230	1.8	PCI/G	J
	Th-232	3.2	PCI/G	J
	U-234	<0.28	PCI/G	R
	U-235	<0.21	PCI/G	U
	U-238	0.75	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YF CANAL POINT	MC0042002	598352.0303	1464728.0154	695.20

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	16800.00	MG/KG	
	Arsenic	7.40	MG/KG	
	Barium	69.10	MG/KG	
	Calcium	71200.00	MG/KG	
	Chromium	22.60	MG/KG	J
	Cobalt	11.20	MG/KG	
	Iron	26800.00	MG/KG	
	Lead	23.60	MG/KG	
	Magnesium	14400.00	MG/KG	
	Manganese	535.00	MG/KG	
	Nickel	24.10	MG/KG	
	Potassium	3640.00	MG/KG	
	Sodium	226.00	MG/KG	
	Thallium	0.24	MG/KG	
	Vanadium	31.60	MG/KG	
	Zinc	77.80	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	67	UG/KG	J
	Benzo(a)pyrene	59	UG/KG	J
	Benzo(b)fluoranthene	120	UG/KG	J
	Benzo(k)fluoranthene	83	UG/KG	J
	Di-n-butylphthalate	59	UG/KG	J
	Fluoranthene	170	UG/KG	J
	Phenanthrene	90	UG/KG	J
Pesticide/PCBs				
	Dieldrin	2.0	UG/KG	JP
Radiological				
	Ac-227	<2.6	PCI/G	U
	Am-241	<0.95	PCI/G	U
	Bi-207	<1.1	PCI/G	U
	Bi-210	<0.50	PCI/G	U
	Co-60	<0.39	PCI/G	U
	Cs-137	<0.25	PCI/G	U
	H-3	28	PCI/G	J
	K-40	23	PCI/G	J
	Pu-238	7.9	PCI/G	J
	Pu-239/240	0.17	PCI/G	J
	Ra-226	<3.4	PCI/G	U
	Sr-90	<0.98	PCI/G	R
	Th-228	0.99	PCI/G	J
	Th-230	1.6	PCI/G	J
	Th-232	0.99	PCI/G	J
	U-234	0.76	PCI/G	R
	U-235	0.095	PCI/G	J
	U-238	0.72	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YF CANAL POINT	MC0042003	598352.0303	1464728.0154	695.20

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	15300.00	MG/KG	
	Arsenic	7.70	MG/KG	
	Barium	61.20	MG/KG	
	Calcium	61500.00	MG/KG	
	Chromium	25.40	MG/KG	J
	Cobalt	11.40	MG/KG	
	Copper	29.80	MG/KG	J
	Iron	25200.00	MG/KG	
	Lead	24.90	MG/KG	
	Magnesium	14900.00	MG/KG	
	Manganese	463.00	MG/KG	
	Mercury	0.15	MG/KG	
	Nickel	25.50	MG/KG	
	Potassium	3240.00	MG/KG	
	Sodium	187.00	MG/KG	
	Thallium	0.29	MG/KG	
	Vanadium	28.80	MG/KG	
	Zinc	80.70	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	110	UG/KG	J
	Benzo(a)pyrene	92	UG/KG	J
	Benzo(b)fluoranthene	150	UG/KG	J
	Benzo(g,h,i)perylene	130	UG/KG	J
	Benzo(k)fluoranthene	160	UG/KG	J
	Di-n-butylphthalate	85	UG/KG	J
	Fluoranthene	300	UG/KG	J
	Indeno(1,2,3-cd)pyrene	110	UG/KG	J
	Phenanthrene	190	UG/KG	J
	Pyrene	210	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	18.	UG/KG	J
Radiological				
	Ac-227	<1.7	PCI/G	U
	Am-241	<0.97	PCI/G	U
	Bi-207	<0.74	PCI/G	U
	Bi-210	<0.50	PCI/G	U
	Co-60	<0.26	PCI/G	U
	Cs-137	<0.23	PCI/G	U
	H-3	25	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	57	PCI/G	J
	Pu-239/240	1.7	PCI/G	J
	Ra-226	<4.1	PCI/G	U
	Sr-90	<0.77	PCI/G	R
	Th-228	0.82	PCI/G	J
	Th-230	1.3	PCI/G	J
	Th-232	0.82	PCI/G	J
	U-234	0.65	PCI/G	R
	U-235	0.12	PCI/G	J
	U-238	0.70	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YF CANAL POINT	MC0042004	598352.0303	1464728.0154	695.20

Depth: 3.0 TO 4.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	12900.00	MG/KG	
	Arsenic	12.00	MG/KG	
	Barium	73.40	MG/KG	
	Calcium	75800.00	MG/KG	
	Chromium	21.80	MG/KG	J
	Cobalt	9.80	MG/KG	
	Copper	31.10	MG/KG	J
	Iron	20400.00	MG/KG	
	Lead	28.70	MG/KG	
	Magnesium	15500.00	MG/KG	
	Manganese	448.00	MG/KG	
	Mercury	0.19	MG/KG	
	Nickel	21.20	MG/KG	
	Potassium	2230.00	MG/KG	
	Sodium	161.00	MG/KG	
	Thallium	0.24	MG/KG	
	Vanadium	25.80	MG/KG	
	Zinc	73.40	MG/KG	J
Semivolatile				
	Benzo(b)fluoranthene	80	UG/KG	J
	Fluoranthene	160	UG/KG	J
	Phenanthrene	140	UG/KG	J
	Pyrene	160	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	22.	UG/KG	J
Radiological				
	Ac-227	<2.9	PCI/G	U
	Am-241	<1.9	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.92	PCI/G	U
	Co-60	<0.44	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	10	PCI/G	J
	K-40	22	PCI/G	J
	Pu-238	9.5	PCI/G	J
	Pu-239/240	0.27	PCI/G	J
	Ra-226	<3.0	PCI/G	U
	Sr-90	<0.51	PCI/G	R
	Th-228	1.5	PCI/G	J
	Th-228	0.80 •	PCI/G	J
	Th-230	160	PCI/G	J
	Th-230	1.3 •	PCI/G	J
	Th-232	1.5	PCI/G	R
	Th-232	0.62 •	PCI/G	R
	U-234	0.85	PCI/G	R
	U-235	0.20	PCI/G	J
	U-238	0.67	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YF CANAL POINT	MC0042005	598352.0303	1464728.0154	695.20

Depth: 4.0 TO 5.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	14300.00	MG/KG	
	Arsenic	8.30	MG/KG	
	Barium	91.10	MG/KG	
	Calcium	48700.00	MG/KG	
	Chromium	27.20	MG/KG	J
	Cobalt	12.00	MG/KG	
	Copper	48.10	MG/KG	J
	Iron	22800.00	MG/KG	
	Lead	39.70	MG/KG	
	Magnesium	16000.00	MG/KG	
	Manganese	501.00	MG/KG	
	Mercury	0.33	MG/KG	
	Nickel	20.50	MG/KG	
	Potassium	2590.00	MG/KG	
	Silver	1.60	MG/KG	
	Sodium	144.00	MG/KG	
	Thallium	0.27	MG/KG	
	Vanadium	28.20	MG/KG	
	Zinc	115.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	150	UG/KG	J
	Acenaphthene	120	UG/KG	J
	Anthracene	960	UG/KG	J
	Benzo(a)anthracene	2000	UG/KG	
	Benzo(a)pyrene	1300	UG/KG	
	Benzo(b)fluoranthene	1500	UG/KG	
	Benzo(g,h,i)perylene	1900	UG/KG	J
	Benzo(k)fluoranthene	1600	UG/KG	
	Carbazole	1700	UG/KG	
	Chrysene	1900	UG/KG	
	Dibenzofuran	530	UG/KG	J
	Fluoranthene	5100	UG/KG	
	Fluorene	1100	UG/KG	
	Indeno(1,2,3-cd)pyrene	1300	UG/KG	
	Naphthalene	500	UG/KG	J
	Phenanthrene	6100	UG/KG	
	Pyrene	3100	UG/KG	
Pesticide/PCBs				
	Aroclor-1248	44.	UG/KG	
Radiological				
	Ac-227	<1.6	PCI/G	U
	Am-241	<2.0	PCI/G	U
	Bi-207	<0.80	PCI/G	U
	Bi-210	<0.43	PCI/G	U
	Co-60	<0.34	PCI/G	U
	Cs-137	<0.30	PCI/G	U
	H-3	9.9	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	14 *	PCI/G	J
	Pu-239/240	<0.29 *	PCI/G	U
	Ra-226	<3.3	PCI/G	U
	Sr-90	<1.1	PCI/G	R
	Th-228	0.86	PCI/G	J
	Th-230	1.2	PCI/G	J
	Th-232	0.86	PCI/G	J
	U-234	0.76	PCI/G	R
	U-235	0.13	PCI/G	J
	U-238	0.70	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN1 WEST BANK LOW POINT	052001	597730.2865	1464452.1647	701.40

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	8600.00	MG/KG	
	Arsenic	39.50	MG/KG	
	Barium	99.20	MG/KG	
	Calcium	39500.00	MG/KG	J
	Chromium	14.70	MG/KG	
	Cobalt	8.10	MG/KG	
	Copper	113.00	MG/KG	
	Iron	16700.00	MG/KG	
	Lead	248.00	MG/KG	
	Magnesium	16700.00	MG/KG	J
	Manganese	391.00	MG/KG	
	Nickel	14.10	MG/KG	
	Potassium	1680.00	MG/KG	
	Sodium	132.00	MG/KG	
	Vanadium	20.40	MG/KG	
	Zinc	142.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	62	UG/KG	J
	Acenaphthene	95	UG/KG	J
	Acenaphthylene	340	UG/KG	J
	Anthracene	340	UG/KG	J
	Benzo(a)anthracene	2000	UG/KG	
	Benzo(a)pyrene	1600	UG/KG	
	Benzo(b)fluoranthene	2000	UG/KG	
	Benzo(g,h,i)perylene	1900	UG/KG	
	Benzo(k)fluoranthene	1900	UG/KG	
	Carbazole	520	UG/KG	
	Chrysene	1800	UG/KG	
	Di-n-butylphthalate	71	UG/KG	J
	Dibenz(a,h)anthracene	420	UG/KG	
	Fluoranthene	3200	UG/KG	
	Fluorene	150	UG/KG	J
	Indeno(1,2,3-cd)pyrene	1400	UG/KG	
	Naphthalene	54	UG/KG	J
	Phenanthrene	1800	UG/KG	
	Pyrene	2900	UG/KG	
	bis(2-Ethylhexyl)phthalate	1900	UG/KG	
Pesticide/PCBs				
	4,4'-DDE	3.6	UG/KG	JP
	Aldrin	1.4	UG/KG	J
	Heptachlor	2.6	UG/KG	JP
Radiological				
	Ac-227	<3.0	PCI/G	U
	Am-241	<0.87	PCI/G	U
	Bi-207	<2.0	PCI/G	U
	Bi-210	<0.64	PCI/G	U
	Co-60	<0.30	PCI/G	U
	Cs-137	0.41	PCI/G	J
	H-3	2.7	PCI/G	J
	K-40	9.8	PCI/G	J
	Pu-238	0.65	PCI/G	J
	Pu-239/240	<0.045	PCI/G	U
	Ra-226	<3.0	PCI/G	U
	Sr-90	0.10	PCI/G	R
	Th-228	0.66	PCI/G	J
	Th-230	1.4	PCI/G	J
	Th-232	0.50	PCI/G	J
	U-234	1.1	PCI/G	J
	U-235	0.14	PCI/G	J
	U-238	0.90	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN1 WEST BANK LOW POINT	052002	597730.2865	1464452.1647	701.40

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10000.00	MG/KG	
	Arsenic	127.00	MG/KG	
	Barium	97.10	MG/KG	
	Calcium	31800.00	MG/KG	J
	Chromium	11.90	MG/KG	
	Cobalt	10.00	MG/KG	
	Copper	41.40	MG/KG	
	Iron	20300.00	MG/KG	
	Lead	34.70	MG/KG	
	Magnesium	13600.00	MG/KG	J
	Manganese	719.00	MG/KG	
	Nickel	16.70	MG/KG	
	Potassium	1670.00	MG/KG	
	Sodium	92.00	MG/KG	
	Vanadium	22.50	MG/KG	
	Zinc	66.00	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	75	UG/KG	J
	Benzo(a)pyrene	68	UG/KG	J
	Benzo(b)fluoranthene	80	UG/KG	J
	Benzo(k)fluoranthene	82	UG/KG	J
	Chrysene	94	UG/KG	J
	Fluoranthene	160	UG/KG	J
	Phenanthrene	74	UG/KG	J
	Pyrene	120	UG/KG	J
	bis(2-Ethylhexyl)phthalate	420	UG/KG	
Pesticide/PCBs				
	Dieldrin	3.5	UG/KG	JP
Radiological				
	Ac-227	<2.5	PCI/G	U
	Am-241	<0.79	PCI/G	U
	Bi-207	<1.5	PCI/G	U
	Bi-210	<0.42	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.25	PCI/G	U
	H-3	2.3	PCI/G	J
	K-40	12	PCI/G	J
	Pu-238	0.76	PCI/G	J
	Pu-239/240	<0.029	PCI/G	U
	Ra-226	<3.2	PCI/G	U
	Sr-90	0.30	PCI/G	R
	Th-228	1.0	PCI/G	J
	Th-230	1.1	PCI/G	J
	Th-232	0.60	PCI/G	J
	U-234	0.72	PCI/G	J
	U-235	0.10	PCI/G	J
	U-238	0.79	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN1 WEST BANK LOW POINT	052003	597730.2865	1464452.1647	701.40

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	12100.00	MG/KG	
	Arsenic	30.70	MG/KG	
	Barium	106.00	MG/KG	
	Calcium	18600.00	MG/KG	J
	Chromium	15.00	MG/KG	
	Cobalt	11.60	MG/KG	
	Copper	19.60	MG/KG	
	Iron	21900.00	MG/KG	
	Lead	19.50	MG/KG	
	Magnesium	7690.00	MG/KG	J
	Manganese	867.00	MG/KG	
	Nickel	18.70	MG/KG	
	Potassium	1720.00	MG/KG	
	Sodium	87.30	MG/KG	
	Vanadium	24.70	MG/KG	
	Zinc	66.10	MG/KG	J
Semivolatile				
	bis(2-Ethylhexyl)phthalate	430	UG/KG	
Radiological				
	Ac-227	<2.5	PCI/G	U
	Am-241	<0.85	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.55	PCI/G	U
	Co-60	<0.44	PCI/G	U
	Cs-137	<0.23	PCI/G	U
	H-3	2.3	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	0.31	PCI/G	J
	Pu-239/240	<0.097	PCI/G	U
	Ra-226	<2.9	PCI/G	U
	Sr-90	0.10	PCI/G	R
	Th-228	0.75	PCI/G	J
	Th-230	1.4	PCI/G	J
	Th-232	0.76	PCI/G	J
	U-234	0.82	PCI/G	J
	U-235	0.19	PCI/G	J
	U-238	0.93	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN2 WEST BANK HIGH POINT	062001	597727.4738	1464460.5262	702.80

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9540.00	MG/KG	
	Arsenic	9.60	MG/KG	
	Barium	94.10	MG/KG	
	Calcium	34100.00	MG/KG	J
	Chromium	14.20	MG/KG	
	Cobalt	7.90	MG/KG	
	Copper	61.50	MG/KG	
	Iron	16900.00	MG/KG	
	Lead	88.60	MG/KG	
	Magnesium	13700.00	MG/KG	J
	Manganese	356.00	MG/KG	
	Mercury	0.20	MG/KG	
	Nickel	15.40	MG/KG	
	Potassium	1450.00	MG/KG	
	Sodium	98.10	MG/KG	
	Vanadium	20.80	MG/KG	
	Zinc	92.80	MG/KG	J
Semivolatile				
	Acenaphthylene	42	UG/KG	J
	Anthracene	60	UG/KG	J
	Benzo(a)anthracene	300	UG/KG	J
	Benzo(a)pyrene	300	UG/KG	J
	Benzo(b)fluoranthene	340	UG/KG	J
	Benzo(g,h,i)perylene	200	UG/KG	J
	Benzo(k)fluoranthene	280	UG/KG	J
	Chrysene	310	UG/KG	J
	Di-n-butylphthalate	71	UG/KG	J
	Fluoranthene	770	UG/KG	
	Indeno(1,2,3-cd)pyrene	300	UG/KG	J
	Phenanthrene	310	UG/KG	J
	Pyrene	520	UG/KG	
	bis(2-Ethylhexyl)phthalate	200	UG/KG	J
Radiological				
	Ac-227	<1.5	PCI/G	U
	Am-241	<0.80	PCI/G	U
	Bi-207	<1.6	PCI/G	U
	Bi-210	<0.38	PCI/G	U
	Co-60	<0.30	PCI/G	U
	Cs-137	<0.41	PCI/G	U
	H-3	2.6	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	<0.035	PCI/G	U
	Pu-239/240	<0.031	PCI/G	U
	Ra-226	<3.7	PCI/G	U
	Sr-90	0.35	PCI/G	R
	Th-228	0.76	PCI/G	J
	Th-230	1.3	PCI/G	J
	Th-232	0.64	PCI/G	J
	U-234	0.77	PCI/G	J
	U-235	0.17	PCI/G	J
	U-238	0.66	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN2 WEST BANK HIGH POINT	062002	597727.4738	1464460.5262	702.80

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	11100.00	MG/KG	
	Arsenic	5.30	MG/KG	
	Barium	113.00	MG/KG	
	Calcium	34300.00	MG/KG	J
	Chromium	16.00	MG/KG	
	Cobalt	10.70	MG/KG	
	Copper	33.00	MG/KG	
	Iron	19500.00	MG/KG	
	Lead	34.60	MG/KG	
	Magnesium	9790.00	MG/KG	J
	Manganese	331.00	MG/KG	
	Mercury	0.37	MG/KG	
	Nickel	16.50	MG/KG	
	Potassium	1350.00	MG/KG	
	Sodium	108.00	MG/KG	
	Thallium	0.13	MG/KG	J
	Vanadium	23.20	MG/KG	
	Zinc	78.80	MG/KG	J
Semivolatile				
	Fluoranthene	77	UG/KG	J
	Pyrene	67	UG/KG	J
	bis(2-Ethylhexyl)phthalate	190	UG/KG	J
Radiological				
	Ac-227	<1.7	PCI/G	U
	Am-241	<0.82	PCI/G	U
	Bi-207	<1.8	PCI/G	U
	Bi-210	<0.70	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.35	PCI/G	U
	H-3	2.6	PCI/G	J
	K-40	13	PCI/G	J
	Pu-238	<0.049	PCI/G	U
	Pu-239/240	<0.044	PCI/G	U
	Ra-226	<3.1	PCI/G	U
	Sr-90	0.58	PCI/G	R
	Th-228	0.91	PCI/G	J
	Th-230	1.5	PCI/G	J
	Th-232	0.78	PCI/G	J
	U-234	0.80	PCI/G	J
	U-235	0.10	PCI/G	J
	U-238	0.82	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN2 WEST BANK HIGH POINT	062003	597727.4738	1464460.5262	702.80

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	11500.00	MG/KG	
	Arsenic	5.90	MG/KG	
	Barium	113.00	MG/KG	
	Cadmium	1.20	MG/KG	
	Calcium	28900.00	MG/KG	J
	Chromium	15.40	MG/KG	
	Cobalt	9.60	MG/KG	
	Copper	44.20	MG/KG	
	Iron	19800.00	MG/KG	
	Lead	39.10	MG/KG	
	Magnesium	10200.00	MG/KG	J
	Manganese	344.00	MG/KG	
	Mercury	0.52	MG/KG	
	Nickel	17.70	MG/KG	
	Potassium	1300.00	MG/KG	
	Sodium	132.00	MG/KG	
	Vanadium	22.90	MG/KG	
	Zinc	94.00	MG/KG	J
Semivolatile				
	Di-n-butylphthalate	58	UG/KG	J
	bis(2-Ethylhexyl)phthalate	490	UG/KG	
Radiological				
	Ac-227	<2.2	PCI/G	U
	Am-241	<0.98	PCI/G	U
	Bi-207	<1.2	PCI/G	U
	Bi-210	<0.48	PCI/G	U
	Co-60	<0.31	PCI/G	U
	Cs-137	<0.28	PCI/G	U
	H-3	3.3	PCI/G	J
	K-40	14	PCI/G	J
	Pu-238	0.21	PCI/G	J
	Pu-239/240	<0.033	PCI/G	U
	Ra-226	<2.8	PCI/G	U
	Sr-90	2.5	PCI/G	R
	Th-228	0.74	PCI/G	J
	Th-230	1.8	PCI/G	J
	Th-232	0.47	PCI/G	J
	U-234	1.1	PCI/G	J
	U-235	0.17	PCI/G	J
	U-238	1.1	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN3 WEST CANAL POINT	072001	597719.8245	1464486.7563	696.60

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	11000.00	MG/KG	
	Antimony	17.80	MG/KG	J
	Arsenic	5.50	MG/KG	
	Barium	85.50	MG/KG	
	Cadmium	0.83	MG/KG	
	Calcium	65700.00	MG/KG	
	Chromium	46.40	MG/KG	
	Cobalt	10.50	MG/KG	
	Copper	124.00	MG/KG	
	Iron	21300.00	MG/KG	
	Lead	61.50	MG/KG	
	Magnesium	18000.00	MG/KG	
	Manganese	487.00	MG/KG	
	Mercury	0.74	MG/KG	
	Nickel	26.50	MG/KG	
	Potassium	1910.00	MG/KG	
	Silver	9.10	MG/KG	
	Sodium	129.00	MG/KG	J
	Vanadium	21.50	MG/KG	
	Zinc	253.00	MG/KG	J
Semivolatile				
	Acenaphthene	32	UG/KG	J
	Acenaphthylene	26	UG/KG	J
	Benzo(a)anthracene	310	UG/KG	J
	Benzo(a)pyrene	280	UG/KG	J
	Benzo(b)fluoranthene	490	UG/KG	
	Benzo(k)fluoranthene	270	UG/KG	J
	Chrysene	390	UG/KG	J
	Di-n-butylphthalate	27	UG/KG	J
	Fluoranthene	810	UG/KG	
	Fluorene	27	UG/KG	J
	Indeno(1,2,3-cd)pyrene	280	UG/KG	J
	Phenanthrene	410	UG/KG	
	Pyrene	620	UG/KG	
	bis(2-Ethylhexyl)phthalate	92	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	490.	UG/KG	P
	Endrin	42.	UG/KG	X
	Endrin ketone	6.9	UG/KG	P
	beta-BHC	7.3	UG/KG	XPJ
	gamma-Chlordane	9.0	UG/KG	XP
Radiological				
	Ac-227	<1.9	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<1.5	PCI/G	U
	Bi-210	<0.51	PCI/G	U
	Co-60	<0.48	PCI/G	U
	Cs-137	<0.78	PCI/G	U
	H-3	48	PCI/G	J
	K-40	19	PCI/G	J
	Pu-238	360	PCI/G	J
	Pu-239/240	24	PCI/G	R
	Ra-226	<5.6	PCI/G	U
	Sr-90	1.5	PCI/G	R
	Th-228	1.9	PCI/G	J
	Th-230	4.2	PCI/G	J
	Th-232	1.7	PCI/G	J
	U-234	1.1	PCI/G	J
	U-235	<0.32	PCI/G	U
	U-238	1.3	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN3 WEST CANAL POINT	072002	597719.8245	1464486.7563	696.60

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10600.00	MG/KG	
	Antimony	19.70	MG/KG	J
	Arsenic	8.00	MG/KG	J
	Barium	82.60	MG/KG	
	Beryllium	0.24	MG/KG	
	Calcium	31700.00	MG/KG	
	Chromium	17.20	MG/KG	
	Cobalt	10.50	MG/KG	
	Copper	26.00	MG/KG	
	Iron	22400.00	MG/KG	
	Lead	29.30	MG/KG	
	Magnesium	11700.00	MG/KG	
	Manganese	702.00	MG/KG	
	Nickel	16.50	MG/KG	
	Potassium	1510.00	MG/KG	
	Sodium	73.70	MG/KG	J
	Thallium	0.21	MG/KG	J
	Vanadium	23.20	MG/KG	
	Zinc	69.60	MG/KG	J
Semivolatile				
	Fluoranthene	100	UG/KG	J
	Pyrene	98	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	120.	UG/KG	JP
	Dieldrin	0.58	UG/KG	JXP
	Endrin	3.6	UG/KG	JXP
	gamma-Chlordane	1.3	UG/KG	JXP
Radiological				
	Ac-227	<1.8	PCI/G	U
	Am-241	<0.74	PCI/G	U
	Bi-207	<0.60	PCI/G	U
	Bi-210	<0.70	PCI/G	U
	Co-60	<0.37	PCI/G	U
	Cs-137	<0.18	PCI/G	U
	H-3	23	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	36	PCI/G	J
	Pu-239/240	0.60	PCI/G	J
	Ra-226	<2.9	PCI/G	U
	Sr-90	<0.28	PCI/G	R
	Th-228	1.1	PCI/G	J
	Th-230	1.6	PCI/G	J
	Th-232	1.3	PCI/G	J
	U-234	1.7	PCI/G	J
	U-235	<0.15	PCI/G	U
	U-238	1.3	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN3 WEST CANAL POINT	072003	597719.8245	1464486.7563	696.60

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	13200.00	MG/KG	
	Antimony	10.40	MG/KG	J
	Arsenic	10.40	MG/KG	J
	Barium	87.70	MG/KG	
	Calcium	29700.00	MG/KG	
	Chromium	18.90	MG/KG	
	Cobalt	11.30	MG/KG	
	Copper	25.30	MG/KG	
	Iron	22000.00	MG/KG	
	Lead	20.60	MG/KG	
	Magnesium	11900.00	MG/KG	
	Manganese	725.00	MG/KG	
	Nickel	19.40	MG/KG	
	Potassium	1870.00	MG/KG	
	Sodium	83.10	MG/KG	J
	Thallium	0.29	MG/KG	J
	Vanadium	27.80	MG/KG	
	Zinc	69.20	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	61	UG/KG	J
	Benzo(b)fluoranthene	87	UG/KG	J
	Benzo(k)fluoranthene	100	UG/KG	J
	Di-n-butylphthalate	37	UG/KG	J
	Fluoranthene	200	UG/KG	J
	Pyrene	140	UG/KG	J
	bis(2-Ethylhexyl)phthalate	140	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	81.	UG/KG	P
	Endrin	3.5	UG/KG	JXP
	gamma-Chlordane	1.4	UG/KG	JXP
Radiological				
	Ac-227	<1.4	PCI/G	U
	Am-241	<0.80	PCI/G	U
	Bi-207	<0.83	PCI/G	U
	Bi-210	<0.61	PCI/G	U
	Co-60	<0.27	PCI/G	U
	Cs-137	<0.27	PCI/G	U
	H-3	23	PCI/G	J
	K-40	17	PCI/G	J
	Pu-238	34	PCI/G	J
	Pu-239/240	1.4	PCI/G	J
	Ra-226	<3.6	PCI/G	U
	Sr-90	<0.65	PCI/G	R
	Th-228	1.2	PCI/G	J
	Th-230	2.1	PCI/G	J
	Th-232	1.5	PCI/G	J
	U-234	1.6	PCI/G	J
	U-235	<0.14	PCI/G	U
	U-238	1.6	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN3 WEST CANAL POINT	072004	597719.8245	1464486.7563	696.60

Depth: 3.0 TO 4.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	13200.00	MG/KG	
	Antimony	14.30	MG/KG	J
	Arsenic	8.50	MG/KG	
	Barium	94.00	MG/KG	
	Beryllium	0.44	MG/KG	
	Calcium	28500.00	MG/KG	
	Chromium	25.00	MG/KG	
	Cobalt	10.60	MG/KG	
	Copper	39.70	MG/KG	
	Iron	22700.00	MG/KG	
	Lead	33.70	MG/KG	
	Magnesium	11400.00	MG/KG	
	Manganese	540.00	MG/KG	
	Mercury	0.28	MG/KG	
	Nickel	21.50	MG/KG	
	Potassium	1640.00	MG/KG	
	Sodium	91.10	MG/KG	J
	Thallium	0.34	MG/KG	J
	Vanadium	26.70	MG/KG	
	Zinc	105.00	MG/KG	J
Semivolatile				
	Benzo(k)fluoranthene	91	UG/KG	J
	Di-n-butylphthalate	36	UG/KG	J
	Fluoranthene	160	UG/KG	J
	Pyrene	120	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	140.	UG/KG	P
	Dieldrin	0.51	UG/KG	JXP
	Endrin	2.9	UG/KG	JXP
	gamma-Chlordane	1.6	UG/KG	JXP
Radiological				
	Ac-227	<1.8	PCI/G	U
	Am-241	<0.84	PCI/G	U
	Bi-207	<0.69	PCI/G	U
	Bi-210	<0.43	PCI/G	U
	Co-60	<0.29	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	21	PCI/G	J
	K-40	17	PCI/G	J
	Pu-238	16	PCI/G	J
	Pu-239/240	0.49	PCI/G	J
	Ra-226	<3.0	PCI/G	U
	Sr-90	<1.2	PCI/G	R
	Th-228	1.9	PCI/G	J
	Th-230	4.0	PCI/G	J
	Th-232	1.1	PCI/G	J
	U-234	1.4	PCI/G	J
	U-235	<0.28	PCI/G	U
	U-238	0.92	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN3 WEST CANAL POINT	072005	597719.8245	1464486.7563	696.60

Depth: 4.0 TO 5.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	13700.00	MG/KG	
	Antimony	11.40	MG/KG	J
	Arsenic	7.30	MG/KG	
	Barium	102.00	MG/KG	
	Beryllium	0.50	MG/KG	
	Cadmium	0.76	MG/KG	
	Calcium	21500.00	MG/KG	
	Chromium	27.30	MG/KG	
	Cobalt	11.00	MG/KG	
	Copper	39.40	MG/KG	
	Iron	23600.00	MG/KG	
	Lead	31.70	MG/KG	
	Magnesium	9040.00	MG/KG	
	Manganese	460.00	MG/KG	
	Mercury	0.28	MG/KG	
	Nickel	25.00	MG/KG	
	Potassium	1500.00	MG/KG	
	Sodium	83.70	MG/KG	J
	Thallium	0.37	MG/KG	J
	Vanadium	27.60	MG/KG	
	Zinc	88.90	MG/KG	J
Semivolatile				
	Di-n-butylphthalate	51	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	61.	UG/KG	P
	Endrin	1.8	UG/KG	JXP
	gamma-Chlordane	1.1	UG/KG	JXP
Radiological				
	Ac-227	<2.5	PCI/G	U
	Am-241	<1.2	PCI/G	U
	Bi-207	<0.76	PCI/G	U
	Bi-210	<0.97	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	23	PCI/G	J
	K-40	17	PCI/G	J
	Pu-238	16	PCI/G	J
	Pu-239/240	1.2	PCI/G	J
	Ra-226	<3.2	PCI/G	U
	Sr-90	0.31	PCI/G	R
	Th-228	1.3	PCI/G	J
	Th-230	2.4	PCI/G	J
	Th-232	1.3	PCI/G	J
	U-234	1.6	PCI/G	J
	U-235	0.29	PCI/G	J
	U-238	1.8	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN3 WEST CANAL POINT	332101	597719.8245	1464486.7563	696.60

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	15800.00	MG/KG	
	Arsenic	5.50	MG/KG	
	Barium	101.00	MG/KG	
	Beryllium	1.00	MG/KG	
	Cadmium	2.40	MG/KG	
	Calcium	74900.00	MG/KG	
	Chromium	41.90	MG/KG	J
	Cobalt	10.70	MG/KG	
	Copper	143.00	MG/KG	J
	Iron	25000.00	MG/KG	J
	Lead	106.00	MG/KG	
	Magnesium	21000.00	MG/KG	
	Manganese	545.00	MG/KG	
	Mercury	0.76	MG/KG	J
	Nickel	28.60	MG/KG	
	Potassium	3410.00	MG/KG	
	Silver	11.80	MG/KG	
	Sodium	157.00	MG/KG	
	Vanadium	30.00	MG/KG	
	Zinc	316.00	MG/KG	J
Semivolatile				
	Anthracene	69	UG/KG	J
	Benzo(a)anthracene	270	UG/KG	J
	Benzo(a)pyrene	300	UG/KG	J
	Benzo(b)fluoranthene	360	UG/KG	J
	Benzo(k)fluoranthene	410	UG/KG	J
	Chrysene	300	UG/KG	J
	Fluoranthene	630	UG/KG	J
	Fluorene	27	UG/KG	J
	Naphthalene	11	UG/KG	J
	Phenanthrene	390	UG/KG	
	Pyrene	550	UG/KG	
Pesticide/PCBs				
	4,4'-DDD	4.8	UG/KG	JXP
	Aldrin	16.	UG/KG	JXP
	Aroclor-1248	1000.	UG/KG	P
	Aroclor-1254	560.	UG/KG	
	Dieldrin	5.3	UG/KG	JXP
	Endrin	35.	UG/KG	JXP
	alpha-Chlordane	24.	UG/KG	JXP
	beta-BHC	8.9	UG/KG	JXP
Radiological				
	Ac-227	<2.8	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<0.65	PCI/G	U
	Bi-210	<0.43	PCI/G	U
	Co-60	<0.29	PCI/G	U
	Cs-137	0.45	PCI/G	J
	H-3	16	PCI/G	J
	K-40	21	PCI/G	J
	Pu-238	450	PCI/G	J
	Pu-239/240	5.3	PCI/G	J
	Ra-226	<4.2	PCI/G	U
	Sr-90	2.6	PCI/G	R
	Th-228	9.9	PCI/G	R
	Th-230	3.2	PCI/G	J
	Th-232	1.8	PCI/G	J
	U-234	1.6	PCI/G	J
	U-235	<0.17	PCI/G	U
	U-238	0.98	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN4 EAST CANAL POINT	082001	597713.4493	1464504.9673	697.10

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	5820.00	MG/KG	
	Arsenic	3.30	MG/KG	
	Barium	113.00	MG/KG	
	Beryllium	0.25	MG/KG	
	Calcium	16100.00	MG/KG	
	Chromium	10.40	MG/KG	
	Cobalt	5.00	MG/KG	
	Copper	33.70	MG/KG	
	Iron	7770.00	MG/KG	
	Lead	24.60	MG/KG	
	Magnesium	4570.00	MG/KG	
	Manganese	187.00	MG/KG	
	Mercury	0.13	MG/KG	
	Nickel	8.60	MG/KG	
	Potassium	1070.00	MG/KG	
	Silver	1.70	MG/KG	
	Sodium	86.20	MG/KG	J
	Thallium	0.14	MG/KG	J
	Vanadium	13.30	MG/KG	
	Zinc	60.60	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	130	UG/KG	J
	Acenaphthylene	77	UG/KG	J
	Anthracene	240	UG/KG	J
	Benzo(a)anthracene	600	UG/KG	
	Benzo(a)pyrene	560	UG/KG	
	Benzo(b)fluoranthene	770	UG/KG	
	Benzo(g,h,i)perylene	580	UG/KG	
	Benzo(k)fluoranthene	750	UG/KG	
	Chrysene	770	UG/KG	J
	Di-n-butylphthalate	45	UG/KG	J
	Fluoranthene	1100	UG/KG	
	Indeno(1,2,3-cd)pyrene	450	UG/KG	
	Naphthalene	83	UG/KG	J
	Phenanthrene	310	UG/KG	J
	Pyrene	920	UG/KG	
Pesticide/PCBs				
	Aroclor-1248	310.	UG/KG	JP
	Dieldrin	0.89	UG/KG	JXP
	beta-BHC	3.6	UG/KG	JXP
	gamma-BHC(Lindane)	2.7	UG/KG	JXP
	gamma-Chlordane	6.4	UG/KG	JXP
Radiological				
	Ac-227	<2.0	PCI/G	U
	Am-241	<2.0	PCI/G	U
	Bi-207	<0.19	PCI/G	U
	Bi-210	<0.65	PCI/G	U
	Co-60	<0.37	PCI/G	U
	Cs-137	<0.29	PCI/G	U
	H-3	2.4	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	530	PCI/G	J
	Pu-239/240	16	PCI/G	R
	Ra-226	<3.3	PCI/G	U
	Sr-90	1.6	PCI/G	R
	Th-228	2.4	PCI/G	J
	Th-230	3.2	PCI/G	J
	Th-232	2.4	PCI/G	J
	U-234	1.6	PCI/G	J
	U-235	0.17	PCI/G	J
	U-238	1.3	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN4 EAST CANAL POINT	082002	597713.4493	1464504.9673	697.10

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9390.00	MG/KG	
	Antimony	10.40	MG/KG	J
	Arsenic	5.90	MG/KG	J
	Barium	82.10	MG/KG	
	Calcium	49600.00	MG/KG	
	Chromium	12.60	MG/KG	
	Cobalt	9.80	MG/KG	
	Copper	22.10	MG/KG	
	Iron	18700.00	MG/KG	
	Lead	26.40	MG/KG	
	Magnesium	15800.00	MG/KG	
	Manganese	767.00	MG/KG	
	Nickel	16.90	MG/KG	
	Potassium	1490.00	MG/KG	
	Sodium	105.00	MG/KG	J
	Thallium	0.29	MG/KG	J
	Vanadium	20.10	MG/KG	
	Zinc	64.20	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	140	UG/KG	J
	Benzo(a)pyrene	140	UG/KG	J
	Benzo(b)fluoranthene	190	UG/KG	J
	Benzo(k)fluoranthene	170	UG/KG	J
	Chrysene	170	UG/KG	J
	Di-n-butylphthalate	39	UG/KG	J
	Fluoranthene	330	UG/KG	J
	Phenanthrene	170	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	51.	UG/KG	P
Radiological				
	Ac-227	<1.8	PCI/G	U
	Am-241	<0.84	PCI/G	U
	Bi-207	<1.4	PCI/G	U
	Bi-210	<0.66	PCI/G	U
	Co-60	<0.37	PCI/G	U
	Cs-137	<0.34	PCI/G	U
	H-3	1.4	PCI/G	J
	K-40	17	PCI/G	J
	Pu-238	16	PCI/G	J
	Pu-239/240	0.34	PCI/G	J
	Ra-226	<2.9	PCI/G	U
	Sr-90	<2.2	PCI/G	R
	Th-228	1.7	PCI/G	J
	Th-230	3.6	PCI/G	J
	Th-232	1.4	PCI/G	J
	U-234	1.8	PCI/G	J
	U-235	<0.13	PCI/G	U
	U-238	0.97	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN4 EAST CANAL POINT	082003	597713.4493	1464504.9673	697.10

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	11200.00	MG/KG	
	Antimony	16.50	MG/KG	J
	Arsenic	5.20	MG/KG	
	Barium	87.70	MG/KG	
	Beryllium	0.53	MG/KG	
	Calcium	25300.00	MG/KG	
	Chromium	14.50	MG/KG	
	Cobalt	9.80	MG/KG	
	Copper	26.70	MG/KG	
	Iron	20000.00	MG/KG	
	Lead	28.60	MG/KG	
	Magnesium	9500.00	MG/KG	
	Manganese	671.00	MG/KG	
	Nickel	20.80	MG/KG	
	Potassium	1460.00	MG/KG	
	Sodium	89.60	MG/KG	J
	Thallium	0.17	MG/KG	J
	Vanadium	24.30	MG/KG	
	Zinc	72.20	MG/KG	J
Semivolatile				
	Benzo(a)pyrene	90	UG/KG	J
	Benzo(b)fluoranthene	120	UG/KG	J
	Chrysene	80	UG/KG	J
	Di-n-butylphthalate	37	UG/KG	J
	Fluoranthene	190	UG/KG	J
	Pyrene	120	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	130.	UG/KG	P
	Endrin	6.5	UG/KG	XP
	Endrin ketone	2.4	UG/KG	JP
	gamma-Chlordane	3.2	UG/KG	XP
Radiological				
	Ac-227	<1.5	PCI/G	U
	Am-241	<0.75	PCI/G	U
	Bi-207	<1.1	PCI/G	U
	Bi-210	<0.39	PCI/G	U
	Co-60	<0.26	PCI/G	U
	Cs-137	<0.23	PCI/G	U
	H-3	1.6	PCI/G	J
	K-40	17	PCI/G	J
	Pu-238	32	PCI/G	J
	Pu-239/240	1.1	PCI/G	J
	Ra-226	<3.6	PCI/G	U
	Sr-90	3.5	PCI/G	R
	Th-228	1.5	PCI/G	J
	Th-230	1.9	PCI/G	J
	Th-232	1.4	PCI/G	J
	U-234	1.8	PCI/G	J
	U-235	<0.13	PCI/G	U
	U-238	1.2	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN4 EAST CANAL POINT	342101	597713.4493	1464504.9673	697.10

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10400.00	MG/KG	
	Arsenic	2.70	MG/KG	
	Barium	126.00	MG/KG	
	Beryllium	1.20	MG/KG	
	Calcium	32000.00	MG/KG	
	Chromium	19.30	MG/KG	J
	Cobalt	6.60	MG/KG	
	Copper	69.20	MG/KG	J
	Iron	17000.00	MG/KG	J
	Lead	29.70	MG/KG	
	Magnesium	8450.00	MG/KG	
	Manganese	270.00	MG/KG	
	Mercury	0.22	MG/KG	J
	Nickel	14.20	MG/KG	
	Potassium	2000.00	MG/KG	
	Silver	3.80	MG/KG	
	Vanadium	22.10	MG/KG	
	Zinc	139.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	77	UG/KG	J
	Anthracene	43	UG/KG	J
	Benzo(a)anthracene	170	UG/KG	J
	Benzo(a)pyrene	150	UG/KG	J
	Benzo(b)fluoranthene	210	UG/KG	J
	Benzo(k)fluoranthene	390	UG/KG	
	Chrysene	160	UG/KG	J
	Fluoranthene	320	UG/KG	J
	Naphthalene	51	UG/KG	J
	Phenanthrene	250	UG/KG	J
	Pyrene	290	UG/KG	J
Pesticide/PCBs				
	4,4'-DDT	1.3	UG/KG	JXP
	Aldrin	15.	UG/KG	JXP
	Aroclor-1248	840.	UG/KG	
	Aroclor-1254	330.	UG/KG	
	Dieldrin	7.6	UG/KG	JXP
	Endrin	27.	UG/KG	JX
	alpha-Chlordane	12.	UG/KG	JXP
	beta-BHC	3.0	UG/KG	JXP
Radiological				
	Ac-227	<2.2	PCI/G	U
	Am-241	<1.3	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.45	PCI/G	U
	Co-60	<0.26	PCI/G	U
	Cs-137	<0.28	PCI/G	U
	H-3	3.0	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	140	PCI/G	J
	Pu-239/240	2.1	PCI/G	J
	Ra-226	<4.5	PCI/G	U
	Sr-90	1.5	PCI/G	R
	Th-228	3.4	PCI/G	R
	Th-230	3.4	PCI/G	J
	Th-232	3.1	PCI/G	J
	U-234	1.5	PCI/G	J
	U-235	<0.17	PCI/G	U
	U-238	2.4	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN5 EAST BANK HIGH POINT	092001	597703.1950	1464532.9447	704.10

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10200.00	MG/KG	
	Arsenic	6.20	MG/KG	
	Barium	85.00	MG/KG	
	Calcium	27800.00	MG/KG	J
	Chromium	14.10	MG/KG	
	Cobalt	9.90	MG/KG	
	Copper	23.90	MG/KG	
	Iron	18000.00	MG/KG	
	Lead	27.80	MG/KG	
	Magnesium	12100.00	MG/KG	J
	Manganese	776.00	MG/KG	
	Nickel	16.80	MG/KG	
	Potassium	1540.00	MG/KG	
	Sodium	67.90	MG/KG	
	Vanadium	22.30	MG/KG	
	Zinc	64.20	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	160	UG/KG	J
	Acenaphthene	480	UG/KG	J
	Acenaphthylene	250	UG/KG	J
	Anthracene	1300	UG/KG	
	Benzo(a)anthracene	2500	UG/KG	
	Benzo(a)pyrene	2600	UG/KG	
	Benzo(b)fluoranthene	2600	UG/KG	
	Benzo(g,h,i)perylene	2000	UG/KG	
	Benzo(k)fluoranthene	2600	UG/KG	
	Carbazole	1000	UG/KG	J
	Chrysene	2800	UG/KG	
	Di-n-butylphthalate	92	UG/KG	J
	Dibenz(a,h)anthracene	700	UG/KG	J
	Dibenzofuran	390	UG/KG	J
	Fluoranthene	6200	UG/KG	
	Fluorene	890	UG/KG	J
	Indeno(1,2,3-cd)pyrene	2200	UG/KG	
	Naphthalene	450	UG/KG	J
	Phenanthrene	5400	UG/KG	
	Pyrene	4600	UG/KG	
Pesticide/PCBs				
	Aldrin	2.5	UG/KG	JP
	Dieldrin	6.8	UG/KG	JP
	Endosulfan II	3.8	UG/KG	JP
	Heptachlor	4.0	UG/KG	JP
Radiological				
	Ac-227	<1.6	PCI/G	U
	Am-241	<1.2	PCI/G	U
	Bi-207	<1.0	PCI/G	U
	Bi-210	<0.57	PCI/G	U
	Co-60	<0.38	PCI/G	U
	Cs-137	<0.26	PCI/G	U
	H-3	2.0	PCI/G	J
	K-40	11	PCI/G	J
	Pu-238	15	PCI/G	J
	Pu-239/240	0.099	PCI/G	J
	Ra-226	<2.4	PCI/G	U
	Sr-90	1.8	PCI/G	R
	Th-228	0.70	PCI/G	J
	Th-230	1.4	PCI/G	J
	Th-232	0.79	PCI/G	J
	U-234	0.79	PCI/G	J
	U-235	0.15	PCI/G	J
	U-238	0.77	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN5 EAST BANK HIGH POINT	092002	597703.1950	1464532.9447	704.10

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9650.00	MG/KG	
	Arsenic	4.80	MG/KG	
	Barium	72.70	MG/KG	
	Calcium	42300.00	MG/KG	J
	Chromium	11.80	MG/KG	
	Cobalt	10.30	MG/KG	
	Copper	16.00	MG/KG	
	Iron	18100.00	MG/KG	
	Lead	20.90	MG/KG	
	Magnesium	18500.00	MG/KG	J
	Manganese	818.00	MG/KG	
	Nickel	16.30	MG/KG	
	Potassium	1470.00	MG/KG	
	Sodium	84.10	MG/KG	
	Vanadium	20.70	MG/KG	
	Zinc	53.60	MG/KG	J
Semivolatile				
	Acenaphthylene	69	UG/KG	J
	Anthracene	100	UG/KG	J
	Benzo(a)pyrene	310	UG/KG	J
	Benzo(b)fluoranthene	270	UG/KG	J
	Benzo(g,h,i)perylene	780	UG/KG	
	Benzo(k)fluoranthene	240	UG/KG	J
	Chrysene	270	UG/KG	J
	Dibenz(a,h)anthracene	100	UG/KG	J
	Fluoranthene	460	UG/KG	
	Indeno(1,2,3-cd)pyrene	290	UG/KG	J
	Naphthalene	45	UG/KG	J
	Phenanthrene	300	UG/KG	J
	Pyrene	430	UG/KG	
	bis(2-Ethylhexyl)phthalate	250	UG/KG	J
Pesticide/PCBs				
	Dieldrin	1.8	UG/KG	JP
	Endrin ketone	15.	UG/KG	P
Radiological				
	Ac-227	<2.0	PCI/G	U
	Am-241	<0.68	PCI/G	U
	Bi-207	<0.87	PCI/G	U
	Bi-210	<0.51	PCI/G	U
	Co-60	<0.23	PCI/G	U
	Cs-137	<0.26	PCI/G	U
	H-3	1.9	PCI/G	J
	K-40	12	PCI/G	J
	Pu-238	18	PCI/G	J
	Pu-239/240	0.53	PCI/G	J
	Ra-226	<2.7	PCI/G	U
	Sr-90	1.2	PCI/G	R
	Th-228	0.86	PCI/G	J
	Th-230	38	PCI/G	J
	Th-232	1.4	PCI/G	J
	U-234	0.49	PCI/G	J
	U-235	0.13	PCI/G	J
	U-238	0.71	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN5 EAST BANK HIGH POINT	092003	597703.1950	1464532.9447	704.10

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9690.00	MG/KG	
	Arsenic	5.70	MG/KG	
	Barium	93.60	MG/KG	
	Cadmium	0.73	MG/KG	
	Calcium	29200.00	MG/KG	J
	Chromium	12.00	MG/KG	
	Cobalt	10.30	MG/KG	
	Copper	19.80	MG/KG	
	Iron	18500.00	MG/KG	
	Lead	27.70	MG/KG	
	Magnesium	13400.00	MG/KG	J
	Manganese	928.00	MG/KG	
	Mercury	0.12	MG/KG	
	Nickel	16.60	MG/KG	
	Potassium	1330.00	MG/KG	
	Sodium	66.90	MG/KG	
	Vanadium	20.30	MG/KG	
	Zinc	58.60	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	69	UG/KG	J
	Acenaphthene	260	UG/KG	J
	Acenaphthylene	97	UG/KG	J
	Anthracene	300	UG/KG	J
	Benzo(a)anthracene	780	UG/KG	
	Benzo(a)pyrene	710	UG/KG	
	Benzo(b)fluoranthene	670	UG/KG	
	Benzo(g,h,i)perylene	930	UG/KG	
	Benzo(k)fluoranthene	650	UG/KG	
	Carbazole	520	UG/KG	
	Chrysene	780	UG/KG	
	Dibenz(a,h)anthracene	270	UG/KG	J
	Dibenzofuran	150	UG/KG	J
	Fluoranthene	1900	UG/KG	
	Fluorene	290	UG/KG	J
	Indeno(1,2,3-cd)pyrene	630	UG/KG	
	Naphthalene	93	UG/KG	J
	Phenanthrene	1900	UG/KG	
	Pyrene	1600	UG/KG	
Pesticide/PCBs				
	Aldrin	1.5	UG/KG	JP
	Dieldrin	0.91	UG/KG	JP
	Endosulfan II	1.4	UG/KG	JP
	Heptachlor	3.4	UG/KG	JP
	Heptachlor epoxide	2.5	UG/KG	
Radiological				
	Ac-227	<1.9	PCI/G	U
	Am-241	<0.76	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.40	PCI/G	U
	Co-60	<0.30	PCI/G	U
	Cs-137	<0.31	PCI/G	U
	H-3	2.9	PCI/G	J
	K-40	12	PCI/G	J
	Pu-238	1.7	PCI/G	J
	Pu-239/240	0.097	PCI/G	J
	Ra-226	<4.3	PCI/G	U
	Sr-90	0.12	PCI/G	R
	Th-228	0.71	PCI/G	J
	Th-230	1.1	PCI/G	J
	Th-232	0.57	PCI/G	J
	U-234	0.89	PCI/G	J
	U-235	0.19	PCI/G	J
	U-238	0.70	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN6 EAST BANK LOW POINT	102001	597696.9197	1464549.9802	704.20

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	11400.00	MG/KG	
	Arsenic	7.60	MG/KG	
	Barium	101.00	MG/KG	
	Calcium	8060.00	MG/KG	J
	Chromium	13.90	MG/KG	
	Cobalt	11.30	MG/KG	
	Copper	20.00	MG/KG	
	Iron	21300.00	MG/KG	
	Lead	26.50	MG/KG	
	Magnesium	4160.00	MG/KG	J
	Manganese	893.00	MG/KG	
	Nickel	19.10	MG/KG	
	Potassium	962.00	MG/KG	
	Sodium	44.40	MG/KG	
	Vanadium	23.40	MG/KG	
	Zinc	57.10	MG/KG	J
Semivolatile				
	Acenaphthylene	96	UG/KG	J
	Anthracene	98	UG/KG	J
	Benzo(a)anthracene	560	UG/KG	
	Chrysene	630	UG/KG	
	Fluoranthene	890	UG/KG	
	Phenanthrene	350	UG/KG	J
	Pyrene	780	UG/KG	
	bis(2-Ethylhexyl)phthalate	420	UG/KG	
Pesticide/PCBs				
	Dieldrin	9.1	UG/KG	JP
	Heptachlor	0.95	UG/KG	JP
	gamma-Chlordane	3.2	UG/KG	JP
Radiological				
	Ac-227	<2.2	PCI/G	U
	Am-241	<0.68	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.37	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.39	PCI/G	U
	H-3	1.7	PCI/G	J
	K-40	13	PCI/G	J
	Pu-238	<0.037	PCI/G	U
	Pu-239/240	<0.033	PCI/G	U
	Ra-226	<2.9	PCI/G	U
	Sr-90	1.1	PCI/G	R
	Th-228	0.91	PCI/G	J
	Th-230	1.9	PCI/G	J
	Th-232	0.88	PCI/G	J
	U-234	0.84	PCI/G	J
	U-235	0.13	PCI/G	J
	U-238	0.92	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN6 EAST BANK LOW POINT	102002	597696.9197	1464549.9802	704.20

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10100.00	MG/KG	
	Arsenic	7.80	MG/KG	
	Barium	79.50	MG/KG	
	Calcium	39400.00	MG/KG	J
	Chromium	11.80	MG/KG	
	Cobalt	9.30	MG/KG	
	Copper	18.40	MG/KG	
	Iron	18900.00	MG/KG	
	Lead	20.90	MG/KG	
	Magnesium	18500.00	MG/KG	J
	Manganese	519.00	MG/KG	
	Nickel	17.10	MG/KG	
	Potassium	1140.00	MG/KG	
	Sodium	80.40	MG/KG	
	Vanadium	21.00	MG/KG	
	Zinc	57.50	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	220	UG/KG	J
	Acenaphthene	580	UG/KG	J
	Acenaphthylene	500	UG/KG	J
	Anthracene	1600	UG/KG	
	Benzo(a)anthracene	3200	UG/KG	
	Benzo(a)pyrene	2600	UG/KG	
	Benzo(b)fluoranthene	2400	UG/KG	
	Benzo(g,h,i)perylene	2500	UG/KG	
	Benzo(k)fluoranthene	2200	UG/KG	
	Carbazole	2200	UG/KG	
	Chrysene	3300	UG/KG	
	Dibenz(a,h)anthracene	870	UG/KG	J
	Dibenzofuran	650	UG/KG	J
	Fluoranthene	7200	UG/KG	
	Fluorene	1200	UG/KG	
	Indeno(1,2,3-cd)pyrene	2100	UG/KG	
	Naphthalene	460	UG/KG	J
	Phenanthrene	7100	UG/KG	
	Pyrene	5600	UG/KG	
	bis(2-Ethylhexyl)phthalate	360	UG/KG	J
Pesticide/PCBs				
	Aldrin	1.3	UG/KG	JP
	Dieldrin	3.0	UG/KG	JP
	Heptachlor	2.3	UG/KG	JP
	Heptachlor epoxide	2.8	UG/KG	JP
Radiological				
	Ac-227	<2.0	PCI/G	U
	Am-241	<0.71	PCI/G	U
	Bi-207	<1.6	PCI/G	U
	Bi-210	<0.60	PCI/G	U
	Co-60	<0.25	PCI/G	U
	Cs-137	<0.24	PCI/G	U
	H-3	1.5	PCI/G	J
	K-40	9.0	PCI/G	J
	Pu-238	<0.042	PCI/G	U
	Pu-239/240	<0.038	PCI/G	U
	Ra-226	<2.9	PCI/G	U
	Sr-90	1.4	PCI/G	R
	Th-228	0.74	PCI/G	J
	Th-230	4.6	PCI/G	J
	Th-232	0.76	PCI/G	J
	U-234	0.73	PCI/G	J
	U-235	<0.044	PCI/G	U
	U-238	0.73	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYN6 EAST BANK LOW POINT	102003	597696.9197	1464549.9802	704.20

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10700.00	MG/KG	
	Arsenic	5.60	MG/KG	
	Barium	93.50	MG/KG	
	Calcium	42500.00	MG/KG	J
	Chromium	14.60	MG/KG	
	Cobalt	12.30	MG/KG	
	Copper	17.00	MG/KG	
	Iron	19200.00	MG/KG	
	Lead	13.50	MG/KG	
	Magnesium	17000.00	MG/KG	J
	Manganese	890.00	MG/KG	
	Nickel	17.30	MG/KG	
	Potassium	1330.00	MG/KG	
	Sodium	86.10	MG/KG	
	Vanadium	21.30	MG/KG	
	Zinc	61.00	MG/KG	J
Semivolatile				
	Anthracene	70	UG/KG	J
	Benzo(a)anthracene	160	UG/KG	J
	Benzo(a)pyrene	150	UG/KG	J
	Benzo(b)fluoranthene	160	UG/KG	J
	Benzo(g,h,i)perylene	160	UG/KG	J
	Benzo(k)fluoranthene	130	UG/KG	J
	Chrysene	210	UG/KG	J
	Di-n-butylphthalate	38	UG/KG	J
	Fluoranthene	350	UG/KG	J
	Indeno(1,2,3-cd)pyrene	120	UG/KG	J
	Phenanthrene	310	UG/KG	J
	Pyrene	300	UG/KG	J
	bis(2-Ethylhexyl)phthalate	94	UG/KG	J
Pesticide/PCBs				
	Heptachlor	2.6	UG/KG	P
Radiological				
	Ac-227	<1.5	PCI/G	U
	Am-241	<0.69	PCI/G	U
	Bi-207	<1.7	PCI/G	U
	Bi-210	<0.36	PCI/G	U
	Co-60	<0.20	PCI/G	U
	Cs-137	<0.21	PCI/G	U
	H-3	1.6	PCI/G	J
	K-40	12	PCI/G	J
	Pu-238	0.68	PCI/G	J
	Pu-239/240	<0.040	PCI/G	U
	Ra-226	<2.1	PCI/G	U
	Sr-90	2.4	PCI/G	R
	Th-228	0.49	PCI/G	J
	Th-230	1.1	PCI/G	J
	Th-232	0.56	PCI/G	J
	U-234	0.57	PCI/G	J
	U-235	0.066	PCI/G	J
	U-238	0.55	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
CANAL DISCRETION POINT 3	282001	597489.9494	1464564.5897	700.10

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	16500.00	MG/KG	
	Arsenic	6.80	MG/KG	J
	Barium	90.30	MG/KG	
	Cadmium	0.90	MG/KG	
	Calcium	4920.00	MG/KG	
	Chromium	26.10	MG/KG	
	Cobalt	10.20	MG/KG	
	Iron	27700.00	MG/KG	
	Lead	19.10	MG/KG	
	Magnesium	4690.00	MG/KG	
	Manganese	432.00	MG/KG	J
	Nickel	17.70	MG/KG	
	Potassium	1700.00	MG/KG	
	Sodium	600.00	MG/KG	
	Thallium	0.13	MG/KG	J
	Vanadium	37.80	MG/KG	
	Zinc	71.50	MG/KG	J
Radiological				
	Ac-227	<3.1	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<1.1	PCI/G	U
	Bi-210	<0.42	PCI/G	U
	Co-60	<0.28	PCI/G	U
	Cs-137	<0.32	PCI/G	U
	H-3	8.7	PCI/G	J
	K-40	12	PCI/G	J
	Pu-238	2.6	PCI/G	J
	Pu-239/240	<0.16	PCI/G	U
	Ra-226	<3.3	PCI/G	U
	Sr-90	<0.55	PCI/G	R
	Th-228	1.6	PCI/G	J
	Th-230	2.9	PCI/G	J
	Th-232	1.0	PCI/G	J
	U-234	0.61	PCI/G	J
	U-235	0.15	PCI/G	J
	U-238	1.0	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ1 WEST BANK LOW POINT	112001	596986.4517	1464201.9493	696.40

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	5450.00	MG/KG	
	Arsenic	5.30	MG/KG	
	Barium	83.40	MG/KG	
	Calcium	82500.00	MG/KG	J
	Chromium	19.90	MG/KG	
	Cobalt	5.30	MG/KG	
	Copper	33.00	MG/KG	
	Iron	12300.00	MG/KG	
	Lead	579.00	MG/KG	
	Magnesium	35900.00	MG/KG	J
	Manganese	658.00	MG/KG	
	Nickel	17.20	MG/KG	
	Potassium	796.00	MG/KG	
	Sodium	188.00	MG/KG	
	Vanadium	16.10	MG/KG	
	Zinc	173.00	MG/KG	J
Semivolatile				
	Acenaphthene	110	UG/KG	J
	Acenaphthylene	230	UG/KG	J
	Anthracene	360	UG/KG	J
	Benzo(a)anthracene	2100	UG/KG	
	Benzo(a)pyrene	1600	UG/KG	
	Benzo(b)fluoranthene	1900	UG/KG	
	Benzo(g,h,i)perylene	1500	UG/KG	
	Benzo(k)fluoranthene	1300	UG/KG	
	Butylbenzylphthalate	220	UG/KG	J
	Carbazole	520	UG/KG	
	Chrysene	1800	UG/KG	
	Di-n-butylphthalate	60	UG/KG	J
	Dibenz(a,h)anthracene	390	UG/KG	
	Fluoranthene	3000	UG/KG	
	Fluorene	160	UG/KG	J
	Indeno(1,2,3-cd)pyrene	1300	UG/KG	
	Phenanthrene	1600	UG/KG	
	Pyrene	2600	UG/KG	
Pesticide/PCBs				
	4,4'-DDT	13.	UG/KG	JP
	Dieldrin	3.5	UG/KG	JP
	Heptachlor epoxide	5.0	UG/KG	JP
	alpha-Chlordane	18.	UG/KG	
	gamma-Chlordane	19.	UG/KG	JP
Radiological				
	Ac-227	<1.2	PCI/G	U
	Am-241	<0.53	PCI/G	U
	Bi-207	<0.44	PCI/G	U
	Bi-210	<0.46	PCI/G	U
	Co-60	<0.25	PCI/G	U
	Cs-137	<0.37	PCI/G	U
	H-3	1.9	PCI/G	J
	K-40	6.5	PCI/G	J
	Pu-238	2.9	PCI/G	J
	Pu-239/240	<0.036	PCI/G	U
	Ra-226	<1.5	PCI/G	U
	Sr-90	0.99	PCI/G	R
	Th-228	0.28	PCI/G	J
	Th-230	0.99	PCI/G	J
	Th-232	0.26	PCI/G	J
	U-234	0.54	PCI/G	J
	U-235	<0.056	PCI/G	U
	U-238	0.44	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ1 WEST BANK LOW POINT	112002	596986.4517	1464201.9493	696.40

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	7580.00	MG/KG	
	Arsenic	5.40	MG/KG	
	Barium	103.00	MG/KG	
	Calcium	63700.00	MG/KG	J
	Chromium	11.30	MG/KG	
	Cobalt	8.20	MG/KG	
	Copper	19.90	MG/KG	
	Iron	13400.00	MG/KG	
	Lead	175.00	MG/KG	
	Magnesium	22500.00	MG/KG	J
	Manganese	1300.00	MG/KG	
	Nickel	18.00	MG/KG	
	Potassium	1070.00	MG/KG	
	Sodium	201.00	MG/KG	
	Vanadium	16.00	MG/KG	
	Zinc	78.60	MG/KG	J
Semivolatile				
	Anthracene	61	UG/KG	J
	Benzo(a)anthracene	190	UG/KG	J
	Benzo(a)pyrene	200	UG/KG	J
	Benzo(b)fluoranthene	190	UG/KG	J
	Benzo(g,h,i)perylene	210	UG/KG	J
	Benzo(k)fluoranthene	230	UG/KG	J
	Chrysene	240	UG/KG	J
	Fluoranthene	620	UG/KG	
	Indeno(1,2,3-cd)pyrene	210	UG/KG	J
	Phenanthrene	330	UG/KG	J
	Pyrene	350	UG/KG	J
	bis(2-Ethylhexyl)phthalate	56	UG/KG	J
Pesticide/PCBs				
	4,4'-DDT	6.3	UG/KG	JP
	Dieldrin	0.56	UG/KG	JP
	Heptachlor epoxide	0.80	UG/KG	JP
	alpha-Chlordane	3.6	UG/KG	JP
	gamma-Chlordane	4.8	UG/KG	J
Radiological				
	Ac-227	<1.4	PCI/G	U
	Am-241	<0.94	PCI/G	U
	Bi-207	<0.53	PCI/G	U
	Bi-210	<0.42	PCI/G	U
	Co-60	<0.29	PCI/G	U
	Cs-137	<0.26	PCI/G	U
	H-3	2.0	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	0.31	PCI/G	J
	Pu-239/240	<0.037	PCI/G	U
	Ra-226	<2.0	PCI/G	U
	Sr-90	0.27	PCI/G	R
	Th-228	0.91	PCI/G	J
	Th-230	1.3	PCI/G	J
	Th-232	0.54	PCI/G	J
	U-234	0.62	PCI/G	J
	U-235	<0.11	PCI/G	U
	U-238	0.57	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ1 WEST BANK LOW POINT	112003	596986.4517	1464201.9493	696.40

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9930.00	MG/KG	
	Arsenic	4.80	MG/KG	
	Barium	120.00	MG/KG	
	Calcium	5360.00	MG/KG	J
	Chromium	13.80	MG/KG	
	Cobalt	12.10	MG/KG	
	Copper	19.10	MG/KG	
	Iron	17900.00	MG/KG	
	Lead	53.00	MG/KG	
	Magnesium	3050.00	MG/KG	J
	Manganese	1430.00	MG/KG	
	Nickel	21.50	MG/KG	
	Potassium	1520.00	MG/KG	
	Sodium	224.00	MG/KG	
	Vanadium	18.20	MG/KG	
	Zinc	66.20	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	78	UG/KG	J
	Benzo(a)pyrene	110	UG/KG	J
	Benzo(b)fluoranthene	150	UG/KG	J
	Benzo(k)fluoranthene	160	UG/KG	J
	Chrysene	69	UG/KG	J
	Fluoranthene	330	UG/KG	J
	Phenanthrene	140	UG/KG	J
	Pyrene	220	UG/KG	J
	bis(2-Ethylhexyl)phthalate	91	UG/KG	J
Pesticide/PCBs				
	gamma-Chlordane	0.65	UG/KG	JP
Radiological				
	Ac-227	<1.5	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<0.61	PCI/G	U
	Bi-210	<0.44	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.21	PCI/G	U
	H-3	3.0	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	0.31	PCI/G	J
	Pu-239/240	0.050	PCI/G	J
	Ra-226	<2.6	PCI/G	U
	Sr-90	<1.0	PCI/G	R
	Th-228	1.8	PCI/G	J
	Th-230	2.2	PCI/G	J
	Th-232	0.95	PCI/G	J
	U-234	0.54	PCI/G	J
	U-235	<0.076	PCI/G	U
	U-238	0.69	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ2 WEST BANK HIGH POINT	122001	596979.7876	1464216.6615	699.80

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	12200.00	MG/KG	
	Antimony	14.70	MG/KG	J
	Arsenic	7.50	MG/KG	J
	Barium	110.00	MG/KG	
	Calcium	28800.00	MG/KG	
	Chromium	18.30	MG/KG	
	Cobalt	10.10	MG/KG	
	Copper	44.80	MG/KG	
	Iron	20000.00	MG/KG	
	Lead	76.50	MG/KG	J
	Magnesium	11800.00	MG/KG	
	Manganese	581.00	MG/KG	
	Mercury	0.27	MG/KG	J
	Potassium	1980.00	MG/KG	
	Sodium	78.50	MG/KG	
	Thallium	0.29	MG/KG	J
	Vanadium	26.40	MG/KG	
	Zinc	93.20	MG/KG	
Semivolatile				
	Acenaphthylene	130	UG/KG	J
	Anthracene	120	UG/KG	J
	Benzo(a)anthracene	420	UG/KG	
	Benzo(a)pyrene	400	UG/KG	J
	Benzo(b)fluoranthene	390	UG/KG	J
	Benzo(g,h,i)perylene	360	UG/KG	J
	Benzo(k)fluoranthene	510	UG/KG	
	Carbazole	65	UG/KG	J
	Chrysene	460	UG/KG	
	Di-n-butylphthalate	41	UG/KG	J
	Fluoranthene	1000	UG/KG	
	Indeno(1,2,3-cd)pyrene	320	UG/KG	J
	Phenanthrene	420	UG/KG	
	Pyrene	770	UG/KG	
Pesticide/PCBs				
	4,4'-DDE	1.1	UG/KG	JP
	Dieldrin	3.4	UG/KG	JP
	Heptachlor epoxide	4.4	UG/KG	P
	alpha-Chlordane	21.	UG/KG	
	gamma-Chlordane	4.7	UG/KG	P
Radiological				
	Ac-227	<1.7	PCI/G	U
	Am-241	<0.81	PCI/G	U
	Bi-207	<1.0	PCI/G	U
	Bi-210	<0.41	PCI/G	U
	Co-60	<0.28	PCI/G	U
	Cs-137	<0.35	PCI/G	U
	H-3	2.4	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	15	PCI/G	J
	Pu-239/240	0.25	PCI/G	J
	Ra-226	<3.3	PCI/G	U
	Sr-90	<1.1	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	1.7	PCI/G	J
	Th-232	0.94	PCI/G	J
	U-234	<0.086	PCI/G	U
	U-235	<0.064	PCI/G	U
	U-238	0.68	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ2 WEST BANK HIGH POINT	122002	596979.7876	1464216.6615	699.80

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9610.00	MG/KG	
	Arsenic	5.30	MG/KG	J
	Barium	85.50	MG/KG	
	Calcium	67300.00	MG/KG	
	Chromium	12.70	MG/KG	
	Cobalt	8.20	MG/KG	
	Iron	14900.00	MG/KG	
	Lead	35.40	MG/KG	J
	Magnesium	34400.00	MG/KG	
	Manganese	638.00	MG/KG	
	Mercury	0.19	MG/KG	J
	Potassium	1310.00	MG/KG	
	Sodium	124.00	MG/KG	
	Thallium	0.22	MG/KG	
	Vanadium	21.90	MG/KG	
	Zinc	50.10	MG/KG	
Semivolatile				
	Benzo(a)anthracene	42	UG/KG	J
	Benzo(a)pyrene	43	UG/KG	J
	Benzo(b)fluoranthene	70	UG/KG	J
	Benzo(k)fluoranthene	53	UG/KG	J
	Chrysene	64	UG/KG	J
	Di-n-butylphthalate	29	UG/KG	J
	Fluoranthene	98	UG/KG	J
	Phenanthrene	42	UG/KG	J
	Pyrene	74	UG/KG	J
Pesticide/PCBs				
	Dieldrin	2.4	UG/KG	JP
	Methoxychlor	3.0	UG/KG	JP
	alpha-Chlordane	1.7	UG/KG	JP
	gamma-Chlordane	0.60	UG/KG	JP
Radiological				
	Ac-227	<1.3	PCI/G	U
	Am-241	<0.68	PCI/G	U
	Bi-207	<1.0	PCI/G	U
	Bi-210	<0.35	PCI/G	U
	Co-60	<0.41	PCI/G	U
	Cs-137	<0.32	PCI/G	U
	H-3	1.5	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	3.5	PCI/G	J
	Pu-239/240	0.079	PCI/G	J
	Ra-226	<3.3	PCI/G	U
	Sr-90	<0.88	PCI/G	R
	Th-228	1.2	PCI/G	J
	Th-230	1.4	PCI/G	J
	Th-232	0.69	PCI/G	J
	U-234	0.41	PCI/G	J
	U-235	<0.063	PCI/G	U
	U-238	0.73	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ2 WEST BANK HIGH POINT	122003	596979.7876	1464216.6615	699.80

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	8510.00	MG/KG	
	Antimony	14.20	MG/KG	J
	Arsenic	5.70	MG/KG	J
	Barium	86.10	MG/KG	
	Calcium	45800.00	MG/KG	
	Chromium	12.30	MG/KG	
	Cobalt	7.10	MG/KG	
	Iron	14600.00	MG/KG	
	Lead	25.90	MG/KG	J
	Magnesium	18400.00	MG/KG	
	Manganese	410.00	MG/KG	
	Potassium	1080.00	MG/KG	
	Sodium	88.20	MG/KG	
	Thallium	0.17	MG/KG	
	Vanadium	18.50	MG/KG	
	Zinc	52.70	MG/KG	
Semivolatile				
	Benzo(a)anthracene	37	UG/KG	J
	Benzo(a)pyrene	37	UG/KG	J
	Benzo(b)fluoranthene	46	UG/KG	J
	Benzo(k)fluoranthene	49	UG/KG	J
	Chrysene	53	UG/KG	J
	Fluoranthene	60	UG/KG	J
	Phenanthrene	29	UG/KG	J
	Pyrene	52	UG/KG	J
Pesticide/PCBs				
	Dieldrin	3.7	UG/KG	
	Endrin	2.3	UG/KG	PBY
	alpha-Chlordane	2.0	UG/KG	P
	gamma-Chlordane	1.7	UG/KG	JP
Radiological				
	Ac-227	<1.4	PCI/G	U
	Am-241	<0.67	PCI/G	U
	Bi-207	<0.84	PCI/G	U
	Bi-210	<0.34	PCI/G	U
	Co-60	<0.24	PCI/G	U
	Cs-137	<0.18	PCI/G	U
	H-3	1.3	PCI/G	J
	K-40	9.4	PCI/G	J
	Pu-238	6.5	PCI/G	J
	Pu-239/240	0.064	PCI/G	J
	Ra-226	<2.7	PCI/G	U
	Sr-90	<0.72	PCI/G	R
	Th-228	0.96	PCI/G	J
	Th-230	1.1	PCI/G	J
	Th-232	0.53	PCI/G	J
	U-234	0.49	PCI/G	J
	U-235	<0.079	PCI/G	U
	U-238	0.64	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ3 WEST CANAL POINT	132001	596973.2039	1464234.5216	696.40

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9280.00	MG/KG	
	Antimony	37.30	MG/KG	J
	Arsenic	5.30	MG/KG	
	Barium	129.00	MG/KG	
	Beryllium	0.31	MG/KG	
	Calcium	80600.00	MG/KG	
	Chromium	54.10	MG/KG	
	Cobalt	10.30	MG/KG	
	Copper	106.00	MG/KG	
	Iron	17800.00	MG/KG	
	Lead	48.10	MG/KG	J
	Magnesium	21600.00	MG/KG	
	Manganese	446.00	MG/KG	
	Mercury	0.55	MG/KG	J
	Nickel	22.20	MG/KG	
	Potassium	1780.00	MG/KG	
	Silver	16.20	MG/KG	
	Sodium	446.00	MG/KG	J
	Vanadium	21.20	MG/KG	
	Zinc	182.00	MG/KG	J
Semivolatile				
	Acenaphthylene	460 **	UG/KG	DJ
	Anthracene	510 **	UG/KG	DJ
	Benzo(a)anthracene	1900 **	UG/KG	D
	Benzo(a)pyrene	1600 **	UG/KG	D
	Benzo(b)fluoranthene	1700 **	UG/KG	D
	Benzo(g,h,i)perylene	1700 **	UG/KG	D
	Benzo(k)fluoranthene	1900 **	UG/KG	D
	Carbazole	220 **	UG/KG	DJ
	Chrysene	2100 **	UG/KG	D
	Dibenz(a,h)anthracene	660 **	UG/KG	DJ
	Fluoranthene	4900 **	UG/KG	D
	Indeno(1,2,3-cd)pyrene	1500 **	UG/KG	D
	Methylene Chloride	13	UG/KG	J
	Phenanthrene	2600 **	UG/KG	D
	Pyrene	3900 **	UG/KG	D
Pesticide/PCBs				
	Aroclor-1254	360. *	UG/KG	JP
	Dieldrin	11. *	UG/KG	PX
	Endrin	23. *	UG/KG	PX
	Methoxychlor	31. *	UG/KG	JP
Radiological				
	Ac-227	<3.8	PCI/G	U
	Am-241	<0.85	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.50	PCI/G	U
	Co-60	<0.31	PCI/G	U
	Cs-137	0.34	PCI/G	J
	H-3	9.9	PCI/G	J
	K-40	13	PCI/G	J
	Pu-238	460	PCI/G	J
	Pu-239/240	2.0	PCI/G	J
	Ra-226	<2.5	PCI/G	U
	Sr-90	0.84	PCI/G	R
	Th-228	2.7	PCI/G	J
	Th-230	1.8	PCI/G	J
	Th-232	1.0	PCI/G	J
	U-234	0.23	PCI/G	R
	U-235	<0.11	PCI/G	U
	U-238	0.35	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ3 WEST CANAL POINT	132002	596973.2039	1464234.5216	696.40

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	13000.00	MG/KG	
	Antimony	26.90	MG/KG	J
	Arsenic	5.30	MG/KG	
	Barium	101.00	MG/KG	
	Beryllium	0.64	MG/KG	
	Calcium	67200.00	MG/KG	
	Chromium	56.30	MG/KG	
	Cobalt	11.00	MG/KG	
	Copper	74.30	MG/KG	
	Iron	19900.00	MG/KG	
	Lead	42.50	MG/KG	J
	Magnesium	18700.00	MG/KG	
	Manganese	413.00	MG/KG	
	Mercury	0.32	MG/KG	J
	Nickel	19.80	MG/KG	
	Potassium	2680.00	MG/KG	
	Silver	9.10	MG/KG	
	Sodium	512.00	MG/KG	J
	Thallium	0.49	MG/KG	J
	Vanadium	26.30	MG/KG	
	Zinc	154.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	64	UG/KG	J
	Acenaphthene	270	UG/KG	J
	Acenaphthylene	120	UG/KG	J
	Acetone	10	UG/KG	J
	Anthracene	300	UG/KG	J
	Benzo(a)anthracene	1600	UG/KG	
	Benzo(a)pyrene	1300	UG/KG	
	Benzo(b)fluoranthene	1600	UG/KG	
	Benzo(g,h,i)perylene	990	UG/KG	
	Benzo(k)fluoranthene	1300	UG/KG	
	Carbazole	750	UG/KG	
	Chrysene	1600	UG/KG	
	Dibenz(a,h)anthracene	340	UG/KG	J
	Dibenzofuran	120	UG/KG	J
	Fluoranthene	3600	UG/KG	
	Fluorene	200	UG/KG	J
	Indeno(1,2,3-cd)pyrene	1000	UG/KG	
	Naphthalene	100	UG/KG	J
	Phenanthrene	2200	UG/KG	
	Pyrene	3000	UG/KG	
Pesticide/PCBs				
	Aroclor-1254	250. *	UG/KG	JP
	Dieldrin	8.0 *	UG/KG	PX
	Endrin	32. *	UG/KG	PX
Radiological				
	Ac-227	<1.9	PCI/G	U
	Am-241	<1.3	PCI/G	U
	Bi-207	<1.7	PCI/G	U
	Bi-210	<0.48	PCI/G	U
	Co-60	<0.51	PCI/G	U
	Cs-137	<0.68	PCI/G	U
	H-3	8.4	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	630	PCI/G	J
	Pu-239/240	16	PCI/G	J
	Ra-226	<2.9	PCI/G	U
	Sr-90	1.5	PCI/G	R
	Th-228	3.1	PCI/G	J
	Th-230	3.5	PCI/G	J
	Th-232	1.5	PCI/G	J
	U-234	0.74	PCI/G	R
	U-235	0.12	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ3 WEST CANAL POINT	132002	596973.2039	1464234.5216	696.40

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Radiological	U-238	0.60	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ3 WEST CANAL POINT	132003	596973.2039	1464234.5216	696.40

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	21600.00	MG/KG	
	Antimony	17.60	MG/KG	J
	Arsenic	6.60	MG/KG	
	Barium	141.00	MG/KG	
	Beryllium	0.88	MG/KG	
	Cadmium	1.30	MG/KG	
	Calcium	25500.00	MG/KG	
	Chromium	30.00	MG/KG	
	Cobalt	11.90	MG/KG	
	Copper	49.00	MG/KG	
	Iron	27100.00	MG/KG	
	Lead	44.60	MG/KG	J
	Magnesium	9770.00	MG/KG	
	Manganese	529.00	MG/KG	
	Mercury	0.47	MG/KG	J
	Nickel	26.90	MG/KG	
	Potassium	3120.00	MG/KG	
	Sodium	754.00	MG/KG	J
	Thallium	0.45	MG/KG	J
	Vanadium	42.30	MG/KG	
	Zinc	162.00	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	81	UG/KG	J
	Benzo(a)pyrene	70	UG/KG	J
	Benzo(b)fluoranthene	110	UG/KG	J
	Benzo(k)fluoranthene	100	UG/KG	J
	Chrysene	110	UG/KG	J
	Fluoranthene	170	UG/KG	J
	Phenanthrene	87	UG/KG	J
	Pyrene	170	UG/KG	J
Pesticide/PCBs				
	Endrin	2.7 •	UG/KG	J
	Methoxychlor	7.1 •	UG/KG	JP
	gamma-Chlordane	2.2 •	UG/KG	JP
Radiological				
	Ac-227	<3.1	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<1.6	PCI/G	U
	Bi-210	<1.5	PCI/G	U
	Co-60	<0.34	PCI/G	U
	Cs-137	<0.26	PCI/G	U
	H-3	5.8	PCI/G	J
	K-40	21	PCI/G	J
	Pu-238	44	PCI/G	J
	Pu-239/240	0.62	PCI/G	J
	Ra-226	<4.0	PCI/G	U
	Sr-90	<1.5	PCI/G	R
	Th-228	1.8	PCI/G	J
	Th-230	2.5	PCI/G	J
	Th-232	1.2	PCI/G	J
	U-234	<0.10	PCI/G	R
	U-235	<0.074	PCI/G	U
	U-238	1.1	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ3 WEST CANAL POINT	132004	596973.2039	1464234.5216	696.40

Depth: 3.0 TO 4.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	19400.00	MG/KG	
	Antimony	19.20	MG/KG	J
	Arsenic	6.30	MG/KG	
	Barium	127.00	MG/KG	
	Beryllium	0.91	MG/KG	
	Calcium	23400.00	MG/KG	
	Chromium	27.40	MG/KG	
	Cobalt	11.00	MG/KG	
	Copper	38.30	MG/KG	
	Iron	27700.00	MG/KG	
	Lead	40.80	MG/KG	J
	Magnesium	9490.00	MG/KG	
	Manganese	588.00	MG/KG	
	Mercury	0.19	MG/KG	J
	Nickel	25.10	MG/KG	
	Potassium	2900.00	MG/KG	
	Sodium	706.00	MG/KG	J
	Thallium	0.31	MG/KG	
	Vanadium	39.30	MG/KG	
	Zinc	110.00	MG/KG	J
Volatile				
	Acetone	19	UG/KG	
	Anthracene	27	UG/KG	J
	Benzo(a)anthracene	120	UG/KG	J
	Benzo(a)pyrene	120	UG/KG	J
	Benzo(b)fluoranthene	180	UG/KG	J
	Benzo(k)fluoranthene	110	UG/KG	J
	Chrysene	160	UG/KG	J
	Fluoranthene	270	UG/KG	J
	Phenanthrene	130	UG/KG	J
	Pyrene	240	UG/KG	J
Pesticide/PCBs				
	Dieldrin	2.6 •	UG/KG	JP
	Endrin	3.1 •	UG/KG	JP
	Methoxychlor	270. *	UG/KG	J
	gamma-Chlordane	1.8 *	UG/KG	JP
Radiological				
	Ac-227	<1.8	PCI/G	U
	Am-241	<0.90	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.66	PCI/G	U
	Co-60	<0.35	PCI/G	U
	Cs-137	<0.23	PCI/G	U
	H-3	5.5	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	50	PCI/G	J
	Pu-239/240	1.0	PCI/G	J
	Ra-226	<4.1	PCI/G	U
	Sr-90	<0.46	PCI/G	R
	Th-228	2.2	PCI/G	J
	Th-230	2.8	PCI/G	J
	Th-232	1.2	PCI/G	J
	U-234	0.71	PCI/G	R
	U-235	<0.066	PCI/G	U
	U-238	0.89	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ3 WEST CANAL POINT	132005	596973.2039	1464234.5216	696.40

Depth: 4.0 TO 5.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	14600.00	MG/KG	
	Antimony	13.80	MG/KG	J
	Arsenic	5.50	MG/KG	
	Barium	106.00	MG/KG	
	Beryllium	0.59	MG/KG	
	Cadmium	1.40	MG/KG	
	Calcium	21600.00	MG/KG	
	Chromium	19.70	MG/KG	
	Cobalt	11.00	MG/KG	
	Copper	38.30	MG/KG	
	Iron	22900.00	MG/KG	
	Lead	37.70	MG/KG	J
	Magnesium	10100.00	MG/KG	
	Manganese	387.00	MG/KG	
	Mercury	0.15	MG/KG	J
	Nickel	22.00	MG/KG	
	Potassium	1990.00	MG/KG	
	Sodium	614.00	MG/KG	J
	Thallium	0.41	MG/KG	
	Vanadium	30.50	MG/KG	
	Zinc	86.40	MG/KG	J
Semivolatile				
	Acenaphthene	82	UG/KG	J
	Acetone	16	UG/KG	
	Anthracene	55	UG/KG	J
	Benzo(a)anthracene	220	UG/KG	J
	Benzo(a)pyrene	180	UG/KG	J
	Benzo(b)fluoranthene	270	UG/KG	J
	Benzo(g,h,i)perylene	150	UG/KG	J
	Benzo(k)fluoranthene	210	UG/KG	J
	Carbazole	270	UG/KG	J
	Chrysene	290	UG/KG	J
	Fluoranthene	710	UG/KG	
	Fluorene	40	UG/KG	J
	Indeno(1,2,3-cd)pyrene	140	UG/KG	J
	Methylene Chloride	2	UG/KG	J
	Naphthalene	31	UG/KG	J
	Phenanthrene	520	UG/KG	
	Pyrene	520	UG/KG	
Pesticide/PCBs				
	Methoxychlor	35.	UG/KG	
	alpha-Chlordane	0.57	UG/KG	JP
Radiological				
	Ac-227	<1.8	PCI/G	U
	Am-241	<1.2	PCI/G	U
	Bi-207	<1.2	PCI/G	U
	Bi-210	<0.68	PCI/G	U
	Co-60	<0.42	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	5.7	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	9.3	PCI/G	J
	Pu-239/240	<0.092	PCI/G	U
	Ra-226	<3.4	PCI/G	U
	Sr-90	<1.4	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	2.4	PCI/G	J
	Th-232	1.1	PCI/G	J
	U-234	0.83	PCI/G	R
	U-235	<0.080	PCI/G	U
	U-238	0.49	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ3 WEST CANAL POINT	352101	596973.2039	1464234.5216	696.40

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	12300.00	MG/KG	
	Arsenic	5.20	MG/KG	
	Barium	88.60	MG/KG	
	Beryllium	0.69	MG/KG	
	Calcium	84200.00	MG/KG	
	Chromium	63.10	MG/KG	J
	Cobalt	8.00	MG/KG	
	Copper	109.00	MG/KG	J
	Iron	19200.00	MG/KG	J
	Lead	44.90	MG/KG	
	Magnesium	25500.00	MG/KG	
	Manganese	423.00	MG/KG	
	Mercury	0.44	MG/KG	J
	Nickel	20.00	MG/KG	
	Potassium	2550.00	MG/KG	
	Silver	9.40	MG/KG	
	Sodium	441.00	MG/KG	
	Vanadium	25.50	MG/KG	
	Zinc	215.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	27	UG/KG	J
	Acenaphthene	260	UG/KG	J
	Acenaphthylene	72	UG/KG	J
	Anthracene	370	UG/KG	J
	Benzo(a)anthracene	1300	UG/KG	
	Benzo(a)pyrene	1100	UG/KG	
	Benzo(b)fluoranthene	1500	UG/KG	
	Benzo(g,h,i)perylene	630	UG/KG	
	Benzo(k)fluoranthene	1300	UG/KG	J
	Carbazole	400	UG/KG	J
	Chrysene	1400	UG/KG	
	Dibenz(a,h)anthracene	280	UG/KG	J
	Dibenzofuran	100	UG/KG	J
	Fluoranthene	2900	UG/KG	J
	Fluorene	190	UG/KG	J
	Indeno(1,2,3-cd)pyrene	550	UG/KG	
	Naphthalene	51	UG/KG	J
	Phenanthrene	2500	UG/KG	
	Pyrene	2900	UG/KG	
Pesticide/PCBs				
	4,4'-DDD	1.2	UG/KG	JXP
	4,4'-DDT	2.0	UG/KG	JXP
	Aroclor-1254	270.	UG/KG	
	Dieldrin	6.7	UG/KG	JXP
	Endrin	27.	UG/KG	JXP
	alpha-Chlordane	10.	UG/KG	JXP
Radiological				
	Ac-227	<1.5	PCI/G	U
	Am-241	<0.90	PCI/G	U
	Bi-207	<0.89	PCI/G	U
	Bi-210	<0.39	PCI/G	U
	Co-60	<0.43	PCI/G	U
	Cs-137	<0.33	PCI/G	U
	H-3	13	PCI/G	J
	K-40	14	PCI/G	J
	Pu-238	1000	PCI/G	J
	Pu-239/240	9.5	PCI/G	J
	Ra-226	<2.9	PCI/G	U
	Sr-90	6.4	PCI/G	R
	Th-228	3.2	PCI/G	R
	Th-230	2.8	PCI/G	J
	Th-232	1.6	PCI/G	J
	U-234	1.7	PCI/G	J
	U-235	<0.29	PCI/G	U

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ3 WEST CANAL POINT	352101	596973.2039	1464234.5216	696.40

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Radiological	U-238	1.2	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ4 EAST CANAL POINT	142001	596966.4836	1464260.4306	700.00

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	6830.00	MG/KG	
	Antimony	28.30	MG/KG	J
	Arsenic	3.80	MG/KG	
	Barium	46.70	MG/KG	
	Calcium	103000.00	MG/KG	
	Chromium	29.30	MG/KG	
	Cobalt	6.00	MG/KG	
	Copper	21.90	MG/KG	
	Iron	13300.00	MG/KG	
	Lead	20.70	MG/KG	J
	Magnesium	49800.00	MG/KG	
	Manganese	420.00	MG/KG	
	Nickel	10.10	MG/KG	
	Potassium	1460.00	MG/KG	
	Sodium	372.00	MG/KG	J
	Thallium	1.40	MG/KG	J
	Vanadium	17.60	MG/KG	
	Zinc	65.80	MG/KG	J
Semivolatile				
	Acenaphthene	28	UG/KG	J
	Acenaphthylene	19	UG/KG	J
	Anthracene	66	UG/KG	J
	Benzo(a)anthracene	260	UG/KG	J
	Benzo(a)pyrene	240	UG/KG	J
	Benzo(b)fluoranthene	260	UG/KG	J
	Benzo(g,h,i)perylene	220	UG/KG	J
	Benzo(k)fluoranthene	230	UG/KG	J
	Carbazole	130	UG/KG	J
	Chrysene	290	UG/KG	J
	Dibenz(a,h)anthracene	65	UG/KG	J
	Fluoranthene	720	UG/KG	
	Fluorene	34	UG/KG	J
	Indeno(1,2,3-cd)pyrene	190	UG/KG	J
	Phenanthrene	370	UG/KG	J
	Pyrene	550	UG/KG	
Pesticide/PCBs				
	Aroclor-1248	130. *	UG/KG	P
	Dieldrin	11. •	UG/KG	PX
	Endrin	7.9 •	UG/KG	X
	Methoxychlor	9.7 •	UG/KG	JP
Radiological				
	Ac-227	<2.1	PCI/G	U
	Am-241	<0.88	PCI/G	U
	Bi-207	<0.49	PCI/G	U
	Bi-210	<0.42	PCI/G	U
	Co-60	<0.20	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	4.6	PCI/G	J
	K-40	8.5	PCI/G	J
	Pu-238	120	PCI/G	J
	Pu-239/240	0.82	PCI/G	J
	Ra-226	<1.5	PCI/G	U
	Sr-90	<2.5	PCI/G	R
	Th-228	1.2	PCI/G	J
	Th-230	2.5	PCI/G	J
	Th-232	0.47	PCI/G	J
	U-234	<0.10	PCI/G	R
	U-235	0.21	PCI/G	J
	U-238	0.37	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ4 EAST CANAL POINT	142002	596966.4836	1464260.4306	700.00

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	19500.00	MG/KG	
	Antimony	19.60	MG/KG	J
	Arsenic	7.10	MG/KG	
	Barium	119.00	MG/KG	
	Beryllium	0.98	MG/KG	
	Calcium	24200.00	MG/KG	
	Chromium	27.30	MG/KG	
	Cobalt	12.20	MG/KG	
	Copper	29.90	MG/KG	
	Iron	29700.00	MG/KG	
	Lead	26.30	MG/KG	J
	Magnesium	9800.00	MG/KG	
	Manganese	749.00	MG/KG	
	Mercury	0.15	MG/KG	J
	Nickel	28.40	MG/KG	
	Potassium	2910.00	MG/KG	
	Sodium	696.00	MG/KG	J
	Thallium	0.49	MG/KG	
	Vanadium	37.60	MG/KG	
	Zinc	101.00	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	54	UG/KG	J
	Benzo(a)pyrene	37	UG/KG	J
	Benzo(b)fluoranthene	85	UG/KG	J
	Benzo(k)fluoranthene	43	UG/KG	J
	Chrysene	73	UG/KG	J
	Fluoranthene	120	UG/KG	J
	Indeno(1,2,3-cd)pyrene	51	UG/KG	J
	Methylene Chloride	3	UG/KG	J
	Phenanthrene	53	UG/KG	J
	Pyrene	160	UG/KG	J
Pesticide/PCBs				
	Dieldrin	2.4	UG/KG	JP
Radiological				
	Ac-227	<2.6	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<1.5	PCI/G	U
	Bi-210	<0.73	PCI/G	U
	Co-60	<0.38	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	12	PCI/G	J
	K-40	26	PCI/G	J
	Pu-238	12	PCI/G	J
	Pu-239/240	0.18	PCI/G	J
	Ra-226	<4.0	PCI/G	U
	Sr-90	<0.73	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	2.7	PCI/G	J
	Th-232	1.6	PCI/G	J
	U-234	<0.091	PCI/G	R
	U-235	<0.068	PCI/G	U
	U-238	0.89	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ4 EAST CANAL POINT	142003	596966.4836	1464260.4306	700.00

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	15200.00	MG/KG	
	Antimony	21.20	MG/KG	J
	Arsenic	6.60	MG/KG	
	Barium	102.00	MG/KG	
	Beryllium	0.58	MG/KG	
	Calcium	64800.00	MG/KG	
	Chromium	23.50	MG/KG	
	Cobalt	10.60	MG/KG	
	Copper	33.90	MG/KG	
	Iron	23700.00	MG/KG	
	Lead	44.50	MG/KG	J
	Magnesium	9740.00	MG/KG	
	Manganese	620.00	MG/KG	
	Mercury	0.19	MG/KG	J
	Nickel	24.50	MG/KG	
	Potassium	2150.00	MG/KG	
	Sodium	594.00	MG/KG	J
	Thallium	0.59	MG/KG	
	Vanadium	30.70	MG/KG	
	Zinc	108.00	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	59	UG/KG	J
	Benzo(a)pyrene	50	UG/KG	J
	Benzo(b)fluoranthene	71	UG/KG	J
	Benzo(k)fluoranthene	78	UG/KG	J
	Chrysene	79	UG/KG	J
	Fluoranthene	150	UG/KG	J
	Methylene Chloride	8	UG/KG	J
	Phenanthrene	85	UG/KG	J
	Pyrene	130	UG/KG	J
Pesticide/PCBs				
	Endrin	1.0 •	UG/KG	JP
	alpha-Chlordane	1.3 •	UG/KG	JP
Radiological				
	Ac-227	<2.0	PCI/G	U
	Am-241	<0.99	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.50	PCI/G	U
	Co-60	<0.53	PCI/G	U
	Cs-137	<0.36	PCI/G	U
	H-3	16	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	20	PCI/G	J
	Pu-239/240	0.16	PCI/G	J
	Ra-226	<2.7	PCI/G	U
	Sr-90	<0.70	PCI/G	R
	Th-228	1.1	PCI/G	J
	Th-230	2.3	PCI/G	J
	Th-232	1.5	PCI/G	J
	U-234	1.6	PCI/G	R
	U-235	0.090	PCI/G	J
	U-238	1.2	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ5 EAST BANK HIGH POINT	152001	596962.5344	1464276.6775	704.80

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10000.00	MG/KG	
	Arsenic	6.20	MG/KG	
	Barium	61.90	MG/KG	
	Beryllium	0.24	MG/KG	
	Calcium	90700.00	MG/KG	
	Chromium	83.10	MG/KG	
	Cobalt	8.00	MG/KG	
	Copper	20.70	MG/KG	
	Iron	16800.00	MG/KG	
	Lead	41.20	MG/KG	J
	Magnesium	19100.00	MG/KG	
	Manganese	668.00	MG/KG	
	Mercury	0.20	MG/KG	J
	Nickel	19.60	MG/KG	
	Potassium	1830.00	MG/KG	
	Sodium	148.00	MG/KG	J
	Vanadium	20.60	MG/KG	
	Zinc	77.80	MG/KG	J
Semivolatile				
	Acenaphthene	710 **	UG/KG	DJ
	Anthracene	810 **	UG/KG	DJ
	Benzo(a)anthracene	1900 **	UG/KG	D
	Benzo(a)pyrene	1700 **	UG/KG	D
	Benzo(b)fluoranthene	1600 **	UG/KG	D
	Benzo(g,h,i)perylene	2100 **	UG/KG	D
	Benzo(k)fluoranthene	1600 **	UG/KG	D
	Carbazole	730 **	UG/KG	DJ
	Chrysene	2200 **	UG/KG	D
	Dibenz(a,h)anthracene	650 **	UG/KG	DJ
	Fluoranthene	5900 **	UG/KG	D
	Fluorene	460 **	UG/KG	DJ
	Indeno(1,2,3-cd)pyrene	1800 **	UG/KG	D
	Phenanthrene	5000 **	UG/KG	D
	Pyrene	3800 **	UG/KG	E
Pesticide/PCBs				
	Dieldrin	11.	UG/KG	JP
	Endosulfan I	2.8	UG/KG	JP
	Heptachlor	0.61	UG/KG	JP
	alpha-BHC	0.90	UG/KG	JP
Radiological				
	Ac-227	<2.1	PCI/G	U
	Am-241	<0.80	PCI/G	U
	Bi-207	<1.5	PCI/G	U
	Bi-210	<0.43	PCI/G	U
	Co-60	<0.25	PCI/G	U
	Cs-137	0.52	PCI/G	J
	H-3	1.1	PCI/G	J
	K-40	11	PCI/G	J
	Pu-238	24	PCI/G	J
	Pu-239/240	0.41	PCI/G	J
	Ra-226	<3.3	PCI/G	U
	Sr-90	<0.28	PCI/G	R
	Th-228	1.1	PCI/G	J
	Th-230	1.8	PCI/G	J
	Th-232	0.73	PCI/G	J
	U-234	<0.083	PCI/G	R
	U-235	<0.062	PCI/G	U
	U-238	0.56	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ5 EAST BANK HIGH POINT	152002	596962.5344	1464276.6775	704.80

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	11400.00	MG/KG	
	Antimony	12.70	MG/KG	J
	Arsenic	6.20	MG/KG	
	Barium	85.10	MG/KG	
	Beryllium	0.37	MG/KG	
	Calcium	65900.00	MG/KG	
	Chromium	31.30	MG/KG	
	Cobalt	8.50	MG/KG	
	Copper	25.30	MG/KG	
	Iron	17400.00	MG/KG	
	Lead	37.50	MG/KG	J
	Magnesium	16800.00	MG/KG	
	Manganese	510.00	MG/KG	
	Mercury	0.28	MG/KG	J
	Nickel	20.80	MG/KG	
	Potassium	1570.00	MG/KG	
	Sodium	101.00	MG/KG	J
	Vanadium	24.10	MG/KG	
	Zinc	62.30	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	45	UG/KG	J
	Benzo(a)pyrene	57	UG/KG	J
	Benzo(b)fluoranthene	62	UG/KG	J
	Benzo(k)fluoranthene	45	UG/KG	J
	Chrysene	57	UG/KG	J
	Fluoranthene	84	UG/KG	J
	Phenanthrene	63	UG/KG	J
	Pyrene	74	UG/KG	J
Pesticide/PCBs				
	Dieldrin	4.3	UG/KG	P
Radiological				
	Ac-227	<1.6	PCI/G	U
	Am-241	<0.79	PCI/G	U
	Bi-207	<1.1	PCI/G	U
	Bi-210	<0.65	PCI/G	U
	Co-60	<0.22	PCI/G	U
	Cs-137	<0.23	PCI/G	U
	H-3	1.0	PCI/G	J
	K-40	14	PCI/G	J
	Pu-238	1.3	PCI/G	J
	Pu-239/240	0.063	PCI/G	J
	Ra-226	<3.0	PCI/G	U
	Sr-90	<0.64	PCI/G	R
	Th-228	0.99	PCI/G	J
	Th-230	1.3	PCI/G	J
	Th-232	0.66	PCI/G	J
	U-234	0.62	PCI/G	R
	U-235	0.094	PCI/G	J
	U-238	0.71	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ5 EAST BANK HIGH POINT	152003	596962.5344	1464276.6775	704.80

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9740.00	MG/KG	
	Antimony	15.20	MG/KG	J
	Arsenic	12.00	MG/KG	
	Barium	114.00	MG/KG	
	Beryllium	1.40	MG/KG	
	Calcium	32300.00	MG/KG	
	Chromium	20.40	MG/KG	
	Cobalt	10.00	MG/KG	
	Copper	26.40	MG/KG	
	Iron	16100.00	MG/KG	
	Lead	40.10	MG/KG	J
	Magnesium	9920.00	MG/KG	
	Manganese	473.00	MG/KG	
	Mercury	0.17	MG/KG	J
	Nickel	17.50	MG/KG	
	Potassium	1270.00	MG/KG	
	Sodium	118.00	MG/KG	J
	Vanadium	24.60	MG/KG	
	Zinc	49.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	39	UG/KG	J
	Benzo(a)anthracene	45	UG/KG	J
	Benzo(a)pyrene	38	UG/KG	J
	Benzo(b)fluoranthene	48	UG/KG	J
	Butylbenzylphthalate	30	UG/KG	J
	Chrysene	52	UG/KG	J
	Fluoranthene	81	UG/KG	J
	Naphthalene	31	UG/KG	J
	Phenanthrene	75	UG/KG	J
	Pyrene	72	UG/KG	J
	bis(2-Ethylhexyl)phthalate	130	UG/KG	J
Pesticide/PCBs				
	4,4'-DDT	2.4	UG/KG	JP
	Aldrin	1.8	UG/KG	JP
	Dieldrin	8.3	UG/KG	P
Radiological				
	Ac-227	<1.6	PCI/G	U
	Am-241	<1.0	PCI/G	U
	Bi-207	<1.7	PCI/G	U
	Bi-210	<0.42	PCI/G	U
	Co-60	<0.40	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	0.90	PCI/G	J
	K-40	14	PCI/G	J
	Pu-238	0.22	PCI/G	J
	Pu-239/240	<0.038	PCI/G	U
	Ra-226	<4.9	PCI/G	U
	Sr-90	<0.59	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	1.8	PCI/G	J
	Th-232	0.89	PCI/G	J
	U-234	1.3	PCI/G	R
	U-235	0.11	PCI/G	J
	U-238	0.86	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ5 EAST BANK HIGH POINT	362101	596962.5344	1464276.6775	704.80

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10800.00	MG/KG	
	Arsenic	5.00	MG/KG	
	Barium	65.00	MG/KG	
	Beryllium	0.60	MG/KG	
	Calcium	86200.00	MG/KG	
	Chromium	50.30	MG/KG	J
	Cobalt	9.60	MG/KG	
	Copper	26.70	MG/KG	J
	Iron	17800.00	MG/KG	J
	Lead	33.70	MG/KG	
	Magnesium	21800.00	MG/KG	
	Manganese	791.00	MG/KG	
	Mercury	0.09	MG/KG	J
	Nickel	17.40	MG/KG	
	Potassium	2060.00	MG/KG	
	Silver	1.10	MG/KG	
	Vanadium	22.50	MG/KG	
	Zinc	85.90	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	43 *	UG/KG	J
	Acenaphthene	130 •	UG/KG	J
	Acenaphthylene	28 *	UG/KG	J
	Anthracene	160 *	UG/KG	J
	Benzo(a)anthracene	580 *	UG/KG	J
	Benzo(a)pyrene	460 *	UG/KG	J
	Benzo(b)fluoranthene	600 *	UG/KG	J
	Benzo(g,h,i)perylene	670 •	UG/KG	J
	Benzo(k)fluoranthene	460 *	UG/KG	J
	Carbazole	200 •	UG/KG	J
	Chrysene	550 *	UG/KG	J
	Dibenzofuran	44 *	UG/KG	J
	Fluoranthene	1400 *	UG/KG	J
	Fluorene	95 •	UG/KG	J
	Indeno(1,2,3-cd)pyrene	430 *	UG/KG	J
	Isophorone	31 *	UG/KG	J
	Naphthalene	64 *	UG/KG	J
	Phenanthrene	920 *	UG/KG	J
	Pyrene	1100 •	UG/KG	J
Pesticide/PCBs				
	4,4'-DDT	3.6	UG/KG	J
	Heptachlor	1.9	UG/KG	JP
	alpha-Chlordane	2.0	UG/KG	J
Radiological				
	Ac-227	<1.3	PCI/G	U
	Am-241	<0.62	PCI/G	U
	Bi-207	<0.88	PCI/G	U
	Bi-210	<0.48	PCI/G	U
	Co-60	<0.33	PCI/G	U
	Cs-137	<0.28	PCI/G	U
	H-3	0.56	PCI/G	J
	K-40	12	PCI/G	J
	Pu-238	9.9	PCI/G	J
	Pu-239/240	<0.21	PCI/G	U
	Ra-226	<1.5	PCI/G	U
	Sr-90	<1.1	PCI/G	R
	Th-228	0.90	PCI/G	J
	Th-230	2.3	PCI/G	J
	Th-232	0.70	PCI/G	J
	U-234	1.2	PCI/G	J
	U-235	<0.17	PCI/G	U
	U-238	1.0	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ6 EAST BANK LOW POINT	162001	596948.7352	1464309.7278	698.60

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	6870.00	MG/KG	
	Antimony	23.00	MG/KG	J
	Arsenic	6.90	MG/KG	
	Barium	58.80	MG/KG	
	Beryllium	0.24	MG/KG	
	Calcium	78800.00	MG/KG	
	Chromium	10.90	MG/KG	
	Cobalt	10.10	MG/KG	
	Copper	25.30	MG/KG	
	Iron	12900.00	MG/KG	
	Lead	73.10	MG/KG	J
	Magnesium	34500.00	MG/KG	
	Manganese	500.00	MG/KG	
	Nickel	15.90	MG/KG	
	Potassium	1090.00	MG/KG	
	Sodium	123.00	MG/KG	J
	Thallium	0.28	MG/KG	
	Vanadium	19.70	MG/KG	
	Zinc	53.10	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	50	UG/KG	J
	Benzo(a)anthracene	76	UG/KG	J
	Benzo(a)pyrene	78	UG/KG	J
	Benzo(b)fluoranthene	120	UG/KG	J
	Chrysene	110	UG/KG	J
	Fluoranthene	180	UG/KG	J
	Naphthalene	40	UG/KG	J
	Phenanthrene	100	UG/KG	J
	Pyrene	150	UG/KG	J
Pesticide/PCBs				
	4,4'-DDT	1.5	UG/KG	JP
	Aldrin	6.9	UG/KG	
	Dieldrin	5.6	UG/KG	P
	Endrin	11.	UG/KG	
	Endrin ketone	2.7	UG/KG	JP
	Methoxychlor	7.4	UG/KG	J
Radiological				
	Ac-227	<1.1	PCI/G	U
	Am-241	<0.65	PCI/G	U
	Bi-207	<0.74	PCI/G	U
	Bi-210	<0.34	PCI/G	U
	Co-60	<0.16	PCI/G	U
	Cs-137	<0.25	PCI/G	U
	H-3	0.80	PCI/G	J
	K-40	5.1	PCI/G	J
	Pu-238	2.6	PCI/G	J
	Pu-239/240	0.30	PCI/G	J
	Ra-226	<1.6	PCI/G	U
	Sr-90	<0.47	PCI/G	R
	Th-228	0.80	PCI/G	J
	Th-230	1.6	PCI/G	J
	Th-232	0.41	PCI/G	J
	U-234	<0.11	PCI/G	R
	U-235	<0.086	PCI/G	U
	U-238	0.65	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ6 EAST BANK LOW POINT	162002	596948.7352	1464309.7278	698.60

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	3160.00	MG/KG	
	Antimony	20.70	MG/KG	J
	Arsenic	3.60	MG/KG	
	Barium	13.10	MG/KG	
	Calcium	123000.00	MG/KG	
	Cobalt	3.80	MG/KG	
	Copper	7.60	MG/KG	
	Iron	6740.00	MG/KG	
	Lead	5.10	MG/KG	J
	Magnesium	47100.00	MG/KG	
	Manganese	255.00	MG/KG	
	Nickel	8.80	MG/KG	
	Potassium	696.00	MG/KG	
	Sodium	179.00	MG/KG	J
	Vanadium	10.40	MG/KG	
	Zinc	24.80	MG/KG	J
Pesticide/PCBs				
	Methoxychlor	1.3	UG/KG	J
Radiological				
	Ac-227	<1.0	PCI/G	U
	Am-241	<0.54	PCI/G	U
	Bi-207	<0.57	PCI/G	U
	Bi-210	<0.24	PCI/G	U
	Co-60	<0.23	PCI/G	U
	Cs-137	<0.18	PCI/G	U
	H-3	0.26	PCI/G	J
	K-40	3.4	PCI/G	J
	Pu-238	0.52	PCI/G	J
	Pu-239/240	0.091	PCI/G	J
	Ra-226	<2.2	PCI/G	U
	Sr-90	<0.52	PCI/G	R
	Th-228	0.19	PCI/G	J
	Th-230	0.84	PCI/G	J
	Th-232	0.28	PCI/G	J
	U-234	0.59	PCI/G	J
	U-235	<0.075	PCI/G	U
	U-238	0.57	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YQ6 EAST BANK LOW POINT	162003	596948.7352	1464309.7278	698.60

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	2680.00	MG/KG	
	Arsenic	3.80	MG/KG	
	Barium	13.00	MG/KG	
	Beryllium	0.36	MG/KG	
	Calcium	133000.00	MG/KG	
	Chromium	7.20	MG/KG	
	Cobalt	3.60	MG/KG	
	Copper	8.00	MG/KG	
	Iron	5990.00	MG/KG	
	Lead	5.90	MG/KG	J
	Magnesium	45000.00	MG/KG	
	Manganese	232.00	MG/KG	
	Nickel	8.40	MG/KG	
	Sodium	156.00	MG/KG	J
	Vanadium	9.70	MG/KG	
	Zinc	22.50	MG/KG	J
Semivolatile				
	Fluoranthene	39	UG/KG	J
	Phenanthrene	31	UG/KG	J
	Pyrene	33	UG/KG	J
Radiological				
	Ac-227	<1.3	PCI/G	U
	Am-241	<0.58	PCI/G	U
	Bi-207	<0.47	PCI/G	U
	Bi-210	<0.28	PCI/G	U
	Co-60	<0.25	PCI/G	U
	Cs-137	<0.13	PCI/G	U
	H-3	0.29	PCI/G	J
	K-40	5.7	PCI/G	J
	Pu-238	3.0	PCI/G	J
	Pu-239/240	<0.062	PCI/G	U
	Ra-226	<1.6	PCI/G	U
	Sr-90	<0.46	PCI/G	R
	Th-228	0.54	PCI/G	J
	Th-230	1.4	PCI/G	J
	Th-232	0.39	PCI/G	J
	U-234	0.31	PCI/G	R
	U-235	<0.062	PCI/G	U
	U-238	0.44	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS1 WEST BANK LOW POINT	172001	596328.2155	1463982.9950	691.90

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10200.00	MG/KG	
	Antimony	11.10	MG/KG	J
	Arsenic	8.60	MG/KG	J
	Barium	107.00	MG/KG	
	Calcium	47800.00	MG/KG	
	Chromium	20.10	MG/KG	
	Cobalt	8.70	MG/KG	
	Copper	35.60	MG/KG	
	Iron	19700.00	MG/KG	
	Lead	406.00	MG/KG	J
	Magnesium	16700.00	MG/KG	
	Manganese	547.00	MG/KG	
	Mercury	0.35	MG/KG	J
	Potassium	1480.00	MG/KG	
	Sodium	102.00	MG/KG	
	Thallium	0.35	MG/KG	
	Vanadium	25.70	MG/KG	
	Zinc	130.00	MG/KG	
Semivolatile				
	Acenaphthene	64	UG/KG	J
	Acenaphthylene	300	UG/KG	J
	Anthracene	310	UG/KG	J
	Benzo(a)anthracene	920	UG/KG	
	Benzo(a)pyrene	860	UG/KG	
	Benzo(b)fluoranthene	1500	UG/KG	
	Benzo(g,h,i)perylene	560	UG/KG	
	Benzo(k)fluoranthene	2200	UG/KG	
	Carbazole	240	UG/KG	J
	Chrysene	95	UG/KG	J
	Di-n-butylphthalate	42	UG/KG	J
	Dibenz(a,h)anthracene	280	UG/KG	J
	Fluoranthene	2400	UG/KG	
	Fluorene	79	UG/KG	J
	Indeno(1,2,3-cd)pyrene	700	UG/KG	
	Phenanthrene	950	UG/KG	
	Pyrene	1400	UG/KG	
Pesticide/PCBs				
	Dieldrin	8.2	UG/KG	P
	Endosulfan I	2.9	UG/KG	P
	Endrin	8.4	UG/KG	PBY
	Heptachlor	0.74	UG/KG	JP
	Methoxychlor	4.2	UG/KG	JP
	gamma-Chlordane	2.5	UG/KG	P
Radiological				
	Ac-227	<1.5	PCI/G	U
	Am-241	<1.3	PCI/G	U
	Bi-207	<1.4	PCI/G	U
	Bi-210	<0.63	PCI/G	U
	Co-60	<0.33	PCI/G	U
	Cs-137	<0.42	PCI/G	U
	H-3	2.6	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	7.4	PCI/G	J
	Pu-239/240	<0.041	PCI/G	U
	Ra-226	<3.3	PCI/G	U
	Sr-90	<0.34	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	1.5	PCI/G	J
	Th-232	0.88	PCI/G	J
	U-234	0.41	PCI/G	J
	U-235	<0.059	PCI/G	U
	U-238	0.64	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS1 WEST BANK LOW POINT	172002	596328.2155	1463982.9950	691.90

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	8580.00	MG/KG	
	Antimony	11.70	MG/KG	J
	Arsenic	7.10	MG/KG	J
	Barium	89.80	MG/KG	
	Calcium	43800.00	MG/KG	
	Chromium	13.80	MG/KG	
	Cobalt	7.90	MG/KG	
	Copper	23.10	MG/KG	
	Iron	15100.00	MG/KG	
	Lead	159.00	MG/KG	J
	Magnesium	21300.00	MG/KG	
	Manganese	385.00	MG/KG	
	Potassium	1150.00	MG/KG	
	Sodium	103.00	MG/KG	
	Thallium	0.20	MG/KG	
	Vanadium	20.10	MG/KG	
	Zinc	83.40	MG/KG	
Semivolatile				
	Acenaphthylene	49	UG/KG	J
	Anthracene	57	UG/KG	J
	Benzo(a)anthracene	260	UG/KG	J
	Benzo(a)pyrene	290	UG/KG	J
	Benzo(b)fluoranthene	380	UG/KG	J
	Benzo(g,h,i)perylene	200	UG/KG	J
	Benzo(k)fluoranthene	270	UG/KG	J
	Chrysene	250	UG/KG	J
	Di-n-butylphthalate	62	UG/KG	J
	Fluoranthene	560	UG/KG	
	Indeno(1,2,3-cd)pyrene	240	UG/KG	J
	Phenanthrene	250	UG/KG	J
	Pyrene	400	UG/KG	
Pesticide/PCBs				
	Dieldrin	9.2	UG/KG	P
	Endrin	6.4	UG/KG	PBY
	Methoxychlor	3.0	UG/KG	JP
	gamma-Chlordane	2.8	UG/KG	P
Radiological				
	Ac-227	<1.8	PCI/G	U
	Am-241	<0.66	PCI/G	U
	Bi-207	<0.99	PCI/G	U
	Bi-210	<0.45	PCI/G	U
	Co-60	<0.23	PCI/G	U
	Cs-137	<0.31	PCI/G	U
	H-3	1.9	PCI/G	J
	K-40	10	PCI/G	J
	Pu-238	2.8	PCI/G	J
	Pu-239/240	<0.053	PCI/G	U
	Ra-226	<2.2	PCI/G	U
	Sr-90	<0.65	PCI/G	R
	Th-228	1.1	PCI/G	J
	Th-230	1.6	PCI/G	J
	Th-232	0.84	PCI/G	J
	U-234	0.68	PCI/G	J
	U-235	0.47	PCI/G	R
	U-238	0.45	PCI/G	R

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS1 WEST BANK LOW POINT	172003	596328.2155	1463982.9950	691.90

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	14700.00	MG/KG	
	Arsenic	7.20	MG/KG	J
	Barium	178.00	MG/KG	
	Calcium	14000.00	MG/KG	
	Chromium	19.30	MG/KG	
	Cobalt	12.40	MG/KG	
	Copper	27.40	MG/KG	
	Iron	25300.00	MG/KG	
	Lead	72.80	MG/KG	J
	Magnesium	7850.00	MG/KG	
	Manganese	1260.00	MG/KG	
	Potassium	2590.00	MG/KG	
	Sodium	93.60	MG/KG	
	Thallium	0.31	MG/KG	
	Vanadium	30.20	MG/KG	
	Zinc	103.00	MG/KG	
Semivolatile				
	Benzo(a)anthracene	120	UG/KG	J
	Benzo(a)pyrene	120	UG/KG	J
	Benzo(b)fluoranthene	150	UG/KG	J
	Benzo(g,h,i)perylene	140	UG/KG	J
	Benzo(k)fluoranthene	120	UG/KG	J
	Chrysene	140	UG/KG	J
	Di-n-butylphthalate	66	UG/KG	J
	Fluoranthene	250	UG/KG	J
	Indeno(1,2,3-cd)pyrene	140	UG/KG	J
	Phenanthrene	100	UG/KG	J
	Pyrene	170	UG/KG	J
Pesticide/PCBs				
	Dieldrin	8.7	UG/KG	P
	Endosulfan I	0.82	UG/KG	JP
	Endrin	5.0	UG/KG	PBY
	Methoxychlor	1.5	UG/KG	JP
	gamma-Chlordane	1.4	UG/KG	JP
Radiological				
	Ac-227	<2.3	PCI/G	U
	Am-241	<0.86	PCI/G	U
	Bi-207	<1.1	PCI/G	U
	Bi-210	<0.45	PCI/G	U
	Co-60	<0.29	PCI/G	U
	Cs-137	<0.26	PCI/G	U
	H-3	1.5	PCI/G	J
	K-40	19	PCI/G	J
	Pu-238	3.6	PCI/G	J
	Pu-239/240	<0.067	PCI/G	U
	Ra-226	<4.2	PCI/G	U
	Sr-90	<0.47	PCI/G	R
	Th-228	1.3	PCI/G	J
	Th-230	1.9	PCI/G	J
	Th-232	1.2	PCI/G	J
	U-234	0.39	PCI/G	J
	U-235	0.32	PCI/G	J
	U-238	0.60	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS2 WEST BANK HIGH POINT	182001	596317.8443	1464008.5323	699.50

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	12400.00	MG/KG	
	Arsenic	5.90	MG/KG	J
	Barium	61.60	MG/KG	
	Calcium	54600.00	MG/KG	
	Chromium	170.00	MG/KG	
	Cobalt	7.60	MG/KG	
	Copper	21.30	MG/KG	
	Iron	19500.00	MG/KG	
	Lead	61.30	MG/KG	J
	Magnesium	12600.00	MG/KG	
	Manganese	466.00	MG/KG	
	Mercury	0.20	MG/KG	J
	Potassium	2440.00	MG/KG	
	Silver	1.20	MG/KG	
	Sodium	106.00	MG/KG	
	Thallium	0.24	MG/KG	
	Vanadium	23.80	MG/KG	
	Zinc	87.40	MG/KG	
Semivolatile				
	2-Methylnaphthalene	19	UG/KG	J
	Acenaphthylene	39	UG/KG	J
	Anthracene	58	UG/KG	J
	Benzo(a)anthracene	200	UG/KG	J
	Benzo(a)pyrene	260	UG/KG	J
	Benzo(b)fluoranthene	310	UG/KG	J
	Benzo(g,h,i)perylene	210	UG/KG	J
	Benzo(k)fluoranthene	270	UG/KG	J
	Chrysene	240	UG/KG	J
	Di-n-butylphthalate	77	UG/KG	J
	Fluoranthene	460	UG/KG	
	Indeno(1,2,3-cd)pyrene	190	UG/KG	J
	Naphthalene	16	UG/KG	J
	Phenanthrene	260	UG/KG	J
	Pyrene	310	UG/KG	J
Pesticide/PCBs				
	Dieldrin	7.9	UG/KG	P
	Endrin	5.9	UG/KG	PBY
	Methoxychlor	17.	UG/KG	J
	beta-BHC	4.5	UG/KG	P
Radiological				
	Ac-227	<2.3	PCI/G	U
	Am-241	<1.2	PCI/G	U
	Bi-207	<1.1	PCI/G	U
	Bi-210	<0.53	PCI/G	U
	Co-60	<0.40	PCI/G	U
	Cs-137	<0.34	PCI/G	U
	H-3	1.4	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	0.74	PCI/G	J
	Pu-239/240	<0.078	PCI/G	U
	Ra-226	<5.1	PCI/G	U
	Sr-90	0.42	PCI/G	R
	Th-228	1.7	PCI/G	J
	Th-230	2.9	PCI/G	J
	Th-232	1.2	PCI/G	J
	U-234	0.78	PCI/G	J
	U-235	<0.071	PCI/G	U
	U-238	0.85	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS2 WEST BANK HIGH POINT	182002	596317.8443	1464008.5323	699.50

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	15000.00	MG/KG	
	Antimony	10.90	MG/KG	J
	Arsenic	5.60	MG/KG	J
	Barium	82.20	MG/KG	
	Calcium	62400.00	MG/KG	
	Chromium	334.00	MG/KG	
	Cobalt	11.30	MG/KG	
	Copper	32.10	MG/KG	
	Iron	23800.00	MG/KG	
	Lead	41.90	MG/KG	J
	Magnesium	15100.00	MG/KG	
	Manganese	517.00	MG/KG	
	Mercury	0.24	MG/KG	J
	Nickel	23.00	MG/KG	
	Potassium	2320.00	MG/KG	
	Silver	1.20	MG/KG	
	Sodium	122.00	MG/KG	
	Thallium	0.25	MG/KG	
	Vanadium	28.50	MG/KG	
	Zinc	118.00	MG/KG	
Semivolatile				
	Acenaphthylene	35	UG/KG	J
	Anthracene	45	UG/KG	J
	Benzo(a)anthracene	240	UG/KG	J
	Benzo(a)pyrene	230	UG/KG	J
	Benzo(b)fluoranthene	310	UG/KG	J
	Benzo(g,h,i)perylene	580	UG/KG	
	Benzo(k)fluoranthene	220	UG/KG	J
	Chrysene	270	UG/KG	J
	Di-n-butylphthalate	50	UG/KG	J
	Dibenz(a,h)anthracene	240	UG/KG	J
	Fluoranthene	490	UG/KG	
	Indeno(1,2,3-cd)pyrene	470	UG/KG	
	Phenanthrene	260	UG/KG	J
	Pyrene	420	UG/KG	
Pesticide/PCBs				
	Dieldrin	8.7	UG/KG	P
	Endrin	5.8	UG/KG	BY
	beta-BHC	4.5	UG/KG	P
Radiological				
	Ac-227	<1.8	PCI/G	U
	Am-241	<0.89	PCI/G	U
	Bi-207	<1.2	PCI/G	U
	Bi-210	<0.47	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.32	PCI/G	U
	H-3	1.1	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	0.87	PCI/G	J
	Pu-239/240	<0.060	PCI/G	U
	Ra-226	<3.9	PCI/G	U
	Sr-90	<1.1	PCI/G	R
	Th-228	2.1	PCI/G	J
	Th-230	2.1	PCI/G	J
	Th-232	1.3	PCI/G	J
	U-234	0.31	PCI/G	J
	U-235	<0.075	PCI/G	U
	U-238	0.79	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS2 WEST BANK HIGH POINT	182003	596317.8443	1464008.5323	699.50

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	14800.00	MG/KG	
	Arsenic	7.20	MG/KG	J
	Barium	126.00	MG/KG	
	Calcium	32900.00	MG/KG	
	Chromium	26.20	MG/KG	
	Cobalt	11.60	MG/KG	
	Copper	41.80	MG/KG	
	Iron	23400.00	MG/KG	
	Lead	48.90	MG/KG	J
	Magnesium	14100.00	MG/KG	
	Manganese	665.00	MG/KG	
	Mercury	0.32	MG/KG	J
	Potassium	1940.00	MG/KG	
	Sodium	89.60	MG/KG	
	Thallium	0.32	MG/KG	
	Vanadium	30.30	MG/KG	
	Zinc	90.40	MG/KG	
Semivolatile				
	Benzo(a)anthracene	90	UG/KG	J
	Benzo(a)pyrene	100	UG/KG	J
	Benzo(g,h,i)perylene	100	UG/KG	J
	Benzo(k)fluoranthene	160	UG/KG	J
	Chrysene	120	UG/KG	J
	Di-n-butylphthalate	39	UG/KG	J
	Fluoranthene	170	UG/KG	J
	Indeno(1,2,3-cd)pyrene	88	UG/KG	J
	Phenanthrene	82	UG/KG	J
	Pyrene	160	UG/KG	J
Pesticide/PCBs				
	Dieldrin	10.	UG/KG	
	Methoxychlor	2.1	UG/KG	JP
Radiological				
	Ac-227	<1.6	PCI/G	U
	Am-241	<1.2	PCI/G	U
	Bi-207	<1.8	PCI/G	U
	Bi-210	<0.76	PCI/G	U
	Co-60	<0.35	PCI/G	U
	Cs-137	<0.38	PCI/G	U
	H-3	0.93	PCI/G	J
	K-40	13	PCI/G	J
	Pu-238	1.1	PCI/G	J
	Pu-239/240	<0.041	PCI/G	U
	Ra-226	<6.2	PCI/G	U
	Sr-90	<0.72	PCI/G	R
	Th-228	1.5	PCI/G	J
	Th-230	2.5	PCI/G	J
	Th-232	1.1	PCI/G	J
	U-234	0.62	PCI/G	J
	U-235	<0.074	PCI/G	U
	U-238	0.90	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS4 EAST CANAL POINT	202001	596311.8416	1464042.8995	695.90

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	15600.00	MG/KG	
	Arsenic	6.90	MG/KG	J
	Barium	97.30	MG/KG	
	Calcium	51600.00	MG/KG	
	Chromium	88.90	MG/KG	
	Cobalt	10.40	MG/KG	
	Copper	56.00	MG/KG	
	Iron	25100.00	MG/KG	
	Lead	41.10	MG/KG	
	Magnesium	16500.00	MG/KG	
	Manganese	713.00	MG/KG	J
	Mercury	0.42	MG/KG	J
	Nickel	22.90	MG/KG	
	Potassium	2640.00	MG/KG	
	Silver	3.10	MG/KG	
	Sodium	148.00	MG/KG	
	Vanadium	29.30	MG/KG	
	Zinc	140.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	17	UG/KG	J
	Acenaphthene	34	UG/KG	J
	Acenaphthylene	33	UG/KG	J
	Anthracene	67	UG/KG	J
	Benzo(a)anthracene	420	UG/KG	
	Benzo(a)pyrene	390	UG/KG	J
	Benzo(b)fluoranthene	400	UG/KG	J
	Benzo(g,h,i)perylene	410	UG/KG	J
	Benzo(k)fluoranthene	630	UG/KG	
	Carbazole	110	UG/KG	J
	Chrysene	460	UG/KG	
	Dibenzofuran	18	UG/KG	J
	Fluoranthene	960	UG/KG	
	Fluorene	30	UG/KG	J
	Indeno(1,2,3-cd)pyrene	390	UG/KG	J
	Naphthalene	16	UG/KG	J
	Phenanthrene	460	UG/KG	
	Pyrene	870	UG/KG	
Pesticide/PCBs				
	Aroclor-1254	140.	UG/KG	P
	Endrin	14.	UG/KG	X
	alpha-BHC	0.93	UG/KG	JPX
	alpha-Chlordane	4.0	UG/KG	PX
Radiological				
	Ac-227	<2.1	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.59	PCI/G	U
	Co-60	<0.48	PCI/G	U
	Cs-137	0.46	PCI/G	J
	H-3	6.0	PCI/G	J
	K-40	14	PCI/G	J
	Pu-238	410	PCI/G	J
	Pu-239/240	3.8	PCI/G	J
	Ra-226	<3.8	PCI/G	U
	Sr-90	0.88	PCI/G	R
	Th-228	2.1	PCI/G	J
	Th-230	5.7	PCI/G	J
	Th-232	2.2	PCI/G	J
	U-234	1.1	PCI/G	J
	U-235	<0.19	PCI/G	U
	U-238	0.96	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS4 EAST CANAL POINT	202002	596311.8416	1464042.8995	695.90

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	24500.00	MG/KG	
	Arsenic	9.60	MG/KG	J
	Barium	102.00	MG/KG	
	Calcium	29600.00	MG/KG	
	Chromium	38.50	MG/KG	
	Cobalt	14.40	MG/KG	
	Copper	27.70	MG/KG	
	Iron	36600.00	MG/KG	
	Lead	27.20	MG/KG	
	Magnesium	9830.00	MG/KG	
	Manganese	600.00	MG/KG	J
	Nickel	33.10	MG/KG	
	Potassium	4360.00	MG/KG	
	Sodium	428.00	MG/KG	
	Vanadium	36.90	MG/KG	
	Zinc	102.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	28	UG/KG	J
	Anthracene	23	UG/KG	J
	Benzo(a)anthracene	120	UG/KG	J
	Benzo(a)pyrene	110	UG/KG	J
	Benzo(b)fluoranthene	150	UG/KG	J
	Chrysene	160	UG/KG	J
	Fluoranthene	320	UG/KG	J
	Indeno(1,2,3-cd)pyrene	120	UG/KG	J
	Naphthalene	22	UG/KG	J
	Phenanthrene	160	UG/KG	J
	Pyrene	260	UG/KG	J
Pesticide/PCBs				
	Aroclor-1254	41.	UG/KG	JP
	Dieldrin	9.5	UG/KG	PX
	Endrin	6.1	UG/KG	PX
	alpha-Chlordane	1.8	UG/KG	JX
Radiological				
	Ac-227	<2.4	PCI/G	U
	Am-241	<1.2	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.63	PCI/G	U
	Co-60	<0.36	PCI/G	U
	Cs-137	<0.66	PCI/G	U
	H-3	3.7	PCI/G	J
	K-40	26	PCI/G	J
	Pu-238	140	PCI/G	J
	Pu-239/240	1.5	PCI/G	J
	Ra-226	<4.9	PCI/G	U
	Sr-90	1.2	PCI/G	R
	Th-228	2.0	PCI/G	J
	Th-230	3.8	PCI/G	J
	Th-232	1.6	PCI/G	J
	U-234	1.3	PCI/G	J
	U-235	<0.14	PCI/G	U
	U-238	1.4	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS4 EAST CANAL POINT	202003	596311.8416	1464042.8995	695.90

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	19400.00	MG/KG	
	Arsenic	7.00	MG/KG	J
	Barium	109.00	MG/KG	
	Cadmium	1.30	MG/KG	
	Calcium	17400.00	MG/KG	
	Chromium	30.40	MG/KG	
	Cobalt	11.80	MG/KG	
	Copper	35.60	MG/KG	
	Iron	28200.00	MG/KG	
	Lead	24.90	MG/KG	
	Magnesium	8680.00	MG/KG	
	Manganese	446.00	MG/KG	J
	Mercury	0.17	MG/KG	J
	Nickel	28.60	MG/KG	
	Potassium	2720.00	MG/KG	
	Sodium	614.00	MG/KG	
	Vanadium	35.20	MG/KG	
	Zinc	111.00	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	110	UG/KG	J
	Benzo(b)fluoranthene	130	UG/KG	J
	Benzo(k)fluoranthene	120	UG/KG	J
	Chrysene	150	UG/KG	J
	Fluoranthene	250	UG/KG	J
	Phenanthrene	100	UG/KG	J
	Pyrene	200	UG/KG	J
Pesticide/PCBs				
	Dieldrin	0.72	UG/KG	JP
	Endrin	5.5	UG/KG	
	alpha-Chlordane	1.4	UG/KG	J
Radiological				
	Ac-227	<2.4	PCI/G	U
	Am-241	<1.3	PCI/G	U
	Bi-207	<1.2	PCI/G	U
	Bi-210	<0.78	PCI/G	U
	Co-60	<0.51	PCI/G	U
	Cs-137	<0.32	PCI/G	U
	H-3	4.8	PCI/G	J
	K-40	28	PCI/G	J
	Pu-238	42	PCI/G	J
	Pu-239/240	0.46	PCI/G	J
	Ra-226	<4.5	PCI/G	U
	Sr-90	<0.94	PCI/G	R
	Th-228	1.8	PCI/G	J
	Th-230	3.1	PCI/G	J
	Th-232	1.5	PCI/G	J
	U-234	1.9	PCI/G	J
	U-235	<0.19	PCI/G	U
	U-238	1.6	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS4 EAST CANAL POINT	202004	596311.8416	1464042.8995	695.90

Depth: 3.0 TO 4.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	17300.00	MG/KG	
	Arsenic	6.00	MG/KG	J
	Barium	110.00	MG/KG	
	Cadmium	0.91	MG/KG	
	Calcium	13600.00	MG/KG	
	Chromium	22.40	MG/KG	
	Cobalt	10.50	MG/KG	
	Copper	30.80	MG/KG	
	Iron	24900.00	MG/KG	
	Lead	22.30	MG/KG	
	Magnesium	6980.00	MG/KG	
	Manganese	369.00	MG/KG	J
	Mercury	0.19	MG/KG	J
	Nickel	25.80	MG/KG	
	Potassium	2140.00	MG/KG	
	Sodium	552.00	MG/KG	
	Thallium	0.16	MG/KG	J
	Vanadium	31.60	MG/KG	
	Zinc	86.10	MG/KG	J
Semivolatile				
	Fluoranthene	27	UG/KG	J
	Pyrene	28	UG/KG	J
Radiological				
	Ac-227	<2.1	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<2.2	PCI/G	U
	Bi-210	<0.52	PCI/G	U
	Co-60	<0.44	PCI/G	U
	Cs-137	<0.36	PCI/G	U
	H-3	5.7	PCI/G	J
	K-40	20	PCI/G	J
	Pu-238	28	PCI/G	J
	Pu-239/240	1.7	PCI/G	J
	Ra-226	<3.0	PCI/G	U
	Sr-90	<1.3	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	3.8	PCI/G	J
	Th-232	1.3	PCI/G	J
	U-234	0.94	PCI/G	J
	U-235	<0.14	PCI/G	U
	U-238	1.3	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS4 EAST CANAL POINT	202005	596311.8416	1464042.8995	695.90

Depth: 4.0 TO 5.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	19200.00	MG/KG	
	Arsenic	7.60	MG/KG	J
	Barium	124.00	MG/KG	
	Cadmium	1.70	MG/KG	
	Calcium	19100.00	MG/KG	
	Chromium	23.80	MG/KG	
	Cobalt	10.20	MG/KG	
	Copper	53.30	MG/KG	
	Iron	26500.00	MG/KG	
	Lead	28.50	MG/KG	
	Magnesium	9910.00	MG/KG	
	Manganese	347.00	MG/KG	J
	Mercury	0.34	MG/KG	J
	Nickel	25.20	MG/KG	
	Potassium	2320.00	MG/KG	
	Sodium	576.00	MG/KG	
	Thallium	0.29	MG/KG	J
	Vanadium	37.50	MG/KG	
	Zinc	111.00	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	42	UG/KG	J
	Fluoranthene	77	UG/KG	J
	Phenanthrene	39	UG/KG	J
	Pyrene	94	UG/KG	J
Pesticide/PCBs				
	Methoxychlor	3.7	UG/KG	JP
Radiological				
	Ac-227	<2.7	PCI/G	U
	Am-241	<1.2	PCI/G	U
	Bi-207	<1.4	PCI/G	U
	Bi-210	<0.64	PCI/G	U
	Co-60	<0.35	PCI/G	U
	Cs-137	<0.40	PCI/G	U
	H-3	6.5	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	27	PCI/G	J
	Pu-239/240	0.33	PCI/G	J
	Ra-226	<6.0	PCI/G	U
	Sr-90	<1.1	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	3.1	PCI/G	J
	Th-232	1.1	PCI/G	J
	U-234	2.4	PCI/G	J
	U-235	<0.17	PCI/G	U
	U-238	2.2	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS4 EAST CANAL POINT	372101	596311.8416	1464042.8995	695.90

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	15600.00	MG/KG	
	Arsenic	5.50	MG/KG	
	Barium	88.20	MG/KG	
	Beryllium	0.80	MG/KG	
	Cadmium	1.30	MG/KG	
	Calcium	75800.00	MG/KG	
	Chromium	51.90	MG/KG	J
	Cobalt	9.80	MG/KG	
	Copper	79.30	MG/KG	J
	Iron	22900.00	MG/KG	J
	Lead	112.00	MG/KG	
	Magnesium	23500.00	MG/KG	
	Manganese	638.00	MG/KG	
	Mercury	0.39	MG/KG	J
	Nickel	19.00	MG/KG	
	Potassium	3660.00	MG/KG	
	Silver	6.00	MG/KG	
	Sodium	204.00	MG/KG	
	Vanadium	30.20	MG/KG	
	Zinc	179.00	MG/KG	J
Semivolatile				
	Acenaphthene	55	UG/KG	J
	Acenaphthylene	46	UG/KG	J
	Anthracene	140	UG/KG	J
	Benzo(a)anthracene	730	UG/KG	
	Benzo(a)pyrene	760	UG/KG	
	Benzo(b)fluoranthene	640	UG/KG	
	Benzo(g,h,i)perylene	490	UG/KG	
	Benzo(k)fluoranthene	1100	UG/KG	J
	Carbazole	150	UG/KG	J
	Chrysene	770	UG/KG	
	Dibenz(a,h)anthracene	160	UG/KG	J
	Fluoranthene	1400	UG/KG	J
	Fluorene	54	UG/KG	J
	Indeno(1,2,3-cd)pyrene	210	UG/KG	J
	Phenanthrene	850	UG/KG	
	Pyrene	1400	UG/KG	
Pesticide/PCBs				
	4,4'-DDD	1.2	UG/KG	JXP
	4,4'-DDT	5.6	UG/KG	JXP
	Aroclor-1254	260.	UG/KG	
	Dieldrin	6.6	UG/KG	JXP
	Endrin	24.	UG/KG	JXP
	alpha-Chlordane	6.6	UG/KG	JXP
Radiological				
	Ac-227	<2.0	PCI/G	U
	Am-241	<1.3	PCI/G	U
	Bi-207	<0.66	PCI/G	U
	Bi-210	<0.44	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.60	PCI/G	U
	H-3	5.8	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	520	PCI/G	J
	Pu-239/240	4.3	PCI/G	J
	Ra-226	<2.4	PCI/G	U
	Sr-90	4.0	PCI/G	R
	Th-228	3.4	PCI/G	R
	Th-230	3.1	PCI/G	J
	Th-232	1.5	PCI/G	J
	U-234	1.3	PCI/G	J
	U-235	0.22	PCI/G	J
	U-238	1.2	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS3 WEST CANAL POINT	192001	596308.3974	1464033.3336	694.50

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	2980.00	MG/KG	
	Arsenic	2.50	MG/KG	J
	Barium	27.10	MG/KG	
	Calcium	117000.00	MG/KG	
	Chromium	31.40	MG/KG	
	Cobalt	2.70	MG/KG	
	Copper	42.70	MG/KG	
	Iron	7560.00	MG/KG	
	Lead	13.80	MG/KG	
	Magnesium	27100.00	MG/KG	
	Manganese	273.00	MG/KG	J
	Nickel	6.70	MG/KG	
	Potassium	588.00	MG/KG	
	Silver	1.40	MG/KG	
	Sodium	322.00	MG/KG	
	Vanadium	8.80	MG/KG	
	Zinc	92.20	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	38	UG/KG	J
	Acenaphthene	230	UG/KG	J
	Acenaphthylene	120	UG/KG	J
	Anthracene	390	UG/KG	J
	Benzo(a)anthracene	1400	UG/KG	
	Benzo(a)pyrene	1100	UG/KG	J
	Benzo(b)fluoranthene	1300	UG/KG	
	Benzo(g,h,i)perylene	370	UG/KG	J
	Benzo(k)fluoranthene	1400	UG/KG	
	Carbazole	320	UG/KG	J
	Chrysene	1300	UG/KG	
	Dibenzofuran	120	UG/KG	J
	Fluoranthene	2300	UG/KG	
	Fluorene	230	UG/KG	J
	Indeno(1,2,3-cd)pyrene	560	UG/KG	
	Naphthalene	56	UG/KG	J
	Phenanthrene	2300	UG/KG	
	Pyrene	2700	UG/KG	
Pesticide/PCBs				
	Aldrin	3.2	UG/KG	PX
	Aroclor-1248	260.	UG/KG	P
	Endrin	14.	UG/KG	PX
	alpha-Chlordane	9.1	UG/KG	PX
Radiological				
	Ac-227	<1.2	PCI/G	U
	Am-241	<0.66	PCI/G	U
	Bi-207	<0.98	PCI/G	U
	Bi-210	<0.28	PCI/G	U
	Co-60	<0.26	PCI/G	U
	Cs-137	<0.21	PCI/G	U
	H-3	8.1	PCI/G	J
	K-40	8.0	PCI/G	J
	Pu-238	420	PCI/G	J
	Pu-239/240	4.3	PCI/G	J
	Ra-226	<1.3	PCI/G	U
	Sr-90	<0.50	PCI/G	R
	Th-228	1.5	PCI/G	J
	Th-230	2.7	PCI/G	J
	Th-232	0.65	PCI/G	J
	U-234	1.4	PCI/G	J
	U-235	<0.17	PCI/G	U
	U-238	0.76	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS3 WEST CANAL POINT	192002	596308.3974	1464033.3336	694.50

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	7930.00	MG/KG	
	Arsenic	5.10	MG/KG	J
	Barium	52.90	MG/KG	
	Cadmium	0.89	MG/KG	
	Calcium	101000.00	MG/KG	
	Chromium	39.70	MG/KG	
	Cobalt	5.20	MG/KG	
	Copper	53.80	MG/KG	
	Iron	13300.00	MG/KG	
	Lead	27.40	MG/KG	
	Magnesium	29600.00	MG/KG	
	Manganese	332.00	MG/KG	J
	Nickel	16.10	MG/KG	
	Potassium	1240.00	MG/KG	
	Silver	2.30	MG/KG	
	Sodium	435.00	MG/KG	
	Vanadium	17.90	MG/KG	
	Zinc	129.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	69	UG/KG	J
	Acenaphthene	270	UG/KG	J
	Acenaphthylene	190	UG/KG	J
	Anthracene	540	UG/KG	J
	Benzo(a)anthracene	2800	UG/KG	
	Benzo(a)pyrene	2000	UG/KG	
	Benzo(b)fluoranthene	2600	UG/KG	
	Benzo(g,h,i)perylene	1600	UG/KG	
	Benzo(k)fluoranthene	1700	UG/KG	
	Chrysene	2400	UG/KG	
	Dibenzofuran	140	UG/KG	J
	Fluoranthene	5100	UG/KG	
	Fluorene	280	UG/KG	J
	Naphthalene	69	UG/KG	J
	Phenanthrene	3100	UG/KG	
	Pyrene	6100	UG/KG	
	Toluene	0.4	UG/KG	
Pesticide/PCBs				
	Aroclor-1248	230.	UG/KG	P
	Endrin ketone	15.	UG/KG	JP
	alpha-Chlordane	7.1	UG/KG	X
Radiological				
	Ac-227	<1.9	PCI/G	U
	Am-241	<0.85	PCI/G	U
	Bi-207	<0.64	PCI/G	U
	Bi-210	<0.38	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	8.4	PCI/G	J
	K-40	8.9	PCI/G	J
	Pu-238	180	PCI/G	J
	Pu-239/240	2.5	PCI/G	J
	Ra-226	<3.1	PCI/G	U
	Sr-90	<0.68	PCI/G	R
	Th-228	0.98	PCI/G	J
	Th-230	2.1	PCI/G	J
	Th-232	0.81	PCI/G	J
	U-234	1.3	PCI/G	J
	U-235	<0.16	PCI/G	U
	U-238	0.86	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS3 WEST CANAL POINT	192003	596308.3974	1464033.3336	694.50

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	16700.00	MG/KG	
	Arsenic	3.90	MG/KG	J
	Barium	96.80	MG/KG	
	Calcium	53800.00	MG/KG	
	Chromium	26.00	MG/KG	
	Cobalt	8.50	MG/KG	
	Copper	30.90	MG/KG	
	Iron	23200.00	MG/KG	
	Lead	20.50	MG/KG	
	Magnesium	17000.00	MG/KG	
	Manganese	463.00	MG/KG	J
	Nickel	20.70	MG/KG	
	Potassium	2250.00	MG/KG	
	Sodium	617.00	MG/KG	
	Vanadium	32.30	MG/KG	
	Zinc	89.60	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	130	UG/KG	J
	Acenaphthene	100	UG/KG	J
	Anthracene	320	UG/KG	J
	Benzo(a)anthracene	750	UG/KG	
	Benzo(a)pyrene	440	UG/KG	
	Benzo(b)fluoranthene	350	UG/KG	J
	Benzo(k)fluoranthene	300	UG/KG	J
	Chrysene	830	UG/KG	
	Dibenzofuran	43	UG/KG	J
	Fluoranthene	950	UG/KG	
	Fluorene	62	UG/KG	J
	Naphthalene	61	UG/KG	J
	Phenanthrene	470	UG/KG	
	Pyrene	3300	UG/KG	
Pesticide/PCBs				
	Aroclor-1248	62.	UG/KG	P
	Endrin ketone	2.5	UG/KG	JP
	alpha-Chlordane	2.6	UG/KG	PX
Radiological				
	Ac-227	<1.5	PCI/G	U
	Am-241	<0.82	PCI/G	U
	Bi-207	<0.93	PCI/G	U
	Bi-210	<0.44	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	5.5	PCI/G	J
	K-40	12	PCI/G	J
	Pu-238	87	PCI/G	J
	Pu-239/240	0.96	PCI/G	J
	Ra-226	<2.7	PCI/G	U
	Sr-90	<0.94	PCI/G	R
	Th-228	0.89	PCI/G	J
	Th-230	1.6	PCI/G	J
	Th-232	1.1	PCI/G	J
	U-234	2.0	PCI/G	J
	U-235	<0.13	PCI/G	U
	U-238	0.98	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS5 EAST BANK HIGH POINT	212001	596304.8269	1464054.7513	701.20

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	21100.00	MG/KG	
	Antimony	12.30	MG/KG	J
	Arsenic	7.80	MG/KG	
	Barium	114.00	MG/KG	
	Beryllium	1.10	MG/KG	
	Calcium	13400.00	MG/KG	
	Chromium	39.90	MG/KG	
	Cobalt	13.60	MG/KG	
	Copper	25.70	MG/KG	
	Iron	32000.00	MG/KG	
	Lead	34.10	MG/KG	J
	Magnesium	7420.00	MG/KG	
	Manganese	547.00	MG/KG	
	Mercury	0.14	MG/KG	J
	Nickel	31.50	MG/KG	
	Potassium	3420.00	MG/KG	
	Sodium	76.90	MG/KG	J
	Thallium	0.30	MG/KG	
	Vanadium	39.00	MG/KG	
	Zinc	97.50	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	25	UG/KG	J
	Acenaphthylene	19	UG/KG	J
	Anthracene	27	UG/KG	J
	Benzo(a)anthracene	110	UG/KG	J
	Benzo(a)pyrene	120	UG/KG	J
	Benzo(b)fluoranthene	170	UG/KG	J
	Benzo(g,h,i)perylene	96	UG/KG	J
	Benzo(k)fluoranthene	210	UG/KG	J
	Chrysene	150	UG/KG	J
	Fluoranthene	260	UG/KG	J
	Indeno(1,2,3-cd)pyrene	120	UG/KG	J
	Methylene Chloride	2	UG/KG	J
	Naphthalene	23	UG/KG	J
	Phenanthrene	140	UG/KG	J
	Pyrene	210	UG/KG	J
Pesticide/PCBs				
	Dieldrin	3.5	UG/KG	JP
Radiological				
	Ac-227	<2.7	PCI/G	U
	Am-241	<0.95	PCI/G	U
	Bi-207	<1.9	PCI/G	U
	Bi-210	<0.56	PCI/G	U
	Co-60	<0.44	PCI/G	U
	Cs-137	<0.26	PCI/G	U
	H-3	1.7	PCI/G	J
	K-40	20	PCI/G	J
	Pu-238	38	PCI/G	J
	Pu-239/240	0.24	PCI/G	J
	Ra-226	<4.1	PCI/G	U
	Sr-90	0.27	PCI/G	R
	Th-228	2.0	PCI/G	J
	Th-230	2.0	PCI/G	J
	Th-232	1.1	PCI/G	J
	U-234	0.54	PCI/G	R
	U-235	<0.047	PCI/G	U
	U-238	0.37	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS5 EAST BANK HIGH POINT	212002	596304.8269	1464054.7513	701.20

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	17700.00	MG/KG	
	Antimony	14.80	MG/KG	J
	Arsenic	6.30	MG/KG	
	Barium	76.10	MG/KG	
	Beryllium	0.47	MG/KG	
	Calcium	62100.00	MG/KG	
	Chromium	43.70	MG/KG	
	Cobalt	11.70	MG/KG	
	Copper	24.30	MG/KG	
	Iron	29400.00	MG/KG	
	Lead	45.80	MG/KG	J
	Magnesium	14400.00	MG/KG	
	Manganese	588.00	MG/KG	
	Mercury	0.39	MG/KG	J
	Nickel	27.30	MG/KG	
	Potassium	3310.00	MG/KG	
	Sodium	135.00	MG/KG	J
	Vanadium	29.00	MG/KG	
	Zinc	88.60	MG/KG	J
Semivolatile				
	Acenaphthene	32	UG/KG	J
	Acenaphthylene	23	UG/KG	J
	Anthracene	60	UG/KG	J
	Benzo(a)anthracene	280	UG/KG	J
	Benzo(a)pyrene	340	UG/KG	J
	Benzo(b)fluoranthene	370	UG/KG	J
	Benzo(g,h,i)perylene	200	UG/KG	J
	Benzo(k)fluoranthene	400	UG/KG	J
	Chrysene	350	UG/KG	J
	Dibenz(a,h)anthracene	92	UG/KG	J
	Fluoranthene	820	UG/KG	
	Indeno(1,2,3-cd)pyrene	270	UG/KG	J
	Phenanthrene	430	UG/KG	
	Pyrene	540	UG/KG	
Pesticide/PCBs				
	Aroclor-1254	200.	UG/KG	JP
	Endrin	20.	UG/KG	JPX
	alpha-Chlordane	7.8	UG/KG	JPX
Radiological				
	Ac-227	<2.3	PCI/G	U
	Am-241	<1.5	PCI/G	U
	Bi-207	<2.5	PCI/G	U
	Bi-210	<0.63	PCI/G	U
	Co-60	<0.61	PCI/G	U
	Cs-137	<0.43	PCI/G	U
	H-3	1.7	PCI/G	J
	K-40	23	PCI/G	J
	Pu-238	300	PCI/G	J
	Pu-239/240	2.1	PCI/G	J
	Ra-226	<6.0	PCI/G	U
	Sr-90	0.90	PCI/G	R
	Th-228	8.7	PCI/G	J
	Th-230	3.8	PCI/G	J
	Th-232	1.8	PCI/G	J
	U-234	0.67	PCI/G	R
	U-235	0.094	PCI/G	J
	U-238	0.49	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS5 EAST BANK HIGH POINT	212003	596304.8269	1464054.7513	701.20

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	17900.00	MG/KG	
	Antimony	13.10	MG/KG	J
	Arsenic	7.50	MG/KG	
	Barium	108.00	MG/KG	
	Beryllium	0.51	MG/KG	
	Calcium	27600.00	MG/KG	
	Chromium	55.40	MG/KG	
	Cobalt	12.20	MG/KG	
	Copper	32.00	MG/KG	
	Iron	27700.00	MG/KG	
	Lead	36.70	MG/KG	J
	Magnesium	9840.00	MG/KG	
	Manganese	577.00	MG/KG	
	Mercury	0.28	MG/KG	J
	Nickel	28.00	MG/KG	
	Potassium	2300.00	MG/KG	
	Sodium	101.00	MG/KG	J
	Thallium	0.35	MG/KG	J
	Vanadium	33.90	MG/KG	
	Zinc	109.00	MG/KG	J
Semivolatile				
	Anthracene	31	UG/KG	J
	Benzo(a)anthracene	110	UG/KG	J
	Benzo(a)pyrene	130	UG/KG	J
	Benzo(b)fluoranthene	170	UG/KG	J
	Benzo(k)fluoranthene	130	UG/KG	J
	Chrysene	150	UG/KG	J
	Fluoranthene	300	UG/KG	J
	Indeno(1,2,3-cd)pyrene	120	UG/KG	J
	Methylene Chloride	3	UG/KG	J
	Phenanthrene	160	UG/KG	J
	Pyrene	230	UG/KG	J
Pesticide/PCBs				
	Dieldrin	1.3	UG/KG	JP
	Endrin	8.8	UG/KG	J
	Methoxychlor	1.5	UG/KG	JP
	alpha-Chlordane	1.6	UG/KG	JP
Radiological				
	Ac-227	<2.1	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<2.3	PCI/G	U
	Bi-210	<0.46	PCI/G	U
	Co-60	<0.37	PCI/G	U
	Cs-137	<0.59	PCI/G	U
	H-3	1.8	PCI/G	J
	K-40	17	PCI/G	J
	Pu-238	130	PCI/G	J
	Pu-239/240	5.1	PCI/G	J
	Ra-226	<3.6	PCI/G	U
	Sr-90	0.65	PCI/G	R
	Th-228	3.3	PCI/G	J
	Th-230	3.4	PCI/G	J
	Th-232	1.8	PCI/G	J
	U-234	1.2	PCI/G	R
	U-235	0.35	PCI/G	J
	U-238	1.2	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS5 EAST BANK HIGH POINT	382101	596304.8269	1464054.7513	701.20

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	27000.00	MG/KG	
	Arsenic	7.70	MG/KG	
	Barium	124.00	MG/KG	
	Beryllium	1.30	MG/KG	
	Calcium	29000.00	MG/KG	
	Chromium	82.90	MG/KG	J
	Cobalt	13.70	MG/KG	
	Copper	32.10	MG/KG	J
	Iron	33700.00	MG/KG	J
	Lead	31.00	MG/KG	
	Magnesium	10900.00	MG/KG	
	Manganese	736.00	MG/KG	
	Mercury	0.16	MG/KG	J
	Nickel	33.90	MG/KG	
	Potassium	5150.00	MG/KG	
	Vanadium	48.90	MG/KG	
	Zinc	118.00	MG/KG	J
Semivolatile				
	Benzo(a)pyrene	76	UG/KG	J
	Benzo(b)fluoranthene	120	UG/KG	J
	Benzo(k)fluoranthene	74	UG/KG	J
	Chrysene	91	UG/KG	J
	Fluoranthene	150	UG/KG	J
	Phenanthrene	93	UG/KG	J
	Pyrene	130	UG/KG	J
Pesticide/PCBs				
	4,4'-DDT	1.6	UG/KG	JXP
	Aroclor-1254	26.	UG/KG	JP
	alpha-Chlordane	0.62	UG/KG	JXP
Radiological				
	Ac-227	<2.3	PCI/G	U
	Am-241	<1.6	PCI/G	U
	Bi-207	<1.7	PCI/G	U
	Bi-210	<0.58	PCI/G	U
	Co-60	<0.53	PCI/G	U
	Cs-137	<0.65	PCI/G	U
	H-3	1.1	PCI/G	J
	K-40	23	PCI/G	J
	Pu-238	230	PCI/G	J
	Pu-239/240	3.3	PCI/G	J
	Ra-226	<5.0	PCI/G	U
	Sr-90	1.0	PCI/G	R
	Th-228	2.7	PCI/G	J
	Th-230	4.1	PCI/G	J
	Th-232	2.1	PCI/G	J
	U-234	1.6	PCI/G	J
	U-235	0.28	PCI/G	J
	U-238	0.79	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS6 EAST BANK LOW POINT	222001	596301.3654	1464064.4647	700.40

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	14400.00	MG/KG	
	Antimony	9.80	MG/KG	J
	Arsenic	7.70	MG/KG	
	Barium	130.00	MG/KG	
	Beryllium	0.55	MG/KG	
	Calcium	22100.00	MG/KG	
	Chromium	28.60	MG/KG	
	Cobalt	9.50	MG/KG	
	Copper	39.20	MG/KG	
	Iron	21700.00	MG/KG	
	Lead	74.10	MG/KG	J
	Magnesium	9090.00	MG/KG	
	Manganese	470.00	MG/KG	
	Mercury	0.46	MG/KG	J
	Nickel	23.40	MG/KG	
	Potassium	2240.00	MG/KG	
	Sodium	70.90	MG/KG	J
	Thallium	0.38	MG/KG	J
	Vanadium	29.70	MG/KG	
	Zinc	99.30	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	50	UG/KG	J
	Acenaphthylene	21	UG/KG	J
	Anthracene	28	UG/KG	J
	Benzo(a)anthracene	120	UG/KG	J
	Benzo(a)pyrene	140	UG/KG	J
	Benzo(g,h,i)perylene	81	UG/KG	J
	Benzo(k)fluoranthene	180	UG/KG	J
	Chrysene	160	UG/KG	J
	Fluoranthene	280	UG/KG	J
	Indeno(1,2,3-cd)pyrene	140	UG/KG	J
	Methylene Chloride	3	UG/KG	J
	Naphthalene	39	UG/KG	J
	Phenanthrene	150	UG/KG	J
	Pyrene	220	UG/KG	J
Pesticide/PCBs				
	4,4'-DDT	2.6	UG/KG	JP
	Dieldrin	11.	UG/KG	JP
	Endosulfan I	2.9	UG/KG	JP
	alpha-Chlordane	1.3	UG/KG	JP
Radiological				
	Ac-227	<2.2	PCI/G	U
	Am-241	<0.91	PCI/G	U
	Bi-207	<1.4	PCI/G	U
	Bi-210	<0.45	PCI/G	U
	Co-60	<0.39	PCI/G	U
	Cs-137	0.34	PCI/G	J
	H-3	1.5	PCI/G	J
	K-40	14	PCI/G	J
	Pu-238	1.4	PCI/G	J
	Pu-239/240	0.047	PCI/G	J
	Ra-226	<2.9	PCI/G	U
	Sr-90	<1.0	PCI/G	R
	Th-228	0.89	PCI/G	J
	Th-230	1.3	PCI/G	J
	Th-232	0.84	PCI/G	J
	U-234	0.58	PCI/G	R
	U-235	<0.064	PCI/G	U
	U-238	0.92	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS6 EAST BANK LOW POINT	222002	596301.3654	1464064.4647	700.40

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	12200.00	MG/KG	
	Antimony	12.00	MG/KG	J
	Arsenic	6.60	MG/KG	
	Barium	134.00	MG/KG	
	Beryllium	0.55	MG/KG	
	Calcium	24600.00	MG/KG	
	Chromium	19.00	MG/KG	
	Cobalt	8.70	MG/KG	
	Copper	27.60	MG/KG	
	Iron	19400.00	MG/KG	
	Lead	51.90	MG/KG	J
	Magnesium	9090.00	MG/KG	
	Manganese	458.00	MG/KG	
	Mercury	0.74	MG/KG	J
	Nickel	21.30	MG/KG	
	Potassium	1530.00	MG/KG	
	Sodium	59.20	MG/KG	J
	Thallium	0.31	MG/KG	
	Vanadium	25.10	MG/KG	
	Zinc	68.80	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	40	UG/KG	J
	Chrysene	46	UG/KG	J
	Fluoranthene	56	UG/KG	J
	Methylene Chloride	5	UG/KG	J
	Phenanthrene	36	UG/KG	J
	Pyrene	69	UG/KG	J
Pesticide/PCBs				
	Dieldrin	4.6	UG/KG	P
	Methoxychlor	4.2	UG/KG	JP
Radiological				
	Ac-227	<1.5	PCI/G	U
	Am-241	<0.75	PCI/G	U
	Bi-207	<1.6	PCI/G	U
	Bi-210	<0.41	PCI/G	U
	Co-60	<0.29	PCI/G	U
	Cs-137	<0.18	PCI/G	U
	H-3	1.5	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	2.5	PCI/G	J
	Pu-239/240	<0.038	PCI/G	U
	Ra-226	<2.5	PCI/G	U
	Sr-90	<0.46	PCI/G	R
	Th-228	1.0	PCI/G	J
	Th-230	1.6	PCI/G	J
	Th-232	0.90	PCI/G	J
	U-234	0.58	PCI/G	R
	U-235	<0.089	PCI/G	U
	U-238	0.74	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS6 EAST BANK LOW POINT	222003	596301.3654	1464064.4647	700.40

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	10900.00	MG/KG	
	Antimony	9.50	MG/KG	J
	Arsenic	6.30	MG/KG	
	Barium	126.00	MG/KG	
	Beryllium	0.66	MG/KG	
	Calcium	25400.00	MG/KG	
	Chromium	19.70	MG/KG	
	Cobalt	8.70	MG/KG	
	Copper	27.00	MG/KG	
	Iron	30500.00	MG/KG	
	Lead	47.00	MG/KG	J
	Magnesium	8460.00	MG/KG	
	Manganese	549.00	MG/KG	
	Mercury	0.65	MG/KG	J
	Nickel	17.70	MG/KG	
	Potassium	1230.00	MG/KG	
	Sodium	58.60	MG/KG	J
	Thallium	0.25	MG/KG	
	Vanadium	33.30	MG/KG	
	Zinc	79.60	MG/KG	J
Semivolatile				
	Benzo(a)anthracene	37	UG/KG	J
	Benzo(a)pyrene	41	UG/KG	J
	Benzo(b)fluoranthene	50	UG/KG	J
	Chrysene	44	UG/KG	J
	Fluoranthene	57	UG/KG	J
	Pyrene	52	UG/KG	J
Pesticide/PCBs				
	Dieldrin	3.9	UG/KG	JP
	alpha-BHC	1.1	UG/KG	JP
Radiological				
	Ac-227	<1.6	PCI/G	U
	Am-241	<0.80	PCI/G	U
	Bi-207	<1.2	PCI/G	U
	Bi-210	<0.43	PCI/G	U
	Co-60	<0.28	PCI/G	U
	Cs-137	<0.26	PCI/G	U
	H-3	1.4	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	3.9	PCI/G	J
	Pu-239/240	0.12	PCI/G	J
	Ra-226	<3.3	PCI/G	U
	Sr-90	<0.21	PCI/G	R
	Th-228	0.95	PCI/G	J
	Th-230	1.4	PCI/G	J
	Th-232	0.89	PCI/G	J
	U-234	<0.080	PCI/G	R
	U-235	<0.060	PCI/G	U
	U-238	0.51	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YYS6 EAST BANK LOW POINT	392101	596301.3654	1464064.4647	700.40

Depth: 0.0 TO 1.0 FT (CO-LOCATED SAMPLE)

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	16800.00	MG/KG	
	Arsenic	7.30	MG/KG	
	Barium	127.00	MG/KG	
	Beryllium	0.85	MG/KG	
	Cadmium	1.80	MG/KG	
	Calcium	22400.00	MG/KG	
	Chromium	39.60	MG/KG	J
	Cobalt	10.50	MG/KG	
	Copper	43.60	MG/KG	J
	Iron	23600.00	MG/KG	J
	Lead	60.00	MG/KG	
	Magnesium	9600.00	MG/KG	
	Manganese	465.00	MG/KG	
	Mercury	0.36	MG/KG	J
	Nickel	26.10	MG/KG	
	Potassium	2770.00	MG/KG	
	Vanadium	34.80	MG/KG	
	Zinc	116.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	37	UG/KG	J
	Benzo(b)fluoranthene	260	UG/KG	J
	Chrysene	130	UG/KG	J
	Fluoranthene	200	UG/KG	J
	Naphthalene	27	UG/KG	J
	Phenanthrene	120	UG/KG	J
	Pyrene	180	UG/KG	J
Pesticide/PCBs				
	4,4'-DDT	1.7	UG/KG	JP
	Endosulfan I	1.5	UG/KG	JP
	alpha-Chlordane	0.69	UG/KG	JP
Radiological				
	Ac-227	<2.9	PCI/G	U
	Bi-207	0.58	PCI/G	J
	Bi-210	<0.32	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.43	PCI/G	U
	H-3	1.1	PCI/G	J
	K-40	16	PCI/G	J
	Pu-238	4.3	PCI/G	J
	Pu-239/240	<0.16	PCI/G	U
	Ra-226	<3.9	PCI/G	U
	Sr-90	<0.71	PCI/G	R
	Th-228	1.6	PCI/G	J
	Th-230	2.6	PCI/G	J
	Th-232	1.1	PCI/G	J
	U-235	<0.17	PCI/G	U
	U-238	0.86	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YS CANAL POINT	232002	595821.1919	1463884.7255	693.40

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	14300.00	MG/KG	
	Antimony	13.50	MG/KG	J
	Arsenic	4.10	MG/KG	
	Barium	101.00	MG/KG	
	Beryllium	0.44	MG/KG	
	Cadmium	1.70	MG/KG	
	Calcium	37500.00	MG/KG	
	Chromium	40.10	MG/KG	
	Cobalt	11.70	MG/KG	
	Copper	51.20	MG/KG	
	Iron	23300.00	MG/KG	
	Lead	33.50	MG/KG	
	Magnesium	14800.00	MG/KG	
	Manganese	431.00	MG/KG	
	Nickel	22.60	MG/KG	
	Potassium	1720.00	MG/KG	
	Silver	0.84	MG/KG	
	Sodium	639.00	MG/KG	J
	Thallium	0.17	MG/KG	J
	Vanadium	30.00	MG/KG	
	Zinc	109.00	MG/KG	J
Semivolatile				
	Di-n-butylphthalate	63	UG/KG	J
	Fluoranthene	120	UG/KG	J
	Pyrene	92	UG/KG	J
	bis(2-Ethylhexyl)phthalate	110	UG/KG	J
Pesticide/PCBs				
	Aroclor-1254	27. *	UG/KG	JP
	Endrin	1.5 *	UG/KG	JXP
	gamma-Chlordane	1.3 *	UG/KG	JXP
Radiological				
	Ac-227	<2.1	PCI/G	U
	Am-241	<1.2	PCI/G	U
	Bi-207	<1.4	PCI/G	U
	Bi-210	<0.57	PCI/G	U
	Co-60	<0.44	PCI/G	U
	Cs-137	<0.53	PCI/G	U
	H-3	21	PCI/G	J
	K-40	18	PCI/G	J
	Pu-238	280	PCI/G	J
	Pu-239/240	5.1	PCI/G	J
	Ra-226	<2.7	PCI/G	U
	Sr-90	1.2	PCI/G	R
	Th-228	2.8	PCI/G	J
	Th-230	6.2	PCI/G	J
	Th-232	1.8	PCI/G	J
	U-234	2.2	PCI/G	J
	U-235	<0.14	PCI/G	U
	U-238	0.85	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YS CANAL POINT	292001	595821.1919	1463884.7255	693.40

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9900.00	MG/KG	
	Arsenic	5.70	MG/KG	J
	Barium	72.80	MG/KG	
	Calcium	68800.00	MG/KG	
	Chromium	74.70	MG/KG	J
	Cobalt	8.10	MG/KG	
	Copper	225.00	MG/KG	J
	Iron	17000.00	MG/KG	
	Lead	47.60	MG/KG	
	Magnesium	19500.00	MG/KG	
	Manganese	366.00	MG/KG	J
	Mercury	0.43	MG/KG	
	Nickel	22.50	MG/KG	J
	Potassium	1890.00	MG/KG	
	Silver	16.90	MG/KG	J
	Sodium	646.00	MG/KG	J
	Thallium	0.56	MG/KG	J
	Vanadium	17.70	MG/KG	
	Zinc	255.00	MG/KG	J
Volatile				
	2-Butanone	42	UG/KG	
	3,3'-Dichlorobenzidine	620	UG/KG	JU
	Acenaphthene	130	UG/KG	J
	Acenaphthylene	360	UG/KG	J
	Acetone	140	UG/KG	J
	Anthracene	410	UG/KG	J
	Benzo(a)anthracene	2000	UG/KG	
	Benzo(a)pyrene	1800	UG/KG	
	Benzo(b)fluoranthene	2300	UG/KG	
	Benzo(g,h,i)perylene	1500	UG/KG	
	Benzo(k)fluoranthene	1900	UG/KG	
	Chrysene	2000	UG/KG	
	Dibenzofuran	92	UG/KG	J
	Fluoranthene	3800	UG/KG	
	Fluorene	200	UG/KG	J
	Indeno(1,2,3-cd)pyrene	1400	UG/KG	
	Naphthalene	52	UG/KG	J
	Phenanthrene	1800	UG/KG	
	Pyrene	4700	UG/KG	J
	bis(2-Ethylhexyl)phthalate	740	UG/KG	
Pesticide/PCBs				
	Aroclor-1248	320.	UG/KG	P
	Aroclor-1254	340.	UG/KG	
	Endrin	30.	UG/KG	PX
	alpha-Chlordane	14.	UG/KG	PX
Radiological				
	Ac-227	<2.4	PCI/G	U
	Am-241	<1.3	PCI/G	U
	Bi-207	<1.3	PCI/G	U
	Bi-210	<0.87	PCI/G	U
	Co-60	<0.39	PCI/G	U
	Cs-137	<0.50	PCI/G	U
	H-3	40	PCI/G	R
	K-40	14	PCI/G	J
	Pu-238	500	PCI/G	J
	Pu-239/240	5.7	PCI/G	J
	Ra-226	<4.3	PCI/G	U
	Sr-90	1.8	PCI/G	R
	Th-228	1.5	PCI/G	J
	Th-230	3.0	PCI/G	J
	Th-232	1.2	PCI/G	J
	U-234	4.1	PCI/G	R
	U-235	<1.2	PCI/G	DL
	U-238	<1.1	PCI/G	DL

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YS CANAL POINT	302002	595821.1919	1463884.7255	693.40

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	13100.00	MG/KG	
	Arsenic	4.30	MG/KG	J
	Barium	94.80	MG/KG	
	Calcium	54200.00	MG/KG	
	Chromium	69.10	MG/KG	J
	Cobalt	9.70	MG/KG	
	Copper	50.80	MG/KG	J
	Iron	20900.00	MG/KG	
	Lead	36.70	MG/KG	
	Magnesium	13300.00	MG/KG	
	Manganese	510.00	MG/KG	J
	Mercury	0.40	MG/KG	
	Nickel	24.40	MG/KG	J
	Potassium	2260.00	MG/KG	
	Silver	3.00	MG/KG	J
	Sodium	513.00	MG/KG	J
	Vanadium	25.20	MG/KG	
	Zinc	126.00	MG/KG	J
Semivolatile				
	2-Methylnaphthalene	120	UG/KG	J
	Acenaphthene	670	UG/KG	J
	Acenaphthylene	84	UG/KG	J
	Acetone	86	UG/KG	J
	Anthracene	810	UG/KG	J
	Benzo(a)anthracene	2700	UG/KG	
	Benzo(a)pyrene	1900	UG/KG	
	Benzo(b)fluoranthene	2600	UG/KG	
	Benzo(g,h,i)perylene	2200	UG/KG	J
	Benzo(k)fluoranthene	1900	UG/KG	
	C10 TERPENE	180	UG/KG	JN
	C10 TERPENE	24	UG/KG	JN
	C10 TERPENE	540	UG/KG	JN
	Carbazole	650	UG/KG	J
	Chrysene	2500	UG/KG	
	Dibenzofuran	380	UG/KG	J
	Fluoranthene	6200	UG/KG	
	Fluorene	650	UG/KG	J
	Indeno(1,2,3-cd)pyrene	1400	UG/KG	
	Naphthalene	250	UG/KG	J
	Phenanthrene	5100	UG/KG	
	Pyrene	6800	UG/KG	
	bis(2-Ethylhexyl)phthalate	240	UG/KG	J
Pesticide/PCBs				
	Aroclor-1248	240.	UG/KG	P
	Aroclor-1254	240.	UG/KG	
	Dieldrin	3.7	UG/KG	JPX
	Endrin	23.	UG/KG	PX
	alpha-Chlordane	8.2	UG/KG	PX
Radiological				
	Ac-227	<1.8	PCI/G	U
	Am-241	<1.2	PCI/G	U
	Bi-207	<2.9	PCI/G	U
	Bi-210	<0.47	PCI/G	U
	Co-60	<0.53	PCI/G	U
	Cs-137	<0.49	PCI/G	U
	H-3	100	PCI/G	J
	K-40	13	PCI/G	J
	Pu-238	760	PCI/G	J
	Pu-239/240	7.3	PCI/G	J
	Ra-226	<1.9	PCI/G	U
	Sr-90	0.77	PCI/G	R
	Th-228	2.9	PCI/G	J
	Th-230	11	PCI/G	J
	Th-232	2.7	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
YS CANAL POINT	302002	595821.1919	1463884.7255	693.40

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Radiological				
	U-234	<1.4	PCI/G	R
	U-235	<1.1	PCI/G	DL
	U-238	<1.1	PCI/G	DL

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
CANAL DISCRETION POINT 1	262001	595756.1541	1463846.5128	693.60

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	14500.00	MG/KG	
	Arsenic	6.90	MG/KG	J
	Barium	91.90	MG/KG	
	Cadmium	0.90	MG/KG	
	Calcium	47900.00	MG/KG	
	Chromium	104.00	MG/KG	
	Cobalt	10.70	MG/KG	
	Copper	102.00	MG/KG	
	Iron	24100.00	MG/KG	
	Lead	47.50	MG/KG	
	Magnesium	15400.00	MG/KG	
	Manganese	459.00	MG/KG	J
	Mercury	0.56	MG/KG	J
	Nickel	23.50	MG/KG	
	Potassium	2360.00	MG/KG	
	Silver	7.50	MG/KG	
	Sodium	512.00	MG/KG	
	Vanadium	27.10	MG/KG	
	Zinc	224.00	MG/KG	J
Semivolatile				
	Acenaphthene	1000	UG/KG	
	Acenaphthylene	95	UG/KG	J
	Anthracene	650	UG/KG	J
	Benzo(a)anthracene	1900	UG/KG	
	Benzo(g,h,i)perylene	320	UG/KG	J
	Benzo(k)fluoranthene	1400	UG/KG	
	Carbazole	320	UG/KG	J
	Chrysene	1800	UG/KG	
	Dibenzofuran	770	UG/KG	J
	Fluoranthene	7000	UG/KG	
	Phenanthrene	6300	UG/KG	
	Pyrene	5200	UG/KG	
	Toluene	1	UG/KG	J
Pesticide/PCBs				
	Aroclor-1254	260.	UG/KG	P
	Endrin	21.	UG/KG	PX
	alpha-Chlordane	8.7	UG/KG	PX
Radiological				
	Ac-227	<2.7	PCI/G	U
	Am-241	<1.6	PCI/G	U
	Bi-207	<1.9	PCI/G	U
	Bi-210	<0.48	PCI/G	U
	Co-60	<0.40	PCI/G	U
	Cs-137	<0.29	PCI/G	U
	H-3	70	PCI/G	J
	K-40	20	PCI/G	J
	Pu-238	600	PCI/G	J
	Pu-239/240	22	PCI/G	J
	Ra-226	<3.8	PCI/G	U
	Sr-90	2.8	PCI/G	R
	Th-228	2.4	PCI/G	J
	Th-230	5.7	PCI/G	J
	Th-232	1.8	PCI/G	J
	U-234	1.3	PCI/G	J
	U-235	0.15	PCI/G	J
	U-238	1.2	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
W CANAL POINT	242001	595029.0663	1463716.1973	691.20

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	9170.00	MG/KG	
	Arsenic	7.90	MG/KG	
	Barium	67.60	MG/KG	
	Calcium	104000.00	MG/KG	
	Chromium	16.00	MG/KG	
	Cobalt	7.40	MG/KG	
	Copper	18.30	MG/KG	
	Iron	16700.00	MG/KG	
	Lead	25.80	MG/KG	
	Magnesium	20900.00	MG/KG	
	Manganese	712.00	MG/KG	
	Nickel	15.10	MG/KG	
	Potassium	1240.00	MG/KG	
	Sodium	269.00	MG/KG	J
	Thallium	0.23	MG/KG	J
	Vanadium	20.00	MG/KG	
	Zinc	55.60	MG/KG	J
Volatile				
	Acetone	10	UG/KG	J
	Di-n-butylphthalate	46	UG/KG	J
	Fluoranthene	86	UG/KG	J
	Pyrene	210	UG/KG	J
	bis(2-Ethylhexyl)phthalate	76	UG/KG	J
Pesticide/PCBs				
	Endrin	1.1	UG/KG	JP
	gamma-Chlordane	0.48	UG/KG	JP
Radiological				
	Ac-227	<1.4	PCI/G	U
	Am-241	<0.82	PCI/G	U
	Bi-207	<1.2	PCI/G	U
	Bi-210	<0.69	PCI/G	U
	Co-60	<0.25	PCI/G	U
	Cs-137	<0.19	PCI/G	U
	H-3	1.5	PCI/G	J
	K-40	10	PCI/G	J
	Pu-238	96	PCI/G	J
	Pu-239/240	0.86	PCI/G	J
	Ra-226	<2.2	PCI/G	U
	Sr-90	<0.94	PCI/G	R
	Th-228	0.96	PCI/G	J
	Th-230	1.7	PCI/G	J
	Th-232	0.67	PCI/G	J
	U-234	1.9	PCI/G	J
	U-235	<0.085	PCI/G	U
	U-238	1.6	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
W CANAL POINT	242002	595029.0663	1463716.1973	691.20

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	16900.00	MG/KG	
	Arsenic	7.70	MG/KG	J
	Barium	115.00	MG/KG	
	Beryllium	0.63	MG/KG	
	Calcium	22000.00	MG/KG	
	Chromium	34.60	MG/KG	
	Cobalt	10.10	MG/KG	
	Copper	28.20	MG/KG	
	Iron	27200.00	MG/KG	
	Lead	24.70	MG/KG	
	Magnesium	12000.00	MG/KG	
	Manganese	743.00	MG/KG	
	Nickel	25.00	MG/KG	
	Potassium	1900.00	MG/KG	
	Sodium	472.00	MG/KG	J
	Thallium	0.15	MG/KG	J
	Vanadium	33.90	MG/KG	
	Zinc	99.70	MG/KG	J
Volatile				
	Methylene Chloride	2	UG/KG	J
	bis(2-Ethylhexyl)phthalate	160	UG/KG	J
Radiological				
	Ac-227	<3.4	PCI/G	U
	Am-241	<0.85	PCI/G	U
	Bi-207	<1.6	PCI/G	U
	Bi-210	<0.76	PCI/G	U
	Co-60	<0.40	PCI/G	U
	Cs-137	<0.21	PCI/G	U
	H-3	1.7	PCI/G	J
	K-40	15	PCI/G	J
	Pu-238	14	PCI/G	J
	Pu-239/240	<0.16	PCI/G	U
	Ra-226	<2.7	PCI/G	U
	Sr-90	<0.54	PCI/G	R
	Th-228	1.4	PCI/G	J
	Th-230	3.4	PCI/G	J
	Th-232	1.2	PCI/G	J
	U-234	43	PCI/G	J
	U-235	1.7	PCI/G	J
	U-238	39	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
W CANAL POINT	242003	595029.0663	1463716.1973	691.20

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	8650.00	MG/KG	
	Antimony	9.50	MG/KG	J
	Arsenic	5.10	MG/KG	
	Barium	60.50	MG/KG	
	Calcium	64900.00	MG/KG	
	Chromium	13.40	MG/KG	
	Cobalt	4.90	MG/KG	
	Copper	13.30	MG/KG	
	Iron	14800.00	MG/KG	
	Lead	14.90	MG/KG	
	Magnesium	37700.00	MG/KG	
	Manganese	691.00	MG/KG	
	Nickel	16.80	MG/KG	
	Potassium	1190.00	MG/KG	
	Sodium	298.00	MG/KG	J
	Thallium	0.12	MG/KG	J
	Vanadium	19.40	MG/KG	
	Zinc	39.10	MG/KG	J
Semivolatile				
	Di-n-butylphthalate	24	UG/KG	J
	bis(2-Ethylhexyl)phthalate	170	UG/KG	J
Radiological				
	Ac-227	<1.7	PCI/G	U
	Am-241	<0.88	PCI/G	U
	Bi-207	<1.0	PCI/G	U
	Bi-210	<0.50	PCI/G	U
	Co-60	<0.32	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	1.4	PCI/G	J
	K-40	13	PCI/G	J
	Pu-238	4.8	PCI/G	J
	Pu-239/240	<0.14	PCI/G	U
	Ra-226	<3.8	PCI/G	U
	Sr-90	<0.90	PCI/G	R
	Th-228	1.5	PCI/G	J
	Th-230	2.8	PCI/G	J
	Th-232	0.85	PCI/G	J
	U-234	8.1	PCI/G	J
	U-235	<0.11	PCI/G	U
	U-238	6.2	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
XXX CANAL POINT	MC0252001	594510.7077	1463628.5890	694.50

Depth: 0.0 TO 1.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	4250.00	MG/KG	
	Arsenic	5.00	MG/KG	
	Barium	46.70	MG/KG	
	Calcium	123000.00	MG/KG	
	Chromium	8.20	MG/KG	J
	Cobalt	5.10	MG/KG	
	Iron	10600.00	MG/KG	
	Lead	14.00	MG/KG	
	Magnesium	29300.00	MG/KG	
	Manganese	739.00	MG/KG	
	Nickel	8.50	MG/KG	
	Potassium	754.00	MG/KG	
	Sodium	176.00	MG/KG	
	Thallium	0.11	MG/KG	
	Vanadium	12.70	MG/KG	
	Zinc	30.00	MG/KG	J
Semivolatile				
	Benzo(a)pyrene	74	UG/KG	J
	Benzo(b)fluoranthene	79	UG/KG	J
	Chrysene	99	UG/KG	J
	Di-n-butylphthalate	55	UG/KG	J
	Fluoranthene	180	UG/KG	J
	Phenanthrene	98	UG/KG	J
Pesticide/PCBs				
	4,4'-DDE	0.87	UG/KG	JP
	4,4'-DDT	3.5	UG/KG	J
Radiological				
	Ac-227	<1.6	PCI/G	U
	Am-241	<0.92	PCI/G	U
	Bi-207	<0.50	PCI/G	U
	Bi-210	<0.32	PCI/G	U
	Co-60	<0.17	PCI/G	U
	Cs-137	<0.14	PCI/G	U
	H-3	0.93	PCI/G	J
	K-40	8.1	PCI/G	J
	Pu-238	0.95	PCI/G	J
	Pu-239/240	0.073	PCI/G	J
	Ra-226	<1.7	PCI/G	U
	Sr-90	0.31	PCI/G	R
	Th-228	0.31	PCI/G	J
	Th-230	2.7	PCI/G	J
	Th-232	0.31	PCI/G	J
	U-234	0.53	PCI/G	R
	U-235	<0.045	PCI/G	U
	U-238	0.33	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
XXX CANAL POINT	MC0252002	594510.7077	1463628.5890	694.50

Depth: 1.0 TO 2.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	4920.00	MG/KG	
	Arsenic	5.80	MG/KG	
	Barium	59.80	MG/KG	
	Calcium	114000.00	MG/KG	
	Chromium	10.00	MG/KG	J
	Cobalt	6.60	MG/KG	
	Iron	11400.00	MG/KG	
	Lead	12.30	MG/KG	
	Magnesium	31500.00	MG/KG	
	Manganese	529.00	MG/KG	
	Nickel	9.80	MG/KG	
	Potassium	692.00	MG/KG	
	Sodium	130.00	MG/KG	
	Thallium	0.30	MG/KG	
	Vanadium	13.40	MG/KG	
	Zinc	28.80	MG/KG	J
Semivolatile				
	Di-n-butylphthalate	36	UG/KG	J
	Fluoranthene	76	UG/KG	J
	Phenanthrene	46	UG/KG	J
	Pyrene	63	UG/KG	J
Pesticide/PCBs				
	Dieldrin	1.6	UG/KG	JP
	Endrin	1.1	UG/KG	JP
Radiological				
	Ac-227	<1.6	PCI/G	U
	Am-241	<0.70	PCI/G	U
	Bi-207	<1.1	PCI/G	U
	Bi-210	<0.34	PCI/G	U
	Co-60	<0.19	PCI/G	U
	Cs-137	<0.16	PCI/G	U
	H-3	1.3	PCI/G	J
	K-40	10	PCI/G	J
	Pu-238	0.40	PCI/G	J
	Pu-239/240	<0.059	PCI/G	U
	Ra-226	<2.5	PCI/G	U
	Sr-90	<0.37	PCI/G	R
	Th-228	0.66	PCI/G	J
	Th-230	1.2	PCI/G	J
	Th-232	0.66	PCI/G	J
	U-234	0.50	PCI/G	R
	U-235	<0.071	PCI/G	U
	U-238	0.59	PCI/G	J

Report Date: 07/26/93

Sampling Point	Sample ID	Northing	Easting	Elevation
XXX CANAL POINT	MC0252003	594510.7077	1463628.5890	694.50

Depth: 2.0 TO 3.0 FT

	Parameter	Concentration	Units	QA Code
Inorganic				
	Aluminum	12800.00	MG/KG	
	Arsenic	6.90	MG/KG	
	Barium	90.30	MG/KG	
	Calcium	35400.00	MG/KG	
	Chromium	15.80	MG/KG	J
	Cobalt	10.40	MG/KG	
	Iron	19900.00	MG/KG	
	Lead	19.10	MG/KG	
	Magnesium	13000.00	MG/KG	
	Manganese	744.00	MG/KG	
	Nickel	18.90	MG/KG	
	Potassium	1590.00	MG/KG	
	Sodium	102.00	MG/KG	
	Thallium	0.25	MG/KG	
	Vanadium	26.90	MG/KG	
	Zinc	61.50	MG/KG	J
Pesticide/PCBs				
	Dieldrin	2.0	UG/KG	J
Radiological				
	Ac-227	<1.6	PCI/G	U
	Am-241	<1.1	PCI/G	U
	Bi-207	<1.2	PCI/G	U
	Bi-210	<0.41	PCI/G	U
	Co-60	<0.37	PCI/G	U
	Cs-137	<0.22	PCI/G	U
	H-3	2.2	PCI/G	J
	K-40	13	PCI/G	J
	Pu-238	0.70	PCI/G	J
	Pu-239/240	0.091	PCI/G	J
	Ra-226	<3.5	PCI/G	U
	Sr-90	<1.2	PCI/G	R
	Th-228	0.73	PCI/G	J
	Th-230	1.7	PCI/G	J
	Th-232	0.73	PCI/G	J
	U-234	0.78	PCI/G	R
	U-235	0.10	PCI/G	J
	U-238	0.58	PCI/G	J

* Reanalyzed
** Dilution

APPENDIX C

APPENDIX C

Sample Analysis Summary

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
DL2	272001	0.0	1.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
				TCL VOCs		DATAC	SAIV06
				RADS		PACE	D20806503
E	012001	0.0	1.0	TAL Metals	07/27/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20729501
E	012002	1.0	2.0	TAL Metals	07/27/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20729501
E	012003	2.0	3.0	TAL Metals	07/27/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20729501
YL	022001	0.0	1.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YL	022002	1.0	2.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YL	022002	1.0	2.0	RADS	07/28/92	PACE	D20729501
YL	022003	2.0	3.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YL	022004	3.0	4.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YL	022005	4.0	5.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YI	MC0032001	0.0	1.0	TAL Metals	07/21/92	DATAC	SAIM01
YI	312101	0.0	1.0	TAL Metals	09/16/92	DATAC	SAIM08
YI	MC0032001	0.0	1.0	TCL SVOCs	07/21/92	DATAC	SAIS01
YI	312101	0.0	1.0	TCL SVOCs	09/16/92	DATAC	SAIS08
YI	MC0032001	0.0	1.0	TCL Pest/PCB	07/21/92	DATAC	SAIP01
YI	312101	0.0	1.0	TCL Pest/PCB	09/16/92	DATAC	SAIO08
YI	MC0032001	0.0	1.0	TCL VOCs	07/21/92	DATAC	SAIV01
YI	312101	0.0	1.0	TCL VOCs	09/16/92	DATAC	SAIV08
YI	MC0032001	0.0	1.0	RADS	07/21/92	PACE	D20724505
YI	312101	0.0	1.0	RADS	09/16/92	PACE	D20917502
YI	MC0032002	1.0	2.0	TAL Metals	07/21/92	DATAC	SAIM01
				TCL SVOCs		DATAC	SAIS01
				TCL Pest/PCB		DATAC	SAIP01

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YI	MC0032002	1.0	2.0	TCL VOCs	07/21/92	DATAC	SAIV01
				RADS		PACE	D20724505
YI	MC0032003	2.0	3.0	TAL Metals	07/21/92	DATAC	SAIM01
				TCL SVOCs		DATAC	SAIS01
				TCL Pest/PCB		DATAC	SAIP01
				TCL VOCs		DATAC	SAIV01
				RADS		PACE	D20724505
YF	MC0042001	0.0	1.0	TAL Metals	07/22/92	DATAC	SAIM01
YF	322101	0.0	1.0	TAL Metals	09/16/92	DATAC	SAIM08
YF	MC0042001	0.0	1.0	TCL SVOCs	07/22/92	DATAC	SAIS01
YF	322101	0.0	1.0	TCL SVOCs	09/16/92	DATAC	SAIS08
YF	MC0042001	0.0	1.0	TCL Pest/PCB	07/22/92	DATAC	SAIP01
YF	322101	0.0	1.0	TCL Pest/PCB	09/16/92	DATAC	SAIO08
YF	MC0042001	0.0	1.0	TCL VOCs	07/22/92	DATAC	SAIV01
YF	322101	0.0	1.0	TCL VOCs	09/16/92	DATAC	SAIV08
YF	MC0042001	0.0	1.0	RADS	07/22/92	PACE	D20724505
YF	322101	0.0	1.0	RADS	09/16/92	PACE	D20917502
YF	MC0042002	1.0	2.0	TAL Metals	07/22/92	DATAC	SAIM01
				TCL SVOCs		DATAC	SAIS01
				TCL Post/PCB		DATAC	SAIP01
				TCL VOCs		DATAC	SAIV01
				RADS		PACE	D20724505
YF	MC0042003	2.0	3.0	TAL Metals	07/22/92	DATAC	SAIM01
				TCL SVOCs		DATAC	SAIS01
				TCL Pest/PCB		DATAC	SAIP01
				TCL VOCs		DATAC	SAIV01
				RADS		PACE	D20724505
YF	MC0042004	3.0	4.0	TAL Metals	07/22/92	DATAC	SAIM01
				TCL SVOCs		DATAC	SAIS01

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YF	MC0042004	3.0	4.0	TCL Pest/PCB	07/22/92	DATAC	SAIP01
				TCL VOCs		DATAC	SAIV01
				RADS		PACE	D20724505
YF	MC0042005	4.0	5.0	TAL Metals	07/22/92	DATAC	SAIM01
				TCL SVOCs		DATAC	SAIS01
				TCL Pest/PCB		DATAC	SAIP01
				TCL VOCs		DATAC	SAIV01
				RADS		PACE	D20724505
YYN5	092001	0.0	1.0	TAL Metals	07/24/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN5	092002	1.0	2.0	TAL Metals	07/24/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN5	092003	2.0	3.0	TAL Metals	07/24/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN6	102001	0.0	1.0	TAL Metals	07/23/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN6	102002	1.0	2.0	TAL Metals	07/23/92	DATAC	SAIM02

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YYN6	102002	1.0	2.0	TCL SVOCs	07/23/92	DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN6	102003	2.0	3.0	TAL Metals	07/23/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN1	052001	0.0	1.0	TAL Metals	07/24/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN1	052002	1.0	2.0	TAL Metals	07/24/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN1	052003	2.0	3.0	TAL Metals	07/24/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN2	062001	0.0	1.0	TAL Metals	07/24/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YYN2	062002	1.0	2.0	TAL Metals	07/24/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN2	062003	2.0	3.0	TAL Metals	07/24/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20727503
YYN3	072001	0.0	1.0	TAL Metals	07/24/92	DATAC	SAIM05
YYN3	332101	0.0	1.0	TAL Metals	09/16/92	DATAC	SAIM08
YYN3	072001	0.0	1.0	TCL SVOCs	07/24/92	DATAC	SAIS05
YYN3	332101	0.0	1.0	TCL SVOCs	09/16/92	DATAC	SAIS08
YYN3	072001	0.0	1.0	TCL Pest/PCB	07/24/92	DATAC	SAIP05
YYN3	332101	0.0	1.0	TCL Pest/PCB	09/16/92	DATAC	SAIO08
YYN3	072001	0.0	1.0	TCL VOCs	07/24/92	DATAC	SAIV05
YYN3	332101	0.0	1.0	TCL VOCs	09/16/92	DATAC	SAIV08
YYN3	072001	0.0	1.0	RADS	07/24/92	PACE	D20805507
YYN3	332101	0.0	1.0	RADS	09/16/92	PACE	
YYN3	072002	1.0	2.0	TAL Metals	08/04/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05
				TCL Pest/PCB		DATAC	SAIP05
				TCL VOCs		DATAC	SAIV05
				RADS		PACE	D20805507
YYN3	072003	2.0	3.0	TAL Metals	08/04/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05
				TCL Pest/PCB		DATAC	SAIP05
				TCL VOCs		DATAC	SAIV05

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YYN3	072003	2.0	3.0	RADS	08/04/92	PACE	D20805507
YYN3	072004	3.0	4.0	TAL Metals	08/04/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05
				TCL Pest/PCB		DATAC	SAIP05
				TCL VOCs		DATAC	SAIV05
				RADS		PACE	D20805507
YYN3	072005	4.0	5.0	TAL Metals	08/04/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05
				TCL Pest/PCB		DATAC	SAIP05
				TCL VOCs		DATAC	SAIV05
				RADS		PACE	D20805507
YYN4	082001	0.0	1.0	TAL Metals	08/04/92	DATAC	SAIM05
YYN4	342101	0.0	1.0	TAL Metals	09/16/92	DATAC	SAIM08
YYN4	082001	0.0	1.0	TCL SVOCs	08/04/92	DATAC	SAIS05
YYN4	342001	0.0	1.0	TCL SVOCs	09/16/92	DATAC	SAIS08
YYN4	082001	0.0	1.0	TCL Pest/PCB	08/04/92	DATAC	SAIP05
YYN4	342101	0.0	1.0	TCL Pest/PCB	09/16/92	DATAC	SAIO08
YYN4	082001	0.0	1.0	TCL VOCs	08/04/92	DATAC	SAIV05
YYN4	342101	0.0	1.0	TCL VOCs	09/16/92	DATAC	SAIV08
YYN4	082001	0.0	1.0	RADS	08/04/92	PACE	D20805507
YYN4	342101	0.0	1.0	RADS	09/16/92	PACE	D20917502
YYN4	082002	1.0	2.0	TAL Metals	08/04/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05
				TCL Pest/PCB		DATAC	SAIP05
				TCL VOCs		DATAC	SAIV05
				RADS		PACE	D20805507
YYN4	082003	2.0	3.0	TAL Metals	08/04/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05
				TCL Pest/PCB		DATAC	SAIP05

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YYN4	082003	2.0	3.0	TCL VOCs	08/04/92	DATAC	SAIV05
				RADS		PACE	D20805507
DL3	282001	0.0	1.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
				TCL VOCs		DATAC	SAIV06
				RADS		PACE	D20806503
YQ1	112001	0.0	1.0	TAL Metals	07/27/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20729501
YQ1	112002	1.0	2.0	TAL Metals	07/27/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20729501
YQ1	112003	2.0	3.0	TAL Metals	07/27/92	DATAC	SAIM02
				TCL SVOCs		DATAC	SAIS02
				TCL Pest/PCB		DATAC	SAIP02
				TCL VOCs		DATAC	SAIV02
				RADS		PACE	D20729501
YQ2	122001	0.0	1.0	TAL Metals	07/27/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YQ2	122002	1.0	2.0	TAL Metals	07/27/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YQ2	122002	1.0	2.0	TCL Pest/PCB	07/27/92	DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YQ2	122003	2.0	3.0	TAL Metals	07/27/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YQ3	132001	0.0	1.0	TAL Metals	07/30/92	DATAC	SAIM04
	352101			TAL Metals	09/16/92	DATAC	SAIM08
	132001			TCL SVOCs	07/30/92	DATAC	SAIS04
	352101			TCL SVOCs	09/16/92	DATAC	SAIS08
	132001			TCL Pest/PCB	07/30/92	DATAC	SAIP04
YQ3	352101	0.0	1.0	TCL Pest/PCB	09/16/92	DATAC	SAIO08
YQ3	132001	0.0	1.0	TCL VOCs	07/30/92	DATAC	SAIV04
YQ3	352101	0.0	1.0	TCL VOCs	09/16/92	DATAC	SAIV08
YQ3	132001	0.0	1.0	RADS	07/30/92	PACE	D20731502
YQ3	352101	0.0	1.0	RADS	09/16/92	PACE	D20917502
YQ3	132001	0.0	1.0	TCL SVOCs	07/30/92	DATAC	SAIS04
YQ3	132001	0.0	1.0	TCL Pest/PCB	07/30/92	DATAC	SAIP04
YQ3	132002	1.0	2.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YQ3	132003	2.0	3.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YQ3	132003	2.0	3.0	RADS	07/30/92	PACE	D20731502
YQ3	132004	3.0	4.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YQ3	132005	4.0	5.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
YQ3	132005	4.0	5.0	TCL VOCs	07/30/92	DATAC	SAIV04
				RADS		PACE	D20731502
YQ4	142001	0.0	1.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YQ4	142002	1.0	2.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YQ4	142003	2.0	3.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YQ5	152001	0.0	1.0	TAL Metals	07/29/92	DATAC	SAIM04
YQ5	362101	0.0	1.0	TAL Metals	09/16/92	DATAC	SAIM08
YQ5	152001	0.0	1.0	TCL SVOCs	07/29/92	DATAC	SAIS04

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YQ5	362101	0.0	1.0	TCL SVOCs	09/16/92	DATAC	SAIS08
YQ5	152001	0.0	1.0	TCL Pest/PCB	07/29/92	DATAC	SAIP04
YQ5	362101	0.0	1.0	TCL Pest/PCB	09/16/92	DATAC	SAIO08
YQ5	152001	0.0	1.0	TCL VOCs	07/29/92	DATAC	SAIV04
YQ5	362101	0.0	1.0	TCL VOCs	09/16/92	DATAC	SAIV08
YQ5	152001	0.0	1.0	RADS	07/29/92	PACE	D20731502
YQ5	362101	0.0	1.0	RADS	09/16/92	PACE	D20917502
YQ5	152002	1.0	2.0	TAL Metals	07/29/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
YQ5	152002	1.0	2.0	TCL VOCs	07/29/92	DATAC	SAIV04
				RADS		PACE	D20731502
YQ5	152003	2.0	3.0	TAL Metals	07/29/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YQ6	162001	0.0	1.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YQ6	162002	1.0	2.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YQ6	162003	2.0	3.0	TAL Metals	07/30/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YQ6	162003	2.0	3.0	TCL Pest/PCB	07/30/92	DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YYS1	172001	0.0	1.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YYS1	172002	1.0	2.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
YYS1	172002	1.0	2.0	TCL VOCs	07/28/92	DATAC	SAIV03
				RADS		PACE	D20729501
YYS1	172003	2.0	3.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YYS2	182001	0.0	1.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YYS2	182002	1.0	2.0	TAL Metals	07/28/92	DATAC	SAIM03
				TCL SVOCs		DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YYS2	182003	2.0	3.0	TAL Metals	07/28/92	DATAC	SAIM03

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YYS2	182003	2.0	3.0	TCL SVOCs	07/28/92	DATAC	SAIS03
				TCL Pest/PCB		DATAC	SAIP03
				TCL VOCs		DATAC	SAIV03
				RADS		PACE	D20729501
YYS4	202001	0.0	1.0	TAL Metals	08/05/92	DATAC	SAIM06
YYS4	372101	0.0	1.0	TAL Metals	09/16/92	DATAC	SAIM08
YYS4	202001	0.0	1.0	TCL SVOCs	08/05/92	DATAC	SAIS06
YYS4	372101	0.0	1.0	TCL SVOCs	09/16/92	DATAC	SAIS08
YYS4	202001	0.0	1.0	TCL Pest/PCB	08/05/92	DATAC	SAIO06
YYS4	372101	0.0	1.0	TCL Pest/PCB	09/16/92	DATAC	SAIO08
YYS4	202001	0.0	1.0	TCL VOCs	08/05/92	DATAC	SAIV06
YYS4	372101	0.0	1.0	TCL VOCs	09/16/92	DATAC	SAIV08
YYS4	202001	0.0	1.0	RADS	08/05/92	PACE	D20806503
YYS4	372101	0.0	1.0	RADS	09/16/92	PACE	D20917502
YYS4	202002	1.0	2.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
				TCL VOCs		DATAC	SAIV06
				RADS		PACE	D20806503
YYS4	202003	2.0	3.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
				TCL VOCs		DATAC	SAIV06
				RADS		PACE	D20806503
YYS4	202004	3.0	4.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
				TCL VOCs		DATAC	SAIV06
				RADS		PACE	D20806503

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YYS4	202005	4.0	5.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
				TCL VOCs		DATAC	SAIV06
				RADS		PACE	D20806503
YYS3	192001	0.0	1.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
				TCL VOCs		DATAC	SAIV06
				RADS		PACE	D20806503
YYS3	192002	1.0	2.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
YYS3	192002	1.0	2.0	TCL VOCs	08/05/92	DATAC	SAIV06
				RADS		PACE	D20806503
YYS3	192003	2.0	3.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
				TCL VOCs		DATAC	SAIV06
				RADS		PACE	D20806503
YYS5	212001	0.0	1.0	TAL Metals	07/29/92	DATAC	SAIM04
YYS5	382101	0.0	1.0	TAL Metals	09/16/92	DATAC	SAIM08
YYS5	212001	0.0	1.0	TCL SVOCs	07/29/92	DATAC	SAIS04
YYS5	382101	0.0	1.0	TCL SVOCs	09/16/92	DATAC	SAIS08
YYS5	212001	0.0	1.0	TCL Pest/PCB	07/29/92	DATAC	SAIP04
YYS5	382101	0.0	1.0	TCL Pest/PCB	09/16/92	DATAC	SAIO08
YYS5	212001	0.0	1.0	TCL VOCs	07/29/92	DATAC	SAIV04
YYS5	382101	0.0	1.0	TCL VOCs	09/16/92	DATAC	SAIV08
YYS5	212001	0.0	1.0	RADS	07/29/92	PACE	D20731502

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YYS5	382101	0.0	1.0	RADS	09/16/92	PACE	D20917502
YYS5	212002	1.0	2.0	TAL Metals	07/29/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YYS5	212003	2.0	3.0	TAL Metals	07/29/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YYS6	222001	0.0	1.0	TAL Metals	07/29/92	DATAC	SAIM04
YYS6	392101	0.0	1.0	TAL Metals	09/16/92	DATAC	SAIM08
YYS6	222001	0.0	1.0	TCL SVOCs	07/29/92	DATAC	SAIS04
YYS6	392101	0.0	1.0	TCL SVOCs	09/16/92	DATAC	SAIS08
YYS6	222001	0.0	1.0	TCL Pest/PCB	07/29/92	DATAC	SAIP04
YYS6	392101	0.0	1.0	TCL Pest/PCB	09/16/92	DATAC	SAIO08
YYS6	222001	0.0	1.0	TCL VOCs	07/29/92	DATAC	SAIV04
YYS6	392101	0.0	1.0	TCL VOCs	09/16/92	DATAC	SAIV08
YYS6	222001	0.0	1.0	RADS	07/29/92	PACE	D20731502
YYS6	392101	0.0	1.0	RADS	09/16/92	PACE	D20917502
YYS6	222002	1.0	2.0	TAL Metals	07/29/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04
				TCL VOCs		DATAC	SAIV04
				RADS		PACE	D20731502
YYS6	222003	2.0	3.0	TAL Metals	07/29/92	DATAC	SAIM04
				TCL SVOCs		DATAC	SAIS04
				TCL Pest/PCB		DATAC	SAIP04

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
YYS6	222003	2.0	3.0	TCL VOCs	07/29/92	DATAC	SAIV04
				RADS		PACE	D20731502
YS	292001	0.0	1.0	TAL Metals	08/07/92	DATAC	SAIM07
				TCL SVOCs		DATAC	SAIO07
				TCL Pest/PCB		DATAC	SAIO07
				TCL VOCs		DATAC	SAIV07
				RADS		PACE	D20810506
YS	302002	1.0	2.0	TAL Metals	08/07/92	DATAC	SAIM07
				TCL SVOCs		DATAC	SAIO07
				TCL Pest/PCB		DATAC	SAIO07
				TCL VOCs		DATAC	SAIV07
				RADS		PACE	D20810506
YS	232002	2.0	3.0	TAL Metals	08/03/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05
				TCL Pest/PCB		DATAC	SAIP05
YS	232002	2.0	3.0	TCL VOCs	08/03/92	DATAC	SAIV05
				RADS		PACE	D20805507
DL1	262001	0.0	1.0	TAL Metals	08/05/92	DATAC	SAIM06
				TCL SVOCs		DATAC	SAIS06
				TCL Pest/PCB		DATAC	SAIO06
				TCL VOCs		DATAC	SAIV06
				RADS		PACE	D20806503
W	242001	0.0	1.0	TAL Metals	07/31/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05
				TCL Pest/PCB		DATAC	SAIP05
				TCL VOCs		DATAC	SAIV05
				RADS		PACE	D20803507
W	242002	1.0	2.0	TAL Metals	07/31/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05

Sample Location	Sample Identifier	Start Depth	End Depth	Analysis	Sample Date	Lab	SDG Number
W	242002	1.0	2.0	TCL Pest/PCB	07/31/92	DATAC	SAIP05
				TCL VOCs		DATAC	SAIV05
				RADS		PACE	D20803507
W	242003	2.0	3.0	TAL Metals	07/31/92	DATAC	SAIM05
				TCL SVOCs		DATAC	SAIS05
				TCL Pest/PCB		DATAC	SAIP05
				TCL VOCs		DATAC	SAIV05
				RADS		PACE	D20803507
XXX	MC0252001	0.0	1.0	TAL Metals	07/23/92	DATAC	SAIM01
				TCL SVOCs		DATAC	SAIS01
				TCL Pest/PCB		DATAC	SAIP01
				TCL VOCs		DATAC	SAIV01
				RADS		PACE	D20724505
XXX	MC0252002	1.0	2.0	TAL Metals	07/23/92	DATAC	SAIM01
				TCL SVOCs		DATAC	SAIS01
				TCL Pest/PCB		DATAC	SAIP01
XXX	MC0252002	1.0	2.0	TCL VOCs	07/23/92	DATAC	SAIV01
				RADS		PACE	D20724505
XXX	MC0252003	2.0	3.0	TAL Metals	07/23/92	DATAC	SAIM01
				TCL SVOCs		DATAC	SAIS01
				TCL Pest/PCB		DATAC	SAIP01
				TCL VOCs		DATAC	SAIV01
				RADS		PACE	D20724505

DATAC = DataChem Lab
PACE = Pace, Inc.
PCB = Polychlorinated Biphenyls
Pest = Pesticides
RADs = Radionuclides
SDG = Sample Delivery Group
TAL = Target Analyte List
TCL = Target Compound List
SVOCs = Semivolatile Organic Compounds
VOCs = Volatile Organic Compounds

APPENDIX D

APPENDIX D

Data Validation
and
Field Quality Assurance

D-1 DATA VALIDATION

The environmental samples (soil/sediment) and field quality control samples (equipment, trip, ambient, duplicate) collected in response to the Special Canal Sampling Investigation were analyzed using the March 1990 CLP SOW for TCL organics (VOCs, SVOCs, pesticides/PCB), TAL inorganics (metals) and radionuclides using EPA-type procedures. The associated data were validated and qualified using the guidelines listed below:

USEPA CLP National Functional Guidelines for Organic Data Review, Multi-Media, Multi-Concentration, [Draft] June 1991;

Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analysis, July 1, 1988;

Laboratory Data Validation Guidelines for Evaluating Radionuclide Analysis, Science Applications International Corporation, [Revision 3], November 7, 1991.

All descriptive data validation qualifiers applied to the concentrations are listed below:

U- The analyte was analyzed for but not detected. The reported concentration is the sample quantitation limit.

UJ- The analyte was analyzed for but not detected. The reported concentration is an estimated value.

J- The reported value is an estimated quantity.

R- The data are unusable. The analyte may or may not be present.

E- The associated sample requires dilution to evaluate the contaminants.

D- The associated sample was diluted to determine the concentrations of contaminants. The concentrations have been corrected by a dilution factor.

P- The compound is presumed to be detected but the qualitative result lacks confidence due to other interfering peaks close to the peak of interest, or due to QC problems.

X- The compound is qualified presumably present because the retention time falls within the retention time range of a multiple peak compound (i.e., Arochlors) that has been detected and could be mistaken for an Arochlor or other multiple peak compound isomer.

N- The compound is a Tentatively Identified Compound (TIC).

Radionuclide Qualifiers

U- Radionuclide may or may not be present. Positive identification not made. Less-than Value is an estimated upper limit.

DL- Detection limit not met.

J- Estimated value.

R- Data are unusable. Radionuclide may or may not be present.

N- Radionuclide presumed to be present. Not positively identified.

Each data point was reviewed and assessed to determine whether the value was considered usable (no qualifiers), usable but estimated (qualified J), or not usable (qualified R). Laboratory and data validation qualifiers were applied to all data, detected and non-detected, as necessary.

For the purpose of the Special Canal Sampling, VOC and SVOC Tentatively Identified Compounds (TIC's) were used to indicate additional contamination present that was not included on the TCL list.

D-1.1 Inorganic Analysis

Eighty-eight environmental soil/sediment samples and 9 duplicate samples were collected during the sampling investigation and were submitted to DataChem Laboratories for TAL metals and cyanide analysis using the March 1990 CLP SOW. Data quality was evaluated using the guidelines and control limits specified in the CLP SOW and the referenced guidelines for inorganic analysis for holding times, calibrations, blanks, interference check samples, matrix spikes, duplicates, furnace atomic adsorption and ICP serial dilution.

Mercury analysis in SDGs SAIM03 and SAIM08 have been qualified J or UJ because of a holding time deviation. Cyanide analysis for the aqueous QC samples have been qualified as unusable (R) due to the pH of the water being less than 12. Overall holding time data was acceptable.

No major problems were encountered in the evaluation of calibration runs. The correlation coefficient for cyanide in SAIM01 through SAIM06 and in SAIM08 was not included in the data set; however, no action was taken. The CC for tantalum and thallium were also missing; however, no action was needed. Overall calibration was acceptable.

There were low level contamination problems in five of eight blanks. The majority of the contamination was less than two times the CRDL. The metal concentrations in the samples were orders of magnitude higher than the blank concentrations. The corresponding metals were qualified J or UJ where required, or the blank concentrations were ignored when the metal concentrations were sufficiently elevated, and no qualifier was issued. Overall, the quality of the blanks was acceptable.

Only two interference check samples, one in SAIM02 and one in SAIM06, failed to meet the QC criteria. The interferences were all less than two times the CRDL. No action was taken. The overall quality of the interference check samples was acceptable.

The metals antimony, selenium, thallium, arsenic, manganese, chromium, zinc, lead, mercury, silver, and copper at one time or another fell out of the prescribed QC limits for matrix spike recovery. They were qualified J or UJ, where appropriate, except for antimony, which was qualified as unusable (R).

Very few problems were encountered in the evaluation of duplicates. Lead and mercury were the only metals that deviated from the prescribed QC limits (SAIM03 for lead and SAIM06 for mercury). Overall duplicate analysis were acceptable.

The metals arsenic, selenium, thallium, and lead in each SDG deviated from the furnace QC criteria. The affected metals have been flagged J or UJ, where appropriate.

Copper (SAIM01), zinc (SAIM01-8), sodium (SAIM04,5,7), and iron (SAIM08) deviated from the prescribed QC limits for ICP serial dilution. The metal deviations have been flagged J or UJ, where applicable. The overall serial dilution was acceptable.

The assessment for the inorganic data set is acceptable for use with qualifiers. Most of the data qualified as estimated (J) because of typical problems in the laboratory concerning spikes or duplicate RPD's. Antimony was qualified as unusable (R). Metals that were out of QC criteria were relatively few. The quality of the data was considered reliable and can be used with qualifications.

D-1.2 Organic Analysis

Environmental soil/sediment samples and field quality control samples collected during the sampling investigation were submitted to DataChem Laboratories for VOC, SVOC, and Pesticide/PCB analysis, using the March 1990 CLP SOW.

D-1.2.1 Volatile Compounds

Eighty-eight soil/sediment samples and 9 duplicate soil/sediment samples were collected. Analysis was performed by DataChem Laboratories using the March 1990 CLP SOW. Data quality was evaluated using the guidelines and control limits specified in the CLP SOW and the referenced guidelines for organic analysis for holding times, tuning, initial and continuing calibration, method blanks, surrogate recoveries, internal standards, and MS/MSD results.

Based on the evaluation of all environmental samples, all holding times were met.

Based on the evaluation of all mass spectroscopy tunings, all tuning criteria were met.

Based on the evaluation of the ICALs, few problems were detected. The initial calibrations for SAIV05, 7, and 8 indicated the acetone values were out of the QC limits for percent RSD. These deviations had no effect on the data because acetone was not detected on site.

Based on the evaluation of the continuing calibrations (CCALs), problems were encountered in SAIV04, 5, and 6 with styrene, 2-hexanone, acetone, vinyl chloride, 2-butanone, and 4-methyl-2-pentanone being out of the QC control limits for percent difference. The majority of the above compounds normally exhibit poor responses when analyzed. None of the compounds were detected on site; therefore no qualifiers other than UJ have been assigned, and none of the above deviations affect data quality.

Based on the evaluation of the internal standard recoveries, SAIV04, 5, and 6 had deviations of internal standards chlorobenzene and difluorobenzene. The area counts deviated from the QC criteria. The compounds affected by the internal standards deviations are; 1,1,1-TCA, carbon tetrachloride,

bromodichloromethane, 1,2-dichloropropane, TCE, dibromochloromethane, 1,1,2-TCA, benzene, cie-1,3-dichloropropane, bromoform, 2-hexanone, 4-methyl-3-pentanone, PCE, 1,1,2,2-TCA, toluene, chlorobenzene, ethylbenzene, styrene, and total xylenes.

Based on the evaluation of all surrogate recoveries, only SAIV04 had deviations for surrogates. In sample 152003 and the corresponding matrix spike and matrix spike duplicate, toluene and bromofluorobenzene deviated from the QC limits for recovery. Since only one sample (and the corresponding matrix spike and matrix spike duplicate) was affected, there was no impact on the data due to these deficiencies.

Based on the evaluation of the method blanks, only one blank failed the specified QC criteria. In SAIV02, method blank VBLK02 contained acetone at 21 ppb. This had no impact on the data since acetone was not detected on site.

Only one MS/MSD sample deviated from the prescribed QC limits, which was 152003 from SAIV04. No data was affected by this deviation.

The overall quality of the volatile data appears acceptable. There were a few problems concerning ICAL and CCAL runs that did flag some data, but no VOCs were detected at the site. The number of compounds out of QC criteria for surrogates, internal standards, MS/MSD and calibrations were few. The qualifiers did not impact the data because no TCL VOCs were detected in the samples.

D-1.2.2 Semivolatile Organic Compounds

Eighty-eight soil/sediment samples and 9 duplicate soil/sediment samples were collected. Analysis was performed by DataChem Laboratories using the March 1990 CLP SOW. Data quality was evaluated using the guidelines and control limits specified in the CLP SOW and the referenced guidelines for organic analysis for holding times, tuning, initial and continuing calibration, method blanks, surrogate recoveries, internal standards, and MS/MSD results.

Based on the evaluation of the holding time data, all sample extraction and analysis met the prescribed holding time criteria except for sample 362101RE which exceeded holding time. All compounds were qualified as estimated (J or UJ).

There were five ICAL runs with compounds that did not meet the QC criteria. These compounds were predominantly 3,3- dichlorobenzidine, 4-chloroaniline, N-nitrosodiphenylamine, 2,4-dinitrophenol, 3-nitroaniline and carbazole, most of which do not have a maximum percent RSD. These are the typical compounds that will exhibit poor behavior chromatographically. The overall quality of the ICAL runs were acceptable.

All eight SDGs exhibited CCAL runs which included compounds that did not meet the QC criteria. They were predominantly the compounds listed in the ICAL section above, plus phenol, 2-fluorobiphenyl, 4,6-dinitro-2-methylphenol, di-N-octylphthalate, benzo(b)phthalate, 4-nitroaniline, 2-nitrophenol, 4-chloroaniline and others that exhibit poor chromatography. Since most of these compounds were poor performers, the associated compounds were qualified J or UJ as necessary. The overall CCAL assessment was acceptable, with qualifications.

All eight SDGs exhibited method blank contamination. The compounds most associated with the contamination were bis(2-ethylhexyl) phthalate and di-N-butylphthalate. SAIS03, 6, and 7 contained aldol condensation products (ACP). All phthalates listed here and detected in samples were flagged with "U" because all detected phthalates were less than five times the blank concentration. The ACP tentatively identified compounds were qualified as unusable (R). Method blank performance other than the listed compounds was acceptable.

All SDGs contained MS/MSDs that exhibited certain compounds out of QC limits. The compounds, 2,4-dinitrotoluene, phenol, 1,2,4-trichlorobenzene, 4-chloro-3-methylphenol, acenaphthene, pyrene and 1,4-dichlorobenzene, have no maximum percent D, and are poor performers chromatographically. These outliers affected only the samples used for the MS/MSD analysis. No qualifiers were assigned to other samples due to the MS/MSD deviations.

Only SDG SAIS06 contained internal standards, namely chrysene and perylene, that were out of QC control limits. The remaining SDGs were free from any internal standard deviations.

SDG's SAIS03, 4, 7, and 8 contained surrogates that were out of QC limits. These surrogates were phenol d5, 2-fluorophenol, terphenyl d14, and 2,4-6 tribromophenol. The qualification of compounds is not needed except for sample 122003 in SAIS03, which had two acid surrogates out (phenol and 2-fluorophenol). Therefore all acid compounds in sample 122003 were flagged J.

There were a number of compounds that failed the criteria for mass spectra identification upon validation that the laboratory failed to detect. Most of these compounds were of the polyaromatic hydrocarbon (PAH) type of compound. Although the sample's spectra looked similar to the standard's spectra, there were enough differences in the reviewers' opinions to question and eliminate some compounds. However, those questioned PAH compounds may be existing as a hydroxide, epoxide, or any number of other variations of the particular PAH. By declaring that the particular PAH compound is not present, doesn't leave out the likelihood that it may exist in another form.

Overall, the quality of the SVOC data was acceptable. The problems concerning the CCAL deviations were caused by poor chemical performers. There were not enough of the good performers that deviated from the QC criteria to raise much concern. There are concerns over the detection of Tentatively Identified Compounds (TIC) that were observed in the blanks. Some of those same chemical classes of TICs (i.e., aldol condensation products) found in the blank were found in the samples. Some compounds failed the mass spectra criteria and were qualified as unusable (R).

D.1.2.3 Pesticide/PCB Compounds

Eighty-eight soil/sediment samples and 9 duplicate soil/sediment samples were collected. Analysis was performed by DataChem Laboratories using the March 1990 CLP SOW. Data quality was evaluated using the guidelines and control limits specified in the CLP SOW and the referenced guidelines for organic analysis for holding times, initial and continuing calibration, method blanks, surrogate recoveries and MS/MSD results.

All holding times for extraction and analysis were met.

There were few deviations encountered in calibration. In SAIP06, the surrogate decafluorobiphenyl was out of QC limits along with endrin ketone, possibly due to carryover from a previous run. All other calibrations met the specified QC criteria.

The laboratory detected methoxychlor in virtually all their method blanks at levels up to 290 ppb. Endrin, dieldrin, and heptachlor epoxide, along with methoxychlor, were detected in certain method blanks. The rinsate blanks in SAIP02 and 5 contained b-BHC, heptachlor, dieldrin, and endosulfan sulfate at low concentrations. All corresponding samples detecting these compounds have been flagged when the concentration was less than five times the action level. Methoxychlor was flagged in virtually all samples as UJ, due to its presence in blanks.

The laboratory had problems with decachlorobiphenyl being continually out of the QC criteria for surrogate recovery (70 times) and most of the time, elevated above the upper control limit. The surrogate tetrachlorometaxylene in contrast was out of the QC criteria less than 15 times. The appropriate qualifiers (J or UJ) were applied.

Only SDG SAIP08 possessed any MS/MSD compounds out of QC criteria, which was endrin, probably due to a shared peak in Arochlor 1254, which elevated the concentration.

Data quality for the pesticide/PCB analyses was acceptable. The hits of Arochlor 1248 and Arochlor 1254 were detected by pattern recognition but never verified by GC/MS. Methoxychlor was detected in laboratory blanks and qualified in samples. Calibrations and surrogate recoveries were acceptable. The MS/MSD results were acceptable. Data can be used as reported with qualifiers.

D-1.3 Radiological Analysis

Eighty-eight soil/sediment samples and 9 duplicate soil/sediment samples were collected. Analysis was performed by PACE, Inc. for the isotopes listed in the Sampling and Analysis Plan. Data quality was evaluated using the control limits specified in the OU-9 QAPjP and the referenced guidelines for radiological analysis for holding times, calibration, blanks, sample specific chemical recovery, laboratory control sample, matrix spike, and duplicate results.

All holding times were met with one exception. One sample was reanalyzed for isotopic plutonium 11 days after the allowable holding time limit of 6 months. Tritium results may have been affected by sample storage, since the samples were not sealed in glass, due to hydrogen exchange with the environment. Therefore, all tritium results were qualified as estimated (J). The bottle for sample 292001 was received damaged. The tritium result for this sample was rejected (R), and the results for all other results were flagged as estimated (J). The Ra-226 by equilibrium with Bi-214 have been qualified as (J), since Rn intermediate is a gas and escapes destoying equilibrium.

Data for initial and continuing calibration were not included in the data packages. Efficiency calibration for gamma spectroscopy was performed with standards larger than the samples. This geometry difference was significant and all gamma spectroscopy results were qualified as estimated (J). Tritium background values for liquid scintillation counting were determined with a factory standard blank of a different geometry. Therefore, all tritium results were qualified as estimated (J) due to improper background subtraction.

Tritium, thorium-228, thorium-230, uranium-234, and uranium-235 had blank results greater than their associated uncertainty, indicating possible contamination or bias due to improper blank subtraction. In such cases, sample results less than 10 times the blank result were qualified as estimated (J).

Sample specific chemical recovery was performed for all isotopic uranium, plutonium, and thorium analyses. Isotopes uranium-232, plutonium-242, and thorium-229 were used as tracers to verify laboratory performance on an individual sample basis. Acceptable recoveries of 50-100 percent were found in all but three thorium, six plutonium, and eight uranium samples. All of these samples were flagged as estimated (J) with the exception of two uranium samples, MC0032001 and MC0032002, which had recoveries greater than 150 percent and lower than 20 percent which were qualified as rejected (R).

Laboratory control samples were analyzed for each type of analysis. All solid LCS results must fall within the control limits of 70-130 percent recovery of the standard value. All LCS results were within limits except for cesium-137 in SDG D207803507 and for all uranium isotopes in SDGs D20731502 and D20917502. All samples with LCS results out of limits were qualified as estimated (J).

Matrix spike samples were analyzed for plutonium, uranium, thorium, tritium, and strontium for nine SDGs. All tritium MS results were within limits. One plutonium-238 (SDG D20803507), two thorium-230 (SDGs D20727503 and D20917502), and two uranium-234/238 (SDGs D20727503 and D20806503) MS results were out of limits, and respective results were qualified as estimated (J). All of the strontium MS results were very poor. As a result, all strontium-90 results were qualified as rejected (R).

Laboratory duplicate analysis samples were analyzed for tritium, plutonium-238, plutonium-239/240, uranium-234, uranium-238, thorium-228, thorium-230, thorium-232, strontium-90, and potassium-40 for nine SDGs. One tritium (SDG D20729501), one thorium-230 (SDG D20724505), one strontium-90 (SDG D20810506), three plutonium-239/240 (SDGs D20724505, D20803507, D2020806503), and six plutonium-238 (SDGs D20729501, D20803507, D20805507, D20806503, D20810506, and D20917502) duplicate analysis results were outside of the limits. All respective results were qualified as estimated (J).

All analytical results were examined for any anomolies (i.e., omissions, legibility, etc.). Quantified results were recalculated for determination of errors. For alpha spectroscopy (uranium, plutonium, thorium), the uncertainties were not calculated to include the background uncertainty. As a result, all actinide data were qualified as estimated (J). Values reported as less than values that had no uncertainties

associated with them were qualified as undetected (U). Some of the plutonium, thorium, and uranium analyses were performed using less than 1 gram sample aliquot size. There was also no indication that these aliquots were taken from a homogenized sample. Therefore, the results of these analyses have been qualified as estimated (J).

The chemical separation specificity was verified for alpha spectroscopy by observation of the alpha energy spectrum. Checks were made on observed peaks to see if it is within 40 keV of the energy for the radionuclide of interest. Checks were also made for any energy spectra peaks that overlap or that have associated peaks that may interfere with the peak of the radionuclide of interest. Interference from thorium in the uranium spectra was found in several analyses. The most significant was thorium-230 interfering with uranium-234. This was due to poor chemical seperation between thorium and uranium. All uranium-234 results were qualified as rejected (R) for SDGs D20724505, D20731502, and D20810506. The uranium-234 result for sample 172002 was also qualified as rejected for the same reason. The thorium-232 result for sample MC0042004 was qualified as rejected (R) because the thorium-230 spectra tailed badly into the the thorium-232 region. Some of the thorium-228 results for SDG D20917502 were qualified rejected (R) due to severe interference of an extraneous peak. In other samples of the same SDG, the thorium-229 tracer peak overlapped with the thorium-230 peak causing more than a 10 percent error in thorium-230. Therefore, the thorium-230 results were qualified as estimated (J) for these samples.

The system performance for each SDG is summarized in the following table. Degradation in system performance may degrade the quality of the data. The raw data was reviewed to determine if unexpected activity, extraneous peaks, loss of resolution, or loss of expected background peaks had occurred.

Data quality for the radionuclide analyses was acceptable with the exception of strontium-90. All of the results that were not qualified below detection (U) and not qualified as rejected (R) were qualified as estimated (J) for one reason or another. Data can be used as reported with qualifiers. The rejected strontium-90 results were attributed to the failure of multiple QC results to fall within acceptable control limits. However, the use of the data as a qualitative indicator of the presence of Sr-90, but not its absence, in the samples may be appropriate.

D-2 FIELD QUALITY ASSURANCE

Seven trip blanks, five ambient blanks, nine rinsate blanks and nine duplicate samples were collected and shipped to DataChem Laboratories for analysis using the same procedures as with the previous samples

System Performance

SDG	System Performance Issues
D20724505	Peak tailing of thorium-230 into thorium-232 region occurred in sample MC0042004. Interference peaks from unseperated thorium in uranium analyses.
D20727503	High backgrounds were observed for thorium-228, thorium-230, and tritium.
D20729501	One uranium analysis showed interference peaks from unseperated thorium.
D20731502	High backgrounds were observed for uranium-234 and thorium-230 results. Uranium spectra showed extraneous peak for thorium-228 causing interference with uranium-234 and thorium-230 analyses.
D20803507	Instrument performance parameters indicated that the quality of data remained consistent for the time period during which the analyses were completed.
D20805507	The plutonium-239 spectra had baseline problems or high background levels.
D20806503	Instrument performance parameters indicated that the quality of data remained consistent for the time period during which the analyses were completed.
D20810506	Uranium spectra showed extraneous peak from either thorium-230 or from plutonium that interfered with uranium-234 analysis.
D20917502	Thorium spectra showed extraneous overlapping peaks which caused interference with thorium-228 and thorium-230 analyses.

collected. Nine rinsate blanks and nine duplicate samples were shipped to PACE, Inc. for the same radiological procedures as the previous samples. The analytical results obtained from the field QC samples were used to assess the effectiveness and efficiency of the collection procedure and equipment decontamination.

The majority of the nine trip blanks prepared by DataChem Laboratories using ASTM Type II water were sent to the site, stored with unused sample bottles, shipped back to the laboratory in the same cooler containing collected environmental samples, and analyzed for VOCs. The remaining trip blanks were prepared in the field by field personnel using ASTM Type II water, shipped to the lab in the same cooler containing collected environmental samples, and analyzed in the same fashion.

Of the seven trip blanks analyzed (TT2201 through TT2207), only one (TT2207) was free of any contaminants. The remaining trip blanks contained methylene chloride, toluene, ethyl benzene, xylene (TT2201-5), and acetone (TT2206,7) at low concentrations (<6 ppb). The reviewer was unable to differentiate between the trip blanks prepared by the lab and those prepared in the field. The contaminants that were detected do not reflect the conditions at the site and are believed to be either laboratory-related contaminants or exhaust gases from automobiles using the main highway that ran within 25 to 100 feet of certain sampling points; this is very close to the location at which the trip blanks were prepared.

Nine rinsate blanks were collected by passing ASTM Type II water through and/or on decontaminated soil/sediment sampling equipment. These blanks were collected and shipped to the laboratories to be analyzed for TCL VOC's SVOC's, pesticide/PCB's, TAL inorganics and radionuclides.

Only two rinsate blanks, RR2404 and RR2406, were contaminated with VOCs, namely acetone (11 and 6 ppb). Acetone is not considered a contaminant at the site and neither was it used in the field for any purpose. The acetone is believed to be a laboratory contaminant, since it was detected in some of the laboratory method blanks.

A total of four rinsate blanks were free of SVOC contaminants. The remaining four contained bis (2-ethyl hexyl) phthalate and di-N-butyl phthalate (aka common phthalates) at concentrations less than 6 ppb. These are not considered site pollutants and are thought to be common laboratory contaminants. However, the ASTM Type II water was stored in a plastic barrel on site, which may be one source of the phthalates.

A total of four rinsate blanks were free of any pesticide/PCB contamination. The remaining five rinsate blanks contained b-BHC, heptachlor, endrin, dieldrin, and endosulfan sulfate at very low concentrations (<.039 ppb). The source of these contaminants is thought to be the laboratory since a number of the pesticides detected in field blanks were detected in some of the laboratory method blanks.

The radionuclide analysis of the rinsate blanks were considered as "blanks" by the lab and were handled and analyzed similarly to the soil samples for the purposes of comparison. For this reason, these aqueous samples were analyzed by gamma spectroscopy with the same counting times as the soil samples. The limited counting times, resulted in elevated detection limits for the gamma spectroscopy of the rinsate blanks. All of the rinsate blanks had reportable levels of thorium-230 that were below 1 pCi/L but above detection limit. One sample, RR2409, had a thorium-230 result of 4.8 pCi/L. All other thorium, plutonium, and thorium isotopes were reported either below detection limit or well below 1 pCi/L.

Of the five ambient blanks analyzed for volatiles, only one (AA2301) contained volatile compounds, namely chloroform. The source of the chloroform is unknown, because it was not used in the field for any purpose nor was it detected in any laboratory method blanks.

A total of nine field duplicates were collected and shipped to DataChem Laboratories for TCL VOC, SVOC, pesticide/PCB and TAL metals using the March 1990 CLP SOW and PACE Inc. for radionuclides. The nine field duplicates were collected and analyzed approximately two months after the initial samples were collected and analyzed.

There were five duplicate samples out of a total of nine that contained volatile organics, namely styrene and methylene chloride at a RPD range of zero to 142 percent RPD. These volatiles were also detected in some of the laboratories method blanks and are not considered originating from the site.

There were a number of SVOC hits, ranging from 16 to 22 hits per SDG. Generally, most of the hits were the same compounds, being the PAH's, phthalates, the fluoranthenes, and pyrenes. Of the 169 compounds detected, only 64 compounds were below the 50 percent RPD control. There were no trends as to which compound was below the 50 percent RPD control the most. Due to the time difference in which the duplicates were collected in relationship to the comparison samples, it is unusual to think the percent RPD would be comparable with the semivolatile compounds (or pesticides either).

No trends were evident as to what particular pesticide(s) were below the 50 percent RPD value. The majority of the pesticides did fail the 50 percent RPD cutoff.

The majority of the inorganic analysis did meet the 50 percent RPD cutoff. Eight out of the nine duplicate samples contained metals that the majority met the RPD cutoff. This result is consistent with the belief that inorganic concentration will have changed little compared to the organic concentrations that stand a greater chance to migrate and vary the concentrations over the time frame of sampling.