



***Annual Monitoring Report  
October 1990 - September 1991***

***Prepared for  
USX***

***July 1992***

*Engineering Company*

RECEIVED

AUG 06 92

ICFMA Ground Water  
& Solid Waste Div

Ground Water & Solid Waste Division Site Response Section
Site Name
Category
Subcategory
Initials _____

***Annual Monitoring Report  
October 1990 - September 1991***

***Prepared for  
USX***

***July 1992***

***Barr***

*Engineering Company  
8300 Norman Center Drive  
Minneapolis, MN 55437  
Phone: (612) 832-2600  
Fax: (612) 835-0186*

ANNUAL MONITORING REPORT  
OCTOBER 1990 - SEPTEMBER 1991  
USS DULUTH WORKS SITE

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION . . . . .	1
2.0 MONITORING ACTIVITIES . . . . .	1
2.1 <u>Water Elevations</u> . . . . .	1
2.2 <u>Water Quality</u> . . . . .	2
3.0 MONITORING RESULTS . . . . .	2
3.1 <u>PAH and Phenolic Compounds</u> . . . . .	2
3.2 <u>General Parameters</u> . . . . .	3
3.3 <u>Metals</u> . . . . .	4
4.0 QUALITY CONTROL REVIEW . . . . .	4
4.1 <u>Field Blank Samples</u> . . . . .	4
4.2 <u>Blind Duplicate Samples</u> . . . . .	5
5.0 RECOMMENDED MONITORING PROGRAM FOR 1992 . . . . .	5

## LIST OF TABLES

TABLE 1	Groundwater Elevations, Duluth Works Site
TABLE 2	Parameter Lists
TABLE 3	Water Quality Monitoring Data, PAH and Phenolic Compounds
TABLE 4	Water Quality Monitoring Data, General Parameters
TABLE 5	Water Quality Monitoring Data, Metals
TABLE 6	Water Quality Monitoring Data, Field Parameters
TABLE 7	Quality Control Data, Field Blank Samples, PAH Compounds
TABLE 8	Quality Control Data, Field Blank Samples, Metals
TABLE 9	Quality Control Data, Blind Duplicate Samples, PAH Compounds
TABLE 10	Quality Control Data, Blind Duplicate Samples, General Parameters
TABLE 11	Quality Control Data, Blind Duplicate Samples, Metals
TABLE 12	Quality Control Data, Blind Duplicate Samples, Coefficient of Variation

## LIST OF FIGURES

FIGURE 1	Groundwater Contours, June 1991
FIGURE 2	Routine Water Quality Monitoring Stations
FIGURE 3	Geographical Distribution of PAH Compounds, June 1991
FIGURE 4	Geographical Distribution of General Parameters, June 1991
FIGURE 5	Geographical Distribution of Metals, June 1991

## LIST OF APPENDICES

APPENDIX A	Analytical Laboratory Reports
APPENDIX B	Concentration Profiles, 1985 - 1991

ANNUAL MONITORING REPORT  
OCTOBER 1990 - SEPTEMBER 1991  
USS DULUTH WORKS SITE

1.0 INTRODUCTION

The USS Duluth Works Site (site) is located in the southern portion of the City of Duluth in St. Louis County, Minnesota. The Duluth Works was an integrated steel mill (coke production, steel production and finishing, and material storage) that ended operations in May, 1979.

This site is the subject of a March 26, 1985 Response Order by Consent (Order) between USS, a Division of USX Corporation and the Minnesota Pollution Control Agency (MPCA). In accordance with the Order, the document entitled "Plans Submitted Pursuant to Part IV and Part V, Task A to Exhibit A, March 26, 1985 Response Order by Consent, U.S. Steel Duluth Works Site" was prepared by Barr Engineering Co. and submitted to the MPCA in May 1985. This report described the geologic and hydrogeologic conditions at the site along with the water quality monitoring plan. The monitoring plan was amended and approved by the MPCA based on the recommendations of the October 1986 - September 1987 Annual Monitoring Report. The following sections summarize the results of the water quality monitoring conducted during the period from October 1990 to September 1991.

2.0 MONITORING ACTIVITIES

2.1 Water Elevations

In June 1991, groundwater elevations were measured in each monitoring well prior to purging the wells and collecting groundwater samples. The groundwater elevations measured in the monitoring wells are shown in Table 1. This data was used to construct the surficial groundwater contours shown on Figure 1. Groundwater flow under the site is generally east toward the St. Louis River estuary. However, the coke plant settling basin acts as a discharge zone for the northern portion of the site.

## 2.2 Water Quality

The procedures specified in the Quality Assurance/Quality Control Plan in the May 1985 report were followed during sample collection. The sampling locations are shown on Figure 2.

Samples were collected quarterly (November, May, June, August) from Surface Water Stations CP-1, CP-2, CP-3, SEEP-1, and WM-1. These samples were analyzed for the "PAH and heterocyclic compounds," "total metals," and "general parameters" listed in Table 2.

In June 1991, samples were collected from Monitoring Wells W6, W7, W8, W9, W10, W11, and W13. A bailer became lodged in the well during sampling at W12 and no sample was collected. A groundwater sample was obtained from Well W12 in August 1991. The samples collected from Monitoring Wells W6 through W13 were analyzed for the "PAH and heterocyclic compounds," "filtered metals," "general parameters," and annual parameters listed in Table 2.

Specific conductance, temperature, and pH were measured in the field immediately after collection of each sample.

## 3.0 MONITORING RESULTS

The following sections summarize the analytical results of samples collected from October 1990 to September 1991. Laboratory analytical reports for these samples are in Appendix A.

### 3.1 PAH and Phenolic Compounds

The analytical results of samples analyzed for PAH and phenolic compounds are presented in Table 3. The geographical distribution of PAH compounds at monitoring wells and surface water stations is shown on Figure 3 for the June sampling event. The data for the June sampling event is shown on Figure 3 because it is the most complete data set.

PAH compounds included in the monitoring program are divided into two groups, List 1 and List 2 (see Table 2). Suspected carcinogenic PAH compounds are designated as List 1. List 2 PAH compounds are not suspected carcinogens. The highest concentrations of List 1 and List 2 PAH compounds were found in Monitoring Well W6 and Surface Water Station CP-2. The monitoring well in the vicinity of the demolition landfill (W12) contained detectable concentrations of List 1 PAH compounds ( $0.0040 \mu\text{g/L}$ ), and low concentrations of List 2 PAH compounds ( $0.027 \mu\text{g/L}$ ).

Graphs illustrating the concentrations of List 1 and List 2 PAH compounds in the surficial aquifer and surface waters from 1985 to 1991 are presented in Appendix B. No significant changes over time in the concentrations of List 1 and List 2 PAH compounds in samples from the monitoring well stations or surface water stations has been observed, except in the samples from CP-2. The concentrations of List 1 and List 2 PAH compounds in samples from CP-2 has fluctuated widely over the past two years. Continued monitoring of this station is required to show any trends in PAH concentration.

### 3.2 General Parameters

The general parameters included in the monitoring program are listed in Table 2. The analytical results of samples analyzed for these parameters are shown in Table 4. The geographical distribution of five general parameters (ammonia-nitrogen, total cyanide, thiocyanate, sulfate, and total organic carbon) are shown on Figure 4 for the June 1991 sampling event. The data for the June sampling event is shown on Figure 4 because it is the most complete data set.

Thiocyanate and sulfate were selected as indicator parameters for determining changes in contaminant concentrations with time. These parameters are considered possible indicators of groundwater and surface water contamination at the site for the following reasons: (1) the parameters have been consistently detected at elevated levels in samples from the surface water stations and monitoring wells at the site, and (2) thiocyanate and sulfate were major constituents of the wastes generated at the site. Graphs showing the concentration of sulfate and thiocyanate in the surficial aquifer and surface waters from 1985 to 1991 are presented in Appendix B. As shown in Appendix B,

the concentration of sulfate in samples from Monitoring Wells W6, W9, W10, W11, W12, and W13 decreased between June 1990 and June 1991. The sulfate concentration in samples collected from Monitoring Wells W7 and W8 did not change between June 1990 and June 1991. There was an increase in thiocyanate concentration at the monitoring stations between June 1990 and June 1991. The concentration of the increase in thiocyanate will be monitored in 1992 to determine if the increase in thiocyanate concentrations is a longer term trend or a short-term aberration in the data.

### 3.3 Metals

Water samples collected from the surface water stations were analyzed for the total metals listed in Table 2. Water samples collected from the monitoring wells were analyzed for the filtered metals listed in Table 2. The analytical results for these samples are listed in Table 5 and a geographical distribution is shown on Figure 5.

The concentrations of metals in samples collected at the site during the monitoring period were below the maximum acceptable contaminant levels for community water supplies.

## 4.0 QUALITY CONTROL REVIEW

Quality control procedures used in the collection and analysis of samples are described in the Quality Assurance/Quality Control Plan in the May 1985 report. A review of the quality control data was conducted to assess the integrity of the sampling procedures and analytical results for samples collected from October 1990 to September 1991.

### 4.1 Field Blank Samples

Field blank samples were collected during each sampling event and analyzed for PAH compounds and metals. The results of the analysis of the field blanks for PAH compounds and metals are presented in Tables 7 and 8, respectively. As shown in Tables 7 and 8, several compounds were detected in the field blanks. Detectable contaminant levels in the field blanks were used to identify potential



false positive values in the corresponding samples. Potential false positive values were defined as concentrations equal to or less than five times the concentration detected in the field blank. Potential false positive values are footnoted with a "b" in the water quality tables.

#### 4.2 Blind Duplicate Samples

A blind duplicate sample was collected at one monitoring station during each sampling event. The duplicate sample was analyzed for the "PAH and heterocyclic compounds," "metals," and "general parameters" listed in Table 2. Tables 9, 10, and 11 show the analytical results of the duplicate samples. A coefficient of variation was computed for each duplicate pair. Table 12 lists the coefficients for each sampling event. A coefficient less than 0.25 is generally considered an indication of acceptable reproducibility of analytical results by the laboratory. Although the coefficients listed in Table 12 are greater than 0.25, the data is considered acceptable due to the very low concentrations detected.

#### 5.0 RECOMMENDED MONITORING PROGRAM FOR 1992

The Response Action Plan (RAP) is currently being prepared for the USS Duluth Works Site. The long-term monitoring plan will be addressed as part of the RAP. The monitoring plan specified in the May 1985 Barr Engineering Co. report with modifications recommended and approved in the October 1986 - September 1987 Annual Monitoring Report will continue to be the routine water quality monitoring plan for the site until the long-term monitoring plan is prepared and approved by the MPCA as part of the RAP for the site.

## ***Tables***

TABLE 1

GROUNDWATER ELEVATIONS  
DULUTH WORKS SITE  
(elevations in feet MSL)

Location	Elevation 06/27/91
W6	606.55
W7	629.42
W8	629.31
W9	620.00
W10	618.50
W11	618.75
W12	610.78
W13	625.75

TABLE 2

## PARAMETER LISTS

## PAH AND HETEROCYCLIC COMPOUNDS

LIST 1		LIST 2
Quinoline	2,3-Benzofuran	Dibenzothiophene
Benzo(a)anthracene	2,3-Dihydroindene	Phenanthrene
Chrysene	Indene	Anthracene
Benzo(b)fluoranthene	Naphthalene	Acridine
Benzo(a)pyrene	Benzo(b)thiophene	Phenanthridine
Indeno(1,2,3,cd)pyrene	Isoquinoline	Carbazole
Dibenzo(ah)anthracene	Indole	Fluoranthene
Benzo(ghi)perylene	2-Methylnaphthalene	Pyrene
	1-Methylnaphthalene	Triphenylene
	Biphenyl	Benzo(k)fluoranthene
	Acenaphthylene	7,12-Dimethylbenz(a)anthracene
	Acenaphthene	Benzo(e)pyrene
	Dibenzofuran	Perylene
	Fluorene	3-Methylcholanthrene
<b>TOTAL METALS</b>		<b>GENERAL PARAMETERS</b>
Chromium		Sulfate
Lead		Ammonia
Nickel		Cyanide
Zinc		Thiocyanate
Arsenic		Total Organic Carbon
<b>FILTERED METALS</b>		<b>ANNUAL PARAMETERS</b>
Chromium		Chemical Oxygen Demand
Lead		Total Dissolved Solids
Nickel		Cadmium
Zinc		Chloride
Arsenic		

TABLE 3

WATER QUALITY MONITORING DATA  
PAH COMPOUNDS

(concentrations in ug/L)

	W6	W7	W8	W9	W10	W11	W12	W13
	-----	-----	-----	-----	-----	-----	-----	-----
	06/28/91	06/28/91	06/28/91	06/28/91	06/28/91	06/27/91	08/29/91	06/27/91
Quinoline	DLND	DLND	DLND	DLND	DLND	DLND	DLND	DLND
Benzo(a)anthracene	0.57	<0.0030	0.0066	0.034	<0.0030	<0.0030	0.0040	0.011
Chrysene	0.62 bc	<0.0030	0.0057 bc	0.025 bc	<0.0030	0.0055 bc	<0.0060	0.026 c
Benzo(b)fluoranthene	0.99 c	<0.0030	0.012 c	0.061 c	<0.0030	0.0039 c	<0.0060	<0.0030
Benzo(a)pyrene	0.55	<0.0030	0.0054	0.021	<0.0030	<0.0030	<0.0030	<0.0030
Indeno(1,2,3,cd)pyrene	0.75	<0.0030	0.0086	0.021	<0.0030	<0.0030	<0.0030	<0.0030
Dibenzo(ah)anthracene	<0.15	<0.0030	<0.0030	0.0071	<0.0030	<0.0030	<0.0030	<0.0030
Benzo(ghi)perylene	0.21	<0.0030	0.0074	0.0074	<0.0030	0.0096	<0.0030	<0.0030
Sum List 1	3.1	ND	0.040	0.15	ND	0.013	0.0040	0.037
2,3-Benzofuran	<0.20	0.0092 b	0.011 b	<0.0080	0.0069 b	0.0067 b	<0.0040	0.0061 b
2,3-Dihydroindene	<0.15	<0.0030	<0.0030	<0.0060	<0.0030	<0.0030	<0.0030	<0.0030
Indene	<0.15	0.0043	<0.0030	<0.0060	<0.0030	<0.0030	0.11	<0.0030
Naphthalene	3.5 b	0.0062 b	0.041 b	0.011 b	0.0070 b	0.025 b	0.0047 b	0.013 b
Benzo(b)thiophene	<0.15	<0.0030	<0.0030	<0.0060	<0.0030	<0.0030	<0.0030	<0.0030
Isoquinoline	DLND	0.011	DLND	DLND	0.0033	DLND	DLND	DLND
Indole	<0.15	<0.0030	<0.0030	<0.0060	<0.0030	<0.0030	<0.0030	<0.0030
2-Methylnaphthalene	<0.15	<0.0030	0.0088	<0.0060	<0.0030	0.013	<0.0030	0.0048
1-Methylnaphthalene	<0.15	<0.0030	0.0068	<0.0060	<0.0030	0.0085	<0.0030	0.0035
Biphenyl	<0.15	<0.0030	<0.0030	<0.0060	<0.0030	0.0033	<0.0030	0.0069
Acenaphthylene	0.16	0.0032	0.0051	0.0084	<0.0030	0.010	0.0057	0.0082
Acenaphthene	<0.15	<0.0030	<0.0030	<0.0060	<0.0030	<0.0030	<0.0030	<0.0030
Dibenzofuran	<0.15	<0.0030	0.0056	<0.0060	<0.0030	<0.0030	<0.0030	<0.0030
Fluorene	0.35	<0.0030	0.0089	<0.0060	<0.0030	0.0035	<0.0030	<0.0030
Dibenzothiophene	<0.15	<0.0030	<0.0030	<0.0060	<0.0030	0.0049	0.0041	0.015
Phenanthrene	1.3 b	<0.0030	0.031 b	0.042 b	0.0034 b	0.026 b	0.013	0.055 b
Anthracene	0.38	<0.0030	0.0035	0.0075	<0.0030	<0.0030	<0.0030	<0.0030
Acridine	DLND	DLND	DLND	DLND	DLND	DLND	DLND	DLND
Phenanthridine	DLND	DLND	DLND	DLND	DLND	0.0033	DLND	DLND
Carbazole	<0.15	<0.0030	0.0082	<0.0060	<0.0030	<0.0030	<0.0030	<0.0030
Fluoranthene	2.1 b	<0.0030	0.030 b	0.11 b	<0.0030	0.012 b	0.021	0.059 b
Pyrene	1.6 b	<0.0030	0.023 b	0.076 b	0.0044 b	0.10 b	0.015	0.60 b
Triphenylene	0.62 bc	<0.0030	0.0057 bc	0.025 bc	<0.0030	0.0055 bc	<0.0060	0.026 c
Benzo(k)fluoranthene	0.99 c	<0.0030	0.012 c	0.061 c	<0.0030	0.0039 c	<0.0060	<0.0030
7,12-Dimethylbenz(a)anthracene	<0.15	<0.0030	<0.0030	<0.0060	<0.0030	<0.0030	<0.0030	<0.0030
Benzo(e)pyrene	0.33	<0.0030	0.0062	0.013	<0.0030	0.0060	<0.0030	<0.0030
Perylene	0.19	<0.0030	<0.0030	<0.0060	<0.0030	<0.0030	<0.0030	<0.0030
3-Methylcholanthrene	<0.15	<0.0030	<0.0030	<0.0060	<0.0030	<0.0030	<0.0030	<0.0030
Sum List 2	1.4	0.018	0.053	0.029	0.0033	0.052	0.17	0.039

-----  
b Potential false positive based on data validation procedure.  
c Compounds coelute. Coeluting compounds are Chrysene and Triphenylene;  
Benzo(b)fluoranthene and Benzo(k)fluoranthene.  
DLND Detection limit not determined.  
ND None detected.  
-- Not analyzed.  
.025

TABLE 3 (cont.)

WATER QUALITY MONITORING DATA  
PAH COMPOUNDS

(concentrations in ug/L)

	CP1					CP2		
	11/29/90	05/14/91	05/14/91	06/27/91	08/29/91	11/29/90	05/14/91	06/27/91
Quinoline	<0.0010	<0.0010	<0.0020	DLND	DLND	<0.024	0.028	DLND
Benzo(a)anthracene	<0.0010	<0.0010	<0.0020	<0.0030	<0.0030	<0.024	0.027	3.8
Chrysene	<0.0010	<0.0010	<0.0020	0.0043 bc	<0.0060	<0.024	<0.024	3.7 c
Benzo(b)fluoranthene	<0.0010	<0.0010	<0.0020	0.0044 c	<0.0060	<0.024	<0.024	5.2 c
Benzo(a)pyrene	<0.0010	<0.0010	<0.0020	<0.0030	<0.0030	<0.024	<0.024	3.3
Indeno(1,2,3,cd)pyrene	<0.0017	<0.0017	<0.0034	<0.0030	<0.0030	<0.041	<0.041	2.2
Dibenzo(ah)anthracene	<0.0014	<0.0014	<0.0028	<0.0030	<0.0030	<0.034	<0.034	0.75
Benzo(ghi)perylene	<0.0010	<0.0010	<0.0020	0.0084	<0.0030	<0.024	<0.024	0.85
Sum List 1	ND	ND	ND	0.013	ND	ND	0.055	20
2,3-Benzofuran	DLND	0.0065 b	0.0043 b	0.0040 bj	<0.0040	DLND	DLND	<0.64
2,3-Dihydroindene	0.017	0.024	0.019	<0.0030	0.016	0.10	0.043	<0.48
Indene	0.015	0.0087	<0.0020	<0.0030	0.0063	0.070	<0.024	<0.48
Naphthalene	0.027 b	0.017 b	0.014 b	0.0078 b	0.023 b	<0.046	<0.046	<0.64
Benzo(b)thiophene	0.0064	0.0021	<0.0020	<0.0030	0.010	0.11	0.10	<0.48
Isoquinoline	DLND	DLND	DLND	DLND	DLND	DLND	0.31	DLND
Indole	<0.0029	<0.0029	<0.0058	<0.0030	<0.0030	<0.070	<0.070	<0.48
2-Methylnaphthalene	0.036	0.0034	<0.0040	<0.0030	<0.0030	<0.048	<0.048	<0.48
1-Methylnaphthalene	0.034	0.0030	<0.0020	<0.0030	<0.0030	0.28	0.17	<0.48
Biphenyl	0.0095	0.0011	<0.0020	<0.0030	<0.0030	0.19	0.095	<0.48
Acenaphthylene	0.0030	0.0019 b	<0.0020	<0.0030	0.0031	0.96	0.45	<0.48
Acenaphthene	0.0041	0.0038 b	<0.0026	<0.0030	0.0041	1.2	1.1	<0.48
Dibenzofuran	0.0093	0.0032	<0.0040	<0.0030	<0.0030	0.92	0.31	<0.48
Fluorene	0.0074	0.0024	<0.0028	<0.0030	<0.0030	1.2	0.41	0.68
Dibenzothiophene	0.0075	DLND	DLND	0.0037	<0.0030	0.11	0.028	<0.48
Phenanthrene	0.010	0.0045	0.0041	0.0084 b	0.0039	0.23	<0.024	4.5 b
Anthracene	0.0013	<0.0010	<0.0020	<0.0030	<0.0030	0.28	0.11	2.0
Acridine	<0.0018	<0.0018	<0.0036	DLND	DLND	0.059	0.20	DLND
Phenanthridine	<0.0014	<0.0014	<0.0028	0.0032	DLND	0.034	0.094	DLND
Carbazole	<0.0011	0.0028	<0.0022	<0.0030	0.0051	0.91	0.17	<0.48
Fluoranthene	0.0087	0.0042 b	0.0028 b	0.0098 b	0.0081	0.97	0.62	8.5 b
Pyrene	0.0048 b	0.0035 b	0.0039 b	0.081 b	0.0063	0.61	0.33	5.9 b
Triphenylene	<0.0010	<0.0010	<0.0020	0.0043 bc	<0.0060	<0.024	<0.024	3.7 c
Benzo(k)fluoranthene	<0.0010	<0.0010	<0.0020	0.0044 c	<0.0060	<0.024	<0.024	5.2 c
7,12-Dimethylbenz(a)anthracene	DLND	DLND	DLND	<0.0030	<0.0030	DLND	DLND	<0.48
Benzo(e)pyrene	<0.0010	<0.0010	<0.0020	0.0033	<0.0030	<0.024	<0.024	1.4
Perylene	<0.0010	<0.0010	<0.0020	<0.0030	<0.0030	<0.024	<0.024	0.76
3-Methylcholanthrene	DLND	DLND	DLND	<0.0030	<0.0030	DLND	DLND	<0.48
Sum List 2	0.17	0.092	0.047	0.010	0.062	8.2	4.5	4.8

b Potential false positive value based on data validation procedure.

c Compounds coelute. Coeluting compounds are Chrysene and Triphenylene;  
Benzo(b)fluoranthene and Benzo(k)fluoranthene.

j Reported value is less than the detection limit.

DLND Detection limit not determined.

ND None detected.

-- Not analyzed.

.026

TABLE 3 (cont.)

WATER QUALITY MONITORING DATA  
PAH COMPOUNDS

(concentrations in ug/L)

	CP2		CP3			SEEP1		
	08/29/91	11/29/90	05/14/91	06/27/91	08/29/91	11/29/90	05/14/91	06/27/91
Quinoline	DLND	<0.024	0.041	0.0034	DLND	<0.032	<0.010	DLND
Benzo(a)anthracene	0.017	<0.024	0.052	<0.0030	0.0081	<0.032	<0.010	0.030
Chrysene	0.014 c	<0.024	0.046 c	<0.0030	0.013 c	<0.032	0.028 c	0.046 c
Benzo(b)fluoranthene	0.020 c	<0.024	0.024 c	0.045 c	0.018 c	<0.032	<0.010	0.035 c
Benzo(a)pyrene	0.0062	<0.024	<0.020	0.022	0.0039	<0.032	<0.010	0.028
Indeno(1,2,3,cd)pyrene	0.0048	<0.041	<0.034	<0.0030	0.0047	<0.054	<0.017	0.0089
Dibenzo(ah)anthracene	<0.0030	<0.034	<0.028	<0.0030	<0.0030	<0.045	<0.014	0.0065
Benzo(ghi)perylene	0.0041	<0.024	<0.020	0.081	0.0039	<0.032	<0.010	0.013
Sum List 1	0.065	ND	0.16	0.15	0.052	ND	0.028	0.17
2,3-Benzofuran	0.011 b	DLND	DLND	0.014 b	0.011 b	DLND	DLND	0.0071 b
2,3-Dihydroindene	<0.0030	0.055	<0.028	<0.0030	<0.0030	0.33	0.17	0.038
Indene	0.012	0.074	<0.020	0.0096	0.0081	<0.032	<0.010	0.0036
Naphthalene	<0.0040	<0.046	<0.038	0.011 b	<0.0040	<0.061	<0.019	<0.0040
Benzo(b)thiophene	0.065	0.063	0.029	0.038	0.014	<0.032	<0.010	<0.0030
Isoquinoline	DLND	DLND	0.23	0.045	DLND	DLND	DLND	DLND
Indole	<0.0030	<0.070	<0.058	0.0044	<0.0030	<0.093	<0.029	<0.0030
2-Methylnaphthalene	<0.0030	<0.048	<0.040	0.013	<0.0030	<0.064	<0.020	<0.0030
1-Methylnaphthalene	0.0045	0.17	0.11	0.019	<0.0030	<0.032	<0.010	<0.0030
Biphenyl	<0.0030	0.13	0.081	0.047	<0.0030	<0.032	<0.010	<0.0030
Acenaphthylene	0.0069	0.76	0.38	0.050	0.0044	0.062	<0.010	<0.0030
Acenaphthene	<0.0030	0.82	0.78	0.021	0.0042	1.1	0.48	0.13
Dibenzofuran	<0.0030	0.64	0.26	0.021	<0.0030	0.077	<0.020	0.13
Fluorene	<0.0030	1.0	0.45	<0.0030	0.0033	1.6	0.52	<0.0030
Dibenzothiophene	0.066	0.11	0.030	0.026	0.058	0.91	0.24	<0.0030
Phenanthrene	0.0037	0.24	0.046	0.038 b	0.0053	<0.032	<0.010	<0.0030
Anthracene	0.0041	0.19	0.10	0.031	0.0058	0.14	0.035	<0.0030
Acridine	0.0096	<0.043	0.22	0.039	0.045	<0.058	<0.018	DLND
Phenanthridine	0.011	<0.034	0.065	0.030	DLND	<0.045	<0.014	DLND
Carbazole	<0.0030	0.78	0.20	<0.0030	<0.0030	<0.035	<0.011	<0.0030
Fluoranthene	0.41	0.78	0.70	0.86 b	0.29	0.085	0.050	0.17 b
Pyrene	0.15	0.43	0.39	1.7 b	0.13	0.12	0.089	0.17 b
Triphenylene	0.014 c	<0.024	0.046 c	<0.0030	0.013 c	<0.032	0.028 c	0.046 c
Benzo(k)fluoranthene	0.020 c	<0.024	0.024 c	0.045 c	0.018 c	<0.032	<0.010	0.035 c
7,12-Dimethylbenz(a)anthracene	<0.0030	DLND	DLND	<0.0030	<0.0030	DLND	DLND	<0.0030
Benzo(e)pyrene	0.0057	<0.024	<0.020	0.042	0.0054	<0.032	<0.010	0.023
Perylene	<0.0030	<0.024	<0.020	0.017	<0.0030	<0.032	<0.010	0.0072
3-Methylcholanthrene	<0.0030	DLND	DLND	<0.0030	<0.0030	DLND	DLND	<0.0030
Sum List 2	0.34	6.2	4.1	0.45	0.15	4.4	1.6	0.33

b Potential false positive value based on data validation procedure.

c Compounds coelute. Coeluting compounds are Chrysene and Triphenylene; Benzo(b)fluoranthene and Benzo(k)fluoranthene.

DLND Detection limit not determined.

ND None detected.

-- Not analyzed.

.026

TABLE 3 (cont.)

WATER QUALITY MONITORING DATA  
PAH COMPOUNDS

(concentrations in ug/L)

	SEEP1	WM1					
	08/29/91	11/29/90	12/05/90	05/14/91	06/27/91	06/27/91	08/29/91
Quinoline	DLND	<0.0060	<0.016	<0.0020	0.0054	DLND	DLND
Benzo(a)anthracene	0.076	<0.0060	<0.016	<0.0020	0.011 c	<0.018	<0.0030
Chrysene	0.14 c	<0.0060	<0.016	0.0041 c	0.018 bc	0.019 bc	0.0060 c
Benzo(b)fluoranthene	0.11 c	<0.0060	<0.016	<0.0020	0.012 c	0.024 b	<0.0060
Benzo(a)pyrene	0.080	<0.0060	<0.016	<0.0020	<0.0030	<0.018	<0.0030
Indeno(1,2,3,cd)pyrene	0.058	<0.010	<0.027	<0.0034	<0.0030	<0.018	<0.0030
Dibenzo(ah)anthracene	<0.048	<0.0084	<0.022	<0.0028	<0.0030	<0.018	<0.0030
Benzo(ghi)perylene	0.12	<0.0060	<0.016	<0.0020	0.0073	<0.018	<0.0030
Sum List 1	0.58	ND	ND	0.0041	0.035	0.024	0.0060
2,3-Benzofuran	<0.064	DLND	DLND	0.034 b	0.10 b	0.046 b	0.0065 b
2,3-Dihydroindene	0.18	0.099	0.19	0.049	0.034	0.039	<0.0030
Indene	<0.048	0.026	0.033	0.094	0.15	0.062	0.037
Naphthalene	<0.064	<0.011	0.040 b	0.012 b	0.0050 b	<0.024	<0.0040
Benzo(b)thiophene	<0.048	0.0096	<0.016	0.0034	<0.0030	<0.018	0.0036
Isoquinoline	0.095	DLND	DLND	DLND	0.027	DLND	DLND
Indole	0.11	<0.017	<0.046	<0.0058	0.0033	<0.018	<0.0030
2-Methylnaphthalene	<0.048	<0.012	<0.032	<0.0040	<0.0030	<0.018	<0.0030
1-Methylnaphthalene	<0.048	<0.0060	<0.016	<0.0020	<0.0030	<0.018	<0.0030
Biphenyl	<0.048	0.0080	0.018	0.0032	0.0044	<0.018	<0.0030
Acenaphthylene	0.051	0.011	0.021	<0.0020	0.0066	<0.018	0.0042
Acenaphthene	0.83	0.39	0.79	0.0055 b	0.023	0.022	0.020
Dibenzofuran	0.10	0.12	0.24	0.031	0.038	0.041	0.0093
Fluorene	0.61	0.26	0.48	0.10	0.066	0.11	0.064
Dibenzothiophene	0.30	0.016	0.024	0.0065	0.013	<0.018	0.0091
Phenanthrene	<0.048	<0.0060	0.030	0.013	0.0092 b	<0.018	0.0034
Anthracene	0.061	<0.0089	<0.016	0.0032	0.014	<0.018	0.0054
Acridine	DLND	<0.011	<0.029	0.0036	DLND	DLND	DLND
Phenanthridine	DLND	<0.0084	<0.022	0.0028	DLND	DLND	DLND
Carbazole	<0.048	0.10	0.22	0.061	0.040	0.053	0.0096
Fluoranthene	0.13	0.088	0.11	0.069	0.17 b	0.19 b	0.051
Pyrene	0.28	0.042	0.044	0.021	0.17 b	0.12 b	0.033
Triphenylene	0.14 c	<0.0060	<0.016	0.0041 c	0.018 bc	0.019 bc	0.0060 c
Benzo(k)fluoranthene	0.11 c	<0.0060	<0.016	<0.0020	0.012 c	0.024 b	<0.0060
7,12-Dimethyl(benz(a)anthracene	<0.048	DLND	DLND	DLND	0.012	<0.018	<0.0030
Benzo(e)pyrene	0.074	<0.0060	<0.016	<0.0020	0.0053	<0.018	<0.0030
Perylene	<0.048	<0.0060	<0.016	<0.0020	<0.0030	<0.018	<0.0030
3-Methylcholanthrene	<0.048	DLND	DLND	DLND	<0.0030	<0.018	<0.0030
Sum List 2	2.8	1.2	2.2	0.51	0.44	0.32	0.25

b Potential false positive value based on data validation procedure.

c Compounds coelute. Coeluting compounds are Chrysene and Triphenylene; Benzo(b)fluoranthene and Benzo(k)fluoranthene.

DLND Detection limit not determined.

ND None detected.

-- Not analyzed.

.026



TABLE 3 (cont.)

WATER QUALITY MONITORING DATA  
PAH COMPOUNDS

(concentrations in ug/L)

	WM1
	-----
	08/29/91
Quinoline	DLND
Benzo(a)anthracene	<0.0030
Chrysene	<0.0060
Benzo(b)fluoranthene	<0.0060
Benzo(a)pyrene	<0.0030
Indeno(1,2,3,cd)pyrene	<0.0030
Dibenzo(ah)anthracene	<0.0030
Benzo(ghi)perylene	<0.0030
Sum List 1	ND
2,3-Benzofuran	0.019 b
2,3-Dihydroindene	0.0038
Indene	0.031
Naphthalene	<0.0040
Benzo(b)thiophene	0.0047
Isoquinoline	DLND
Indole	<0.0030
2-Methylnaphthalene	<0.0030
1-Methylnaphthalene	<0.0030
Biphenyl	<0.0030
Acenaphthylene	<0.0030
Acenaphthene	0.021
Dibenzofuran	<0.0030
Fluorene	0.044
Dibenzothiophene	0.011
Phenanthrene	<0.0030
Anthracene	<0.0030
Acridine	DLND
Phenanthridine	DLND
Carbazole	0.0092
Fluoranthene	0.042
Pyrene	0.025
Triphenylene	<0.0060
Benzo(k)fluoranthene	<0.0060
7,12-Dimethylbenz(a)anthracene	<0.0030
Benzo(e)pyrene	<0.0030
Perylene	<0.0030
3-Methylcholanthrene	<0.0030
Sum List 2	0.19

-----  
b Potential false positive value based on data validation procedure.

DLND Detection limit not determined.

ND None detected.

-- Not analyzed.

.026

TABLE 4

WATER QUALITY MONITORING DATA  
GENERAL PARAMETERS

(concentrations in mg/L)

	W6	W7	W8	W9	W10	W11	W12	W13
	06/28/91	06/28/91	06/28/91	06/28/91	06/28/91	06/27/91	08/29/91	06/27/91
	50	50	50	50	50	50	50	50
Biochemical Oxygen Demand	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	--	--	--	--	--	15	220	31
Chloride	--	--	--	--	--	3	3	4
Cyanide, total	0.09	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Ammonia Nitrogen	<0.1	<0.1	1.3	0.2	<0.1	<0.1	0.2	<0.1
Total Dissolved Solids	--	--	--	--	--	--	610	--
Sulfate	160	240	<1	98	140	33	180	110
Thiocyanate, mg/L	9.9	7.1	4.9	6.0	5.0	5.3	1	9.5
Total Organic Carbon	6.0	4.3	13	5.3	4.4	7.1	4.0	5.9
	CP1				CP2			
	11/29/90	05/14/91	05/14/91	06/27/91	08/29/91	11/29/90	05/14/91	06/27/91
	50	50	51	50	50	50	50	50
Biochemical Oxygen Demand	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	<50	--	--	--	--	<50	--	--
Chloride	17	--	--	--	--	59	--	--
Cyanide, total	0.02	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.02
Ammonia Nitrogen	0.1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1
Total Dissolved Solids	300	--	--	--	--	400	--	--
Sulfate	41	29	29	23	40	66	49	41
Thiocyanate, mg/L	<1.0	19	22	6.3	<1.0	<1.0	17	9.1
Total Organic Carbon	14	8.7	8.4	6.2	7.4	13	8.9	7.3
	CP2	CP3			SEEP1			
	08/29/91	11/29/90	05/14/91	06/27/91	08/29/91	11/29/90	05/14/91	06/27/91
	50	50	50	50	50	50	50	50
Biochemical Oxygen Demand	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	--	<50	--	--	--	<50	--	--
Chloride	--	54	--	--	--	19	--	--
Cyanide, total	0.02	0.04	0.01	0.02	0.03	<0.01	<0.01	<0.01
Ammonia Nitrogen	<0.1	0.3	0.2	<0.1	<0.1	0.2	<0.1	<0.1
Total Dissolved Solids	--	390	--	--	--	550	--	--
Sulfate	40	71	52	43	50	130	140	110
Thiocyanate, mg/L	<1.0	<1.0	17	6.0	<1.0	<1.0	25	4.8
Total Organic Carbon	9.2	13	8.3	7.0	8.1	19	32	16
	SEEP1	WM1						
	08/29/91	11/29/90	11/29/90	05/14/91	06/27/91	08/29/91	08/29/91	
	50	50	51	50	50	50	51	
Biochemical Oxygen Demand	--	--	--	--	--	--	--	
Chemical Oxygen Demand	--	<50	53	--	--	--	--	
Chloride	--	18	18	--	--	--	--	
Cyanide, total	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	
Ammonia Nitrogen	0.3	0.1	0.1	0.2	<0.1	<0.1	<0.1	
Total Dissolved Solids	--	750	740	--	--	--	--	
Sulfate	120	260	260	240	230	190	--	
Thiocyanate, mg/L	<1.0	<1.0	<1.0	19	5.6	<1.0	--	
Total Organic Carbon	17	20	19	11	6.7	8.5	8.3	

50 Samples analyzed by Pace Laboratories.

51 Pace sample duplicate.

-- Not analyzed.

.031

TABLE 5

WATER QUALITY MONITORING DATA  
METALS

(concentrations in ug/L, unless noted otherwise)

	W6 ----- 06/28/91	W7 ----- 06/28/91	W8 ----- 06/28/91	W9 ----- 06/28/91	W10 ----- 06/28/91
Arsenic, filtered	<2.0	<2.0	<2.0	<2.0	<2.0
Cadmium, filtered	--	--	--	--	--
Chromium, filtered	12	10	7.9	2.2	2.8
Lead, filtered	<1.0	<1.0	<1.0	<1.0	2.5
Nickel, filtered	<4.0	<4.0	<4.0	<4.0	<4.0
Zinc, filtered, mg/L	0.039	0.021	0.016	0.046	0.058
	W11 ----- 06/27/91	W12 ----- 08/29/91	W13 ----- 06/27/91		
Arsenic, filtered	<2.0	<78	<2.0		
Cadmium, filtered	<0.10	0.14	<0.10		
Chromium, filtered	6.8	2.8	10		
Lead, filtered	<1.0	<1.0	<1.0		
Nickel, filtered	<4.0	<13	<4.0		
Zinc, filtered, mg/L	0.009	0.012	0.015		
	CP1 -----				
	11/29/90	05/14/91	06/27/91	08/29/91	12/30/91
Arsenic	<94	<2.0	<4.0	<78	<80
Cadmium	<10	--	--	--	--
Chromium, total	<10	<1.0	12	<1.0	<1.0
Lead	<45	<1.0	7.3	<2.0	<2.0
Nickel	<21	<50	<13	<13	<15
Zinc, mg/L	<0.006	<0.01	0.041	0.005	0.009 b
	CP2 -----				
	11/29/90	05/14/91	06/27/91	08/29/91	12/30/91
Arsenic	<94	<2.0	<4.0	<78	<80
Cadmium	<10	--	--	--	--
Chromium, total	<10	1.1	9.6	<1.0	1.28
Lead	<45	<1.0	21	<2.0	<2.0
Nickel	<21	<50	<13	<13	<15
Zinc, mg/L	<0.006	<0.01	0.087	0.030	0.015 b
	CP3 -----				
	11/29/90	05/14/91	06/27/91	08/29/91	12/30/91
Arsenic	<94	<2.0	<4.0	<78	<80
Cadmium	<10	--	--	--	--
Chromium, total	<10	1.0	1.3	<1.0	<1.0
Lead	<45	<1.0	<2.0	<2.0	<2.0
Nickel	<21	<50	<13	<13	<15
Zinc, mg/L	<0.006	<0.01	0.049	0.028	0.012 b

b Potential false positive value based on data validation procedure.

-- Not analyzed.

.036

TABLE 5 (cont.)

WATER QUALITY MONITORING DATA  
METALS

(concentrations in ug/L, unless noted otherwise)

	SEEP1				
	11/29/90	05/14/91	06/27/91	08/29/91	12/30/91
Arsenic	<94	<2.0	<4.0	<78	<80
Cadmium	<10	--	--	--	--
Chromium, total	<10	<2.0	1.2	1.0	1.32
Lead	<45	1.6	<2.0	3.9	<2.0
Nickel	<21	<50	<13	<13	<15
Zinc, mg/L	<0.006	0.02	0.006	0.039	0.015 b

	WM1				
	11/29/90	05/14/91	06/27/91	08/29/91	12/30/91
Arsenic	<94	<2.0	<4.0	<78	<80
Cadmium	<6	--	--	--	--
Chromium, total	<10	1.6	1.2	1.1	2.07
Lead	<45	<1.0	<2.0	<2.0	<2.0
Nickel	<21	<50	<13	<13	<15
Zinc, mg/L	0.040	0.06	0.009	0.059	0.21

b Potential false positive value based on data validation procedure.

-- Not analyzed.

.036

TABLE 6

WATER QUALITY MONITORING DATA  
FIELD PARAMETERS

	W6 ----- 06/28/91	W7 ----- 06/28/91	W8 ----- 06/28/91	W9 ----- 06/28/91	W10 ----- 06/28/91	W11 ----- 06/27/91	W12 ----- 06/27/91	
Temperature, oC	14.0	19.0	14.0	14.0	13.0	22.0	17.0	33
Specific Conductance, umhos/cm@25oC	545	1350	1250	470	900	750	1050	600
pH, standard units	7.4	7.0	6.7	6.9	7.0	6.7	6.6	7.13
	W13 ----- 06/27/91	CP1 ----- 11/29/90					CP2 ----- 11/29/90	
Temperature, oC	13.0	3.0	16	21.0	38	3.0	17	24.0
Specific Conductance, umhos/cm@25oC	900	435	370	350	500	600	520	470
pH, standard units	6.4	7.4	8.0	7.2	7.83	7.4	8.2	7.2
	CP2 ----- 08/29/91	CP3 ----- 11/29/90					SEEP1 ----- 11/29/90	
Temperature, oC	28	3.0	21	23.0	32.4	6.0	22	20.0
Specific Conductance, umhos/cm@25oC	570	565	430	490	550	750	800	900
pH, standard units	7.49	8.0	8.5	7.0	8.02	7.4	7.5	7.0
	SEEP1 ----- 08/29/91	WM1 ----- 11/29/90						
Temperature, oC	27	4.0	20	22.0	26.8			
Specific Conductance, umhos/cm@25oC	800	950	900	900	1800			
pH, standard units	7.04	7.8	8.3	6.8	7.64			

TABLE 7

QUALITY CONTROL DATA  
FIELD BLANK SAMPLES  
PAH COMPOUNDS

(concentrations in ug/L)

FIELD BLANKS					
	11/29/90	05/14/91	06/27/91	06/28/91	08/29/91
Quinoline	<0.0010	<0.0010	DLND	DLND	DLND
Benzo(a)anthracene	<0.0010	<0.0010	<0.0060	<0.012	<0.0030
Chrysene	<0.0010	<0.0010	<0.0060	<0.012	0.0074 c
Benzo(b)fluoranthene	<0.0010	<0.0010	<0.0060	<0.012	<0.0060
Benzo(a)pyrene	<0.0010	<0.0010	<0.0060	<0.012	<0.0030
Indeno(1,2,3,cd)pyrene	<0.0017	<0.0017	<0.0060	<0.012	<0.0030
Dibenzo(ah)anthracene	<0.0014	<0.0014	<0.0060	<0.012	<0.0030
Benzo(ghi)perylene	<0.0010	<0.0010	<0.0060	0.013	<0.0030
2,3-Benzofuran	DLND	DLND	<0.0080	<0.016	<0.0040
2,3-Dihydroindene	0.0072	<0.0014	<0.0060	<0.012	<0.0030
Indene	<0.0010	<0.0010	<0.0060	<0.012	0.014
Naphthalene	0.032	0.0036	<0.0080	0.017 b	<0.0040
Benzo(b)thiophene	<0.0010	<0.0010	<0.0060	<0.012	<0.0030
Isoquinoline	DLND	DLND	DLND	DLND	DLND
Indole	<0.0029	<0.0029	<0.0060	<0.012	<0.0030
2-Methylnaphthalene	0.0033	<0.0020	<0.0060	<0.012	<0.0030
1-Methylnaphthalene	0.0024	<0.0010	<0.0060	<0.012	<0.0030
Biphenyl	<0.0010	<0.0010	<0.0060	<0.012	<0.0030
Acenaphthylene	<0.0010	<0.0010	<0.0060	<0.012	<0.0030
Acenaphthene	<0.0013	<0.0013	<0.0060	<0.012	0.0047
Dibenzofuran	<0.0020	<0.0020	<0.0060	<0.012	<0.0030
Fluorene	<0.0014	<0.0014	<0.0060	0.015	0.0034
Dibenzothiophene	DLND	DLND	<0.0060	<0.012	<0.0030
Phenanthrene	<0.0010	<0.0010	<0.0060	0.024	0.0084
Anthracene	<0.0010	<0.0010	<0.0060	<0.012	<0.0030
Acridine	<0.0018	<0.0018	DLND	DLND	DLND
Phenanthridine	<0.0014	<0.0014	DLND	DLND	DLND
Carbazole	<0.0011	<0.0011	<0.0060	<0.012	<0.0030
Fluoranthene	<0.0010	<0.0010	<0.0060	0.076	0.031
Pyrene	<0.0010	<0.0010	<0.0060	0.29	0.012
Triphenylene	<0.0010	<0.0010	<0.0060	<0.012	0.0074 c
Benzo(k)fluoranthene	<0.0010	<0.0010	<0.0060	<0.012	<0.0060
7,12-Dimethylbenz(a)anthracene	DLND	DLND	<0.0060	<0.012	<0.0030
Benzo(e)pyrene	<0.0010	<0.0010	<0.0060	<0.012	<0.0030
Perylene	<0.0010	<0.0010	<0.0060	<0.012	<0.0030
3-Methylcholanthrene	DLND	DLND	<0.0060	<0.012	<0.0030

b Potential false positive value based on data validation procedure.

c Compounds coelute.

DLND Detection limit not determined.

.039

TABLE 8

QUALITY CONTROL DATA  
FIELD BLANK SAMPLES  
METALS

(concentrations in ug/L, unless noted otherwise)

	FIELD BLANKS	
	08/29/91	12/30/91
Arsenic	<78	<80
Cadmium	--	--
Chromium, total	<1.0	<1.0
Lead	<2.0	<2.0
Nickel	<13	<15
Zinc, mg/L	0.034	0.014 b

.....  
b Potential false positive value based on data validation procedure.

-- Not analyzed.

.040

TABLE 9

QUALITY CONTROL DATA  
BLIND DUPLICATE SAMPLES  
PAH COMPOUNDS

(concentrations in ug/L)

	WM1*		CP1		WM1		WM1	
	12/05/90 Sample	11/29/90 Duplicate	05/14/91 Sample	05/14/91 Duplicate	06/27/91 Sample	06/27/91 Duplicate	08/29/91 Sample	08/29/91 Duplicate
Quinoline	<0.016	<0.0060	<0.0010	<0.0020	0.0054	DLND	DLND	DLND
Benzo(a)anthracene	<0.016	<0.0060	<0.0010	<0.0020	0.011	<0.018	<0.0030	<0.0030
Chrysene	<0.016	<0.0060	<0.0010	<0.0020	0.018 bc	0.019 bc	0.0060 c	<0.0060
Benzo(b)fluoranthene	<0.016	<0.0060	<0.0010	<0.0020	0.012 c	0.024 b	<0.0060	<0.0060
Benzo(a)pyrene	<0.016	<0.0060	<0.0010	<0.0020	<0.0030	<0.018	<0.0030	<0.0030
Indeno(1,2,3,cd)pyrene	<0.027	<0.010	<0.0017	<0.0034	<0.0030	<0.018	<0.0030	<0.0030
Dibenzo(ah)anthracene	<0.022	<0.0084	<0.0014	<0.0028	<0.0030	<0.018	<0.0030	<0.0030
Benzo(ghi)perylene	<0.016	<0.0060	<0.0010	<0.0020	0.0073	<0.018	<0.0030	<0.0030
Sum List 1	ND	ND	ND	ND	0.035	0.024	0.0060	ND
2,3-Benzofuran	DLND	DLND	0.0065 b	0.0043 b	0.10 b	0.046 b	0.0065 b	0.019 b
2,3-Dihydroindene	0.19	0.099	0.024	0.019	0.034	0.039	<0.0030	0.0038
Indene	0.033	0.026	0.0087	<0.0020	0.15	0.062	0.037	0.031
Naphthalene	0.040 b	<0.011	0.017 b	0.014 b	0.0050 b	<0.024	<0.0040	<0.0040
Benzo(b)thiophene	<0.016	0.0096	0.0021	<0.0020	<0.0030	<0.018	0.0036	0.0047
Isocquinoline	DLND	DLND	DLND	DLND	0.027	DLND	DLND	DLND
Indole	<0.046	<0.017	<0.0029	<0.0058	0.0033	<0.018	<0.0030	<0.0030
2-Methylnaphthalene	<0.032	<0.012	0.0034	<0.0040	<0.0030	<0.018	<0.0030	<0.0030
1-Methylnaphthalene	<0.016	<0.0060	0.0030	<0.0020	<0.0030	<0.018	<0.0030	<0.0030
Biphenyl	0.018	0.0080	0.0011	<0.0020	0.0044	<0.018	<0.0030	<0.0030
Acenaphthylene	0.021	0.011	0.0019 b	<0.0020	0.0066	<0.018	0.0042	<0.0030
Acenaphthene	0.79	0.39	0.0038 b	<0.0026	0.023	0.022	0.020	0.021
Dibenzofuran	0.24	0.12	0.0032	<0.0040	0.038	0.041	0.0093	<0.0030
Fluorene	0.48	0.26	0.0024	<0.0028	0.066	0.11	0.064	0.044
Dibenzothiophene	0.024	0.016	DLND	DLND	0.013	<0.018	0.0091	0.011
Phenanthrene	0.030	<0.0060	0.0045	0.0041	0.0092 b	<0.018	0.0034	<0.0030
Anthracene	<0.016	<0.0089	<0.0010	<0.0020	0.014	<0.018	0.0054	<0.0030
Acridine	<0.029	<0.011	<0.0018	<0.0036	DLND	DLND	DLND	DLND
Phenanthridine	<0.022	<0.0084	<0.0014	<0.0028	DLND	DLND	DLND	DLND
Carbazole	0.22	0.10	0.0028	<0.0022	0.040	0.053	0.0096	0.0092
Fluoranthene	0.11	0.088	0.0042 b	0.0028 b	0.17 b	0.19 b	0.051	0.042
Pyrene	0.044	0.042	0.0035 b	0.0039 b	0.17 b	0.12 b	0.033	0.025
Triphenylene	<0.016	<0.0060	<0.0010	<0.0020	0.018 bc	0.019 bc	0.0060 c	<0.0060
Benzo(k)fluoranthene	<0.016	<0.0060	<0.0010	<0.0020	0.012 c	0.024 b	<0.0060	<0.0060
7,12-Dimethylbenz(a)anthracene	DLND	DLND	DLND	DLND	0.012	<0.018	<0.0030	<0.0030
Benzo(e)pyrene	<0.016	<0.0060	<0.0010	<0.0020	0.0053	<0.018	<0.0030	<0.0030
Perylene	<0.016	<0.0060	<0.0010	<0.0020	<0.0030	<0.018	<0.0030	<0.0030
3-Methylcholanthrene	DLND	DLND	DLND	DLND	<0.0030	<0.018	<0.0030	<0.0030
Sum List 2	2.2	1.2	0.092	0.047	0.44	0.32	0.25	0.19

- \* Duplicate collected on a different date than sample.  
b Potential false positive value based on data validation procedure.  
c Compounds coelute. Coeluting compounds are Chrysene and Triphenylene;  
Benzo(b)fluoranthene and Benzo(k)fluoranthene.  
DLND Detection limit not determined.  
ND None detected.  
-- Not analyzed.

.041



TABLE 10

QUALITY CONTROL DATA  
BLIND DUPLICATE SAMPLES  
GENERAL PARAMETERS

(concentrations in mg/L, unless noted otherwise)

	WM1		CP1		WM1		CP2	
	11/29/90 Sample	11/29/90 Duplicate	05/14/91 Sample	05/14/91 Duplicate	08/29/91 Sample	08/29/91 Duplicate	12/30/91 Sample	12/30/91 Duplicate
Biochemical Oxygen Demand	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	<50	53	--	--	--	--	--	--
Chloride	18	18	--	--	--	--	--	--
Cyanide, total	<0.01	<0.01	<0.01	<0.01	<0.01	--	0.02	0.02
Ammonia Nitrogen	0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.4
Total Dissolved Solids	750	740	--	--	--	--	--	--
Sulfate	260	260	29	29	190	--	59	57
Thiocyanate, mg/L	<1.0	<1.0	19	22	<1.0	--	5.2	4.8
Total Organic Carbon	20	19	8.7	8.4	8.5	8.3	7.8	5.7

-- Not analyzed.

.042

TABLE 11

QUALITY CONTROL DATA  
BLIND DUPLICATE SAMPLES  
METALS

(concentrations in ug/L, unless noted otherwise)

	WM1		CP1		CP2	
	11/29/90 Sample	11/29/90 Duplicate	05/14/91 Sample	05/14/91 Duplicate	12/30/91 Sample	12/30/91 Duplicate
Arsenic	<94	<94	<2.0	<2.0	<80	<80
Cadmium	<6	<10	--	--	--	--
Chromium, total	<10	<10	<1.0	<2.0	1.28	1.25
Lead	<45	<45	<1.0	<1.0	<2.0	<2.0
Nickel	<21	<21	<50	<50	<15	<15
Zinc, mg/L	0.040	0.019	<0.01	0.01	0.015 b	0.012 b

b Potential false positive value based on data validation procedure.

-- Not analyzed.

.043

TABLE 12

STATISTICAL ANALYSIS  
BLIND DUPLICATE SAMPLES  
COEFFICIENT OF VARIATION

Location -----	Sampling Date -----	Coefficient of Variation -----
WM1	11/29/90 & 12/05/90	0.37
CP1	05/14/91	0.30
WM1	06/27/91	0.31
WM1	08/29/91	0.33

-----  
2, .002

## ***Figures***



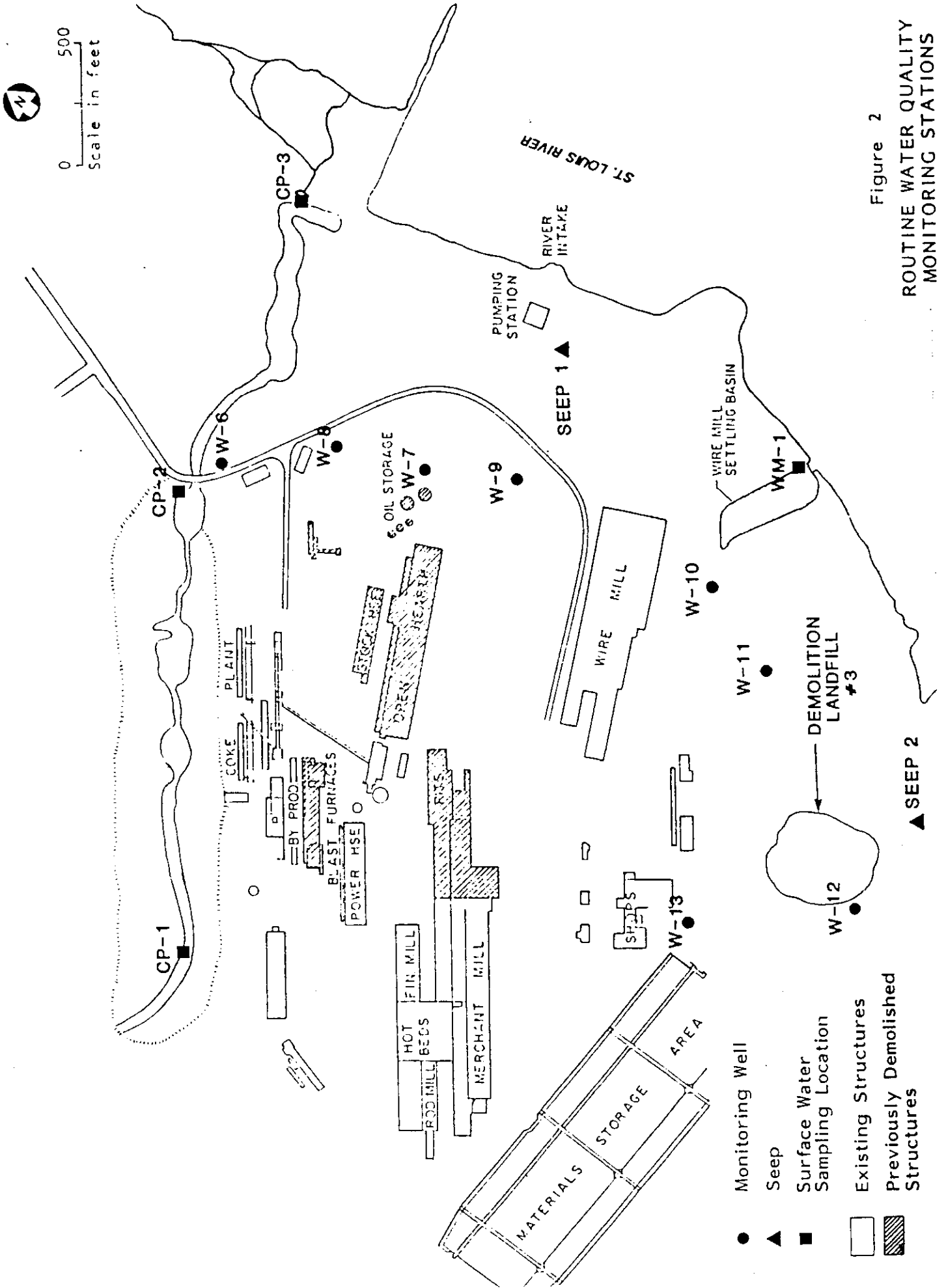
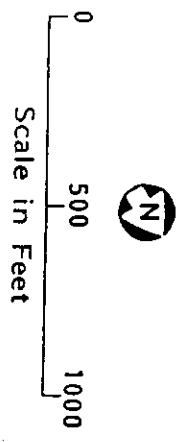
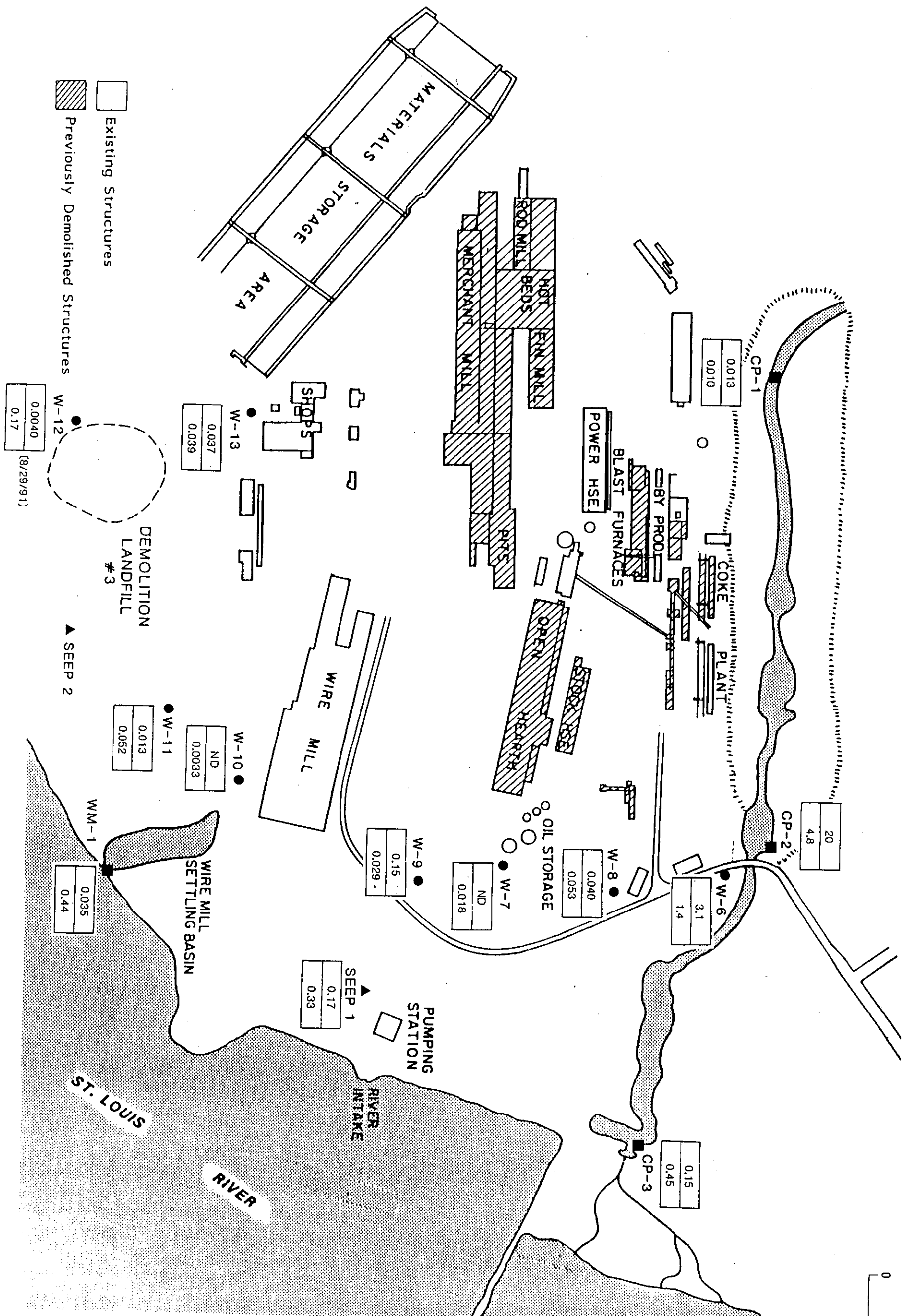


Figure 2  
 ROUTINE WATER QUALITY  
 MONITORING STATIONS

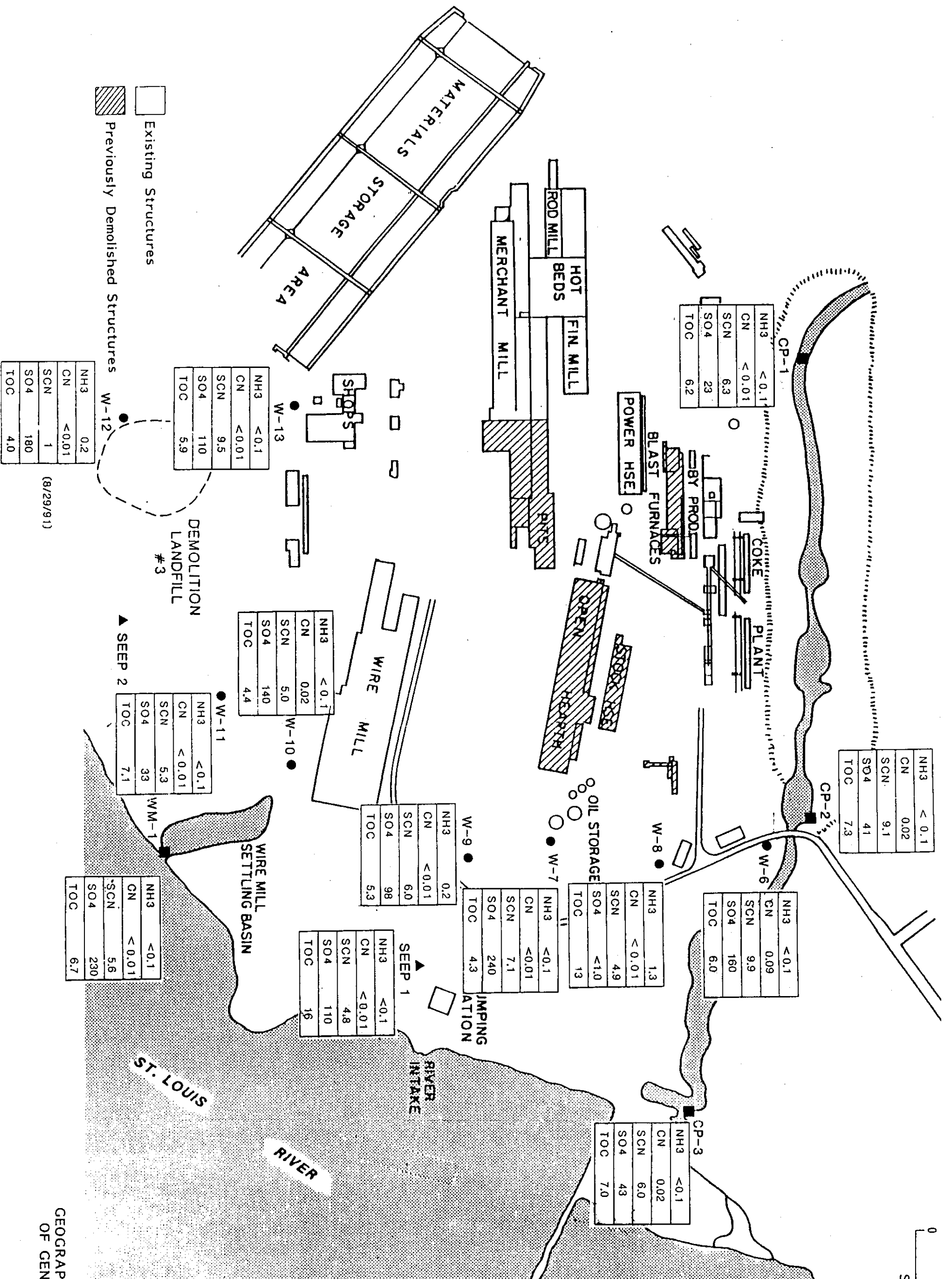


Sum List 1 Compounds (ug/L)  
 Sum List 2 Compounds (ug/L)  
 ND Not Detected

Figure 3  
 GEOGRAPHICAL DISTRIBUTION  
 OF PAH COMPOUNDS  
 June, 1991



0 500 1000  
Scale in Feet



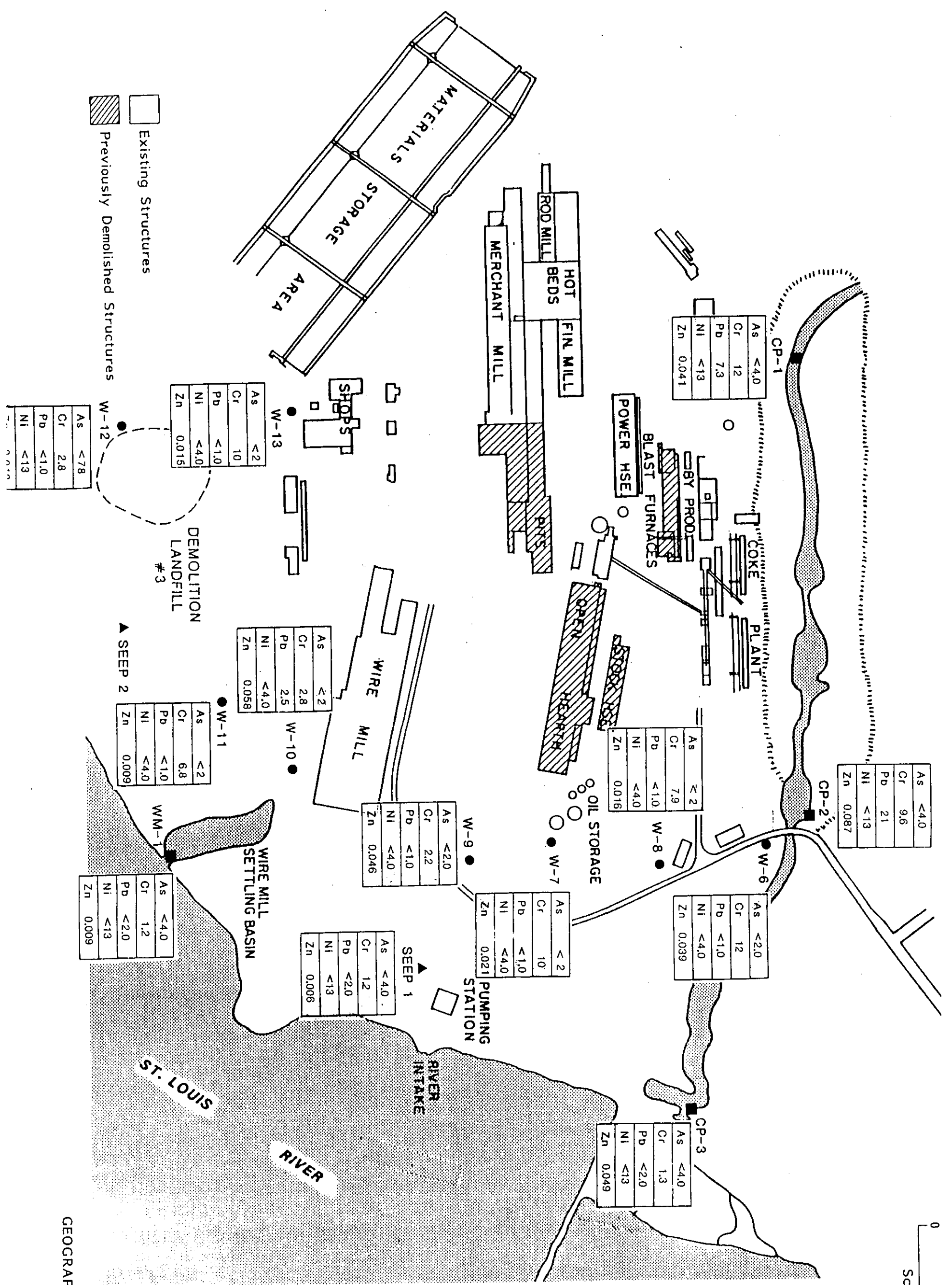
NH3 = Ammonia-Nitrogen  
 CN = Total Cyanide  
 SCN = Thiocyanate  
 SO4 = Sulfate  
 TOC = Total Organic Carbon  
 Concentration in mg/L

Figure 4  
 GEOGRAPHICAL DISTRIBUTION  
 OF GENERAL PARAMETERS  
 June, 1991





0 500 1000  
Scale in Feet



As = Arsenic  
Cr = Chromium  
Pb = Lead  
Ni = Nickel  
Zn = Zinc

Concentration in ug/L

Figure 5  
GEOGRAPHICAL DISTRIBUTION  
OF METALS  
June, 1991