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**FINAL**

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**ZINC SOURCE INVESTIGATION REPORT  
FIRST PIEDMONT ROCK QUARRY/  
ROUTE 719 SITE, PITTSYLVANIA COUNTY,  
VIRGINIA**

---

**PREPARED FOR:**

**FIRST PIEDMONT CORPORATION**

108 South Main Street  
Chatham, Virginia 24531

**THE GOODYEAR TIRE & RUBBER COMPANY**

1144 East Market Street  
Akron, Ohio 44316-0001

**CORNING INCORPORATED**

Corning, New York 14831

**PREPARED BY:**

**PARSONS**

10521 Rosehaven Street  
Fairfax, Virginia 22030

and

19101 Villaview Road, Suite 100  
Cleveland, Ohio 44119-3088

**DECEMBER 2003**

Date	Total Zinc (ug/L)						
	FP-001A	FP-001B	FP-002A	FP-003A	FP-006A	FP-006B	FP-008A
RI	32.3	61.3	16.6	20.2	55.2	504	2050
4th qtr 1995	NS	NS	19	66	224	224	719
1st qtr 1996	NS	NS	65	34	420	440	694
2nd qtr 1996	NS	NS	37	77	Dry	466	376
3rd qtr 1996	NS	NS	23	36	379	322	294
4th qtr 1996	NS	NS	48	35	Dry	202	271
1st qtr 1997	NS	NS	90	77	377	222	215
2nd qtr 1997	NS	NS	ND	123	264	104	173
3rd qtr 1997	NS	NS	34	26	Dry	119	169
4th qtr 1997	NS	NS	ND	ND	470	111	338
1st qtr 1998	NS	NS	ND	ND	280	140	184
2nd qtr 1998	NS	NS	137	73	Dry	286	184
3rd qtr 1998	NS	NS	ND	154	Dry	284	243
5/25/1999	<20	<20	<20	<20	Dry	39	265
10/25/1999	<20	<20	<20	<20	291	30.8	208
5/23/2000	<20	<20	<20	<20	Dry	38	270
11/29-30/2000	17.6	4.31	7.55	4.43	NS	30.1	44
6/13/2001	ND	ND	ND	ND	NS	ND	101
11/28/2001	ND	ND	ND	ND	NS	ND	37
6/20/2002	3.7	ND	3.5	ND	NS	8.7	48
11/6/2002	ND	ND	4.8	10.6	NS	10.9	178
4/15/2003	18.1	14.9	10.9	15.8	NS	15.8	134
9/4/2003	18	36	13	25	NS	25	92
3/23/2004	11	4.3	14	12	NS	10	157

NS = Not sampled, ND = Not detected.

# PARSONS

10521 Rosehaven Street • Fairfax, Virginia 22030 • (703) 591-7575 • Fax: (703) 591-1305 • www.parsons.com

December 15, 2003

Mr. Tom Wade  
First Piedmont Corporation  
108 South Main Street  
P.O. Box 1069  
Chatham, VA 24531

Re: Final Report for Zinc Source Investigation  
First Piedmont Rock Quarry/Route 719 Site, Pittsylvania County, Virginia

Dear Mr. Wade:

Enclosed are two copies of the referenced report. Two copies of the report were submitted to Mr. Ronnie Davis at U.S. Environmental Protection Agency, Region 3 on Friday December 12, 2003 for arrival on Monday, December 15, 2003. A copy of the transmittal letter to U.S. EPA is bound in the front of the report. We have also submitted one copy to the U.S. Fish and Wildlife Service and Virginia Department of Environmental Quality, and two copies each to Mike Ford at Corning, Inc. and Jeff Sussman at The Goodyear Tire & Rubber Company. Electronic copies have been distributed to the PRP Group by e-mail. Comments provided by Mike Ford on the revised draft report were incorporated into the final report.

If you or any members of the PRP Group have any questions, please feel free to call me at (703) 934-2383 or Peter Gelman at (216) 486-9005. We appreciate the opportunity to work with you on this project.

Sincerely,



Mark A. Collins  
Environmental Studies Manager

MAC:jb

G:\739\739086\ZN\_WORKPLAN\FINAL\ZNRPTLET.DOC

Enclosures

cc: Mr. Jeff Sussman, The Goodyear Tire & Rubber Company (w/ 2 copies Final Report)  
Mr. Mike Ford, Corning Incorporated (w/ 2 copies Final Report)  
Mr. Peter Gelman, P.E., Parsons (w/ 1 copy Final Report)  
File 739086 – Draft Report for Zinc Source Investigation



AR303331

December 12, 2003

**VIA FEDERAL EXPRESS PRIORITY OVERNIGHT**

Mr. Ronnie M. Davis  
Remedial Project Manager  
Hazardous Waste Cleanup Division (3HS23)  
U.S. EPA, Region III  
1650 Arch Street  
Philadelphia, PA 19103-2029

Re: First Piedmont Rock Quarry/Route 719 Superfund Site, Pittsylvania County, Virginia  
Zinc Source Investigation Report

Dear Mr. Davis:

On behalf of First Piedmont Corporation, The Goodyear Tire & Rubber Company, and Corning Incorporated, Parsons is pleased to submit two copies of the referenced report for your review. Copies of the report have also been submitted to Mr. John McCloskey with the U.S. Fish and Wildlife Service and Mr. Kelvin Greene with the Virginia Department of Environmental Quality.

After you have reviewed and provided comments on the report, the Potentially Responsible Parties Group would like to schedule a meeting to discuss the next steps. Please feel free to contact me at (703) 934-2383 or Mr. Tommy Stump with First Piedmont Corporation at (434) 432-0211 with any questions or comments.

Sincerely,



Mark A. Collins  
Environmental Studies Manager

MAC:jb

G:\739 739086 ZNRPT EPALET.DOC

Enclosure: two copies of Final Report

cc: Mr. John McCloskey, USFWS (1 copy of Final Report)  
Mr. Kelvin Greene, Virginia DEQ (1 copy of Final Report)  
Mr. Tommy Stump, First Piedmont Corporation  
Mr. Tom Wade, First Piedmont Corporation  
Mr. Jeff Sussman, The Goodyear Tire & Rubber Company  
Mr. Mike Ford, Corning Incorporated  
Mr. Peter Gelman, P.E., Parsons  
File 739086



---

FINAL

**ZINC SOURCE INVESTIGATION REPORT  
FIRST PIEDMONT ROCK QUARRY/ROUTE 719 SITE,  
PITTSYLVANIA COUNTY, VIRGINIA**

Prepared for:

**First Piedmont Corporation  
108 South Main Street  
Chatham, Virginia 24531**

**The Goodyear Tire & Rubber Company  
1144 East Market Street  
Akron, Ohio 44316-0001**

**Corning Incorporated  
Corning, New York 14831**

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**PARSONS**  
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Fairfax, Virginia 22030  
and  
19101 Villaview Road, Suite 100  
Cleveland, Ohio 44119-3088

DECEMBER 2003

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**PARSONS**

## EXECUTIVE SUMMARY

This report has been prepared by Parsons to present the findings of the zinc source investigation conducted at the First Piedmont Rock Quarry/Route 719 Site (the site) in Pittsylvania County, Virginia. The investigation was conducted for the Potentially Responsible Parties (PRP) Group, which consists of First Piedmont Corporation, The Goodyear Tire & Rubber Company, and Corning Incorporated.

The zinc source investigation was conducted in accordance with the Final Zinc Source Investigation Work Plan (April 2003). Soil and sediment samples were collected on 9 September 2003 from a total of 18 sampling stations, including 13 soil stations and 5 sediment stations. All sample were analyzed for total zinc.

Results of the zinc source investigation indicate the following:

- Zinc concentrations in surficial soils down gradient of the former waste pile are similar to site background concentrations, indicating that these soils are not a source of zinc to the Southern Drainage.
- Zinc concentrations in surficial soils down gradient of the former carbon black pile and the old disposal area exceed site background concentrations, but do not exceed U.S. EPA Region III Risk Based Concentrations.
- Zinc oxide disposed of at the carbon black pile is the apparent primary source of zinc in surficial soils down gradient of the carbon black pile.
- Sediment zinc concentrations at potentially influenced stations (AI04, AI05, and AI08) in the Southern Drainage were substantially lower than the June 2001 sampling event.

# FINAL ZINC SOURCE INVESTIGATION

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Appendix A	Laboratory Report for Soil and Sediment Zinc Analyses
Appendix B	Data Validation Report

## ACRONYM LIST

°C	Degrees Celsius
µg/L	Micrograms Per Liter
AI	Additional Investigation
g	Grams
LEL	Lowest Effect Level
LOEC	Lowest Observed Effect Concentration
mg/kg	Milligrams Per Kilogram
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NPL	National Priorities List
PRP	Potentially Responsible Parties
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RBC	Risk Based Concentration
ROD	Record of Decision
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
U.S. EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WEGS	Westinghouse Environmental and Geotechnical Services, Inc.

## SECTION 1

### INTRODUCTION

#### 1.1 BACKGROUND

---

This document presents the findings of the zinc source investigation conducted at the First Piedmont Rock Quarry/Route 719 Superfund Site (the site) on 9 September 2003. The U.S. Environmental Protection Agency (U.S. EPA) initiated a Five-Year Review of the site on 15 June 1999 (U.S. EPA, 1999). Potential sediment contamination issues were identified during the Five-Year Review and U.S. EPA signed an Amendment to the Administrative Order on 30 June 2000 (U.S. EPA, 2000). The Amendment required an Additional Investigation (AI) at the site, which included sampling and analysis of sediments in the Southern Drainage and Lawless Creek.

The Potentially Responsible Parties (PRP) Group consisting of First Piedmont Corporation, The Goodyear Tire and Rubber Company, and Corning Incorporated, conducted the AI during 2001 in accordance with the U.S. EPA-approved Work Plan dated May 2001 (Parsons, 2001a). Findings of the AI are presented in the Final AI Report dated December 2001 (Parsons, 2001b).

The AI identified zinc as a constituent of concern in the Southern Drainage based on elevated sediment zinc concentrations and sediment toxicity test results. The Remedial Investigation (RI) conducted at the site indicated that the carbon black pile was a source of zinc to the Southern Drainage (WEGS, 1990). The carbon black pile and associated soils were removed in 1994 as part of the Remedial Action (RA) (ENSCI, 1995). However, the AI results raised concerns that there might still be sources contributing zinc to the Southern Drainage.

These concerns are based on the relatively high sediment zinc concentration measured in June 2001 during the AI at station AI-04, which is located immediately down gradient of a site drainage that conveyed runoff from the former carbon black pile. Sediment zinc

concentrations at upstream reference stations (AI-01, AI-02, and AI-03) ranged from 13.9 to 25 mg/kg, while the concentration at AI-04 was 347 mg/kg. Downstream transport of sediments is expected during periods of high flow in this high-gradient portion of the Southern Drainage. Therefore, sediment zinc concentrations would be expected to decrease overtime, unless additional inputs occur. While there are no historical data for AI-04 to identify trends, the relatively high zinc concentration measured during the AI raised concern that zinc might still be entering the Southern Drainage. Based on a 25 June 2002 meeting and subsequent correspondence, U.S. EPA and the PRP Group agreed that further investigation of potential zinc sources is appropriate.

## 1.2 PROJECT OBJECTIVES AND SCOPE

This report has been prepared by Parsons to summarize and discuss the findings of the zinc source investigation. The primary objective of this investigation was to further evaluate potential sources of zinc to the Southern Drainage. This was accomplished by collecting and analyzing soil samples from suspected source areas and from areas down gradient of the suspected source areas. A secondary objective was to collect additional sediment zinc data for the Southern Drainage to help identify trends. This was accomplished by collecting and analyzing sediment samples from selected stations that were sampled during the AI in June 2001. A site visit was conducted with Mr. John McCloskey, U.S. Fish and Wildlife Service (USFWS), on 18 March 2003 to confirm the sampling locations.

The scope of the zinc source investigation included the following activities:

- Preparation of the Zinc Source Investigation Work Plan (submitted final in April 2003);
- Field sampling of soils and sediment of sediments for analysis of total zinc (completed on September 9, 2003); and
- Preparation of the Zinc Source Investigation Report (this document).

## 1.3 REPORT STRUCTURE

This report is organized to include the following:

- Section 1: Introduction – provides the objectives and scope of the project;

- Section 2: Background Information – includes a brief description of the site and descriptions of potential zinc sources;
- Section 3: Methods;
- Section 4: Results and Discussion;
- Section 5: References;
- Appendix A: Laboratory Report for Soil and Sediment Zinc Analyses; and
- Appendix B: Data Validation Report.



## SECTION 2

### BACKGROUND INFORMATION

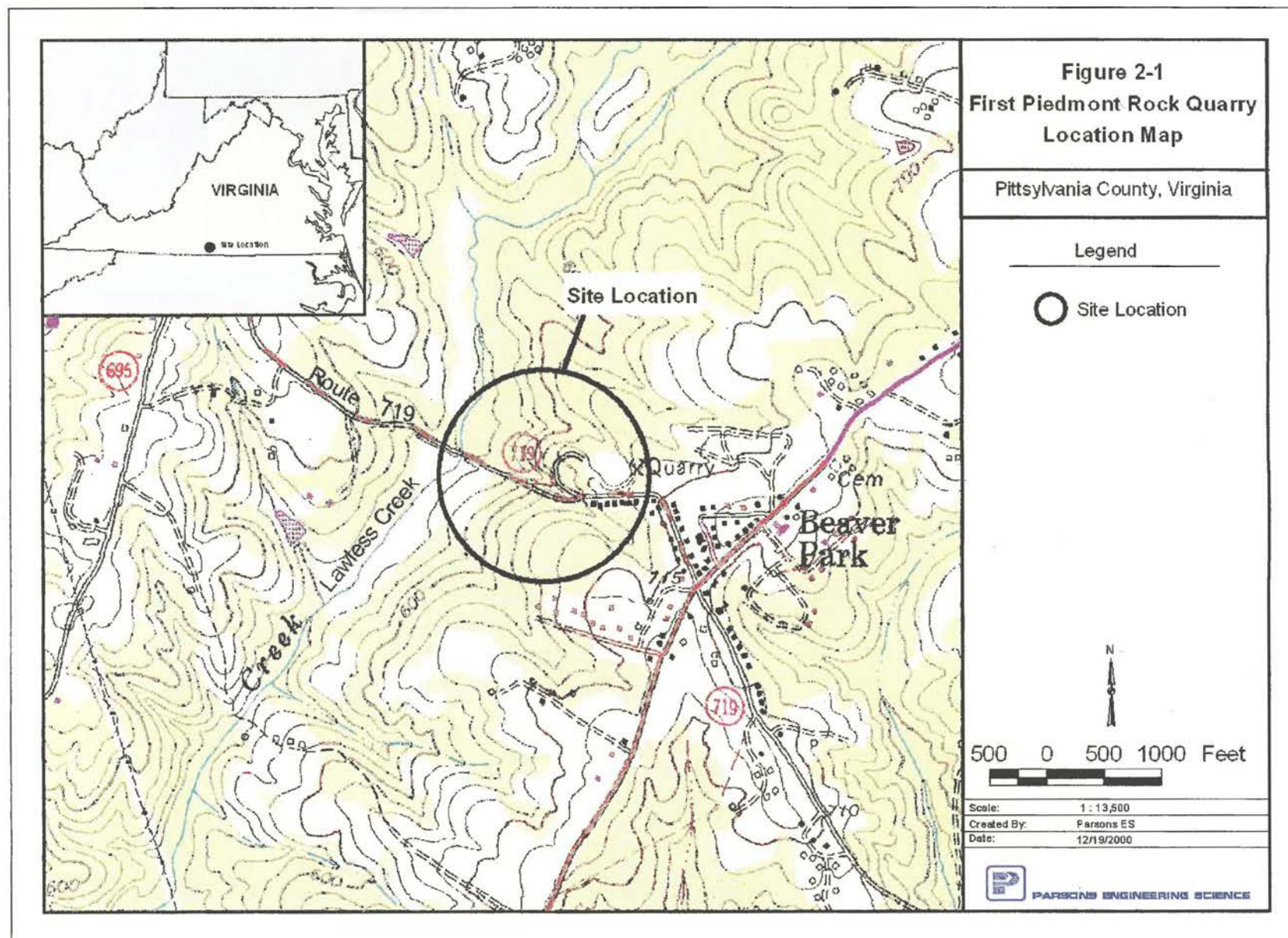
#### 2.1 INTRODUCTION

The First Piedmont Rock Quarry/Route 719 Superfund Site is located along Route 719 in Pittsylvania County, Virginia, about six miles north of Danville, Virginia (Figure 2-1). The site is an abandoned rock quarry located on a topographically high ridge. It is bordered by wooded areas to the north and east, by woods and a floodplain leading to Lawless Creek to the west, and by Route 719 and the community of Beaver Park to the south. First Piedmont Corporation leased the four-acre rock quarry site, which is part of a 182-acre parcel of private land, from April 1, 1970 to April 1, 1975. Waste disposal occurred on approximately two acres of the site from April 1970 to July 1972 under supervision of the Pittsylvania County Health Department (PRP Group, 1990).

The site was listed on the National Priorities List (NPL) in July 1987. The PRPs identified for this site are First Piedmont Corporation, The Goodyear Tire and Rubber Company, and Corning Incorporated. The Record of Decision (ROD) was signed on 28 June 1991 and an Administrative Order was issued on 23 July 1992. The selected remedies for cleaning the site were: excavation and off-site disposal of the non-landfill waste; off-site disposal of the surface drums and debris; installation of a Resource Conservation and Recovery Act (RCRA) Subtitle C caps over the landfill; and collection and treatment of the leachate. The RA started on 30 June 1994 and was completed on 29 September 1995.

Background information for the site was summarized in the Final AI Work Plan (Parsons, 2001a) and the Final AI Report (Parsons, 2001b). Additional background information is provided in the RI Report (WEGS, 1990), the RA Report (ENSCI, 1995), and the ROD (U.S. EPA, 1991). Therefore, this section focuses on background information related to potential sources of zinc.





## 2.2 CARBON BLACK PILE

As shown in Figure 2-2, the carbon black pile was located west of the quarry along the entrance road and approximately 150 feet northeast (up gradient) of the Southern Drainage. Stormwater runoff from this area would be expected to flow into the Southern Drainage via a small drainage shown in Figure 2-2 (referred to as the site drainage). In addition to carbon black, which consists of over 90% carbon, bags of zinc oxide were reportedly disposed of at the carbon black pile (WEGS, 1990 and U.S. EPA, 1991). Four soil samples were collected at the carbon black pile during the RI (Table 2.1), with zinc concentrations ranging from 69.4 to 288 mg/kg (WEGS, 1990). Reference (background) soil samples exhibited zinc concentrations of 17.9 and 21.1 mg/kg. Sampling conducted during removal of the carbon black pile in 1994 indicated a zinc concentration of 141,000 mg/kg. This sample was "grayish white and appeared to be from within deteriorated paper bags" (ENSCI, 1995), which apparently contained zinc oxide. Based on this information, the carbon black pile was considered the primary source of zinc to the Southern Drainage.

Carbon black excavations began on 8 September 1994. The carbon black excavation continued to bedrock over most of the excavation area. However, excavation on the northeast end of the area did not extend to bedrock due to virgin soil and depth to bedrock. In this area, the excavation progressed to a depth where visual cues indicated that the carbon black had been successfully removed. Over the rest of the area bedrock was reached and "bucket clean faces" were established. Carbon black excavations were completed on 16 September 1994. The U.S. EPA representative, Anne Estabrook of CH2M Hill, examined the excavation on 20 September 1994. Ms. Estabrook requested "cosmetic" excavations to be performed to demonstrate that all carbon black veins had been successfully removed. This excavation work was completed on 21 September 1994. Following this demonstration, Ms. Estabrook approved the remedial activity. Transport of all staged material from the excavation was completed on 4 October 1994. An estimated volume of 1,260 cubic yards of material was removed from the carbon black pile area, compared to pre-remedial action volume estimates of 100 to 190 cubic yards (ENSCI, 1995). The RA Report also indicates that all of the "zinc bags" were removed from the excavation zone. The excavation was returned to original grade by filling with clean borrow material and the area was seeded. Confirmatory soil sampling was not required or conducted following the carbon black excavation.

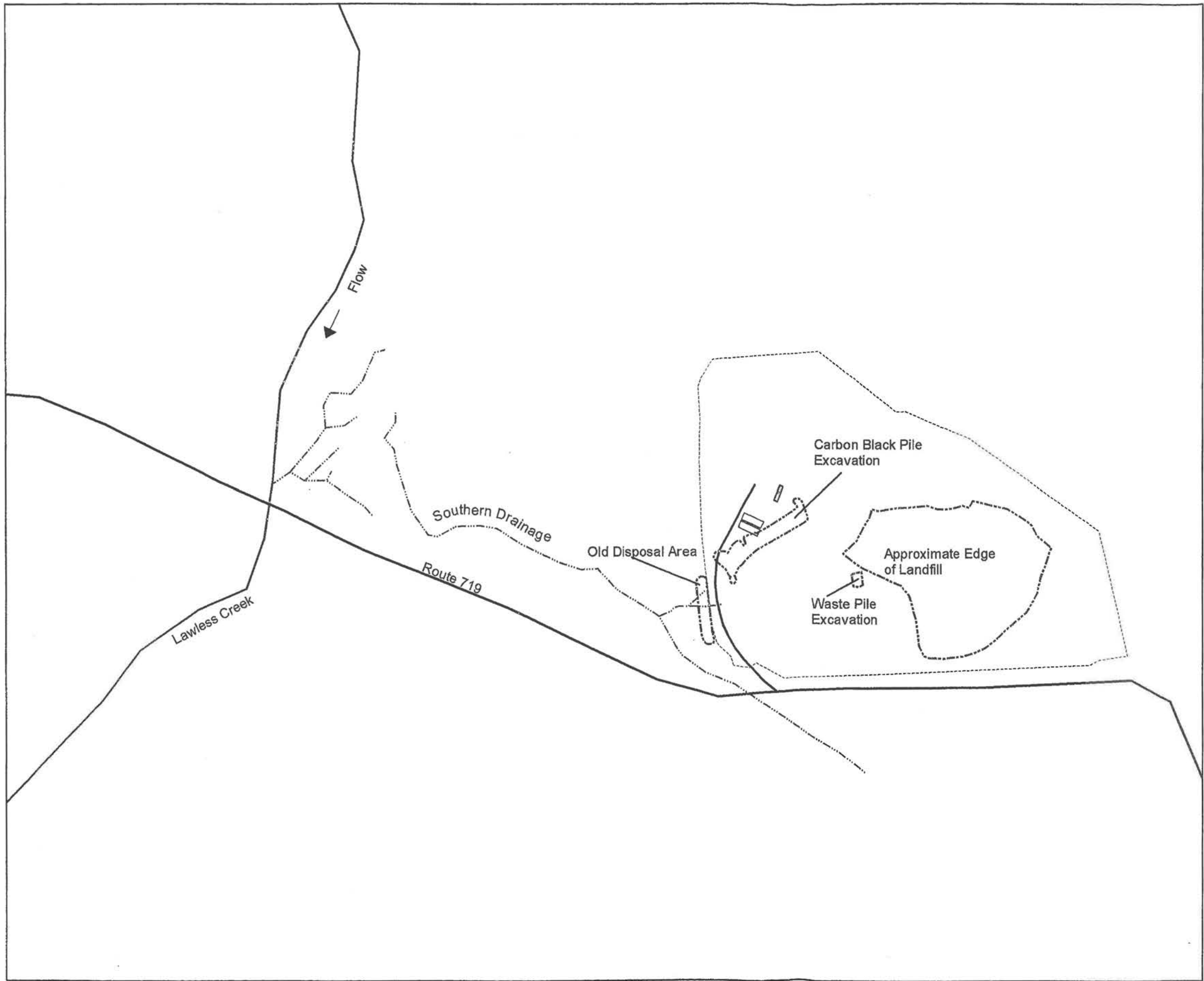
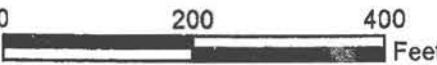


Figure 2-2  
First Piedmont Rock Quarry  
Potential Zinc Sources

Pittsylvania County, Virginia

**Legend**

- Potential Zinc Sources
- Fence
- Intermittent Drainage
- Streams
- Leachate Tanks
- Support Trailer



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**PARSONS**

**TABLE 2.1**  
**REMEDIAL INVESTIGATION SOILS ZINC DATA**

Sample Location	Description	Zinc Concentration (mg/kg)
Natural Soils		10-300 <sup>(a)</sup> , 50 <sup>(b)</sup>
FP-101	Reference Soils	17.9
FP-102	Reference Soils	20.1
FP-117	Carbon Black Pile Soils	288
FP-118	Carbon Black Pile Soils	241
FP-119	Carbon Black Pile Soils	109
FP-120	Carbon Black Pile Soils	69.4
FP-110	Waste Pile Soils	215
FP-111	Waste Pile Soils	175
FP-112	Waste Pile Soils	127
FP-113	Waste Pile Soils	66.6
FP-410	Source Area Soils (Waste Pile)	662

Source: RI Report (WEGS, 1990).

<sup>(a)</sup>Common range (U.S. EPA, 1983)

<sup>(b)</sup>Average (U.S. EPA, 1983)

## 2.3 WASTE PILE

As shown in Figure 2-2, the waste pile was located southwest of the quarry and covered approximately 300 square feet. The former waste pile contained scrap rubber, nylon cord, steel wire, pallets, and glass. As shown in Table 2.1, soil zinc concentrations at or near the waste pile ranged from 66.6 to 662 mg/kg during the RI (WEGS, 1990). The waste pile was located up gradient of the Southern Drainage, but it is less likely to be a source of zinc due to its distance from the Southern Drainage and lack of a well-defined surface runoff migration pathway.

Debris and soils visibly discolored due to metal leaching were removed from the waste pile on 12 September 1994. A total of 95 cubic yards of material was removed from the waste pile area and disposed of as a special waste. Vertical limits of the waste pile excavation extended to nine feet below grade and below soils visually discolored by metal leaching and surface debris. Confirmatory sampling was conducted, but the analysis did not include zinc (ENSCI, 1995).

**TABLE 2.1**  
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FP-111	Waste Pile Soils	175
FP-112	Waste Pile Soils	127
FP-113	Waste Pile Soils	66.6
FP-410	Source Area Soils (Waste Pile)	662

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## 2.4 OLD DISPOSAL AREA

It appears that the old disposal area was used during quarrying operations. Disposal in this area occurred a long time prior to use of the site by the PRPs and no PRP wastes were disposed of in this area. Therefore, the old disposal area has never been considered part of the Superfund site. Consequently, this area has not been subjected to detailed investigations, sampling, or remedial action (WEGS, 1990).

The old disposal area is located adjacent to the access road, west of the quarry, and immediately south of the former carbon black pile. The approximate location and extent of the old disposal area are shown in Figure 2-2. Surface runoff from this area is expected to enter the Southern Drainage via the site drainage shown in Figure 2-2. Material exposed at the surface in this area includes numerous glass and plastic bottles, crushed stone, miscellaneous metallic debris, and scrap wood. The exact extent and thickness of the waste in this area have not been defined (WEGS, 1990). The old disposal area is a potential source of zinc to the Southern Drainage based on the presence of metallic debris, its proximity to the Southern Drainage, and of the presence of a well-defined surface runoff migration pathway.



## SECTION 3

### METHODS

#### 3.1 SOIL SAMPLING LOCATIONS AND PARAMETERS

Soil samples were collected and analyzed to further evaluate potential sources of zinc to the Southern Drainage. Figure 3-1 shows the sampling station locations. A total of 13 soil samples were collected from reference locations, potential source areas, and areas located down gradient of potential sources and up gradient of the Southern Drainage. All samples were analyzed for total zinc. Sampling included the following:

- **Reference Soils** - Two soil samples were collected from reference locations to measure the background zinc concentration. Samples were collected southwest of the Southern Drainage in areas that have not been influenced by the site.
- **Carbon Black Pile and Old Disposal Area** - The RI concluded that the former carbon black pile was the most likely source of zinc to the Southern Drainage. The old disposal area, which is located adjacent to and down gradient of the former carbon black pile, is also a potential zinc source. Therefore, the sampling effort was focused in these two areas. A majority of the surface runoff from these areas flows to the Southern Drainage via the site drainage. This drainage is a potential migration pathway for zinc. The natural drainage pattern in this area appears to have been altered during improvement to the gravel access road at the site. As shown in Figure 3-1, two short drainage channels converge east of the existing fence. It appears that the northern channel historically received runoff from the carbon black pile area. However, this channel currently receives very little runoff due to grading of the access road. It appears that any runoff from the former carbon black pile area would flow south along the eastern edge of the gravel roadbed and then west through a galvanized metal culvert under the access road. Runoff is then conveyed through a black plastic pipe for approximately 50 feet before discharging to the site drainage. As shown in Figure 3-1, soil samples were collected to evaluate both the historic and current runoff patterns. In addition, one sample was collected from each side of the drainage channel to evaluate potential zinc transport via

sheet flow and potential zinc input from the old disposal area. A total of nine soil samples were collected from the former carbon black pile area/old disposal area.

- **Waste Pile** - Two soil samples were collected down gradient from the former waste pile.

### 3.2 SEDIMENT SAMPLING LOCATIONS AND PARAMETERS

Sediment samples were collected from five sampling stations in the Southern Drainage. Four of the samples were established during the AI in June 2001. All five samples were analyzed for total zinc to help identify trends. The sampling locations included:

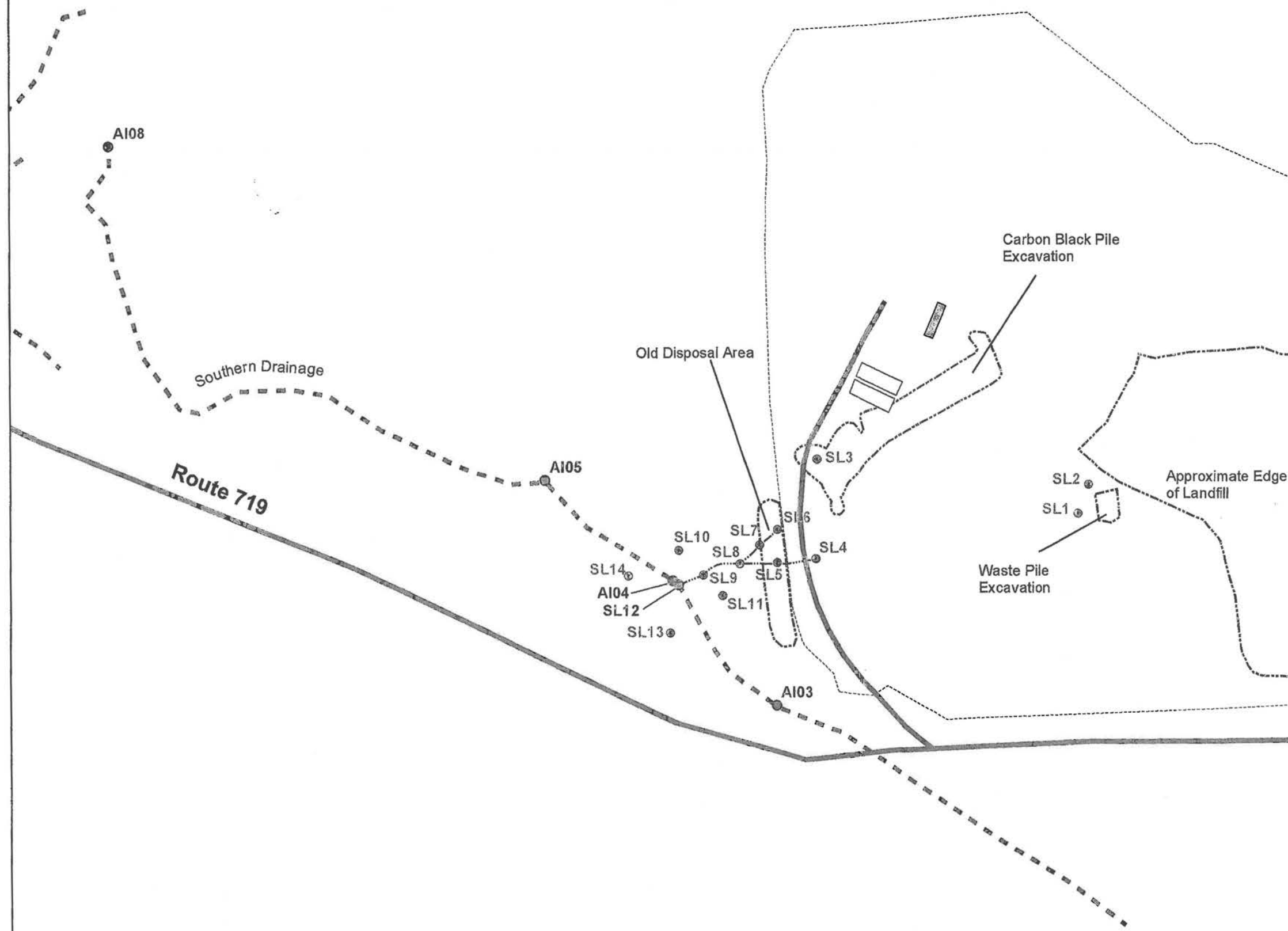
- AI-03 – Southern Drainage upstream reference, 130 feet downstream of Rt. 719 and immediately upstream of old disposal area;
- AI-04 – Southern Drainage potentially influenced, 269 feet downstream of Rt. 719 and downstream of old disposal area;
- AI-05 – Southern Drainage potentially influenced, 690 ft downstream of Rt. 719 and immediately upstream of floodplain;
- AI-08 - within Lawless Creek floodplain; and
- SL-12 – Southern Drainage potentially influenced, at the confluence of the site drainage, approximately 250 feet downstream of Rt. 719 (new sample location).

**Figure 3-1**  
**First Piedmont Rock Quarry**  
**Soil and Sediment**  
**Sample Locations**  
**September 9, 2003**

Pittsylvania County, Virginia

## Legend

- Potential Zinc Sources
- Fence
- Intermittent Drainage
- Southern Drainage
- Soil Sample Locations
- Sediment Sample Locations
- Leachate Tanks
- Support Trailer



50 25 0 50 100  
 Feet

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**PARSONS**

### 3.3 SAMPLING PROCEDURES

#### 3.3.1 Soil Sampling

Soil samples were collected from the 13 stations specified in Figure 3-1. Sample volume, container type, preservation, and holding time requirements are provided in Table 3.1. Samples were collected from the upper six inches of soil at each station with a hand trowel. Soil was placed in a plastic bag and homogenized. The homogenized samples were transferred to pre-cleaned, labeled sample containers provided by the laboratory. The sample containers were placed in sealed plastic bags and immediately stored in a cooler on ice. Unused soil was returned to the sample hole. Soil color, texture, and odor were recorded for each sample. All sampling locations were marked with a wooden stake and surveyed. Samples were shipped to the laboratory via overnight courier service in a cooler on ice. All sampling activities were documented in a bound field logbook and a standard chain-of-custody form was completed.

TABLE 3.1

#### SAMPLE REQUIREMENTS

Parameter	Amount (g)	Container Type	Preservation	Holding Time
Soil/Sediment Total Zinc	50	Plastic	Ice to 4°C	6 months

#### 3.3.2 Sediment Sampling

Sediment samples were collected from the five stations specified in Figure 3-1. Sample volume, container type, preservation, and holding time requirements are provided in Table 3.1. Samples were collected from the upper six inches of sediment at each station with a hand trowel. Samples were collected so as not to cause cross-contamination. The farthest downstream sample was collected first, followed by the next closest upstream samples in order. With the exception of SL12, all samples were collected from depositional areas where fine-grained sediments were present. The Southern Drainage lacks true depositional areas in the immediately vicinity of the confluence of the site drainage. Sediment was placed in a plastic bag and homogenized. The homogenized samples were transferred to pre-cleaned, labeled sample containers provided by the laboratory. The sample containers were placed in sealed

plastic bags and immediately stored in a cooler on ice. Unused sediment was returned to the sample location. Sediment color, texture, and odor were recorded for each sample. The presence or absence of standing or flowing surface water was documented at each sampling station. All sampling locations were marked with a wooden stake. Samples were shipped to the laboratory via overnight courier service in a cooler on ice. All sampling activities were documented in a bound field logbook and a standard chain-of-custody form was completed.

### 3.3.3 Field Quality Control Samples

Field quality control samples (field duplicates and equipment blanks) were collected and analyzed as specified in Table 3.2.

### 3.4 ANALYTICAL PROCEDURES

Reed and Associates, Inc. in Newport News, Virginia conducted the zinc analyses in accordance with the methods specified in Table 3.2 and the laboratory's Quality Assurance/Quality Control Manual. Field duplicates and equipment blanks were collected and analyzed as specified in Table 3.2. In addition, the laboratory conducted method blank and matrix spike/matrix spike duplicate analyses with each group of less than or equal to 20 samples.

TABLE 3.2

#### ANALYTICAL PROGRAM FOR THE ZINC SOURCE INVESTIGATION

Analytical Parameter	Method	Field Samples	Field QC Samples		Total Field Samples
			Field Duplicate	Equipment Blank	
Soil Metals					
Total Zinc	SW-846 6010B	13	1	1	15
Sediment Metals					
Total Zinc	SW-846 6010B	5	1	1	7

### 3.5 DATA REPORTING

The laboratory provided a deliverables package for the zinc analyses including all laboratory quality assurance/quality control data, results of analyses, project narratives, and raw data (Appendix A). Parsons conducted an independent data validation to ensure that the data quality objectives were met (Appendix B).





## SECTION 4

### RESULTS AND DISCUSSION

#### 4.1 INTRODUCTION

This section presents the results of the zinc source investigation for the First Piedmont Rock Quarry/Route 719 Site. Soil and sediment sampling was conducted on 9 September 2003. Samples were identified and labeled using the sampling station codes, as shown in Figure 3-1 (e.g., SL1, SL2, AI03, AI04, etc.). Detailed results of the laboratory analyses are presented in Appendix A and are summarized in Table 4.1. The Data Validation Report (Appendix B) indicates that no quality control problems were found during validation of the data submitted by the laboratory. No data were qualified during validation. All results as reported and qualified by the laboratory are considered usable as reported.

#### 4.2 SOIL SAMPLING RESULTS

##### 4.2.1 Reference Soils

The soil zinc concentrations for the reference locations were 22.6 mg/kg (SL13) and 34.7 mg/kg (SL14) (Table 4.1 and Figure 4-1). These concentrations are similar to reference soil zinc concentrations obtained during the RI (17.9 and 20.1 mg/kg, WEGS, 1990). The average background soil zinc concentration for the site is 23.8 mg/kg ( $n = 4$ ) based on results of this investigation and the RI. This value is within the common range of soil zinc concentrations for natural soils report by U.S. EPA (U.S. EPA, 1983).

##### 4.2.2 Former Waste Pile Soils

The soil zinc concentrations for the samples collected down gradient of the former waste pile were 23.9 mg/kg (SL1) and 36.8 mg/kg (SL2) (Table 4.1 and Figure 4-1). These concentrations are similar to background, indicating that surface soils down gradient of the former waste pile are not a source of zinc to the Southern Drainage.

TABLE 4.1

**SOIL AND SEDIMENT ZINC DATA FOR THE FIRST PIEDMONT ROCK  
QUARRY/ROUTE 719 SITE, SEPTEMBER 9, 2003**

<b>Sample Location</b>	<b>Zinc Concentration (mg/kg)</b>
<b>Reference Soils</b>	
SL-13	22.6
SL-14	34.7
<b>Soils Down Gradient of Former Waste Pile</b>	
SL-1	23.9
SL-2	36.8
<b>Soils Down Gradient of Former Carbon Black Pile/Old Disposal Area</b>	
SL-3 <sup>(1)</sup>	489
SL-4	91.5
SL-5	238
SL-6	64.4
SL-7	305
SL-8	533
SL-9	440
SL-10	41.1
SL-11	66.8
SL-15 (SL-11 dup)	60.2
<b>Soil Screening Values</b>	
RBC Industrial	310,000
RBC Residential	23,000
<b>Reference Sediment</b>	
AI03	28.3
<b>Potentially Influenced Sediment</b>	
SL-12	772
A-I04	18
AI-04A (AI-04 dup)	19
AI-05	77.3
AI-08	280
<b>Sediment Screening Values</b>	
LEL	120
SEL	820
LOEC	>124

(1)SL3 and SL4 are up gradient of the old disposal area.

RBC Industrial = U.S. EPA Risk Based Concentration for industrial sites (U.S. EPA, 2003).

RBC Residential = U.S. EPA Risk Based Concentration for residential sites (U.S. EPA, 2003).

LEL = Lowest Effect Level (Persaud et al., 1992).

SEL = Severe Effect Level (Persaud et al., 1992).

LOEC = Lowest Observed Effect Concentration (Parsons, 2001).

Figure 4-1  
**First Piedmont Rock Quarry  
 Soil Sample Results  
 September 9, 2003**

Pittsylvania County, Virginia

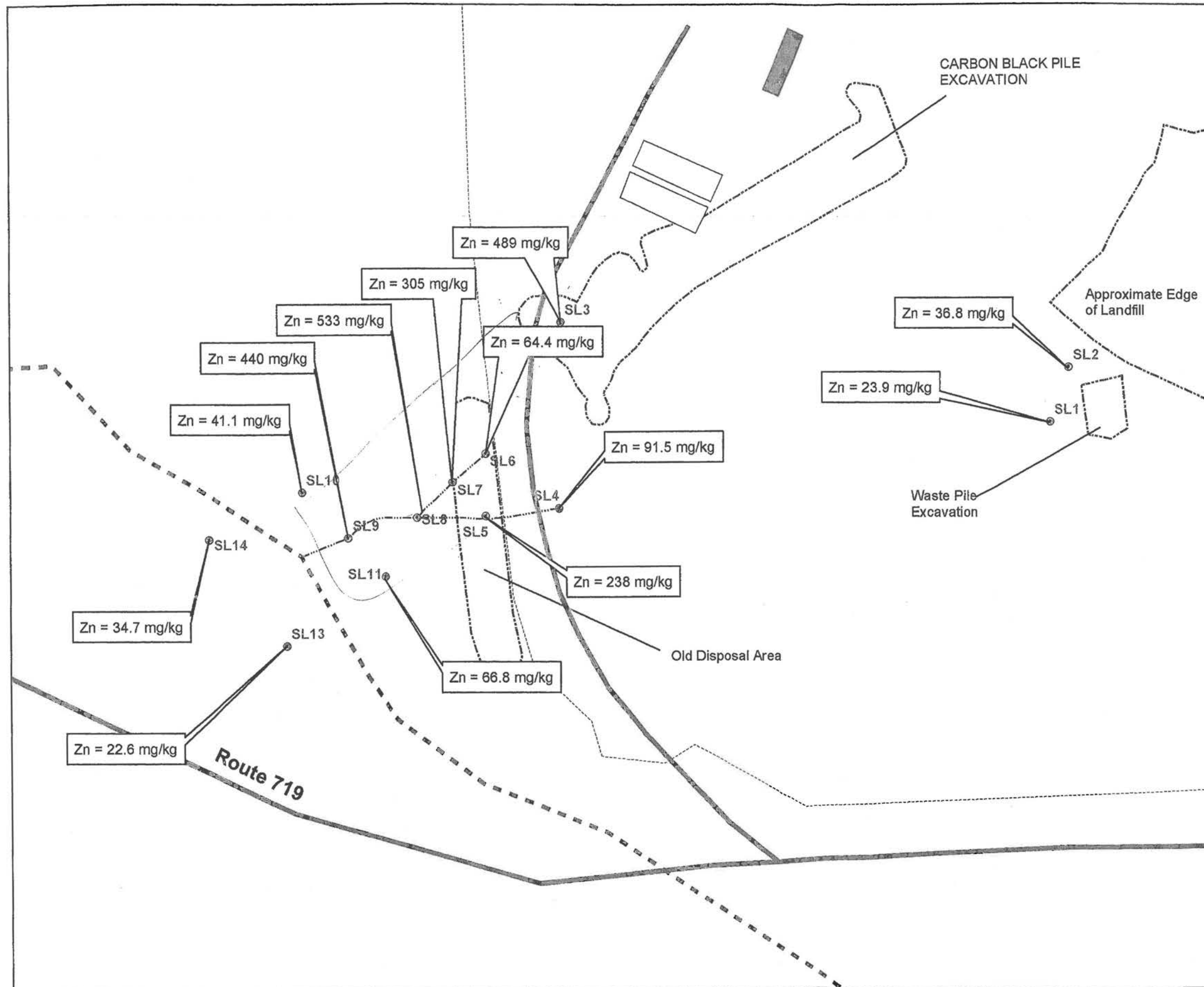
## Legend

- Potential Zinc Sources
- Fence
- Intermittent Drainage
- - - Southern Drainage
- Soil Sample Locations
- Leachate Tanks
- Support Trailer



Scale:	1 : 600
Created By:	Parsons
File:	Piedmont_Soil_Sx.mxd
Date:	2/24/03
Figure Number:	4-1

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### 4.2.3 Former Carbon Black Pile and Old Disposal Area Soils

The soil zinc concentrations for samples collected down gradient of the former carbon black and old disposal area ranged from 41.1 to 533 mg/kg (Table 4.1 and Figure 4-1). All of these values are higher than the site's average background concentration (23.8 mg/kg), but are lower than the U.S. EPA Region III Risk Based Concentrations (RBCs) for industrial sites (310,000 mg/kg) and residential sites (23,000 mg/kg).

The highest soil zinc concentration was measured at SL8 (533 mg/kg), which is located at the confluence of the north and south arms of the site drainage. Relatively high concentrations were also observed at other stations within the site drainage (SL5, SL7, and SL9). The second highest concentration was measured at SL3 (489 mg/kg), which is up gradient of the old disposal area and appears to be within or near the area excavated during removal of the carbon black pile. The zinc concentrations were relatively low at SL4 (91.5 mg/kg) and SL6 (64.4 mg/kg), which are located at the head of the south and north arms of the site drainage, respectively. Both of these locations appear to have been graded during improvement of the site access road. SL10 (41.1 mg/kg) and SL11 (66.8 mg/kg) exhibited relatively low zinc concentrations. These samples were collected from areas north and south of the site drainage (Figure 4-1).

These data indicate that the highest zinc concentrations were primarily measured within the site drainage (Figure 4-1). The elevated soil zinc concentrations at SL5, SL7, SL8, and SL9 suggest a historic migration pathway for zinc. However, the natural drainage pattern in this area was altered during improvement to the gravel access road and during the RA. Therefore, current migration of zinc through these drainage channels via surface runoff is uncertain.

Potential sources of zinc in these areas include the zinc oxide that was disposed of at the carbon black pile and metal debris in the old disposal area. Determining the contribution of each potential source is difficult; however, the following factors suggest that the carbon black pile was the primary source:

- Sampling conducted during removal of the carbon black pile in 1994 indicated a very high zinc concentration of 141,000 mg/kg. This sample was "grayish white and

appeared to be from within deteriorated paper bags" (ENSCI, 1995), which apparently contained zinc oxide.

- A high zinc concentration was measured at SL3 (489 mg/kg), which is located up gradient of the old disposal area. This sample location also appears to be in or near the area excavated during removal of the carbon black pile, based on site drawings prepared during remedial action.
- It appears that the site drainage historically conveyed runoff from the carbon black pile and the highest zinc concentrations were measured in the site drainage.
- The zinc concentrations at SL10 (41.1 mg/kg) and SL11 (66.8 mg/kg) were relatively low. These stations have less potential to be influenced by the carbon black pile runoff and more potential to be influenced by the old disposal area.

It should also be noted that the galvanized culvert running under the gravel access road is also a potential source of zinc at SL9. A plastic pipe is connected to the culvert on the west side of the access road and the pipe discharges immediately up gradient of SL9.

### 4.3 SEDIMENT SAMPLING RESULTS

#### 4.3.1 Reference Sediments

The sediment zinc concentration for the reference station AI03 was 28.3 mg/kg (Table 4.1, Figure 4-2). This value is approximately two times the zinc concentration measured at AI03 in June 2001 (14 mg/kg), but is within the historic range for reference sediment samples collected from the Southern Drainage (13.9 to 39.1 mg/kg). The average reference sediment zinc concentration for the Southern Drainage is 22.8 mg/kg (n = 6) based on results of this investigation, the AI, and the RI.

#### 4.3.2 Potentially Influenced Sediments

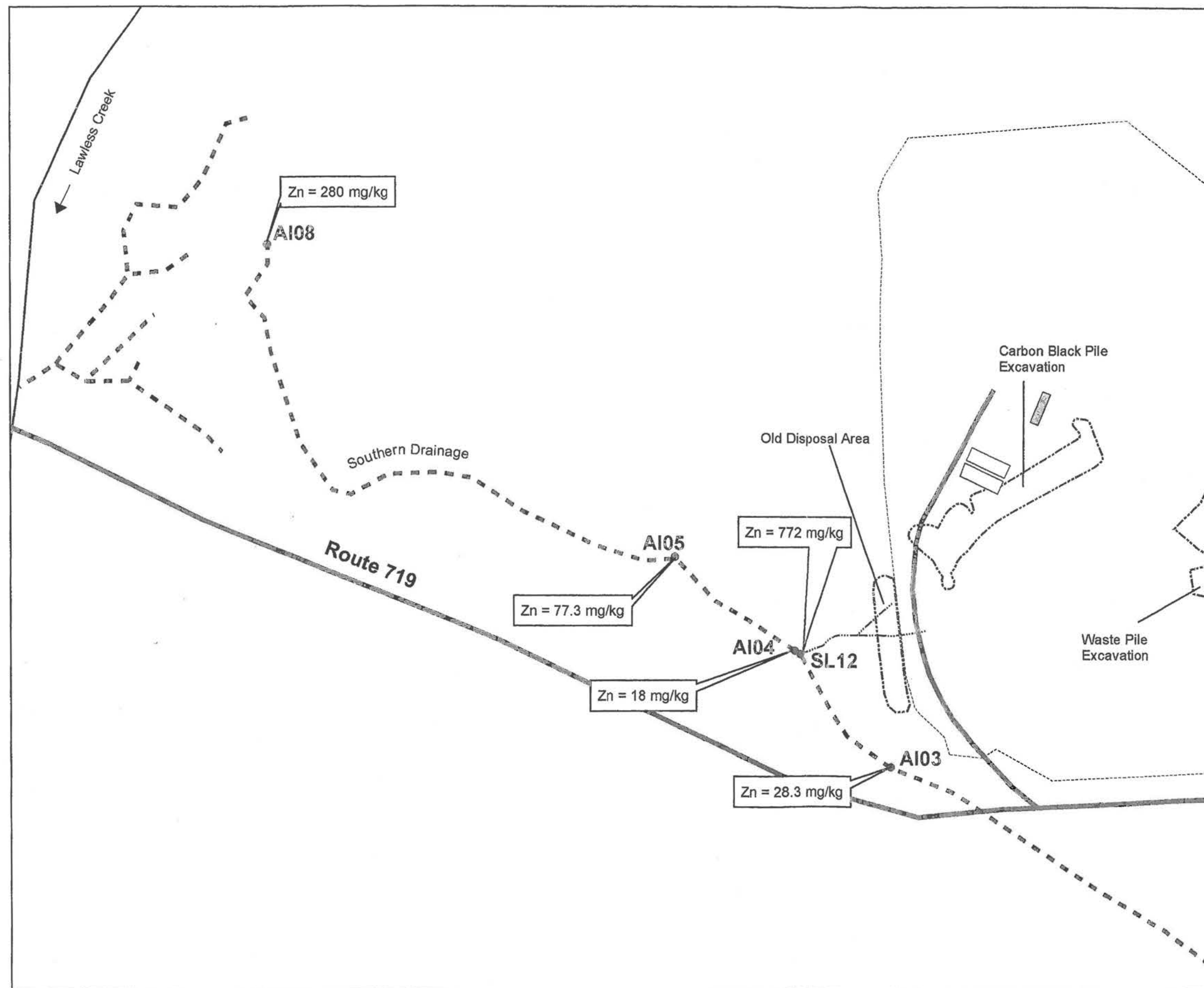
The sediment zinc concentrations for the potentially influenced stations ranged from 18 to 772 mg/kg (Table 4.1, Figure 4-2). With the exception of SL12, the sediment stations sampled during September 2003 were also sampled in June 2001. As summarized in Table 4.2, the concentrations at AI04, AI05, and AI08 were lower in September 2003 compared to June

Figure 4-2  
First Piedmont Rock Quarry  
Sediment Sample Results  
September 9, 2003

Pittsylvania County, Virginia

## Legend

- Potential Zinc Sources
- Fence
- Intermittent Drainage
- Streams
- Sediment Sample Locations
- Leachate Tanks
- Support Trailer



50 25 0 50 100 150  
Feet

Scale: 1 : 1,200  
Created By: Parsons  
File: Piedmont\_Sediment\_Sx.mxd  
Date: 2/24/03  
Figure Number: 4-2

**PARSONS**

2001. The most substantial change was observed at AI04, where the zinc concentration decreased from 347 mg/kg in June 2001 to 18 mg/kg in September 2003 (329 mg/kg decrease). Zinc concentrations at AI05 and AI08 decreased by 100.7 and 171 mg/kg, respectively.

TABLE 4.2

**COMPARISON OF SOUTHERN DRAINAGE SEDIMENT ZINC DATA  
FOR THE SEPTEMBER 2003 AND JUNE 2001 SAMPLING EVENTS**

Sample Location	Total Zinc Concentration (mg/kg)	
	September 2003	June 2001
AI03	28.3	14
AI04	18	347
AI05	77.3	178
AI08	280	451

#### 4.4 SUMMARY

Results of the zinc source investigation conducted at the First Piedmont Rock Quarry/Route 719 Site indicate the following:

- Zinc concentrations in surficial soils down gradient of the former waste pile are similar to site background concentrations, indicating that these soils are not a source of zinc to the Southern Drainage.
- Zinc concentrations in surficial soils down gradient of the former carbon black pile and the old disposal area exceed site background concentrations, but do not exceed RBCs.
- Zinc oxide disposed of at the carbon black pile is the apparent primary source of zinc in surficial soils down gradient of the carbon black pile.
- Sediment zinc concentrations at potentially influenced stations (AI04, AI05, and AI08) in the Southern Drainage were substantially lower than the June 2001 sampling event.



## SECTION 5

### REFERENCES

NOAA. 2003. *Annual Climatological Summary for Station 441614, Chatham, Virginia (2000 – 2003)*. National Climatic Data Center, Ashville, NS.

Parsons. 2001a. *Final Additional Investigation Work Plan, First Piedmont Rock Quarry/Route 719 Site, Pittsylvania County, Virginia*. Prepared for Potentially Responsible Parties Group by Parsons, Fairfax, VA and Cleveland, OH.

Parsons. 2001b. *Final Additional Investigation Report, First Piedmont Rock Quarry/Route 719 Site, Pittsylvania County, Virginia*. Prepared for Potentially Responsible Parties Group by Parsons, Fairfax, VA and Cleveland, OH.

U.S. EPA. 1983. *Hazardous Waste Land Treatment, SW-874*. U.S. EPA Office of Solid Waste and Emergency Response. Page 273, Table 6.46.

U.S. EPA. 1991. *Record of Decision, First Piedmont Rock Quarry/Route 719 Site, Danville, Virginia*. United States Environmental Protection Agency, Region III, Philadelphia, PA.

U.S. EPA. 1999. *Five-year Review Report, First Piedmont Rock Quarry Superfund Site, Danville, Virginia*. United States Environmental Protection Agency, Region III, Philadelphia, PA.

U.S. EPA. 2000. *Amendment to Administrative Order, First Piedmont Rock Quarry (Route 719) Superfund Site*. United States Environmental Protection Agency, Region III, Philadelphia, PA.

U.S. EPA. 2003. *U.S. EPA Region III Risk Based Concentration Table 10/15/03*. <http://www.epa.gov/reg3hwmd/risk/>.

WEGS. 1990. *Technical Memorandum, Subtask 8.2, Remedial Investigation Report, First Piedmont Rock Quarry/Route 719 Site (Volumes I and II)*. Prepared for Potentially Responsible Parties Group and U.S. EPA by Westinghouse Environmental and Geotechnical Services, Inc., Cary, NC.



## **APPENDIX A**

### **LABORATORY REPORT FOR SOIL AND SEDIMENT ZINC ANALYSES**



**Prepared for:**

**Parsons Engineering Science, Inc.  
Project ID: First Piedmont**

**October 3, 2003**

Parsons Engineering Science, Inc  
Project: First Piedmont



Narrative

This report contains the results of samples collected on September 9, 2003 in support of the referenced project.

Sample Receipt

Two liquid samples and twenty soil samples for zinc were received via Federal Express on September 10, 2003. The pH was verified for the liquid samples and documented on the C-O-C. The samples were then logged into the LIMS with laboratory assigned numbers and released for analysis.

Sample Results

The signed sample results are attached. All soil samples are reported on a dry weight basis

Sample Analysis

The samples were digested using hydrochloric acid and nitric acid. The digestates were analyzed on an ICP-AES (TJA 61E Trace) instrument.

Quality Control- All QA/ QC requirements were met.

Zinc: The samples and the associated QC were digested on September 12, 2003 and analyzed on September 16, 2003. The matrix spikes were performed on samples from this project. The method blank is below the reporting limit. The matrix spikes and the laboratory fortified blank (LFB) recoveries are within the acceptance range (see table).

Remarks

The two aqueous samples are field blanks supplied by Parsons Engineering Science. The results of the field blank were verbally reported on September 23, 2003.



## *Sample Results*

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

Special Notes:  
 RE: 739086 - FIRST PIEDMONT

SAMPLE COLLECTED BY: CLIENT

GRAB COLLECTION:

Date: 9/9/03 Time: 1055

COMPOSITE COLLECTION:

Start Date: Time:

End Date: Time:

PICK UP BY: FEDERAL EXPRESS

SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)



SAMPLE ID: SL-EB01  
 SAMPLE NO: 03-14630

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	200.7	0.005	0.091	mg/L	FPE	9/16/03	1151

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

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RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director

Date: 07-Oct-03

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 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT

GRAB COLLECTION:

Date: 9/9/03 Time: 1100

COMPOSITE COLLECTION:

Start Date: Time:

End Date: Time:

PICK UP BY: FEDERAL EXPRESS

SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)



Special Notes:

RE: 739086 - FIRST PIEDMONT

SAMPLE ID: AI-EB01

SAMPLE NO: 03-14631

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	200.7	0.005	0.082	mg/L	FPE	9/16/03	1125

NOTES:

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*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director

Date: 07-Oct-03

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 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0755  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



**Special Notes:**

RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS

**SAMPLE RECEIPT:**

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-1  
 SAMPLE NO: 03-14632

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.581	23.9	mg/Kg	FPE	9/16/03	1332
% Moisture	SM 2540B	0.001	11.7	%	KLS	9/10/03	1300

**NOTES:**

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

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Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

Elaine Claiborne

Elaine Claiborne  
 Laboratory Director

Date: 07-Oct-03

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 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0759  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



Special Notes:  
 RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS  
 SAMPLE RECEIPT:  
 Date: 9/10/03 Time: 0950  
 NUMBER OF CONTAINERS: 1  
 SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-2  
 SAMPLE NO: 03-14611

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.549	36.8	mg/Kg	FPE	9/16/03	1201
% Moisture	SM 2540B	0.001	11.4	%	KLS	9/10/03	1300

**NOTES:**

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

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Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

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 Laboratory Director

Date: 07-Oct-03

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 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

Special Notes:  
 RE: 739086 - FIRST PIEDMONT

SAMPLE COLLECTED BY: CLIENT

GRAB COLLECTION:

Date: 9/9/03 Time: 0811

COMPOSITE COLLECTION:

Start Date: Time:

End Date: Time:

PICK UP BY: FEDERAL EXPRESS

SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)



SAMPLE ID: SL-3  
 SAMPLE NO: 03-14612

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.573	489	mg/Kg	FPE	9/16/03	1208
% Moisture	SM 2540B	0.001	12.8	%	KLS	9/10/03	1300

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

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Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director

Date: 07-Oct-03

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 FAX: 703-591-1305

Special Notes:  
 RE: 739086 - FIRST PIEDMONT

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0817  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



PICK UP BY: FEDERAL EXPRESS

SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-4  
 SAMPLE NO: 03-14613

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.623	91.5	mg/Kg	FPE	9/16/03	1211
% Moisture	SM 2540B	0.001	19.1	%	KLS	9/10/03	1300

**NOTES:**

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

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Results reported on a dry weight basis.

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Date: 07-Oct-03

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 FAX: 703-591-1305

Special Notes:  
 RE: 739086 - FIRST PIEDMONT

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0833  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



PICK UP BY: FEDERAL EXPRESS

SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-5  
 SAMPLE NO: 03-14614

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.627	238	mg/Kg	FPE	9/16/03	1214
% Moisture	SM 2540B	0.001	19.3	%	KLS	9/10/03	1300

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

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Results reported on a dry weight basis.

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Elaine Claiborne  
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Date: 07-Oct-03

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 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0839  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



Special Notes:  
 RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS  
 SAMPLE RECEIPT:  
 Date: 9/10/03 Time: 0950  
 NUMBER OF CONTAINERS: 1  
 SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-6  
 SAMPLE NO: 03-14615

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.544	64.4	mg/Kg	FPE	9/16/03	1218
% Moisture	SM 2540B	0.001	6.40	%	KLS	9/10/03	1300

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.  
 Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.  
 Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director  
 Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0847  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



**Special Notes:**

RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS

**SAMPLE RECEIPT:**

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-7

SAMPLE NO: 03-14616

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.140	305	mg/Kg	FPE	9/16/03	1221
% Moisture	SM 2540B	0.001	24.0	%	KLS	9/10/03	1300

**NOTES:**

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.

Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director

Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

**Special Notes:**

RE: 739086 - FIRST PIEDMONT

SAMPLE COLLECTED BY: CLIENT

GRAB COLLECTION:

Date: 9/9/03 Time: 0851

COMPOSITE COLLECTION:

Start Date: Time:

End Date: Time:

PICK UP BY: FEDERAL EXPRESS

SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)



SAMPLE ID: SL-8

SAMPLE NO: 03-14617

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.627	533	mg/Kg	FPE	9/16/03	1231
% Moisture	SM 2540B	0.001	25.2	%	KLS	9/10/03	1300

**NOTES:**

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.

Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director

Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0900  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



Special Notes:  
 RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS  
 SAMPLE RECEIPT:  
 Date: 9/10/03 Time: 0950  
 NUMBER OF CONTAINERS: 1  
 SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-9  
 SAMPLE NO: 03-14618

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.116	440	mg/Kg	FPE	9/16/03	1235
% Moisture	SM 2540B	0.001	14.7	%	KLS	9/10/03	1300

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.

Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director  
 Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0912  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



Special Notes:  
 RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS

SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-10  
 SAMPLE NO: 03-14619

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.534	41.1	mg/Kg	FPE	9/16/03	1238
% Moisture	SM 2540B	0.001	10.7	%	KLS	9/10/03	1300

**NOTES:**

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.

Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

Elaine Claiborne  
 Elaine Claiborne  
 Laboratory Director  
 Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0946  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



Special Notes:  
 RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS  
 SAMPLE RECEIPT:  
 Date: 9/10/03 Time: 0950  
 NUMBER OF CONTAINERS: 1  
 SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-13  
 SAMPLE NO: 03-14622

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.602	22.6	mg/Kg	FPE	9/16/03	1255
% Moisture	SM 2540B	0.001	13.6	%	KLS	9/10/03	1300

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.  
 Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.  
 Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*  
 Elaine Claiborne  
 Laboratory Director  
 Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0953  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



## Special Notes:

RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS

## SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-14  
 SAMPLE NO: 03-14623

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.636	34.7	mg/Kg	FPE	9/16/03	1258
% Moisture	SM 2540B	0.001	17.8	%	KLS	9/10/03	1300

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.

Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director  
 Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 0930  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



Special Notes:  
 RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS  
 SAMPLE RECEIPT:  
 Date: 9/10/03 Time: 0950  
 NUMBER OF CONTAINERS: 1  
 SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: SL-15  
 SAMPLE NO: 03-14624

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.604	60.2	mg/Kg	FPE	9/16/03	1301
% Moisture	SM 2540B	0.001	17.5	%	KLS	9/10/03	1300

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.  
 Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.  
 Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director  
 Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 1006  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



Special Notes:  
 RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS  
 SAMPLE RECEIPT:  
 Date: 9/10/03 Time: 0950  
 NUMBER OF CONTAINERS: 1  
 SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: AI-08  
 SAMPLE NO: 03-14625

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.829	280	mg/Kg	FPE	9/16/03	1312
% Moisture	SM 2540B	0.001	42.5	%	KLS	9/10/03	1300

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.  
 Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.  
 Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director  
 Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

Special Notes:  
 RE: 739086 - FIRST PIEDMONT

SAMPLE COLLECTED BY: CLIENT

GRAB COLLECTION:

Date: 9/9/03 Time: 1017

COMPOSITE COLLECTION:

Start Date: Time:

End Date: Time:

PICK UP BY: FEDERAL EXPRESS

SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)



SAMPLE ID: AI-05  
 SAMPLE NO: 03-14626

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.550	77.3	mg/Kg	FPE	9/16/03	1315
% Moisture	SM 2540B	0.001	13.6	%	KLS	9/10/03	1300

**NOTES:**

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

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Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director

Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 1028  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



Special Notes:  
 RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS  
 SAMPLE RECEIPT:

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: AI-04  
 SAMPLE NO: 03-14627

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.464	18.0	mg/Kg	FPE	9/16/03	1318
% Moisture	SM 2540B	0.001	16.1	%	KLS	9/10/03	1300

## NOTES:

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.

Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director

Date: 07-Oct-03

# REPORT OF ANALYSIS

**CLIENT:** Parsons Engineering Science, Inc.  
**ATTN:** Mark Collins  
**ADDRESS:** 10521 Rosehaven Street  
                 Fairfax, VA 22030  
**PHONE:** 703-934-2383  
**FAX:** 703-591-1305

**SAMPLE COLLECTED BY:** CLIENT  
**GRAB COLLECTION:**  
**Date:** 9/9/03      **Time:** 1049  
**COMPOSITE COLLECTION:**  
**Start Date:**              **Time:**  
**End Date:**              **Time:**



**Special Notes:**  
 RE: 739086 - FIRST PIEDMONT

**PICK UP BY:** FEDERAL EXPRESS  
**SAMPLE RECEIPT:**  
**Date:** 9/10/03      **Time:** 0950  
**NUMBER OF CONTAINERS:** 1  
**SAMPLE CONDITION:** ☒ Good    ☐ Other (See C-O-C)


**SAMPLE ID:** AI-03  
**SAMPLE NO:** 03-14628

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.671	28.3	mg/Kg	FPE	9/16/03	1322
% Moisture	SM 2540B	0.001	23.2	%	KLS	9/10/03	1300

**NOTES:**

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.  
 Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.  
 Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

  
 Elaine Claiborne  
 Laboratory Director  
 Date: 07-Oct-03

# REPORT OF ANALYSIS

CLIENT: Parsons Engineering Science, Inc.  
 ATTN: Mark Collins  
 ADDRESS: 10521 Rosehaven Street  
 Fairfax, VA 22030  
 PHONE: 703-934-2383  
 FAX: 703-591-1305

SAMPLE COLLECTED BY: CLIENT  
 GRAB COLLECTION:  
 Date: 9/9/03 Time: 1035  
 COMPOSITE COLLECTION:  
 Start Date: Time:  
 End Date: Time:



**Special Notes:**

RE: 739086 - FIRST PIEDMONT

PICK UP BY: FEDERAL EXPRESS

**SAMPLE RECEIPT:**

Date: 9/10/03 Time: 0950

NUMBER OF CONTAINERS: 1

SAMPLE CONDITION: ☒ Good ☐ Other (See C-O-C)

SAMPLE ID: AI-04A  
 SAMPLE NO: 03-14629

Parameter	Method Number	JRA QL	Result	Unit	Analyst	Date	Time
Total Zinc	6010B	0.638	19.0	mg/Kg	FPE	9/16/03	1325
%Moisture	SM 2540B	0.001	13.2	%	KLS	9/10/03	1300

**NOTES:**

JRA Quantification Level is the concentration of the lowest calibration standard above zero with a reliable signal.

Reproduction of this report is not permitted, except in full, without written approval from James R Reed & Associates.

Results reported on a dry weight basis.

RESPECTFULLY SUBMITTED

*Elaine Claiborne*

Elaine Claiborne  
 Laboratory Director

Date: 07-Oct-03



# CHAIN OF CUSTODY

Company Name: Parsons Engineering Science, Inc  
Company Contact: Mark Collins Telephone: 703-934-2383  
Results To: Mark Collins Bill To:  
Address: 10521 Rosehaven Street, Fairfax, Va 22030  
Fax # 703-591-1305  
Project ID: 1390816: First Piedmont

## ANALYSES REQUESTED

Company Name: Parsons Engineering Science, Inc

Company Contact: Mark Collins

Results To: Mark Collins

Address: 10521 Rosehaven Street, Fairfax, Va 22030

Project ID: 139086 : First Piedmont

Telephone: 703-934-2383

Bill To:

Fax # 703-591-1305

Preserv.	1	1																		

JRA ID #	Sample Type*	Sample Location	Composite				Grab		Total # of cont.	% Moisture	Total Zinc	ANALYSES REQUESTED																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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SL-11	soil							9-9-03	0914	1	X	X	03-14	620																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

\*WW= Wastewater, GW = Groundwater, DW - Drinking Water, HW - Hazardous Waste, OTHERS

Sampled By: E. Lussier  
Relinquished By: [Signature]  
Received By: [Signature]  
Relinquished By: [Signature]  
Received By: [Signature]

Date/Time: 9-9-03 / 1300  
Date/Time:                       
Date/Time:                       
Date/Time: 9-10-03 0950

### Preservatives:

- 1 = <4°C 6 = Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> + HCl 10 = Ascorbic Acid + HCl  
2 = HNO<sub>3</sub> 7 = NaOH + ZnOAc 11 = HCl  
3 = H<sub>2</sub>SO<sub>4</sub> 8 = H<sub>2</sub>SO<sub>4</sub> + FAS 12 = KH<sub>2</sub>PO<sub>4</sub> + Na<sub>2</sub>HPO<sub>4</sub> + Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>  
4 = NaOH 9 = NH<sub>4</sub>Cl  
5 = Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>

CN Interference Check: Positive Negative  
Sulfide:                        
Oxidizing Agent:                      

Arrival Temp: 3.3°C

JAMES R. REED and ASSOCIATES (757) 873-4703; FAX (757) 873-1498  
770 Pilot House Drive, Newport News, VA 23606

AR303393



# CHAIN OF CUSTODY

Company Name: Parsons Engineering Science, Inc  
Company Contact: Mark Collins Telephone: 703-934-2383  
Results To: Mark Collins Bill To:  
Address: 10521 Rosehaven Street, Fairfax, Va 22030  
Fax # 703-591-1305  
Project ID: 739086 : First Treatment

## ANALYSES REQUESTED

Company Name: Parsons Engineering Science, Inc

Company Contact: Mark Collins

Results To: Mark Collins

Address: 10521 Rosehaven Street, Fairfax, Va 22030

Project ID: 739086 : First Pretreatment

Telephone: 703-934-2383

Bill To:

Fax # 703-591-1305

Preserv.

1

1

</

\*WW= Wastewater, GW = Groundwater, DW - Drinking Water, HW - Hazardous Waste, OTHERS

Sampled By:

E. JESSIER

Date/Time: 9-9-03 / 1300

Relinquished By:

Date/Time:

Received By:

Date/Time:

Relinquished By:

Date/Time:

Received By:

REDEX

Date/Time: 9-10-03 0950

## Preservatives:

- 1 = <4°C    6 = Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> + HCl    10 = Ascorbic Acid + HCl  
2 = HNO<sub>3</sub>    7 = NaOH + ZnOAc    11 = HCl  
3 = H<sub>2</sub>SO<sub>4</sub>    8 = H<sub>2</sub>SO<sub>4</sub> + FAS    12 = KH<sub>2</sub>PO<sub>4</sub> + Na<sub>2</sub>HPO<sub>4</sub> + Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>  
4 = NaOH    9 = NH<sub>4</sub>Cl  
5 = Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>

CN Interference Check:    Positive    Negative

Sulfide:    \_\_\_\_\_

Oxidizing Agent:    \_\_\_\_\_

Arrival Temp: 3.2°C

JAMES R. REED and ASSOCIATES (757) 873-4703; FAX (757) 873-1498  
770 Pilot House Drive, Newport News, VA 23606

AR303394





### ANALYSES REQUESTED

[illegible]

\*WW= Wastewater, GW = Groundwater, DW - Drinking Water, HW - Hazardous Waste, OTHERS

Sampled By: E. Lussier Date/Time: 9-9-03 / 1300  
Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
Relinquished By: Red Ex Date/Time: \_\_\_\_\_  
Received By: V. Smith Date/Time: 9-10-03 0950

Preservatives:

1 =  $<4^{\circ}\text{C}$     6 =  $\text{Na}_2\text{S}_2\text{O}_3 + \text{HCl}$     10 = Ascorbic Acid + HCl  
2 =  $\text{HNO}_3$     7 =  $\text{NaOH} + \text{ZnOAc}$     11 = HCl  
3 =  $\text{H}_2\text{SO}_4$     8 =  $\text{H}_2\text{SO}_4 + \text{FAS}$     12 =  $\text{KH}_2\text{PO}_4 + \text{Na}_2\text{HPO}_4 + \text{Na}_2\text{S}_2\text{O}_3$   
4 = NaOH    9 =  $\text{NH}_4\text{Cl}$   
5 =  $\text{Na}_2\text{S}_2\text{O}_3$

CN Interference Check:      Positive      Negative

**Sulfide:**

Oxidizing Agent: \_\_\_\_\_

Arrival Temp: 3.3°C

AR303395





## *Quality Control*





Concentration units: ug/L

ICV: % R LIMITS - METALS (95 - 115%)  
CCV: % R LIMITS - METALS (90 - 110%)



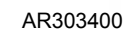
JRA # :03-14611 through 03-14632

concentration units: ug/L

\*post spike

**%R LIMITS - Metals (70 - 130%)    Cyanide and Sulfide 80 - 120%**

**% RPD LIMITS: Metals/ Cyanide/ Sulfide +/- 20%**





### Duplicate Analysis Summary

JRA #:03-14611 through 03-14632

concentration units: ug/L

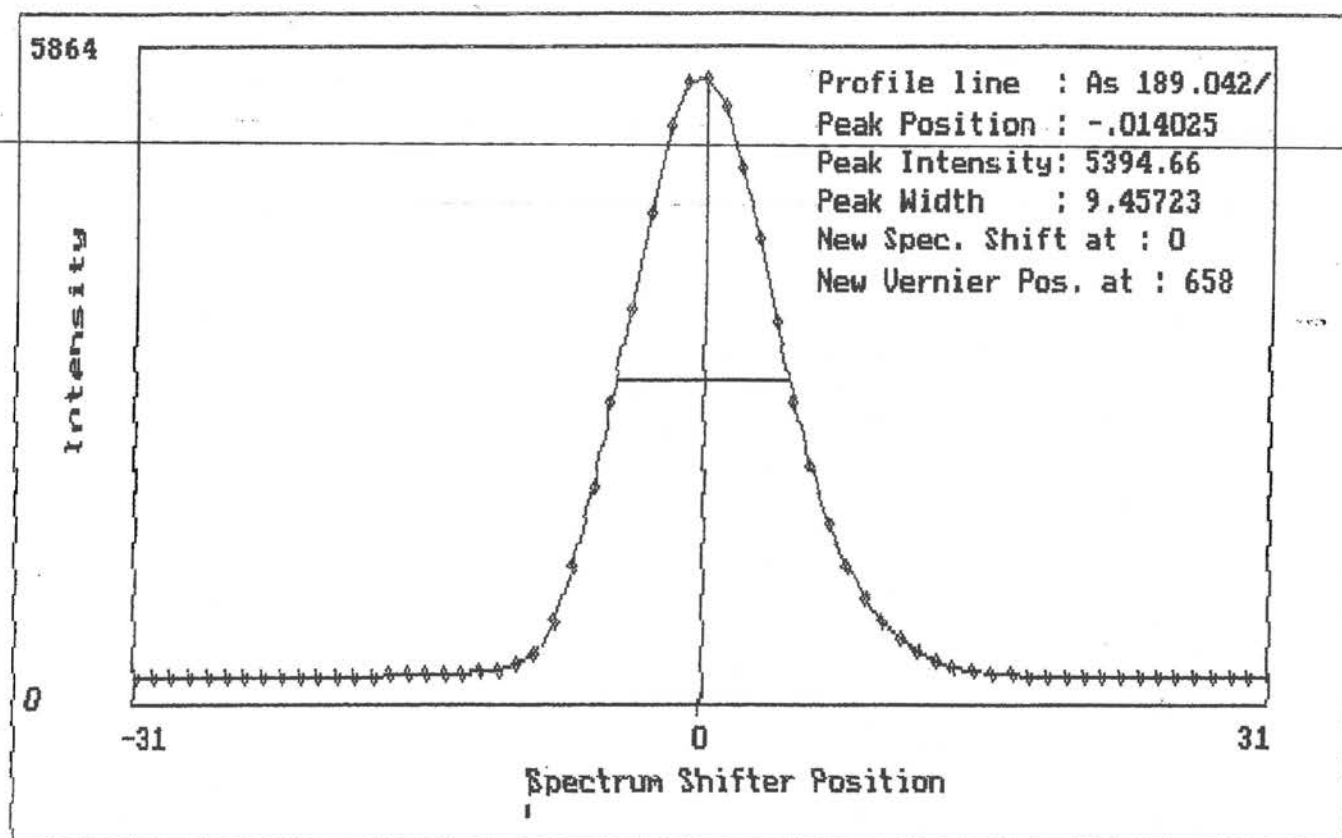
Sample ID	Analyte	Sample Result	Duplicate Result	%RPD
03-14611	Zinc	336.7	333.7	0.90
03-14621	Zinc	215.5	215.9	0.19
03-14629	Zinc	149.4	148.1	0.87

<sup>1</sup> Front column

<sup>2</sup> Middle column

**Matrix spike Recovery: +/- 40% (40% -- 160%)**

**% RPD LIMITS: +/- 20%**



## **APPENDIX B**

### **DATA VALADATION REPORT**

**DATA VALIDATION REPORT  
SOIL AND SEDIMENT SAMPLES FOR FIRST PIEDMONT ROCK  
QUARRY/ROUTE 719 SITE, SEPTEMBER 9, 2003**

## **OVERVIEW**

Parsons conducted a sampling event during September 2003 at the First Piedmont Rock Quarry/Route 719 site. All work was performed in accordance with the project Work Plan (Parsons, April 2003), the Quality Assurance Project Plan from the laboratory (James R. Reed and Associates) and the required EPA method.

A total of 22 samples were collected during this sampling event including soil, sediment and associated field quality control (QC) samples. The samples included the following field QC samples: two equipment blank samples, two field duplicates, and three matrix spike/matrix spike duplicate (MS/MSD) samples. All samples were analyzed for zinc only using approved EPA methods (MCAWW 200.7 for the aqueous equipment blanks) and SW 846 6010B for the soil and sediment samples. James R. Reed & Associates of Newport News, Virginia using the USEPA-approved analytical methods specified in the Work Plan performed all analyses.

This data validation/quality assurance (QA) summary report presents a summary and assessment of the analytical data generated for this sampling event. All data submitted by the laboratory have been evaluated using the National Functional Guidelines for Evaluating Inorganic Data (EPA, July 2002) with modifications from Region III (April 1993).

This report addresses only those problems affecting the usability of the data. Deviations from the analytical methods and a discussion of the overall usability of the data are presented in the summary section of this report.

## **SUMMARY OF DATA VALIDATION**

This section summarizes any laboratory or quality control (QC) problems leading to rejection or qualification of data, and the overall usability of the data. Except as indicated in this report, the samples were collected, prepared and analyzed following the procedures described in the analytical methods. Except as indicated in this report, all samples were prepared and analyzed within the specified holding times using the USEPA-approved analytical procedures.

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No QC problems were found during validation of the data. No reported results have been qualified. All reported results should be considered usable as qualified in this report.

Target metal zinc was detected in all of the samples including the two equipment blank samples. Zinc concentration in the 'SL' samples ranged from 22.6 mg/Kg for SL-13 to 533 mg/Kg for SL-8. Zinc concentration in the equipment blank associated with the 'SL' sample (0.091 mg/L) is insignificant compared to the levels of zinc in the 'SL' samples. Zinc concentration in the 'AI' samples ranged from 18 mg/Kg for AI-04 to 280 mg/Kg for AI-08. Zinc concentration in the equipment blank associated with the 'AI' samples (0.082 mg/L) is also insignificant compared to the levels of zinc in the 'AI' samples.

Two field duplicates were collected with the samples. Sample SL-15 is a duplicate of SL-11 and AI-04A is a duplicate of AI-04. The target metal zinc was detected in each of the duplicate samples above the reporting limit. The precision (as relative percent difference) between the results for the duplicate pairs is excellent (<10%)

Three matrix spikes/duplicates were analyzed in support of the samples. No accuracy (as percent recovery of spikes) outliers were reported for the matrix spikes (samples SL-1, SL-11 and SL-EB01 were analyzed as matrix spikes). The reported percent recoveries of zinc in the spikes were well within the control limits (75-125%).

Three laboratory duplicates were also analyzed (samples SL-2, SL-12 and AI-04A). The precision between the results for the duplicates was well within the control limit of <20% RPD (relative percent difference).

All other Quality Control results reported by the laboratory including laboratory blanks and calibration standards were in control. No quality control problems were found during validation of the data submitted by the laboratory. No data have been qualified during validation. All results as reported and qualified by the laboratory are considered usable as reported.