

**DRAFT CLOSURE REPORT  
ON**

REMOVAL ACTIONS IN THE SOUTH FORK COEUR D'ALENE  
RIVER FLOODPLAIN NEAR OSBURN IDAHO:

OSBURN FLATS 1997-1999  
OSBURN TEST PLOTS 1997-1999  
OSBURN ADDITIONAL AREAS 1998- 1999  
SILVERTON  
EVOLUTION  
BIG CREEK FLATS

Submitted by:

Silver Valley Natural Resource Trustees  
Kellogg, Idaho

May 9, 2000

REMOVAL ACTIONS IN THE SOUTH FORK COEUR D' ALENE  
RIVER SYSTEM NEAR OSBURN IDAHO:

OSBURN FLATS 1997

OSBURN TEST PLOTS 1997 – 1999

OSBURN ADDITIONAL AREAS 1998

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# REMOVAL ACTIONS IN THE SOUTH FORK COEUR D' ALENE RIVER SYSTEM NEAR OSBURN IDAHO:

OSBURN FLATS 1997 ,  
OSBURN TEST PLOTS 1997 – 1999  
OSBURN ADDITIONAL AREAS 1998

## SECTION 1 - EXECUTIVE SUMMARY

A voluntary and cooperative, jointly sponsored group of projects to reduce non point source loading of trace metals to the South Fork Coeur d'Alene River from Historic depositions in the floodplain near Osburn, Idaho.

Project sponsors included Silver Valley Natural Resource Trustees, Coeur d'Alene Basin Restoration Project, Bureau of Land Management, Idaho Division of Environmental Quality, Silver Valley Resources, Inc., Environmental Protection Agency, Hecla Mining Company, Idaho Department of Fish and Game, Zanetti Brothers, Coeur d'Alene Tribe. Total funds for all actions between 1997 to 1999 was \$1,141,624.

At the Osburn flats of the South Fork Coeur d'Alene , 75,000 cy of floodplain tailings and contaminated soils were removed and reposed on the east pond of the Silver Balley Resources pond complex. A secondary high water channel was stabilized in the removal area. This unit was funded by SVNRT, Hecla Mining Company and Silver Resources. The total cost was \$621,181.

Test plots were set up in 1997 at the North East corner of the Osburn Flats to study the potential of "in situ" treatment of zinc leaching from soils into the groundwater. Five amendments were piloted over a two year period. The total cost of the test plots pilot unit was \$53,213.

On the SFCdR floodplain downstream of Osburn, in 1998. 77,000cy of contaminated soils were removed from Silverton, the Evolution Mill site and the Big Creek Flats. Since some of the land ownership was BLM, arrangements were made to take the materials to the Bunker Hill Central Impoundment at Kellogg. Removal areas opened to the river erosion force were stabilized at Big Creek flats. This project was partially funded with Federal #319 grant of \$75,000 with match from the Silver Valley Natural Resource Trustees. This unit was bid and managed as though it were federal funds in its entirety. The total cost of this unit was \$448,714.

## PRIMARY DOCUMENTS:

"Work Plan For Osburn Response" Silver Valley Natural Resource Trustees, Golder Associates Inc., Redmond, Washington. June 26, 1997

"Decision Memorandum for Removal Actions in the South Fork Coeur d' Alene River System," USEPA, Signed by Earl Liverman, Chris Field, and Randall F. Smith, Approved October 22, 1997. CERCLIS identification number for this non-time critical removal action is IDD048340921.

"Decision Memorandum for Change in the Scope of Response for the Response Action underway at the Osburn Flats reach of the South Fork Coeur d'Alene River System," USEPA, Signed by Earl Liverman, Chris Field, and Randall F. Smith, Approved October 9, 1998.

EECA "Engineering Evaluation/Cost Analysis for Osburn Flats Response Action" USEPA, 1997.

"Lysimeter Install and Sampling - Osburn Flats" Golder Associates Inc. Sept., 1998.

"Osburn Response Action Plan 1998: Additional Removal sites at Silverton, Evolution and Big Creek," Construction Contract Bid Document, SVNRT June 1998.

"Profits for Hecla from 40 Year Old Tailings," by W.L. Zeigler. Engineering and Mining Journal (Vol.145, No.5) May 1944.

"Construction Documents for Removal Actions In The South Fork Coeur d' Alene River System Near Osburn Idaho Project." Silver Valley Natural Resource Trustees. Contractor Billing Worksheets, Daily Construction Reports, QA/QC, Consultant Reports and Team Meeting Reports. Osburn Flats 1997, Osburn Test Plots 1997 – 1999, Osburn Additional Areas 1998.

## **PROJECT GOALS:**

The Osburn Response is a voluntary and cooperative, jointly sponsored group of projects to reduce non-point source loading of trace metals to the South Fork Coeur d'Alene River from Historic Deposition of mine waste in the floodplain.

- 1) Continue a multi-agency and stakeholder approach to characterization and planning.
- 2) Determine the sources of non point source loading between Wallace Idaho and Big Creek Idaho on the South Fork Coeur d' Alene River;
- 3) Complete removals of contaminated flood plain soils in highest priority areas with high recovery potential.
- 4) Delineate potential project sites for action as funding becomes available.
- 5) Make use of existing repository locations in Canyon Creek, Osburn and the Central Impoundment area during the brief time they are available.
- 6) Work with local contractors in the most cost efficient planning and construction processes available.
- 7) Evaluate potential for passive, in situ soil treatments, in test plots designed and located in the deposits on Osburn flats.

## **SPONSORSHIP:**

The reach had been designated by the Coeur d'Alene Basin Restoration Project as an area for mine tailings removal and habitat improvement through floodplain stabilization. The Silver Valley Natural Resource Trustees had reserved \$2,230,000 for work in this area.

A technical planning group including impacted landowners, Idaho Division of Environmental Quality, USEPA, Silver Valley Resources, Hecla Mining Company, ASARCO, the Silver Valley Natural Resource Trustees, the Coeur d'Alene Tribe and the Bureau of Land Management was initiated. The reach was broken into six areas with several landowners, public and private.

## **PROJECT ACCOMPLISHMENTS:**

Characterization of the surface water loading between Wallace and Big Creek was designed to increase understanding of the multiple sites. Historic groundwater information was reviewed. Tailing depositions in floodplain were mapped using 1939 photos.

Team and Trustee Decision Process clarified options and set priorities. To date three projects were undertaken.

At the Osburn Flats in 1997-1998, 75,000 cy of floodplains tailings and contaminated soils were removed and reposed on the east pond of the Silver Valley Resources complex. A secondary high water channel was stabilized in the removal area.

Test plots were initiated in 1997 at the North East corner of the Osburn Flats to study the potential of "in situ" treatment of tailings in areas protected from the direct action of the river.

In 1998, 77,000 cy of contaminated floodplain materials were removed from Silverton, the Evolution Mill site and the Big Creek Flats. These materials taken to the Bunker Hill Central Impoundment at Kellogg Idaho. Removal areas at the Big Creek Flats were protected by rock berms encouraging wetland development

This Site Completion Report documents that the Silver Valley Natural Resource Trust and other sponsors have completed construction activities for the Osburn Response in accordance with the work plans. The response is a non-time critical action occurring between 1997 and 1999. Mrs. Earl Liverman, OSC, has met with the project manager and technical implementation teams on an as-needed basis. Environmental Consultants and Contractor Golder Associates oversaw critical points of construction, directed installation and groundwater sampling at the "Test Plots".

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### **SECTION 2 - INTRODUCTION**

The Osburn Response focuses on groundwater and surface water quality problems in the South Fork Coeur d'Alene River between Wallace to Big Creek . One hundred years of silver, lead and zinc ore extraction and milling has resulted in deposition of trace metals in contaminated soils and tailings along the banks and within the floodplain of the river. These soils present a chronic deterioration in water quality as the metals erode from the banks and leach into the system from deposition areas. At the Osburn flats sediment samples showed lead concentrations of 123 - 49,800 ppm and zinc concentrations from 441- 30,100 ppm

The cost estimate for the Osburn projects for the SVNRT was \$1,400,000, which anticipated removals in the reach of the Osburn flats. The groundwater and surface water sampling during characterization, and the availability of a federal grant for part of the costs for removals in the Osburn additional areas, increased the opportunities for removal volumes. The final SVNRT expenditures are listed in Section 6, and total \$1,123,108.

The excavation and disposal of the mine tailings and sediments was undertaken as a non-time critical action pursuant to the comprehensive environmental Response, Compensation, and Liability Act, 12 U.S.C., 9601. The “Good Neighbor” provision of CERCLA 107(d) provides protection from CERCLA liability for persons who render care, assistance or advice regarding CERCLA actions.

EPA provided an on-scene coordinator, Idaho DEQ provided water monitoring. A team of stakeholders planned the characterization and the work plan in conjunction with the Silver Valley Natural Resource Trustees.

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### **SECTION 3 – HISTORY OF THE SITE**

Osburn , situated on the South Fork Coeur d'Alene River, was originally a construction camp for the Mullan Road; and it was later the site of a trading post run by one Bill Osborne. Osburn was the county seat from 1890 to 1893, when it lost out to Wallace.

Historic mining practices are only one part of the picture. The river in this section was confined by the Interstate Highway and historically by various dikes and impoundments. An historic wood plank dam at Two Mile bridge caused the deposition of jig tailings and mixed mine wastes over a twenty three year period from 1910 to 1933. Following the 1993 flood the Osburn dam was not rebuilt. The flood caused relocation of materials downstream South under the present communities of Osburn and Polaris. Hecla Mining Company ran a tailings re-treatment plant at Osburn in the location of the present Zanetti Bros. plant, reprocessing 2 million tons of jig tailings from the immediate floodplain. The plant burned in 1944 . Pockets of tailings were not processed and not available to the company primarily due to access issues. Other materials were left behind because of the significant wood and other debris intermixed. Soil sampling show lead concentrations ranging between 123 to 49,800 ppm and zinc concentrations from 441 - 30,100ppm on areas left behind.

The Big Creek Flats downstream was also a depositional area although no dam feature was placed there. In 1978 a local group proposed a restoration plan and park for this area. The railroad loading area at Bent was the dominant feature on the South Side. The Idaho Transportation Department Yards was the dominant feature on the North Side.

Two working mines and three historic mill sites( Hercules. Evolution and Polaris), the UP railroad corridor and several impoundments at Osburn and Terror Gulch also needed to be considered.

### **CHARACTERIZATION AND PLANNING:**

The Osburn Response was planned by a stakeholder technical group working with the Trustees, working to understand groundwater and surficial data as well as the loading to the SFCDR. The potential of a "mystery site" was alluded to by the Coeur d'Alene Tribe and others, and theory needed to be put to the test. Beginning in early 1996, the technical team, using Golder Associates as consultant, joined the task of attempting to

understand the loading and dilution effects through this reach by dividing it into understandable areas, reviewing well data, and conducting a flow sampling event.

Results of the review did not identify a mystery site and did not identify a single advantageous project site. The understanding grew that there is a consistent picture of gradual loading from Wallace to Big Creek, or, put another way, cumulative loading from multiple locations.

Osburn Flats and the Big Creek Flats were considered in greater detail with a preliminary removal and restoration planning effort. Alternatives included:

- Excavation with removal to repository
- Capping to minimize infiltration
- Armoring to prevent erosion
- Treatment of water and soils
- Regrading
- Revegetating
- Rerouting/channelizing/habitat enhancement of River

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**SECTION 4 – PROJECT EXECUTION**

**SUMMARY OF SCHEDULE - OSBURN FLATS:**

1996

May 11	Technical Committee Organization Meeting	
June 11	Characterization meetings, results, site selection	
July 18	“	“
August 7	“	“
September 9	“	“
September 12	“	“
September 18	“	“
October, November	Test Pits in Removal areas	

1997

June 9	Draft design and bid package
July 7	RDR Meeting/Agency Review
July 14–August 15	Public Comment Period
July 28	Osburn Public Meeting
August 1 – 27	Bid Process
October 17 - Nov. 4	Test Plots Constructed
October 31	Begin upstream south rock structure
November 15	Begin upstream north side protection/diversion structures

1998

January 8	River structures complete, BMP removed
April 30	Test Plot Watering and Sampling begins
May 1	Mob haul road construction, guardrails, etc
July 29	Prepare repository site on ASARCO ponds
August 6	Tailings removal - downstream floodplain
November 11	Construct stabilization channel
November 23	Complete repository cover/fine tune drainage

1999

March 20	Revegetation and revetment work
September 1	Dismantle Test plots

## SUMMARY OF SCHEDULE - OSBURN ADDITIONAL REMOVAL SITES

1998

May 14	Trustees Authorize Osburn Additional Sites Removals
June 3 – 18	Bid Process
July 20	Tailings Removal to CIA
September 15	Silverton Tailings removal completed
October 7	Evolution Tailings removal completed
November 2	Big Creek Tailings removal completed

Public outreach for the Osburn projects was accomplished by newspaper articles about the project planning, a fact sheet, a document repository at the Osburn City Hall and at the Wallace Library and the advertised Public Comment Period and the Public meeting held on July/28/97 at the Public Safety Building in Wallace. All technical meetings and Trustee meetings are open to the public.

All bid documents and fiscal payments and reports are open to the public and monthly fiscal reports are routinely distributed at basin meetings.

### Activities

#### **BMP's – Best Management Practices during construction**

Channel protection during removals was accomplished with the placement of a large diversion structure that confined the river while removals were being done. Adjustments to the structure were done at the completion of the project to allow high flow waters to spill through to the newly installed high flow side channel. Hay bales were also used to reduce site run off and aid in stream protection. Water trucks were used to keep fugitive dust down.

#### **Test Plot Construction**

Test plots were designed and installed to determine whether an amendment mixed with the contaminated soils could reduce the mobility of cadmium and zinc into the ground water.

In the control plot, tailings interacting with water without amendment produces a leachate characterized by elevated concentrations of dissolved cadmium and dissolved zinc (109 mg/L)

Of the four amendments tried, ferric sulfate appears significantly more effective than the other amendments in reducing both cadmium concentrations and zinc concentrations equivalent to a 99.5% reduction in cadmium and a 99.95% reduction in zinc.

## **Tailings Removal**

The depths of tailing removals were between 1 to 7 feet. The tailings were removed using hydraulic excavators and hauled to the repository area in scrapers on Osburn flats, and hauled to the CIA at Bunker Hill by trucks. The criteria for the depth of tailings removal was the shallowest of:

1. Color change in the sediment is observed. This typically indicates the lower limit of tailings (reddish brown) which were deposited on natural soils (yellowish-gray brown). All tailings above the natural soil will be removed.
2. A natural silt or organic laid is encountered. The silt layer is present at several locations although discontinuous because of historic reworking of the materials on the flats. Organic materials indicated by roots, black organic decomposed materials can be seen in some areas. All tailings above this plane will be removed.
3. Groundwater is encountered. All tailings above groundwater will be removed. The tailings below the groundwater talve are assumed to already be leached or will not oxidize and will contribute little metals loading.

## **Tailings Disposal**

An Agreement was reached with Silver Valley Resources Corporation to place the contaminated materials from the mine tailings and sediments from the flood plain of the South fork of the Coeur d'Alene River onto the Osburn Tailings pond. No independent requirements were placed on Silver Valley Resources in accepting the mine tailing and sediments excavated pursuant to this CERCLA action.

## **QA/QC**

In accordance with Section 02200 part 1.8 of the Construction Contract Bid Notice Request for Bid for Osburn Flats Response Action 1997, compaction test where completed by Strata Geotechnical Engineering & Materials Testing on tailings material and capping material.



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**SECTION 5 – PROJECT MILESTONES: VARIATIONS FROM  
INITIAL SCOPE**

The actions called the Osburn Additional Areas were added to the initial approval in October 1998, allowing for removal of tailings from BLM and other properties to the Bunker Hill Central Impoundment Area. A small percentage of this work (from Silverton) was anticipated and paid for with a Federal Clean Water 319 grant of \$75,000. This response to bid under federal procurement was very competitive and the contractor was expeditious in moving material. The SVNRT trustees then approved considerable additional work on this contract to include the Evolution mill site floodplain and Big Creek Flats on the SFCdR. These areas had been characterized in the preliminary planning phase of the Osburn work. Removals were targeted by referencing sample results from those test pits.

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**SECTION 6 – SUMMARY OF COSTS (as of 4-30-00)**

6a.	OSBURN FLATS REMOVAL 1997 SV5OSB-01, 02, 03, 05, 06		
	REMEDIAL DESIGN	\$	93,988
	REMEDIAL ACTION	\$	406,432
	CONSTRUCTION MANAGEMENT	\$	<u>121,212</u>
	TOTALS	\$	621,632
6b.	OSBURN TEST PLOTS SV5OSB-04		
	REMEDIAL ACTION	\$	40,308
	CONSTRUCTION MANAGEMENT	\$	<u>12,905</u>
	TOTALS	\$	53,213
6c.	OSBURN ADDITIONAL 1998 SV5OSB-07, 08 / SVSFCR-01		
	REMEDIAL ACTION	\$	449,385
	CONSTRUCTION MANAGEMENT	\$	<u>17,394</u>
	TOTALS	\$	<u>466,779</u>
	(Non Match Federal 319 of \$75.000)		
	ALL TOTALS		\$1,141,624

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## **SECTION 7 – DIFFICULTIES ENCOUNTERED**

### 7.1 Difficulties encountered with Vegetation.

An adequate water supply and a lack of type (A and O) Horizons, topsoil, were found to be the major determining factors in successful revegetative efforts. Because of the extreme conditions under which new vegetation was subjects, IE remnants of mining impacts, lack of topsoil, and summertime direct sunlight, drought stress was magnified. The lack of fines in the soil matrix after removals were finished and the penchant for Lead and Zinc to form an ionic bond with phosphorous greatly reducing its bioavailability, necessitated the use of a “prime release” fertilizer regimen thereby ensuring the availability of nutrients to the vegetation over a much longer period of the growing season, greatly increasing the chance of survival. Because organic recycling normally found in the type O horizon is nonexistent, it is imperative that nutrients be spoon fed for 4-5 years to mimic the natural multi year breakdown of organic matter that naturally releases nutrients over time.

### 7.2 Difficulties encountered with Haul.- Infrastructure stress

The haul of 75,000 cy of materials from the Osburn flats removal areas to the Silver Resources Impoundment was uneventful except for the load limit put on the Nuchols Gulch Road at the time when rock delivery was scheduled. The haul of 77,000 cy of materials to the CIA through the Smeltonville /190 exchange required negotiations with the city of Smeltonville, to head off designation of a load limit on the city roads. A toll of \$1,000 was paid as a token for repair work that may need to be done.

7.3 Difficulties encountered receiving approval of Repository location by owners and/or agencies delayed project one year.

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### **SECTION 8 – RECOMMENDATIONS – LESSONS LEARNED**

Work can be done in a timely and cost effective manner if the sponsors are willing to take risks and to adjust to field changes that may be encountered. The understanding of the loading of metals to the surface waters and planning of scope was accomplished with an organized sampling protocol, historic record review and minimal test pits.

The depth of removals near the river, between the river and the new channel, somewhat compromised the planned habitat zone on the lower third of the site. River water breached the barrier bar, forcing more than the desired 1/3 flow into the lowest wetland. Over time this annual force would damage vegetation.

Repairs are planned in summer 2000.

Water management strategies for the Osburn Ponds were being adjusted concurrently with the construction and lay down of the tailings upon the repository. The company design and requirements changed during this time period. If anticipated the location of the new tails would have been adjusted. The Company will continue to work on surface water runoff for their ponds.

Federal funding of part of the project brought additional procurement and personnel issues to the contract for the Osburn Additional Areas work. This provided an important experience in various components including bid award and payroll certification among others.

Experienced excavators can determine tailing removal levels easily. The depth of removal to groundwater was not functional guidance and was confounding. The groundwater in the immediate floodplain drops with the seasonal draught. The Silverton removal area had to be reworked. A better resolution if this removal depth is desired to accomplish submersion of materials. would be to determine groundwater levels in two prior years.

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**SECTION 9 - INDEX OF DOCUMENTS OF SITE**

Assorted correspondence back and forth with Silver Valley Resources, SVNRT and EPA.

Bureau of Land Management. 1998. BLM's letter about using CIA.

Golder Associates Inc. 1998. Lysimeter Install and Sampling - Osburn Flats, Idaho.

Golder Associates Inc. 1997. Soil/Sediments Analytical Results

Golder Associates Inc. 1997. Surface Water Sample Summary. Osburn Test Plots  
Baseline.

Golder Associates Inc. 1997. Test Pit Logs for Areas 1 through 5.

Golder Associates Inc. 1997. Volume Estimates for Areas 1 through 5.

Golder Associates Inc. 1997. Work Plan for Osburn Flats Response .

Idaho State Natural Resource Trustees. 1993. South Fork Coeur d' Alene River  
Inventory File, Remediation Sites.

Idaho State Natural Resource Damage Trust Fund. 1994. Trustees Action Plan – 1994.  
South Fork Coeur d' Alene River.

McCulley, Frick & Gilman, Inc. 1992a. Upstream Surface Water Sampling Program,  
Fall 1991 Low-Flow Event; South Fork Coeur d' Alene river Basin above the  
Bunker Hill Superfund Site. Report Prepared for the Trustees for the State of  
Idaho Natural Resource Trust Fund and Hecla Mining Company. March. 1992.

McCulley, Frick & Gilman, Inc. 1996. Investigation of Surface and Groundwater Metal  
Contamination from Past Mining Activities near Osburn, Idaho.

"Profits for Hecla from 40-Year-Old Tailings. "Engineering and Mining Journal", May  
1994, pp 68-71.

Silver Valley Natural Resource Trustees. 1997. Copies of legal notices for public  
meeting and request for bid.

Silver Valley Natural Resource Trustees. 1997. Summary of Public Meeting and Responses to Public Comments.

Silver Valley Natural Resource Trustees. Request for Bid - Osburn Flats Response Action 1997.

Silver Valley Natural Resource Trustees. Request for Bid - Osburn Flats Response Action 1997, Addendum 1.

Silver Valley Natural Resource Trustees. Daily Construction Reports.

Silver Valley Natural Resource Trustees. 1998. Copies of legal notices for Request for Bid.

Silver Valley Natural Resource Trustees. 1998. Daily Construction Reports.

Silver Valley Natural Resource Trustees. 1998. Letter to EPA for use of CIA.

Silver Valley Natural Resource Trustees. 1998. Osburn Response Action Plan - Additional Removal Sites at Silverton, Evolution, and Big Creek.

Silver Valley Natural Resource Trustees. 1998. Request for Bid - The Osburn Response Action 1998.

US EPA. 1997. Decision Memorandum for Removal Actions in the South Fork Coeur d' Alene River System.

US EPA. 1997. Engineering Evaluation/Cost Analysis for Osburn Flats Response Action.

US EPA. 1998. EPA's response to BLM.

US EPA. 1998. Memo for Change in the scope of Response for the Response Action underway at the Osburn Flats reach of the South Fork Coeur d' Alene River System.



# SILVER VALLEY NATURAL RESOURCE TRUST FUND

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## TRUSTEES

CHUCK MOSS, Chairman  
Executive Office of the Governor

CLIVE STRONG  
Natural Resource Division  
Office of the Attorney General

SHERRY KRULITZ  
Shoshone County Commission

DUANE LITTLE

ERIC LASSFOLK

J. CHRIS PFAHL  
ASARCO Inc.

ROBERT LAUNHARDT  
Sunshine Mining & Refining

FACT SHEET  
July 28, 1997

## OSBURN RESPONSE ACTION PLAN - OSBURN FLATS

The Osburn Response is focusing on groundwater and surface water quality problems in the South Fork Coeur d'Alene River. One hundred years of silver, lead and zinc ore extraction and milling activity along the South Fork and its tributaries has resulted in deposition of trace (heavy) metals contaminated tailings along the banks and floodplain of the river. These metals leach from the soils and pollute the waters of the river, and they erode into the river.

The Osburn flats has been designated by the Coeur d'Alene Basin Restoration Project as an area for mine tailings removal and floodplain stabilization activities. Soils samples from the floodplain show contamination in the soils with zinc concentrations from 441 to 30,100 ppm and lead concentrations in the soils ranging between 123 to 49,800 ppm.

What will be done?

This source control project involves the excavation and removal of 75,000 cubic yards of tailings and mixed mine waste. The material will be taken to an existing tailings pond east of the removal area. The area impacted by the removals will be stabilized and revegetated and existing vegetation which would become vulnerable because of the removal will be protected.

One area of the flats, on the north side and confined by the frontage road is the location of a pilot project for “in situ” treatment, rather than removals. Five test plots will be defined and various amendments will be added to indicate the final “in situ” remedy for these acres. Base line water monitoring has been taken , so the Trustees will be able to identify any change and the effectiveness of this approach to floodplain tailings remediation.

#### Historic Activities:

An historic wood plank dam was constructed in 1910 to block sediments and mine waste from moving down the south fork. Until 1933, when destroyed by a major flood, materials backed up behind the dam, filling the flats with jig tailings and mixed mine wastes. In the late 1930’s Hecla Mining Company operated a mill to reprocess the materials for zinc until the mill was destroyed by fire. Today, the Interstate freeway divides the original floodplain and tailings impoundments were built on the East end of the valley.

#### How is the project being accomplished?

The project is being funded by the Silver Valley Natural Resource Trustees. The project is one of many cooperative efforts to address historic tailings deposits in the river system. The project sponsors include the Silver Valley Natural Resource Trustees, Silver Valley Resources, Hecla Mining company, Idaho Division of Environmental Quality, the US EPA and the Coeur d’Alene Basin Restoration Project.

The project is identified as a non-time critical removal action under CERCLA authorities.

For more information on the project, please contact Marti Calabretta (208) 753-6115.

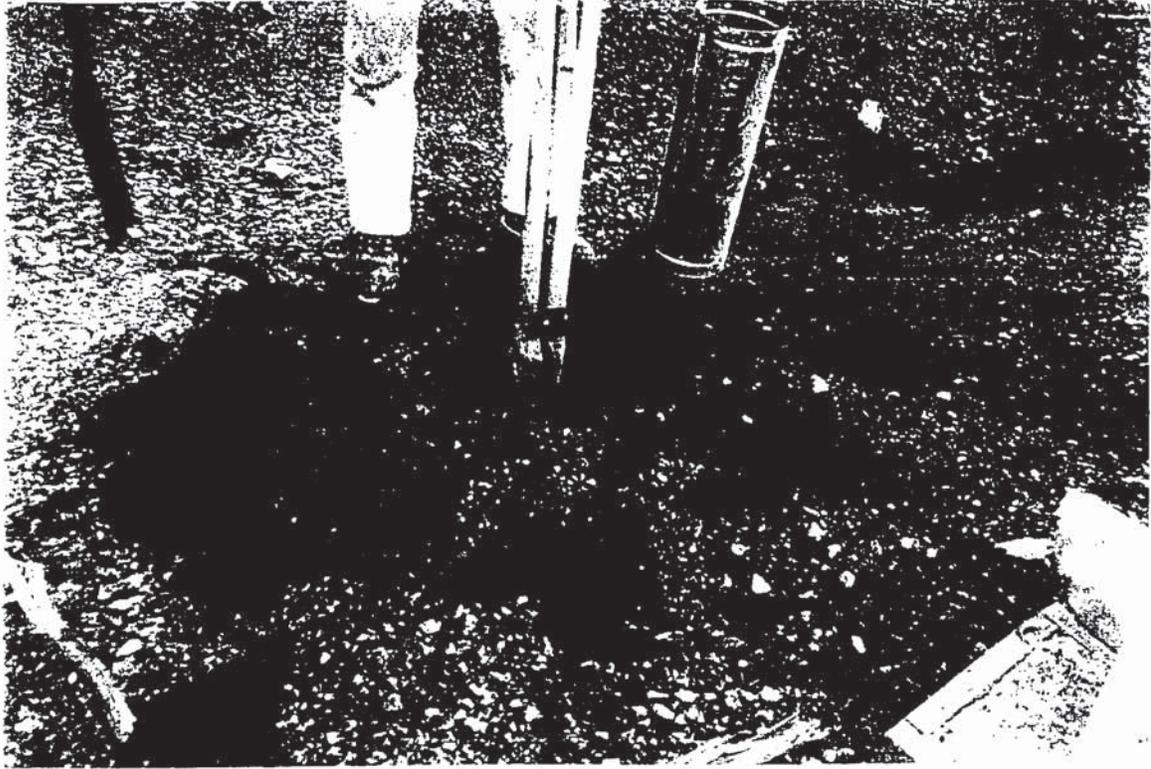


Photo 1 Digging Lysimeter Installation Holes

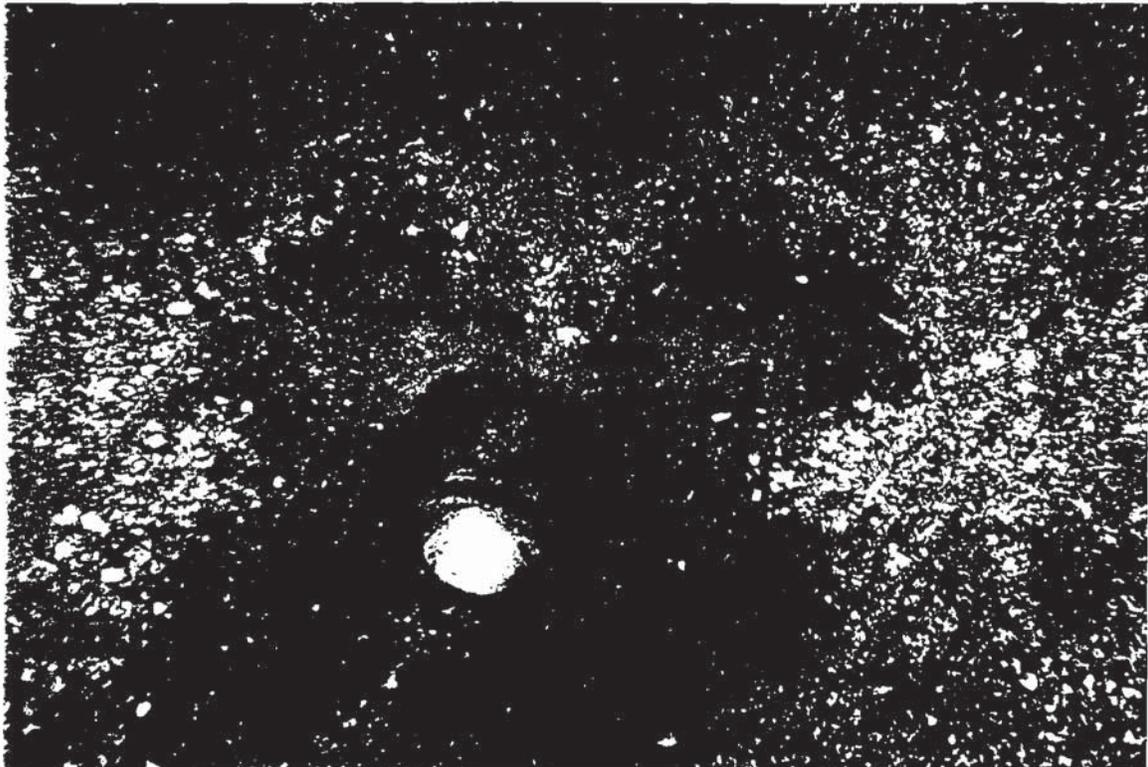


Photo 2 200 Mesh Silica Flour in Base of 3' Deep Installation Hole

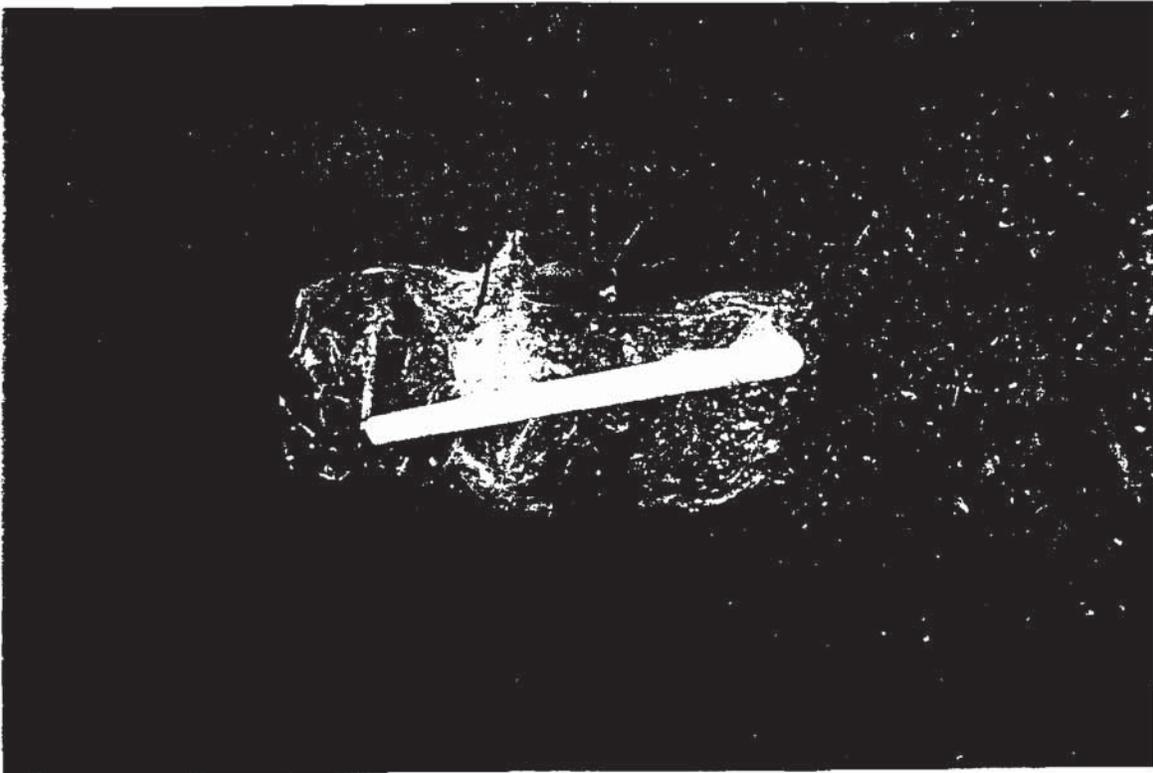


Photo 3 36" 1920F1 Pressure-Vacuum Soil Water Sampler (Lysimeter)



Photo 4 Placement of Lysimeter in 3' Deep Hole on 2" of Silica Flour



Photo 5 Backfilling Lysimeter with Excavated Soil



Photo 6 Installation of 2" ABS Riser over top of Lysimeter

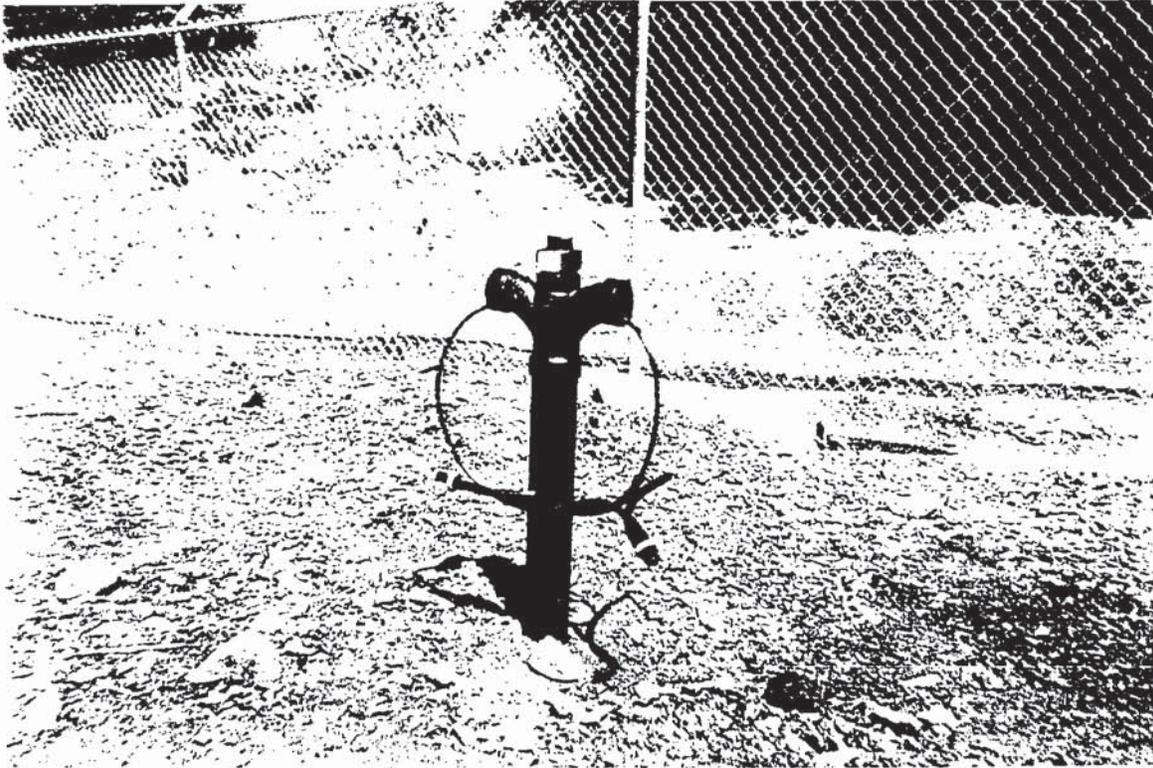


Photo 7 Completed Lysimeter Installation

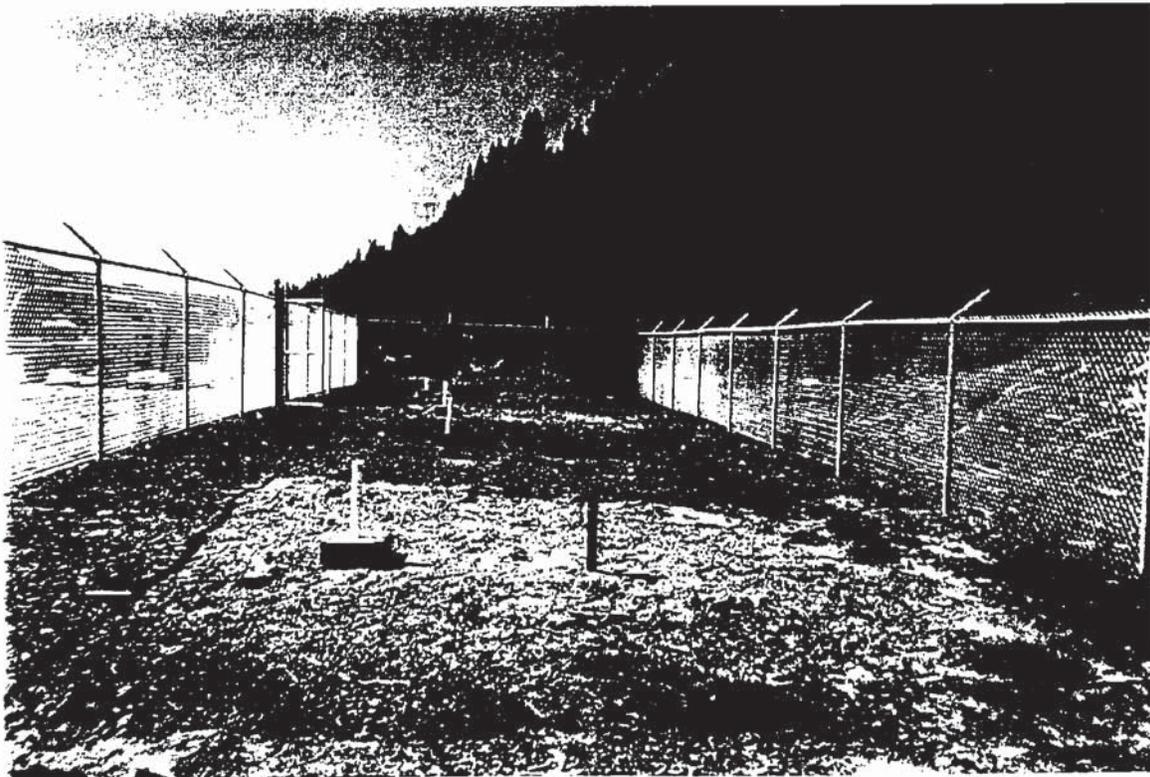


Photo 8 Looking W Across Test Plots (#4 in the foreground)

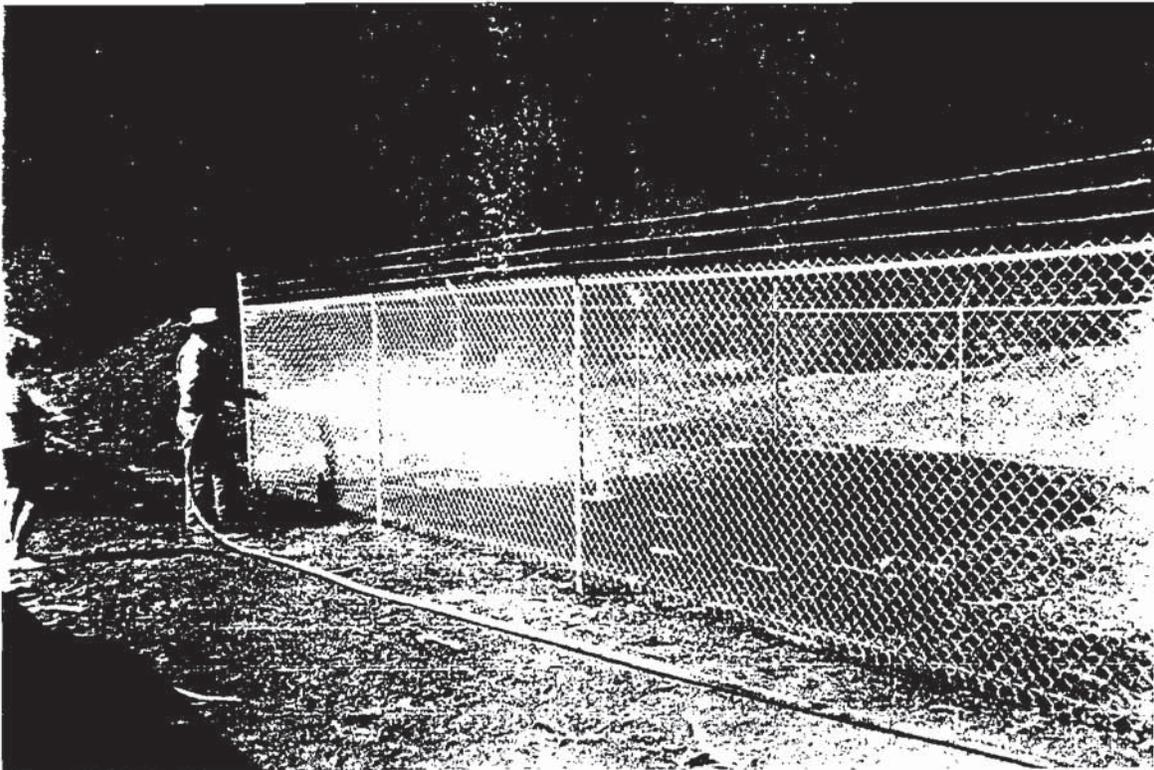
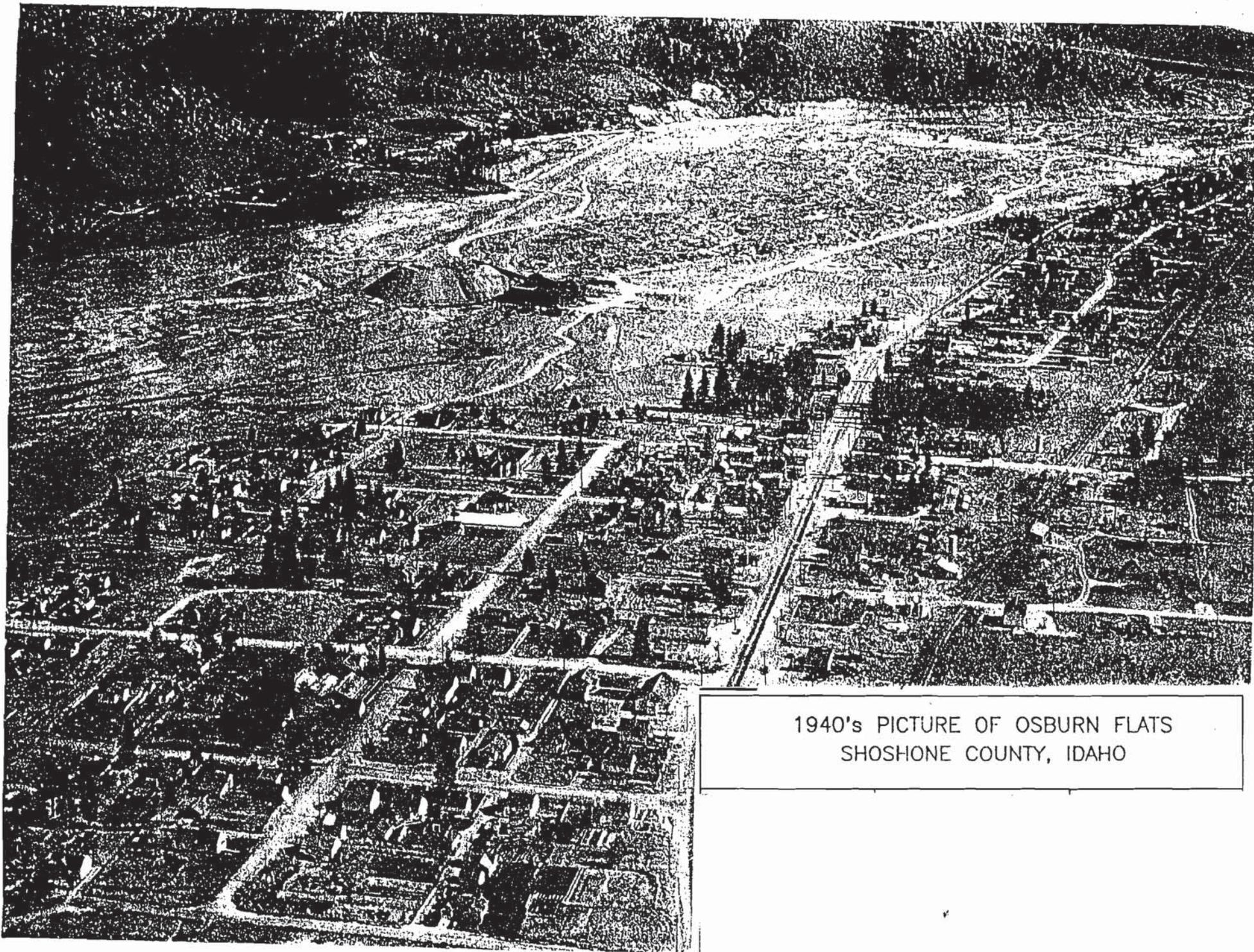


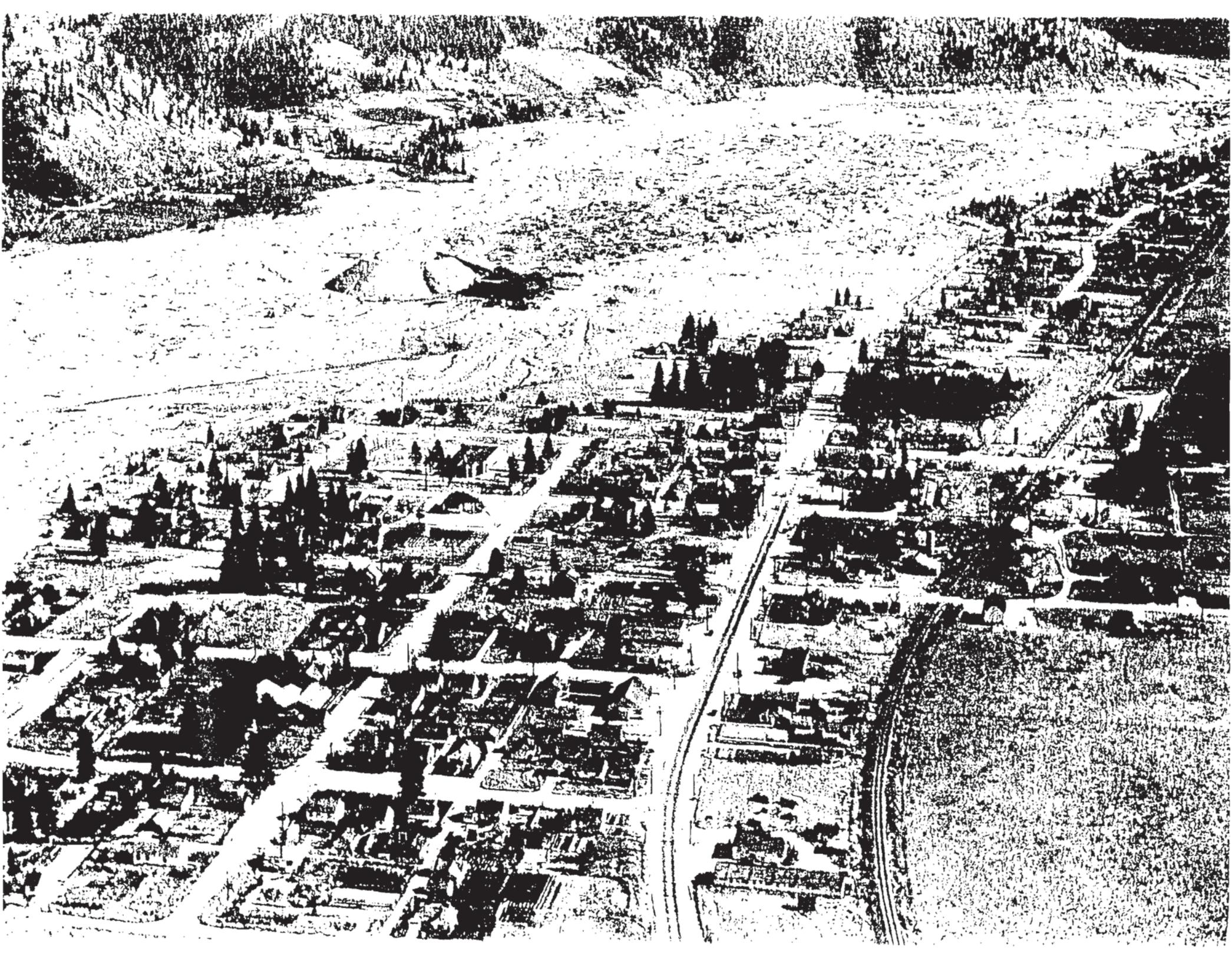
Photo 9 Test Plot Irrigation



Photo 10 Irrigation Water Ponded on Test Plot #1 (15 minutes after irrigation)



1940's PICTURE OF OSBURN FLATS  
SHOSHONE COUNTY, IDAHO



# Figure 1. S.F. Coeur d'Alene Watershed Huc # 17010302

- Huc # 17010302-(#)
- Water Quality Limited Segments
- S.F. Coeur d'Alene R.# 1
  - Pine Creek # 2
  - E.F. Pine Creek # 4
  - Government Gulch # 6
  - Moon Creek # 7
  - Canyon Creek # 14
  - Nine Mile Creek # 16
  - E.F. Nine Mile Creek # 17
  - Terror Gulch # 18

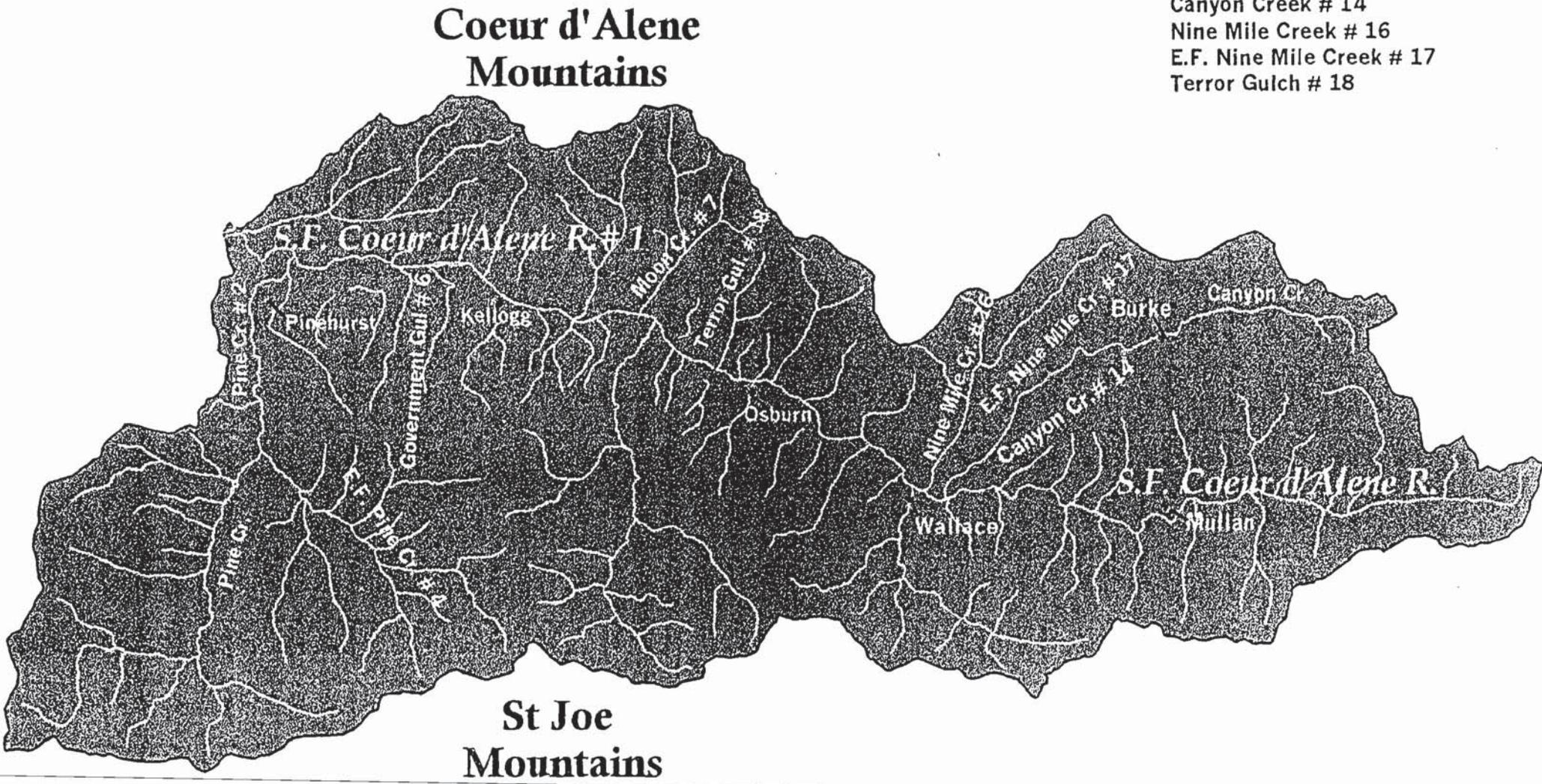
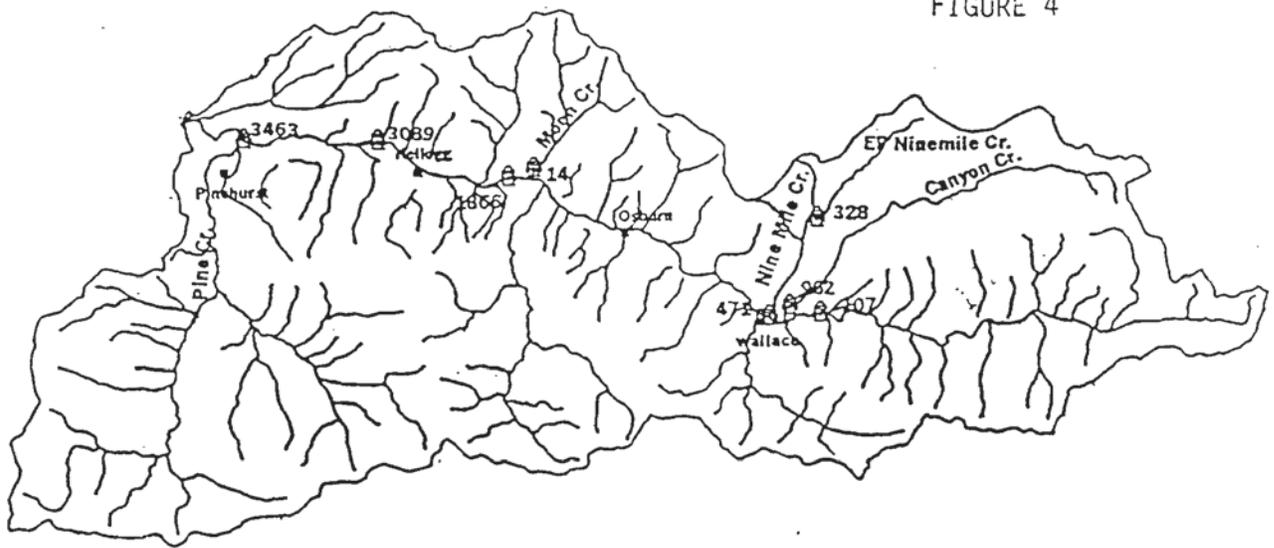
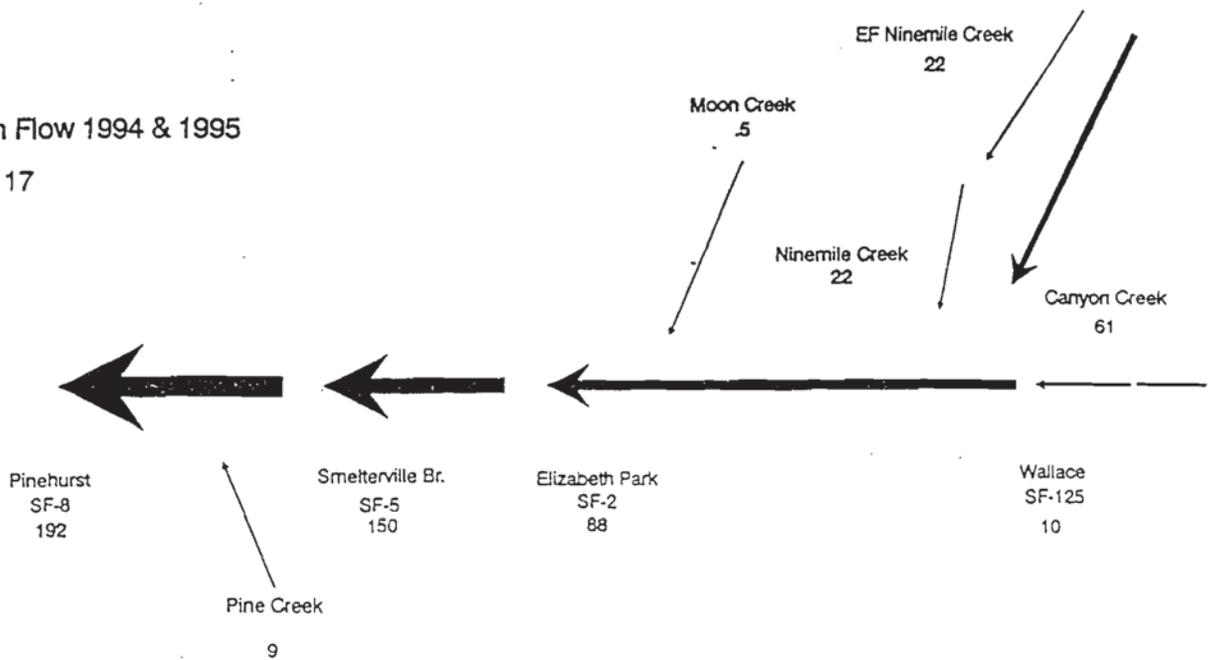


FIGURE 4

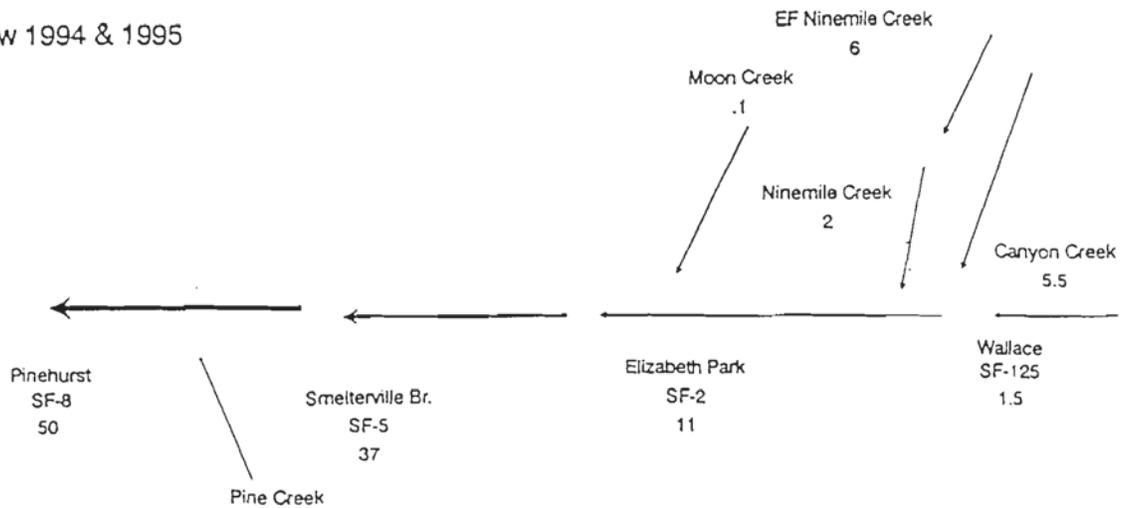


SF Coeur d'Alene River  
Total Lead Load (lb/d)

High Flow 1994 & 1995  
n = 17



Low Flow 1994 & 1995  
n = 17



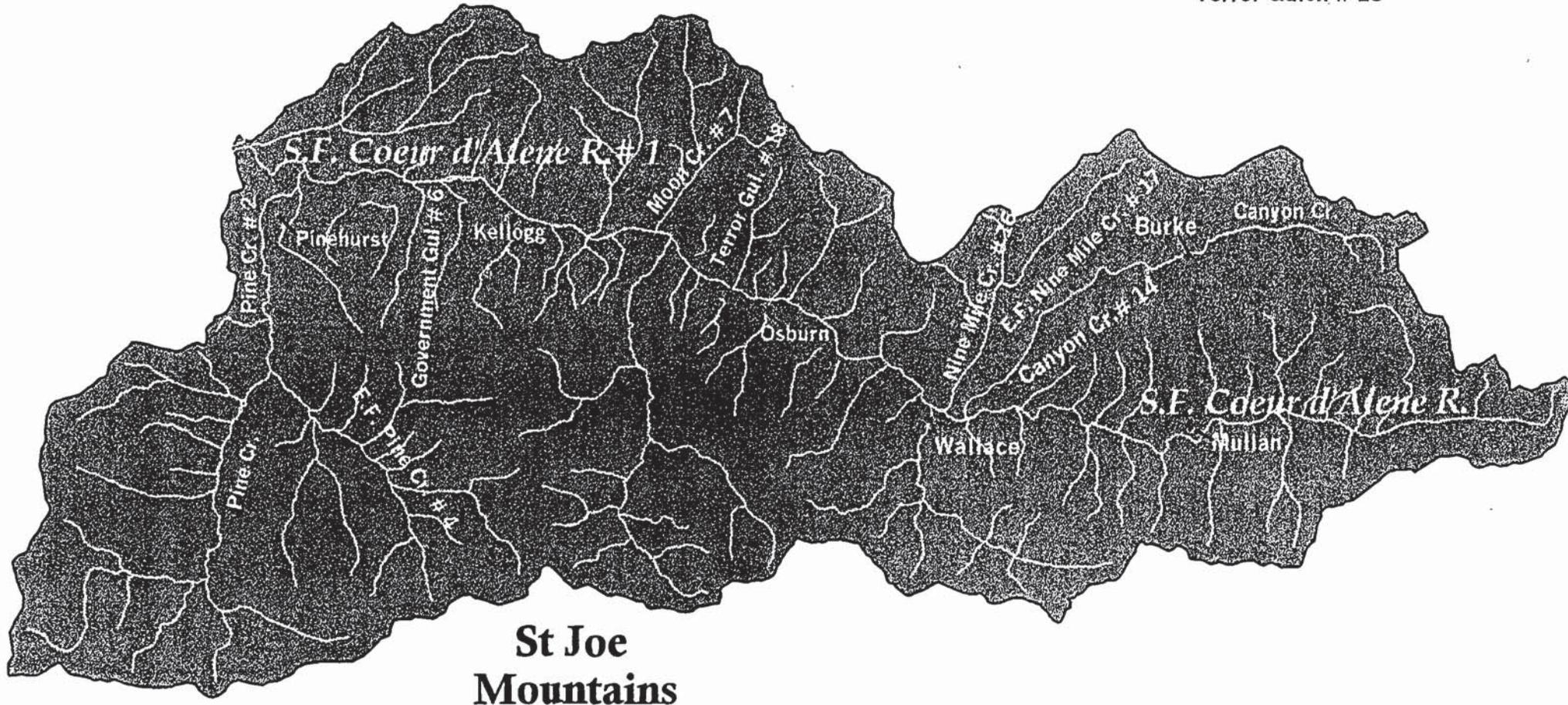
# Figure 1. S.F. Coeur d'Alene Watershed Huc # 17010302

Huc # 17010302-(#)

Water Quality Limited Segments

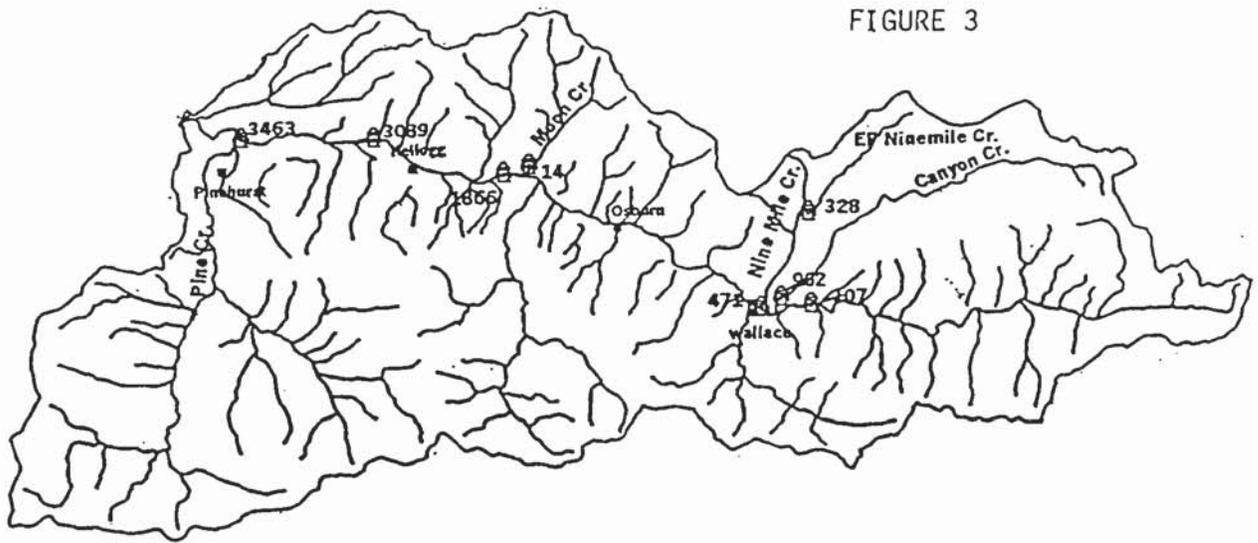
- S.F. Coeur d'Alene R. # 1
- Pine Creek # 2
- E.F. Pine Creek # 4
- Government Gulch # 6
- Moon Creek # 7
- Canyon Creek # 14
- Nine Mile Creek # 16
- E.F. Nine Mile Creek # 17
- Terror Gulch # 18

Coeur d'Alene  
Mountains



St Joe  
Mountains

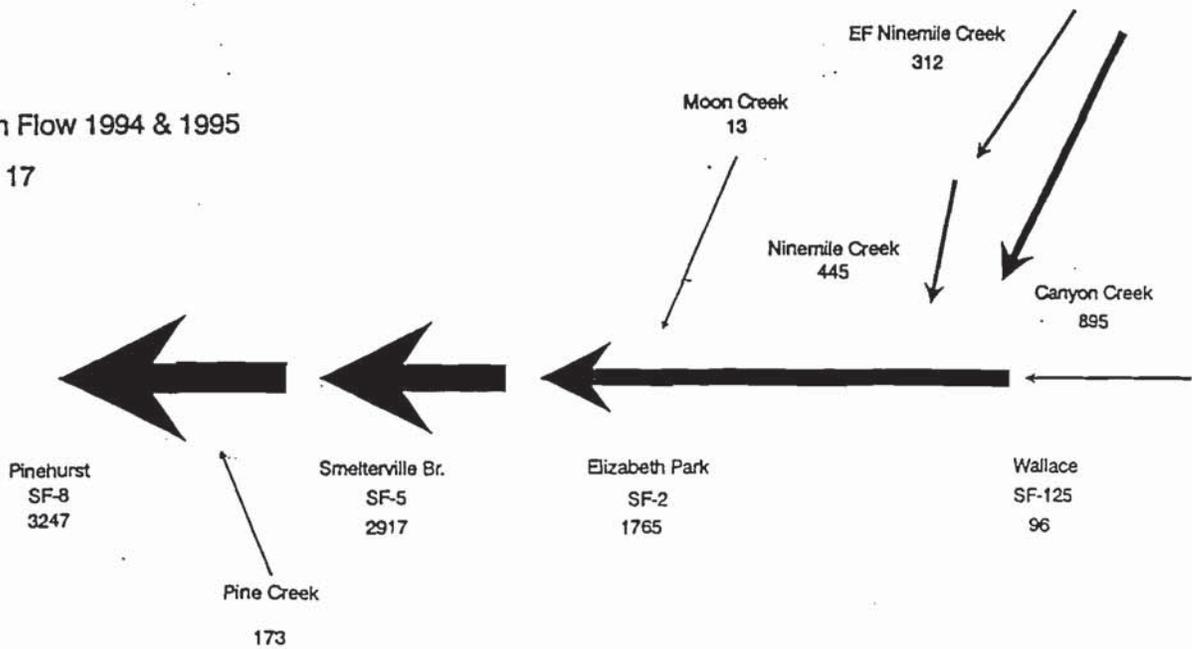
FIGURE 3



SF Coeur d'Alene River  
Total Zinc Load (lb/d)

High Flow 1994 & 1995

n = 17



Low Flow 1994 & 1995

n = 17

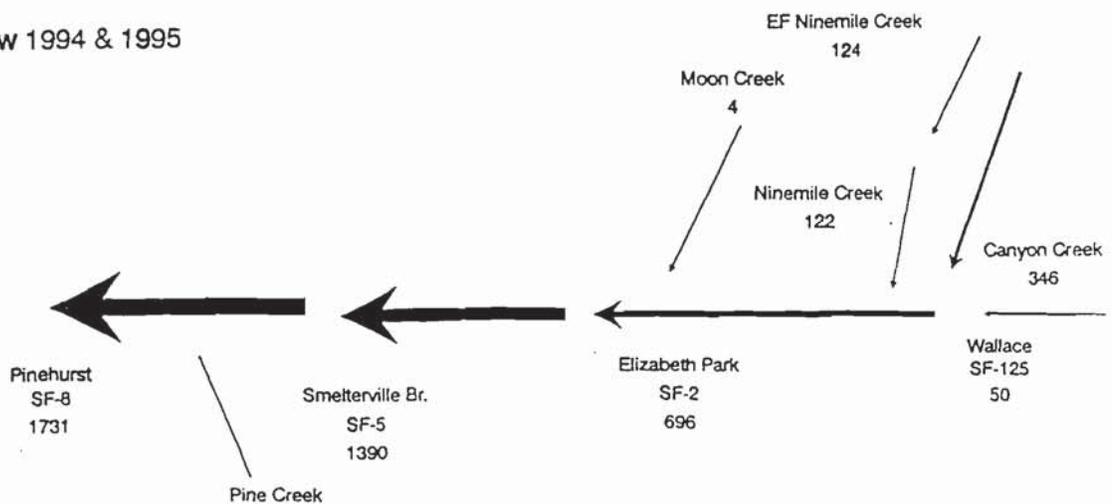
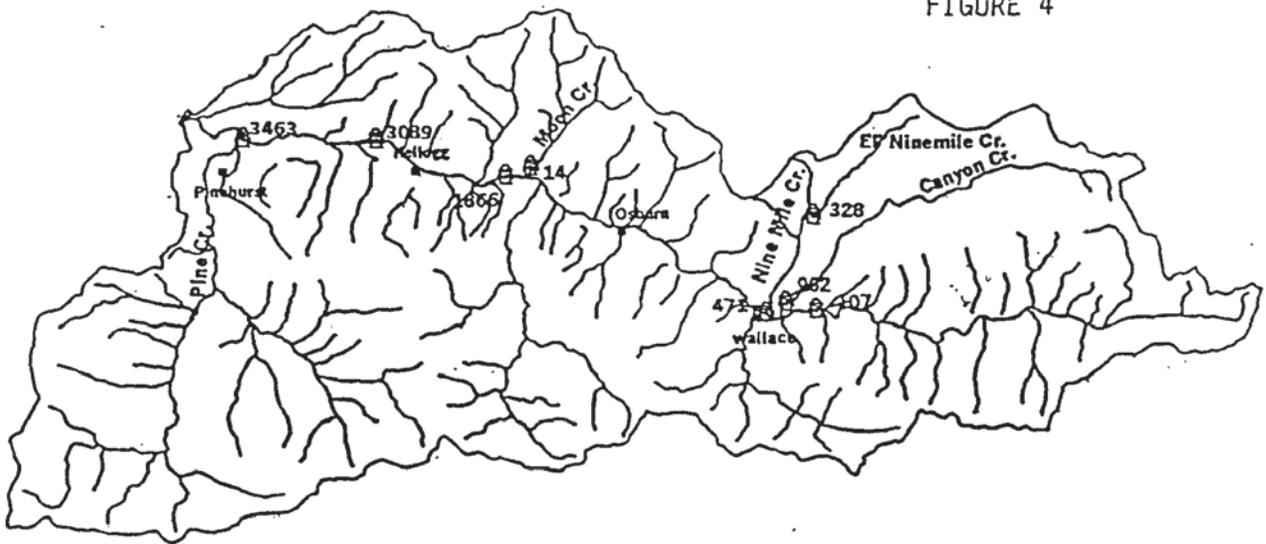
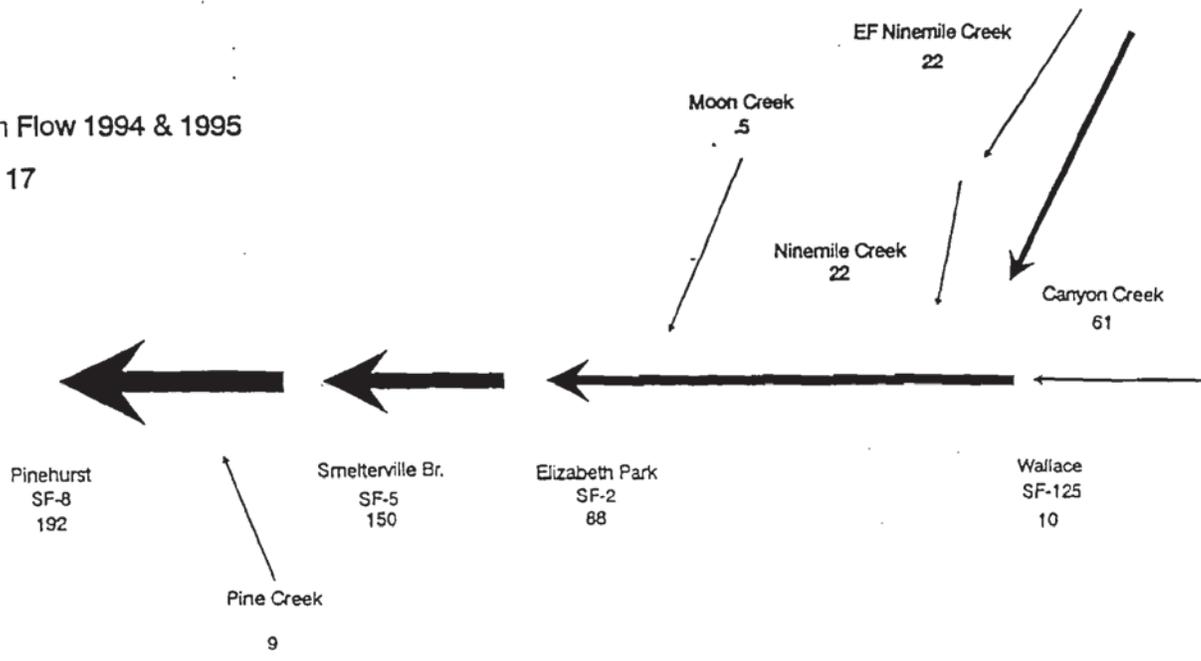


FIGURE 4

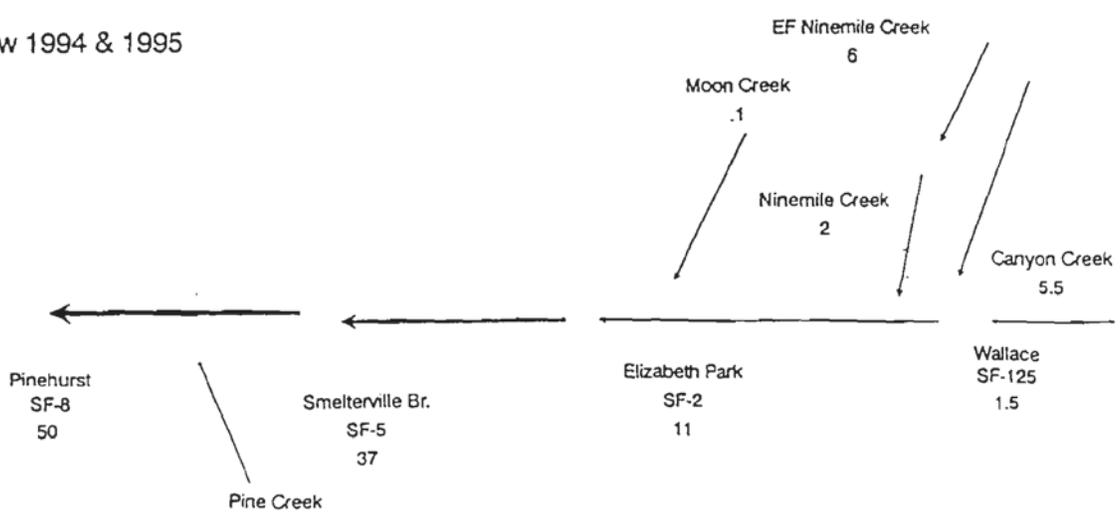


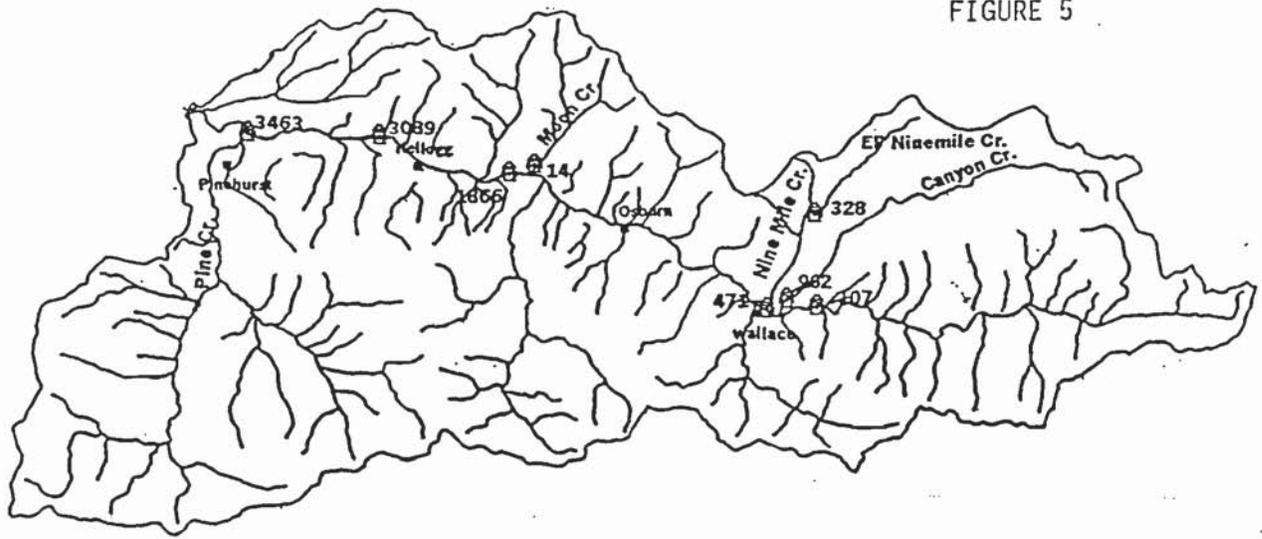
SF Coeur d'Alene River  
Total Lead Load (lb/d)

High Flow 1994 & 1995  
n = 17



Low Flow 1994 & 1995  
n = 17

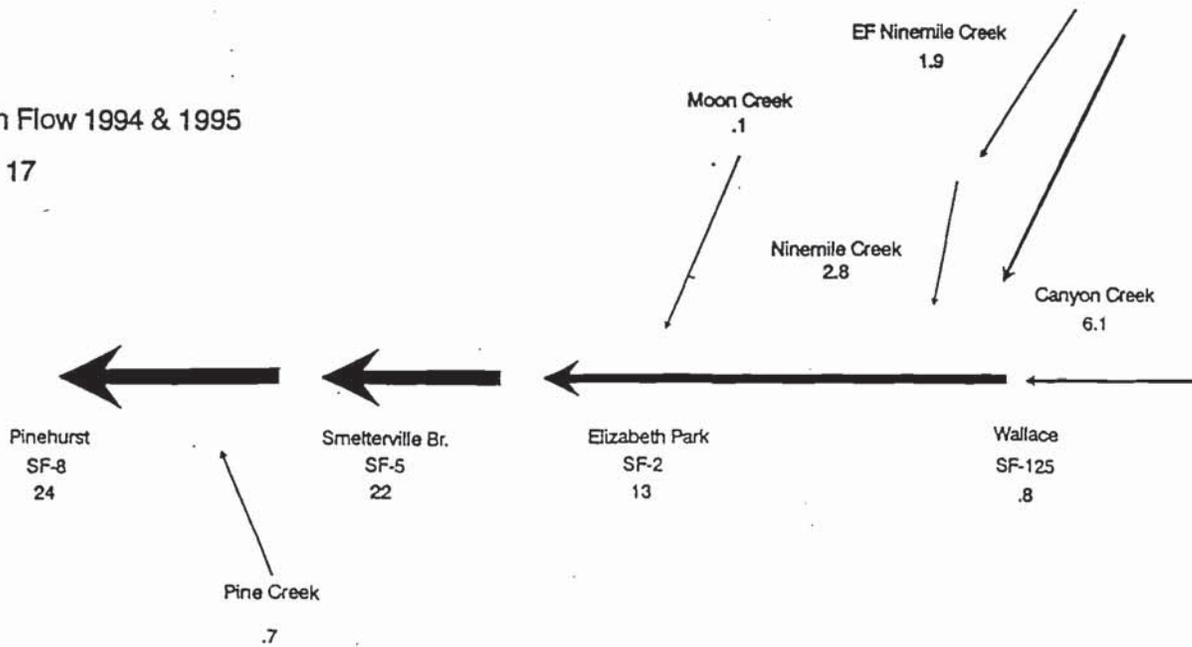




SF Coeur d'Alene River  
Total Cadmium Load (lb/d)

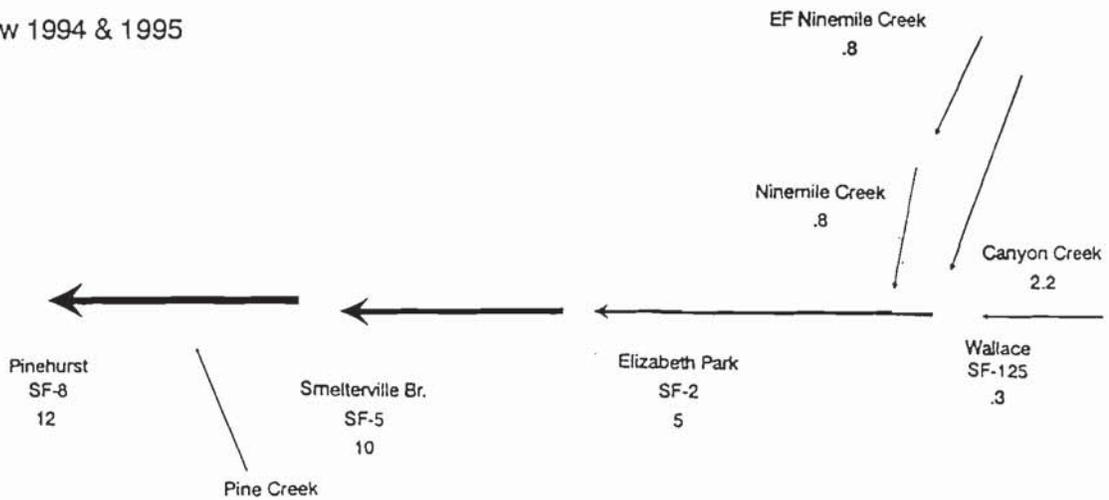
High Flow 1994 & 1995

n = 17



Low Flow 1994 & 1995

n = 17



TOTAL METALS LOADING DATA

SF CdA River  
Total metals Load (lbs/d)  
Low Flow

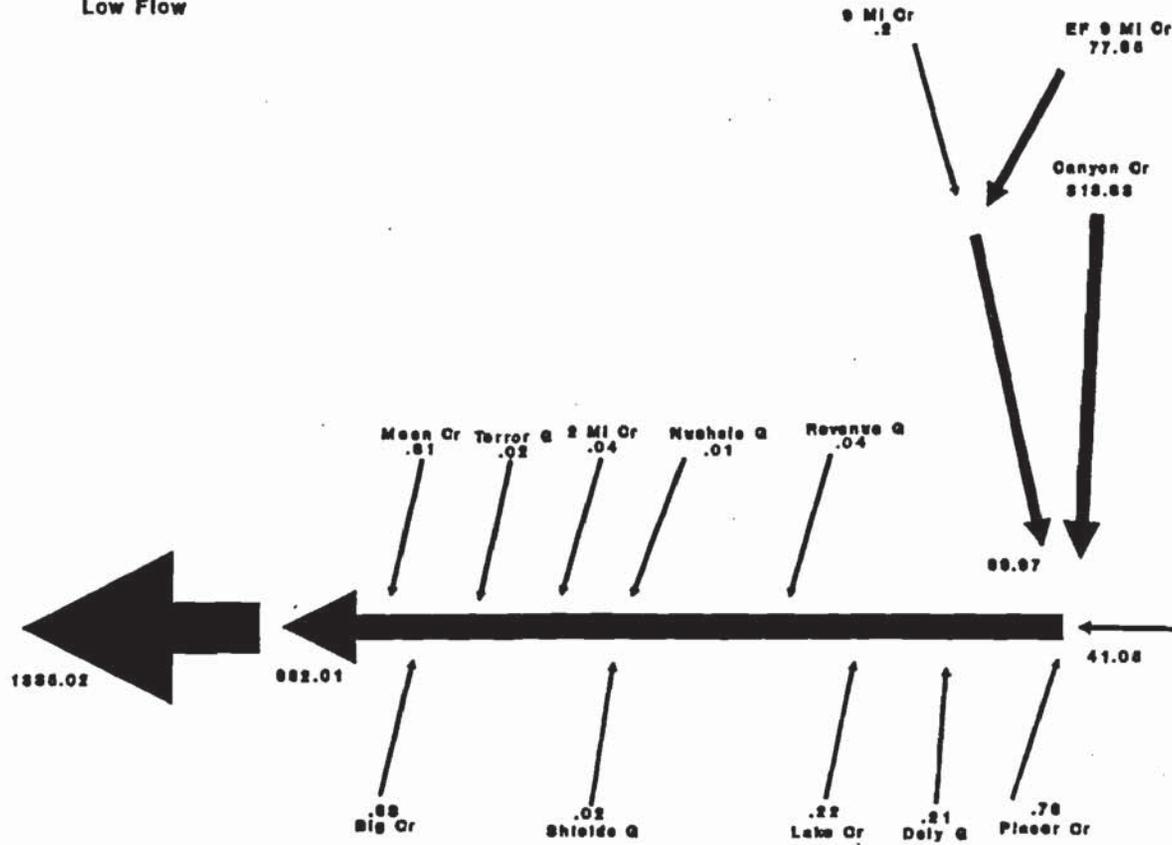
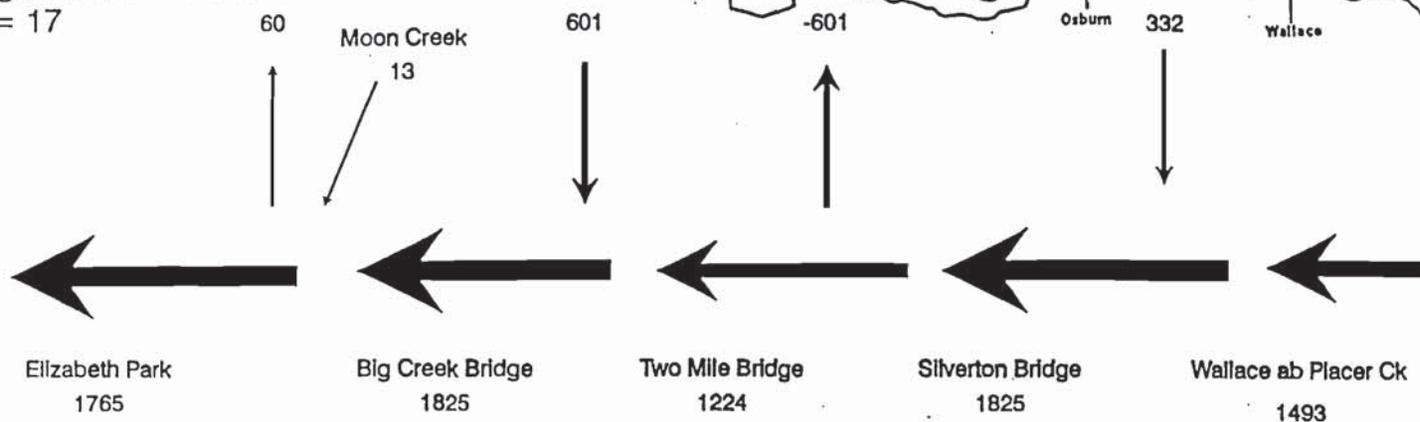


FIGURE 1

SF Coeur d'Alene River  
Wallace to Elizabeth Park  
Total Zinc Load (lb/d)

High Flow 1994 & 1995  
n = 17



Low Flow 1994 & 1995  
n = 17

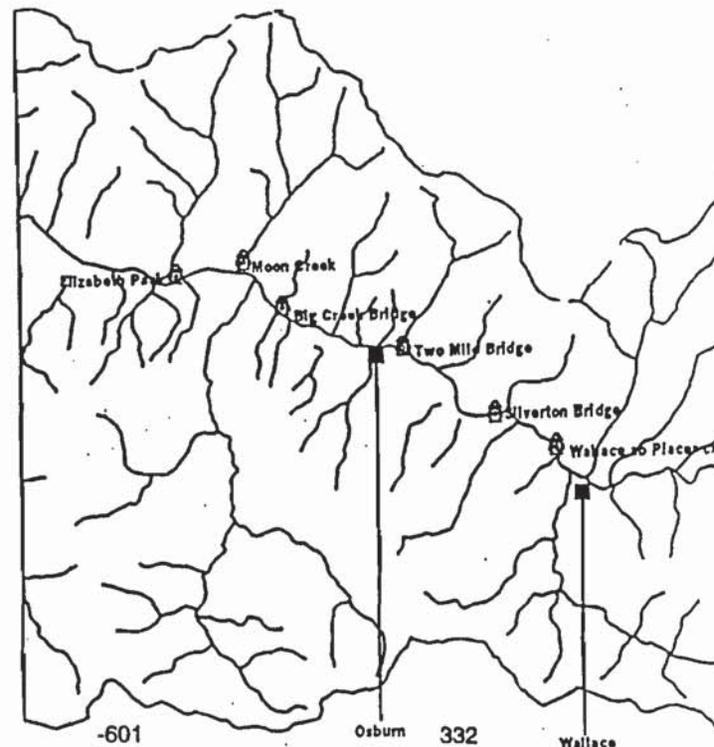
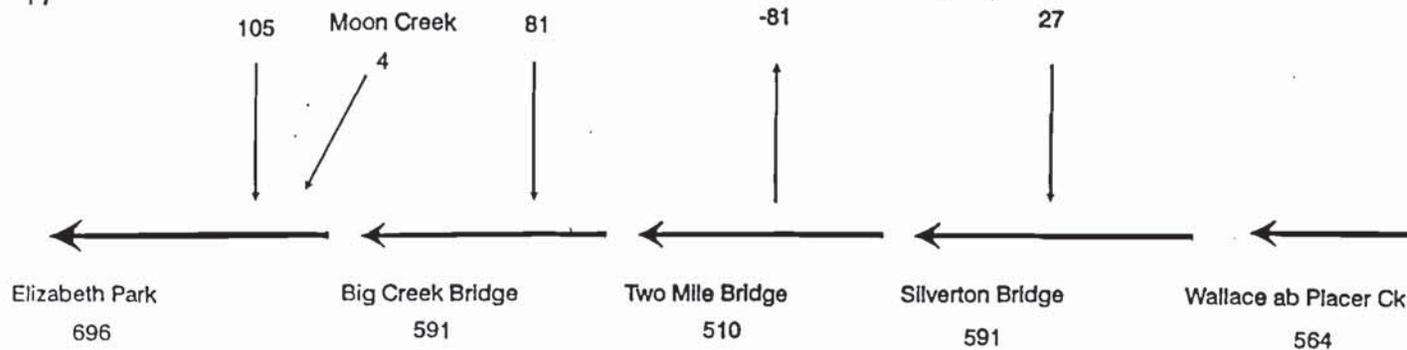


FIGURE 15

SF Coeur d'Alene River  
Wallace to Elizabeth Park  
Total Lead Load (lb/d)

High Flow 1994 & 1995  
n = 17



Low Flow 1994 & 1995  
n = 17

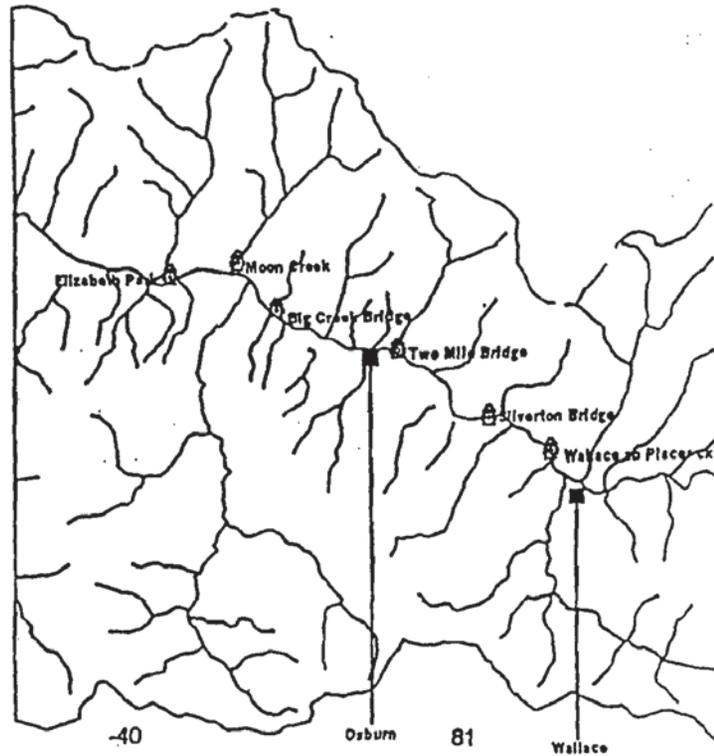
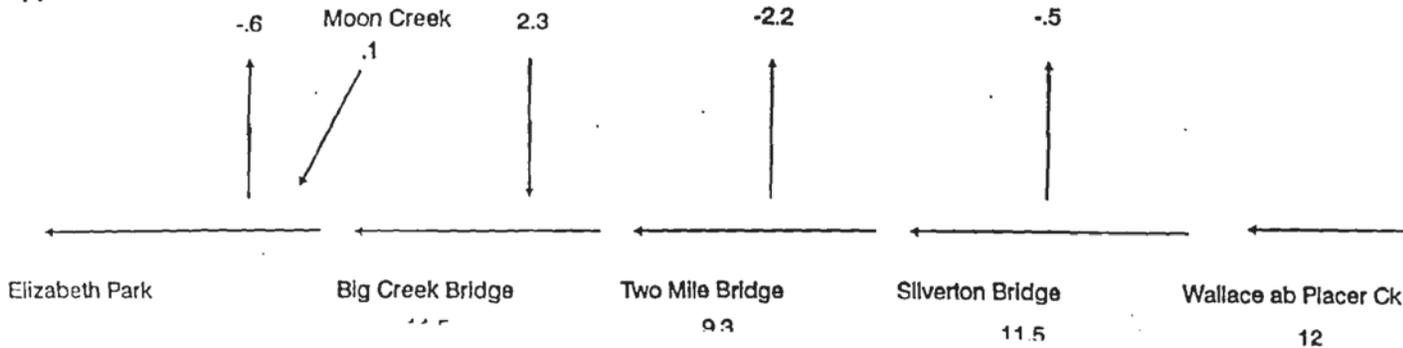
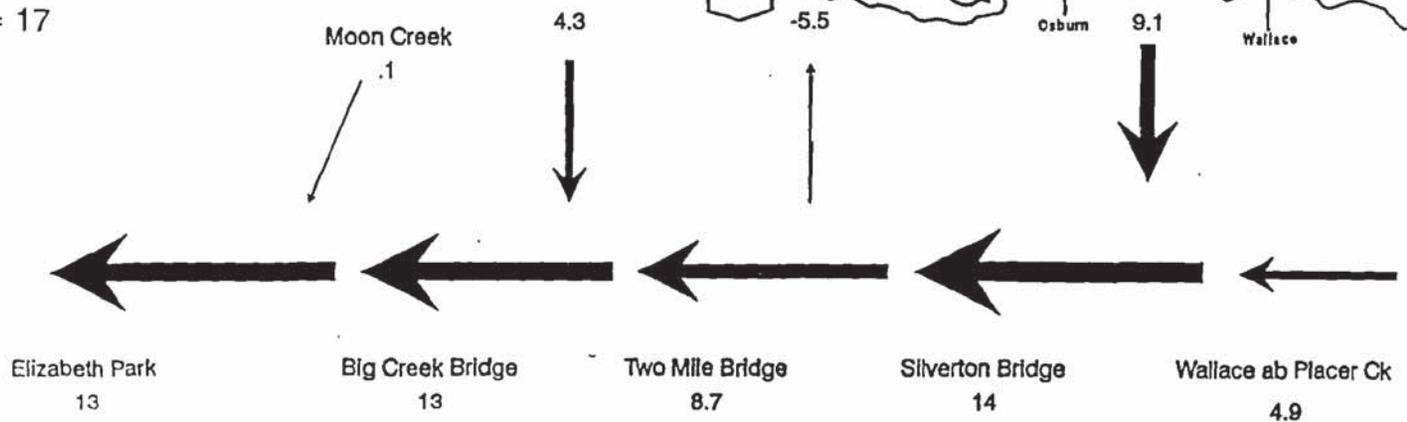


FIGURE 16

SF Coeur d'Alene River  
Wallace to Elizabeth Park  
Total Cadmium Load (lb/d)

High Flow 1994 & 1995  
n = 17



Low Flow 1994 & 1995  
n = 17

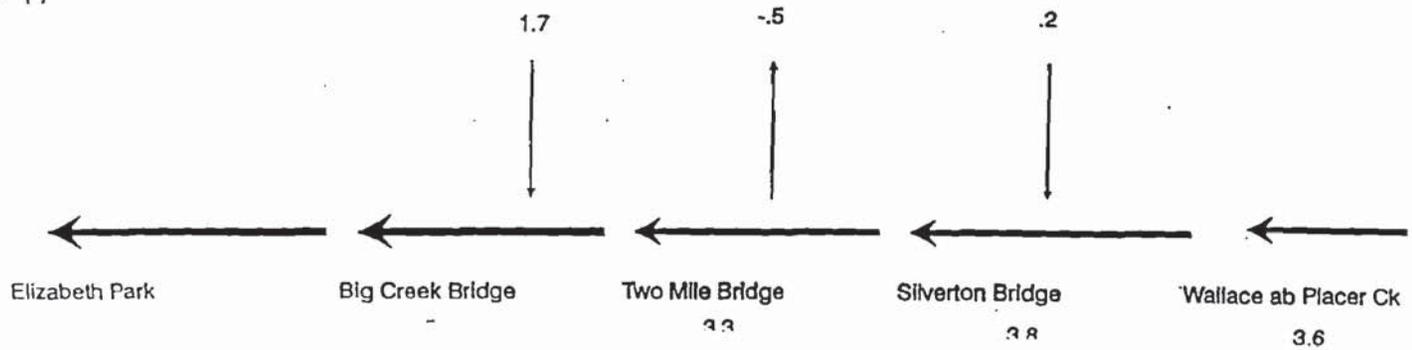


FIGURE 17

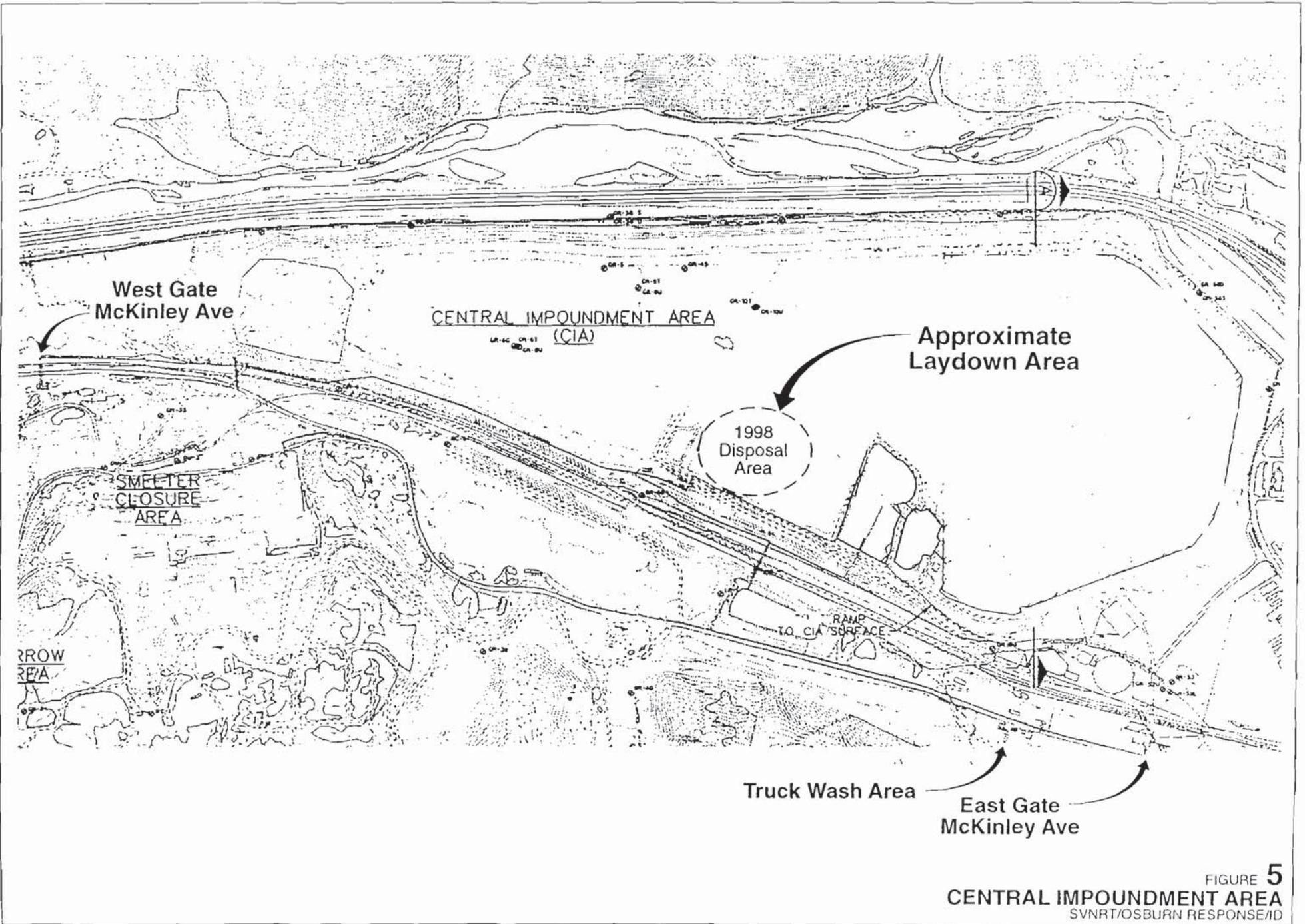


FIGURE 5  
CENTRAL IMPOUNDMENT AREA  
SVNRT/OSBURN RESPONSE/ID

# Coeur d'Alene River Basin Completed Clean Up Projects

Bunker Hill Superfund Site  
 Lead & Zinc Smelter Closures (EPA-DEQ)  
 Milo Ck. (EPA-DEQ) (38,400 yds)  
 Gulch Removals (EPA-DEQ) (761,000 yds)  
 Bunker Ck. (EPA-DEQ) (463,000 yds)  
 Smilterville Flats Removal (EPA-DEQ)  
 (1,5000,000 yds)  
 West Page Pond Removal & Stabilization (UPG)  
 (35,000 yds)

Cataldo Flats  
 Soil Amendment (MOA-EPA-DEQ)  
 Cataldo Boat Ramp Remediation (DEQ-EPA-MOA-SC)

Silverton Tailings Removal (SVNRT) (3,820 yds)

Evolution Mill Site Removal (SVNRT) (21,840 yds)

Silver Crescent Removal (USFS)

Big Creek Flats (SVNRT) (39,754 yds)

Ninemile Creek  
 Interstate Removal (SVNRT)  
 Success Removal (EPA-DEQ)  
 Ninemile Ck. Removal (SVNRT)  
 Rex Mill Demolition (Private)  
 Total yds Removed (152,000)

Cd'A River Bank Stabilization (CBRC-SVNRT)

Medimont Bend Bank Stabilization (EPA-DEQ-SORE)

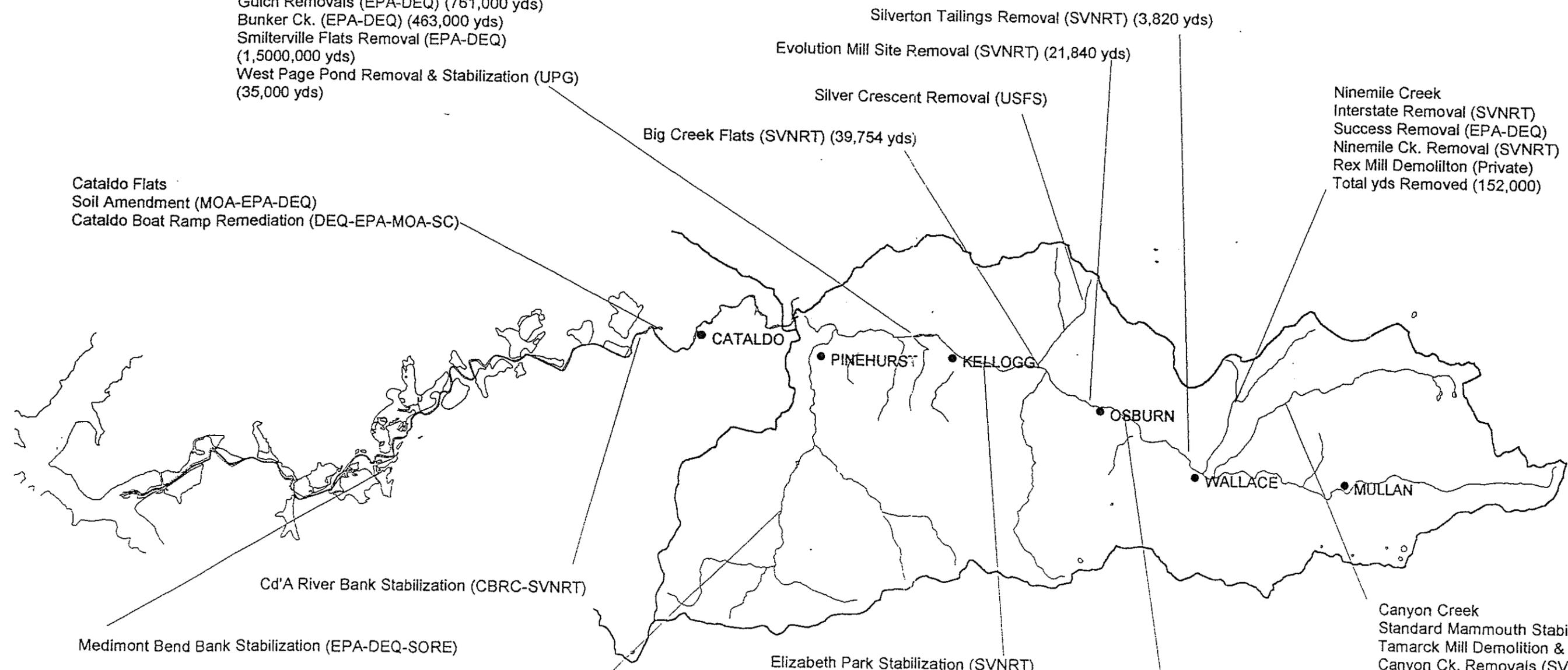
Elizabeth Park Stabilization (SVNRT)

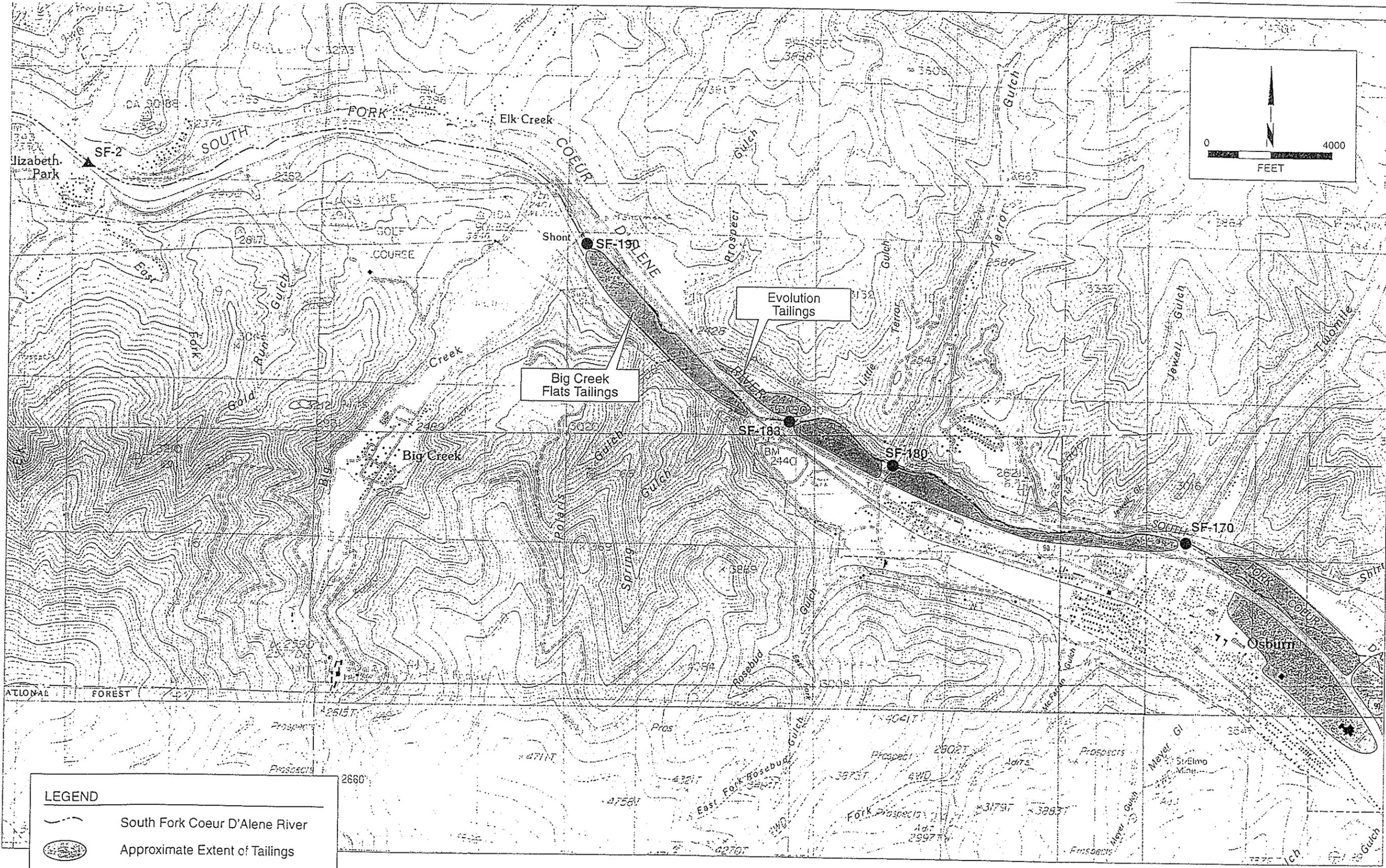
Pine Creek-EF Pine Creek  
 Douglas Removal (EPA) (61,000 yds)  
 Amy-Matchless, Liberal King, Denver Removals (BLM) (29,000 yds)

Osburn Flats Removal (SVNRT) (58,000 yds)

Canyon Creek  
 Standard Mammoth Stabilization (ASARCO)  
 Tamarck Mill Demolition & Stabilization (Hecla)  
 Canyon Ck. Removals (SVNRT)  
 Gertie Dump Stabilization (Private)  
 Canyon Silver Mill Removal (SVNRT-DEQ)  
 Gem Mill Site Removal (SVNRT-UPRR)  
 Total yds Removed (599,000)

ASARCO - ASARCO Mining Company  
 BLM - Bureau Of Land Management  
 DEQ - Idaho Division Of Environmental Quality  
 EPA - Environmental Protection Agency  
 Hecla - Hecla Mining Company  
 MOA - Mine Owners Association  
 SC - Shoshone County  
 SORE - Save Our River Environment  
 SVNRT - Silver Valley Natural Resource Trust  
 UPG - Upstream Mining Group  
 USFS - U.S. Forest Service





**LEGEND**

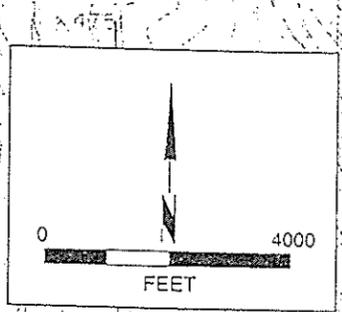
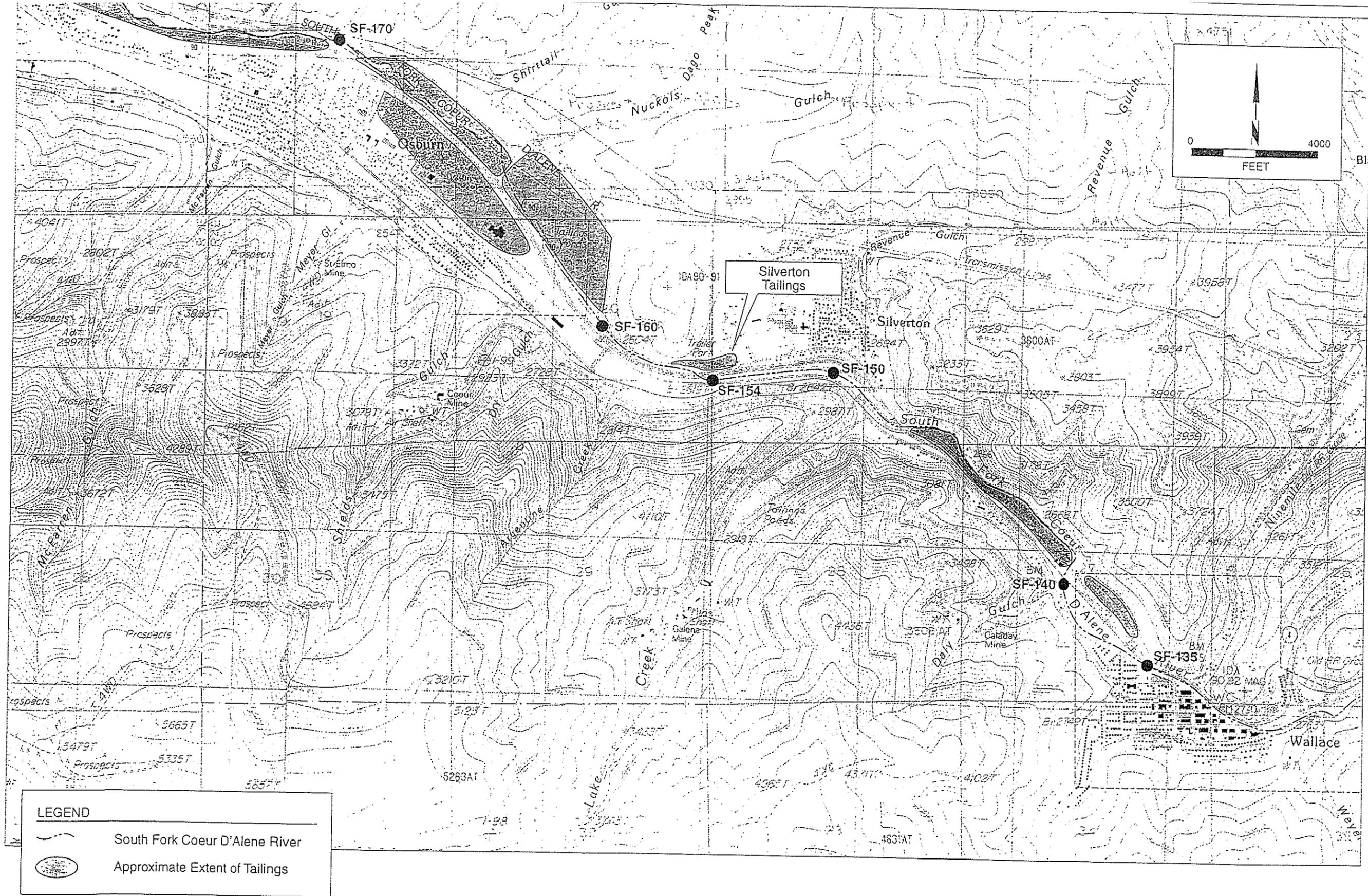
-  South Fork Coeur D'Alene River
-  Approximate Extent of Tailings

Source: USGS 7.5 minute quads. Contour interval 40 feet.

PROJECT NO. 963 1416.700 DRAWING NO. 76888 DATE 6/3/98 DRAWN BY TK

**FIGURE 1**  
**SITE PLAN**  
 SVNRTF/OSBURN RESPONSE/ID

Golder Associates



**LEGEND**

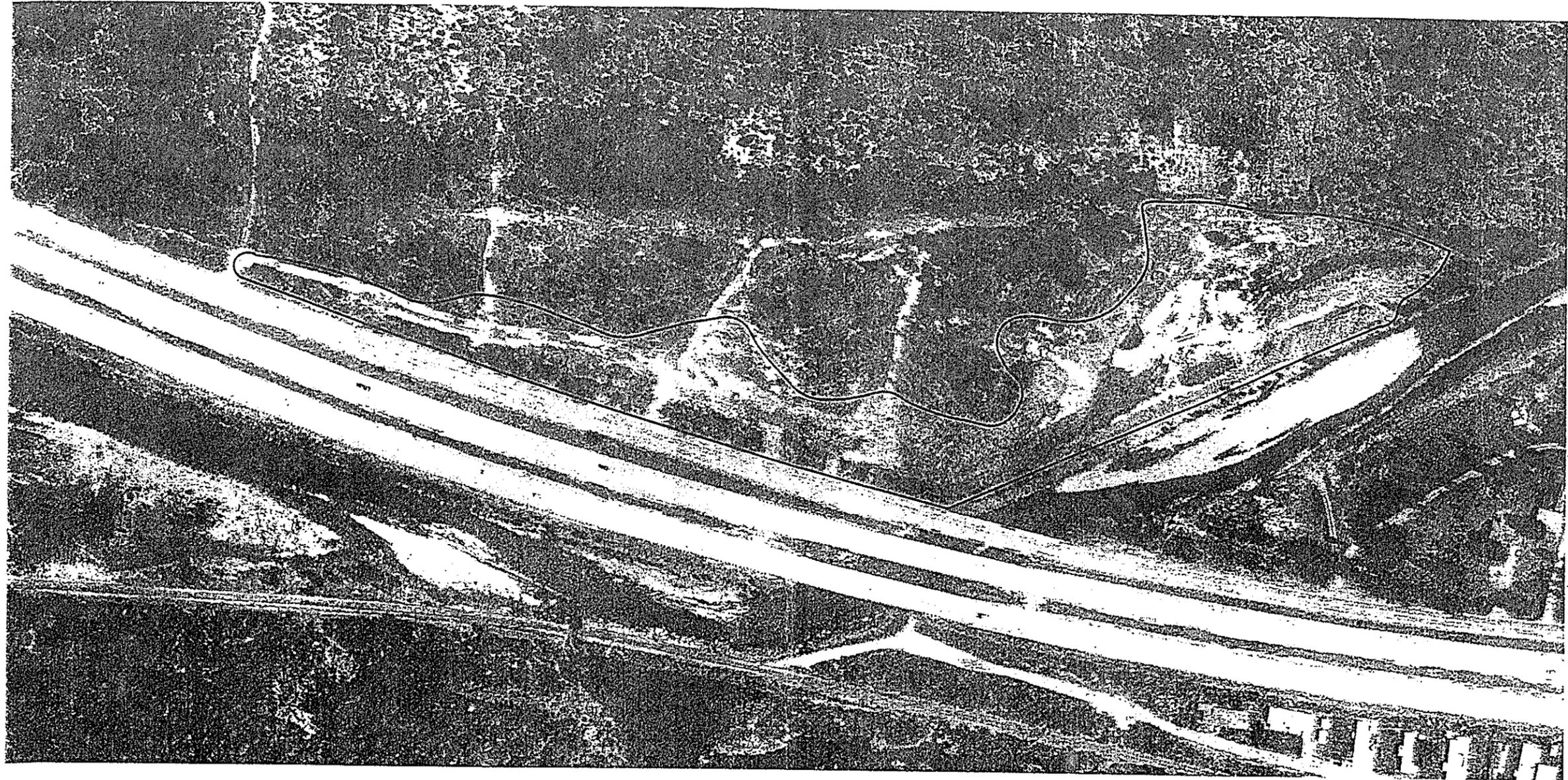
- South Fork Coeur D'Alene River
- Approximate Extent of Tailings

Source: USGS 7.5 minute quads. Contour interval 40 feet.

PROJECT NO. 963 1416.700 DRAWING NO. 76889 DATE 6/1/98 DRAWN BY TK

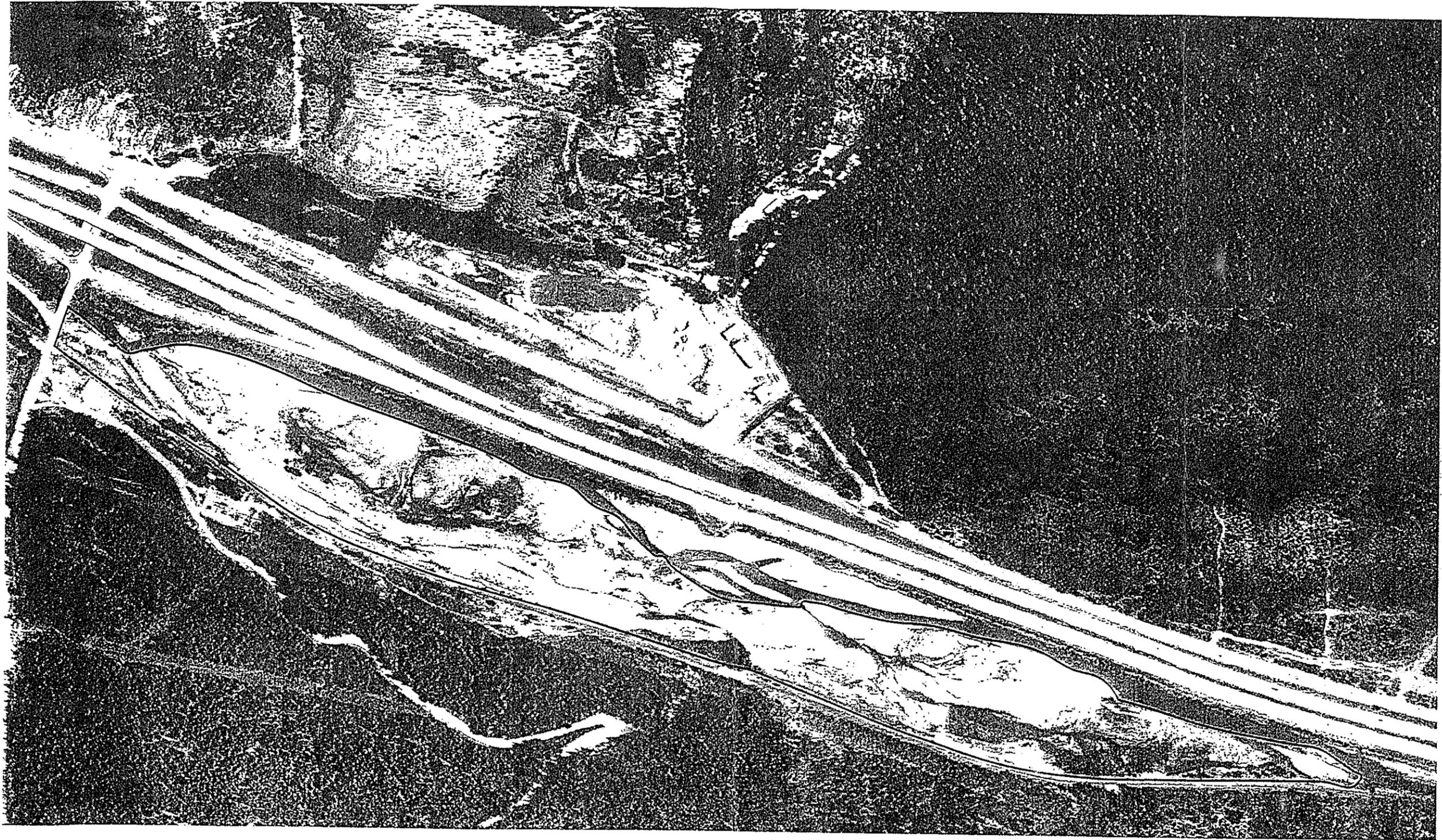
**FIGURE 2**  
**SITE MAP**  
 SVNRTF/OSBURN RESPONSE/ID

Golder Associates



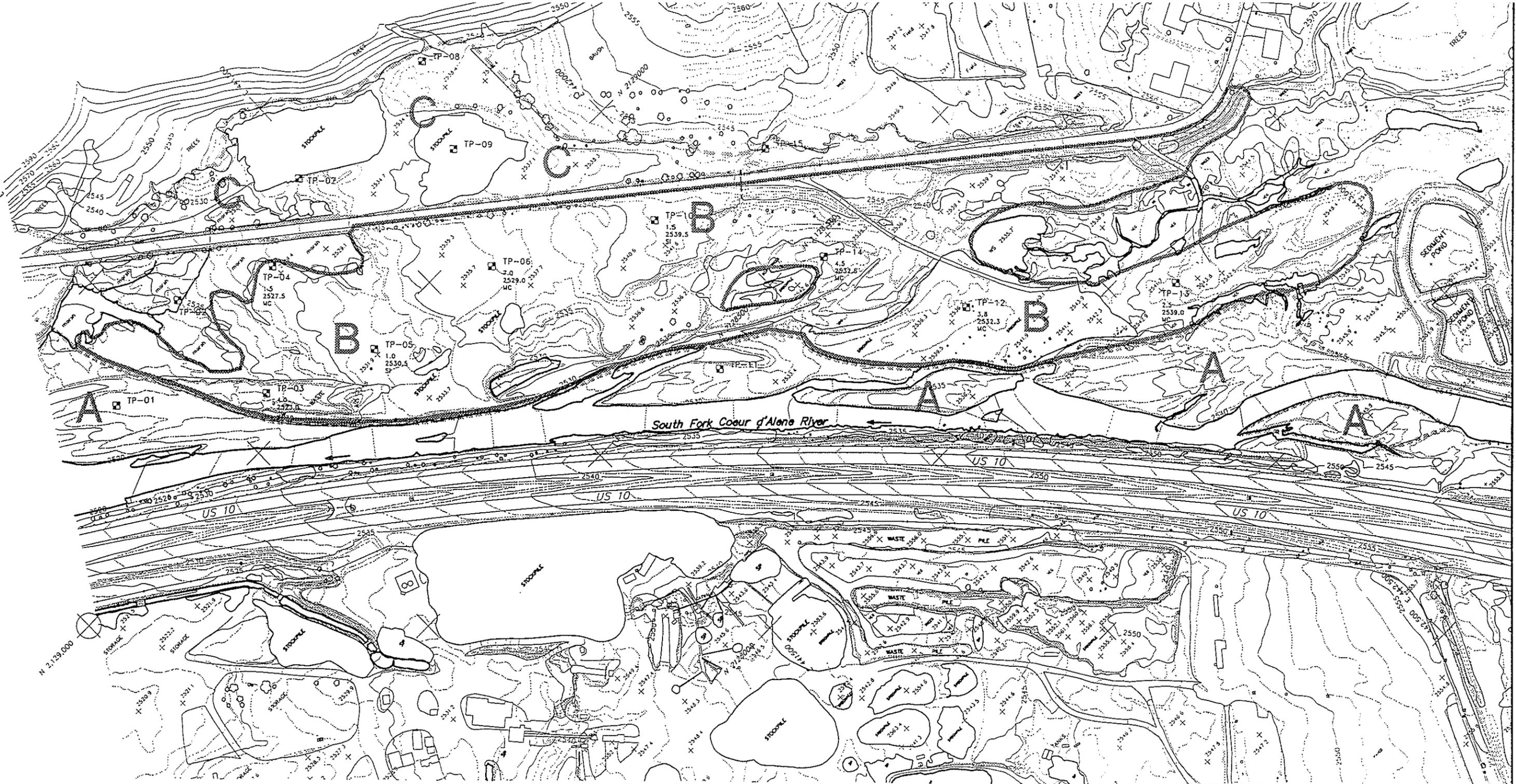
SCALE: 1 inch = 199 feet

FIGURE 3  
OSBURN RESPONSE  
EVOLUTION TAILINGS  
SVNRT/OSBURN RESPONSE/ID

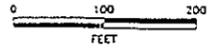


SCALE: 1 inch = 389 feet

FIGURE 4  
OSBURN RESPONSE  
BIG CREEK FLATS TAILINGS  
SVNRT/OSBURN RESPONSE/ID



LEGEND:  
 TESTPT NUMBER AND LOCATION  
 TP-10  
 1.5 — DEPTH OF SOIL TO BE REMOVED (FEET)  
 2539.5 — ELEVATION AFTER REMOVAL (FEET A.M.S.L.)  
 SI — BASIS FOR DEPTH:  
 GW = GROUNDWATER  
 MC = MATERIAL COLOR CHANGE  
 SI = SILT LAYER

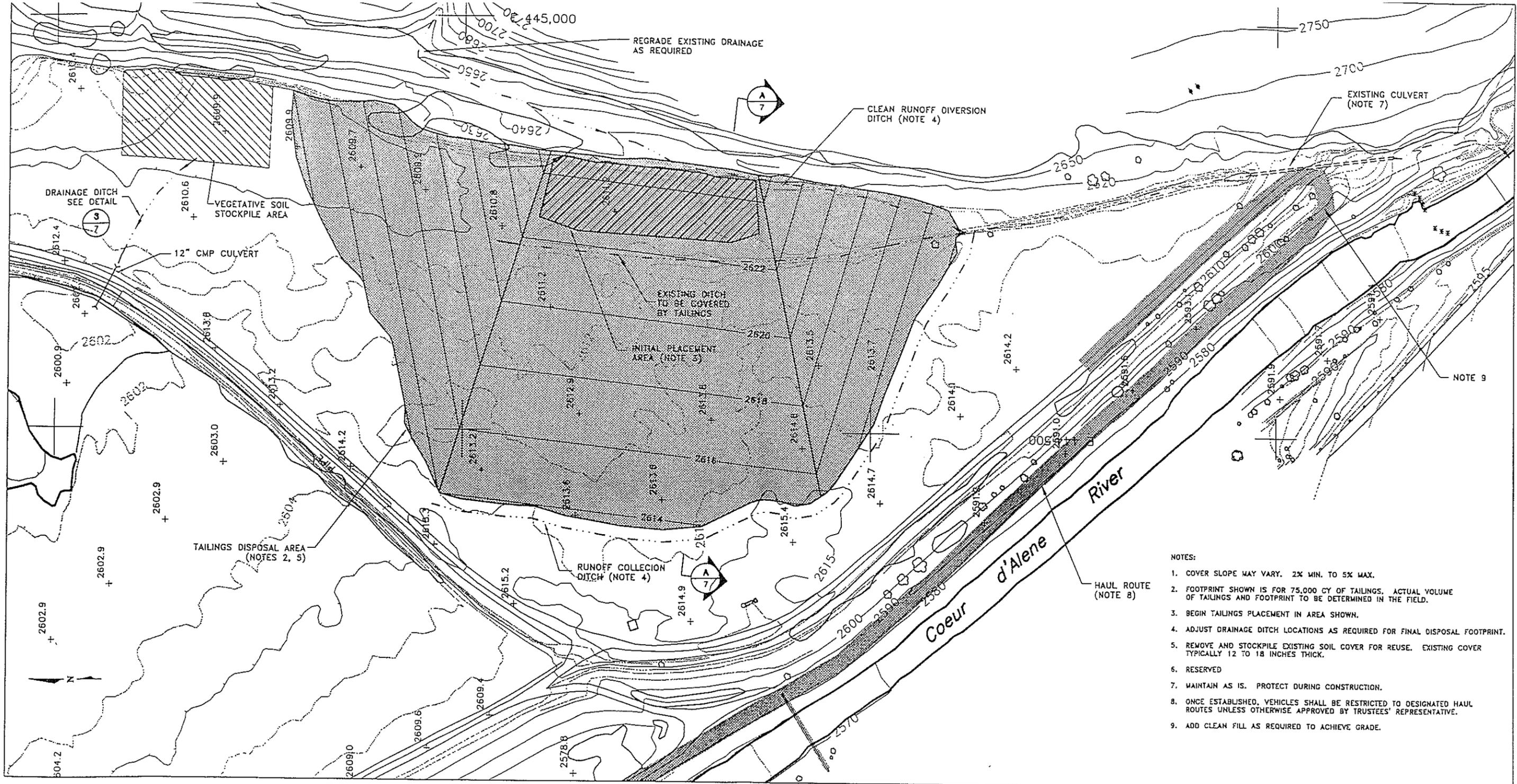


**Golder Associates**

SCALE: SEE DWG.	PROJECT NO.: 263-1416	TASK NO.: 400
DES BY: SJS	PROJECT: SVNRT/OSBURN TAILINGS/ID	
DR BY: DJH	REPORT:	
CHK BY: FSS	SHEET TITLE: <b>TAILINGS REMOVAL</b>	
RYW BY: FSS	SHEET: <u>  </u> OF <u>  </u>	
<b>SILVER VALLEY TRUSTEES</b>		DRAWING NO. REV.
		1 0

REV.	DATE	DESCRIPTION	DR BY	RYW BY

C:\SOSKPRO\A\55\9631416\400\71141 5-27-97 11:24 ari: NONE



- NOTES:
1. COVER SLOPE MAY VARY. 2% MIN. TO 5% MAX.
  2. FOOTPRINT SHOWN IS FOR 75,000 CY OF TAILINGS, ACTUAL VOLUME OF TAILINGS AND FOOTPRINT TO BE DETERMINED IN THE FIELD.
  3. BEGIN TAILINGS PLACEMENT IN AREA SHOWN.
  4. ADJUST DRAINAGE DITCH LOCATIONS AS REQUIRED FOR FINAL DISPOSAL FOOTPRINT.
  5. REMOVE AND STOCKPILE EXISTING SOIL COVER FOR REUSE. EXISTING COVER TYPICALLY 12 TO 18 INCHES THICK.
  6. RESERVED
  7. MAINTAIN AS IS. PROTECT DURING CONSTRUCTION.
  8. ONCE ESTABLISHED, VEHICLES SHALL BE RESTRICTED TO DESIGNATED HAUL ROUTES UNLESS OTHERWISE APPROVED BY TRUSTEES' REPRESENTATIVE.
  9. ADD CLEAN FILL AS REQUIRED TO ACHIEVE GRADE.



REV.	DATE	DESCRIPTION	DR BY	CHK BY
0	9/1/97	ISSUED FOR BID	SJS	FSS

**Golder Associates**

SCALE: AS SHOWN	PROJECT NO.: 1000-10000	TASK NO.: 1000
DES BY: SJS	PROJECT: SYNRT/OSBURN TAILINGS/10	
DR BY: SJS	REPORT:	
CHK BY: FSS	SHEET TITLE:	
XYW BY: FSS	<b>TAILINGS DISPOSAL AREA</b>	
<b>SILVER VALLEY TRUSTEES</b>		
SHEET: 6 OF 6		REV.:
DRAWING NO. 6		0

D:\JOLMER | CA\2525K760\DATA\851116\250\627280.DWG | 7-21-97 9:01 | wfi, NONE

