

**DRAFT CLOSURE REPORT
ON**

NINE MILE CREEK REMOVAL ACTION 1994 - 1997

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 OF MINE TAILINGS IN NINE MILE AND EAST FORK NINE MILE
CREEK WALLACE, IDAHO

Submitted by:

Silver Valley Natural Resource Trustees
Kellogg, Idaho

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NINE MILE CREEK REMOVAL ACTION 1994 - 1997

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 OF MINE TAILINGS IN NINE MILE AND THE EAST FORK NINE MILE CREEK WALLACE, IDAHO

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NINE MILE CREEK REMOVAL ACTION 1994 - 1997

SECTION 1 - EXECUTIVE SUMMARY

A voluntary and cooperative, jointly sponsored group of projects planned and completed in order to reduce non point source loading of trace metals to the South Fork Coeur d'Alene River from historic depositions of mine tailings in Nine Mile and East Fork Nine Mile Creek at Wallace Idaho. Contaminated sediments from the floodplain immediate to the creek were excavated along five miles, and placed in a repository near the confluence of the West Fork and Nine Mile Creek beginning in summer 1994. Separate projects were conducted under the work plan and CERCLA authorities. Total cost for all sponsors was \$642,145 including removals of 95,000 cy materials and required stream and floodplain stabilization work.

PRIMARY DOCUMENTS:

"Action Memorandum for the Ninemile Creek Emergency Removals." Signed by the Coeur d'Alene Basin Restoration Project Steering Committee: Gwen Burr of Idaho Division of Environmental Quality, Henry Si John of the Coeur d'Alene Tribe and Lynn McKee of the US EPA. Signed July 13, 1994.

"Approval Letter for 1994 Ninemile Creek Drainage Removal Actions"
US EPA.

"Work Plan for 1994 Ninemile Drainage Projects." McCulley, Frick & Gilman, Inc. for the Silver Valley Natural Resource Trustees.

"Construction Documents for Nine Mile Creek Removal Action Project." Silver Valley Natural Resource Trustees. Contractor Billing Worksheets, Daily Construction Reports, QA/QC, Consultant Reports and Team Meeting Reports. 1994-1997

PROJECTS GOALS:

This source control project was consistent with the Silver Valley Natural Resource Trustees general Remedial Action Objective:

"Restoration, to the maximum practicable extent, of water quality and aquatic habitat in the Coeur d'Alene river basin through limitation of the transport of dissolved and solid phase metallic contaminants originating from mining –related sources to and within the South Fork of the Coeur d'Alene River and its tributaries."

Historic mining practices initiated in 1886, brought about the chronic deterioration of water quality in the South Fork Coeur d'Alene River. The tributaries of

East Fork Nine Mile Creek/Nine Mile Creek were known to contribute a total metals load during high flow of 522 lbs./day and during low flow 98 lbs./day. Riparian habitat was heavily damaged over five miles of drainage.

The projects anticipated improving water quality and habitat for fish and wildlife. Removals of high concentrations of lead and zinc from the floodplain in the Ninemile drainage would accelerate natural recovery and reduce the amount of zinc and lead entering Coeur d'Alene Lake.

The projects promoted voluntary participation and full opportunity for all agency and stakeholders to learn and experience the realities of source control in a drainage heavily impacted by historic mining practices and closed sites.

Through cooperative and participation in planning, the projects sought to minimize transaction costs and consultant time. The projects were envisioned to be "pilot" projects clarifying the future course.

SPONSORSHIP:

In the early planning and development of an overall cleanup plan for the Coeur d'Alene Basin, a consensus was reached that remediation should start at the headwaters of the South Fork Coeur d'Alene. In 1993 independent projects were undertaken in the Ninemile Creek Drainage by Hecla Mining Company and US EPA.

In late 1993 and 1994 rough conceptual plans for remediation projects removing mine tailings from the banks and floodplain were agreed to. The cooperative planning effort drew participation from the following stakeholders:

- Coeur d'Alene Basin Restoration Project
- Coeur d'Alene Tribe
- Idaho Division of Environmental Quality
- Hecla Mining Company
- US Department of Interior - Bureau of Land Management
- US Environmental Protection Agency
- Silver Valley Natural Resource Trustees

3.8 miles of the drainage, twelve acres, were divided into three areas with three separate sponsors.

DEQ hired a local contractor to work in the East Fork of Ninemile Creek at the area formerly known as Sunset down to the Dobson Pass Road.

Hecla Mining did removals in the "flats" from the Dobson Pass Road to the confluence of the East Fork and West Fork of Ninemile Creek. Hecla Mining accepted

transfer of ownership of the Day Rock tailings impoundment which would serve as repository for the removed waste.

Silver Valley Natural Resource Trustees performed removals from the confluence downstream to the miners cemetery. The Trustees provided construction supervision of the repository development and closure.

The need for stream reconstruction and floodplain stabilization became apparent during the work on East Fork Ninemile and was added to the scope of work. The SVNRT assumed these costs and managed this restoration work.

PROJECT ACCOMPLISHMENTS:

Over two seasons, beginning in July 1994, 95,000 cubic yards of tailings and contaminated floodplain soils were removed from the floodplain and reposed at the Day Rock Impoundment. This represents 3,175,000 lbs of Lead and 242,160 lbs of Zinc. The Day Rock Facility was closed in fall 1997.

The total cost of the projects was \$642,145 for the construction phase (all sponsors/all costs). The SVNRT had estimated \$510,000 for its share of the effort, and actually spent \$384,896. Hecla Mining Company has assumed long term O & M responsibility by accepting ownership for the repository site. As part of the basin TMDL effort, the Idaho Division of Environmental Quality is doing ongoing monitoring of the water quality in the Nine Mile Creek drainage.

Public Participation and Acceptance of the Project

This was the first significant remedial effort outside of the Bunker Hill Superfund Site "Box", impacting numerous properties and using public roads for transportation.

Most landowners signed voluntary access forms and general interest in the actions developed during the projects duration. A public meeting and distribution of a "fact sheet" along with the placement of materials in the Wallace Public Library at the beginning of the project, while necessary, did not fit the time table of public interest. Local knowledge of the five mines and numerous mills and loading areas was considerable but not offered by the former employees and older residents until the projects were underway.

Preliminary Project Effectiveness

While preliminary post-project water quality monitoring showed initial signs of a trend toward improved water quality, two mill sites within the upper drainage, the Success and the Interstate will need specific source control remedial actions before beneficial uses return to the drainage.

NINE MILE CREEK REMOVAL ACTION 1994 - 1997

SECTION 2 - INTRODUCTION

Beginning in 1991, several government agencies, entities and landowners were engaged in developing an overall cleanup plan for the Coeur d'Alene Basin. Data collected for the RIFS and ROD efforts at the Bunker Hill Superfund Site lead to a greater understanding of the contribution from historic mining activities on the South Fork Coeur d'Alene River and the tributaries in the headwaters east of Elizabeth Park.

The Coeur d'Alene Basin Restoration Project provided leadership in developing the "Framework" for basin wide activities. During 1991 and 1992, the first upstream water sampling was initiated by the Silver Valley Natural Resource Trustees using consultant McCulley, Frick and Gilman. The Silver Valley Natural Resource Trust Fund was established in 1986. A \$4.5 million dollar natural resource damage claim was settled between the State of Idaho and several mining companies operating in the Silver Valley. In 1993, the Trustees completed an inventory of sites impacted by historic mining in the Silver Valley. The Trustee Action Plan was approved which gave priority to areas with the largest metals contributions and specifically tailings removals from the stream corridors and floodplain. In 1993, the EPA conducted an Emergency Time Critical Removal at the Success Mill site in EFNM, and Hecla Mining Company relocated tailings at the Interstate/Callahan mill site.

Many stakeholders were interested in pursuing early removal actions as a learning experience on developing constructive and cooperative working relationships between agencies, to better understand the disturbance and benefits of such a remedial activity, and to begin training local contractors in remedial work.

Historic mining activities in the drainage were considerable. Ninemile Gulch had five mine sites located within its drainage area. The mine sites are in upstream order: the California and the Monarch in Blackcloud Creek; the Dayrock, Success, Rex Tamarack and the Interstate Callahan in Ninemile creek. These mines produced approximately 3.75 million tons of ore with a projected waste of 3 million tons of tailings, much of which was directly discharged to the creeks.

Concentrations of lead and zinc in soil and tailings near Ninemile Creek are extremely high. The concentrations range from 180 parts per million to 101,044 ppm lead. For zinc the range was between 864 ppm to 56,175 ppm. The water moving through the tailings transports dissolved and solid phase metallic contaminants into the surface water and groundwater.

The goals of the projects were to improve water quality and habitat in order to begin the process to restore the beneficial uses to the Ninemile Creek drainage and to reduce the amount of zinc and lead entering Coeur d'Alene Lake from the South Fork mining district through source control.

A second goal related to process, using the Good Samaritan provisions of CERCLA, and a cooperative and open planning process, the sponsors sought to address issues of liability and avoid permit delays and excessive transaction costs.

The site was divided into three sections with different sponsors funding and managing each section. Not foreseen, after three weeks, in August 1994, the SVNRT assumed contract administration for DEQ as well as their own project area.

NINE MILE CREEK REMOVAL ACTION 1994 - 1997

SECTION 3 - HISTORY OF THE SITE

The history of mining activities causing impacts in the Ninemile drainage had specific implications for removal activities.

The earliest mining claims were filed in 1884. By 1886, the Granite Mine (later named the Success) was tramming ore over the hill to a mill in Canyon Creek. Although the route for a railroad was surveyed in 1888, the rail was not in place to Sunset on EFNM until 1902. A picture of the Rex Mill at Sunset (Bradyville) in 1906 shows the end of the Ninemile Canyon track. The Rex Mill was connected to its mine, the Rex, by aerial tram.

The movement of ore out of the valley did not wait for the railroad. By 1890, 32 tons/day was moved by sleds into Wallace. EFNM canyon was narrow and dominated by cedar swamps. To move supplies to the upstream mines and sled the ore down, a "corduroy road" was developed on the SE canyon edge. This road was constructed using hillside soils and large squared off timbers placed tightly across the road. ("so the horses had something to grab onto and the wheels did not get caught in ditches") During initial removals in EFNM the contractor uncovered remnants of a large barn and two black smith sheds. Teams of four horses were used and this mode of transportation continued for more than a decade. Later the County surfaced this road, the evidence of the original road can be seen in midcanyon. The implications for the removal was that the road predated the release of wastes which were focused through a "launder" onto the opposing slopes and wetland open areas. The Railroad did not compete on this narrow valley floor but developed on a high bench with trestle crossing at the rock outcropping approaching Sunset.

Waters from the Headwaters was flumed off for upstream operations, and it is reported that the creek was dry most of the year. During Spring runoff, the drainage was a "fury" water from one side to the other moving everything. "We got a lot more snow back then." Early operations counted on the Spring wash to move waste materials clear of their operations onto the flats below. Dammed and flumed water was directed to the creek for the maximum effect.

The earliest milling operations were inefficient and both "jig tailings" and deep pockets of gray and black materials were removed in EFNM and at the Dobson Pass Road flats. A small secondary mill was established on a "corduroy" foundation in the mid canyon open area below the Rex. This was a primitive concentrator which included a thickener and other equipment. The remnants of the building were removed from the site on 9/24/94.

Former local workers and senior residents noted that for years everything was put in the creek, "tailings, slimes, arsenic, garbage, sewage, the poor old creek was hardly moving at all, just a slow moving sludge." "I hated to see the launder put in and all the

tailings dumped onto the cedar swamps." " The cedars died, smothered, and then the locals cut them down and used the wood." The implications for the removal team was that the original creek bed filled immediately and "the creek was bumped over and around, made her way through."

The Ninemile Tailing removal plan had not anticipated stream bed removals and subsequent reconstruction. But in fact, the older pre-mining channel below the elevation of the existing channel was filled with jig tailings and emitted groundwater with a low pH. The extensive removals left the valley floor with near total disturbance and destroyed any habitat and stability that had been gained over 6 decades.(Appendix A to Workplan).

A second small recovery mill was operated by Small near the Dobson Pass Road.

Beyond the historic sites where operations occurred, other human impacts caused traps for wastes which have been held over time. According to locals there are at least two historic dam sites, one at Blackcloud and the second near the cemetery where materials would have been dredged out annually and eventually covered over. Historic culverts, abutments and smaller dam remnants also trapped materials. The present Dobson Pass Culvert was originally the location of the railroad bridge and materials on the downstream side were stockpiled from the Rex mill for use by the County road department.

These removal actions along three miles of creek follow earlier erosion control measures at the Success and Interstate sites. It is comparable to peeling off the obvious layers, knowing full well that the loading to the surface water is impacted as well by these less obvious and buried historic features.

NINE MILE CREEK REMOVAL ACTION 1994 - 1997

SECTION 4 - PROJECT EXECUTION

Development of a repository and three project areas were defined by sponsors and the work group developing the work plan. Removal of waste material, and vegetative stabilization was anticipated, impacting twelve acres and three and eight/ten miles of creek. Closure of the repository would complete the work.

The "work group" first convened on February 4, 1994. All documents were developed as a cooperative effort by;

Idaho State Department of Environmental Quality
Idaho State Natural Resource Damage Trustees
Hecla Mining Company
The United States Department of Interior-Bureau of Land Management
Coeur d'Alene Tribe
Coeur d'Alene Basin Restoration Project

The work group continued to assemble through the project duration. US EPA assigned an "On Site Coordinator."

The draft work plan was submitted for the Remedial Design Review Committee of the Coeur d'Alene Basin Restoration Project on May 3, 1994 and issues were identified and considered, including 1) the impermeability of the repository cap as planned, 2) the need for state of the art monitoring in-stream below the repository, and 3) the placement of topsoil in areas where the topsoil layer would be broken. Completed areas would be left in such a manner as to discourage access for recreation use.

An MOA was signed by the principles of the Coeur d'Alene Basin Restoration Project defining the project as a Time Critical Removal under CERCLA in July 1994.

A voluntary BMP audit was held on August 30, 1994. by the "How Clean is Clean" work group of the Coeur d'Alene Basin Restoration Project.

4.1 Transfer of Property for Repository and Preparation of the Repository Area

The repository area is the pre existing tailings impoundment constructed in the late 1960's for the Dayrock Mill. Hecla Mining Company accepted transfer of approximately 2.4 acres from the owner.

Hecla Mining Company retained McCulley Frick and Gilman to evaluate the stability of the impoundment prior to the transfer of property. It was determined that no additional preparation to the surface would be necessary since the surface of the tailings is firm. Additional space to the hillside east of the pond was stripped of topsoil. About 200 feet of access road was widened and upgraded for haul trucks. Drainage on the north

end of the pond was improved with the construction of a diversion ditch to capture any surface flow, preventing water from entering the disposal area.

4.2 Excavation -Removal of Waste Material

The project was divided into three areas of the floodplain for the purpose of sponsorship, contracting and management.

Excavation in all areas was accomplished by a hydraulic excavator and loaded into trucks for transfer to the repository. The removal "line" was an organic layer of native materials underlying the accumulated wastes. Determination was made by the operator and the project sponsors' personnel on the site. The following guidance was developed through the experience.

1. Color change in the sediment is observed. The reddish brown color of tailings were deposited on native soils either by flume or river action.
2. A natural silt or organic soils is observed to be different from milled products. "jigs" Organic soils layer is indicated by roots, black organic decomposed materials, twigs, etc and clearly distinguished from sharp edged milled materials. In some areas, historic reworking of the materials by the stream or human action (subsequent milling) disturbed the pre-mining silt and organic layers.

Best Management Practices were applied to the site. These guidelines were written by Idaho Division of Environmental Quality and included provisions for water and sediment control during construction, monitoring of construction impacts during and post project, provision for Health and Safety compliance for workers.

The Bureau of Land Management staff attempted on-site verification in two areas on East Fork Nine Mile Creek.

4.3 Three Project Areas Defined and Completed

4.3.1 DOBSON PASS ROAD TO DAYROCK MILL SITE

In July, 1994 Hecla Mining Company retained Zanetti Brothers as their contractor to prepare access to the repository and begin removals in this reach. Best Management Practices included development of a downstream trap, silt fence and operator discipline. The removals in this reach totaled 11,500 cy at a cost of \$39,968.

4.3.2 LOWER EAST FORK NINEMILE - FROM SUNSET TO DOBSON ROAD CULVERT

The Division of Environmental Quality retained RDS of Cataldo and work began in September, 1994. Funding included Federal Clean Water 319 Grants from Region X for \$84,300 and Region VI for \$75,000. Match was provided by Hecla Mining Company for \$4,000 and Idaho Trust Fund for \$10,000. Nearly all September activity occurred upstream between Sunset and the Outcropping. October activities occurred from the rock outcropping into the "flat", a former mill site and large area of flumed materials. Lower EFNMs removals were concluded in fall 1995.

Total waste removal was 38,555 cy at a cost of \$204,000. During early excavation, it became clear that the plan would need to be revised to include considerable floodplain stabilization and stream re-construction. This had not been anticipated. Contributions of rock and timber from Hecla and BLM properties are estimated at \$30,000. DEQ was without funds to complete this work and the Trust committed \$45,900 for the work.

4.3.3 NINEMILE CREEK FLOODPLAIN - BLACKCLOUD TO McCARTHY

The Idaho Natural Resource Trust Fund (Silver Valley Natural Resource Trustees) retained ERI of Smeltonville to remove materials from the wetland and a wetland at Blackcloud. Winter actions at the Blackcloud site in January 1995. Stream stabilization activities followed closely the removals in 1995. Flooding events in 1996 and 1997 slowed need for fine tuning some structure efforts.

Total Tailings removals from this area was 44,000 cy at a cost of \$180,000.

4.4 Cap Construction and repository closure.

The material taken to the repository was placed in three foot lifts. Drainage was considered in a seasonal closure plan allowing the site to remain open through inclement weather.

The waste materials were capped with at least one foot of growth medium and seeded with an appropriate seed mixture. The growth medium was farmed from the adjacent hillside and consisted of soils and subsoil that are capable of sustaining vegetation. Water management included a natural crown to the layout and additional drainage ditches. The property was hydroseeded and organic debris was dispersed over the surface to vegetate the area and discourage recreation disturbance.

The closure was complete in December 1997.

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SECTION 5 - PROJECT MILESTONES: VARIATION FROM INITIAL SCOPE

Deeper excavations were encountered and pre-mining channels uncovered requiring stream construction after removals.

The assumptions of the Technical Work Team during project scoping was that this steep (6-8% gradient) stream reach had cut through the deposited tailings into a stable channel at an elevation lower than the adjacent tailings. This assumption was proven incorrect during excavation in EFNM in fall of 1994. Excavation uncovered a pre-mining channel which was 2-4 feet lower in elevation than the existing channel and had been filled with tailings late in the last century. Water with a low pH was seen seeping from this buried stream channel. In some areas the existing channel was perched several feet atop tailings which the project targeted for removal. Any high water event post removals were almost certainly shift the flow to the lowest points with potential mass erosion and downstream sedimentation.

The Technical Team was called to review the problem and look at alternatives. One option would have been to fill the original channel with rock. The alternative preferred was to place the stream back into its pre-mining course and stabilize that effort with a series of rock and log structures. The Trustees accepted the cost and design for this project addition.

Deeper removals and alignment of the Stream into its earlier channel drove additional changes in the Best Management Practices during removals.

NINE MILE CREEK REMOVAL ACTION 1994 - 1997

SECTION 6 – SUMMARY OF COSTS (thru 4-30-00)

Remedial Design through 4-30-94

Remedial Action /Construction Management after 5-1-94

6a.	Nine Mile and East Fork Nine Mile Creek SV19ML-01- Funding SVNRT		
	Remedial Design	\$	16,761
	Remedial Action	\$	273,810
	Construction Management	\$	96,325
	TOTALS	\$	386,896

NON MATCH

Other Sponsor's Contributions

a.	Day Rock Fishing Pond SV19ML-06 Funding Source Federal IF&G Match also from BLM		
	Remedial Action	\$	70,560
	Construction Management(SVNRT)	\$	4,721
b.	Dobson Pass "Flats" and Day Rock Repository Funding Source Hecla Mining Company	\$	55,000
c.	East Fork NineMile Removals Only Funding Source DEQ/EPA InKind and Materials : Hecla and BLM Construction Management (SVNRT)	\$	277,000

NINEMILE CREEK COST SUMMARY

Prepared by Marti Calabretta

Cost for site administration include field supervision, independent audit function, Geotechnical and Stability Analysis and design of Dayrock Repository, sampling and consultant billed to Trustees

1*. DEQ -EFNM

Total cy tails:	38,553.5 cy	\$ 204,334.
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2. TRUSTEES EFNM & Dobson

Channel Stabilization Work		
Time /Materials =		\$38,333.

3. HECLA MINING COMPANY Dobson Flats to Day Rock

Total cy tails:	11,500 cy	\$39,968.
Repository O&M		14,000 (credit)

4. TRUSTEES NINEMILE REMOVAL

Total cy tails	44,000 cy	\$180,000
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5. TRUSTEES PROJECT MANAGEMENT SERVICES

Field Supervisor	\$ 38,000.
Audit	1,519
Consultant/ Pommerening	3,928.
Consultant /Environmental	
MFG	55,529.
Supplies	1,251.

Total Management	\$66,027
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PROJECT TOTALS	\$542,662
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*Not Trust Funds

Federal Dollars: \$267,550

Hecla Mining Company \$53,968 includes \$14,000 in-kind O&M

NINE MILE CREEK REMOVAL ACTION 1994 - 1997

SECTION 7 - DIFFICULTIES ENCOUNTERED

7.1 The CERCLA process moved expeditiously over 6 months of meetings. A community public hearing was held and information flyers distributed. This was the first remedial action of its type in the east valley along the South Fork Coeur d'Alene River. The residents of the drainage were skeptical of using their "tax" money for this purpose. As a voluntary action, the sponsors gained access to most properties along the drainage. *Two property owners did not agree to activities and these sections were not addressed.

7.2 Removal scope was never envisioned to include the entire floodplain. Two areas, the Dobson Road flats and McCarthy flats were not addressed at breadth but stopped at twenty five feet from the centerline of the creek as the decision of the planning team.. The Blackcloud "wetlands" proved to be the dump for the working mill. This approximate 3 acres was not removed to depth. The historic railroad right of way was not removed.

7.3 The contracts were granted to small local firms at a very competitive price. It was given that they had mixed level of experience. The haul used a county road with active use. There was much curiosity. Project management on site was critical.

7.4 The decision to use on site materials (timber and rock) challenged the project manager and production control staff to count and record accurately without the benefit of scales.

7.5 The disturbance of removing material can be likened to surgery and the flushing effect of the subsequent runoffs distort the water quality data of that period used for other planning.

NINE MILE CREEK REMOVAL ACTION 1994 - 1997

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. As, well the initial problems indicated the need for a consistent management presence at the site.

8.1 Beginning with Hecla Mining Company at the Dobson Flats section, the sponsor had a field representative present at all times that equipment was working in order to 1) Confirm the count, loads, T&M and others, 2) respond to public, 3) be available for contractor direction. The Trust provided the controls implementing the DEQ project as well as its own. Thus, it is recommended that future projects continue to have project sponsor presence at all times work is in progress.

8.2 Costs for creek reconstruction and floodplain stabilization were underprojected and thus the recommendation that stabilization requirements will be better evaluated and included in future bids, ie. for the Canyon Creek contracts.

8.3 Cooperative planning with joint sponsorship and funding helps relieve delays and consultant costs. The team met through the project duration as needed to understand and give direction. Thus, to minimize second guessing and have the maximum shared learning experience, regularly scheduled management team meetings are recommended, even when separate parties are doing non-related activities.

8.4 The very nature of this small Time Critical Project executed by local contractors and with the goal of acting as a pilot and training exercise for future actions was conducive to insuring the best bang for the buck . All contractors worked cooperatively. Sponsors shared resources. The project did grant local experience and visibility to three local contractors preparing all involved for the next planning and bid activities in Canyon Creek. It is recommended that projects and bid packets continue to encourage local contractors and the development of additional experienced operators.

8.5 Informal recreation patterns were disrupted. The decision was made to discourage people from activities in certain areas using rough surfaces and berms, and to encourage recreation in at least one area capped. DEQ capped, hydroseeded and planted the area near the Day Rock Fish Pond. It is recommended that projects of this scope through communities consider recreation opportunities and attempt to find funding for enhancements. This was accomplished in the subsequent reconstruction of the fish pond using a grant from Idaho Fish and Game .

- 8.6 Long term O & M responsibilities were accepted by Hecla Mining Company for the repository. The additional costs associated with acquisition, site development and O & M were avoided. Thus it is recommended that a landowner be encouraged to accept responsibility for these items rather than relying on a public entity, (state, county) to perform this activity. The owner also has a vested interest in quality control
- 8.7 Disruption of the soils and construction activities impact surface water quality monitoring for five years. Therefore any data used from sampling during this period should be interpreted in evaluating the need for additional actions. It is recommended that the EPA RIFS process add this reality in an interpretation of the water quality data.
- 8.8 Continued monitoring by Idaho DEQ is recommended to determine project effectiveness over a decade.

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SECTION 9 - INDEX OF DOCUMENTS OF SITE

Coeur d' Alene Basin Restoration Project. May, 1994. Draft Memorandum for a Removal Action at the Ninemile Creek Projects, Wallace, Shoshone County, Idaho.

Coeur d' Alene Basin Restoration Project. June, 1994. Draft Memorandum for a Removal Action at the Ninemile Creek Projects, Wallace, Shoshone County, Idaho.

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IDHW-DEQ. 1994. Extracted Removal Work Plan for 1994 Ninemile Drainage Projects for Soil Placement and Revegetation Contractors.

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US EPA. 1994. Approval Letter for 1994 Ninemile Creek Drainage Removal Actions.

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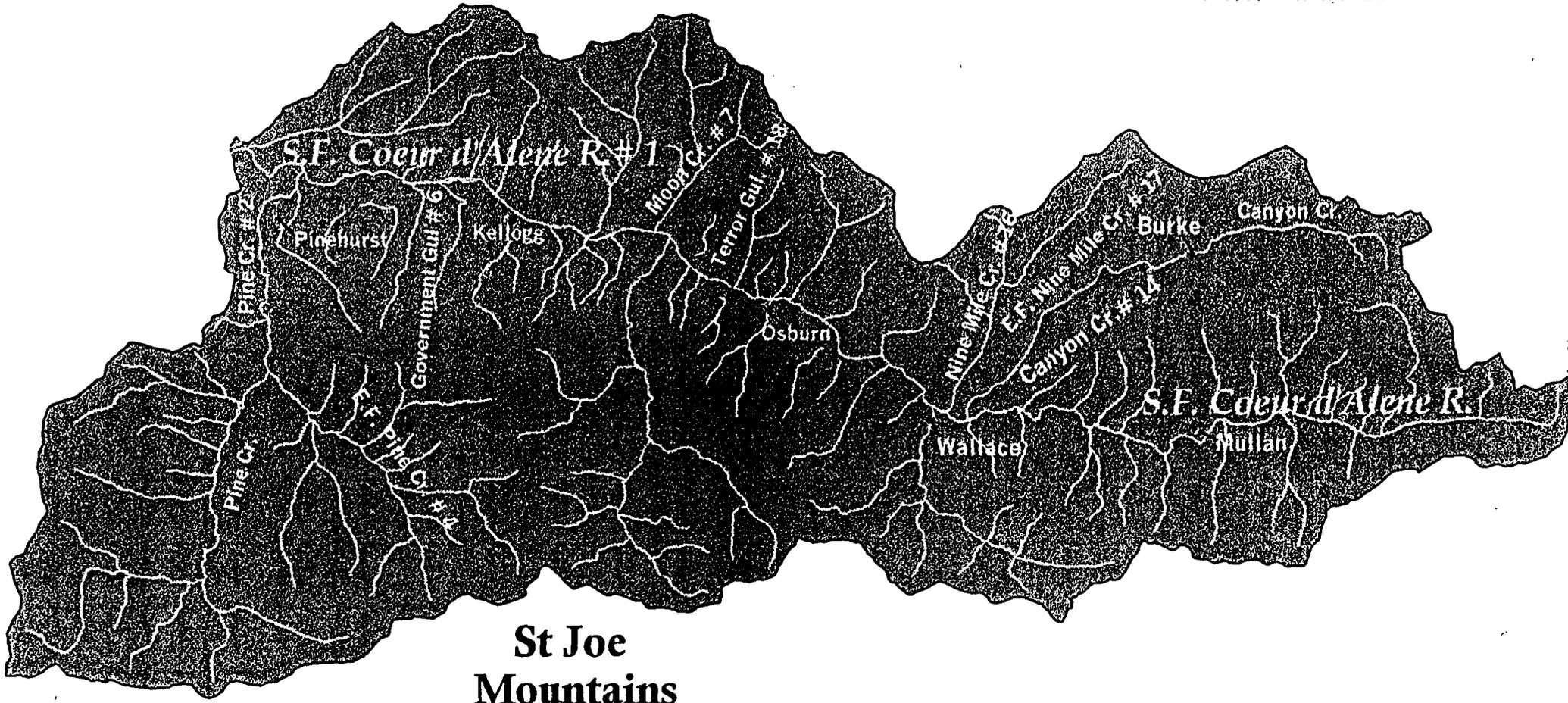
Figure 1. S.F. Coeur d'Alene Watershed Huc # 17010302

Huc # 17010302-(#)

Water Quality Limited Segments

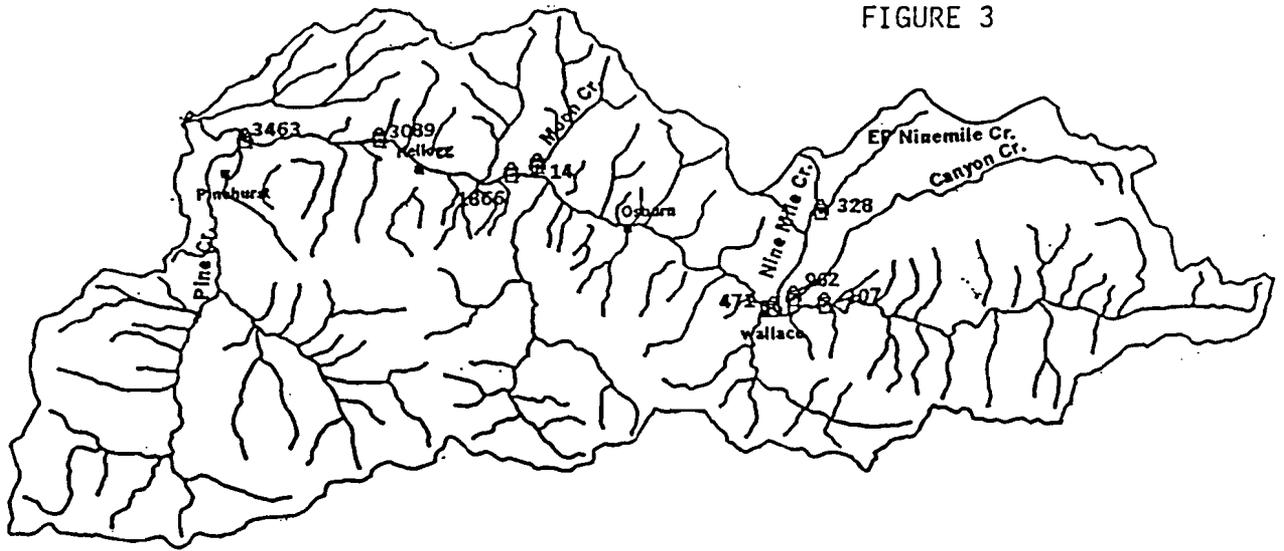
- S.F. Coeur d'Alene R. # 1
- Pine Creek # 2
- E.F. Pine Creek # 4
- Government Gulch # 6
- Moon Creek # 7
- Canyon Creek # 14
- Nine Mile Creek # 16
- E.F. Nine Mile Creek # 17
- Terror Gulch # 18

Coeur d'Alene
Mountains



St Joe
Mountains

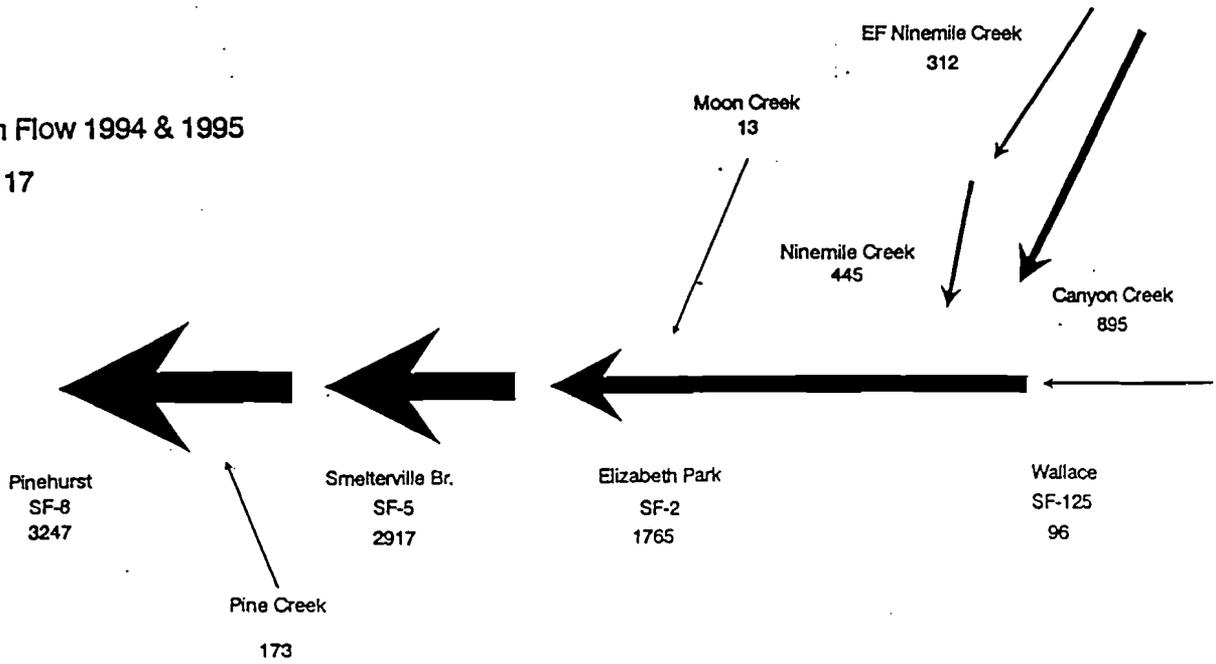
FIGURE 3



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

High Flow 1994 & 1995

n = 17



Low Flow 1994 & 1995

n = 17

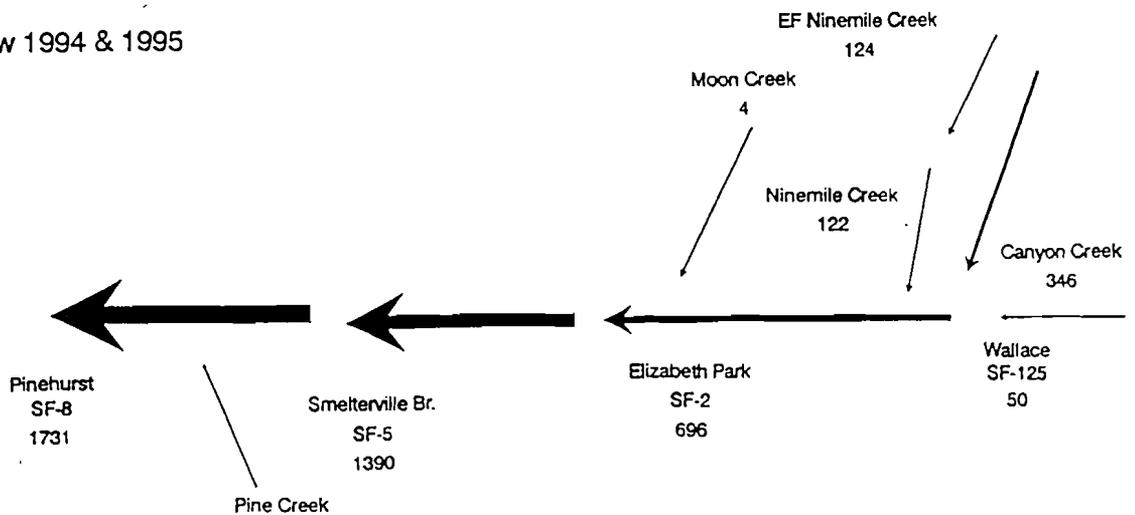
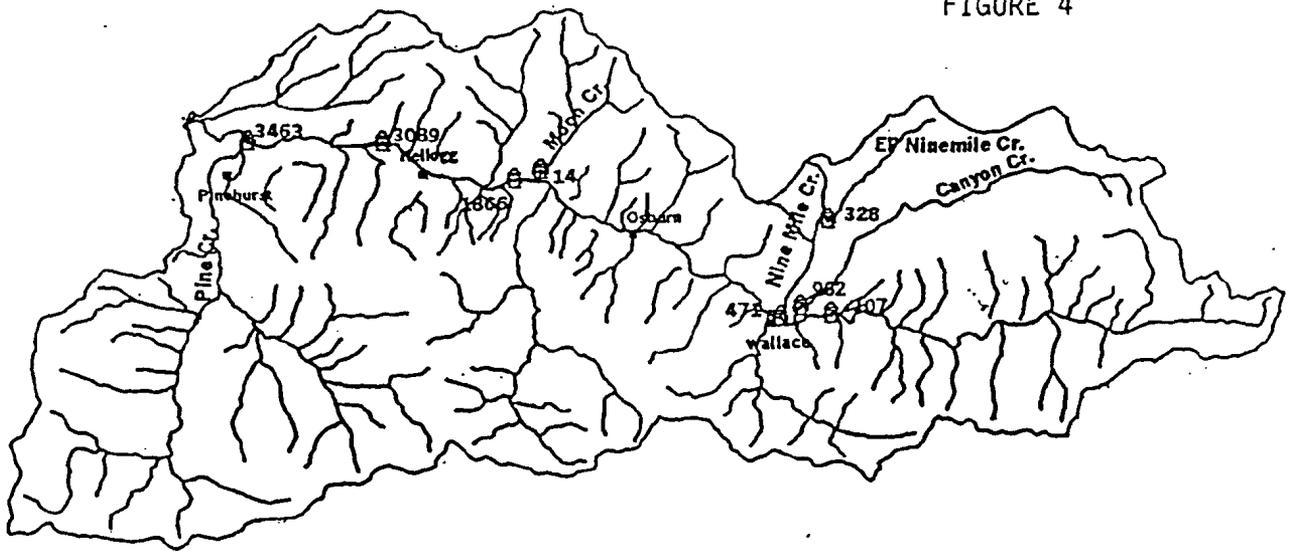
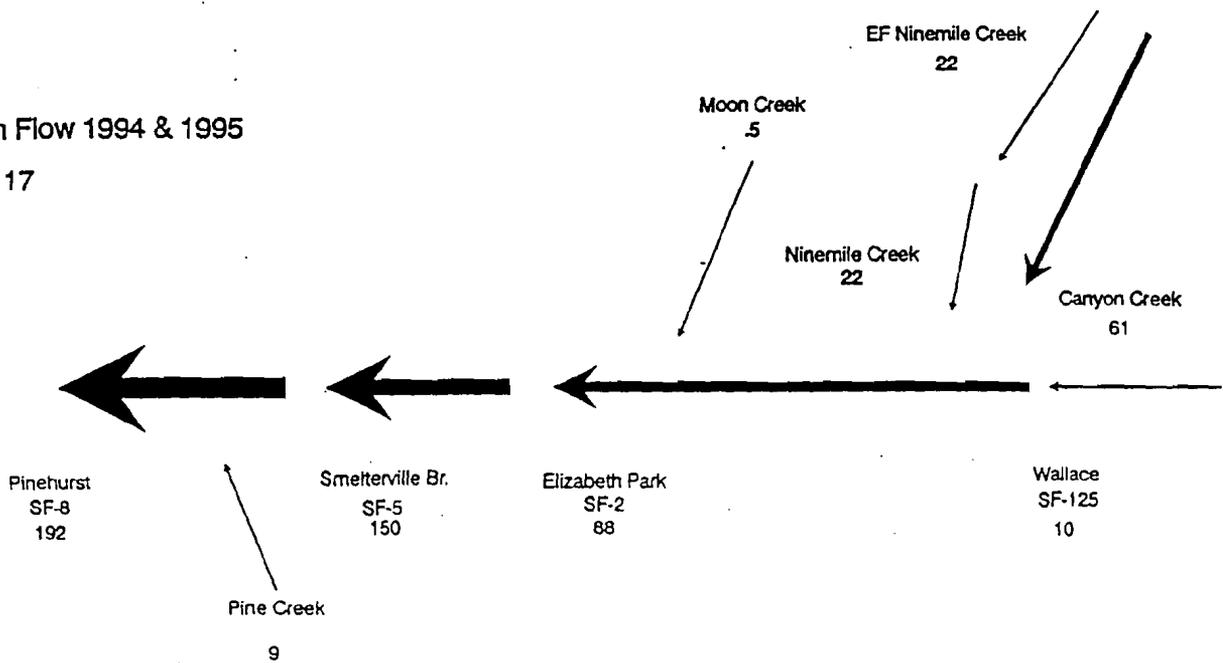


FIGURE 4



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

High Flow 1994 & 1995
n = 17



Low Flow 1994 & 1995
n = 17

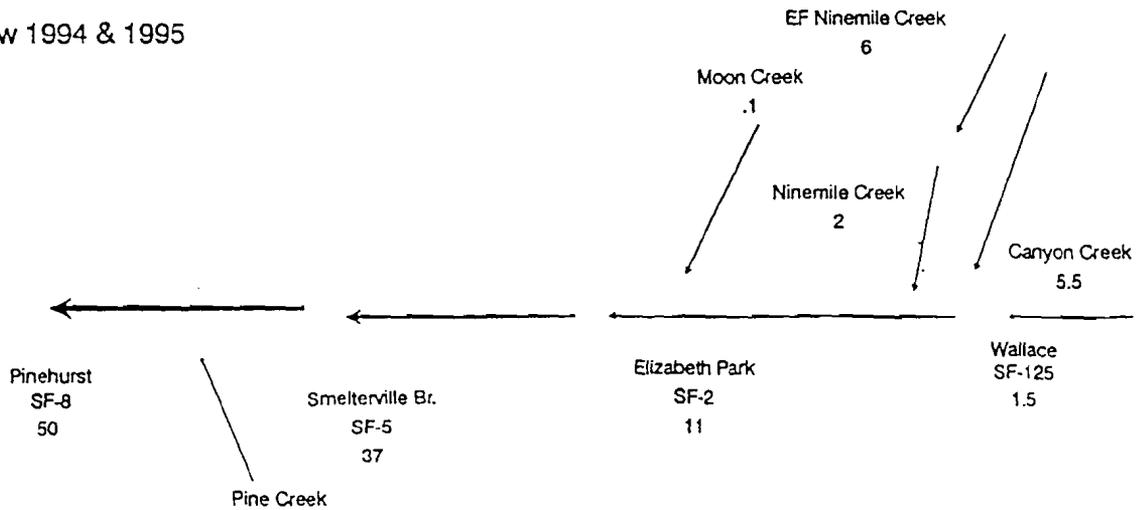
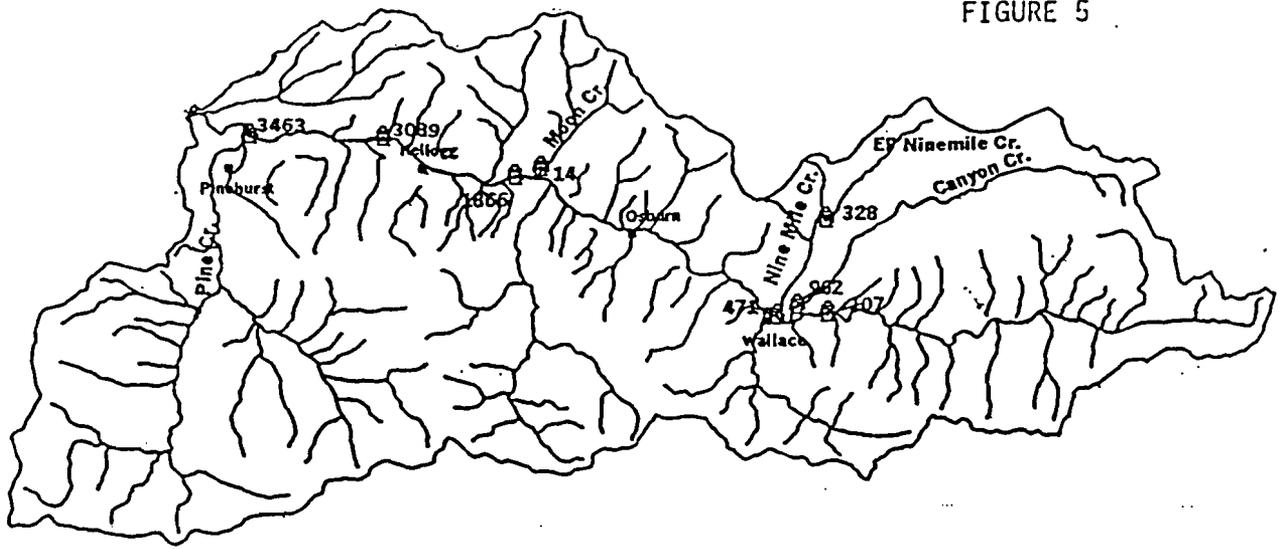


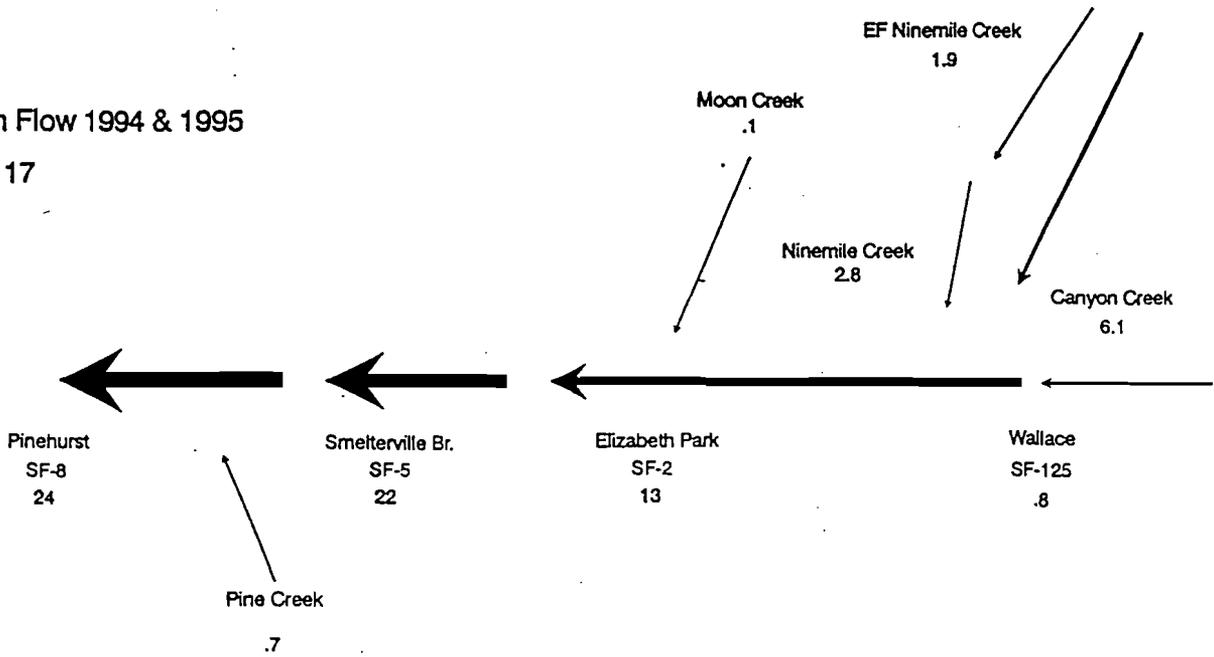
FIGURE 5



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

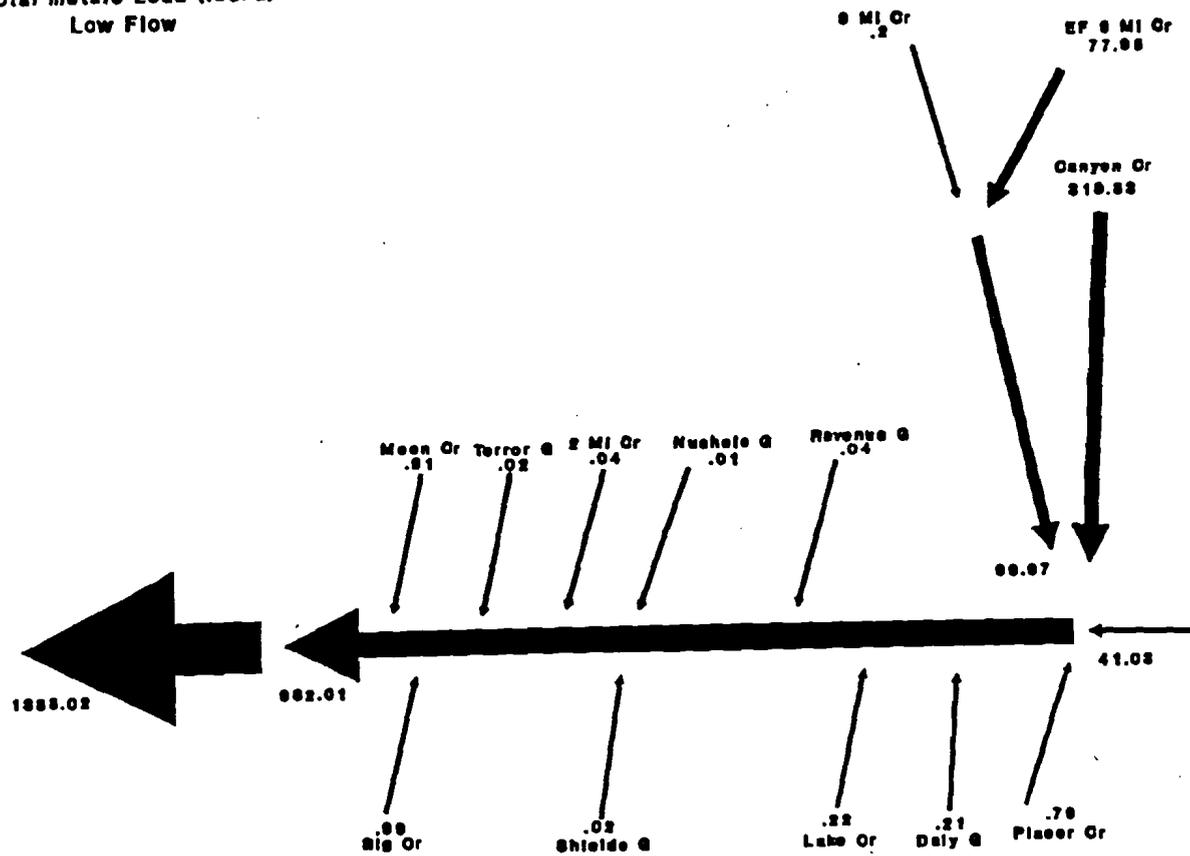
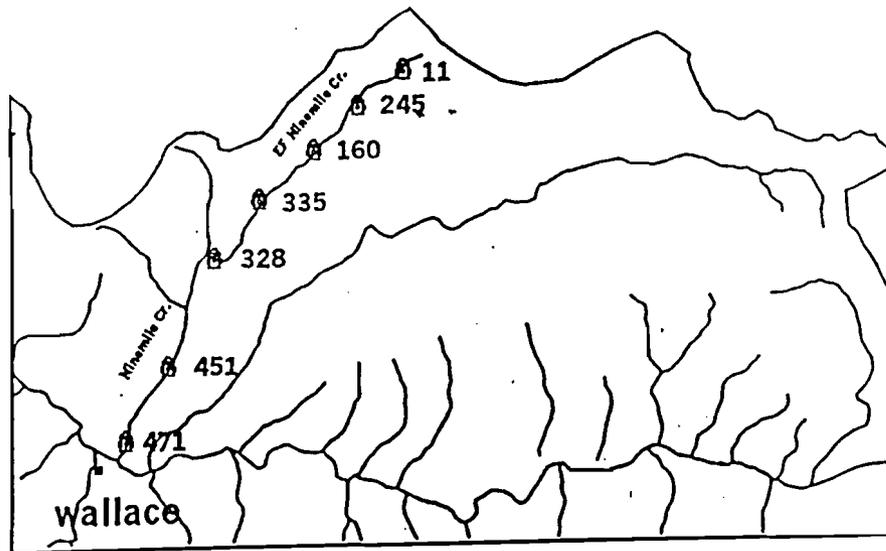


FIGURE 1

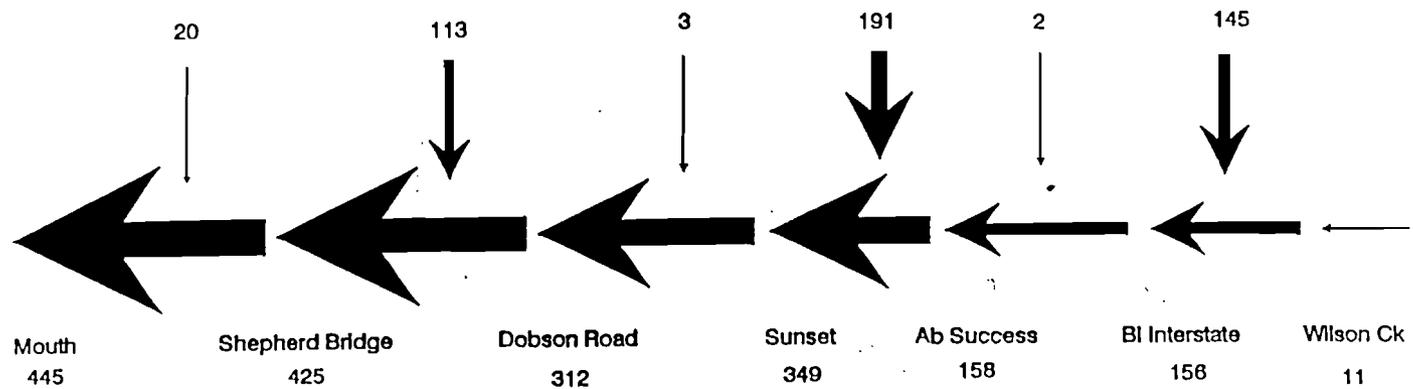


Ninemile - East Fork Ninemile Creeks

Total Zinc Load (lbs/d)

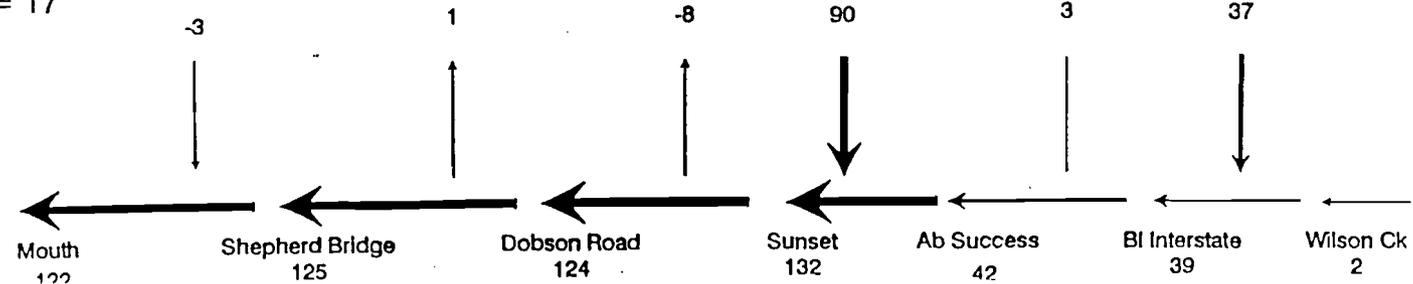
High Flow 1994 & 1995

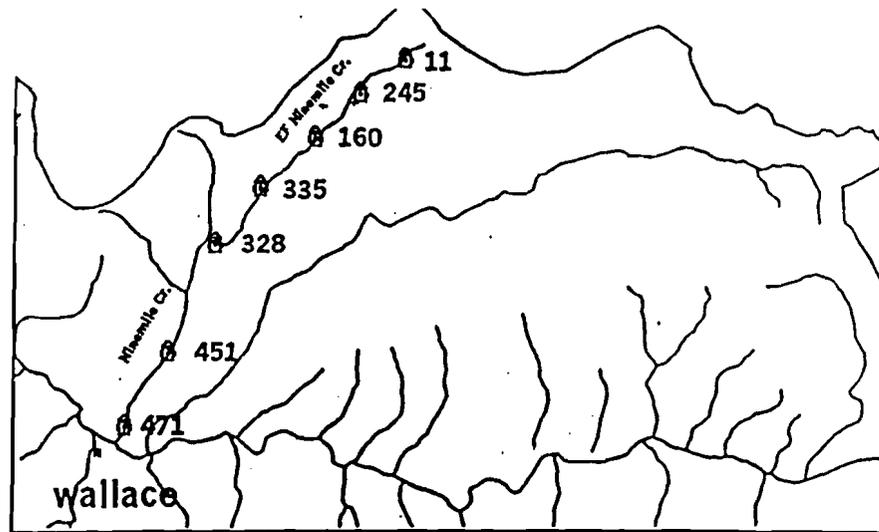
n = 17



Low Flow 1994 & 1995

n = 17



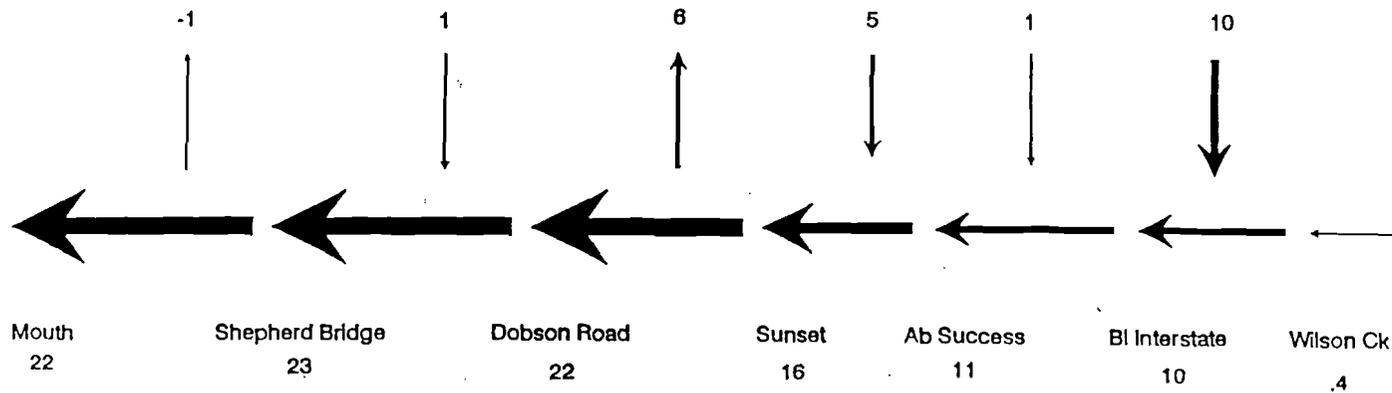


Ninemile - East Fork Ninemile Creeks

Total Lead Load (lbs/d)

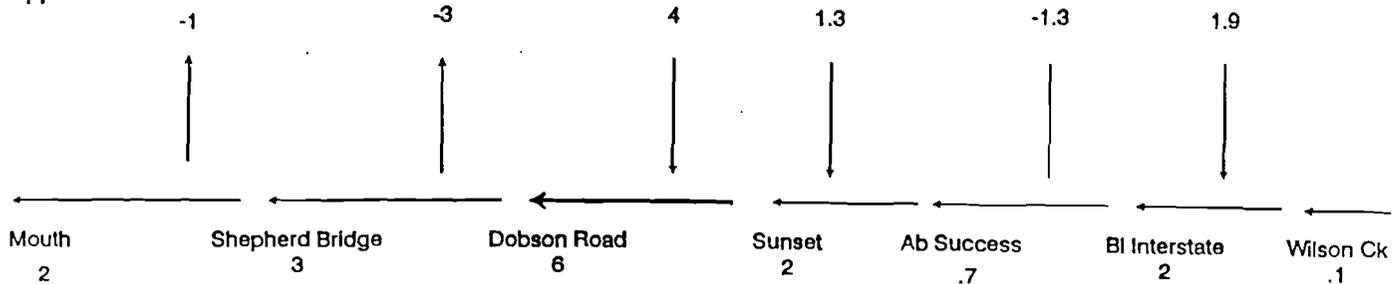
High Flow 1994 & 1995

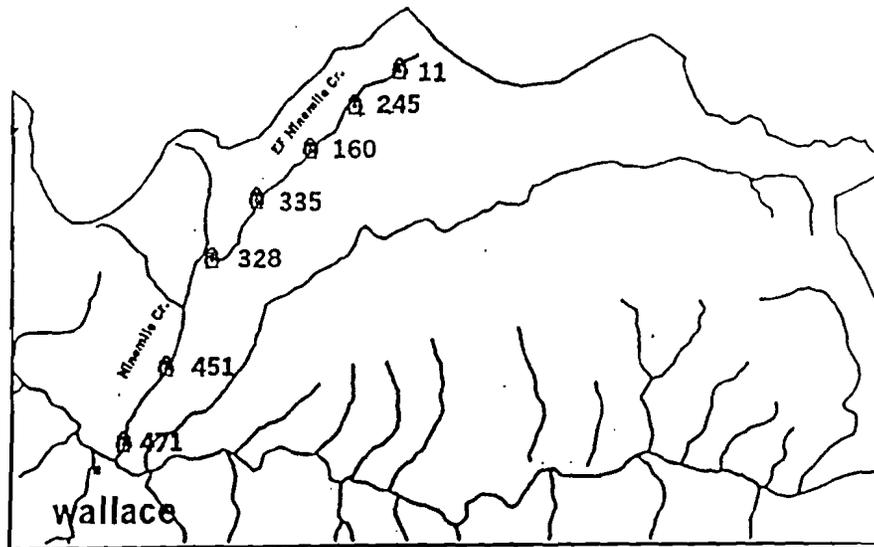
n = 17



Low Flow 1994 & 1995

n = 17



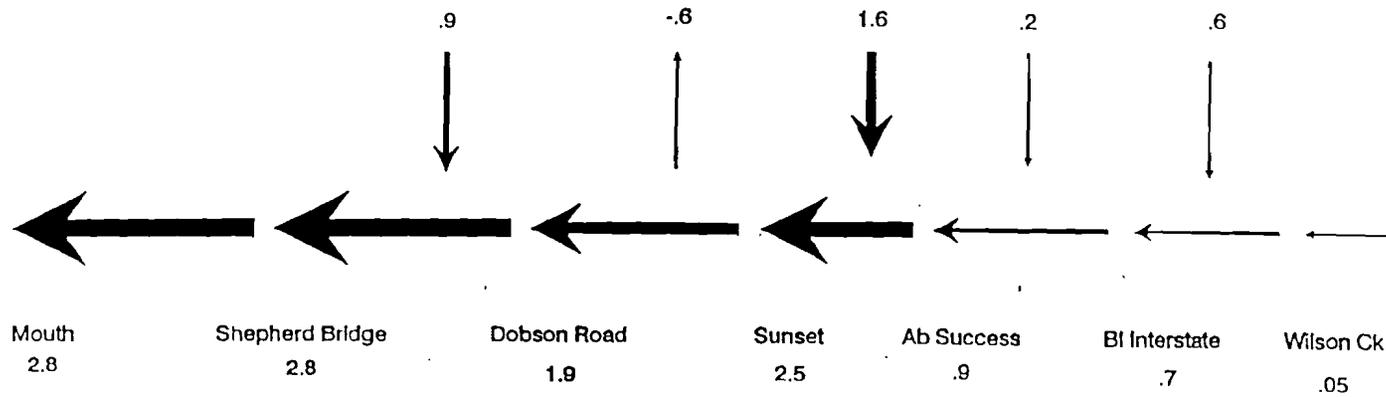


Ninemile - East Fork Ninemile Creeks

Total Cadmium Load (lbs/d)

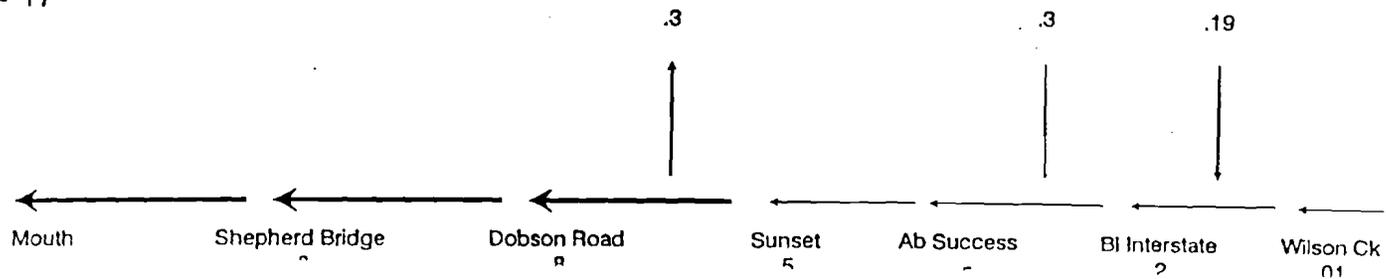
High Flow 1994 & 1995

n = 17



Low Flow 1994 & 1995

n = 17



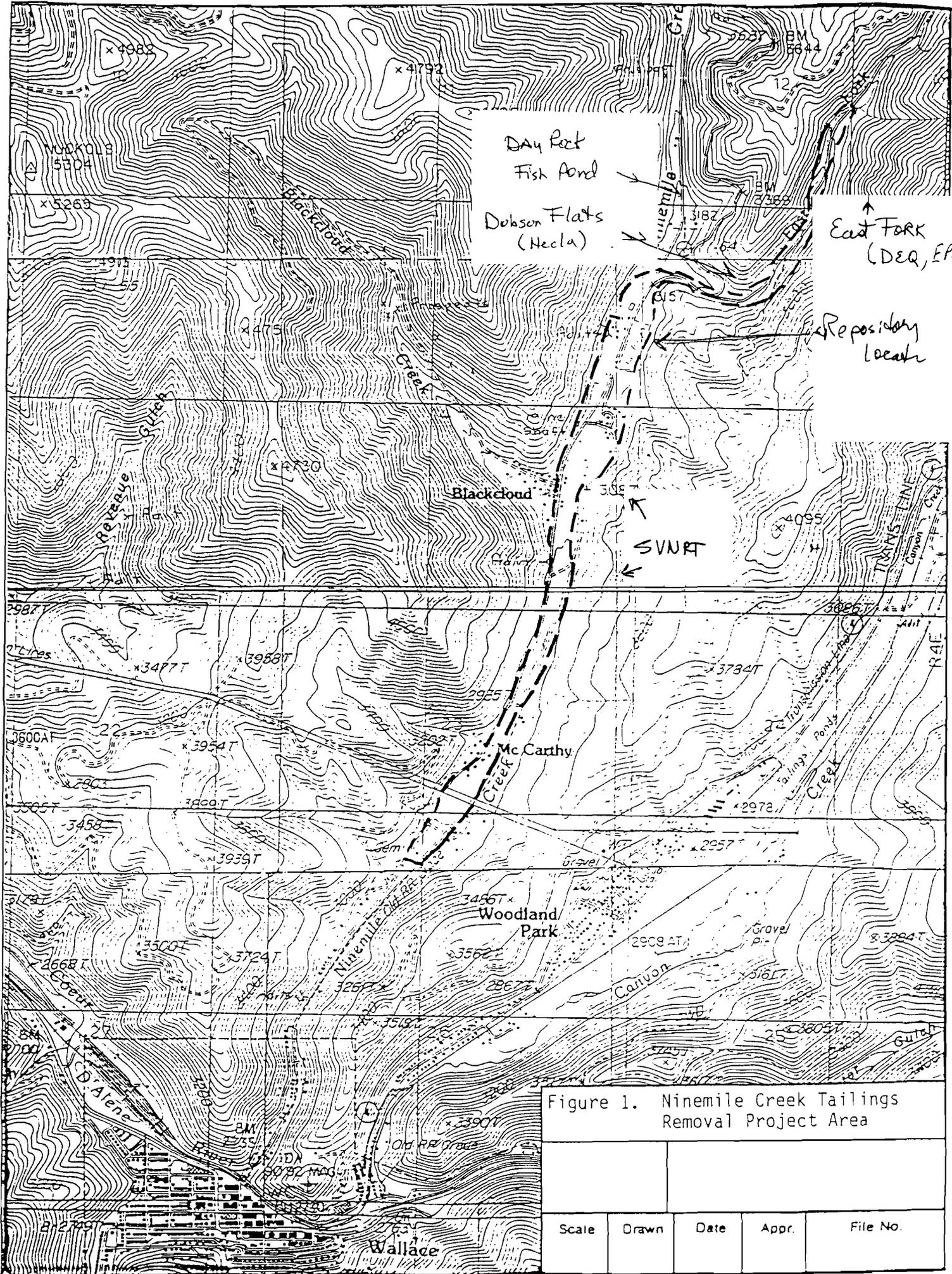
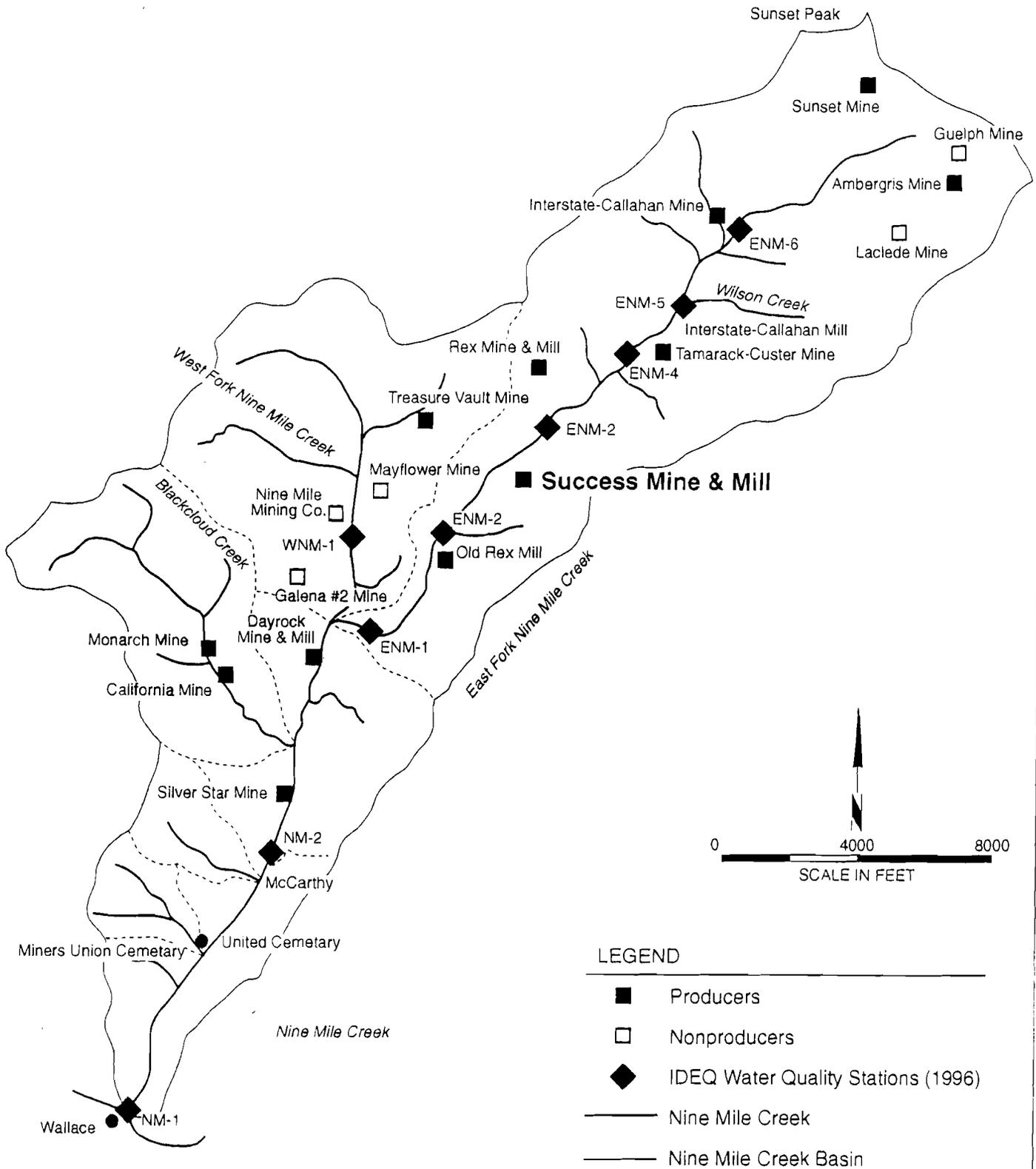


Figure 1. Ninemile Creek Tailings Removal Project Area

Scale	Drawn	Date	Appr.	File No.



LEGEND

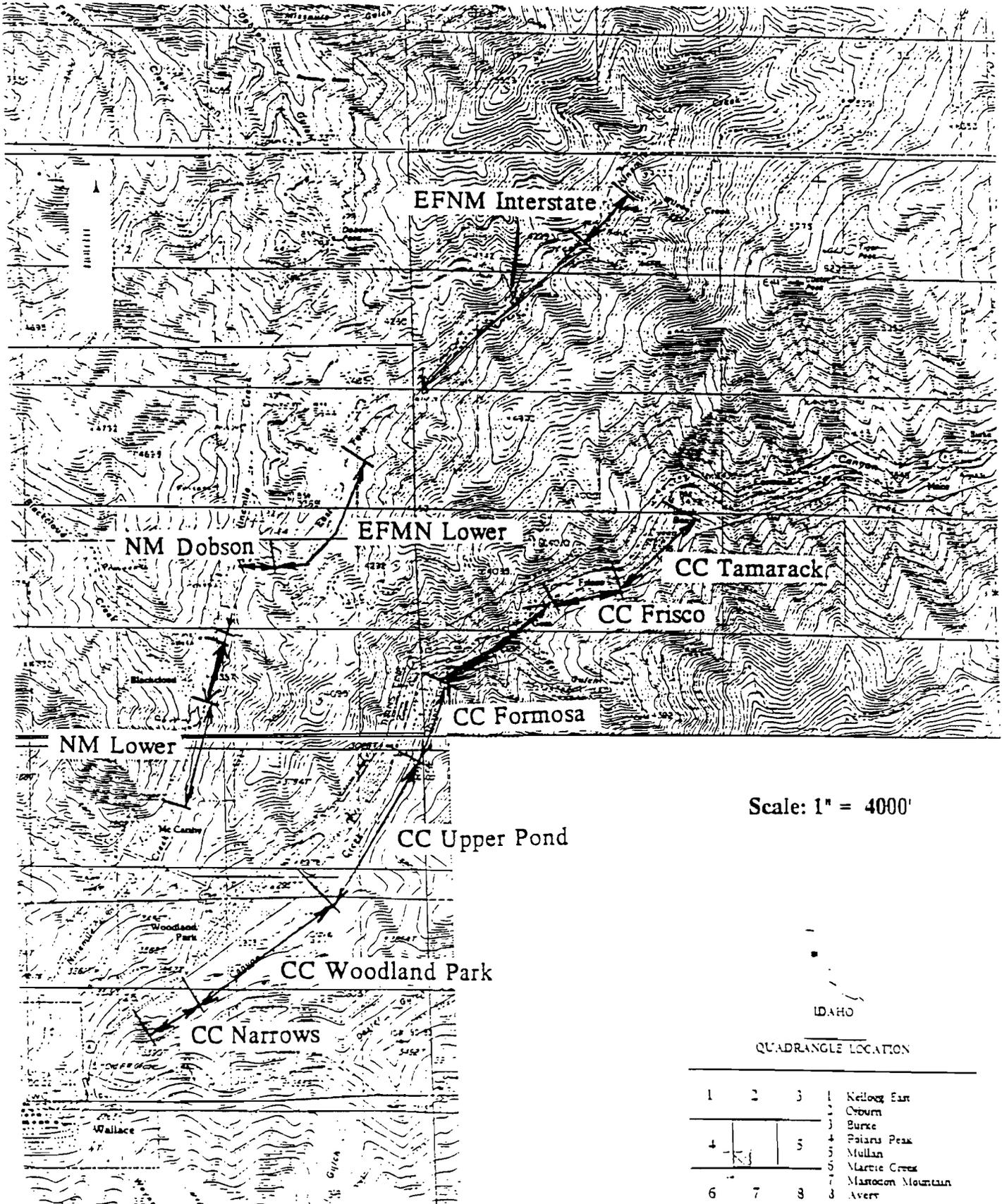
- Producers
- Nonproducers
- ◆ IDEQ Water Quality Stations (1996)
- Nine Mile Creek
- - - Nine Mile Creek Basin

DRAWING **2.1**
MINE AND MILL SITES IN
NINEMILE CREEK DRAINAGE
 SVNRT/SUCCESS EECA/ID

Silver Valley Natural Resource Trust Fund Tailings Removal and Floodplain Stabilization Project

SITE MAP - South Fork Coeur d'Alene River Upper Tributaries including:
Canyon Creek, Nine Mile Creek and East Fork Nine Mile Creek

Note: South Fork Cd'A River Projects not shown this sheet





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Fax: 556-7271

G
McCulley
Frick &
Gilman, inc

Memorandum

TO: Marti Calabretta
FROM: Tom Mullen *TM*
DATE: December 15, 1997
RE: Day Rock Closure

MFG Project No.: 2291.17

The following memorandum documents closure activities for the Day Rock Repository located up Nine Mile Creek. Closure activities were performed by Environmental Reclamation, Inc. (ERI) of Smelterville, Idaho from October 20 through November 21, 1997. Required tasks included capping of the repository, construction of diversion ditches, and revegetation of the closure surface and topsoil borrow source. Additional tasks, including construction of a south diversion ditch outlet and additional armoring in erosion-sensitive areas was requested by McCulley, Frick & Gilman, Inc. (MFG). See Table 1 for a summary of billable tasks.

ERI excavated topsoil from an area approximately 300 feet long by 100 feet wide and 5 feet deep on the adjacent hillside east of the repository. Topsoil was placed on top of the repository to an approximate thickness of 1 to 2 feet. At the request of Hecla and the Silver Valley Trustees, slash and stumps originating from the hillside borrow source were distributed on top of a rough graded surface of the topsoil cap. In addition to placement of the slash and stumps, frequent wet weather prevented any final grading of the closure surface. The closure surface, however, still follows the prescribed 3 horizontal to 1 vertical slopes along the west side and -3 percent slope on the east side. The hillside borrow source was graded to a 2 horizontal to 1 vertical slope.

A runoff diversion ditch was constructed along the east edge of the closure area. Much of the channel flows to the north and ties into the north outlet near the northwest corner of the closure area. A short south flow channel ties into the south outlet near the southeast corner. MFG requested the contractor to also construct a runoff ditch along the south side of the closure area and tie it into the south outlet. Additional riprap, at MFG's request, was placed on the apron and down the south embankment of the repository for erosion protection.

Along the west side, MFG requested the contractor to ensure that the road surface slopes inward 1 to 3 percent to a small diversion ditch between the access road and the toe of the 3 to 1 front slope. ERI, however, constructed a much larger ditch by placing topsoil along the access road to a thickness of 3 to 4 feet. MFG informed ERI this configuration was not acceptable and required the contractor to lower the height and inward slope of the excessively placed material.

An armored dissipation basin was constructed near the northwest corner of the closure area and connected to the runoff ditch along the front slope and the runoff ditch along the back slope by the north outlet. MFG requested additional armoring near the head of the north outlet due to observed erosion by diverted drainage originating from the east hillside.

The contractor hydroseeded approximately 2.8 acres of area, including the topsoil cap and the borrow source on the east hillside. The hydroseed consisted of a mixture consistent with Technical Specification



100 of the original bid package. Because of the relatively large area and limited access, hydroseeding was performed in stages as topsoil was progressively placed from the south end towards the north end.

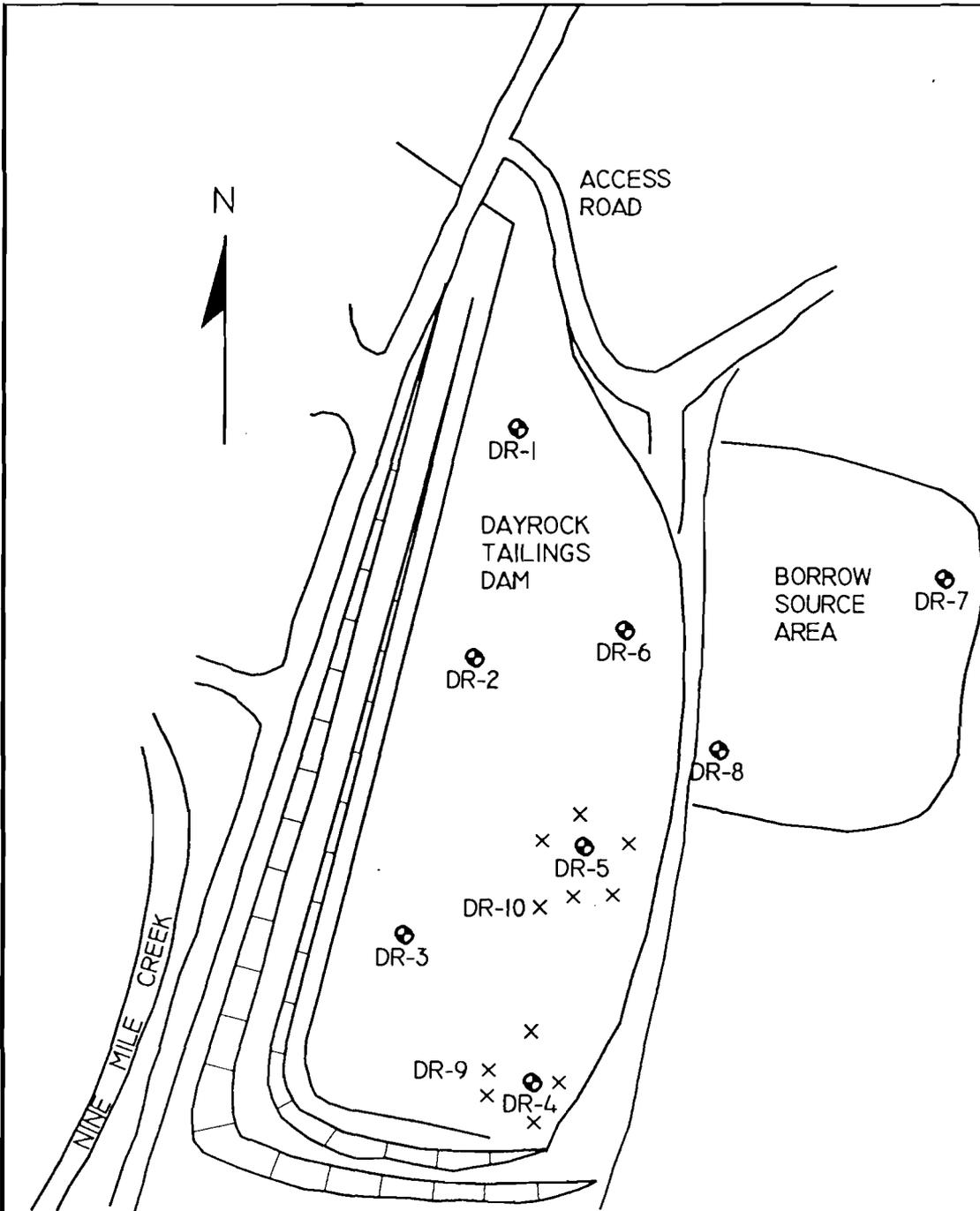
Although the work plan does not require confirmation sampling of the closure cap and borrow source, the Silver Valley Trustees requested MFG to collect samples for metals analyses from topsoil materials (Figure 1). Analytical samples of the borrow source and the placed topsoil were collected and analyzed for lead, cadmium, arsenic, and zinc. Table 2 presents the analytical results of topsoil samples. Six discrete samples were collected from the topsoil cap and two discrete samples were collected from the hillside borrow source. With the exception of two locations, samples averaged 450 milligrams per kilogram (mg/kg). Samples collected from the southeast corner and the middle of the east half (DR-4 and DR-5) contained 2,260 and 1,050 mg/kg lead, respectively. Composite samples DR-9 and DR-10 were collected in the vicinity of sample locations DR-4 and DR-5, respectively, to determine if the above average results were possible nugget effects. Samples DR-9 and DR-10 contained 543 and 5,350 mg/kg lead, respectively. Zinc concentrations in all samples range from 65 to 675 mg/kg.

The area around sample location DR-5 (thus DR-10) appears to contain relatively higher concentrations of lead. For comparison, the Removal Work Plan for 1994 Ninemile Drainage Projects indicates that lead concentrations in the buried organic horizon and alluvium ranges from 180 to 2,600 mg/kg and from 603 to 11,210 mg/kg, respectively. Lead concentrations in the topsoil, including the higher reported values are all within the range of alluvial materials found throughout the Ninemile drainage.

cc: Matt Fein, Hecla Mining Company
Tony Chavez - MFG, Osburn

TABLE 1. DAY ROCK REPOSITORY BILLABLE TASKS

Description	Units	Quantity
Contract Tasks		
Capping of repository, construction of diversion ditches and other closure tasks required	Lump Sum	1
Revegetation of the repository cap and the soil borrow area (15 loads)	Per Acre	2.8
Time and Materials		
Man-hours (south outfall)	Hour	22
Volvo 150 front-end loader (south outfall)	Hour	2
Cat 225 excavator (south outfall)	Hour	6
Geotextile (south and north outfalls)	Feet	100
Riprap (south and north outfalls)	tons	87.7
Straw Bales (east hillside)	Each	22



EXPLANATION

- 
DR-4 DISCRETE SAMPLE LOCATION
- 
DR-9

X

 COMPOSITE SAMPLE LOCATION



McCulley Frick & Gilman, Inc.
 PROVIDING ENVIRONMENTAL CONSULTING AND ENGINEERING SERVICES

DAYROCK REPOSITORY TOPSOIL SAMPLE LOCATIONS		
DRAWN BY: D.E. HILL	PROJECT: 2291.17	REVISION:
DATE: 12-16-97	CHECKED BY:	DRAWING NUMBER
SCALE: NONE	APPR'VD BY:	FIGURE 1

TABLE 2. TOPSOIL AND BORROW SOURCE SAMPLE RESULTS

Sample ID	Lead (mg/kg)	Cadmium (mg/kg)	Arsenic (mg/kg)	Zinc (mg/kg)
DR-1	492	1.52	< 10.0	115
DR-2	455	1.2	< 10.0	113
DR-3	465	1.32	10.1	65.2
DR-4	2260	4	11.4	358
DR-5	1050	1.82	< 10.0	120
DR-6	372	1.1	< 10.0	86.5
DR-7	332	3.4	< 10.0	550
DR-8	608	1.8	< 10.0	106
DR-9	543	1.52	< 10.0	87
DR-10	5350	5.05	10.4	675

Notes:

- 1) Samples DR-9 and DR-10 are composite samples collected near sample locations DR-4 and DR-5, respectively.
- 2) Samples DR-7 and DR-8 were collected from the borrow source on the east hillside.