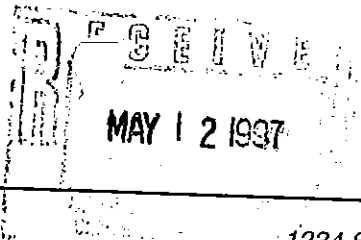




Okanogan County Health District



1234 S. 2nd • Box 231
Okanogan, WA 98840
(509) 422-7140
1-800-222-6410

Date: March 21, 1997

From: Michael Huchton, Okanogan County Health District
RE: Summary of Results of Abandoned Mine Land Investigations

Listed below is a summary of results of analytical testing of soil and surface water from 41 completed investigations of Abandoned Mine Lands in Okanogan County plus 4 in adjacent Whatcom County administrated by Okanogan National Forest. Each of the listed contaminants has been determined to be above MTCA cleanup levels as extracted from the Model Toxics Control Act Cleanup Levels and Risk Calculation (CLARC II) Update, August 31, 1994. These interpretations are based upon consideration of water standing at the portal of a mine and of water flowing on the surface just prior to submerging into soil, as surface water. (Consideration of these waters as groundwater or actually sampling from groundwater would, of course, result in higher factors of contamination as well as additional contaminants considered to be above cleanup levels.)

Pre-field screening (historical records) was utilized to separate sites into four categories of estimated hazard levels: A= High likelihood of hazardous wastes
B= Possible likelihood of hazardous wastes
C= No determination
D= No hazard

A table of priority metals analyzed, together with approximate cleanup levels utilized in this investigation, is included in this transmission.

Haz. Cat. Own Oth.	MINE	CONTAMINATE	FACTOR ABOVE CLEANUP LEVEL	MATRIX	LOCATION TWN/RNG/SEC	NEAR/ WATERSHED
B P S	First Thought	Arsenic	37X	soil	35 25 NENE 31	Conconully/ Loup Loup (Okanogan River)
		Arsenic	18X	soil		
		Lead	1.9X	soil		
		Arsenic	83X	water		
		Cadmium	36X	water		
		Lead	1.1X	water		
		Copper	2.3X	water		
		Zinc	2.8X	water		
B P S	Last Chance	Arsenic	14X	soil	35 25 C NE 31	Conconully/ Loup Loup (Okanogan River)
A P S	La Grange	Arsenic	5X	soil	34 25 SENW 05	Conconully/ Loup Loup (Okanogan River)
		Lead	1.1X	soil		
A	Sheridan	Arsenic	21.7X	water	38 31 SWNW 24	Wauconda/



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MTCA Cleanup Levels (tentative) for metals on Abandoned Mine Lands

NAME	Groundwater (Method B)	Surface Water (Method B)	Soil (Res) (Method B)	Soil (Ind) (Method. C)
	<u>ug/L (ppb)</u>	<u>ug/L (ppb)</u>	<u>mg/Kg (ppm)</u>	<u>mg/Kg (ppm)</u>
Antimony	6.4	1040	32	1400
Arsenic	4.8	17.7	60	2600
Beryllium	80	682	400	17500
Cadmium	8	20.3	80	3500
Chromium	80;1600	162,000	8000	17500
Copper	592	2660	2960	130000
Lead	(5.0)	(50)	(250)	(1000)
Mercury	4.8	-	24	1050
Nickel	320	1100	1600	70000
Selenium	80	-	400	17500
Silver	80	25000	400	17500
Zinc	4800	16500	24000	105000

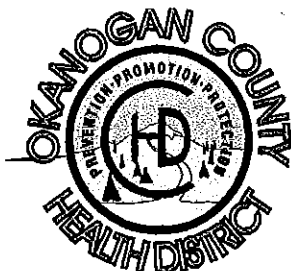
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Okanogan County Health District

1234 So. Second, PO Box 231, Okanogan, WA

98840

(509)422-7140 or 1-800-222-6410

February 7, 1997

WASHINGTON DEPARTMENT OF ECOLOGY TOXICS CLEANUP PROGRAM

INITIAL INVESTIGATION REPORT - DATA COLLECTION

Site Name: *Sheridan Mine*

Location: *Sheridan Mining District near Wauconda, WA* Town: *38N* Range: *31E* Section: *SW 1/4 NW 1/4 24*

Site Owner/operator: *United States Forest Service, Okanogan National Forest*

Address: *1240 South 2nd Ave., P.O. Box 950, Okanogan, WA 98840*

Dates(s) of Initial Inspection / Data Collection: *May 30, 1995*

Samples or field measurements: *no air one soil no ground water one surface water none other*

Photographs: *5* Maps: *3*

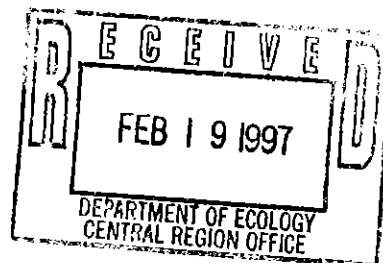
Weather: *fair, warm, dry*

Lead Inspector: *R. Michael Huchton*

Signature: *R. Michael Huchton, R.D.*

Other Inspectors: *none*

Signature(s): _____



(1)

(2)

1. The first part of the report is a general introduction to the subject of the study. It is followed by a description of the methods used in the study.

The second part of the report is a detailed description of the results of the study. It is followed by a discussion of the results and their implications.

The third part of the report is a conclusion and a list of references.

Appendix A

Table 1. Summary of the results of the study.

Table 2. Summary of the results of the study.

The first part of the report is a general introduction to the subject of the study. It is followed by a description of the methods used in the study.

The second part of the report is a detailed description of the results of the study. It is followed by a discussion of the results and their implications.

The third part of the report is a conclusion and a list of references.

The fourth part of the report is a list of references.

Appendix B

Table 3. Summary of the results of the study.

Table 4. Summary of the results of the study.

Table 5. Summary of the results of the study.

Table 6. Summary of the results of the study.

Table 7. Summary of the results of the study.

Table 8. Summary of the results of the study.

Table 9. Summary of the results of the study.



Okanogan County Health District

1234 S. 2nd • Box 231
Okanogan, WA 98840
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1-800-222-6410

February 7, 1997

Initial Investigation - Sheridan Mine site
near Wauconda, WA

1) Site description/history

The Sheridan Mine is located in undeveloped forest land in a small gulch one mile north of East Fork Cougar Creek on U. S. Forest Service property approximately 1 mile west of the Ferry County line seven miles northeast of Wauconda in Okanogan County- Twn. 38N, Rng 31E, SW ¼ NW ¼ Sec.24.

The Sheridan Mine is reported to be an abandoned gold and silver production mine from 1906 to approximately 1919 and also 1920. In 1918 a 50 ton/day flotation mill was built at the mine and produced an estimated \$60,000 to \$100,000 of ore averaging as much as 300 oz/ton silver shipped until 1920. The mine is no longer in operation.

Silver minerals occur in a series of closely spaced, silicified and pyritized shear zones in altered and silicified andesites and dacites of the Toroda Creek graben, a volcanic-tectonic depression resulting from east-west extension during the Eocene. Brecciation of the rocks accompanied the shearing and clasts of the breccia have been considerably altered and silicified by hydrothermal solutions.

The vein was mined from several levels over a vertical distance of about 500 ft. and along a strike for about 400 ft. Several raises connect the different levels of the mine. Most adits have a heading of N35E.

2) The Human Hazard Value calculated from U.S. Bureau of Mines methodology was 44.3 (HHAZVAL) and the Environmental Hazard Value was 53.2 (EHAZVAL). This value is a category A.

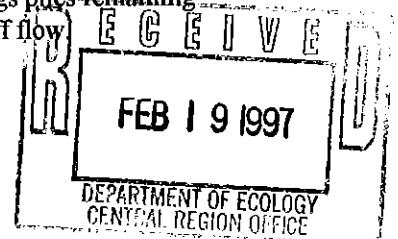
3) Personnel:

Michael Huchton - Okanogan County Health District

4) Site Visit:

On the morning of May 30, 1995, Michael Huchton proceeded the approximately 0.7 miles SSE on the Cougar Creek Road, then 2.4 miles E on the East Fork Cougar Creek Road, and then NNE for about 0.7 miles on the unnamed access road to the mine.

The first feature encountered was the collapsed mill ruins located along the east side of the road and up the slope of the steep hillside (photo # 431-05). The foundation and considerable boards and timber were essentially all that remained. Soil sample # 431-02 was collected from the scant tailings piles remaining below the collapsed mill site near the loading area adjacent to potential seasonal runoff flow.



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Approximately 200 yards to the north past the collapsed ruins of a mill building was the next feature visited -the collapsed adit #1 (photo # 431-04) which was closed to entry by rotten timbers and eroded hillside. The adit had no water or drainage but was located above a working level and access road system built of waste rock and perhaps tailings.

The access road curved around to the right and uphill for a vertical distance of about 250 ft. to the next collapsed adit # 2 (photo # 431-01) which had collapsed into an approximately 40 ft long trench up to about 18 ft deep. There was no water or drainage associated with this adit.

The access road then curved around to the left and uphill for a vertical distance of about 250 ft. to the next collapsed adit # 3. Adit # 3 was mostly collapsed by almost 10 ft. of eroded hillside material blocking the entrance (photo # 431-03) but it was open to entry behind the pile (photo # 431-02). The adit had water standing inside behind the dam of eroded material at the entrance and which seeped out only slightly through this eroded till. This water had an approximate pH of 5.0 by litmus pH paper and a conductivity of 1275 umhos/cm. by portable field conductivity meter. Water sample # 431-01 was collected from the water in the adit. Not retracing the access road from the adit back toward the millsite failed to disclose any more features although it is possible other development occurred.

5) Results:

The water sample collected from the standing water in adit # 3 was analyzed for Total Metals - Arsenic, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Copper, Zinc, Nickel, Antimony, and Beryllium. The results of the laboratory analyses indicated that arsenic and lead exist at elevated levels but only **Arsenic** exists at a level above Model Toxics Control Act cleanup levels as extracted from Cleanup Levels and Risk Calculations (CLARC II) Update, February 1996.

The **Arsenic** concentration of **385 ppb** was approximately **21.7** times above cleanup levels for surface water by Method B.

The soil sample collected from the tailings below the mill were analyzed for Total Metals- Arsenic, Cadmium, Chromium, Lead, Mercury, Selenium, Silver, Copper, Zinc, Nickel, Antimony, and Beryllium. The results of the laboratory analyses indicated that residues of arsenic, lead, and copper exist at elevated levels but only **Lead** existed at a level above Model Toxics Control Act cleanup levels as extracted from Cleanup Levels and Risk Calculations (CLARC II) Update, February 1996.

The **Lead** concentration of **454 ppm** was approximately **1.8** times above cleanup levels for residential soil by Method B.

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Sheridan (431)

ALTERNATE NAMES		DISTRICT	COUNTY
Phil Sheridan		Sheridan	Okanogan
PRIMARY QUADRANGLE	SCALE	1/2° x 1° QUAD	1° x 2° QUAD
Bodie Mountain	1:24,000	Republic	Okanogan
LATITUDE	LONGITUDE	SECTION, TOWNSHIP, AND RANGE	
48° 46' 42.73" N	118° 51' 17.17" W	SW 1/4 NW 1/4 sec. 24, 38N, 31E	
LOCATION: in a small gulch 1 mi north of the East Fork Toroda Creek			
HOST ROCK: NAME		LITHOLOGY	AGE
Klondike Mountain Formation		andesite, dacite	Eocene
COMMODITIES	ORE MINERALS	NON-ORE MINERALS	
Ag Au	silver mineral	quartz, calcite, pyrite	
DEPOSIT TYPE		MINERALIZATION AGE	
vein, epithermal breccia		Eocene	

PRODUCTION: Between 1906 and 1919, shipments of high-grade gold-silver ore were made to smelters. In 1918 a 50-ton/day flotation mill was built at the mine, and concentrates averaging as much as 300 oz/ton Ag were shipped until 1920. For this period, the mine production was estimated at \$60,000 to \$100,000 (Moen, 1980, p. 72).

TECTONIC SETTING: The Toroda Creek graben is a volcano-tectonic depression, which resulted from east-west extension during the Eocene (Holder and others, 1989).

ORE CONTROLS: Silver minerals occur in a series of closely spaced, silicified and pyritized shear zones in altered and silicified andesites and dacites. Brecciation of the rocks accompanied the shearing, and clasts of the breccia have been considerably altered and silicified by hydrothermal solutions. The main vein is 1-7 ft wide, strikes N20E, and dips 50NW. During mining operations it was necessary to closely assay the vein material in order to establish borders of the ore shoots (Moen, 1980, p. 72).

GEOLOGIC SETTING: The ore is in altered and silicified volcanic rocks of the Eocene Klondike Mountain Formation. The geology here is similar to that described for the American Flag mine).

COMMENTS: A 50-ton/day flotation mill was built in 1918. Most adits have heading of N35E. The vein was mined from several levels over a vertical distance of about 500 ft and along strike for about 400 ft. Several raises connect the different levels of the mine (Moen, 1980, p. 72).

REFERENCES

- Holder, R. W.; Gaylord, D. R.; Holder, G. A. M., 1989, Plutonism, volcanism, and sedimentation associated with core complex and graben development in the central Okanogan Highlands, Washington. *In* Joseph, N. L.; and others, editors, 1989, Geologic guidebook for Washington and adjacent areas: Washington Division of Geology and Earth Resources Information Circular 86, p. 187-200.
- Hunting, M. T., 1956, Inventory of Washington minerals—Part II, Metallic minerals: Washington Division of Mines and Geology Bulletin 37, v. 1, 428 p.; v. 2, 67 p.
- Moen, W. S., 1980, Myers Creek and Wauconda mining districts of northeastern Okanogan County, Washington: Washington Division of Geology and Earth Resources Bulletin 73, 96 p., 6 pl.
- Patty, E. N., 1921, The metal mines of Washington: Washington Geological Survey Bulletin 23, 366 p.

APPENDIX C. -A-, INVENTORY AND INVESTIGATION FORM

U. S. Bureau of Mines
AML INVENTORY FORM
Part I - Pre-Field Data (Side 1)

EVALUATOR Huchton

PAGE 1 OF 7

SITE NUMBER

431

DATE OF INVESTIGATION May 30, '95

1) PROPERTY NAME:

Sheridan Mine

Alternate Names

Phil Sheridan

MILS Sequence No.

MRDS No.

BOM Mineral Property File No.

State ID No.

EPA ID No.

2) OWNERSHIP:

What is the current ownership of the site? Check one.

Federal ☒

Indian ☐

State ☐

County ☐

Municipal ☐

Private/Patented ☐

Unknown ☐

Other ☐

If the owner is known, fill in the following information.

Name of Agency

U.S. Forest Service, Okanogan Natl Forest

Address

1240 So. 2nd Ave, Okanogan, WA 98840

Telephone Number

509 - 826 - 3275

Ownership includes

Surface only ☐

Minerals only ☐

Both ☒

3) LOCATION DATA:

Fill in location information as available.

State

Washington

County

Okanogan

Township

38

N

Range

31

E

Section

24

Section Subdivision

SW 1/4 NW 1/4

Meridian

Latitude

48° 46' 42.73" N

Longitude

118° 51' 17.17" W

UTM Zone

Northing

Easting

Elevation

4400

Specify units for elevation.

Feet ☒

Meters ☐

Map Name

Bodie Mountain

Map Scale

1:24,000

1:250,000 Quadrangle

Okanogan

Mining District

Sheridan

Approximate area of site

25

Measured in

Square feet ☐

Acres ☒

Hectares ☐

4) HISTORICAL DATA:

Check all that apply.

Type of Operation:

Surface ☐

Underground ☒

Surface-Underground ☐

Mineral Location ☐

Placer ☐

Prospect ☐

Dredge ☐

Processing Plant ☐

Well ☐

Unknown ☐

No Data ☐

Status of Operation:

Past Producer ☒

Explored Prospect ☐

Raw Prospect ☐

Unknown ☐

Developed Prospect (greater than 300 meters of workings) ☐

SITE NUMBER 431

DATE OF INVESTIGATION May 30, '95

4) HISTORICAL DATA (Continued.)

Check all that apply.

Commodities:

Arsenic ☐ Cadmium ☐ Copper ☐ Lead ☐ Mercury ☐ Zinc ☐

Other (specify) Silver, Gold

Commodity Groups:

Metals ☒ Coal ☐ Oil and Gas ☐ Uranium or Geothermal ☐

Industrial Minerals ☐ Sand and Gravel ☐ Non-Energy Leasable ☐

Other (specify)

Acid Producers or Indicator Minerals:

Arsenopyrite ☐ Chalcopyrite ☐ Galena ☐ Marcasite ☐ Sphalerite ☐ Sulfide ☐

Iron Oxide ☐ Limonite ☐ Pyrite ☒ Pyrrhotite ☐ Stibnite ☐

Size/Production:

Indicate the total amount of ore produced to date in metric tons (mt).

Small (0-10,000 mt) ☐ Small-Medium (10,000mt-250,000mt) ☐ Medium (250,000mt-500,000mt) ☐

Medium-Large (500,000mt-1,000,000mt) ☐ Large (Over 1,000,000mt) ☐

Mill Method:

Amalgamation ☐ Arrastre ☐ Gravity ☐ Crusher (only) ☐ Heap Leach ☐ Leach ☐

CIP (Carbon-in-Pulp) ☐ Cyanidation ☐ Stamp ☐ Flotation ☒ Jig Plant ☐ Retort ☐

No Mill ☐ Unknown ☐

Neutralizing Host Rock:

Carbonate ☐ Dolomite ☐ Limestone ☐ Marble ☐

Workings/history:

Indicate size, number, and type of mine openings, if available.

Years of Operation: From 1906 To 1969

Annual Precipitation: Check one.

Less than 25 centimeters ☐

More than 25 centimeters ☒

5) SPECIALTY DATA: Check all that apply.

Site in a known or suspected floodplain:

None ☐ Annual - 10 years ☐ 10 - 100 years ☐ 100 - 500 years ☐ Less than once every 500 years ☐

Threatened and Endangered Plants and Animals:

a) Are any threatened and/or endangered plants and/or animals on or near the site? Circle one.

YES NO

b) If present, list type(s).

COMMENTS: H = 5X2X1.2X1.4X2.2X1.2 = 44.3

E = 6X2X1.2X1.4X2.2X1.2 = 53.2

(A)

INVESTIGATION DATE May 30, 1995PAGE 3 OF 7GPS LOCATION 48° 46' 42.72" N LAT 118° 51' 17.12" W LONGSITE NUMBER 431 SITE NAME Sheridan MineEVALUATOR R. Michael Huchton AGENCY ADDRESS Box 231, Okanogan, WA 98840 TELEPHONE (509) 422-7145

1) NEAREST SITE(S) OF HUMAN ACTIVITY (Give distance, circle units, or mark N/A)

Dwelling(s) 1.5 km mi School N/A km mi Workplace km mi
Campground 5 km mi Trail N/A km mi Road 1.5 km mi

2) SENSITIVE ENVIRONMENTS (If any, give name or distance, if known)

Circle one per group

a) Threatened and Endangered Species UNK YES NO
b) Wetlands 2.3 km mi UNK YES NO
c) Fisheries 2.5 km mi UNK YES NO
d) Other km mi UNK YES NO

3) WATER Are bodies of water found on or within 2 mi (3.2 km) of the site? Circle one, and check all that apply. YES NOStream ☒ River ☐ Pond ☐ Lake ☐ Bay ☐ Other ☐Name of nearest water body East Fork Cougar Creek Distance .6 km mi

4) AIRBORNE POLLUTANTS

Circle one per group

a) Dust UNK YES NO
b) Spray UNK YES NO
c) Vapor UNK YES NO
d) Other Name UNK YES NO

5) RADIATION Did pre-field research indicate this area has produced uranium? Circle one.

YES NO

If yes, take radiation reading and record value.

 Counts per second (cps)

6) EXPLOSIVES Are any explosives or blasting supplies found on the site? Circle one.

UNK YES NO

If present, list type and location.

7) OTHER Are any of the following present? Check all that apply, provide comments as necessary below.

Acrid Odor ☐ Drum(s)/Tank(s) ☐ Overhead Wire(s) ☐ Power Substation(s) ☐ Tramway(s) ☐
Antennas ☐ Fence(s) ☐ Pipe(s) ☐ Scrap Metal ☐ Transformer(s) ☐
Aviation Hazard(s) ☐ Flume(s) ☐ Pole(s) ☐ Tower(s) ☐ Trestle(s) ☐
Bag(s) ☐ Headframe(s) ☐ Power Line(s) ☐ Tram Bucket(s) ☐ Wooden Structure(s) ☒
Chemical(s) ☐ Overhead Cable(s) ☐ Other (specify)

Site appears to have cultural significance or value ☐ (Check if yes)8) PHOTOGRAPH NUMBERS 431-05

9) SKETCH NUMBERS

COMMENTS

INVESTIGATION DATE May 30, 1995PAGE 4 OF 7SITE NUMBER 431SITE NAME Sheridan Mine

10) FEATURE Number MILL SITE #1 Fill out one form per feature. Check appropriate box below.

Adit ☐	Decline ☐	Machinery ☐	Ore Stockpile ☐	Quarry ☐	Slope ☐
Building ☐	Glory Hole ☐	Mill Building ☒	Pit, Large, >3 m ☐	Shaft ☐	Subsidence ☐
Cistern ☐	Highwall ☐	Mill Tailings ☐	Pit, Small, <3 m ☐	Solution Mining Well ☐	Sump ☐
Crosscut ☐	Leach Pad ☐	Mine Dump ☐	Placer Mine ☐	Solution Pond ☐	Trench ☐
Other					Tunnel ☐

11) CONDITION Does the condition of the above identified feature represent a physical hazard? Circle one. YES NO

Check the conditions that best describe the physical character of the above feature.

Breached ☐	Collapsed, Partial ☐	Empty ☐	Foundation ☒	Standing ☐	Unstable Walls ☐
Caved ☐	Concealed ☐	Eroded ☐	Intact ☐	Subsided ☐	Wind Erosion ☐
Caved, Partial ☐	Concealed, Partial ☐	Eroded, Partial ☐	Open to Entry ☐	Unconfined ☐	
Collapsed ☒	Confined ☐	Fenced ☐	Rotten Cribbing ☐	Other	

12) SIZE OF FEATURE Indicate size of feature and specify units (feet or meters).

Measurement

Length <u>150</u>	Width <u>95</u>	Depth or Height <u>70</u>	Actual ☐	Feet ☒
			Estimate ☒	Meters ☐
Slope (Degrees)	Bank Stability: Stable ☐	Unstable ☐	Marginally Stable ☒	

13) WATER Is water present at the feature? Circle one. YES NO

Is water emanating from or passing through the feature? Circle one. YES NO

a) If water is present, how does it occur? Check all that apply.

Standing ☐	Filled ☐	Partly Filled ☐	Flowing ☐	Intermittent ☐
-----------------------------------	---------------------------------	--	----------------------------------	---------------------------------------

b) If present, determine: GPM: Conductivity: pH:

c) Observe water bed color. (Check all that apply, or specify other.)

Brown ☐	Green ☐	Yellow ☐	Yellow-orange ☐	Orange ☐	Gray-black ☐	Other (specify)
--------------------------------	--------------------------------	---------------------------------	--	---------------------------------	-------------------------------------	--------------------------------------

14) PLANTS Are plants present on or around the feature? Circle one. YES NO

If yes, check one.

Healthy ☐	Stressed ☐	Dead ☐	Barren ☐	Partial Revegetation ☐	Full Revegetation ☐	Other (specify)
----------------------------------	-----------------------------------	-------------------------------	---------------------------------	---	--	--------------------------------------

15) STAINING Stains may indicate spills, oxidation, or alteration. Are non-water-related stains present? YES NO

If stains are present, check appropriate color or specify other.

Yellow-orange ☐	Gray-black ☐	Other (specify)
--	-------------------------------------	--------------------------------------

16) MACHINERY Is machinery present at this feature? Circle one. YES NO

a) Location of machinery. Check all that apply.

Inside Building ☐	No Building ☐	Outside Building ☐	Other (specify)
--	--------------------------------------	---	--------------------------------------

b) Type of machinery. Check all that apply or specify other.

Amalgamation Equipment ☐	Crusher(s) ☐	Ore Bin(s) ☐	Stamp Mill(s) ☐	Val(s) ☐
Arrastre ☐	Flotation Cell Group ☐	Retort(s) ☐	Tank(s) ☐	
Ball Mill(s) ☐	Leach Tank(s) ☐	Rod Mill(s) ☐	Thickener(s) ☐	
Others (specify)				

17) PHOTOGRAPH NUMBERS 431-05

18) SKETCH NUMBERS

COMMENTS

INVESTIGATION DATE May 30, 95PAGE 5 OF 7

GPS LOCATION

SITE NUMBER 431SITE NAME SheridanEVALUATOR HuchtenAGENCY Okanogan Co. Health Dist.ADDRESS Box 231, OkanoganTELEPHONE (509) 472-7145

1) NEAREST SITE(S) OF HUMAN ACTIVITY (Give distance, circle units, or mark N/A)

Dwelling(s) 1.6 km miSchool N/A km miWorkplace N/A km miCampground 5 km miTrail km miRoad 7.6 km mi

2) SENSITIVE ENVIRONMENTS (If any, give name or distance, if known)

Circle one per group

a) Threatened and Endangered Species UNK YES NOb) Wetlands km mi

UNK YES NO

c) Fisheries km miUNK YES NOd) Other km miUNK YES NO3) WATER Are bodies of water found on or within 2 mi (3.2 km) of the site? Circle one, and check all that apply. YES NOStream ☒River ☐Pond ☐Lake ☐Bay ☐Other Name of nearest water body East Fork Cougar CreekDistance 0.8 km mi

4) AIRBORNE POLLUTANTS

Circle one per group

a) Dust

UNK YES NO

b) Spray

UNK YES NO

c) Vapor

UNK YES NO

d) Other

Name UNK YES NO

5) RADIATION Did pre-field research indicate this area has produced uranium? Circle one.

YES NO

If yes, take radiation reading and record value.

 Counts per second (cps)

6) EXPLOSIVES Are any explosives or blasting supplies found on the site? Circle one.

UNK YES NO

If present, list type and location.

7) OTHER Are any of the following present? Check all that apply, provide comments as necessary below.

Acrid Odor ☐Drum(s)/Tank(s) ☐Overhead Wire(s) ☐Power Substation(s) ☐Tramway(s) ☐Antennas ☐Fence(s) ☐Pipe(s) ☐Scrap Metal ☐Transformer(s) ☐Aviation Hazard(s) ☐Flume(s) ☐Pole(s) ☐Tower(s) ☐Trestle(s) ☐Bag(s) ☐Headframe(s) ☐Power Line(s) ☐Tram Bucket(s) ☐Wooden Structure(s) ☒Chemical(s) ☐Overhead Cable(s) ☐Other (specify) Site appears to have cultural significance or value ☐ (Check if yes)

8) PHOTOGRAPH NUMBERS

431-p2, 431-p3

9) SKETCH NUMBERS

COMMENTS

INVESTIGATION DATE May 30, 1995PAGE 6 OF 7SITE NUMBER 431SITE NAME Sheridan Mine

10) FEATURE Number 03 Fill out one form per feature. Check appropriate box below.

Adit ☒	Decline ☐	Machinery ☐	Ore Stockpile ☐	Quarry ☐	Slope ☐
Building ☐	Glory Hole ☐	Mill Building ☐	Pit, Large, >3 m ☐	Shaft ☐	Subsidence ☐
Cistern ☐	Highwall ☐	Mill Tailings ☐	Pit, Small, <3 m ☐	Solution Mining Well ☐	Sump ☐
Crosscut ☐	Leach Pad ☐	Mine Dump ☐	Placer Mine ☐	Solution Pond ☐	Trench ☐
Other ☐					Tunnel ☐

11) CONDITION Does the condition of the above identified feature represent a physical hazard? Circle one. YES NO

Check the conditions that best describe the physical character of the above feature.

Breached ☐	Collapsed, Partial ☒	Empty ☐	Foundation ☐	Standing ☐	Unstable Walls ☐
Caved ☐	Concealed ☐	Eroded ☐	Intact ☐	Subsided ☐	Wind Erosion ☐
Caved, Partial ☐	Concealed, Partial ☒	Eroded, Partial ☐	Open to Entry ☐	Unconfined ☐	
Collapsed ☐	Confined ☐	Fenced ☐	Rotten Cribbing ☐	Other ☐	

12) SIZE OF FEATURE Indicate size of feature and specify units (feet or meters).

Measurement

Length <u>730</u>	Width <u>10</u>	Depth or Height <u>8</u>	Actual ☐	Feet ☒
			Estimate ☒	Meters ☐
Slope (Degrees) ☐	Bank Stability: Stable ☐	Unstable ☐	Marginally Stable ☒	

13) WATER Is water present at the feature? Circle one. YES NO

Is water emanating from or passing through the feature? Circle one. YES NO

a) If water is present, how does it occur? Check all that apply.

Standing ☒	Filled ☐	Partly Filled ☒	Flowing ☐	Intermittent ☐
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b) If present, determine: GPM: ☐ Conductivity: 1250 μ S/cm pH: 9.0 x 1.5

c) Observe water bed color. (Check all that apply, or specify other.)

Brown ☐	Green ☐	Yellow ☐	Yellow-orange ☒	Orange ☐	Gray-black ☐	Other (specify) ☐
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14) PLANTS Are plants present on or around the feature? Circle one. YES NO

If yes, check one.

Healthy ☒	Stressed ☐	Dead ☐	Barren ☐	Partial Revegetation ☐	Full Revegetation ☐	Other (specify) ☐
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15) STAINING Stains may indicate spills, oxidation, or alteration. Are non-water-related stains present? YES NO

If stains are present, check appropriate color or specify other. Yellow-orange ☐ Gray-black ☐ Other (specify) ☐

16) MACHINERY Is machinery present at this feature? Circle one. YES NO

a) Location of machinery. Check all that apply.

Inside Building ☐	No Building ☐	Outside Building ☐	Other (specify) ☐
--	--------------------------------------	---	--

b) Type of machinery. Check all that apply or specify other.

Amalgamation Equipment ☐	Crusher(s) ☐	Ore Bin(s) ☐	Stamp Mill(s) ☐	Val(s) ☐
Arrastre ☐	Flotation Cell Group ☐	Retort(s) ☐	Tank(s) ☐	
Ball Mill(s) ☐	Leach Tank(s) ☐	Rod Mill(s) ☐	Thickener(s) ☐	
Others (specify) ☐				

17) PHOTOGRAPH NUMBERS 431-02, 431-03

18) SKETCH NUMBERS

COMMENTS

U.S. Bureau of Mines
AML INVENTORY FORM

Part III - Supplemental Data (Notes, Sketches, Photographs, etc.)

PAGE 7

OF

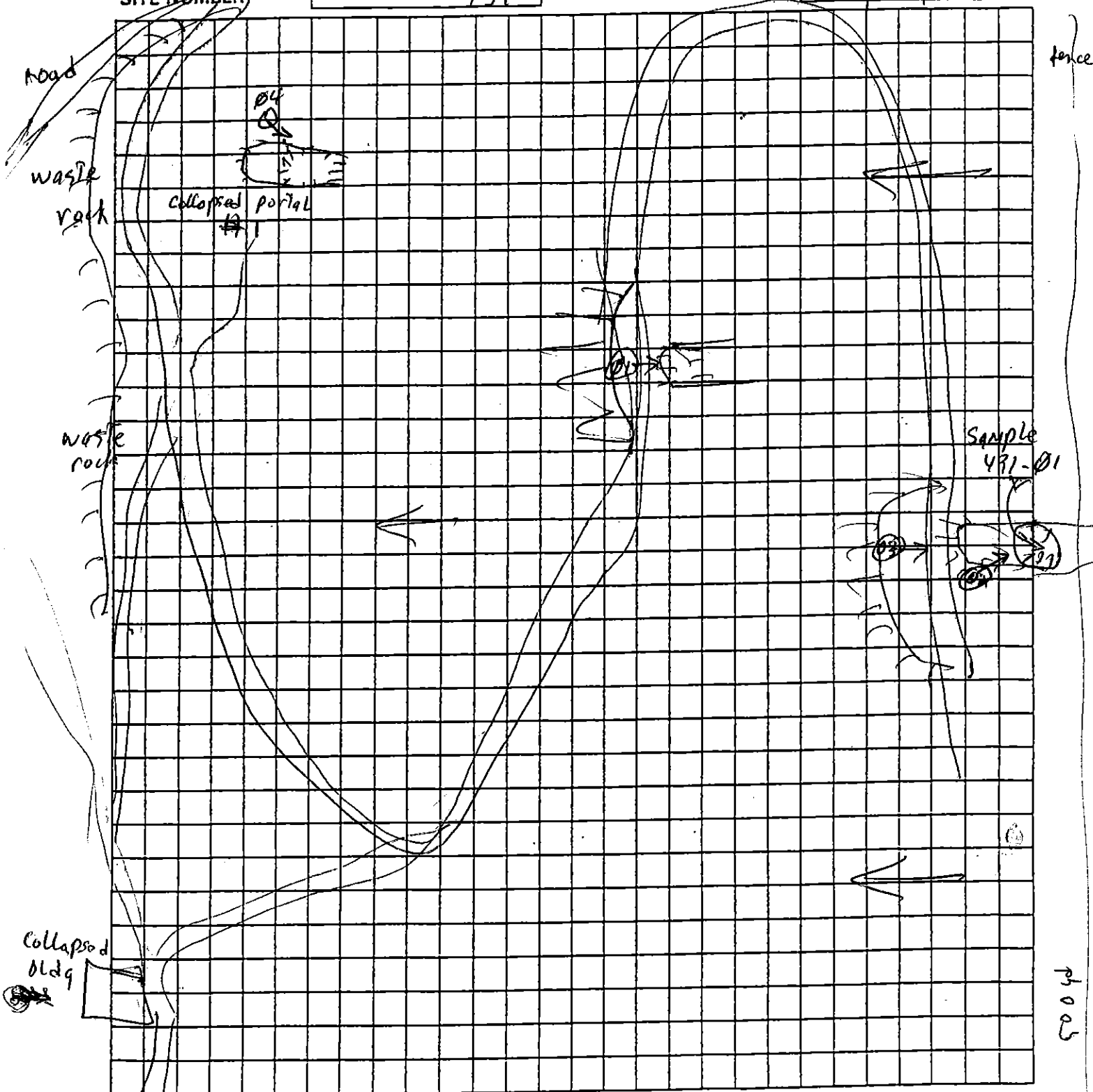
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SITE NUMBER

431

DATE

May 30, 1995



NOTE: Be sure to provide a north arrow and the scale on sketch maps.

300 yd

1 inch = apx. 100 ft.



101

300 yd

Sample 431-02

collapsed Mill



Okanogan County Health District

1234 S. 2nd • Box 231
Okanogan, WA 98840
(509) 422-7140
1-800-222-6410

May 16, 1995

Sampling and Analysis Plan - Sheridan Mine site near Wauconda, WA

1) Site description/history

The Sheridan Mine is located in undeveloped forest land in a small gulch one mile north of East Fork Cougar Creek on U. S. Forest Service property approximately 1 mile west of the Ferry County line seven miles northeast of Wauconda in Okanogan County- Twn. 38N, Rng 31E, SW ¼ NW ¼ Sec.24.

The Sheridan Mine is reported to be an abandoned gold and silver production mine from 1906 to approximately 1919 and also 1920. In 1918 a 50 ton/day flotation mill was built at the mine and produced an estimated \$60,000 to \$100,000 of ore averaging as much as 300 oz/ton silver shipped until 1920. The mine is no longer in operation.

Silver minerals occur in a series of closely spaced, silicified and pyritized shear zones in altered and silicified andesites and dacites of the Toroda Creek graben, a volcanic-tectonic depression resulting from east-west extension during the Eocene. Brecciation of the rocks accompanied the shearing and clasts of the breccia have been considerably altered and silicified by hydrothermal solutions.

The vein was mined from several levels over a vertical distance of about 500 ft. and along a strike for about 400 ft. Several raises connect the different levels of the mine. Most adits have a heading of N35E.

2) Personnel Involved:

Michael Huchton - Okanogan County Health District

3) Sample Analysis:

White Earth Analytical, Inc. of Ephrata was determined to be certified for total metals and toxic characteristic leach procedure analysis in soil and was selected on the basis of convenience of delivery to the lab. Request for analysis has been submitted and sample containers have been shipped to Okanogan County Health District office. Samples are to be delivered to White Earth Analytical by Michael Huchton or Brett & Son courier on May 31, 1995.

4) Sampling:

Proposed date of field sampling - May 30, 1995

Objective - Document the presence/absence of significant contamination concentrations.

Locations - It is intended that one sample be taken from each leaking vat found, one sample taken from at least one heap pile (if any found) at a point where surface water pooling has existed. It is intended that

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one (and also possibly another) soil sample be taken from any worked tailings pile found. (See attached site sketch for approximate locations.) Sampling locations may change in the field. It is intended that one water sample be taken from any surface water found.

Parameter(s) - Soil samples will be analyzed for:

Total metals - Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc

Toxicity Characteristic Leaching Procedure, Metals - Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver

Water samples will be analyzed for:

Dissolved metals - Antimony, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc

Suspicious sites will also be tested for cyanide residues if warranted.

Matrix - Surface soil (exposed) and/or subsurface soil will be sampled. Surface (mine shaft or pit) water will be sampled if present.

Frequency - One time sampling event only.

Containers - Total metals: For solids (soil)- 8 oz. wide mouth glass with Teflon liners

For liquids (water)- Container sufficient to hold 600 mL minimum, with Teflon lined caps

Dissolved metals: For liquids- Polyethylene containers sufficient to hold 600 mL minimum with Teflon lined lids

TCLP: (100% solids)- 8 oz wide mouth glass jars sufficient to hold 600 g, with Teflon lid liners

Cyanide: 250 mL narrow mouth amber polyethylene

Preservative - Water samples are to be acidified to pH <2 with HNO₃; samples will be cooled with ice to 4 degrees C. and stored in cooler until delivery to lab. Cyanide samples to be preserved according to field test procedures.

Decontamination - Some sampling equipment (stainless steel spoons) to be dedicated and returned to lab for disposal and some, if used (large stainless steel digging spoon and/or coring tools) to be decontaminated on site using established decontamination procedures.

5) Site-specific field screening:

It is intended that any surface water present, any standing water at the portal, and any drainage or seepage be field screened for pH with pH litmus paper and for conductivity with a portable field conductivity meter. It is also intended to screen significant tailings or waste rock piles for pH using pH litmus paper on paste with distilled water. The waste rock screening will be determined at site at time of sampling event and will be biased toward high likelihood of storm water runoff encounter and appearance of mineralization.

6) Special Service Order Form and Chain of Custody form completed.

7) Laboratory QA/QC:

Analyses will be done by White Earth Analytical, Inc. of Ephrata which validates its own analytical program by the use of spike recoveries, establishing detection limits for each matrix, and using QC check samples and blanks for surrogate recoveries, etc.

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WHITE EARTH ANALYTICAL

P.O. Box 635 103 12th Ave. S.W. Ephrata, WA 98823
(509)754-3821 (800)462-2007 FAX (509)754-4239

WEA Sample #: WE5053105

Page 1 of 3

Customer Sample #: 431 - 01 *Sheridan Mine*

Date Sampled: 05/30/95

Customer Name: OKANOGAN CO. HEALTH DISTRICT

Date Received: 05/31/95

Cust. Account #: 2219

Due Date: 06/14/95

Parameter	Date Analyzed	Time Analyzed	Analyst	Result	Units
Antimony	6/27	1600	JB	< 0.005	mg/L
Arsenic	6/18	1235	JB	21.78 0.385 ←	mg/L , 017
Beryllium	6/29	1700	JB	0.016	mg/L
Cadmium	6/28	1208	JB	0.006	mg/L
Copper	6/23	1817	JB	1.31	mg/L
Chromium	6/26	1621	JB	0.020	mg/L
Lead	6/29	2359	JB	0.024 ←	mg/L —
Mercury	6/14	0825	JB	< 0.0005	mg/L
Nickel	7/3	1745	JB	1.0	mg/L
Selenium	6/17	1720	JB	< 0.005	mg/L
Silver	6/16	1809	JB	< 0.005	mg/L
Zinc	7/3	1600	JB	1.4	mg/L

Approved by: _____

Date: _____

James D. Blandford
7/6/95

WHITE EARTH ANALYTICAL

P.O. Box 635 103 12th Ave. S.W. Ephrata, WA 98823
(509)754-3821 (800)462-2007 FAX (509)754-4239

WEA Sample #: WE5053106

Page 2 of 3

Customer Sample #: 431 - 02

Date Sampled: 05/30/95

Customer Name: OKANOGAN CO. HEALTH DISTRICT

Date Received: 05/31/95

Cust. Account #: 2219

Due Date: 06/14/95

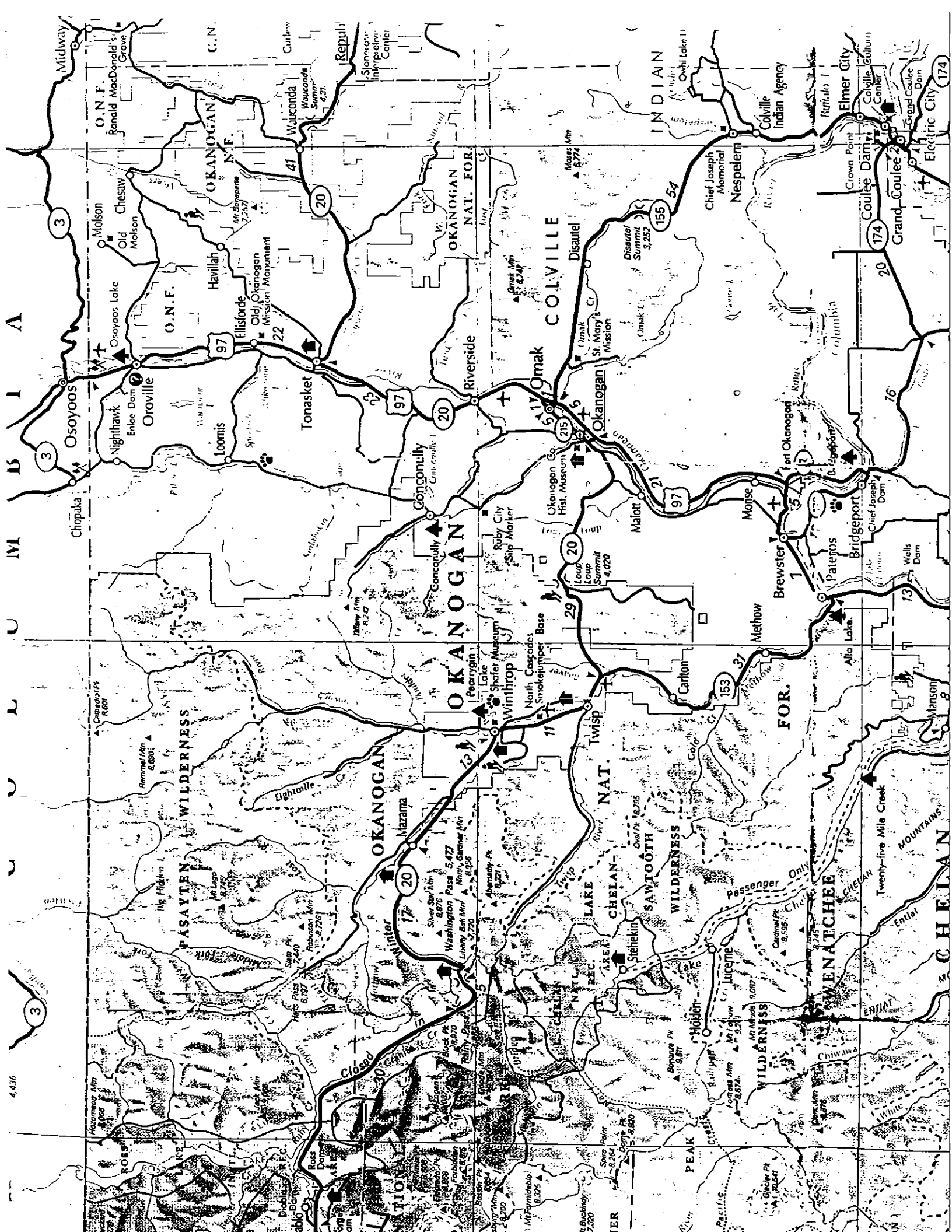
Parameter	Date Analyzed	Time Analyzed	Analyst	Result	Units
Antimony	6/27	1600	JB	< 0.005	mg/L
Arsenic	6/18	1235	JB	19.6	mg/L
Beryllium	6/29	1700	JB	1.5	mg/L
Cadmium	6/28	1208	JB	1.5	mg/L
Copper	6/23	1817	JB	861.6	mg/L
Chromium	6/26	1621	JB	9.7	mg/L
Lead	6/29	2359	JB	453.9 ←	mg/L -
Mercury	6/14	0825	JB	0.03	mg/L
Nickel	7/3	1745	JB	273	mg/L
Selenium	6/17	1720	JB	1.6	mg/L
Silver	6/16	1809	JB	1.11	mg/L
Zinc	7/3	1600	JB	212	mg/L

Approved by: _____

James D. Blanchard

Date: _____

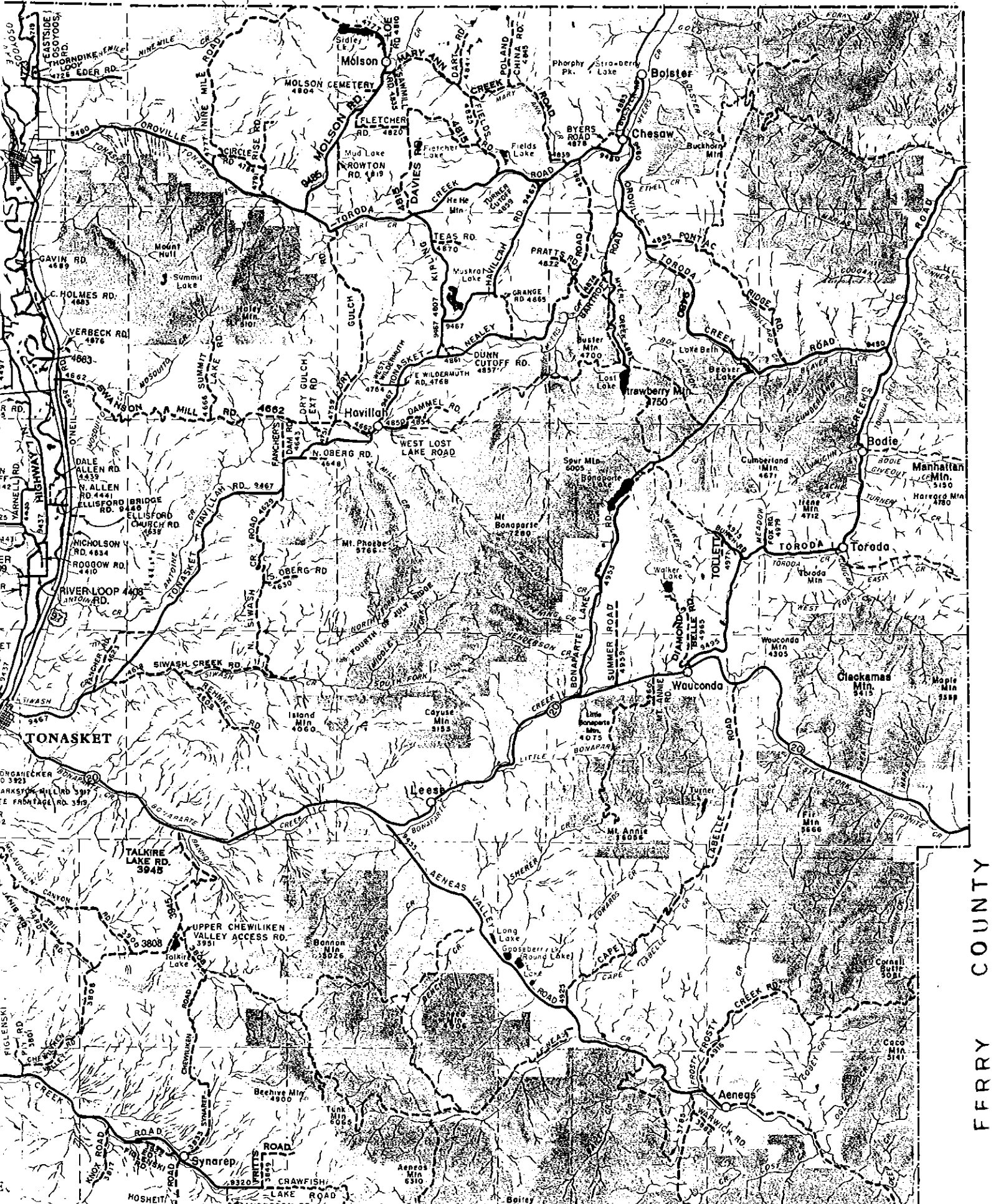
7/10/95



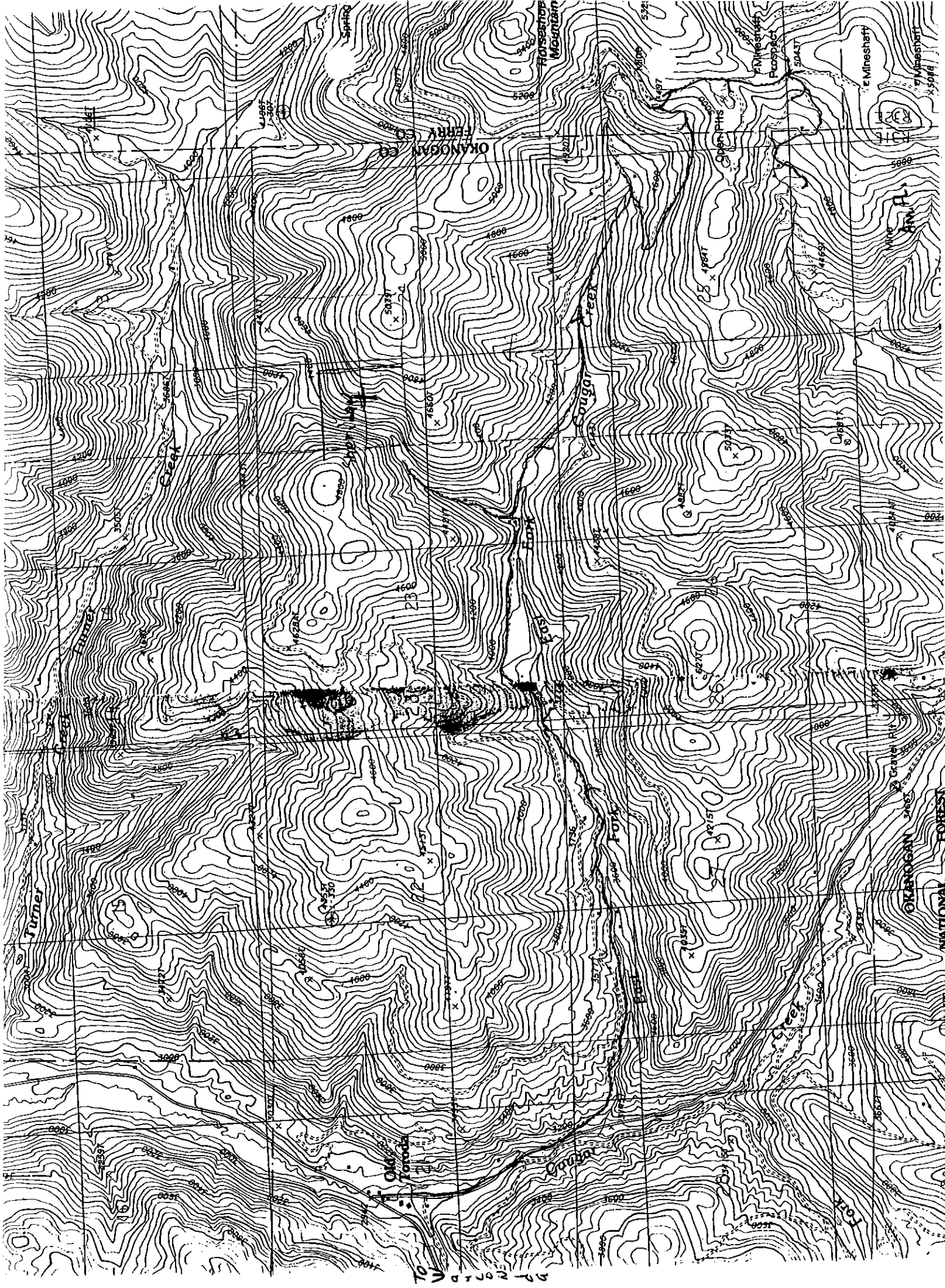
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ISH COLUMBIA



FERRY COUNTY





Okanogan County Health District

237 North 4th • Box 231
Okanogan, WA 98840
(509) 422-7140
1-800-222-6410

Date: August 23, 1995

To: Tony Grover, DOE CRO
Don Abbott, DOE CRO

From: Michael Huchton, Okanogan County Health District

RE: Summary of Partial Results of Abandoned Mine Land
Investigations

Listed below is a summary of results of analytical testing of soil and surface water from the 14 of 22 completed investigations for which results have been received. Each of the listed contaminants has been determined to be above MTCA cleanup levels as extracted from the Model Toxics Control Act Cleanup Levels and Risk Calculation (CLARC II) Update, August 31, 1994. These interpretations are based upon consideration of water standing at the portal of a mine and of water flowing on the surface just prior to submerging into soil, as surface water. (Consideration of these waters as groundwater or actually sampling from groundwater would, of course, result in higher factors of contamination as well as additional contaminants considered to be above cleanup levels.)

A table of priority metals analyzed, together with approximate cleanup levels utilized in this investigation, is included in this transmission.

<u>MINE</u>	<u>CONTAMINANT</u>	<u>FACTOR ABOVE CLEANUP LEVEL</u>	<u>MATRIX</u>
First Thought	Arsenic	37X	soil
	Arsenic	18X	soil
	Lead	--	soil
	Arsenic	83X	water
	Cadmium	36X	water
	Lead	--	water
	Copper	2.3X	water
	Zinc	2.8X	water
Last Chance	Arsenic	14X	soil
4th of July	Arsenic	5X	soil
	Lead	--	soil
	Mercury	1.6X	soil

Sheridan	Arsenic	27X	water
	Lead	--	water
	Lead	--	soil
American Flag	Lead	--	soil
Antimony Queen	Antimony	2.8X	soil
	Arsenic	75X	soil
Bodie	Antimony	2.6X	soil
Black Bear	Lead	--	soil
Pinnacle	Arsenic	24X	soil
Alder	Cadmium	2.5X	water
	*Arsenic	*2.9X	*soil
	*Cadmium	*4X	*soil
	*Lead	*--	*soil

*Not Official (due to lack of proper notification of PLP prior to sampling event)

[Note: the Arlington Mine tailings pile will probably contain elevated total metal levels of Arsenic, Lead, and Selenium based upon the extrapolation of TCLP results and similar comparisons of total metal vs TCLP results.]

The only 'clean' mines investigated to date are the Red Shirt, War Eagle, Minnie (water only), and possibly Arlington.

Eight additional mines have been investigated and are awaiting results of analysis.

Approximately 12 to 14 additional mines will be investigated before completion of project.

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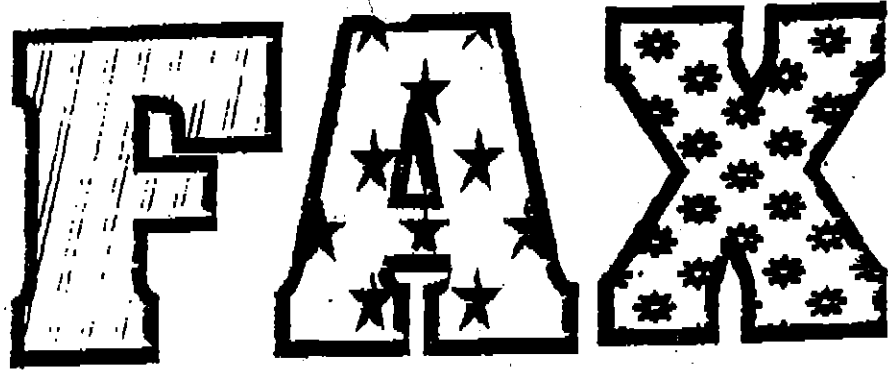
Okanogan County Health District

237 North 4th • Box 231
Okanogan, WA 98840
(509) 422-7140
1-800-222-6410

NAME	Groundwater (Method B)	Surface Water (Method B)	Soil(Res) (Method B)	Soil(Ind) (Meth. C)
	ug/L(ppb)	ug/L(ppb)	mg/Kg(ppm)	mg/Kg(ppm)
Antimony	6.4	1040	32	1400
Arsenic	4.8	17.7	60	2600
Beryllium	80	682	400	17500
Cadmium	8	20.3	80	3500
Chromium	80;1600	162,000	8000	17500
Copper	592	2660	2960	130000
Lead	-	-	-	-
Mercury	4.8	-	24	1050
Nickel	320	1100	1600	70000
Selenium	80	-	400	17500
Silver	80	25000	400	17500
Zinc	4800	16500	24000	105000



OKANOGAN COUNTY
HEALTH DISTRICT
P.O. BOX 231
237 N. 4th
OKANOGAN, WA. 98840
(509) 422-7140
1-800-222-6410



FAX 1-509-422-7142

TO : Tony Grover & Don Abbott
FROM : Michael Huchton - Okanogan Co. H.D.

DATE : Aug. 24, '95

TOTAL PAGES INCLUDING COVER: 4

CONTACT : (509) 422-7145

COMMENTS : Here's an advance summary

since Michael Spencer will be at your office

Today and this was to be one of the topics.
RMT

