



***Abandoned Mine Lands
Initial Investigation Report
Princess Maude Mine
Republic, Washington***

***Prepared for
Washington State
Department of Ecology***

***December 28, 2006
17274-00(PM)***

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Rick Roeder, Project Manager***

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Prepared by
Hart Crowser, Inc.



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EXPIRES 12/03/2007

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ABANDONED MINE LANDS INITIAL INVESTIGATION REPORT

PRINCESS MAUDE MINE

REPUBLIC, WASHINGTON

1.0 EXECUTIVE SUMMARY

Information obtained during this assessment is summarized in Table 1:

Table 1 – Princess Maude Mine Data Summary

Mine Name:	Princess Maude Mine (Southern Republic)
Last Known Operation:	Ore was shipped from this mine; however, no volume or date was located. According to Huntting (1956), there was a 70-foot incline and a 200-foot adit from which 200-foot and 300-foot drifts were driven. The claim was patented; however, no evidence of a currently active patent was located. The last shipment of ore recorded from the Republic-area mines was in 1946 (Huntting).
Location:	1.0 mile southwest of Republic, Washington by road, in Ferry County. Latitude, Longitude: 48.63226, 118.74833 Quadrangle Map: Storm King Mtn. and Republic TRS: Township 36N, Range 32E, Section 12, center
Features Observed	Three waste rock piles (approximately 1,200 CY) Ten small, dry, open pits
Results above Criteria	Five waste rock samples exceeded MTCA criteria for human health criteria for arsenic and ecological protection criteria for arsenic and mercury. Some samples also exceeded ecological criteria for antimony, nickel, and silver. The arsenic concentration in one waste rock sample has the potential to fail TCLP dangerous waste criteria.
Work by Others	No previous site assessment information was identified.
Potential Receptors / Degree of Hazard	Human health risks are possible for recreational and occupational (logging) users. A site-specific terrestrial ecological evaluation is required to evaluate risk to ecological receptors.

2.0 INTRODUCTION

This report summarizes the results of the initial limited soil and surface water investigation at the Princess Maude Mine site located near Republic, Washington (Figures 1 and 2). Hart Crowser performed this initial investigation

for the Washington State Department of Ecology (Ecology) under Contract No. C06254 according to the Ecology Statement of Work (SOW) and project Sampling and Analysis Plan (SAP) prepared by Hart Crowser (Hart Crowser 2006).

The objectives of this initial investigation are to:

- Determine whether the site has released or has a potential to release hazardous substances to the environment at concentrations above Model Toxics Control Act (MTCA) human health or ecological screening levels, to identify sites that may require additional investigation and sampling;
- Identify and document waste source areas including estimates of waste mass and/or volume; and
- Identify and document the presence of potential waste transport pathways and receptors.

For this study, samples were collected of the soil-like fraction of waste rock, mine tailings, and/or natural soils that was potentially affected by mining. Analytical results were compared to the MTCA criteria for soils. Use of terms such as “soils” or “waste rock”, etc. are for convenience only and do not indicate potential future designation in accordance with Chapter 173-350 WAC, or Chapter 173-303 WAC, or other regulatory criteria.

Subsurface openings observed for this study may include shafts, adits, prospect pits, collapsed stopes, and/or excavations completed for other purposes. The terms used in this report are based on visual interpretation in the field and may not fully characterize historic site use.

Prior to the site visit, Hart Crowser performed file reviews; evaluated aerial photographs, U.S. Forest Service and USGS maps; reviewed the Inventory of Washington Minerals; and reviewed county tax assessor records to:

- Identify the location of mines and associated features/structures;
- Identify property owners, mineral claimants, and mine operators; and
- Obtain contact information to gain permission for site access.

Table 2 presents the project team members and their roles and responsibilities for this investigation. A site visit was accomplished on June 12 and 13, 2006.

3.0 SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

3.1 Site Location

The Princess Maude Mine is located on private land 0.5 mile southwest of the town of Republic, Washington, on Copper Mountain (Figures 1 and 2). The land is owned by and access permission was granted from Vaagen Bros. Lumber (565 West 5th Colville, WA 99114).

To reach the site from Republic:

- Go south on State Route 21 toward the Keller Ferry.
- In about half a mile, turn west onto Pendale Road. Set odometer to 0. Pass the Gun Range and go up the hill.
- At 0.9 mile, stay to the left, on the main road.
- At 1.4 miles, you will see two parallel roads on the left, one higher than the other, a road straight ahead, and a logging road on the right. Take the upper road on the left.
- You will come to another fork in the road, splitting to the left, center, and straight. The left road has a gate. Go straight ahead, up the hill. The road turns to the left (south). Some of the exploratory pits lie slightly uphill of the road about 100 feet after the left turn. The larger pits and shafts are about 800 feet south, below the road. There is a large waste rock pile on the uphill side of the road at that point.

The access description provided herein is based on observations at the time the site was visited for this work. References to roads do not reflect property ownership, and does not imply that public access is available.

The Butte and Boston Mine is below the Princess Maude Mine, to the east (Figures 1 and 2). The Princess Maude Mine is located on Ferry County Tax Parcel No. 23612900004000.

3.2 Site Description

The Princess Maude Mine is an inactive gold and silver mine. The last date of operation is unknown, but may have been 1946, when the Republic Mine shut

down. A waste rock pile, WR-1, of approximately 500 cubic yards lies downslope of a collapsed adit and contains light gray andesite (Photograph 1).

A second waste rock pile, WR-2, of approximately 300 cubic yards is north and downslope of WR-1 (Photograph 2). Five pits of varying size are arranged in a line extending east from WR-2. The average size of these pits is approximately 10 by 12 by 6 feet deep (Photograph 3).

Approximately 500 feet north of WR-2, is a third waste rock pile, WR-3, sitting just east of the access road. WR-3 is approximately 400 cubic yards in volume and is surrounded by another line of seven pits, oriented north-south. The pits range in size from 2 by 2 feet, to 16 by 16 feet. The layout of waste rock piles and pits is shown on Figure 3. A cross sectional view is presented on Figure 4.

There is active logging surrounding the site. Evidence indicating the presence of deer (droppings and bones) and human activity (bottles and cans) was abundant.

No seeps or ponds were observed on the site. The nearest surface water is a tributary of North Fork Creek, located approximately 3,000 feet to the west. No residences or cabins were observed in the vicinity though a gun club is located 0.75 mile from the site and the town of Republic is about 1.25 miles to the northeast.

3.3 Site Ownership and Operations History

Information on site ownership and operations is based on readily available public information and may not reflect all details of ownership and operations. An ownership timeline is shown in Table 3.

Table 3 – Ownership Timeline

Date	Owner	Notes
Current Land Ownership	Vaagen Brothers Lumber (including mineral rights)	Parcel No. 23612900004000, Ferry County Tax Assessor
Current Claim Ownership	No currently patented claim was located.	Ferry County Tax Assessor
12-28-2004	Hecla Mining Company sold 10 parcels to Vaagen Brothers Lumber	Vaagen Brothers Lumber (Ferry County)
11-22-2004	Hecla Mining Company sold 9 parcels to Vaagen Brothers Lumber	Vaagen Brothers Lumber (Ferry County)

Date	Owner	Notes
10-21-1981	Day Mines, Inc. merged into Hecla Mining	Hecla Mining Co. (University of Idaho)
04-25-1979	Knob Hill Mines sold three parcels to Day Mines, Inc.	Day Mines, Inc. (Ferry County)
1932	Blaine-Republic Co.	Huntting, 1956
1915-1926	Alliance Mining Co.	Huntting, 1956
1914	Anaconda Gold Mining & Reduction Co.	Huntting, 1956
1910	Southern Republic Mining Co.	Huntting, 1956

4.0 SITE INVESTIGATION ACTIVITIES

An initial site investigation was conducted on June 12 and 13, 2006. Photographs were taken, and GPS waypoints and waste rock samples were collected. Site sketches showing mine features and sample locations were completed. Photo locations and directions, GPS waypoints, sample locations, and the likely direction of surface water flows are shown on Figure 3.

4.1 Soil and Waste Pile Sampling

Five waste rock samples were collected. Two samples were collected from WR-1, two were collected from WR-2, and one sample was collected from WR-3. Sample descriptions are provided in Table 4 and analytical results are presented in Table 5.

4.2 Surface Water and Seep Sampling

No surface water drainage or seeps were observed at the time of our site visit. Therefore, no water samples were collected.

4.3 Sediment Sampling

Because there was no surface water drainage on site, no sediment samples were collected.

5.0 ANALYTICAL RESULTS AND ENVIRONMENTAL HAZARD ASSESSMENT

Soil and water quality data were compared to regulatory criteria for screening purposes as discussed below. Further analysis, including risk-based analyses may be appropriate in additional future site assessments.

5.1 Soil

Soil and waste rock sample analytical results were compared with applicable MTCA Method A cleanup levels, MTCA Method B cleanup levels for soil ingestion, soil ingestion and dermal contact combined, and with criteria for ecological protection of plants, soil biota, and wildlife. The five samples collected (Maude-WR1-S1, Maude-WR1-S2, Maude-WR2-S1, Maude-WR2-S2, and Maude-WR3-S1) exceeded both Method A and Method B criteria for arsenic. These five samples also exceeded ecological criteria for arsenic and mercury. Maude-WR2-S1 and Maude-WR3-S1 exceeded the ecological criteria for silver, while Maude-WR1-S1 and Maude-WR2-S1 exceeded the ecological criteria for nickel and antimony, respectively. The arsenic concentration in sample Maude-WR1-S2 is high enough to potentially fail toxicity characteristic leaching procedure (TCLP) criteria for dangerous waste. Analytical results are summarized in Table 5.

5.2 Air

No air samples were collected. Although the waste rock piles were exposed, no windblown dust or other indication of airborne contaminants was observed. Since there are no residences or cabins in the vicinity, airborne contaminated dust would only pose a threat to potential recreational or occasional occupational site users.

5.3 Methodology for Threatened and Endangered Species Information

We contacted the Washington State Department of Natural Resources (DNR), the Washington State Department of Fish and Wildlife (WDFW), the U.S. Fish and Wildlife Service (USFWS), and the Colville National Forest – USDA Forest Service to obtain information on the presence of state and federal threatened or endangered terrestrial and aquatic species. We determined that the WDFW maintained the most accurate and up-to-date information on species distribution in its Priority Habitats and Species (PHS) Database. We requested maps and narratives identifying documented species presence at the Princess Maude Mine. In addition, we contacted DNR and requested information on rare plants and high quality native wetland and terrestrial ecosystems within the vicinity of the Princess Maude Mine.

Our search ranges included a 4-mile radius for terrestrial species and a 15-mile radius for aquatic species.

We reviewed approximately 86 PHS maps and accompanying narratives to determine whether any threatened or endangered species were documented within our search ranges. We drew 4- and 15-mile radii around the Princess Maude Mine on a Colville National Forest Map. We then examined the PHS maps in relation to the search ranges for our project areas. All state and federal threatened and endangered species and habitats that occurred within our search ranges were recorded. Species and habitats that occurred on the edge of our search range were considered within the range and recorded.

A summary of the threatened and endangered species within our search ranges is provided in Table 6.

6.0 SUMMARY AND CONCLUSIONS

The Princess Maude Mine site contains several small pits and 1,200 cubic yards of waste rock with the potential to exceed MTCA and ecological protection criteria. The main contaminants of concern are arsenic and mercury, though some waste rock also exceeds the ecological criteria for antimony, nickel, and silver. Human health risks would be limited to potential recreational or occupational site users. MTCA Method A and B screening criteria may overestimate risk to recreational users since their exposure duration is less than the duration for a residential scenario. A site-specific terrestrial ecological evaluation (TEE) would be required to evaluate ecological risks. Additional sampling and analysis are required to determine if waste rock exceeds TCLP dangerous waste criteria for arsenic.

Potential exposure pathways are shown on Figure 5.

7.0 USE OF THIS REPORT

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature and conditions of the work completed, in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of the Washington State Department of Ecology, for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

The information in this report is intended to be used to determine whether the site has released or has a potential to release hazardous substances to the environment at concentrations above Model Toxics Control Act (MTCA) human health or ecological screening levels.

8.0 REFERENCES

Ecology 1990. Washington Ranking Method Scoring Manual. Ecology Publication 90-14. Revised April 1992.

Ecology 2001a. Model Toxics Control Act Cleanup Levels and Risk Calculations (CLARC II) Update. November 2001.

Ecology 2001b. Adopted Amendments. Model Toxics Control Act Cleanup Regulations. Chapter 173-340-WAC. February 2001.

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<http://ferrywa.taxsifter.com/taxsifter/T-Parcelsearch.asp> accessed numerous times. Tax maps are available only at the Assessor's office in Republic, Washington.

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Mindat.org website <http://www.mindat.org/index.php>

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Warring, Mary S., 2006 "Eureka! There's Gold in Ferry County: With Emphasis on the Republic Mines." Ferry County Historical Society, Republic, Washington, 2006.

J:\Jobs\1727400\Princess Maude\Princess Maude Report.doc

Table 2 - Project Team Roles and Responsibilities

Project Role	Personnel Assignment	Roles/Responsibilities
Ecology Project Manager	Rick Roeder Ecology (509) 454-7837	Client Project Manager
Program Manager	Mike Bailey Hart Crowser (206) 324-9530	Ensures that all work is carried out in accordance with contractual obligations and the Delivery Order statement of work. Assists the Project Manager as needed with technical decisions and in resolving issues. Final reviewer.
Project/Task Manager	Roger McGinnis Hart Crowser (206) 324-9530	Overall responsibility for execution of the Work Plan. Coordinate with Client, Field Manager and Program Manager as necessary to resolve issues.
Corporate Health and Safety Officer (HSO)	Mike Ehlebracht Hart Crowser (206) 324-9530	Overall responsibility for review and answering questions regarding H&S.
Field Manager and Site Safety Coordinators (SSC)	Abby Bazin/Pat Reed Hart Crowser (206) 324-9530	Ensures that explorations are conducted and samples are collected in accordance with project specifications. Coordinates field activities with Project and Program Managers.
Mine Information Research	Pat Reed Mike Swenson Hart Crowser (206) 324-9530	Determined location of mine, access route, and ownership
Project Chemist	Erin Breckel Hart Crowser (206) 324-9530	Performs laboratory coordination and data quality review to assure analytical methods and data are consistent with project needs and data quality objectives.
Laboratory Services	Harvey Jacky Columbia Analytical Services (360) 577-7222	Analyzes soil, sediment, and water samples.

Table 4 – Princess Maude Mine Sample Inventory

Sample Name	Sample Location	Sample Description
Waste Rock Samples		
Maude-WR1-S1	Center of WR-1	Dark brown, gravelly, silty SAND overlain by a gray, weathered sandy GRAVEL
Maude-WR1-S2	Southeast end of WR-1	Dark brown, gravelly, silty SAND overlain by a gray, weathered sandy GRAVEL
Maude-WR2-S1	South end of WR-2	Moist, gray-brown, silty, sandy GRAVEL
Maude-WR2-S2	North end of WR-2	Moist, brown, silty, gravelly SAND
Maude-WR3-S1	Center of WR-3	Dry to moist, red-brown, silty, sandy GRAVEL

Table 5 - Analytical Results for Soil Samples - Princess Maude Mine

Sheet 1 of 2

SDG Sample ID Sampling Date	MTCA Method A (a)	MTCA Method B		Ecological Protection (c) Plant/Soil Biota/Wildlife	K0605942 Maude-WR1-S1 6/13/2006	K0605942 Maude-WR1-S2 6/13/2006	K0605942 Maude-WR2-S1 6/13/2006
		Soil Ingestion (b)	Soil Ingestion & Dermal Contact (b)				
Total Solids in %					98.7	99.1	99.3
Total Metals in mg/kg							
Aluminum	--	80,000	72,072	50 / -- / --			
Antimony	--	32	29	5 / -- / --	0.92	1.02	6.74
Arsenic	20	0.67	0.62	10 ^(d) / 60 / 132	22.3	111	43.7
Beryllium	--	160	144	10 / -- / --	0.63	0.74	0.57
Cadmium	2	80	74	4 / 20 / 14	0.14	0.2	0.19
Chromium	2,000 ^e	120,000 ^e	44,571 ^e	42 / 42 / 67	27.5	25.9	18.2
Copper	--	2,960	2,700	100 / 50 / 217	28.8	19.5	33.7
Iron	--	24,000	21,622	-- / -- / --			
Lead	250	--	--	50 / 500 / 118	16	19.9	10.2
Manganese	--	11,200	10,090	1,100 / -- / 1,500			
Mercury	2	24	18	0.3 / 0.1 / 5.5	0.88 J	0.13 J	0.36 J
Nickel	--	1,600	1,441	30 / 200 / 980	32.7	24.2	12.3
Selenium	--	400	360	1 / 70 / 0.3	1 U	1.5 J	1 U
Silver	--	400	360	2 / -- / --	0.42	1.17	6.57
Thallium	--	5.6	5.0	1 / -- / --	0.06	0.12	0.08
Zinc	--	24,000	22,000	86 / 200 / 360	68.1	66.1	40.9

Table 5 - Analytical Results for Soil Samples - Princess Maude Mine

SDG	K0605942	K0605942
Sample ID	Maude-WR2-S2	Maude-WR3-S1
Sampling Date	6/13/2006	6/13/2006
Total Solids in %	98.0	98.6
Total Metals in mg/kg		
Aluminum		
Antimony	2.1	2.05
Arsenic	96.8	174
Beryllium	1.08	0.4
Cadmium	0.21	0.05 J
Chromium	23.2	24.8
Copper	28.1	26.9
Iron		
Lead	15.9	16.3
Manganese		
Mercury	0.32 J	0.22 J
Nickel	23.2	12.4
Selenium	1.3 J	4
Silver	1.86	15.9
Thallium	0.16	0.07
Zinc	62.7	49.8

Notes:

U = Not detected at the detection limit indicated.

J = Estimated value.

-- Not established or Not applicable.

Bold - Concentration exceeds ecological criterion.

Box - Concentration exceeds MTCA Method A or Method B criterion.

(a) WAC 173-340-740(2), WAC 173-340-900 (Table 740-1). Model Toxics Control Act (MTCA) Method A.

(b) WAC 173-340-740(3). MTCA Method B Unrestricted land use soil cleanup standards. For carcinogenic constituents, the value presented is the lower of the non-carcinogenic and carcinogenic level calculated using Equations 740-1 and 740-2 for ingestion only. Equations 740-4 and 740-5 for ingestion and dermal contact. Information from CLARC 3.1 was used unless otherwise noted.

(c) WAC 173-340-740(3)(b)(ii), WAC 173-340-749, WAC 173-340-900 (Table 749-3).

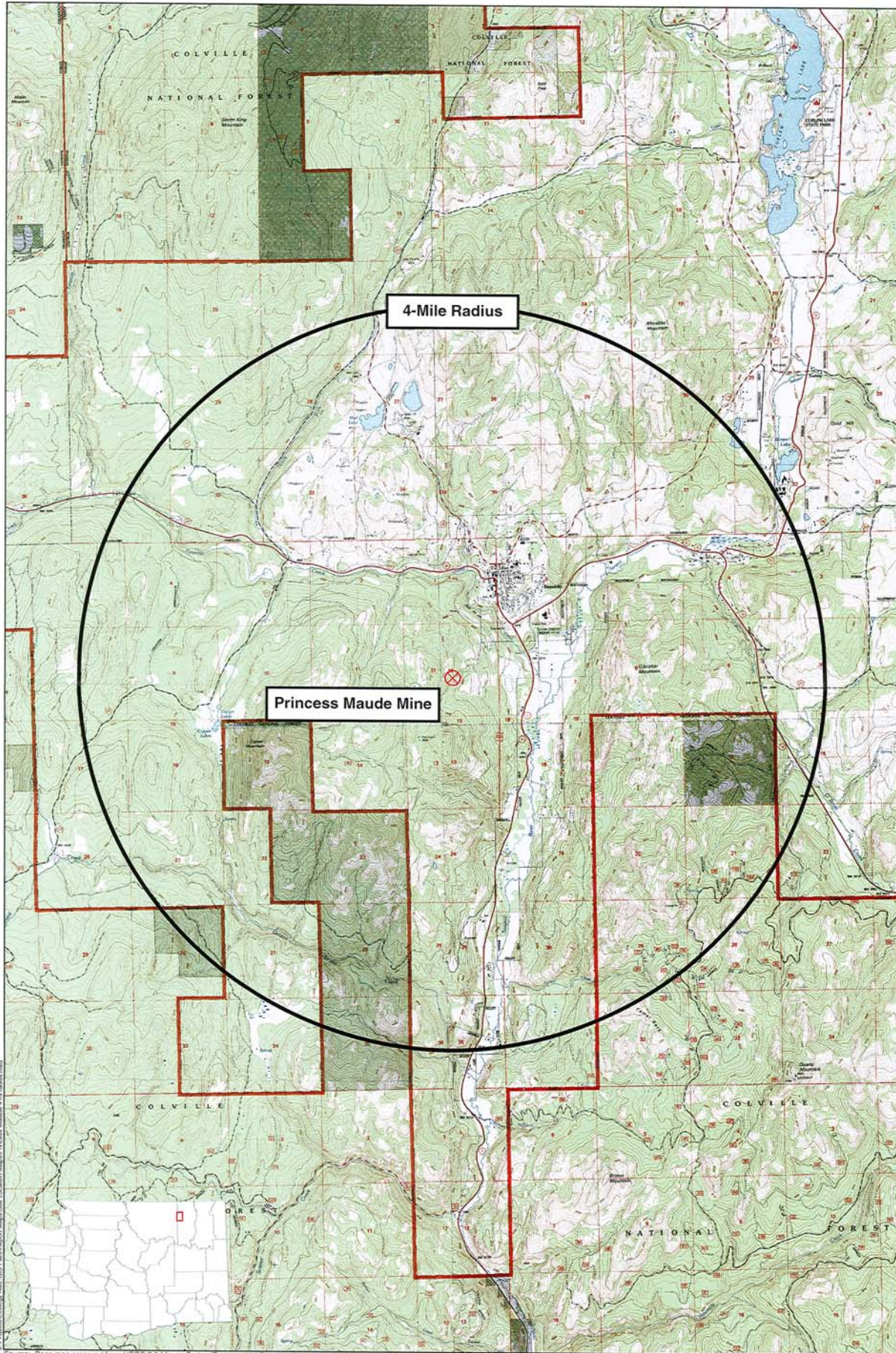
(d) Based on Arsenic V (10 mg/kg)

(e) Based on Chromium III

Table 6 - Threatened and Endangered Species

Species	Federal Status		State Status		Narrative
	T	E	T	E	
Grizzly bear (<i>Ursus arctos</i>)	X			X	Near Sanpoil River

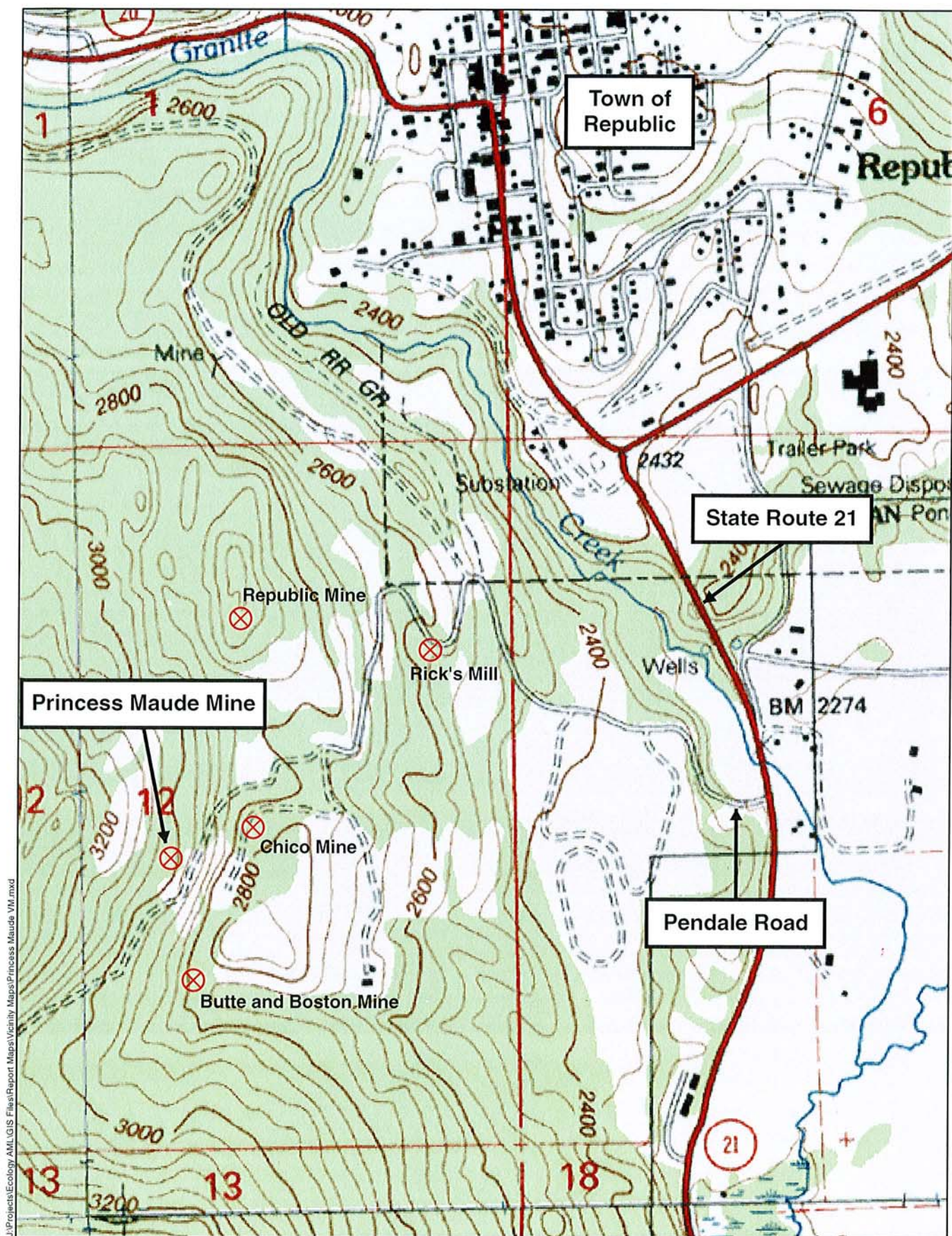
Site Location Map
Princess Maude Mine



Source: Base map prepared from USGS 7.5 Minute Series (Topographic) Bear Mt. Quadrangle (1992), Republic Quadrangle (1992), Swan Lake Quadrangle (1992), and Storm King Mtn. (1992).

0 0.5 1 2
 Scale in Miles

Vicinity Map Princess Maude Mine



Source: Base map prepared from USGS 7.5 Minute Series (Topographic) Bear Mt. Quadrangle (1992), Republic Quadrangle (1992), Swan Lake Quadrangle (1992), and Storm King Mtn. (1992).

0 500 1,000

Scale in Feet

⊗ Mine Location Visited in Field



HARTCROWSER











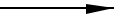






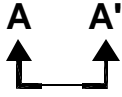
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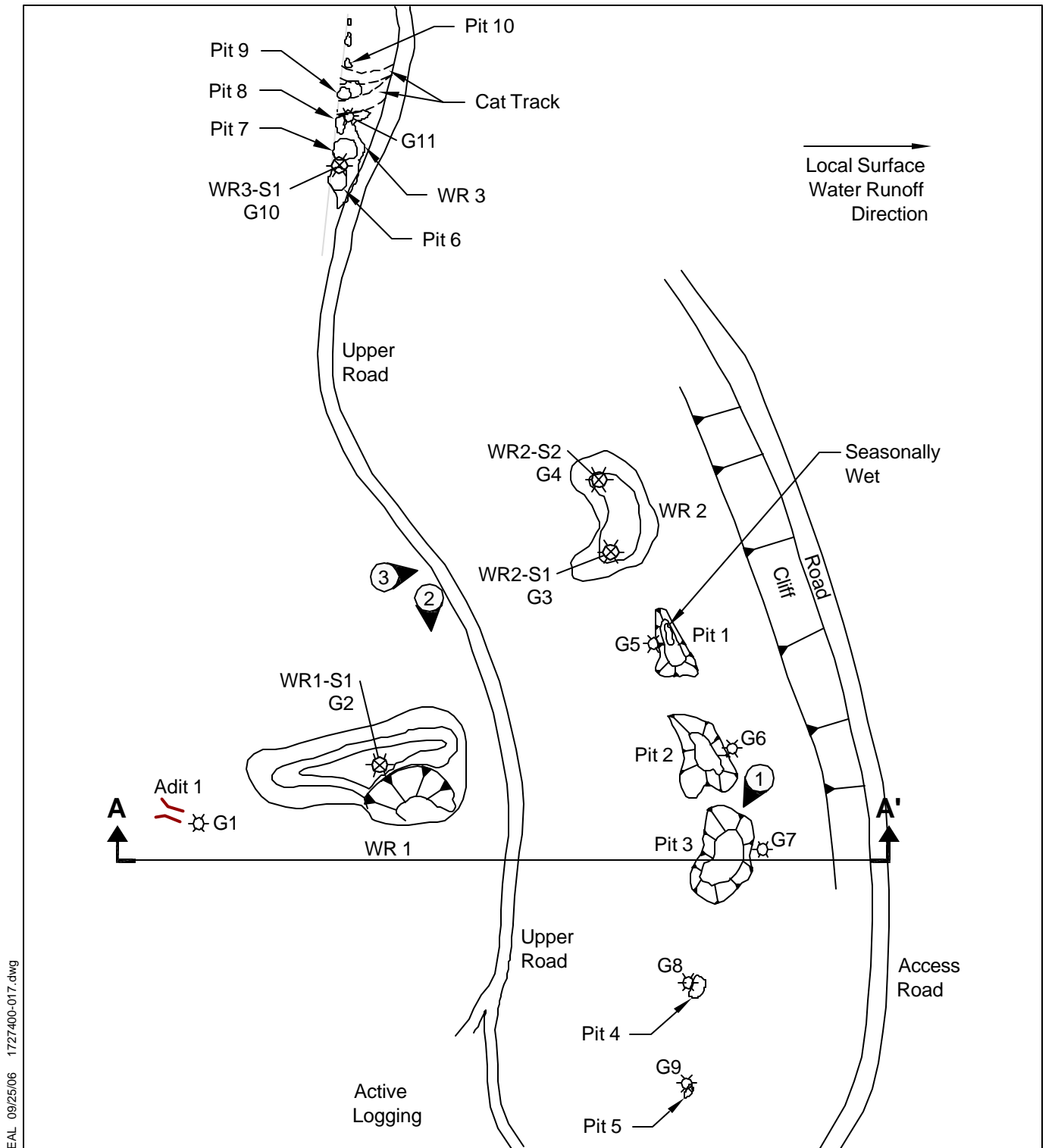
Figure 2

Standard Key for Site Plan

Princess Maude Mine

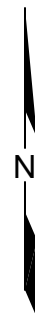
	GPS Data Point Location and Number
WR1-S2 	Soil or Waste Rock Sample Location and Number (Note: Site name prefix also part of sample number)
W1 	Water Sample Location and Number
45 	Composite Sediment Sample Location and Number
	Adit
	Shaft
	Prospect/Pit
	Building/Structure
	Seep
	Drainage Channel
	Intermittent/Seasonal Drainage Channel
	Wood Debris
	Metal Debris
	Soil or Seep Staining
	Other Feature
	Groundwater Well
	Photo Location, Number and Direction
	Approximate Cross Section Location and Designation

Site Plan Princess Maude Mine



EAL 09/25/06 1727400-017.dwg

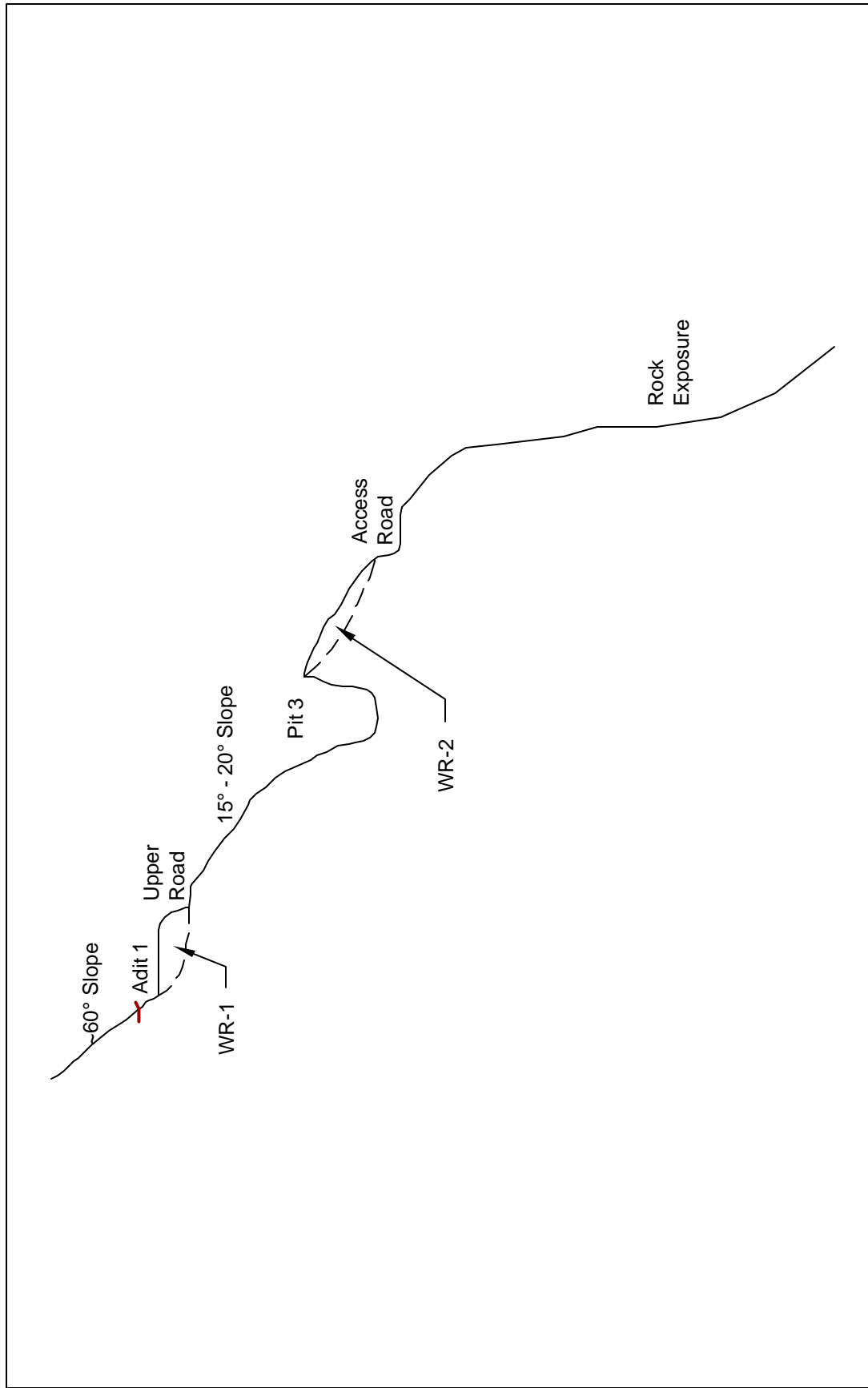
Source: Base map prepared from...



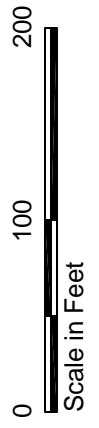
0 100 200
Scale in Feet

HARTCROWSER
17274-00 (PM) 9/06
Figure 3

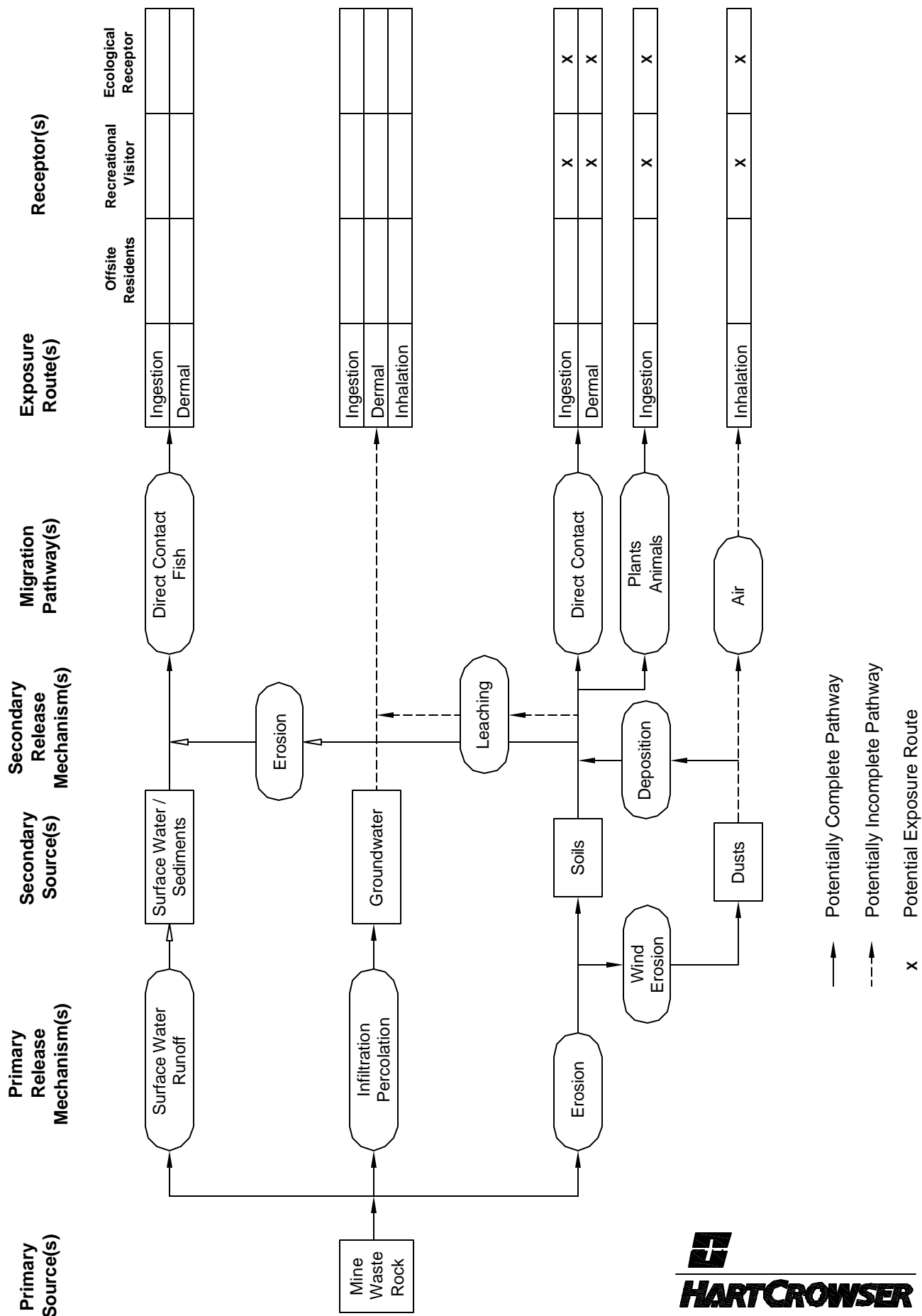
Cross Section A-A' **Princess Maude Mine**



Source: Base map prepared from...



Mine Waste Rock Conceptual Site Model for Human and Ecological Risk Princess Maude Mine



APPENDIX A FIELD DOCUMENTATION

AML Feature Inventory

Feature ID Princess Maude
 Surveyor(s) Alroy Babin, Pat Reed

USGS Quad: Republic

Survey Date 6/12 & 6/13/06

Directions to Site (from a main road or landmark appearing on map)

From Repulse Bay 2.1 south approximately 1 mile
 Turn right (west) on Pleasure Rd. at 0.9
 0.9 stay left at white sign
 1.4 go left turn onto Pleasure Rd. to the left.
 1.5 go right at white road, up the hill.
 At triangle about 30 m go right, follow up the hill.
 White road #103 starts immediately on right, more further south below the road.

Terrain Slope (Circle where applicable): 1. Flat 2. Vertical 3. Sloped (if sloped, report approx slope angle)
 slope angle: deg

Physical Features / Sources

Mine Openings:

Count / ID	Condition: (open / closed / collapsed / flooded / other)	Nominal Dimensions in feet	Water Present (Y/N)	Flowrate in GPM	pH	Cond in mS	Temp in C	Animals Present (for bats, other)	Photo # (Site-Photos-Date)	GPS Coord (Report in NAD 83, WA North Zone, State Plane Coordinates, Units of Feet)	Elevation in feet above MSL*
Shells											
ad(s)	Collapsed	see sketch	N	X				22		see GPS	
pile(s)	open		N								
other (explain)											

*Elevation Measurement Method: B=barometer, T=Topo Map, O=Other (explain)

Mining Activity-Related Piles:

Count / ID	Dimensions in ft (L x W x H)	Seepage Visible? (Y/N)	Seepage: Active / Inactive?	Estimated Particle Gradation (eg. 0.5" - 2")	# of Samples	% Ground Cover	Distressed Vegetation (Y/N)	Recent Human Activity (Y/N)	General Description of Location(s)
waste rock pile(s)	see sketch	N	N/A		1/2/1	20%	N	by	Active logging camp
tailings pile(s)									
ore / leach pile(s)									
debris pile(s)									
other (explain)									

Miscellaneous Notes:

AML Feature Inventory

Feature ID Princess Maude

Surveyor(s) Abby Bazin, Pat Reed

Survey Date 6/12/06

6/13

Physical Features / Sources (Continued)

Mining Activity-Related Ponds or Liquid Containment Structures:

Count / ID	Dimensions in ft (L X W X H)	Lined (Y/N)	Liquid Present (Y/N)	Feature Vol in yds ³	Liquid Vol in yds ³	pH	Parameters: Cond in mS	Temp in C	Animals Present (e.g. bats, other)	# of Samples
leach pond(s)										
tailings pond(s)										
tailings impoundment(s)										
other (explain)										

Seep(s), Creek(s), Pond(s), Lake(s)

Count / ID	Location	Flowrate in GPM	pH	Parameters: Cond in mS	Temp in C	Odor, sheen, discoloration?
0						

Soil or Seep Staining

Count / ID	Location	Color	Distance from Potential Contaminant Source to Receptor	Source & Receptor
0				
0				
0	Dry basin - road runoff	white		

Seasonal Flow Paths or Channels

Count / ID	Water Present (Y/N)	Flowrate in GPM	pH	Parameters: Cond in mS	Temp in C	Distance from Potential Contaminant Source to Receptor	Source & Receptor
0	N	-					

Wetlands

Count / ID	Flowrate in GPM	pH	Parameters: Cond in mS	Temp in C	Distance from Potential Contaminant Source to Receptor	Source & Receptor	# of Samples
0							

AML Feature Inventory

page 3

Feature ID	Princess Mandel
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Surveyor(s) Alay Babin, Pat Reed

Physical Features / Sources (Continued)

Water Supply Structures

Count / ID	Inner Diameter	Depth	Soil Type	Served	Distance from Potential Contaminant Source	General Location
—						
—						
—						
—						
—						

Chemicals Assoc with Mill

Buildings / Structures

[illegible]

Liquid or Waste Containment Structures

Count / ID	Volume in Gal.	Condition	Suspected Contents
drums			
tanks			
other			

Debris / Refuse

Number	Size	Description
—		assay equip & reagents
—		drums
—		scrap lumber
—		scrap metal
—		machinery
—		other

Ground Cover, Vegetation, Evidence of Wildlife or Recent Human Activity

[illegible]

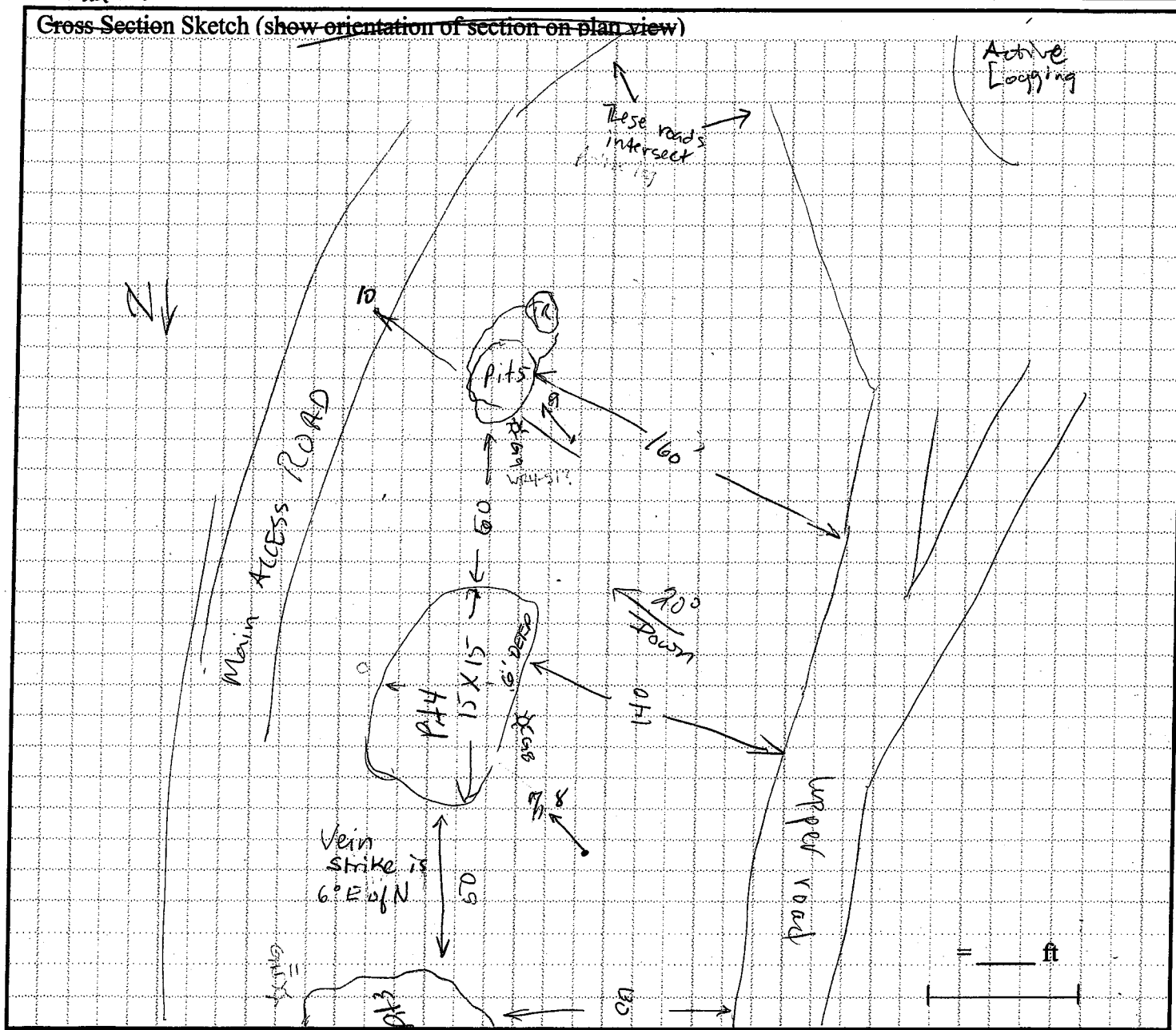
***Note whether vegetation is distressed**

Princess Maude South

Feature ID Princess Maude
Date 6/13
Weather _____

Plan View

Cross Section Sketch (show orientation of section on plan view)



INCLUDE THE FOLLOWING IN THE FIELD SKETCH FOR:

X - X' Cross Section Orientation

Scale Bar

Photo Location(s) and View Direction(s)

Sample Location(s) and ID(s):

- W-# Water
- S-# Soil
- T-# Tailings
- R-# Rock (Waste)
- O-# Ore
- S-# Other (Describe)

LOCATION(S) OF:

- MILLS
- BUILDINGS
- STRUCTURES
- MINING-RELATED PILES
- OTHER

SURFACE WATER (PONDS, SEEPS, ETC.)

GPS Collection Location *

Elevation (Topographic Variation)

GPS File: R061223A

Active logging is taking place south of the site

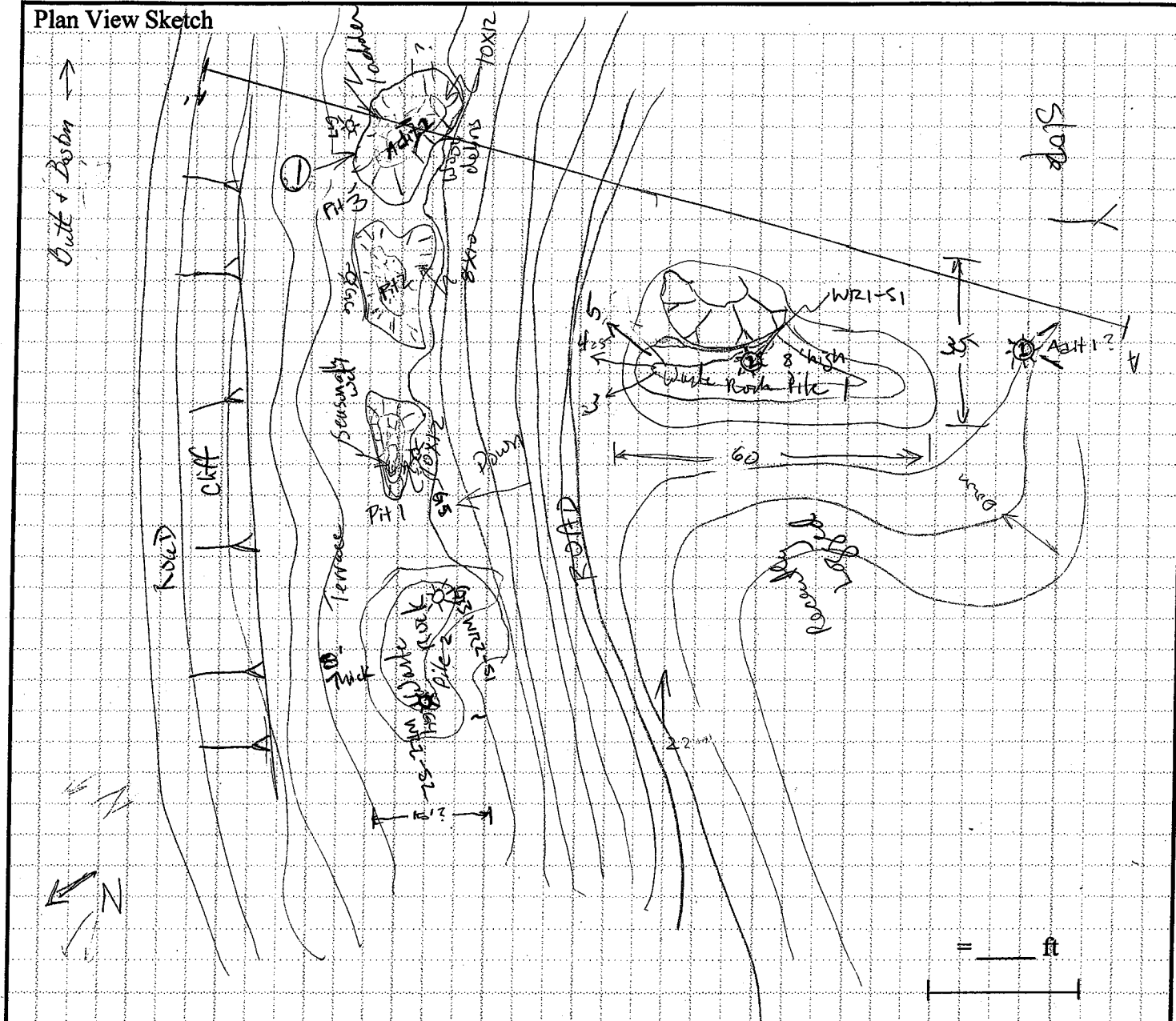
made or vert.
509 684 2580
Deep Creek Mining Co.

AML FEATURE INVENTORY/MONITORING FIELD FORM

Feature ID Princess Maude
Date 6/12 & 6/13
Weather _____

Princess Maude (Central)

Plan View Sketch



INCLUDE THE FOLLOWING IN THE FIELD SKETCH FOR:

North Arrow

Scale Bar

Photo Location(s) and View Direction(s)

Sample Location(s) and ID(s):

W-# Water

S-# Soil

T-# Tailings

R-# Rock (Waste)

O-# Ore

S-# Other (Describe)

FOOTPRINT(S) OF:

MILLS

BUILDINGS

STRUCTURES

MINING-RELATED PILES

OTHER

SURFACE WATER (PONDS, SEEPS, ETC.)

GPS Collection Location *

Elevation (Topographic Variation)

Slope Direction

RO61223A

North Area

Feature ID Princess Maude

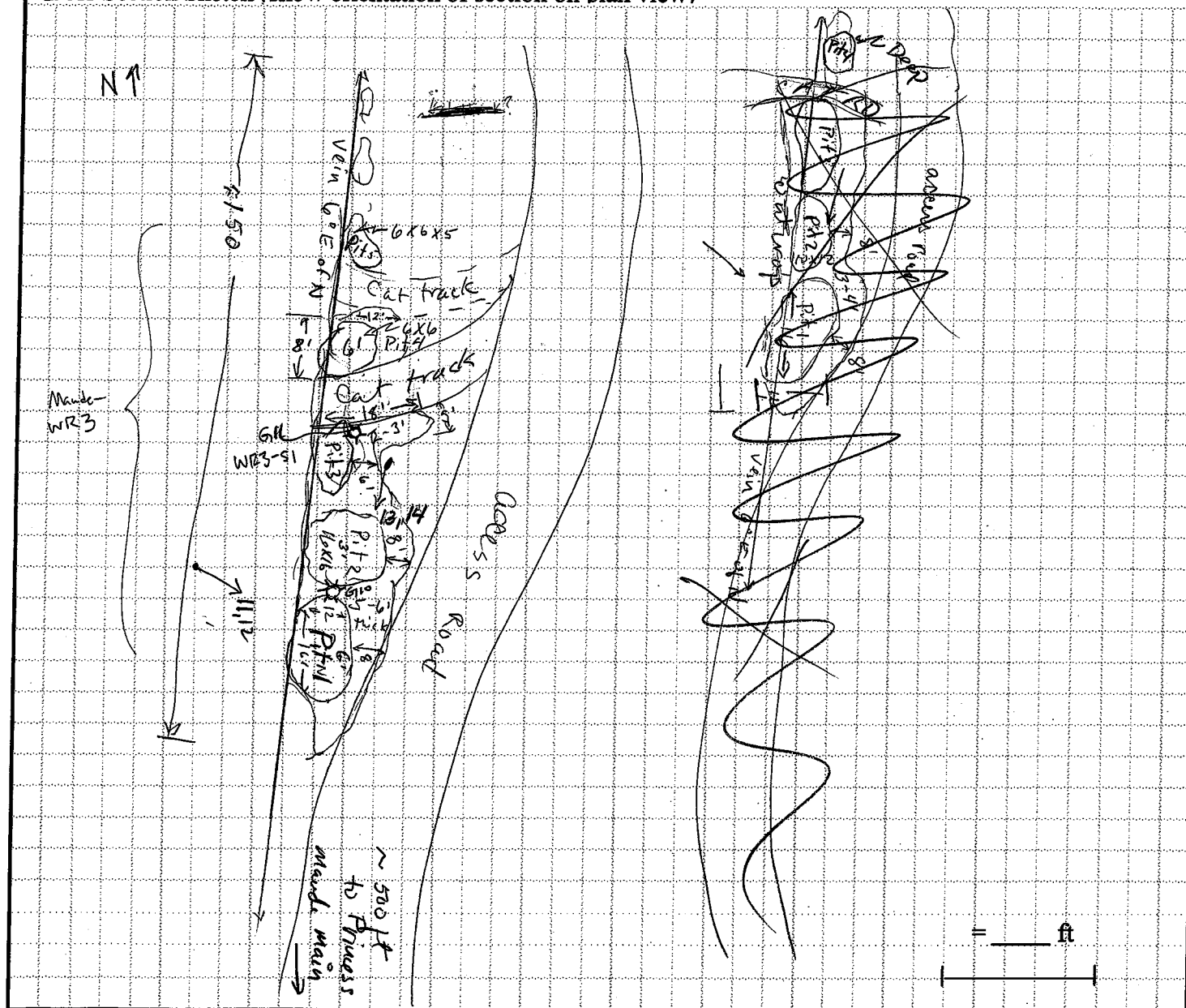
Date 6/13

Weather _____

North

Plan View

Cross Section Sketch (show orientation of section on plan view)



INCLUDE THE FOLLOWING IN THE FIELD SKETCH FOR:

X - X' Cross Section Orientation

Scale Bar

Photo Location(s) and View Direction(s)

Sample Location(s) and ID(s):

W-# Water

S-# Soil

T-# Tailings

R-# Rock (Waste)

O-# Ore

S-# Other (Describe)

LOCATION(S) OF:

MILLS

BUILDINGS

STRUCTURES

MINING-RELATED PILES

OTHER

SURFACE WATER (PONDS, SEEPS, ETC.)

GPS Collection Location ☆

Elevation (Topographic Variation)

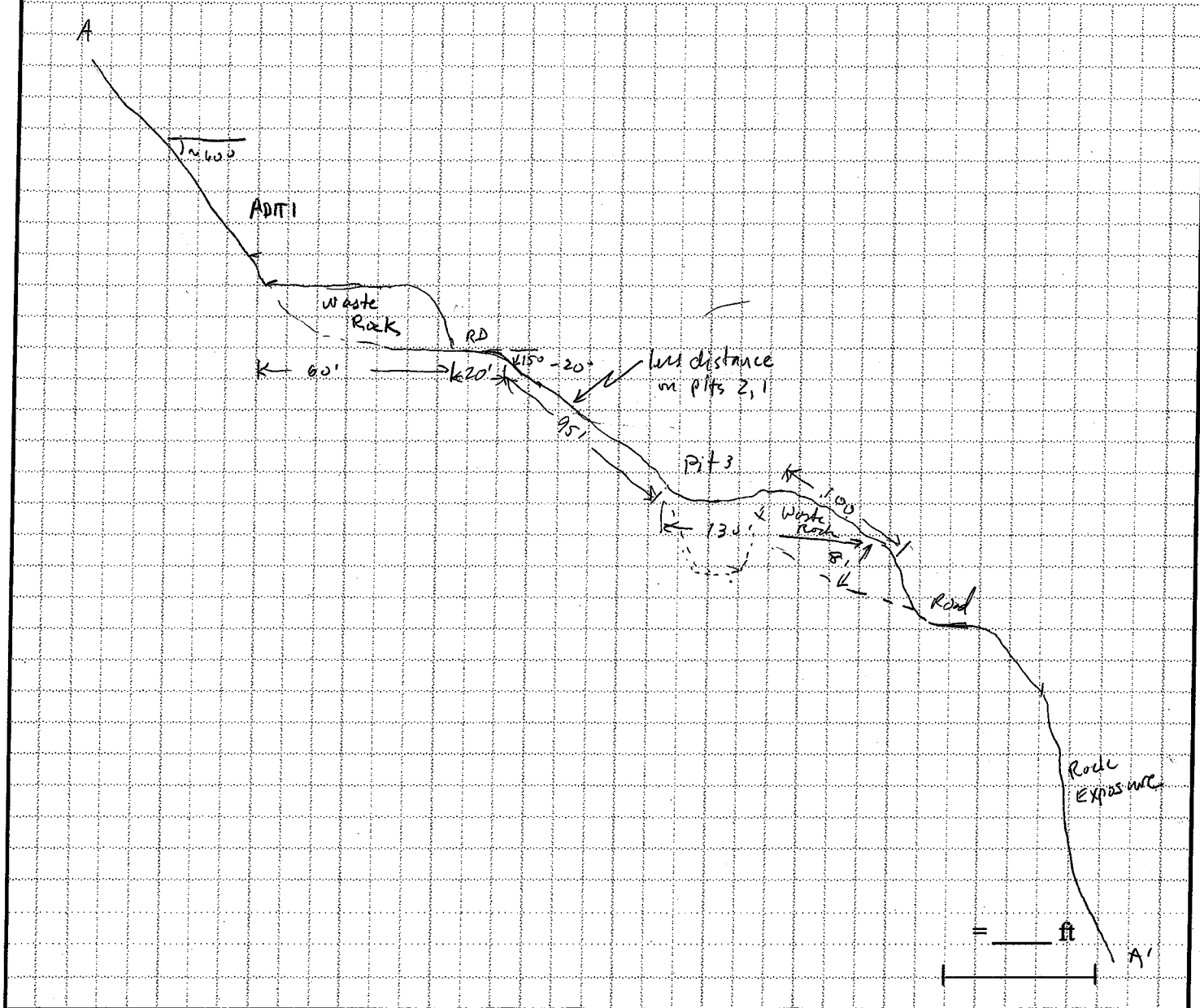
ROG1223A

Feature ID Princess Maude

Date _____

Weather _____

Cross Section Sketch (show orientation of section on plan view)



INCLUDE THE FOLLOWING IN THE FIELD SKETCH FOR:

X - X' Cross Section Orientation

Scale Bar

Photo Location(s) and View Direction(s)

Sample Location(s) and ID(s):

W-# Water

S-# Soil

T-# Tailings

R-# Rock (Waste)

O-# Ore

S-# Other (Describe)

LOCATION(s) OF:

MILLS

BUILDINGS

STRUCTURES

MINING-RELATED PILES

OTHER

SURFACE WATER (PONDS, SEEPS, ETC.)

GPS Collection Location *

Elevation (Topographic Variation)

Ecology AML

Princess Maude			
Coordinate Name	Northing	Easting	Altitude
G1 MAUDE ADIT 1	1208064	2064064	3042
G2 MAUDE WR 1	1208043	2064132	3049
G3 MAUDE WR2 S1	1208067	2064233	3014
G4 MAUDE WR2 S2	1208081	2064253	3013
G5 MAUDE PIT 1	1208025	2064221	3002
G6 MAUDE PIT 2	1207980	2064245	2997
G7 MAUDE PIT 3	1207933	2064247	2998
G8 MAUDE PIT 4	1207797	2064220	2982
G9 MAUDE PIT 5	1207731	2064227	2959
G10 MAUDE PITS 6 & 7	1208546	2064333	2971
G11 MAUDE PIT 8	1208588	2064355	2976
Average	1208078	2064230	3000

Notes:

Northings and Eastings are reported in units of US Feet, relative to NAD 83 State Plane Coordinate System, Washington Zone South.



Photograph 1 - View of WR-1 and access road.



Photograph 2 - View of WR-2.



Photograph 3 - View of Pit 3.