



***Abandoned Mine Lands
Initial Investigation Report
Butte and Boston Mine
Republic, Washington***

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

***December 28, 2006
17274-00(B&B)***

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Rick Roeder, Project Manager***

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Prepared by
Hart Crowser, Inc.



Abby S. Bazin, E.I.T.
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Environmental Engineer



EXPIRES 12/03/2007

Michael J. Bailey, P.E.
Senior Principal Engineer

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ABANDONED MINE LANDS INITIAL INVESTIGATION REPORT

BUTTE AND BOSTON MINE

REPUBLIC, WASHINGTON

1.0 EXECUTIVE SUMMARY

Information obtained during this site assessment is summarized in Table 1.

Table 1 – Butte and Boston Mine Data Summary

Mine Name:	Butte and Boston Mine (Boston and Butte)
Last Known Operation:	Huntting (1956) does not indicate any production. In 1902, the development included a 265-foot shaft, a 75-foot shaft, and 285-foot adit, a 35-foot adit, and 400 feet of drifts. He notes that it was the same vein as on the Princess Maude property.
Location:	0.5 mile southwest of Republic, Washington, by road. Latitude, Longitude: 48.62975, 118.74770 (Chico: 48.63287, 118.74574) Quadrangle Map: Storm King Mtn. and Republic TRS: Township 36N, Range 32E, Section 12, SW ¼
Features Observed	One collapsed adit One waste rock pile (approximately 950 cy) One seasonally wet area Chico Mine Site – one waste rock pile (approximately 90 cy)
Results above Criteria	Two soil samples from the Butte and Boston Mine and one from the Chico Mine exceed MTCA human health criteria for arsenic. Various samples exceeded ecological screening criteria for antimony, arsenic, mercury, selenium, and silver.
Work by Others	No previous site assessment information was identified.
Potential Receptors / Degree of Hazard	Human health risks are possible for recreational site users. A site-specific terrestrial ecological evaluation is required to evaluate risks to ecological receptors.

2.0 INTRODUCTION

This report summarizes the results of the initial limited soil and surface water investigation at the Butte and Boston Mine site located near Republic, Washington (Figure 1). 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. During our observations at the Butte and Boston site, Ecology’s Project Manager suggested we also analyze a waste rock sample from an adjacent mine, the Chico Mine, although that site was not formally inventoried.

3.0 SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

3.1 Site Location

The Butte and Boston Mine is located on private land one-half mile southwest of the town of Republic, Washington, on Copper Mountain (Figure 1). 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, with a road going to the left, one in the center, and one straight. The left road has a gate. Park at the gate and walk down that road.
- Butte and Boston is associated with the Princess Maude and Republic Mines. It is east of Princess Maude, below the steep rock exposure on the uphill side of the road. There are two large ponds at the foot of the rock face, on the mine road. Follow the road south past the rock face into the woods, where it splits. Take the western (right) fork, which is more overgrown than the eastern roadbed. Head toward the steep slope covered with brush directly ahead. The adit entrance is at the foot of the slope, with a large fir growing on the edge. The flattened waste rock pile is the most obvious landmark.

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.

3.2 Site Description

The Butte and Boston Mine is an inactive gold and silver mine on the eastern slope of a ridge. The valley to the east is occupied by the Sanpoil River, which

flows from north to south. The site drains to the east into Granite Creek, which flows southeast into the Sanpoil River.

The mine is located in Section 12, Township 36 North, Range 32 East, Willamette Meridian. Its northern end is in the northwest quarter of the southeast quarter. It continues west into the adjoining northeastern quarter of the southwest quarter and then also the west half of the SW quarter of the SE quarter, and east half of the SE quarter of the SW quarter. According to the map obtained from the Ferry County Tax Assessor's office, the actual patented claim is 18 acres in area.

An L-shaped waste rock pile, WR-1, of approximately 950 cubic yards lies east of an adit at the foot of a steep hill (Figure 3, Photographs 1 and 2). WR-1 varies in thickness from 5 to 8 feet and contains moist, orange-red, silty, gravelly Sand. Short strands of barbed wire are scattered throughout the pile.

Several adits are present in the vicinity, but only one is believed to be a part of the Butte and Boston claim. This adit is on the west side of the waste rock pile and is partially collapsed. We did not observe any drainage seeping from the adit.

A seasonally wet area lies adjacent to WR-1. Two large, stagnant ponds, which may be a part of the Butte and Boston claim are to the north. Several other mine claims containing adits and waste rock surround the Butte and Boston claim. One such claim, the Chico Mine, is situated north of the ponds. The Chico site contains an adit west of the access road and a small waste rock pile east of the road between two small stagnant ponds (Photographs 3 and 4). Evidence indicating the presence of deer (droppings and bones) and human activity (bottles and cans) was abundant. Metal debris (cars, refrigerator, scrap) is scattered throughout the area. The surrounding vegetation consists of low shrubs, with some pine, aspen, and alder. We did not observe any evidence of vegetative distress.

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

Year	Owner	Source
Current Land Owner	Vaagen Bros. Lumber	Ferry County Tax Assessor, Parcels 8008737 and 1754700
Current Claim Owner	No records of a current patented claim could be located.	Ferry County Tax Assessor
1932	Blaine-Republic Company	Hunting (1956)
1918-1926	Alliance Mining Company	Hunting (1956)
1914	Anaconda Gold Mining & Reduction Company	Hunting (1956)

4.0 SITE INVESTIGATION ACTIVITIES

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

4.1 Soil and Waste Pile Sampling

Two waste rock samples were collected from the Butte and Boston Mine site on June 13, 2006. A third waste rock sample was collected from the adjacent Chico Mine site. The Chico Mine results are included in this report as requested by Ecology. Sample descriptions are shown in Table 4 and analytical results are presented in Table 5.

4.2 Surface Water and Seep Sampling

No surface water or seep samples were collected at the Butte and Boston site. A seasonally wet area was located adjacent to the waste rock pile, but at the time of the site visit no water was actively draining from the waste rock pile or adit.

Water was observed draining from the Chico adit; however, no samples were collected because this site was not the objective of our site visit.

4.3 Sediment Sampling

No drainage channels were observed on site, so no sediment samples were collected.

5.0 ANALYTICAL RESULTS AND ENVIRONMENTAL HAZARD ASSESSMENT

A seasonal wetland lies east of the site. No flowing water was observed, but during wet periods it is likely that water from this wetland flows east and drains into Granite Creek, a tributary of the Sanpoil River. Granite Creek lies approximately 0.9 mile east of the site.

Approximately 4,700 feet northeast of the mine is the municipal water well field for the City of Republic. Five private domestic wells were identified in the vicinity of the municipal wells. The Ferry County Parks and Recreation Department has installed a domestic water supply well in the southwest corner of Section 12, which is approximately 7,000 feet west of the Butte and Boston mine. There is also a domestic private well shown in Ecology records in the northeast corner of Section 12.

No residences were observed on site, although the town of Republic is approximately 1 mile northeast of the site. The nearest residence is 0.9 mile to the northeast.

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. Both samples from the Butte and Boston Mine site, as well as the sample collected from the Chico Mine site contained concentrations of arsenic that exceeded both MTCA Method A and Method B criteria, as well as the ecological protection criteria. Those three samples also exceeded the ecological criteria for mercury. Samples Butte-WR1-S1 exceeded the ecological criteria for antimony, selenium, and silver. Sample Chico-WR1-S1 exceeded the ecological criteria for copper, selenium, and silver.

5.2 Air

We did not observe any visual indications of airborne contaminants on the site. The waste rock pile sits in a valley and is surrounded by vegetation, so it is relatively protected from wind erosion. In addition, no residences or cabins are

in the vicinity; so contaminated wind-blown dust is not likely a concern at this site.

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 Butte and Boston 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 Butte and Boston 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 Butte and Boston 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 Butte and Boston site includes an adit and about 965 cubic yards of waste rock with metal concentrations above MTCA human health and ecological protection criteria. The main contaminants of concern are arsenic, mercury, selenium, and silver. An additional 90 cubic yards of waste rock containing similar contaminants are located at the adjacent Chico Mine Site.

Human health risks would be limited to potential recreational users since there are no residences in the immediate vicinity. 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. It is recommended that a second visit be made during the wet season to collect water samples from the wetland area and ponds, if water is flowing.

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.

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

Hart Crowser 2006. Sampling and Analysis Plan, Abandoned Mine Lands Assessments, Washington State. Prepared for Washington State Department of Ecology. June 9, 2006.

Hunting, Marshall T., 1956, "Inventory of Washington Minerals", Part II Metallic Minerals, 2 volumes. State of Washington Department of Conservation and Development, Bulletin No. 37, Washington State printing office, Olympia, Washington.

Henry Day, "The Records of the Aurum Mining Company" University of Idaho Special Collections, accessed on 6/26/06 by PLR, at <http://www.lib.uidaho.edu/special-collections/Manuscripts/dmginv/mg235.htm>

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

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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 – Butte and Boston Mine Sample Inventory

Sample Name	Sample Location	Sample Description
Waste Rock Samples		
Butte-WR1-S1	South end of WR-1 at Butte and Boston Mine Site	Moist, red-orange, silty, gravelly SAND
Butte-WR1-S2	Near center of WR-1 at Butte and Boston Mine Site	Moist, red-orange, silty, gravelly SAND
Chico-WR1-S1	Near center of WR-1 at Chico Mine Site	Dry, light brown to tan, well graded, silty GRAVEL with sand.

Table 5 - Analytical Results for Soil Samples - Butte and Boston Mine

SDG Sample ID Sampling Date	MTCA Method A (a)	MTCA Method B		Ecological Protection (c) Plant/Soil Biota/Wildlife	K0605942 Butte-WR1-S2 6/13/2006	K0606045 Butte-WR1-S1 6/13/2006	K0606045 Chico-WR1-S1 6/13/2006
		Soil Ingestion (b)	Soil Ingestion & Dermal Contact (b)				
Total Solids in %					99.1	76.6	85
Total Metals in mg/kg							
Aluminum	--	80,000	72,072	50 / -- / --			
Antimony	--	32	29	5 / -- / --	2.4	6.25 J	1.18
Arsenic	20	0.67	0.62	10 / 60 / 132	66.5	338 J	123
Beryllium	--	160	144	10 / -- / --	0.36	0.12	0.7
Cadmium	2	80	74	4 / 20 / 14	0.05 J	0.05 U	0.12
Chromium	2,000 ^e	120,000 ^e	44,571 ^e	42 / 42 / 67	19.1	20	22.8
Copper	--	2,960	2,700	100 / 50 / 217	17	10.1	55.6
Iron	--	24,000	21,622	-- / -- / --			
Lead	250	--	--	50 / 500 / 118	10.8	11.1	19.4
Manganese	--	11,200	10,090	1,100 / -- / 1,500			
Mercury	2	24	18	0.3 / 0.1 / 5.5	0.24 J	0.32 J	0.66 J
Nickel	--	1,600	1,441	30 / 200 / 980	9.7	5.4	12.5
Selenium	--	400	360	1 / 70 / 0.3	1 U	2.6	2.8
Silver	--	400	360	2 / -- / --	0.67	2.97 J	6.88
Thallium	--	5.6	5.0	1 / -- / --	0.16	0.37	0.08
Zinc	--	24,000	22,000	86 / 200 / 360	39.4	29.7	75.6

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).

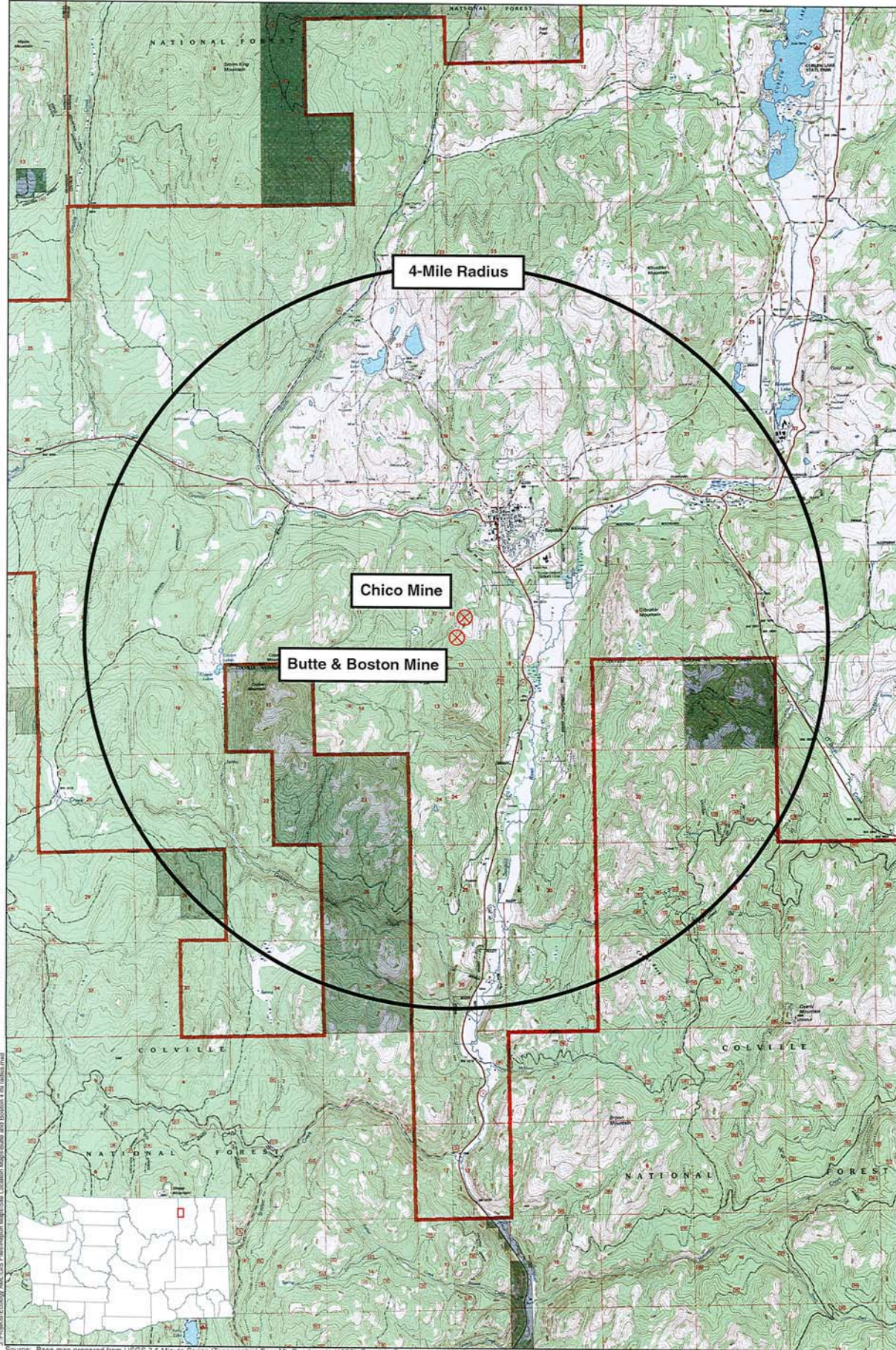
(d) Based on Arsenic V (10 mg/kg)

(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
Butte & Boston Mine and Chico Mine

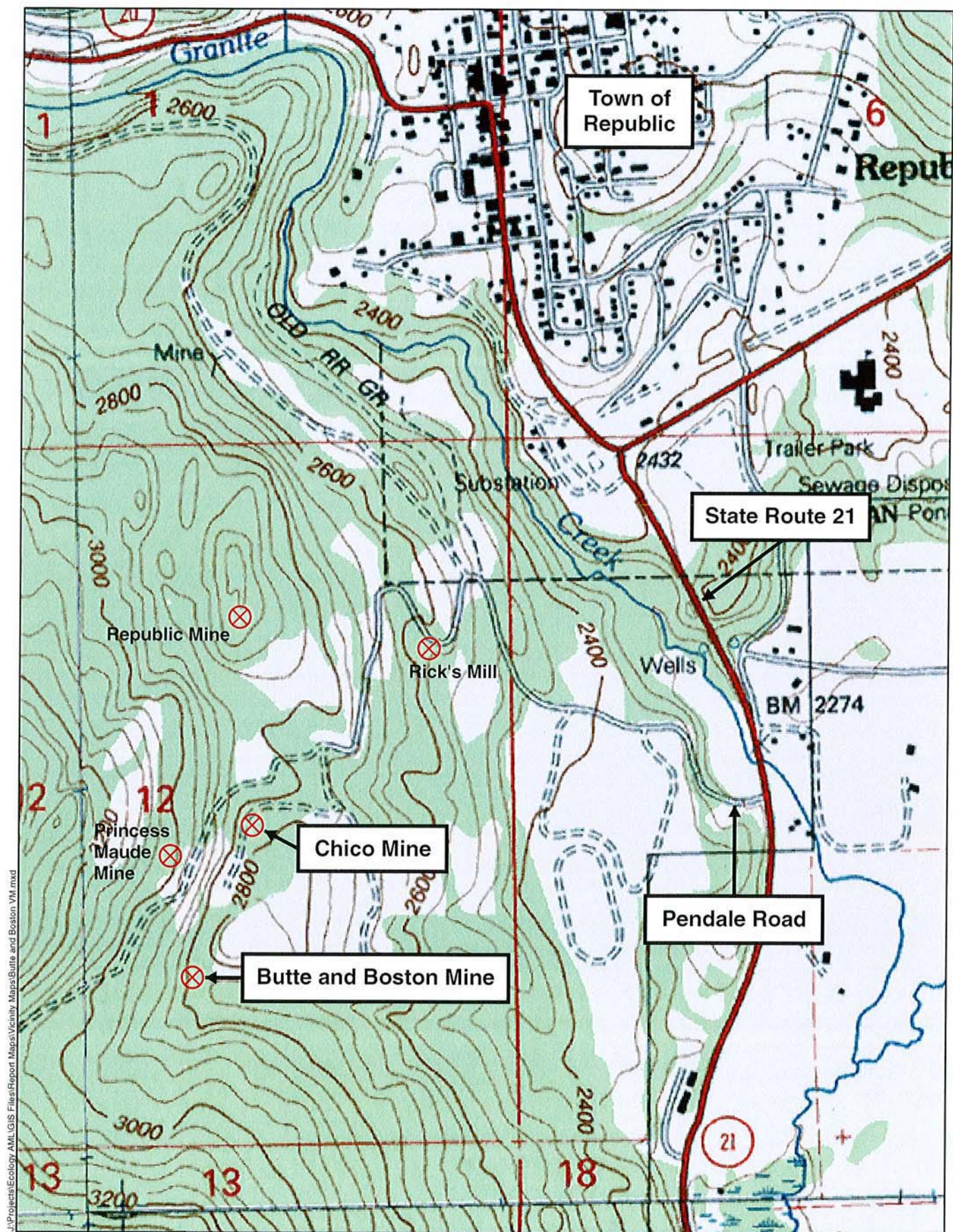


Source: Base map prepared from USGS 7.5 Minute Series (Topographic) Bear Mt. Quadrangle (1992), Republic Quadrangle (1992), Swan Lake Quadrangle (1992), and Storm King Mtn. (1992).

0 0.5 1 2
 Scale in Miles

Vicinity Map

Butte & Boston Mine and Chico 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



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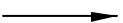
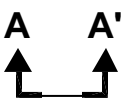
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Figure 2

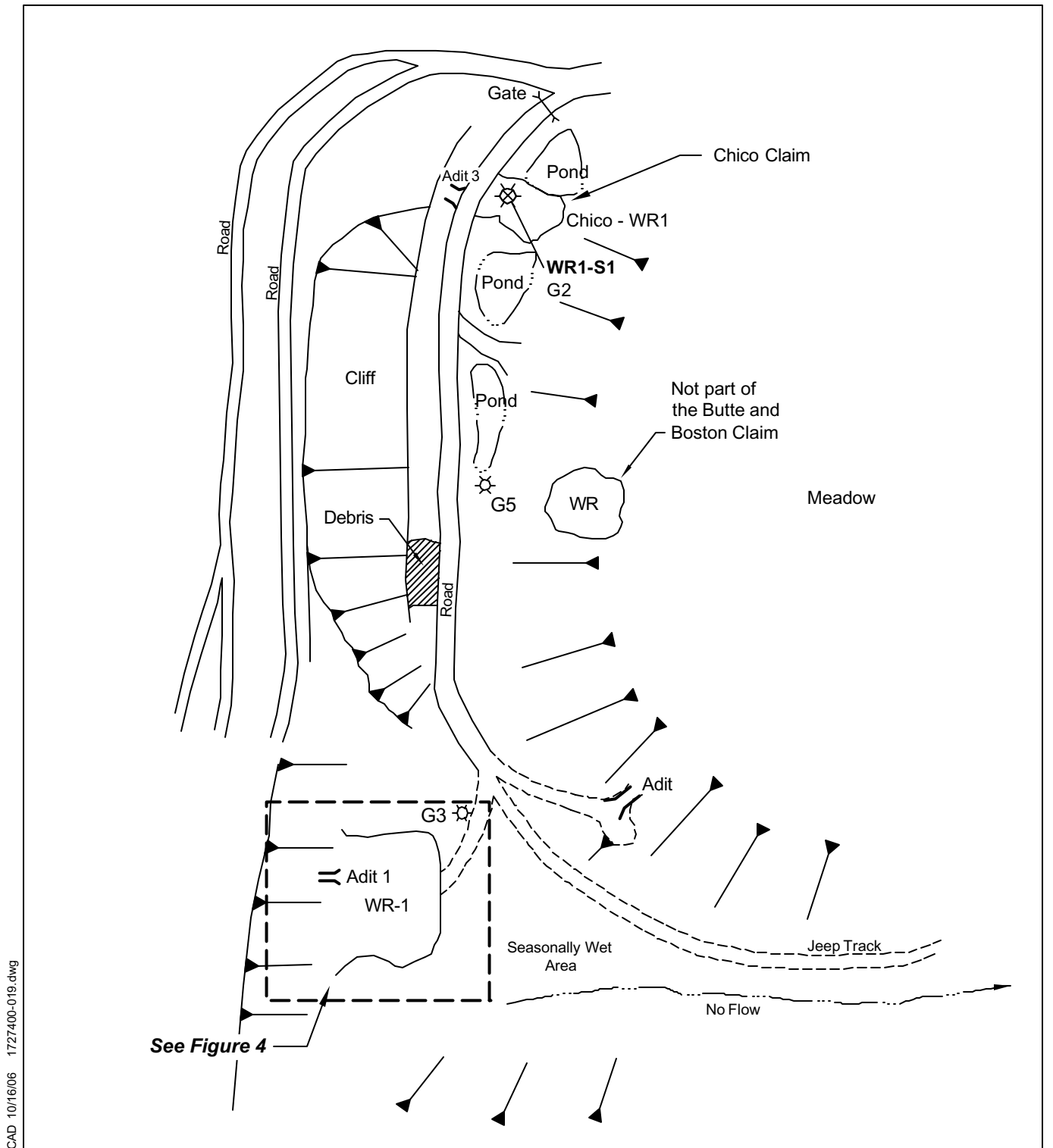
Standard Key for Site Plan

Butte and Boston Mine

G2 	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
	Wood/Metal Debris
	Soil or Seep Staining
	Other Feature
	Groundwater Well
	Claim Corner Marker
	Photo Location, Number and Direction
A  A'	Approximate Cross Section Location and Designation

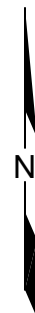
Site Plan

Butte and Boston Mine and Chico Mine



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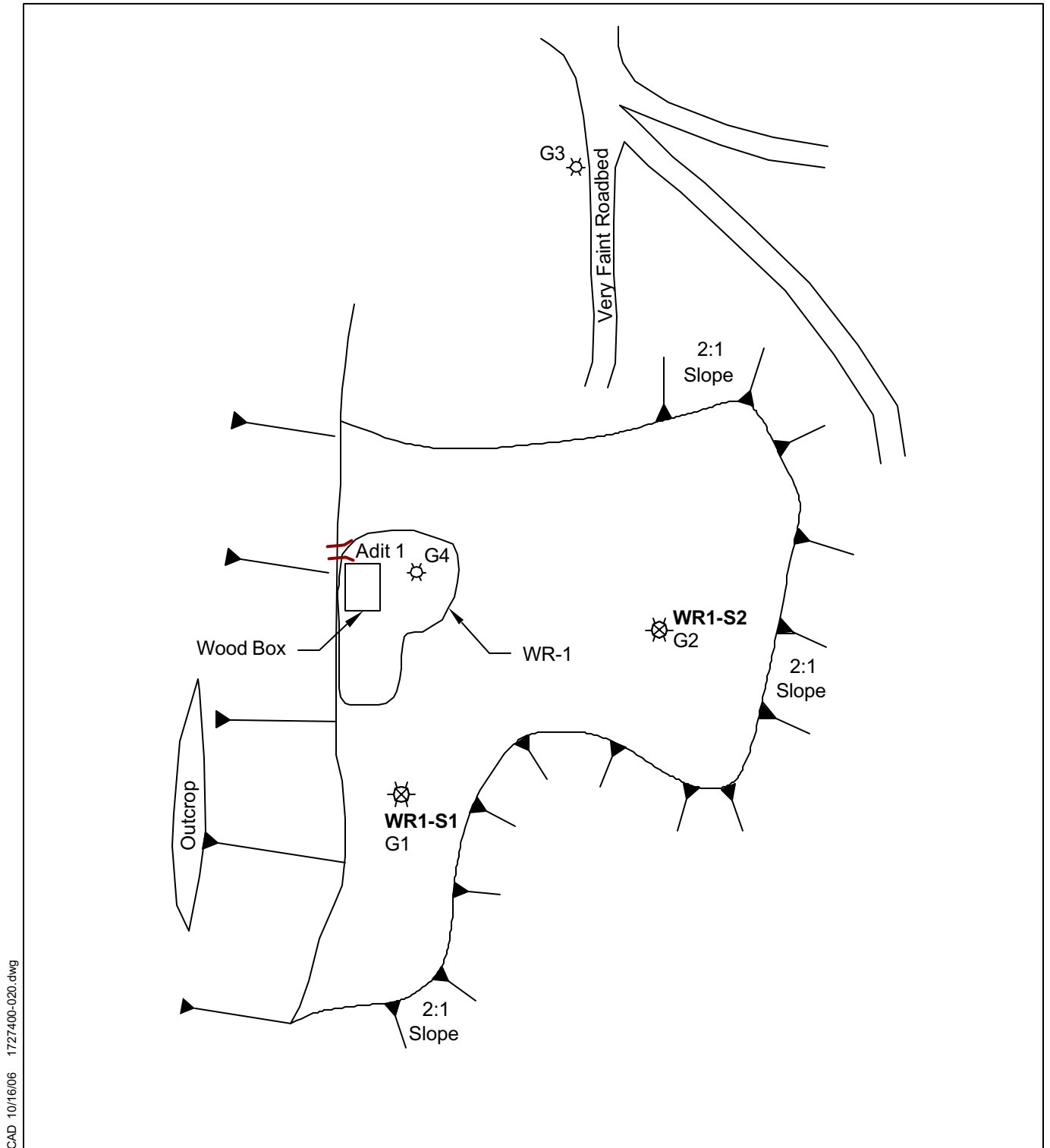
Source: Base map prepared from field notes.



0 80 160
Scale in Feet

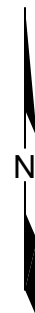
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Figure 3

Site Plan Detail
Butte and Boston Mine



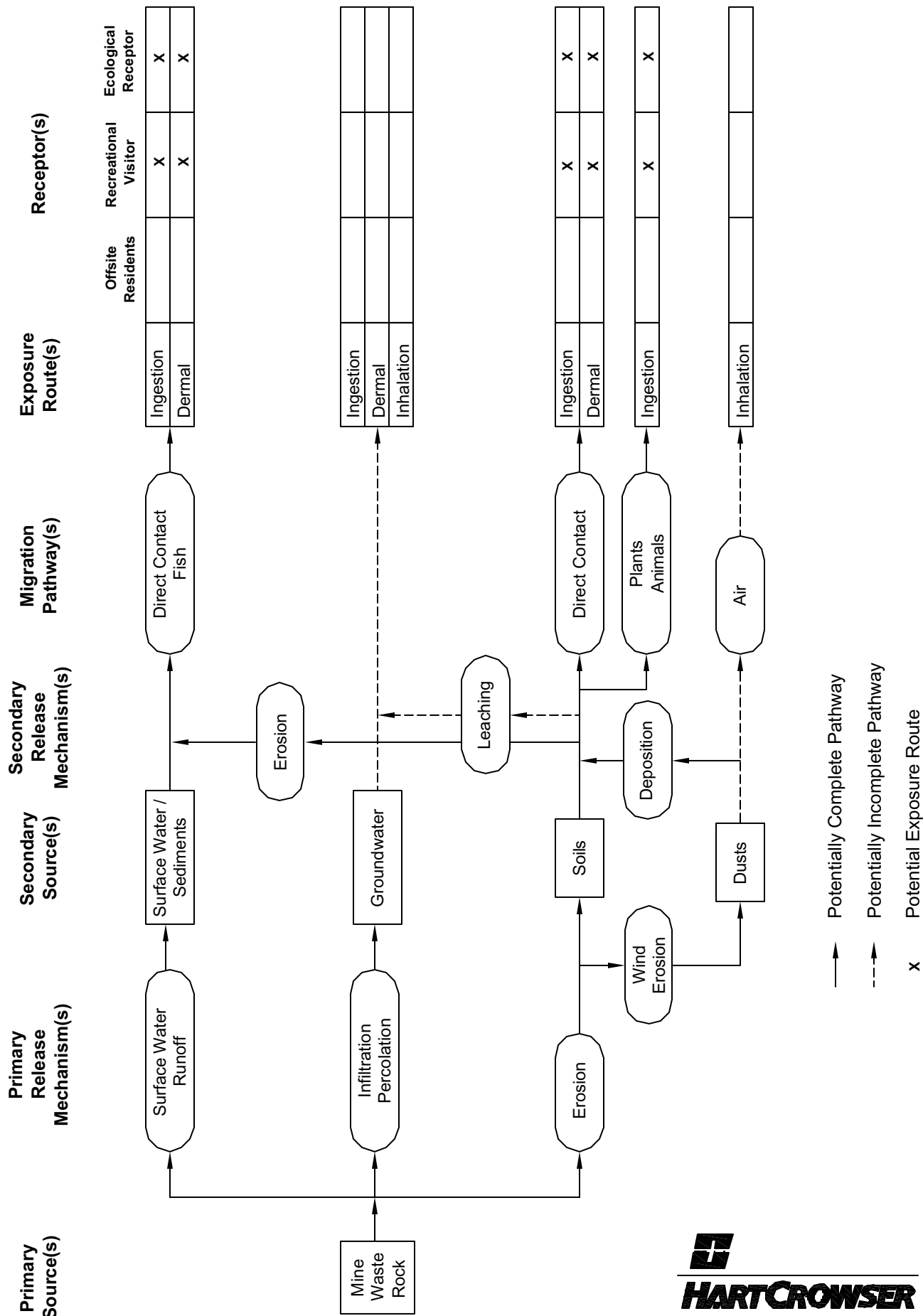
CAD 10/16/06 1727400-020.dwg

Source: Base map prepared from field notes.



0 25 50
Scale in Feet

Mine Waste Rock Conceptual Site Model for Human and Ecological Risk



APPENDIX A FIELD DOCUMENTATION

AML Feature Inventory

page 1

Feature ID Butte + Boston
 Surveyor(s) Pat Reed, Ashley Babin

USGS Quad: Republic

Survey Date 6/12/06

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

South of Republic on Hwy 2 is Ponderosa Rd. About 1/2 mile south of town, take Ponderosa west past Good Ole's. Go up with past first left hand in "white" on sign 1.4 mi. go left on top of hill road. 1.5 miles up road in left. Park & walk.

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	Parameters: Cond in mS	Temp in C	Animals Present (for bats, other)	Photo # (Site-Photo-Date)	GPS Coord (Report in NAD 83, WA North Zone, State Plane Coordinates, Units of Feet)	Elevation in feet above MSL*
Shaft(s)	1	PS									
adit(s)	1	factually collapsed	N					N		See GPS	
pit(s)											
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)	Feature Vol. in yds ³	Seepage Visible? (Y/N)	Seepage: Active / Inactive?	Estimated Particle Gradation (eg. 0.5" - 4")	# of Samples	% Ground Cover	Distressed Vegetation (Y/N)	Recent Human Activity (Y/N)	General Description of Location(s)
waste rock pile(s)	W12-1	500 ft x 4 ft x 4 ft	N	N/A		2	30-40	N	N	
tallings pile(s)	0									
ore / leach pile(s)	0									
debris pile(s)	0									
other (explain)	0									

Miscellaneous Notes:

AML Feature Inventory

page 2

Feature ID Battle & Boston

Survey Date Oct 13/06

Surveyor(s) Alamy Babin, Pat Read

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	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	Cond in mS	Temp in C	Odor, sheen, discoloration?
1	S of WZ-1					
3	N of WZ-1	None → drainage was dry & heavily vegetated. No channels were seen from WZ to this feature but this is a likely drainage path for SW.				

Soil or Seep Staining

Count / ID	Location	Distance from Potential Contaminant Source to Receptor	Color	Source & Receptor
soil				
seep				
other				

Seasonal Flow Paths or Channels

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

Wetlands

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

AML Feature Inventory

page 3

Feature ID Wattle + Boston

Survey Date 6/13/06

Surveyor(s) Abby Dazin, Pat Reed

Physical Features / Sources (Continued)

Water Supply Structures

Count / ID	Inner Diameter	Depth	Soil Type	Served	Distance from Potential Contaminant Source	General Location
0						
0						
0						
0						

Mill Present (Y/N)	Mill Footprint in ft.²	Waste Associated with Mill	Chemicals Assoc with Mill
2			

Buildings / Structures

Count / ID	Bldg. Footprint in ft.²	Suspected Bldg. Use	Bldg. Condition	Comments
0				

Liquid or Waste Containment Structures

Count / ID	Volume in Gal.	Condition	Suspected Contents
0			
0			
0			

Debris / Refuse

Number	Size	Description
0		
0		
1	6'x8'x10	Box ...
0		
0		
2	2'x10'x10'x10'	boxed wire (site boundary?)

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

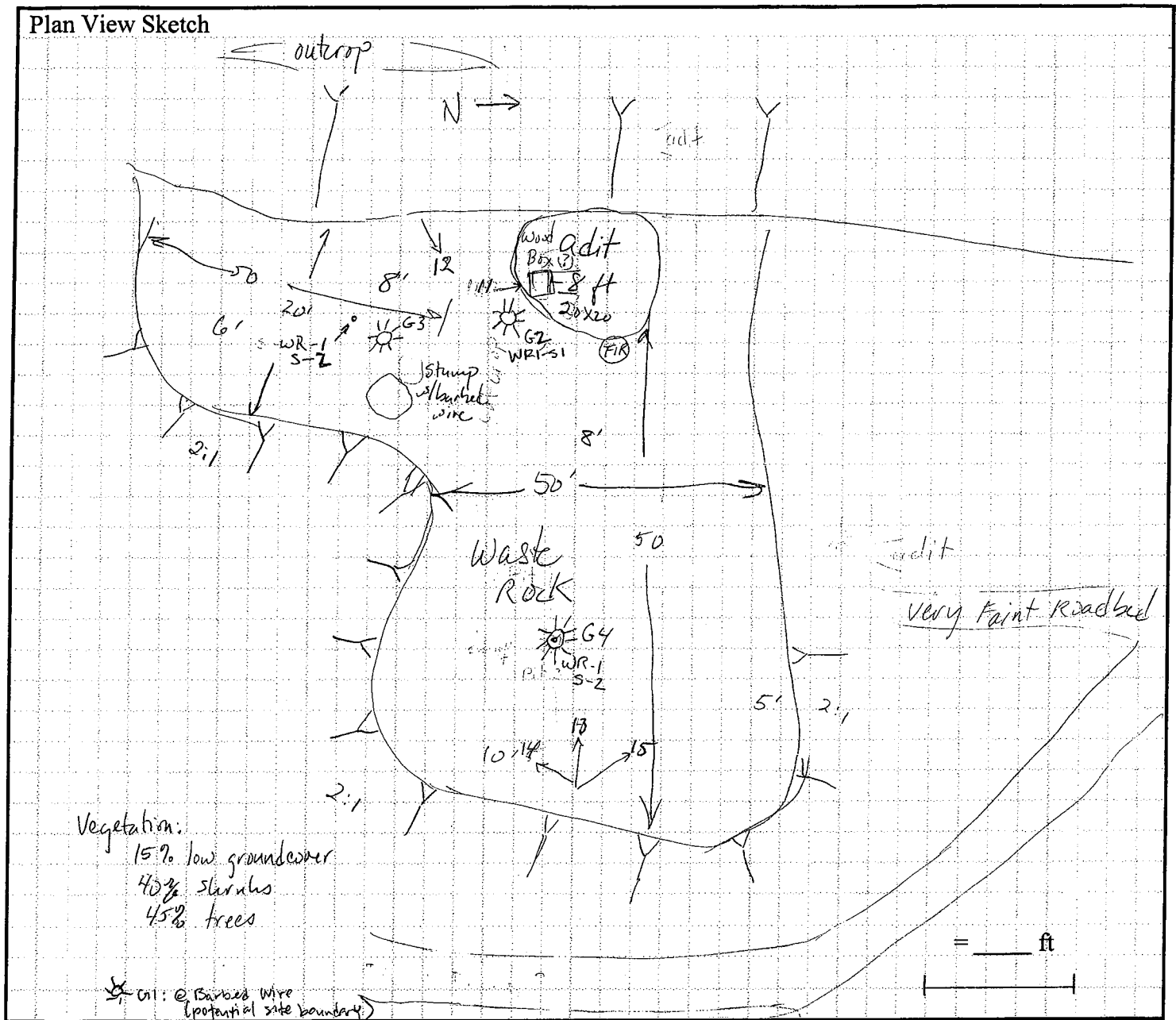
Type / Name	Number	Endangered / Threatened (Y/N)	Comments*
Groundcover	15%		
Shrubs	40%		
Trees (Mt. Hemlock, D. Fir, Silver Fir)	45%		

*Note whether vegetation is distressed

AML FEATURE INVENTORY/MONITORING FIELD FORM

Feature ID	<u>Butte & Boston</u>
Date	<u>6/16/06</u>
Weather	_____

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 Y DOWN ↓

GPS File: R041316A

File R041315A has GPS coord for neighboring claims

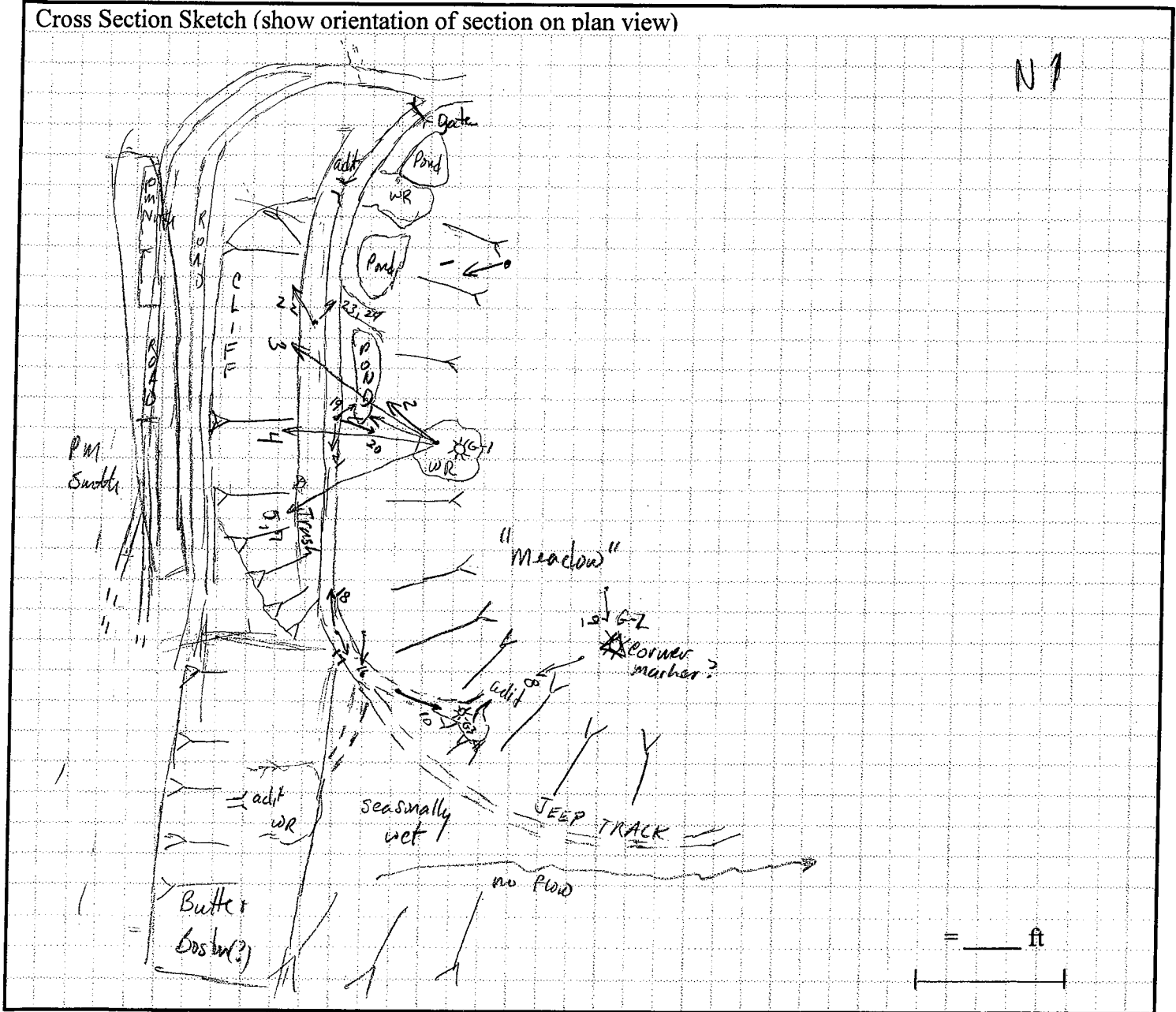
G15 taken @ pond east of site

G6 taken @ WR pile east of site - possibly Chico claim

Feature ID Butte + Boston
 Date 6/13/06
 Weather _____

Overview

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

Butte and Boston			
Coordinate Name	Northing	Easting	Altitude
G1 BUTTE WR1 S1	1207099.744	2064395.351	2762
G2 BUTTE WR1 S2	1207128.569	2064409.084	2770
G3 BUTTE BARBED WIRE	1207275.218	2064439.497	2800
G4 BUTTE ADIT 1	1207111.636	2064386.537	2792
G5 BUTTE POND 1	1207858.881	2064646.549	2755
Average	1207295	2064455	2776

Chico			
Coordinate Name	Northing	Easting	Altitude
G6 CHICO WR 1	1208257.607	2064849.145	2277
Average	1208258	2064849	2277

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 Butte and Boston Mine waste rock (WR-1).



Photograph 2 - View of Butte and Boston Mine adit.



Photograph 3 - View of Chico Mine Waste Rock (WR-1).



Photograph 4 - View of stagnant pond near Chico Mine site. ←Up