ABBREVIATED PRELIMINARY ASSESSMENT

BUFFALO MINE

Wallowa-Whitman National Forest
Grant County, OR

August 2006

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EXECUTIVE SUMMARY

The United States Department of Agriculture, Forest Service (Forest Service) performed an Abbreviated Preliminary Assessment for the Buffalo Mine (Site) to determine the need for further site characterization. The Site is located approximately 3.5 aerial miles north of Granite, Oregon off County Road 73, then Forest Service Road 7340-015. The Site is situated on moderately steep side slopes at an elevation of 6000 feet above mean sea level.

The Site consists of patented claims as well as claims on National Forest System (NFS) lands administered by the Wallowa-Whitman NF. The following occur on NFS lands: two adits, one at the 500 and one at the 600 Level, with associated wasterock and tailings ponds at each level. Water treatment facilities at the 600 Level, and miscellaneous buildings.

A Niton XLt, 700 Series unit was used for In Situ screening of wasterock material. Water and sediment samples were not collected as part of this investigation.

All metals detected at the site exceeded screening criteria for bird, invertebrate, or plants. Of these, only arsenic (13.13 to338 mg/kg) exceeded EPA Region IX Preliminary Remediation Goals for industrial screening levels (1.6 mg/kg). Based upon human health and ecological risk assessments conducted at other mine sites throughout Oregon, arsenic would be considered a risk for this Site. For example, risk assessments at other mine sites have shown arsenic levels generally less than 85 mg/kg do not pose serious risk to human health and the environment and anything above this level would require a removal action.

Water was discharging from the 600 Level drift. The water did appear visually impacted by metals. (See Photo 3, Appendix D) Vegetation was healthy and thriving along the edges of the ponds. It is suspected this water eventually discharges into a small tributary to Granite Creek.

Currently the 500 and 600 Levels, which are on NFS lands, are under a plan of operations. The plan includes:

- Removal of all wasterock material and depositing processed material on patented claims.
- Removal of all tailings and depositing reprocessed material on patented claims.
- Removal of the mill at the 600 Level and other facilities.
- Continuation of monitoring and treatment of water discharge from the 600 Level.

Based upon the above plan of operations, the site is given a Low Priority for any future site assessments. However, should the claimants no longer wish to implement their plan of operation, and more importantly, quit water treatment, on National Forest System lands administered by the Wallowa-Whitman NF, then the priority should be elevated to High. Currently, access to the site is blocked by patented property and a Forest Service gate closing access from another spur road, which would require hiking approximately a mile to access the 600 Level.

1.0 INTRODUCTION

An Abbreviated Preliminary Assessment (APA) was performed by the United States Department of Agriculture, Forest Service (Forest Service) in accordance with:

- EPA "Guidance for Performing Preliminary Assessments Under CERCLA",
- EPA "Improving Site Assessment: Abbreviated Preliminary Assessments" of 1999,
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980,
- Superfund Amendments and Reauthorization Act (SARA) of 1986,
- National Contingency Plan as outlined in 40 CFR Parts 300.410I(1)(i-v).

The purpose:

- Determine whether or not there is a potential for a release of contaminants to the environment and/or to human health.
- Document whether further site characterization is warranted.

A Niton XLt 700 Series was utilized to help in the preliminary screening of this Site.

2.0 SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

The Buffalo Mine (Site) is located:

- Approximately 3.5 aerial miles north of Granite, OR.
- Located at an elevation of 6000 feet above mean sea level (MSL).
- Via County Road 73, then Forest Service Road 7340-015.
- On National Forest System lands administered and managed by the Wallowa-Whitman National Forest.

Location:

- Lat./Long 44° 51' 52.4"N/118° 23' 26"W
- Legal: Willamette Meridian, T8S, R35.5E, S14
- USGS quadrangle: Granite. Plate 1, Appendix C
- Granite Mining District

The Site on Forest Service administered lands consists of:

- Miscellaneous structures and a mill
- Wasterock materials scattered around. Several tailings ponds and a water treatment system, which consisted of three ponds, of which one was dry, 2 metal overflow tanks, a water treatment system within a truck trailer and a wetland type pond further down slope.
- Open adits at the 500 and 600 Levels. The 600 Level had water discharge and was being treated by the above mentioned ponds.

Historical Information

- Mid-1880's – Development began, but no production records prior to 1903.
- 1903 to 1958 – The mine has been continuously active.
- 1953 to 1958 – Treatment of 7938 tons of ore yielded 8760 oz of gold and 62,004 oz of silver.
    - Mill recovery averaged 90 to 94%
- 1958 to present – Activity confined to exploration and development of veins at greater depth and reprocessing tailings material.

Development

- The mine is developed by about 10,000 feet of drifts and crosscuts divided among four adit levels; the 200, 400, 500, and 600.

Currently, the mine is active.

3.0 SITE SAMPLING AND TEST RESULTS

A Niton XLt, 700 Series was used to assess the material from the wasterock dump for potential contamination.

- In Situ testing was performed per EPA Method 6200.
- Surface soils were removed to approximately 4 to 6 inches below grade in order to get below highly oxidized surface layers and to create a flat surface to place the Niton.
- Rocks, debris and other deleterious materials were removed.

Refer to Appendix A for a listing of elements that were detected as well as those that exceeded any regulatory requirements.

4.0 REMOVAL ACTION JUSTIFICATION

The NCP states that an appropriate removal action may be conducted at a site when a threat to human health or welfare or the environment is identified.

- The removal action is undertaken to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or the threat of a release at a site.
- Section 300.415(b)(2)(i-viii) of the NCP outlines eight factors to be considered when determining the appropriateness of a removal action.
- The applicable factors are outlined below and provide justification for completing the removal action, if required.

Factor	Site Condition	Justification
1) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants	No risk to humans based upon current operations at the site, especially the water treatment.	Not at this time, but subject to change
2) Actual or potential contamination of drinking water supplies or sensitive ecosystems	Contaminated water, which is being treated	Not at this time, but subject to change
3) Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat of release.	None located at the site.	No
4) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate	Arsenic. Refer to Appendix A.	Yes
5) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released	None that would impact the site.	No
6) Threat of fire or other explosion	None	No

7) The availability of other appropriate federal or state response mechanisms to respond to the release	N/A	No
8) Other situations or factors that may pose threats to public health or welfare of the United States or the environment	None	No

5.0 SUMMARY

All metals detected at the site exceeded screening criteria for bird, invertebrate, or plants. Of these, only arsenic (13.13 to 338 mg/kg) exceeded EPA Region IX Preliminary Remediation Goals for industrial screening levels (1.6 mg/kg).

- Based upon human health and ecological risk assessments conducted at other mine sites throughout Oregon, arsenic would be considered a risk for this Site.
    - For example, risk assessments at other mine sites have shown arsenic levels generally less than 85 mg/kg do not pose serious risk to human health and the environment and anything above this level would require a removal action.

Water was discharging from the 600 Level drift.

- The water did appear visually impacted by metals. (See Photo 3, Appendix D)
- Vegetation was healthy and thriving along the edges of the ponds.
- A water treatment system has been installed and is operational. The system consists of:
    - Two large ponds
    - One dry pond
    - Two metal overflow tanks that flow into a wetland type pond further down slope
    - Truck trailer with water treatment equipment.
- It is suspected this water eventually discharges into a small tributary to Granite Creek.

6.0 RECOMMENDATION

Currently the 500 and 600 Levels, which are on NFS lands, are under a plan of operations. The plan includes:

- Removal of all wasterock material and depositing processed material on patented claims.
- Removal of all tailings and depositing reprocessed material on patented claims.
- Removal of the mill at the 600 Level and other facilities.
- Continuation of monitoring and treatment of water discharge from the 600 Level.

Based upon the above information, the site is given a low priority for any future site assessments. However, should the claimants no longer wish to implement their plan of operation, and more importantly, quit water treatment, on National Forest System lands administered by the Wallowa-Whitman NF, then the priority should be elevated to High. Currently, access to the site is blocked by patented property and a Forest Service gate closing access from another spur road, which would require hiking approximately a mile to access the 600 Level.

Appendix D contains additional photos of the Site.

7.0 DISCLAIMER

This abandoned mine/mill site was created under the General Mining Law of 1872 and is located solely on National Forest System (NFS) lands administered by the Forest Service. The United States has taken the position and courts have held that the United States is not liable as an "owner" under CERCLA Section 107 for mine contamination left behind on NFS lands by miners operating under the 1872 Mining Law. Therefore, Forest Service believes that this site should not be considered a "federal facility" within the meaning of CERCLA Section 120 and should not be listed on the Federal Agency Hazardous Waste Compliance Docket. Instead, this site should be included on EPA's CERCLIS database. Consistent with the June 24, 2003 OECA/FFEO "Policy on Listing Mixed Ownership Mine or Mill Sites Created as a Result of the General Mining Law of 1872 on the Federal Agency Hazardous Waste Compliance Docket," we respectfully request that the EPA Regional Docket Coordinator consult with the Forest Service and EPA Headquarters before making a determination to include this site on the Federal Agency Hazardous Waste Compliance Docket.

REFERENCES

Brooks, Howard C., 1968; *Gold and Silver in Oregon*; Oregon Department of Geology and Mineral Industries; Bulletin 61.

http://www.topozone.com

Appendix A

NITON ANALYTICAL RESULTS

SAMPLE LOCATION	TEST RESULTS Element	mg/kg	STATE GUIDELINES Receptor	mg/kg	EPA Standard	mg/kg
Sample #1 Wasterock	Arsenic	110	Plants	**8.0**	Industrial	**1.6**
500 Level	Chromium	97.6	Invertebrates	**0.4**	Industrial	450
	Copper	43	Invertebrates	50.0	Industrial	41,000
	Iron	34,321	Plants	**10.0**	Industrial	100,000
	Lead	38.5	Birds	**16.0**	Industrial	750
	Manganese	607	Invertebrates	**100.0**	Industrial	19,000
	Nickel	87.4	Plants	**30.0**	Industrial	20,000
	Selenium	2.1	Plants	**1.0**	Industrial	5,100
	Zinc	142.6	Plants	**50.0**	Industrial	100,000
Sample #2 - Wasterock	Arsenic	132.6	Plants	**8.0**	Industrial	**1.6**
second location at	Chromium	90.9	Invertebrates	**0.4**	Industrial	450
500 Level	Copper	124	Invertebrates	**50.0**	Industrial	41,000
	Iron	29,346	Plants	**10.0**	Industrial	100,000
	Lead	73.7	Birds	**16.0**	Industrial	750
	Manganese	1819	Invertebrates	**100.0**	Industrial	19,000
	Nickel	55.9	Plants	**30.0**	Industrial	20,000
	Selenium	0.99	Plants	1.0	Industrial	5,100
	Zinc	207	Plants	**50.0**	Industrial	100,000
Sample #3 Next to pond	Arsenic	58.4	Plants	**8.0**	Industrial	**1.6**
#2 at the 600 Level	Chromium	143	Invertebrates	**0.4**	Industrial	450
	Copper	45.7	Invertebrates	50.0	Industrial	41,000
	Iron	26,841	Plants	**10.0**	Industrial	100,000
	Lead	25.85	Birds	**16.0**	Industrial	750
	Manganese	357	Invertebrates	**100.0**	Industrial	19,000
	Mercury	3.52	Invertebrates	**0.1**	Industrial	310
	Nickel	84.8	Plants	**30.0**	Industrial	20,000
	Selenium	1.17	Plants	**1.0**	Industrial	5,100
	Zinc	112.1	Plants	**50.0**	Industrial	100,000
Sample #4 Tailings	Arsenic	338	Plants	**8.0**	Industrial	**1.6**
material located below	Chromium	190	Invertebrates	**0.4**	Industrial	450
tailings pond, which is	Copper	75.6	Invertebrates	**50.0**	Industrial	41,000
located below pond #1	Iron	21,733	Plants	**10.0**	Industrial	100,000
	Lead	122.8	Birds	**16.0**	Industrial	750
	Manganese	703	Invertebrates	**100.0**	Industrial	19,000
	Mercury	11.1	Invertebrates	**0.1**	Industrial	310
	Nickel	81	Plants	**30.0**	Industrial	20,000
	Zinc	294	Plants	**50.0**	Industrial	100,000
Sample #5 Tailings	Arsenic	286	Plants	**8.0**	Industrial	**1.6**
pond at 600 Level - dry	Chromium	66.2	Invertebrates	**0.4**	Industrial	450
	Copper	37.9	Invertebrates	50.0	Industrial	41,000
	Iron	21,643	Plants	**10.0**	Industrial	100,000
	Lead	94	Birds	**16.0**	Industrial	750

	Manganese	539	Invertebrates	**100.0**	Industrial	19,000
	Nickel	74	Plants	**30.0**	Industrial	20,000
	Zinc	246	Plants	**50.0**	Industrial	100,000
Sample #6 Disturbed	Arsenic	13.13	Plants	**8.0**	Industrial	**1.6**
material in tailings pond	Chromium	46.7	Invertebrates	**0.4**	Industrial	450
at the 500 Level	Copper	35.3	Invertebrates	50.0	Industrial	41,000
	Iron	18,592	Plants	**10.0**	Industrial	100,000
	Lead	23.4	Birds	**16.0**	Industrial	750
	Manganese	470	Invertebrates	**100.0**	Industrial	19,000
	Nickel	48.8	Plants	**30.0**	Industrial	20,000
	Selenium	0.29	Plants	1.0	Industrial	5,100
	Zinc	110.1	Plants	**50.0**	Industrial	100,000
Sample #7 Tailings	Arsenic	242	Plants	**8.0**	Industrial	**1.6**
material at the 500 Level	Chromium	105.5	Invertebrates	**0.4**	Industrial	450
	Copper	30.75	Invertebrates	50.0	Industrial	41,000
	Iron	4659	Plants	**10.0**	Industrial	100,000
	Lead	64.5	Birds	**16.0**	Industrial	750
	Manganese	411	Invertebrates	**100.0**	Industrial	19,000
	Mercury	2.82	Invertebrates	**0.1**	Industrial	310
	Nickel	51.2	Plants	**30.0**	Industrial	20,000
	Selenium	2.67	Plants	**1.0**	Industrial	5,100
	Zinc	402	Plants	**50.0**	Industrial	100,000

Appendix B

ABBREVIATED PRELIMINARY ASSESSMENT CHECKLIST

ABBREVIATED PRELIMINARY ASSESSMENT CHECKLIST

This checklist can be used to help the site investigator determine if an Abbreviated Preliminary Assessment (APA) is warranted. This checklist should document the rationale for the decision on whether further steps in the site assessment process are required under CERCLA. Use additional sheets, if necessary.

Checklist Preparer:

Dennis Boles, Environmental Engineer — August 10, 2006
(Name/Title) (Date)

Ochoco NF, 3160 NE 3rd St, Prineville, OR 97754 — 541.923.0393
(Address) (Phone)

djboles@fs.fed.us
(E-Mail Address)

Site Name: Buffalo Mine

Previous Names: N/A

Site Location: The Site is located approximately 3.5 aerial miles north of Granite, OR.

Legal Description: Willamette Meridian, T8S, R35.5W, S14

Describe the release (or potential release) and its probable nature: Arsenic and potentially AMD, if not treated.

Part 1 - Superfund Eligibility Evaluation

If All answers are "no" go on to Part 2, otherwise proceed to Part 3	YES	NO
1. Is the site currently in CERCLIS or an "alias" of another site?		X
2. Is the site being addressed by some other remedial program (Federal, State, or Tribal)?		X
3. Are the hazardous substances potentially released at the site regulated under a statutory exclusion (i.e., petroleum, natural gas, natural gas liquids, synthetic gas usable for fuel, normal application of fertilizer, release located in a workplace, naturally occurring, or regulated by the NRC, UMTRCA, or OSHA)?		X
4. Are the hazardous substances potentially released at the site excluded by policy considerations (i.e., deferred to RCRA corrective action)?		X
5. Is there sufficient documentation to demonstrate that no potential for a release that could cause adverse environmental or human health impacts exist (i.e., comprehensive remedial investigation equivalent data showing no release above ARARs, completed removal action, documentation showing that no hazardous substance release have occurred, or an EPA approved risk assessment completed)?		X

Please explain all "yes" answer(s). _____

Part 2 - Initial Site Evaluation

For Part 2, if information is not available to make a "yes" or "no" response, further investigation may be needed. In these cases, determine whether an APA is appropriate. Exhibit 1 parallels the questions in Part 2. Use Exhibit 1 to make decisions in Part 3.

If the answer is "no" to any questions 1, 2, or 3, proceed directly to Part 3.	**YES**	**NO**
1. Does the site have a release or a potential to release?	X	
2. Does the site have uncontained sources containing CERCLA eligible substances?	X	
3. Does the site have documented on-site, adjacent, or nearby targets?		**X**

If the answers to questions 1, 2, and 3 above were all "yes" then answer the questions below before proceeding to Part 3.	**YES**	**NO**
4. Does documentation indicate that a target (i.e., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site?		**X**
5. Is there an apparent release at the site with no documentation of exposed targets, but there are targets on site or immediately adjacent to the site?		**X**
6. Is there an apparent release and no documented on-site targets or targets immediately adjacent to the site, but there are nearby targets (i.e., targets within 1 mile)?	**X**	
7. Is there no indication of a hazardous substance release, and there are uncontained sources containing CERCLA hazardous substances, but there is a potential to release with targets present on site or in proximity to the site?		**X**

Notes:

EXHIBIT 1
SITE ASSESSMENT DECISION GUIDELINES FOR A SITE

Exhibit 1 identifies different types of site information and provides some possible recommendations for further site assessment activities based on that information. You will use Exhibit 1 in determining the need for further action at the site, based on the answers to the questions in Part 2. Please use your professional judgment when evaluating a site. Your judgment may be different from the general recommendations for a site given below.

Suspected/Documented Site Conditions		**APA**	**SI**
1. There are no releases or potential to release.		True	**False**
2. No uncontained sources with CERCLA-eligible substances are present on site.		True	**False**
3. There are no on-site, adjacent, or nearby targets		**True**	False
4. There is documentation indicating that a target (i.e., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site.	Option 1: APA SI	True	True
	Option 2: SI	**False**	False
5. There is an apparent release at the site with no documentation of exposed targets, but there are targets on site or immediately adjacent to the site.	Option 1: APA SI	True	True
	Option 2: SI	**False**	N/A
6. There is an apparent release and no documented on-site targets and no documented immediately adjacent to the site, but there are nearby targets. Nearby targets are those targets that are located within 1 mile of the site and have a relatively high likelihood of exposure to a hazardous substance migrating from the site.		False	**True**
7. There is no indication of a hazardous substance release, and there are uncontained sources containing CERCLA hazardous substances, but there is a potential to release with targets present on site or in proximity to the site.		False	**True**

Part 3 - EPA Site Assessment Decision

When completing Part 3, use Part 2 and Exhibit 1 to select the appropriate decision. For example, if the answer to question 1 in Part 2 was "no," then an APA may be performed and the "NFRAP" box below should be checked. Additionally, if the answer to question 4 in Part 2 is "yes," then you have two options (as indicated in Exhibit 1): Option 1 -- conduct an APA and check the "Lower Priority SI" or "Higher Priority SI" box below; or Option 2 -- proceed with a combined PA/SI assessment.

Check the box that applies based on the conclusions of the APA:

( ) NFRAP
( ) Higher Priority SI
(X) Lower Priority SI
( ) Defer to RCRA Subtitle C
( ) Defer to NRC
( ) Refer to Removal Program – further site assessment needed
( ) Refer to Removal Program – NFRAP
( ) Site is being addressed as part of another CERCLIS site
( ) Other: _____

Regional EPA Reviewer: N/A _____ _____
Print Name/Signature Date

PLEASE EXPLAIN THE RATIONALE FOR YOUR DECISION:

High Priority Sites:

1. Water discharge from adit and/or wasterock/tailings material, and
2. Wasterock adjacent to surface water sources, and
3. Sensitive fishery habitat, and
4. May or may not be readily accessible by the general public.

Medium Priority Sites:

1. No water discharge from adit or wasterock/tailings material, and
2. There is surface water in the area, but not immediately adjacent to the Site, and
3. Easily accessible by the general public.

Low Priority Sites:

1. No water discharge from the adit or wasterock/tailings material, and
2. No surface water in the area, and
3. Not easily accessible to the general public.

Based upon the information provided in the APA and the above criteria, this site has been given a Low Priority for further evaluation, primarily because the site is under a plan of operations. However, should work cease at the site, then the level would be elevated to High Priority.

Appendix C

Quadrangle

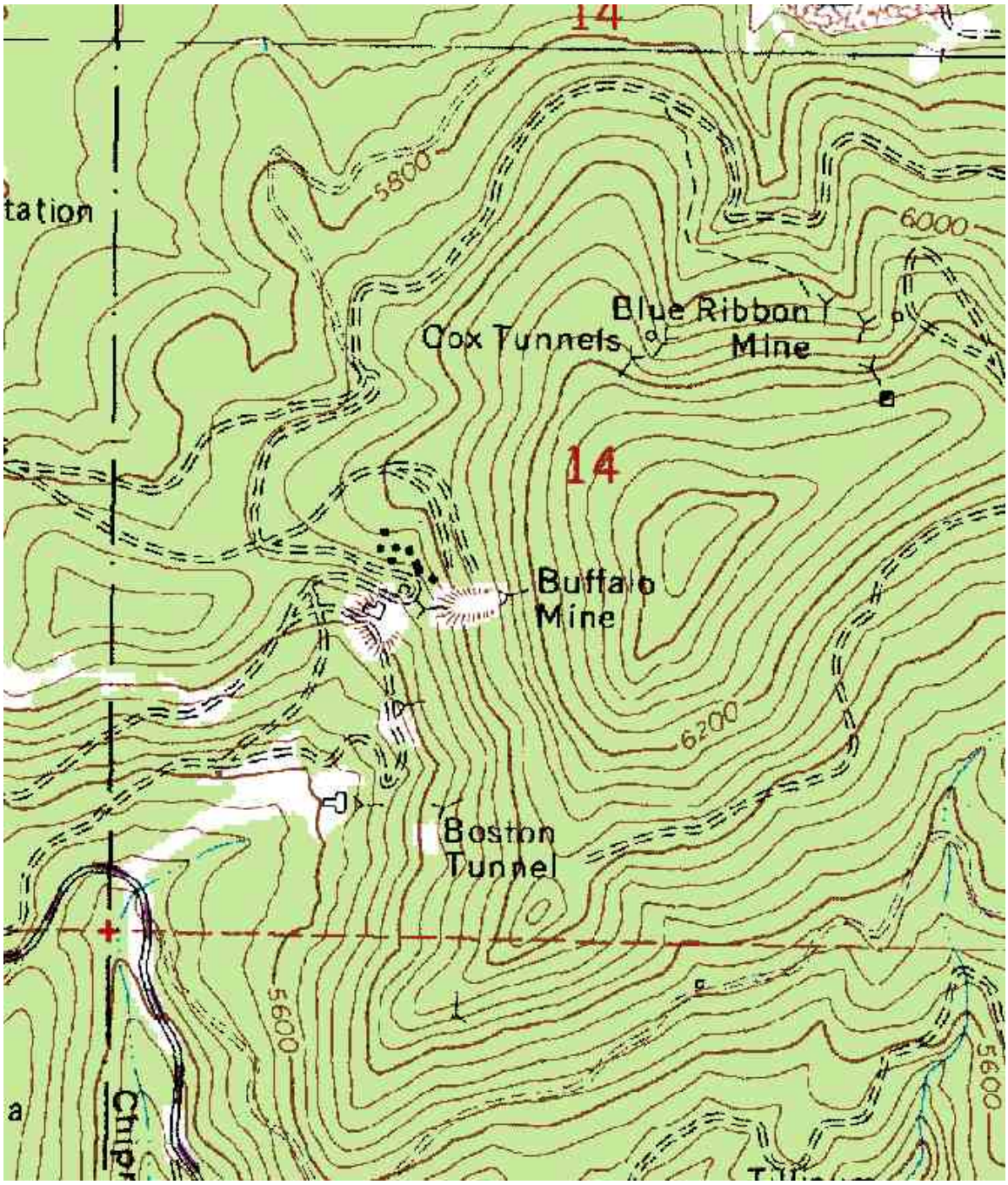

Plate 1. Granite Quadrangle showing the location of the Buffalo Mine.

Appendix D

Site Photos

Photo 1. Portal at the 500 Level. (Photo by D. Boles)

Photo 2. Inside Portal at the 600 Level (Photo by D. Boles)

Photo 3. Discharge water from the 600 Level (Photo by D. Boles)

Photo 4. First treatment pond below the 600 Level Portal (Photo by D. Boles)

Photo 5. First and second treatment pond. (Photo by D. Boles)

Photo 6. Discharge tanks below treatment pond #2. (Photo by D. Boles)

Photo 7. Water treatment facility (Photo by D. Boles)