

ABBREVIATED PRELIMINARY ASSESMENT

KELLY CAMP



Colville National Forest
Republic Ranger District
Ferry County, WA

June, 2004

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EXECUTIVE SUMMARY

The Forest Service performed an Abbreviated Preliminary Assessment for the Kelly Camp Mine (Site) to determine the need for further site characterization. The Site is located on the southeast side of Kelly Mountain in between Trout Creek and the North Fork Trout Creek approximately 8 miles upstream of Curlew Lake. The Site is situated on moderate to steep side slopes with elevations ranging from 4,560 ft. above mean sea level (MSL) to 4,680 ft. above MSL at the upper mine workings.

Soil samples were collected from two waste dumps for bench testing using a Niton XRF unit. Water and sediment samples were not collected as part of this investigation. Mine workings are about 4,000 feet from the North Fork Trout Creek, the nearest surface waters.

For both waste dump samples, arsenic concentrations exceeded Washington's Model Toxics Control Act (MTCA) Method A cleanup levels for industrial properties and EPA Region IX Preliminary Remediation Goals (PRGs) for cancer endpoint. Chromium concentrations exceed PRGs and may exceed MTCA Method A cleanup levels as well but this analysis did not speciate between Chromium III and Chromium VI. Lead, copper, nickel, selenium, tin, and possibly arsenic and chromium exceeded soil concentrations established under MTCA to be protective of terrestrial ecological receptors at most sites. However, exceedence of ecological receptor values does not necessarily trigger cleanup actions.

There are also serious physical hazards associated with the Site. The main health and safety concerns involve the two open adits and associated stopes at the upper workings that are open to the surface. Closure of these Site openings should be considered along with other hazardous mine sites when prioritizing Forest closure projects.

Based on the environmental and physical hazards associated with the Site, it is recommended that a Site Inspection (SI) be performed.

1.0 INTRODUCTION

An Abbreviated Preliminary Assessment (APA) was performed by the US Forest Service in accordance with the EPA “Guidance for Performing Preliminary Assessments Under CERCLA”, EPA “Improving Site Assessment: Abbreviated Preliminary Assessments” of 1999, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the National Contingency Plan as outlined in 40 CFR Parts 300.410(c)(1)(i-v).

The purpose of this assessment was to determine whether or not there is a potential for a release of contaminants to the environment and/or to human health. The purpose of an APA is to determine whether further site characterization is warranted. A Niton XRF 700 Series was utilized to help in the preliminary screening of this Site.

2.0 SITE DESCRIPTION, OPERATIONAL HISTORY, AND WASTE CHARACTERISTICS

The Kelly Camp Mine is located approximately 11 aerial miles north of Republic, WA on the Republic Ranger District of the Colville National Forest. The Site lies on the southeast side of Kelly Mountain on the ridge dividing Trout Creek and the North Fork Trout Creek approximately 8 miles upstream of Curlew Lake. Mine workings are about 4,000 feet from the North Fork, the nearest of the two surface waters. The Site falls within the Republic mining district.

Location information:

Lat./Long.:	N48° 48' 09" W118° 47' 20"
Legal:	Willamette Meridian, T 38 N, R 32 E, Section 9, SW ¼
USGS quadrangle:	Bodie Mountain

Historic information about the Site is sparse. Culver and Broughton (1945) described a Kelly property located in section 6 to the northwest. As of September of 1943, the authors reported that development work on the property consisted of a westward-trending adit, a shaft inclined to the south, and numerous open cuts. Hunting (1956) reported on a Kelly Camp in section 4 with development comprising a 120 ft. westward trending adit, several shafts, and numerous open cuts. A 25-ton mill was constructed on Lake Curlew in 1952. Ten tons of ore was shipped to the mill in 1951 for pilot tests; production was also reported for 1954 and 1955.

Hunnting (1956) reported that the deposit contains a considerable volume of low-grade ore. The main commodities produced at the Site were tungsten, copper, and molybdenum (Derkey and others, 1990). The primary ore minerals at the Site were chalcopyrite, scheelite, magnetite, and molybdenite; gangue minerals include garnet, epidote, and calcite (Derkey and others, 1990). Host rock for the mineralization is calc-silicate gneiss, schist, and quartzite.

At present, the Site consists of an open adit, inclined shaft and several openings into a near-surface stope: 1) A lower adit with associated waste rock dump and 2) an upper shaft with waste rock dump that accesses stopes open or collapsed to the surface, shafts/winzes, and drifts or crosscuts. Some internal mine workings in the upper shaft are flooded.

There are also serious physical hazards associated with the Site. The main health and safety concerns involve an open lower adit and upper inclined shaft that access various stopes and shafts, some of which are open or collapsed to the surface. Numerous open cuts and trenches are located throughout the Site.

Access to the Site can be accomplished from Republic, WA by County Route 270 to the northwest to it's junction with County 257. Proceed to the northeast on County 257 which turns into County 201. Proceed to junction with County 517 and head northwest on 517 to the Forest boundary. At the Forest boundary proceed to the northwest on Forest Service Road 2148 along the North Fork Trout Creek. At approximately 2 miles, proceed southeast on the 191 Spur to the mine site.

Currently, the Site is inactive and unclaimed.

3.0 SITE SAMPLING AND TEST RESULTS

Soil Samples

A Niton XRF, XL-722S was used to assess composite grab samples taken from the waste dumps at the Site. Samples collected for bench testing were collected in accordance with EPA Method 6200. Surface soils were removed to approximately 4 to 6 inches below grade in order to get below highly oxidized surface layers. Rocks, debris and other deleterious materials were removed. Samples were then collected, bagged, and labeled. Samples were later dried and prepared for bench testing using the Niton XRF.

A summary of the analytical results compared to Washington's Model Toxics Control Act (MTCA) Method A cleanup standards for industrial soils, EPA Region IX Preliminary Remediation Goals (PRGs), and Washington's MTCA simplified ecological evaluation standards as outlined in Appendix A

For both waste dump samples, arsenic concentrations exceeded Washington's Model Toxics Control Act (MTCA) Method A cleanup levels for industrial properties and EPA Region IX Preliminary Remediation Goals (PRGs) for cancer endpoint (Appendix A). Chromium concentrations exceeded PRGs and may have exceeded MTCA cleanup goals as well, but this analysis did not speciate between Chromium III and Chromium VI (Appendix A). Lead, copper, nickel, selenium, tin, and possibly arsenic and chromium exceeded soil concentrations established under MTCA to be protective of terrestrial ecological receptors at most sites (Appendix A). However, exceedence of ecological receptor values does not necessarily trigger cleanup actions.

4.0 SUMMARY

Arsenic and chromium exceeded MTCA Method A cleanup goals and EPA Region IX industrial PRGs. Two open adits and associated mine workings (e.g. stopes, shafts) pose health and safety risks to the general public recreating at the Site. Mine workings are about 4,000 feet from the North Fork Trout Creek, the nearest surface waters.

5.0 RECOMMENDATION

Based on bench sampling of the material from the waste dump with the Niton XRF unit and EPA's APA Checklist (Appendix A), it is recommended that a Site Inspection (SI) be completed. As part of this inspection, a thorough study of the area to determine the extent of contamination is warranted. The area should be sampled to determine the presence of waste material and tailings, and if present, the potential waste piles and tailings should be sampled at depth and a determination of volumes should be calculated. An analysis of total and available metals as well as acid base accounting (ABA) is required for any waste rock or tailings identified at the Site.

The Site poses significant physical hazards to the general public recreating at the Site. The main health and safety concerns involve an open lower adit and upper inclined shaft that access various stopes and shafts, some of which are open or collapsed to the surface. Closure of these Site openings should be considered along with other hazardous mine sites when prioritizing Forest closure projects.

Appendix C contains additional photos of the Site.

REFERENCES

- Culver, H.E., and Broughton, W.A., 1945, Tungsten resources of Washington: State of Washington Department of Conservation and Development, Division of Geology Bulletin No. 34, 89 p.
- Derkey, R.E., Joseph, N.L., and Lasmanis, R., 1990, Metal mines of Washington-preliminary report: Washington Department of Natural Resources, Division of Geology and Earth Resources Open File Report 90-18. 577 p.
- Huntting, M.T., 1956, Inventory of Washington minerals – Part II, Metallic minerals: Washington Division of Mines and Geology Bulletin No. 37, v. 1, 428 p.

Appendix A

NITON XRF ANALYTICAL DATA SUMMARY

Table 1. Analytical results from waste rock pile #1.

SAMPLE	ANALYTE	ANALYTICAL RESULT (mg/kg)	MTCA Method A (mg/kg) ¹	EPA REGION IX PRG (mg/kg) ²	SIMPLIFIED ECOLOGICAL EVALUATION (mg/kg) ³
Waste Rock #1	Total Arsenic	196.1	20	Noncancer – 260 Cancer - 1.6	
	Arsenic III Arsenic V				20 260
	Cadmium	ND	2	450	36
	Total Chromium	500		450	135
	Chromium VI	--	19	64	
	Chromium III	--	2,000	100,000	
	Lead	317.2	1,000	750	220
	Mercury	ND	2	310	Inorganic - 9 Organic - .7
	Antimony	ND		410	--
	Cobalt	758.8		1,900	--
	Copper	6,307.2		41,000	550
	Iron	54,000		100,000	--
	Manganese	ND		19,000	23,500
	Molybdenum	ND		5,100	71
	Nickel	ND		20,000	1,850
	Selenium	70.5		5,100	.8
	Silver	ND		5,100	--
	Tin	351.8		100,000	(275)
	Zinc	180.7		100,000	570

¹ From WAC 173-340-900, Table 745-1, Method A Cleanup Levels for Industrial Properties.

² From EPA, Region IX, Preliminary Remediation Goals, 10/1/2002.

³ From WAC 173-340-900, Table 749-2, Priority Contaminants of Ecological Concern for Sites that Qualify for the Simplified Terrestrial Ecological Evaluation Procedure. All concentrations are for industrial/commercial sites; if unavailable, unrestricted land use values denoted with parenthesis () were utilized.

Table 2. Analytical results from waste rock pile #2.

SAMPLE	ANALYTE	ANALYTICAL RESULTS (mg/kg)	MTCA Method A (mg/kg) ¹	EPA REGION IX PRG (mg/kg) ²	SIMPLIFIED ECOLOGICAL EVALUATION (mg/kg) ³
Waste Rock #2	Total Arsenic	181.6	20	Noncancer – 260 Cancer - 1.6	
	Arsenic III Arsenic V				20 260
	Cadmium	--	2	450	36
	Total Chromium	1,100		450	135
	Chromium VI	--	19	64	
	Chromium III	--	2,000	100,000	
	Lead	190.1	1,000	750	220
	Mercury	ND	2	310	Inorganic - 9 Organic - .7
	Antimony	--		410	--
	Cobalt	ND		1,900	--
	Copper	14,195.2		41,000	550
	Iron	89,300		100,000	--
	Manganese	ND		19,000	23,500
	Molybdenum	ND		5,100	71
	Nickel	5,760		20,000	1,850
	Selenium	48.8		5,100	.8
	Silver	--		5,100	--
	Tin	--		100,000	(275)
	Zinc	287.8		100,000	570

¹ From WAC 173-340-900, Table 745-1, Method A Cleanup Levels for Industrial Properties.

² From EPA, Region IX, Preliminary Remediation Goals, 10/1/2002.

³ From WAC 173-340-900, Table 749-2, Priority Contaminants of Ecological Concern for Sites that Qualify for the Simplified Terrestrial Ecological Evaluation Procedure. All concentrations are for industrial/commercial sites; if unavailable, unrestricted land use values denoted with parenthesis () were utilized.

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: Greg Graham, Geologist for
Dennis Boles, Environmental Engineer June 1, 2004
 (Name/Title) (Date)

Winema NF, 2819 Dahlia St, Klamath Falls, OR 97601 541-219-1201
 (Address) (Phone)

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

Site Name: Kelly Camp

Previous Names (if any): Kelly, Kelly Mine

Site Location: The Site is located approximately 11 aerial miles north of Republic, WA along the 391 Spur of Forest Service Road 2148 on the Republic Ranger District of the Colville National Forest.

Legal Description: Willamette Meridian, T38 R32 Section 9, SW 1/4
Latitude: 48° 48' 09" Longitude: W118° 47' 20"

Describe the release (or potential release) and its probable nature: The material in the mine waste dumps is contaminated. The following elements exceed MTCA Method A cleanup goals and/or EPA Region IX PRGs for industrial properties:

Arsenic – 181.6-196.1 mg/kg (MTCA Method A-20; PRG-1.6 noncancer endpoint, 260 cancer endpoint)

Chromium – 500-1,100 mg/kg (MTCA Method A-19 for Cr VI, 2,000 for Cr III; PRG-450).

Lead, copper, nickel, selenium, tin, and possibly arsenic and chromium exceeded soil concentrations established under MTCA to be protective of terrestrial ecological receptors at most sites.

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 ARAR’s, 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	FULL PA	PA/SI	SI
1. There are no releases or potential to release.		Yes	No	No	No
2. No uncontained sources with CERCLA-eligible substances are present on site.		Yes	No	No	No
3. There are no on-site, adjacent, or nearby targets		Yes	No	No	No
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	Yes	No	No	Yes
	Option 2: PA/SI	No	No	Yes	No
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	Yes	No	No	Yes
	Option 2: PA/SI	No	No	Yes	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.		No	Yes	No	No
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.		No	Yes	No	No

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:	
<input type="checkbox"/> NFRAP	<input type="checkbox"/> Refer to Removal Program – further site assessment needed
<input type="checkbox"/> Higher Priority SI	<input type="checkbox"/> Refer to Removal Program – NFRAP
<input checked="" type="checkbox"/> Lower Priority SI	<input type="checkbox"/> Site is being addressed as part of another CERCLIS site
<input type="checkbox"/> Defer to RCRA Subtitle C	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Defer to NRC	
Regional EPA Reviewer: <u> N/A </u>	
_____	_____
Print Name/Signature	Date

PLEASE EXPLAIN THE RATIONALE FOR YOUR DECISION:

For both waste dump samples, arsenic concentrations exceeded Washington's Model Toxics Control Act (MTCA) Method A cleanup levels for industrial properties and EPA Region IX Preliminary Remediation Goals (PRGs) for cancer endpoint. Chromium concentrations exceed PRGs and may exceed MTCA cleanup goals as well but this analysis did not speciate between Chromium III and Chromium VI. Lead, copper, nickel, selenium, tin, and possibly arsenic and chromium exceeded soil concentrations established under MTCA to be protective of terrestrial ecological receptors at most sites. However, exceedence of ecological receptor values does not necessarily trigger cleanup actions.

Mine workings are about 4,000 feet from the North Fork Trout Creek, the nearest surface waters.

NOTES:

Appendix C

ADDITIONAL SITE PHOTOS



Photo 1. Partially collapsed lower adit (photo by R. Lentz, 7/17/2002).



Photo 2. View north across open cut toward inclined shaft and stope openings (photo by R. Lentz, 7/17/2002).



Photo 3. View down inclined shaft (photo by R. Lentz, 7/17/2002).

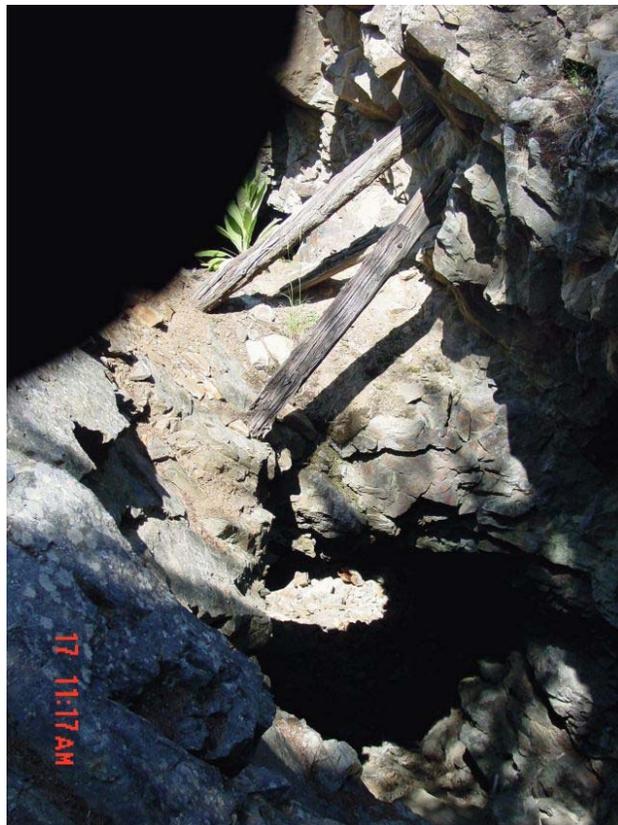


Photo 4. View into open cut with opening into stope (photo by R. Lentz, 7/17/2002).

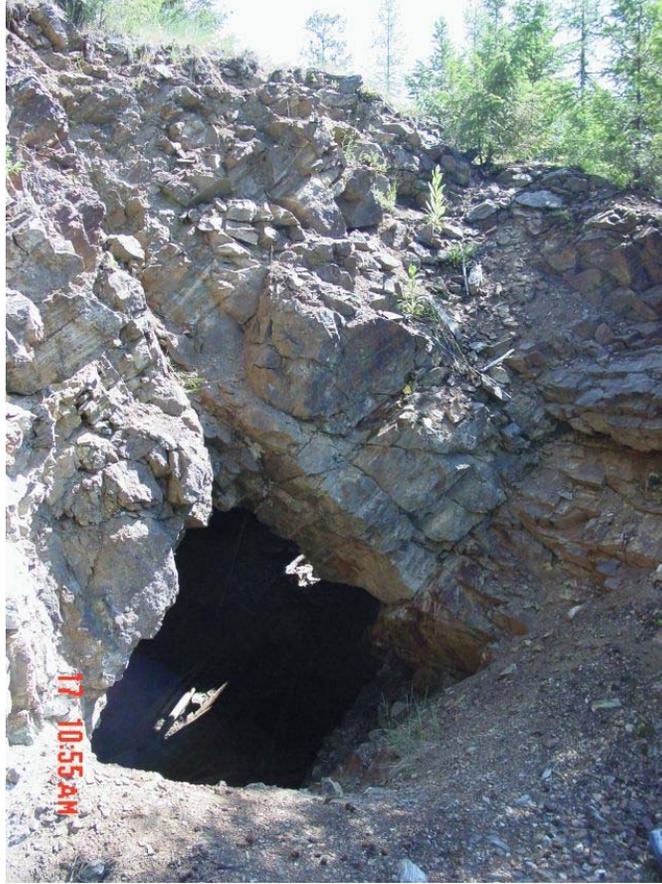


Photo 5. View into stope showing daylight on the other side (photo by R. Lentz, 7/17/2002).



Photo 6. Exploration cut; see close up in Photo 4 (photo by R. Lentz, 7/17/2002).



Photo 7. Shot rock from previous mining and exploration activities (photo by R. Lentz, 7/17/2002).