

ABBREVIATED PRELIMINARY ASSESMENT

RAINY MINE AND MILLSITE



Mt. Baker-Snoqualmie National Forest
Snoqualmie Ranger District
King County, WA

September, 2003

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EXECUTIVE SUMMARY

The Forest Service performed an Abbreviated Preliminary Assessment for the Rainy Mine and Millsite (Site) to determine the need for further site characterization. The Site is located approximately 12 miles northeast of North Bend, WA along Quartz Creek, a tributary of the Taylor River which flows into the Middle Fork of the Snoqualmie River. The Site is situated on gentle to moderate side slopes at an elevation of approximately 1,800 ft. above mean sea level (MSL).

A Niton XRF unit was used for In Situ field screening of material in the waste dump at the Site. A sediment sample was also collected from waste dump seep discharge to Quartz Creek for bench testing using the Niton XRF. Water samples were not collected as part of this investigation. However, pH and conductivity readings obtained from seeps at the base of the waste dump suggest potential acid rock drainage into Quartz Creek.

Arsenic was the only constituent of concern that exceeded EPA Region IX Preliminary Remediation Goals (PRGs) as to acceptable industrial levels in soil.

Based on the arsenic concentrations in the waste dump material and sediments, as well as potential acid rock drainage directly to Quartz Creek, 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 Rainy Mine and Millsite (Site) is located approximately 12 miles northeast of North Bend, WA on the Snoqualmie Ranger District of the Mount Baker-Snoqualmie National Forest. The Site is adjacent to Quartz Creek, a tributary of the Taylor River which flows into the Middle Fork of the Snoqualmie River. The Site falls within the Snoqualmie Mining District.

Location information:

Lat./Long.	West zone adit	N47° 34' 13.3" W121° 33' 20.5"
	East zone workings	N47° 34' 10.0" W121° 33' 08.8"
Legal:	Willamette Meridian, T 24 N, R 10 E, Section 16, NW ¼	
	Willamette Meridian, T 24 N, R 10 E, Section 9, SW ¼	
USGS quadrangle:	Lake Philippa	

The Site was originally claimed under the authority of the General Mining Law of 1872 in the early 1900's (Livingston, 1971). In 1946, M.F. Gilbreath relocated the original claims and staked additional ground (Livingston, 1971). A 50 ton-per-day floatation mill was constructed on the property in 1951 (Livingston, 1971). The mill was utilized until 1954 to process test shipments of ore. Also in 1951, a small mill, assayer shed, and bunkhouse were built on the property (Northwest Underground Explorations, 1997).

The Site has two mineralized breccia pipes about 800 feet apart known as the east and west zones (Derkey and others, 1990). The east zone development consisted of a short adit with a 100-foot deep double-compartment shaft that accesses a stope at the 60-foot level and a 40-foot raise (Livingston, 1971). At present, the adit is caved but collapse features are apparent from the old workings up the hillside to the access road. A shaft or collapse feature, flooded at depth, is open to the surface atop the remains of a concrete foundation. Development on the west zone consists of a 100-foot long adit that remains open at the portal. Waste rock piles are associated with both areas of development work.

Livingston (1971) reported that 363 tons of ore were mined from 1952 to 1956 yielding 127, 974 pounds of copper, 3,377 ounces of silver, and 94 ounces of gold. A Report of Mineral Examination for 28 unpatented mineral claims of the Rainy property reported production amounting to 2,000 tons from 1951 to 1957. Apparently most of the production came when the property was leased to the Western States Copper Company from 1952 until at least 1956 (Hutting, 1956). Northwest Underground Explorations

(1997) reported that the last major exploration work at the Site was completed in 1957 when 2,000 feet of diamond drilling was done.

The primary ore minerals at the property are chalcopyrite, brannerite, molybdenite, and scheelite; primary gangue minerals are pyrite, pyrrhotite, arsenopyrite, quartz, and tourmaline (Derkey and others, 1990). Copper, molybdenum, silver, and gold were the main commodities produced from the property.

The property is heavily overgrown with vegetation in most places. There are remains of other structures in the area. Access to the Site can be accomplished from North Bend, WA by proceeding northeast on County Road 56 along the Middle Fork of the Snoqualmie River for approximately 12 miles to the Taylor River and Forest Service Road 5640. From the bridge that crosses Taylor River, proceed north and then northwest for two miles to the Site. The Site is southwest of the road and is marked by an overgrown access road and well established trail.

Currently, the Site is inactive but active mining claims blanket the Site. A search of Bureau of Land Management records indicates that the Site is encumbered by the Rainy (ORMC22468), Rainy #1 (ORMC22469), Rainy #2 (ORMC22470), and Rainy #3 (ORMC22471) lode claims. The claimants for all four claims and their addresses are as follows:

David M. Gilbreath
509 223rd Street SW
Bothell, WA 98021

Robert C. Jackson
P.O. Box 809
Ravensdale, WA 98051

A Public Law 167 determination was completed in 1965 for the Rainy Lode and it was determined that the claimants do have surface rights (Donna Kauffman, Bureau of Land Management, personal communication on 8/25/03). Surface rights were waived by the claimants for the Rainy #1, Rainy #2, and Rainy #3 lodes (Donna Kauffman, Bureau of Land Management, personal communication on 8/25/03).

3.0 SITE SAMPLING AND TEST RESULTS

Water Samples

The Site was visited on October 2 and 11, 2002. At that time, water was ponded in the west zone adit behind sloughed material at the portal and numerous seeps were discharging at the base of the waste rock dump in the east zone. These seeps create a marsh-like area characterized by significant precipitation of iron oxide, hydroxide, and/or oxy-hydroxide minerals. After passing through the wetland, these waters discharge to Quartz Creek. No discharge was observed from the caved adit in the east zone but the workings are presumed to be flooded. No water samples were collected as part of this investigation. However, field parameters were obtained using a Hanna Instruments HI-9812 pH-EC-TDS meter, the results of which are outlined below:

Field Parameters

	<u>pH</u>	<u>Conductivity (µS/cm)</u>
Ponded water in West Zone Adit	7.6	120
Seeps from dump to Quartz Creek	4.7-6.5	30-40

The pH measurements indicate a high potential for acid rock drainage from the sulfide-rich waste piles that could adversely affect surface water quality in Quartz Creek.

Snoqualmie Falls, on the Snoqualmie River, northwest of North Bend, WA is a natural barrier to anadromous fish passage (Washington State Conservation Commission, 2002). No Bull Trout/Dolly Varden have been documented upstream of Snoqualmie Falls (Washington State Conservation Commission, 2002).

Soil Samples

A Niton XRF, XL-722S was used to assess the waste dump material In Situ 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. Rocks, debris and other deleterious materials were removed. The soil was worked to obtain a smooth surface on which to set the Niton. A sediment sample was also collected, bagged, and labeled from where the seeps at the base of the waste dump discharge to Quartz Creek. The sample was later dried and prepared for bench testing using the Niton XRF per EPA Method 6200. The results from this effort are provided below.

The following constituents exceeded EPA Region IX PRG industrial levels:

<u>Location</u>	<u>Constituent</u>	<u>Result (mg/kg)</u>	<u>PRG (mg/kg)</u>
Waste rock dump (east zone)	Arsenic*	63.3-145.2	1.6
Sediment – seep discharge to Quartz Creek	Arsenic*	139	1.6

*Arsenic – for noncancer endpoint, the PRG is 260 mg/kg. For cancer endpoints, the PRG is 1.6 mg/kg.

4.0 SUMMARY

The remains of this facility are accessible to the public and promoted in Northwest Underground Exploration's *Discovering Washington's Historic Mines* (1997). A well-established trail system accesses various features at the Site.

Arsenic was the only constituent of concern that exceeded EPA Region IX industrial levels in soil. pH measurements from seeps at the base of the waste dump indicate potential acid rock drainage directly to Quartz Creek.

5.0 RECOMMENDATION

Based on the In Situ screening of material from the waste rock dumps, bench testing of sediments, the high potential for acid rock drainage, 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 as well as sampling water from pore spaces of the stream gravels immediately above and below the Site. Sampling of the benthic macroinvertebrates are also required. In addition to testing water samples from the pore spaces of the gravels for the presence of metallic elements, water parameters such as pH, conductivity, turbidity, dissolved oxygen, temperature, total dissolved solids, hardness, and oxygen reduction potential are required. 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. Acid base accounting (ABA) is required if waste material is present besides what had been observed during this assessment. Sediment samples are to be collected from transects of the stream and preferably at depth and analyzed

for total as well as for available metals. Surface water samples are also required for analyses of both total and dissolved metal concentrations in Quartz Creek, Taylor River, and Middle Fork of the Snoqualmie River as well as in any other seeps and/or tributaries that may be present in the vicinity of the Rainy mine and millsite.

Appendix B contains additional photos of the Site.

REFERENCES

- 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.
- Livingston, V.E., 1971, Geology and mineral resources of King County, Washington: State of Washington Department of Natural Resource, Division of Mines and Geology Bulletin No. 63, 200 p.
- Northwest Underground Explorations, 1997, Discovering Washington's historic mines, Volume 1: The west central cascade mountains: Oso Publishing, Arlington, WA, 230 p.
- Washington State Conservation Commission, 2002, Salmonid habitat limiting factors analysis, Snohomish River watershed, Water Resource Inventory Area 7, 331 p.

Appendix A

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 September 15, 2003
 (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: Rainy Mine and Millsite

Previous Names (if any): Quartz Creek, Rainy Fraction, Fathers Day, Western States Copper

Site Location: The Site is located approximately 12 miles northeast of North Bend, WA along Forest Service Road 5640.

Legal Description: Willamette Meridian, T 24 N, R 10 E, Section 16, NW ¼
Willamette Meridian, T 24 N, R 10 E, Section 9, SW ¼

<u>Lat./Long.</u>	<u>West zone adit</u>	<u>N47° 34' 13.3" W121° 33' 20.5"</u>
	<u>East zone workings</u>	<u>N47° 34' 10.0" W121° 33' 08.8"</u>

Describe the release (or potential release) and its probable nature: The material comprising the mine waste dumps is contaminated. Arsenic concentrations of 63.3-145.2 mg/kg exceed EPA Region IX PRGs for industrial soils of 1.6 mg/kg for cancer endpoint. Furthermore, a sediment sample from where the waste dump seeps discharge to Quartz Creek has arsenic concentrations of 139 mg/kg.

pH measurements at the Site indicate a high potential for acid rock drainage directly to Quartz Creek. Numerous seeps discharge at the base of the sulfide-rich waste rock piles into a wetland with significant iron oxide, hydroxide, and/or oxy-hydroxide precipitation before the effluent enters Quartz Creek.

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		X

occurred, or an EPA approved risk assessment completed)?		
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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 checked="" type="checkbox"/> Higher Priority SI	<input type="checkbox"/> Refer to Removal Program – NFRAP
<input 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:

The Site is promoted in Northwest Underground Exploration's *Discovering Washington's Historical Mines (1997)* and trails at the Site suggest frequent visitation by the public for rock and mineral collecting. Arsenic concentrations in the waste dump and sediments at the seep discharge to Quartz Creek exceed EPA Region IX industrial soil PRGs of 1.6 mg/kg for cancer endpoint. The Site has a high potential for acid rock drainage directly to Quartz Creek. Based on these facts, it is recommended that an SI be implemented.

NOTES:

Forest Service Road 5640 is gated at the Taylor River Bridge, keys may be obtained from the Snoqualmie Ranger Station in North Bend, WA. The road to the mine is passable with a high clearance vehicle, four-wheel drive is recommended. At the Site, the access road is overgrown and a bridge across a creek is unusable. Access may require dozer work to construct access down moderate to steep slope. A track-mounted drill rig could probably negotiate but hand auger may work best given site conditions.

Appendix B

ADDITIONAL SITE PHOTOS



Photo 1. Remains of mill foundation or head house; shaft or collapse feature is behind downed snag at top of picture, view to the northeast (photo by G. Graham, 10/2/2002).



Photo 2. View of shaft or collapse feature mentioned in Photo 1, flooded at depth (photo by G. Graham 10/2/2002).



Photo 3. View of waste rock dumps below remains of mill, multiple seeps are present at the base of the piles, view to the northwest (photo by G. Graham, 10/2/2002).



Photo 4. View from top of southeast end of waste rock dump looking towards Quartz Creek, view to the southwest (photo by G. Graham, 10/2/2002).



Photo 5. View of water from seeps at base of waste rock piles discharging directly into Quartz Creek (photo by G. Graham, 10/2/2002).