



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 Emergency Response Unit
1200 Sixth Avenue
Seattle, Washington 98101**

Reply To Attn Of: ECL-116

MEMORANDUM

DATE: April 13, 2007

SUBJECT: Request for a Removal Action to be Conducted at the Black Butte Mine,
Cottage Grove, Oregon

FROM: Kathy Parker, On-Scene Coordinator *Kathy Parker*
Carl Kitz, On-Scene Coordinator

THRU: Chris D. Field, Unit Manager *Chris D. Field*
Emergency Response Unit, Office of Environmental Cleanup

TO: Daniel D. Opalski, Director
Office of Environmental Cleanup

I. Purpose

The purpose of this action memorandum is to request and document approval of the proposed time-critical removal action described herein for the Black Butte Mine, Cottage Grove, Oregon. The CERCLIS ID No. is OR000515759 and the Site ID No. is 10EK.

This action meets the criteria for initiating a removal action under the National Contingency Plan (NCP), 40 C.F.R. §300.415.

II. Site Conditions And Background

A. Site Description

1. Physical Location

The Black Butte Mine (BBM) is located in southern Lane County, in the Coast Fork Willamette River basin, approximately ten miles south of Cottage Grove, Oregon. The BBM is located on the northwest flank of Black Butte (see Figures I & II.). The legal description of the BBM Site is: Section 16, Township 23 South, Range 3 West, Willamette Meridian.

The BBM is a former mercury mine. From 1927 to 1940, BBM was one of Oregon's largest producers of mercury. Motor vehicle access to the Site is restricted by a locked gate. The road leading to this gate crosses private property owned by Michael Pooler. Michael Pooler is a former BBM worker and currently lives at a home located near the entrance to the Site.

The primary features of the Site include a former mill structure containing a rotary kiln, mercury condenser, and ore storage/crushing equipment (New Furnace Area), another mill and furnace area (Old Ore Furnace), several old dilapidated buildings, a system of unimproved roads, mine adits, and piles of waste rock and mill tailings.

The pile of waste rock and mill tailings located in a relatively flat area below the New Furnace Area is referred to as the Main Tailings Pile. It is bordered on the northeast by Dennis Creek. A mine access road leads from the Pooler's residence up to and over the main tailings pile and continues up beyond the "404" Adit. Tailings in the Main Tailings Pile are gravel-sized with lesser amounts of fine- to sand-sized material. Tailings on the northeast edge of the Main Tailings Pile dip steeply to the northeast toward Dennis Creek.

Remnants of a second waste pile lie to the northwest of the Old Ore Furnace. This area borders Furnace Creek to the southwest. Materials in this area are finer grained than in the Main Tailings Pile. The "404" Adit is located up gradient of the Old Ore Furnace and New Furnace Area. Ore from the "404" Adit historically was transported to the Old Ore Furnace via a tramway. The Dennis Creek Adit is located up-gradient of the New Furnace Area. Ore historically was transported from the Dennis Creek Adit to the New Furnace Area via a railway. Seven adits have been identified in unpublished work completed by the Oregon Department of Environmental Quality (ODEQ). Four or more of these adits are located above the "404" Adit.

Between 1957 and 1995, the mean monthly wind speed averaged between 6.7 and 8.2 mph at the nearest meteorological station in Eugene with recorded wind gusts of up to 56 mph. Between 1943 and 2006, the mean monthly temperature at the Cottage Grove Dam averaged between 32.3F and 79.9F with an average annual precipitation of 47.7 inches/year and an average snow fall of 5 inches per year.

Potential human health and environmental impacts from historic mine wastes present at the BBM Site include public health and safety risks, increased metal concentrations in surface water, and increased sediment load to surface water. Elevated mercury levels in fish found in the Cottage Grove Reservoir pose health risks when eaten. The potential negative health effects of mercury relate to these risk factors:

1. Chemical form of mercury ,
2. Dose,
3. Age of the person exposed (fetuses are more susceptible),
4. Duration of exposure,

5. Route of exposure: inhalation, ingestion, dermal contact,

6. Health of the person exposed.

Surrounding Land Use and Distance to Nearest Populations

The BBM area drains to Dennis Creek and Furnace Creek. Smaller unnamed creeks drain into Dennis Creek from the area above the Main Tailings Pile. Dennis Creek borders the northeast side of the Site and flows westward into Garoutte Creek, approximately 0.25 miles downstream of BBM. The Main Tailings Pile fronts approximately 600 feet of Dennis Creek and mine tailings are located within thirty feet of the creek bed.

Furnace Creek, an intermittent stream, borders the southwest side of the BBM area. Furnace Creek also flows into Garoutte Creek. Furnace Creek is adjacent to the Old Ore Furnace Area and mine tailings are in contact with the creek.

Garoutte Creek flows northward approximately one mile to the Coast Fork Willamette River, which in turn empties into Cottage Grove Lake, a reservoir used extensively for recreational activities including contact recreation (i.e. swimming, canoeing, and scuba diving) and fishing. This lake is visited by almost a half-million people every year for camping, picnicking, swimming, water skiing, fishing and boating.

The aquifers in the vicinity of the BBM are the Fisher Formation (bedrock aquifer) and the alluvial aquifer along Dennis Creek, Garoutte Creek, and the Coast Fork Willamette River. Depth to groundwater and hydraulic conductivity of these aquifers at the BBM Site are unknown. Well logs in the vicinity of the BBM indicate that the shallowest depth to water-bearing strata in bedrock is twenty-nine feet below ground surface (bgs). Local groundwater gradients are unknown but are likely toward the streams. The nearest spring is London Springs, located approximately four miles north of the Site. Its source, use, and quality are unknown.

Vulnerable or Sensitive Populations, Habitats, and Natural Resources

The BBM was identified in recent Total Maximum Daily Load (TMDL) investigations as a significant contributor of mercury to sediment and fish tissue in Cottage Grove Reservoir, located approximately six miles downstream of BBM. Cottage Grove Reservoir and the main stem of the Willamette River, is the nation's thirteenth largest watershed. The Oregon Department of Human Services has issued health advisories to limit consumption of fish harvested from the Cottage Grove Reservoir due to elevated mercury concentrations in fish tissue.

Other Mines in the Area

BBM is located in the upper portion of the Coast Fork Willamette River Watershed (CFW) approximately four miles north of the Calapooya Divide which separates the Willamette River

Basin from the Umpqua River Basin. Two tributaries, Furnace Creek and Dennis Creek, drain the Site and enter Garoutte Creek about 1000 feet west and about 1500 feet northwest of the Site, respectively. Approximately one mile north of the Site Garoutte Creek enters the Coast Fork Willamette which continues northward about six miles where it drains into Cottage Grove Reservoir. The Coast Fork Willamette River continues northward towards the Eugene-Springfield area where it finally meets with the Willamette River.

The Site is situated in the Black Butte-Elkhead Mercury District (District) along with about seven prospects and one other historical mercury producing mine, Elkhead, which is located in the Umpqua Basin. The District spans the Calapooya Divide. The only mercury-producing mine within the CFW is the BBM. There are several prospects within a few miles of the Site, and within the CFW, where cinnabar and related mineralogy have been historically noted, but production did not take place at those locations. BBM is the only significant mercury source in the CFW beyond the local background mercury load from the District soils. Recent reports have shown that the BBM is a significant source of mercury contamination of the Cottage Grove Reservoir as described next.

The abstract of the J.-G. Park and L.R. Curtis report dated July 22, 1997 “Mercury Distribution in Sediments and Bioaccumulation by Fish in Two Oregon Reservoirs: Point Source and Nonpoint-Source Impacted Systems” states, “These results indicated that a point source, Black Butte Mine, contributed amounts of mercury greatly in excess of mobilization from natural deposits, atmospheric deposition, and small scale uses of the metal as an amalgamating agent in gold mining (to Cottage Grove Reservoir).” The final report for the U.S. Army Corps of Engineers “Sources and Chronology of Mercury in the Cottage Grove Reservoir” by Lawrence R. Curtis, Department of Environmental and Molecular Toxicology dated May 20, 2003 also demonstrates that the BBM is the source of mercury contamination found in the Cottage Grove Reservoir. On page 37 in the Conclusions Section, the report states “Elevated mercury concentrations in soils surrounding the Black Butte Mine supports the conclusion that the Black Butte Mine is a point source of contamination to the reservoir”.

3. Site Characteristics

The BBM was first put into operation by S. P. Garoutte in 1890 and a 40-ton-per-day Scott-Hutner furnace was installed at the Site. In 1897, the Quicksilver Mining Company took over the property until 1909, when the mine was closed due to depressed mercury prices. During that period of operation, the capacity of the furnace was increased and 15,000 feet of development work was completed.

In 1916, the BBM was reopened by an unnamed New York based company operated by Earl B. Crane. A flotation unit and a redesigned Scott furnace were used from 1916 until 1919, when declining mercury prices again forced the shutdown of the mine.

The BBM was operated by the Quicksilver Syndicate from 1927 to 1942. Two rotary furnaces were installed increasing the mines capacity to 150 tons per day. During this period, old furnace

tailings were re-treated. The mine was closed again in 1943.

In 1956 and 1957, the mine was leased by Mercury & Chemicals Corporation of New York. The uppermost levels of the mine (900 and 1,100 foot levels) were explored and developed during this time. Mining operations ceased during 1957.

In January 1994, BBM was purchased by the Land and Timber Company, which is still the current owner.

4. Release or Threatened Release Into The Environment Of A Hazardous Substance, Or Pollutant Or Contaminant

The contaminant of concern, mercury, is a hazardous substance and pollutant or contaminant as defined by sections 101(14) and 101(33) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §9601(14) and (33).

EPA's technical support contractor, Ecology & Environment, Inc. completed a Site investigation of the BBM Site in 2005. This investigation characterized mining-related impacts. Sampling data was collected from the five main areas. These are the Main Tailings Pile, the new furnace area, the Old Furnace Area, the three creeks, Dennis Creek Adit and the "404" Adit. The extent of mercury contamination is summarized in the investigation and compared to various benchmarks. Table 1 lists these benchmarks by media type and constituent. Analytical results also are presented in Tables 2 through 6. Mercury and arsenic concentrations in waste rock and tailings were compared to EPA Region 9 Preliminary Remediation Goals (PRGs) and ODEQ Maximum Allowable Soil Concentrations (MASCs) for both residential and industrial soils. Concentrations of mercury in sediment were compared to EPA Region 9 residential soil PRGs, National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SquiRT) threshold effects levels (TELs) and probable effects levels (PELs) for fresh water sediment (Buchman 1999), and ODEQ Level II Screening Level Values (SLVs) for soil. Concentrations of mercury in surface water were compared to EPA National Recommended Water Quality Criteria (NRWQC) and ODEQ Level II SLVs for fresh water. For the purpose of interpretation of sampling results, analytical data are compared to the most conservative criteria of those listed above and in Table 1.

Total mercury in waste rock/tailings samples collected during the 2005 Removal Assessment and the 1999 Site Investigation of Black Butte Mine ranged in concentration from 1.13 to 54,300 mg/kg. Total mercury concentrations in waste rock/tailings samples collected from the Main Tailings Pile and near the Old Ore Furnace ranged from 1.13 to 2,420 mg/kg. In the New Furnace area, total mercury concentrations in waste rock/tailings/soil samples ranged from 91.9 to 54,300 mg/kg. The high concentrations of mercury in the immediate area of the mill structure and furnace are likely the result of localized spillage of elemental mercury during processing activities. SPLP analyses for mercury leachate were non-detects indicating mercury is being transported from the Black Butte Mine to surrounding creeks via erosion and not leaching.

Total mercury in sediment samples collected during the 2005 Removal Assessment from Dennis Creek, Furnace Creek, and Garoutte Creek ranged in concentration from 0.45 to 37.4 mg/kg. The total mercury concentration of 37.4 mg/kg was from a location in Furnace Creek where tailings were present in the creek.

In 2002, Oregon State University (OSU) collected six surface sediment samples along a longitudinal transect through the center of Cottage Grove Reservoir. Total mercury in these sediment samples ranged in concentration from 0.7 to 3.6 mg/kg. OSU also collected three sediment cores from the Cottage Grove Reservoir to examine the variation of mercury deposition within the reservoir over time. Total mercury in sediment cores ranged in concentration from 0.5 to 3.9 mg/kg. The concentration of total mercury varied over core depth with the highest values occurring from 32 to 34 cm depth (corresponding to a period of deposition in the mid-1960's).

Tissue samples from five largemouth bass were analyzed in an OSU study from 1990. Muscle tissue from the oldest two fish showed mercury concentrations of 1.49 to 1.79 ppm (or mg/kg). Ten largemouth bass were also collected from Cottage Grove Reservoir in 1998 by Oregon DEQ. Total mercury concentrations in muscle tissue from ten fish ranged in concentration from 0.86 to 1.6 mg/kg.

The owner, Land and Timber Company, has used the property for logging. Future use of this Site may continue to be logging or may eventually become recreational. Because of the possibility of recreational use, the residential PRGs and MASCs are referenced for interpretation of analytical results. Although residential values are more conservative than industrial values, the ODEQ considers residential values more appropriate to evaluate potential recreational use than industrial values.

The total mercury concentration in the surface water sample, where waste rock/tailings are in contact with Furnace Creek exceeded both the NRWQC - CMC for mercury and the ODEQ Level II SLV (aquatic) for mercury.

All of the sediment samples, including the background samples, exceeded ODEQ Level II soil SLV for invertebrates for mercury. However, only the sediment sample from Furnace Creek substantially exceeded the background total mercury concentration.

The EPA Region 9 PRG (residential) for total mercury was exceeded for soil samples in the Main Tailings Pile, the Old Ore Furnace area, and the New Furnace area.

5. NPL Status

The Site is not listed on the National Priorities List (NPL) nor has the Site been proposed for the NPL.

B. Other Actions To Date

1. Previous Actions

There have been no previous removal actions at the BBM Site. However, there have been a number of previous sampling events. In July 2004, ODEQ asked EPA to conduct a removal assessment. In May 2005, the EPA Region 10, Office of Environmental Cleanup tasked Ecology and Environment to conduct a removal assessment. The field work was performed in September 2005, and the final report delivered to EPA on March 31, 2006. Prior sampling or assessment events include:

- 1990, an OSU study of mercury in fish in the Cottage Grove and Dorena Reservoirs, published in the report: “An Ecosystem Approach to Mercury Bioaccumulation by Fish in Reservoirs” by S.M. Allen-Gil, D.J. Gilroy and L.R.Curtis, Oregon State University Department of Fisheries and Wildlife, 1990;
- 1996, an ODEQ preliminary assessment, published in the report: “Preliminary Assessment, Black Butte Mine...” by Keith Andersen, Oregon Department of Environmental Quality, for David Bennet, April 1, 1998;
- 1998, an EPA Site inspection published in the report: “Black Butte Mine Site Inspection Report TDD 98-04-0004” by Ecology and Environment, Inc., prepared for Mark Ader, April 1998;
- 2003, U.S.ACE study published in the report: “Sources and Chronology of Mercury Contamination in Cottage Grove Reservoir for U.S. Army Corps of Engineers, Portland, Oregon” by L.R. Curtis, Oregon State University, May 20, 2003;
- 2004, an ODEQ study published in the report: “Reconnaissance Soil Sampling at the BBM for ODEQ”, by Oregon State University, August 9, 2004.

2. Current Actions

There are no current EPA actions at the Site, other than the planning for a Superfund Lead Removal Action.

C. State and Local Authorities’ Roles

1. State and Local Actions To Date

The ODEQ performed a preliminary assessment (PA) in 1996. The PA was conducted to identify potential public health and environmental threats related to the Site. The scope of the investigation included a review of available file information, interviews, a target survey, and an on-site reconnaissance inspection. No new sampling was conducted for this assessment. Based on the work conducted under this PA, ODEQ recommended a Site Inspection be carried out to

more fully evaluate the threat associated with the mine and tailings pile. There have been no other state or local actions conducted within the affected waters to address the mine waste contaminants. August 12, 2002 memorandum by Amanda Spencer, ODEQ requested official designation of the BBM as an “Orphan Site” and to make (the) Site account available for funding of stabilization and cleanup of the mine. In that memorandum Amanda Spencer stated that the land owner, The Land and Timber Company, was unwilling to complete the investigation/cleanup the BBM Site. A letter dated May 26, 2006 from Kerri L. Nelson, ODEQ, to Chris Field, requested EPA carry out a removal action. This request was made “due to limited funding in the ODEQ Orphan Account”.

2. Potential for Continued State and Local Response

ODEQ will conduct post removal sampling to verify removal effectiveness and help to determine if any additional cleanup work is required by the state and conduct yearly inspections of the repository and covered areas.

3. Tribes and Cultural Resources

a. Tribes

In June 2006, OSC Carl Kitz notified Preston Sleeper with the U.S. Department of Interior by phone and by email of the pending removal action and provided background information on the Site. Mr. Sleeper informed Mr Kitz that there are no tribes in the BBM drainage area, including the Willamette River. To help ensure that no Tribal concerns were overlooked, information concerning the proposed removal work was shared with the Confederated Tribes of Coos, Lower Umpqua and Siuslaw, Cow Creek, The Cow Creek Band of Umpqua Indians, and the Confederated Tribes of Siletz. No concerns regarding the proposed removal action have been reported by any Tribes.

b. Cultural Resources

The State Archaeologist, with the State Historic Preservation Office (SHPO), was sent information about the planned removal work. Based on the concerns/feedback from the SHPO a Cultural Resource Survey was initiated. Archaeological Investigations Northwest, Inc. (AINW) was contracted through Ecology and Environment, Inc. to conduct an archaeological survey of the project Area of Potential Effects (APE) to address the project’s possible impacts on significant archaeological resources . As the project is a federal undertaking, AINW’s work was done in compliance with Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations (36 C.F.R. § 800), and according to the requirements of the Secretary of the Interior’s Standards and Guidelines for Archaeology and Historic Preservation.

Records from the Oregon State Historic Preservation Office (SHPO) were reviewed to determine if archaeological Sites had been recorded or if archaeological surveys had been conducted in the vicinity of the Black Butte Mine. A review of the National Register of Historic Places was also

conducted to determine if any listed archaeological or historic properties are located in or near the proposed project area. The results indicated that no listed archaeologicals are in or near the proposed project area. A review of the SHPO database, which is a listing of the Oregon Inventory of Historic Properties, indicated no inventoried resources were located in the proposed project area.

4. EPA Region 10 Regional Mining Team

Patricia McGrath of the EPA Region 10 Mining team was briefed on the pending removal and agreed with the need for a clean-up at the BBM and the proposed removal actions. The BBM is the only mercury mine with drainage to the Cottage Grove Reservoir.

III. Threats To Public Health Or Welfare Or The Environment, And Statutory And Regulatory Authorities

In determining the appropriateness of this removal action, EPA considered all the factors listed in Section 300.415(b)(2) of the NCP. The factors set forth below apply to this removal action based upon the current conditions at the BBM Site. EPA has determined that the Site is a threat to the public health or welfare or the environment, and a removal action is appropriate under Section 300.415(b)(2) of the NCP. Any or all of these factors may be present at a Site, and any one of these factors may determine the appropriateness of a removal action.

A. Threats to Public Health or Welfare

1. Exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants (300.415[b][2][i])

The elevated concentrations of mercury in waste rock and tailings of the Main Tailings Pile, Old Furnace area, New Furnace Area, and Furnace Creek and proximity to Dennis, Furnace and Garoutte Creeks indicate that human exposure pathways exist. A report by J.-G. Park and L.R. Curtis dated July 22, 1997 “Mercury Distribution in Sediments and Bioaccumulation by Fish in Two Oregon Reservoirs: Point-Source and Nonpoint-Source Impacted Systems” states that the BBM is the source of elevated levels of mercury in Cottage Grove Reservoir fish. Table 5-3 of the 2005 EPA Removal Assessment Report shows the elevated levels of mercury in sediments that were deposited as a result of the BBM.

2. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate (300.415[b][2][iv])

The mine waste contaminated soils are not vegetated, thus the soils are susceptible to migration because of water- and wind-borne influences. Erosion throughout the contaminated materials is widespread and moving this material into the active waterways of Dennis, Furnace and Garoutte Creeks and elsewhere throughout the Site.

3. Minimization or elimination of the effects of weather conditions that may cause hazardous substances, pollutants or contaminants to migrate or to be released (300.415[b][2][v])

Mine wastes are slumping and eroding directly into the creeks with subsequent transport downstream. During the springtime, snow melt, rainfall or other run-off inducing events tend to spread the contaminated materials further from the Site. The warmer temperatures and dry weather typical in the summer and fall months in and near the Site contribute to wind-borne dispersal of mine-contaminants.

4. Availability of other appropriate federal or state response mechanisms to respond to the release (300.415[b][2][vii])

The ODEQ does not have the resources to provide the appropriate timely response needed to address actual or potential human health and ecological risks associated with the mine waste contaminants described herein. No other state or federal resources have been identified to provide a timely response.

B. Threats to the Environment

1. Exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants (300.415[b][2][i])

Ecological receptors have been exposed to Site contaminants through direct contact with mine waste contaminated materials and with water and sediments contaminated by mine-waste materials; ingestion of mine-waste materials and water and sediments contaminated by mine-waste materials; and / or ingestion of contaminated food (e.g., sediment- or soil-dwelling insects, vegetation). Highly contaminated sediment from the mine Site is likely being transported downstream.

2. Actual or potential contamination of drinking water supplies or sensitive ecosystems (300.415[b][2][ii])

The concentration of mercury in Furnace Creek is likely a result of mine waste materials migrating off the Site. Excavation of the mine waste contaminated materials is anticipated to have a positive effect on surface water quality and the sensitive aquatic ecosystem of Furnace Creek.

3. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate (300.415[b][2][iv])

There is cause for concern near the Black Butte Mine Site and for some distance downstream in Dennis, Furnace and Garoutte Creeks because of the likelihood for continued erosion of contaminated materials into the stream and subsequent downstream material migration.

Recovery and restoration efforts for fish and other species could only be enhanced with improved water quality in Cottage Grove Reservoir and the Willamette River drainage.

IV. Endangerment Determination

Actual or threatened releases of hazardous substances from this Site may present an imminent and substantial endangerment to public health, welfare, or the environment.

V. Proposed Actions And Estimated Costs

The following objectives, which are designed to address the aforementioned threats to human health or welfare and the environment, have been developed for the Site:

- Mitigate exposure pathways to mine waste contaminated soils and sediments through excavation and containment of the contaminated materials.
- Reduce sediment loading in Dennis and Furnace Creeks to reduce mercury contamination in the creeks, Cottage Grove reservoir and Willamette River.

Starting and completion dates for the proposed work depend on the weather. Based on the analysis of the nature and extent of mine waste contamination and the response objectives listed in the preceding paragraph, the following three alternative actions were evaluated for the BBM:

- Alternative 1 - No action. Site conditions remain unaltered and risks to human health and the environment persist.
- Alternative 2 – Construction of an engineer designed on-site repository for permanent storage of excavated materials; excavation of mercury contaminated mine tailings along adjacent creeks, and other highly mercury contaminated soils located on the Site; consolidation of such material in the repository. After completion of the excavation work, capping the repository with clean soil and hydro-seeding the cap to prevent erosion.
- Alternative 3 - Excavation of mine waste, contaminated soil and sediment, and transport to an off-site landfill; reconstruction of the creek channels; and grading, revegetation, and erosion protection of disturbed areas.

Alternative 1 was not selected because it would not address the actual or potential imminent and substantial human health and ecological threats posed by the mine-waste-contaminated soils and sediments. Alternative 3 was not selected because of the substantial disposal-related costs which would be incurred with transport to an off-site repository, and damage to the creek beds. Alternative 2 was selected as it would provide protection from direct contact and significantly reduce the off Site migration of mercury to adjacent creeks and downstream waterways.

A. Proposed Actions

1. Proposed Action Description

Alternative 2 is the proposed action (as described below) consisting of excavation of mine tailings and contaminated soils, and consolidation beneath a soil capped repository constructed on-site. The identification of mine waste contaminated materials will be accomplished by removing the visible mine tailings, and with confirmation by systematic field screening of surface soils with a field portable X-ray fluorescence (FPXRF) instrument using ODEQ soil cleanup guidelines for mercury. The following excavation work is proposed:

- 30,000 cubic yards tailings excavated from the Main Tailings Pile.
- 3,000 cubic yards excavated from the Old Ore Furnace and Furnace Creek areas.
- 2,000 cubic yards excavated from the New Furnace Area.

The cleanup goal for mercury in the Main Tailings Pile is 8 to 10 mg/kg (background levels). Cleanup in other highly contaminated areas identified above will be excavation, to the extent practicable, to less than EPA region 9 PRG of 115 mg/kg (adjusted for mercury sulfide).

REPOSITORY

The repository area has been surveyed and the conceptual design has also been completed. Final design plans for the removal work, including repository design, excavation work, and cover for excavated areas and repository were prepared by E&E in March 2007. A post cleanup plan is currently being prepared by E&E which will describe the necessary actions, such as deed

restrictions, required to maintain the integrity of the repository after the removal is completed.

MAIN TAILINGS PILE

The waste rock/tailings on the north-northeast edge of the main waste rock/tailings on the side sloping toward Dennis Creek are unstable and subject to erosion and undercutting by water erosion from unnamed tributaries of Dennis Creek. Removal and stabilization of the waste rock/tailings in this area will be performed.

NEW FURNACE AREA

In the New Furnace Area, contaminated soils in the immediate area of the mill structure will be covered with clean soil.

OLD ORE FURNACE

In the Old Ore Furnace area, contaminated soils will be removed in the immediate area of the furnace structure and Furnace Creek.

Best Management Practices

Temporary Best Management Practices (BMPs) will be employed throughout the removal action. This will include control of erosion, control of fugitive dust, and storm water management.

2. Contribution to Remedial Performance

ODEQ concurs on the proposed removal action and the consistency of that action with any future actions the state may take with regard to the Black Butte Mine Site.

3. Description of Alternative Technologies

No other technologies were considered practical from economic, engineering, and/or timing perspectives.

4. EE/CA

An engineering evaluation/cost analysis (EE/CA) is not required for an EPA time-critical response action.

5. Applicable or relevant and appropriate requirements

The NCP requires that removal actions attain Applicable or Relevant and Appropriate Requirements (ARARs) under federal or state environmental or facility siting laws, to the extent practicable (40 C.F.R §300.415[j]). In determining whether compliance with ARARs is practicable, EPA may consider the scope of the removal action and the urgency of the situation. (40 C.F.R. §300.415[j]).

a. Federal

1. The substantive provisions of Section 404 of the Clean Water Act (CWA), 33 U.S.C. §1344, are applicable requirements and will be met to the extent practicable. For example, the proposed removal action will be conducted to avoid the discharge of dredged or fill material into navigable waters, through the use of BMPs, such as silt fences, hay bales, or other means necessary to control potential discharge from the Site.
2. In accordance with the Endangered Species Act of 1973, 16 U.S.C. §1531 et. seq., EPA will consult with the U.S. Fish and Wildlife Service regarding potential effects on federally listed species and their habitats prior to performing the proposed removal action.
3. The tailings left from mining activities at Black Butte Mine were created from beneficiation and extraction processes at the Site and hence are subject to the “Bevill Exemption,” described in 40 C.F.R. §261.4(b)(7), which exempts the tailings from being defined as RCRA hazardous

waste. Although the two furnaces on the Site were used by the mine, no process waste has been identified in any of the areas that this removal action will address.

b. State

1. To the extent practical, O.A.R. 340-122-70 (removals) Oregon Cleanup Rules will be addressed. Oregon Cleanup Rules allow consideration for the lowest cost cleanup measure, which often is capping in place. In addition, a removal action under state rules is not considered a final remedy thus allowing for flexibility in generating a Site-specific cleanup level. Residual risk, cost, and practicality should all be evaluated in order to make a reasonable Site-specific cleanup level. Final remedy-specific actions, such as the hot spot evaluation and a 10^{-6} risk evaluation for residual contaminants should be addressed, if practical.
2. Any discharge to the waters of the state fall under the Oregon Water Quality Rules, O.A.R. 340, Division 41. The substantive requirements of these rules will be met during the removal action. In general, the ODEQ rules mimic the federal rules and therefore the substantive requirements of O.A.R. 340-41 will be met as long as the federal requirements are met. BMPs and erosion-control will limit the runoff of turbidity and heavy metals.
3. The Oregon Air Pollution Control Regulations and Oregon Emission Standards for Hazardous Air Pollutants, O.A.R. 340, Division 200 and 246, respectively, are potentially applicable if heavy-metal contaminated dust is generated above regulatory thresholds. BMPs such as dust control will be used to mitigate the generation of fugitive dust which will meet the substantive requirements of these rules.
4. Oregon Hazardous Waste Regulations, O.A.R. 340, division 100 through 103, may be applicable if liquid mercury waste is found on Site. The substantive requirement of this rule will be met if hazardous wastes are encountered during the removal.
5. Oregon Department of State Lands Rules, O.A.R. 141, division 85, may be applicable if excavation activities are conducted below the seasonal high water line of Dennis or Furnace Creeks. Work conducted below the seasonal high water mark of the creeks is considered work within waters-of-the-state and therefore the substantive requirements of these rules should be met.
6. Oregon Fish and Wildlife Department Rules for in-stream water rights and fish passage, O.A.R. 635, Division 400 and 412, may be applicable if excavation activities are conducted below the seasonal high water line of Dennis or Furnace Creeks. The substantive requirements of these rules will be met if excavation is conducted below the seasonal high water line of Dennis or Furnace Creeks.

6. Project Schedule

The starting date for the Removal Action is dependent on weather conditions and snow at the

Site. We anticipate beginning removal action work in the Spring of 2007, with the on-site work taking approximately 30 to 40 days.

B. Estimated Costs

<u>Regional Removal Allowance Costs</u>	
ERRS (Construction, equipment, and material including 15% contingency)	\$587,000
<u>Other Extramural Costs Not Funded from the Regional Allowance</u>	
START	\$100,000
Coast Guard Strike Team	\$10,000
<u>Total Extramural costs</u>	\$697,000
<u>Project Cost Contingency (20%)</u>	\$140,000
TOTAL REMOVAL PROJECT CEILING	\$837,000

VI. Expected Change In The Situation Should Action Be Delayed Or Not Taken

The Action Memorandum approval process was initiated in September 2006. Weather conditions at the Site did not allow the removal action to start until the Spring of 2007. If the response action should be delayed or not taken hazardous substances will remain as potential human health and ecological threats, based on ingestion exposure pathways; and hazardous substances will remain a continuing source of solid and dissolved-phase contaminants.

VII. Outstanding Policy Issues

None.

VIII. Enforcement

See attached Confidential Enforcement Addendum.

IX. Recommendation

This decision document presents the selected removal action for the BBM Site, Lane County, Oregon, developed in accordance with CERCLA, as amended. It is not inconsistent with the NCP. This decision is based on the administrative record for the Site.

VII. Outstanding Policy Issues

None.

VIII. Enforcement

See attached Confidential Enforcement Addendum.


IX. Recommendation

This decision document presents the selected removal action for the BBM Site, Lane County, Oregon, developed in accordance with CERCLA, as amended. It is not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP, 40 C.F.R. § 300.415(b)(2), criteria for a removal action and we recommend your approval for the proposed removal action. The total project ceiling if approved will be \$ 831,900. Of this, an estimated \$523,250 comes from the Regional removal allowance.

Approval:

Signature:

 Date: 6/27/07
Daniel D. Opalski, Director
Office of Environmental Cleanup

Disapproval:

Signature:

Date:

Daniel D. Opalski, Director
Office of Environmental Cleanup

Documents Referenced for Administrative Record:

1. "Water to Woods, Part II: Cottage Grove Community and Parks System Overview", Cottage Grove Community Development Department. 3/16/2007 website: <http://www.cottagegrove.org/commdev/parksplan/Part%20II.pdf>.
2. "Sources and Chronology of Mercury Contamination in Cottage Grove Reservoir for U.S. Army Corps of Engineers, Portland, Oregon" by L.R. Curtis, Oregon State University, May 20, 2003.
3. "Elevated Levels of Mercury in Sport Caught Fish From Cottage Grove Reservoir in Lane County" April 22, 2004, Bonnie Widerburg, Environmental Toxicology, Oregon Department of Human Services. 3/16/2007 website: <http://www.oregon.gov/DHS/ph/envtox/2004-0422.shtml>.
4. "Fish Advisories: Consumption Guidelines", 3/16/2007 website: <http://www.oregon.gov/DHS/ph/envtox/fishconsumption.shtml>.
5. "Mercury Distribution in Sediments and Bioaccumulation by Fish in Two Oregon Reservoirs in Point Source and Non-Point Source Impacted Systems", J-G. Park, L.R. Curtis, OSU, Archives of Environmental Contamination and Toxicology 33,423-429 (1997), accepted July 22, 1997.
6. "Black Butte Mine Site Removal Assessment Report, Lane County, Oregon, TDD 06-01-0005" by Ecology and Environment, Inc., prepared for Marc Callaghan, March 21, 2006.
7. "Reconnaissance Soil Sampling at the BBM for ODEQ", by Oregon State University, August 9, 2004.
8. "Black Butte Mine Site Inspection Report TDD 98-04-0004" by Ecology and Environment, Inc., prepared for Mark Ader, April 1998.
9. "Preliminary Assessment, Black Butte Mine" by Keith Andersen, Oregon Department of Environmental Quality, for David Bennet, April 1, 1998.
10. "An Ecosystem Approach to Mercury Bioaccumulation by Fish in Reservoirs" by S.M. Allen-Gil, D.J. Gilroy and L.R. Curtis, Oregon State University Department of Fisheries and Wildlife, 1990.
11. "Archeological Survey at the Black Butte Mine, Lane County, Oregon", by Archeological Investigations Northwest, Inc. for EPA, February 20, 2007.
12. "Mercury in Oregon Lakes" by A. Newell, D. Drake, and B.L. Stifel, Oregon Department of Environmental Quality, May 1996.

13. "DEQ Request for EPA Removal at Black Butte Mine – Lane County, OR", Letter from Kerri L. Nelson ODEQ Western Regional Administrator to Chris Field, EPA Removal Manager, May 26, 2006.
14. "Independent Government Cost Estimate (IGCE), Black Butte Mine, Cottage Grove, Oregon", prepared by Carl Kitz, 2006.
15. Western Regional Climate Center, Historical Climate Information, accessed on 4/12/2007 from web site: <http://www.wrcc.dri.edu/climatedata.html>.
16. Personal Conversation log between Carl Kitz and Patricia McGrath, EPA Mining Coordinator, June 12, 2006.
17. Phone Conversation log between Carl Kitz and Preston Sleeper, Department of Interior, June 2006.
18. "Black Butte Mine Preliminary Potentially Responsible Party Search", EPA Memorandum from Gretchen F. Schmidt to Carl Kitz, June 22, 2006.

Figure 3. Black Butte Mine Area Map

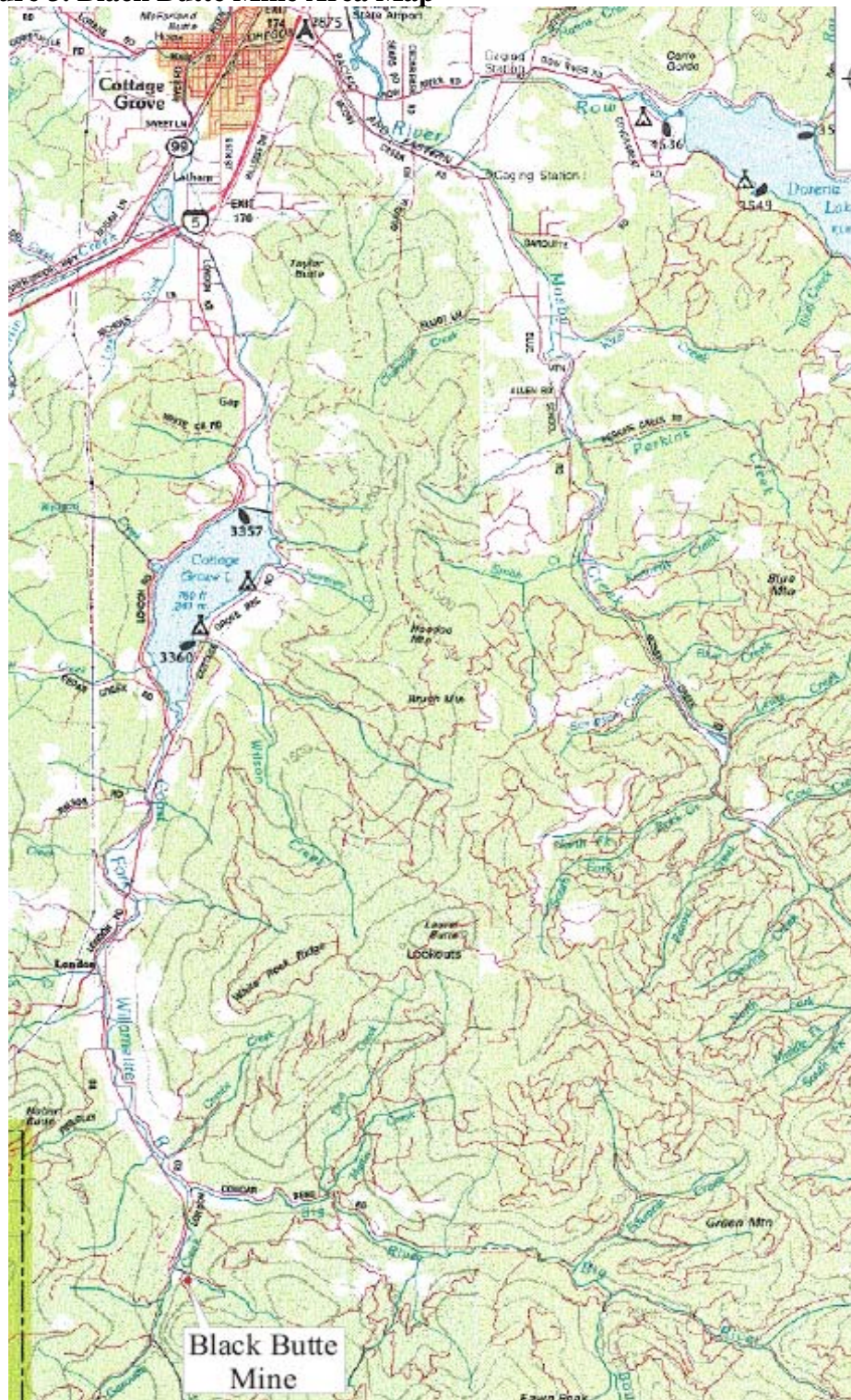
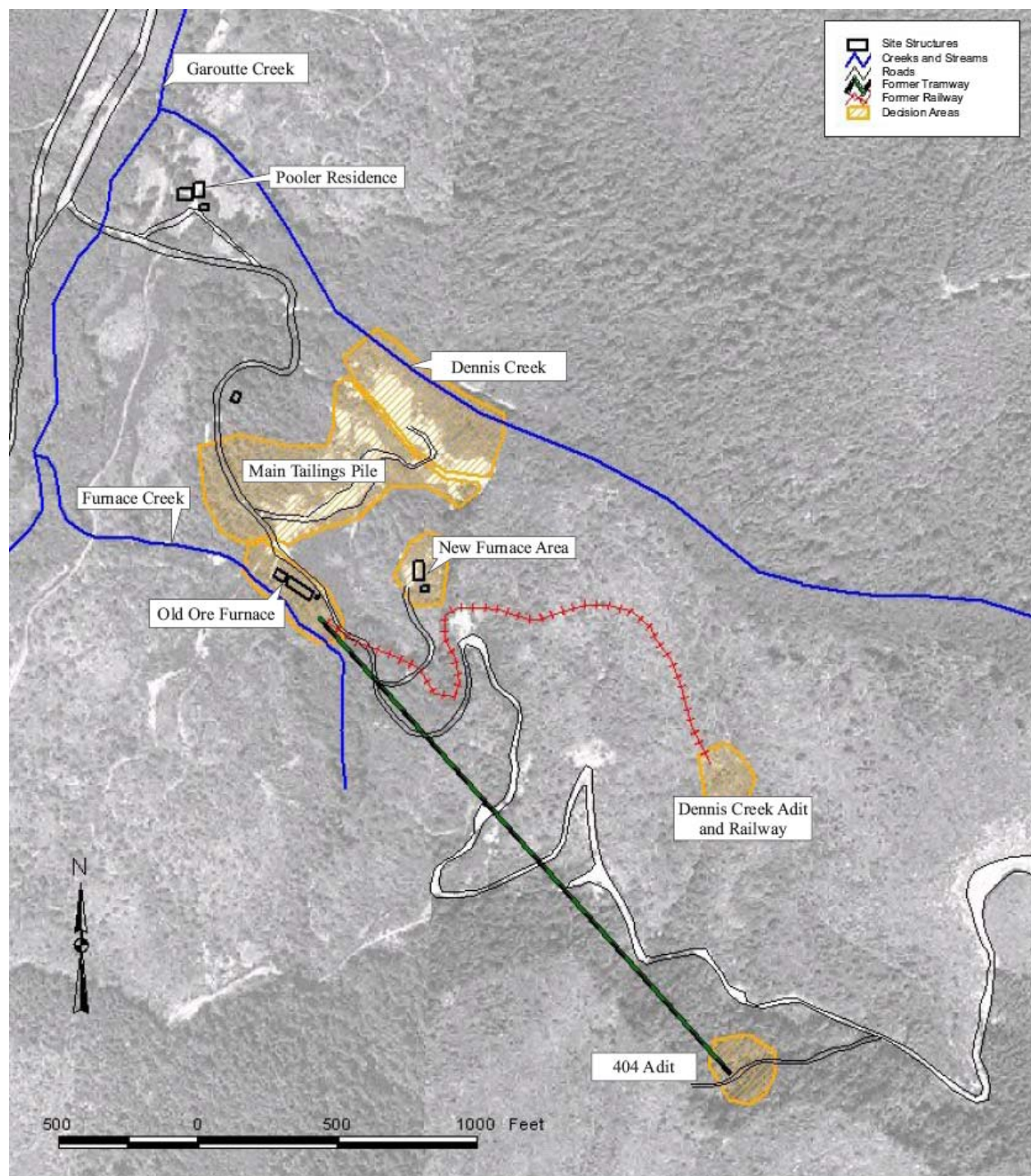


Figure 7. Black Butte Mine



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Figure 4 – Photograph of Old Ore Furnace, May 2006

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Figure 7 - Black Butte Mine Map

Table 1 –Potentially Applicable or Relevant and Appropriate Requirements for Black Butte Mine

Table 2 – Total Mercury and Arsenic in Waste Rock/Tailings Samples from Removal Assessment and Site Inspection, Black Butte Mine

Table 3 – Total Mercury in Sediment (Creeks and Adit) Samples from Removal Assessment and Site Inspection, Black Butte Mine

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Photo 7 – Water Quality Parameters in Surface Water (Creek and Adit) (YSI 556 MOS #A59664), Black Butte Mine Removal Assessment

CONCURRENCE SHEET

Black Butte Mine Action Memorandum

NAME	INITIALS	DATE
Kathy Parker	gmkp	4/13/2007
Chris Field		
Cliff Villa	av	4/13/2007