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OFFICE OF
ENVIRONMENTAL CLEANUP

August 16, 2016

SUBJECT: Second Amendment to the Action Memorandum, including an Extension of the 12 Month Exemption and an Increase in the Cost Ceiling Allowance, to Conduct the Removal Action at the Bonanza Mine Site, Nonpareil, Douglas County, Oregon

FROM: Daniel D. Heister, On-Scene Coordinator
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TO: Chris D. Field, Program Manager
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I. PURPOSE

The purpose of this Second Amendment to the Action Memorandum is to request and document approval of an extension to the 12-month exemption and increase in the cost ceiling allowance for completion of the time-critical removal action at the Bonanza Mine Site, Nonpareil, Douglas County, Oregon (Site). If the cost ceiling increase is approved, the total removal project costs will change from \$3,215,000 to \$4,261,200.

The Action Memorandum was approved on 5 June 2014, and the First Amendment to the Action Memorandum was approved on 9 October 2014. The proposed removal action documented in this Second Amendment to the Action Memorandum will be performed by the U.S. Environmental Protection Agency (EPA), in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601 *et seq.* (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA, Pub. L. 99-499).

II. SITE CONDITIONS AND BACKGROUND

The removal action was initiated by EPA on 4 August 2014 and was completed by the EPA on 6 December 2014.

Current Site Conditions

The removal action completed during 2014 included the excavation of approximately 38,500 cubic yards (yd³) of mine-waste contaminated material. This material was placed in an on-Site repository, an area which already contained approximately 130,000 yd³ of calcine and waste rock, and covered with a protective barrier consisting of an impermeable membrane and vegetated soil cover. Excavated areas were backfilled and graded with approximately 44,500 yd³ of clean material obtained from off-Site quarries and on-Site sources, and pre-existing grades were restored and disturbed areas were stabilized by placing erosion control slash material and seeding.

The removal action also required replacement of two manufactured homes because the homes were sited on mine-waste contaminated materials which needed to be excavated, and could not be temporarily relocated without damage. Subsurface septic systems associated with the two trailers were replaced, along with electrical power. Additionally, Site-wide utilities, including the drinking water system and telephone cable system were replaced because they were installed in mine-waste contaminated materials, which needed to be excavated, and could not be temporarily relocated without damage.

When the EPA demobilized from the Site in early December 2014, responsibility for maintaining, monitoring, and repairing of Site features were assumed by the property owner under Oregon Department of Environmental Quality (ODEQ) oversight. The EPA prepared a Maintenance, Monitoring, and Repair Plan (MMRP) to serve as the guideline for conducting the post-removal site control (PRSC) activities, and the property owner recorded an Easement and Equitable Servitude (EES) which included a commitment to perform these activities. In the event that the property owner was not able to perform the PRSC work, ODEQ agreed to do so subject to the availability of funding.

A. Purpose of 12-month Exemption Request

The PRSC activities include inspection of the on-Site mine waste repository and maintenance of erosion control features. Although the property owner has performed inspections and reported to ODEQ as required by the MMRP and EES, EPA is informed that neither the property owner nor ODEQ have the available funds to conduct the needed repair of the mine waste repository.

The underlying cause of the partial failure of the repository cover is not known; however, it is suspected to have resulted from the period of inclement weather conditions described in the following subsection, as opposed to faulty engineering and construction of the repository cover. Approval of an extension to the 12-month exemption for conducting the removal action would enable the EPA to return to the Site to perform needed PRSC activities to prevent disturbance or exposure to the mine-waste contaminated materials remaining beneath the protective barrier.

B. Purpose of the Ceiling Increase

In mid-January 2016, the property owner reported to ODEQ that a slide of repository cover material had occurred, and was likely the result of recent very heavy rainfall. An extremely wet December was apparently followed by a dry period early in January turning to heavy rainfall at the end of January. Most of the heaviest January rainfalls occurred after the slide was reported. January saw increasing temperatures and for approximately a week before the slide, the low temperatures were maintained above freezing. The

property owner indicated to ODEQ that a hard freeze and sudden thaw had occurred just prior to the slide.

Soon after receiving the property owner's report, ODEQ inspected the Site and observed that approximated two-thirds of the repository cover material showed evidence of movement. The EPA visited the Site in late February 2016 to inspect the slide, document on-Site conditions, and assess repair alternatives.

Based on the Site inspection and subsequent evaluation, PRSC activities are required to ensure the long-term protectiveness and durability of the removal action. Approval of a cost ceiling increase would enable construction of the PRSC features outlined in the "Proposed Action" section of this Second Amendment to the Action Memorandum. If the ceiling increase is not granted, the soil cover is expected to continue moving and further exposing the impermeable membrane to the degradational effects of UV light and other weather and surface conditions. If the impermeable membrane is thus compromised, the membrane will eventually fail its purpose and result in the exposure of waste material at the surface.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Threats to public health or welfare or the environment, and statutory and regulatory authorities have not changed from the descriptions provided in the Action Memorandum.

IV. ENDANGERMENT DETERMINATION

The endangerment determination has not changed from the description provided in the Action Memorandum.

V. EXEMPTION FROM STATUTORY LIMITS

A. \$2 Million Exemption

An exemption to the \$2 million statutory limit for conducting the removal action was authorized in the Action Memorandum. The authorized amount was then increased in the First Amendment to the Action Memorandum, and this amount needs to be further increased in order to conduct the repository repair work. This work continues to meet the exemption criteria in Section 104(c)(1)(A) of CERCLA, 42 U.S.C. § 9604(c)(1)(A).

B. 12-Month Exemption

Consistent with Section 104(c)(1)(A) of CERCLA, 42 U.S.C. §9604(c)(1)(A), an exemption from the statutory limit requiring performance of a removal action within a 12-month period of time is also warranted for the Site. The \$2 million and 12-month exemptions to the statutory limits are based on meeting the following criteria.

1. There is an immediate risk to public health or welfare or the environment

Site inspections have revealed that a cover material slide had occurred at different locations on the repository cover that exposed the underlying linear low-density polyethylene (LLDPE) liner. The geosynthetic drainage layer (GDC), a component of the overall cover design, was also observed along the edge of many areas of the slide just above the LLDPE liner. The GDC had separated at seams in some areas while in others it had sheared. In the sheared areas, the shears left long strands of plastic from the Geonet mesh and ripped through the geotextile fabric. The GDC has also folded over onto itself in several areas along the edges of the slide.

The intended function of the GDC is to allow water infiltrating the cover soil to enter the GDC to readily flow to a toe drain at the base of the repository slope. It appears that a portion of the cover soil that was used in the repository had a higher permeability than the off-site sourced material proposed for the cover and considered in the repository design. While the fast-draining cover soil allows for water to readily drain to the GDC layer, the high flow and pressure within the GDC during a heavy precipitation event may exceed the modeled conditions considered for the design, resulting in shear forces exceeding the factor of safety of the repository design. If conditions are not improved, there is a risk of further cover movement during heavy precipitation events and possibly tearing or other damage to the LLDPE liner. To date no damage has been observed to the underlying LLDPE liner. If repairs are delayed and the LLDPE is damaged, repairs will become more complicated and costly. Also, it is critical to implement the repairs prior to potential impacts from the upcoming rainy season in order to prevent releases of waste from the repository which could threaten the public and the environment.

Proposed repairs to the repository cover include re-covering exposed LLDPE with appropriate cover material. Repairs and modifications also include slope drains to improve drainage from the repository cover, and rock-filled gabion baskets along a portion of the toe of the repository slope to provide a higher factor of safety, and higher resistance to slope movement.

2. Continued response actions are immediately required to prevent, limit, or mitigate an emergency

Immediate implementation of the repository repair described herein is required to prevent, mitigate, or minimize the human health and ecological threats posed by the hazardous substances buried in the waste repository. Without correcting the repository cover conditions, the contaminated mine wastes may be exposed by precipitation and other weather events. Exposure of the mine wastes will allow water to infiltrate into the mine wastes and mobilize contamination to surface water and soil. Exposed mine waste will then be directly accessible to humans and other environmental receptors. Areas previously benefitting by the removal action will be re-contaminated. The repair work needs to be undertaken as soon as possible to avoid these results.

3. Assistance will not otherwise be provided on a timely basis

The current property owner does not appear to have the resources to perform the repair work, and ODEQ has indicated it does not have the funding or resources to conduct this work, thus ODEQ requested the EPA's assistance with repairing the repository cover. There are no known other appropriate federal or state response mechanisms capable of providing the appropriate resources in the prompt manner needed to address the potential human health and ecological risks associated with the repository and the hazardous substances placed beneath the protective barrier.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Action

The following proposed repair work is consistent with the removal action and this work is necessary to avoid a foreseeable threat involving the migration of contaminants both on- and off-Site.

1. Proposed Action Description

Replace Soil at Exposed Areas of Liner

Additional cover soil with appropriate drainage qualities will be placed over the exposed areas of LLDPE to protect the liner, provide physical separation/isolation of the contaminated mine waste, and allow for precipitation and snowmelt drainage from the repository. The soil will protect the exposed liner and provide a permanent, protective barrier.

Improve Drainage

A slope drain system will be added to improve the cover system drainage. The drain system will include two lateral pipe drains placed approximately one-third and two-thirds down slope from the top of the repository. The lateral drains will connect to a drain pipe parallel to the slope, installed from the top of the repository to the toe drain. The drainage system will collect water from the run-on control ditch at the top of the slope, as well as from the horizontal drain lines, and discharge to the toe drain. The drain system will alleviate pore pressure at the LDPE interface and to help stabilize the repository cover system during heavy precipitation events.

Install Rock Gabions

Rock-filled gabion baskets will be installed along an approximately 400 foot section of the slope toe to shore the slope against additional cover movement. Additionally, the gabions will help protect the drain channel and maintain a functional drainage profile. The gabions will help prevent cover soil from sliding across the channel preventing water ponding and potential saturation of mine wastes. The repository slope behind the gabions would be filled with well-drained soil to the top of the gabions, and graded up to the adjacent repository slope to maintain a positive drainage profile.

Restoration of Disturbed Subareas

Areas of exposed cover soil and areas disturbed by the repairs will be seeded and temporarily stabilized using a combination of mulch and slash.

Best-Management Practices (BMPs)

Temporary Best Management Practices (BMPs) will be employed throughout construction for control of erosion, fugitive dust, and storm water management, and to minimize and to avoid adverse impacts on wildlife and their habitats.

2. Project Schedule

It is expected that project implementation will begin in early September 2016 and will take approximately 6 to 8 weeks to complete.

B. Estimated Costs

Extramural Costs	Current Ceiling	1st Amendment Ceiling	Proposed 2nd Amendment Ceiling
Regional Allowance Costs ERRS	\$2,000,000	\$2,450,000	\$3,021,000
Other Extramural Costs Not Funded From The Regional Allowance START	\$250,000	\$375,000	\$530,000
Extramural Cost Contingency (20%)	\$225,000	\$390,000	\$710,000
Subtotal, Extramural Costs	\$2,475,000	\$3,215,000	\$4,261,200
Total Removal Action Project Ceiling	\$2,475,000	\$3,215,000	\$4,261,200

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the 12-month exemption request and project cost ceiling increase request are not approved, the objectives of the Action Memorandum will not be fully achieved because the damaged protective barrier and the mine-waste contaminants which are contained beneath it would be susceptible to further degradation, thus causing for an uncontrolled release of the mine-waste contaminants and potentially re-contaminating areas previously benefitting from the removal action.

VIII. OUTSTANDING POLICY ISSUES

Information pertaining to outstanding policy issues has not changed from the description provided in the Action Memorandum.

IX. ENFORCEMENT

Information pertaining to enforcement has not changed from the description provided in the Action Memorandum.

X. RECOMMENDATION

This decision document presents the selected repair work in furtherance of the removal action at the Bonanza Mine Site, Nonpareil, Douglas County, Oregon, developed in accordance with CERCLA, as amended, and is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.415. This decision is based on the administrative record for the Site.


Conditions at the Site continue to meet the CERCLA Section 104(c)(1)(A) criteria for exemption from the statutory limits of \$2 million dollars and 12-months, and I recommend your approval of the proposed repair work. The total project ceiling if approved will be \$4,261,200, of which an estimated \$3,021,000 will be funded from the Regional removal allowance. The total cost of this repair work is \$1,046,200.

XI. APPROVAL / DISAPPROVAL

APPROVAL:



Chris D. Field, Program Manager
Emergency Management Program



Date

DISAPPROVAL:

Chris D. Field, Program Manager
Emergency Management Program

Date