



United States Department of the Interior

NATIONAL PARK SERVICE

North Cascades National Park
Lake Chelan National Recreation Area
Ross Lake National Recreation Area
810 State Route 20
Sedro-Woolley, Washington 98284-9394

IN REPLY REFER TO:

August 22, 2016

Memorandum

Subject: Approval for CERCLA Time-Critical Removal Action at the Newhalem Penstock, North Cascades National Park Service Complex

1.0 PURPOSE AND AUTHORITY

The purpose of this Action Memorandum (AM) is to request approval of and document the basis for the proposed time-critical removal action (TCRA) described herein for the Newhalem penstock (Site) located within North Cascades National Park Service Complex (NOCA), Washington, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, (CERCLA), 42 U.S.C. §§ 9601 *et seq.* The President has delegated response authority under CERCLA Section 104 to the Secretary of the United States Department of the Interior (DOI) by Executive Order 12580, 52 Fed. Reg. 2923 (1987), as amended by Executive Order 13016, 61 Fed. Reg. 45871 (1996), to respond to the release or threat of release of hazardous substances on or from land under the jurisdiction, custody, or control of DOI. The National Park Service (NPS) Pacific West Regional Director, through delegations of authority, retains CERCLA Section 104 authority for the Site.

A TCRA is proposed because risks to public health, welfare, and the environment as a result of the release or threat of release of hazardous substances at the Site dictate that the response action should be commenced as expeditiously as possible, with initiation of on-site work within six (6) months of the NPS decision to proceed with the action. Funding for the removal action is being provided by the Potentially Responsible Party (PRP), Seattle City Light (SCL). If this action is approved, on-Site project work is anticipated to start in August 2016.

2.0 SITE CONDITIONS AND BACKGROUND

This TCRA is intended to address threats to human health and the environment but is not expected to be the final response action taken at this Site. The following section provides an overview of the Site's history and current characteristics, including the Site's historical uses, and discusses the nature and extent of surface soil contamination.

2.1 Site Description

The Newhalem Creek Hydroelectric Project is located across the Skagit River from Newhalem, WA. Seattle City Light operates the project under a Federal Energy Regulatory Commission (FERC) license issued most recently in 2013. The project comprises a powerhouse, penstock, bedrock power tunnel, and creek diversion structure. The penstock was originally constructed by SCL in the 1920s as part of the power plant used during construction of the Gorge Dam and is still in operation. The penstock is 1,122 feet long, approximately 904 feet of which is above ground. The remaining 218 feet is located within the bedrock tunnel. The aboveground portion of the 30-inch diameter penstock rests on wood frame supports, or pedestals, with bases of wood, concrete, or stone.

In order to comply with FERC dam safety guidelines, SCL is preparing to replace the badly deteriorated wooden saddles that can no longer safely support the penstock that conveys water to the Newhalem powerhouse. Of the original penstock saddles, 52 are made from treated wood, which have deteriorated over time and need to be replaced. Several of these saddles were burned in the August 2015 wildland fire and temporary supports were installed at four saddle locations as an emergency project to prevent the penstock from being damaged by buckling. The 52 wooden saddles, including the five temporary supports, will be replaced with permanent cast-in-place concrete saddles in the summer/fall of 2016. Soils around the penstock are known to contain elevated levels of lead, arsenic, and polycyclic aromatic hydrocarbons (PAHs). The lead is from old paint on the penstock; the arsenic and PAHs are from the treated timbers used for the saddles. Contaminated soils will be excavated as part of removing the wooden saddles and constructing formwork for cast-in-place concrete footings and saddles. Approval of this AM would authorize the removal and disposal of contaminated soil that must be excavated to complete the scope of work during the penstock saddle replacement project.

2.1.1 Removal Site Evaluation

The Newhalem penstock has been maintained by SCL to provide power generation for the residents of Newhalem. It is not known with certainty if sandblasting was used to remove old coats of paint, which may have contained lead before repainting the penstock. Much sandblast grit used historically in the Puget Sound region was derived from metal slag and may have contained heavy metals including lead, arsenic, copper, and zinc. In addition, the wood supports from the penstock may have been preserved with copper chromium arsenate (CCA), creosote, or pentachlorophenol, all of which were used historically in the area to retard the growth of moss and fungi. If wood preservatives were used, these chemicals may have leached into nearby soil.

An initial investigation was performed in support of the penstock pedestal replacement project described above to determine disposition of soils likely to be disturbed by that work:

- Seattle City Light Newhalem Penstock Soil Sampling/XRF Survey, Newhalem, Washington (Hart Crowser, 2014).

The results of this investigation stated that soil lead and arsenic concentrations in the immediate vicinity of the penstock exceed Washington State Model Toxics Control Act (MTCA) Method A unrestricted land use cleanup level of 250 mg/kg (for lead) and 20 mg/kg (for arsenic), and soil

PAH concentrations in close proximity to wood supports exceed the MTCA Method B unrestricted soil cleanup level of 0.137 mg/kg benzo(a)pyrene toxic equivalent.

2.1.2 Physical Location

The Newhalem penstock is located within Ross Lake National Recreation Area, in Whatcom County, Washington, within NOCA. While the Site itself contains infrastructure for power generation, surrounding land is managed by the NPS as part of the National Recreation Area. The aboveground portion of the penstock is located on a steep and somewhat rocky slope above the powerhouse. Newhalem averages 80 inches of precipitation annually, with 77% of total precipitation occurring between October and March. In August 2015, wildfires burned much of the surrounding area, including some of the wooden penstock saddle supports, reducing native vegetation and increasing the impacts of erosion. An ephemeral stream runs adjacent to and beneath the penstock, flowing all the way down the slope to the powerhouse. Ephemeral stream outflow enters the tailrace and discharges into the Skagit River, which supports all five native species of salmon including federally listed Puget Sound Chinook and Puget Sound Steelhead.

The population center for the company town of Newhalem, which is owned by SCL and populated entirely by employees of the Skagit River Hydroelectric Project, or local county, state, or federal agencies, is located directly across the Skagit River from its convergence with the powerhouse tailrace. There are approximately two dozen permanent residences in the town, which gets its drinking water from a well located on the same side of the river as the town.

2.1.3 Site Characteristics

The Newhalem Creek Hydroelectric Project, FERC license No. 2705, is a small hydro project of 2.7 megawatts. The Newhalem Creek Powerhouse power tunnel and steel penstock structures are both listed as contributing resources (structures) to the Skagit River and Newhalem Creek Hydroelectric Project Historic District, which was listed on the National Register of Historic Places in 1996. This Site is located on land that is owned by the United States and managed by the NPS, but the hydroelectric project infrastructure is owned, operated, and maintained by SCL. The powerhouse and infrastructure is located along a trail system originating in the nearby Newhalem Creek Campground managed by the NPS and is interpreted for the public via onsite signage and wayside exhibits.

NPS is exercising lead agency authority to perform or oversee performance of response actions under CERCLA, including this proposed TCRA, which is being conducted and funded by SCL. The removal action proposed in this AM is the first removal for the Site, but is not expected to be the final action. NPS will seek to recover any response costs incurred in oversight of SCL's work, including project management and oversight costs.

2.1.4 Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant

SCL has conducted two investigations in the project area. Soil sampling was conducted in August 2014 in the immediate vicinity of the penstock, and additional sampling was conducted

in October 2015 to further evaluate the extent of soil contamination. Samples were also collected in April 2016 from the wood saddles to determine the specific type of preservative(s) in the wood. Results of the soil sampling indicate that soil in the vicinity of the penstock contains levels of lead and arsenic above the MTCA cleanup levels. Wood sample analysis results indicate the wood was preserved with coal-tar creosote. In some locations, soil within approximately 2-3 inches of the wood saddles contains levels of carcinogenic PAHs above MTCA cleanup levels. Hazardous substances detected at the Site are described in more detail in the following.

Lead is considered a persistent, bioaccumulative and toxic (PBT) hazardous substance that has the potential to cause adverse impacts to human health and the environment. Soil lead concentration data collected from transects along the penstock was compared to and in some locations exceeded the MTCA, 173-340 WAC Method A regulatory cleanup level for unrestricted land use: Human Health – Unrestricted Land Use: 250 parts per million (ppm)

Arsenic is a known carcinogen and hazardous substance that has the potential to cause adverse impacts to human health and the environment. Soil arsenic concentration data collected from transects along the penstock was compared to and in some locations exceeded the MTCA, 173-340 WAC Method A regulatory cleanup level for unrestricted land use: Human Health – Unrestricted Land Use: 20 parts per million (ppm)

Polycyclic aromatic hydrocarbons (PAHs) are a broad class of substances (many of which are hazardous) found in fossil fuels and are produced, generally, during incomplete combustion of organic matter; benzo(a)pyrene is a well-researched example of a coal tar PAH whose metabolites are mutagenic and highly carcinogenic. When establishing and determining compliance with cleanup levels for mixtures of carcinogenic polycyclic aromatic hydrocarbons (carcinogenic PAHs), the MTCA, 173-340 WAC Method B regulatory cleanup levels established for benzo(a)pyrene are used as the cleanup levels for mixtures of carcinogenic PAHs when assessing human health risk¹: Human Health – Unrestricted Land Use: 0.137 parts per million (ppm)

Note that Site contaminants were only compared to cleanup levels protective of human health for unrestricted land use because of the immediate threat of exposure to workers during the penstock project execution. Future evaluation of the Site will include a site-specific terrestrial ecological evaluation to determine chemicals of ecological concern, exposure pathways, terrestrial ecological receptors of concern, and ecological-based cleanup levels for future action at the Site.

Field Sampling Activities

The 2014 and 2015 field activities conducted by SCL consisted of establishing 13 transects along the penstock, marking sample locations, conducting an XRF survey, and collecting samples for laboratory analysis. The field survey was conducted using a portable XRF to screen soil samples

¹The Method A value of 0.1 mg/kg is for Benzo(a)pyrene. Method A footnote d indicates if a mixture of cPAHs is present, the total toxic equivalents should be calculated. Therefore, Method B was used to incorporate the toxicities of all cPAHs that were present. The Method A value of 0.1 mg/kg is the Method B toxicity based value (0.137 mg/kg) rounded to one significant figure.

for metals historically associated with sandblast grit, lead-based paint, and wood preservatives (lead, arsenic, copper, chromium, and zinc). Selected samples were also submitted for laboratory analysis of selected metals, toxicity characteristic leaching procedure (TCLP) for metals (lead), and semi-volatile organic compounds associated with creosote and pentachlorophenol wood preservatives.

Transects extended from the penstock outward to the east and west. Along each transect, XRF measurements were conducted at regular intervals to define the lateral extent of lead and arsenic in soil. XRF analyzer calibration, standardization, and sampling methods were conducted according to manufacturer's instructions to provide consistent measurements, reduce detection limits, and increase confidence in the measured concentrations. XRF measurements were also collected at three locations outside the penstock system clearing (at least 500 feet away), to provide a background level by which to evaluate observed metals concentrations.

Lead concentrations in samples collected from around the penstock ranged from 9.6 to 2,000 ppm, as measured by laboratory analysis. The two samples collected for background purposes contained lead concentrations of 12 and 42 ppm. XRF screening results ranged up to 5,485 ppm, and 10 of the 13 transects had at least one sample with elevated lead concentrations above MTCA unrestricted land use concentration of 250 ppm.

Arsenic concentrations in samples collected from around the penstock ranged from non-detect to 25 ppm, as measured by laboratory analysis. Only one laboratory sample indicated elevated arsenic concentrations above MTCA unrestricted land use concentration of 20 ppm. XRF screening results ranged up to 787 ppm, and 10 of the 13 transects had at least one sample with arsenic concentration above MTCA unrestricted land use concentration of 20 ppm.

Analysis of two samples collected from soils within three inches of select stained wood support saddles yielded no detection of semivolatile organic compounds (SVOCs), including pentachlorophenol or other chlorinated phenols associated with wood preservatives. PAHs and methylphenols (cresols) often associated with creosote-preserved wood were detected in both samples collected adjacent to wood supports. PAH concentrations expressed in terms of benzo(a)pyrene toxic equivalents (TEQ) exceeded the MTCA Method B unrestricted soil cleanup level of 0.137 ppm in both samples – specifically, 0.2657 ppm and 4.038 ppm.

In summary, the highest concentrations of lead and arsenic were detected in the soil beneath and in very close proximity (within a few feet) of the penstock pipe. Concentrations decrease distinctly with distance away from the penstock system; generally, concentrations decrease by an order of magnitude approximately 20 feet away from either side of the penstock system. Background readings show lead and arsenic at concentrations less than the XRF detection limits.

Historical Source of Impacts to Soil

The Newhalem penstock is known to have been painted several times throughout its history and appears to have been coated with lead paint, based on soil lead concentrations exceeding MTCA criteria in close proximity to the penstock. Although it is not known whether sandblasting was used to remove old coatings, that method is known to have been used at other SCL facilities in the past. Sandblast grit used historically in some Puget Sound region locations is known to have

been derived from metal slag containing heavy metals. The Site investigations completed to date have not observed evidence of sandblast grit beneath or near the penstock, and concentrations of metals commonly associated with sandblast grit (arsenic, copper, and zinc) are low and generally within the range of natural background concentrations in Site soils. Sandblast grit is therefore not currently considered a contamination source. PAHs in the form of coal-tar creosote were used as preservative in portions of the wood saddles.

Physical Setting and Methods to Protect Against Contaminant Release

The penstock Site is located near the left (south) bank of the Skagit River across from the town of Newhalem. The penstock runs downhill, south to north, in a forest clearing approximately 600 feet south of the river. The area surrounding the clearing is heavily forested and steep terrain with very difficult access. After emerging from a bedrock tunnel at the top of the clearing, the penstock runs down steep terrain with intermittent bedrock outcrops to the Powerhouse. The saddle removal and replacement locations, i.e., soil excavation areas, are along most of the penstock alignment through this area.

Due to the steep terrain, there is a potential for erosion and movement of excavated and disturbed contaminated soil down the hill toward the Skagit River. Other project activities that could cause the spread or release of contamination at or from the Site include travel up and down trails and access routes, staging and movement of equipment, excavation and removal activities required for saddle replacement, and movement/transport of soil and debris. One ephemeral stream runs through a small, portion (approximately 107 ft.) of the project area. Work is planned to be conducted when this stream is dry to reduce the potential risk of transporting contaminated soil off-site. Removal of contaminated soil and wood debris from the Site after excavation will permanently remove the risk of it causing release or spread of contamination.

2.1.5 National Priorities List (NPL) Status

The Newhalem penstock Site is not listed or proposed for listing on the NPL.

2.2 Previous and Current Actions to Date

There have been no government or private actions undertaken in the past. No cleanup actions have been performed at the Site to date. Actions proposed in this AM are not expected to comprise the final cleanup for the Site.

2.3 State and Local Authorities Role and Actions to Date

The NPS is the lead agency for this Site. No State or local actions have been performed at the Site to date.

3.0 THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

The SCL project will address critical infrastructure needs for power production, as authorized under their FERC license, at the Newhalem penstock Site where construction workers will be

replacing treated wooden saddles with cast-in-place concrete saddles. Construction is estimated to take 12-14 weeks and is scheduled to occur between August and November of 2016. As part of the project, SCL will be excavating soils contaminated with lead, arsenic, and PAHs. This poses a threat to human health and the environment.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) are the implementing regulations for CERCLA and at 40 C.F.R. section 300.415(b)(2) sets forth the factors the NPS shall consider to determine whether a response action is appropriate. Those factors applicable to this TCRA include the following:

- ***Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.***
 - *For human receptors, the primary migration pathway would be ingestion or inhalation of contaminated media (e.g. soil). The primary human receptor would be Site construction workers. Any work performed at this Site needs to be conducted in accordance with health and safety protocols for working with hazardous substances.*
- ***High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.***
 - *Site contamination is largely concentrated in surface soils that have the potential and are likely to migrate. The penstock is located in a steep, rocky gully with an ephemeral stream that discharges into the Skagit River. Soil disturbance and removal associated with this project must occur before heavy rains begin in November to prevent the migration of contaminated surface soils and exposure to sensitive aquatic species.*
- ***Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.***
 - *This Site receives an average of 80 inches of precipitation annually, with 77% of total precipitation occurring between October and March. Winter rains combined with steep, rocky terrain and near-surface soil contamination will likely cause contaminants in disturbed soils to migrate into surface water if not removed before the rainy season.*
- ***Other situations or factors that may pose threats to public health or welfare of the United States or the environment.***
 - *Construction workers will be exposed to contaminated soils in order to complete essential repairs to the Newhalem penstock. Any work performed at this Site needs to be conducted in accordance with health and safety protocols for working with hazardous substances in order to limit worker exposure.*

4.0 ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances at the Site, if not addressed by implementing the response action selected in this AM, pose a threat to public health or the

environment. This TCRA is necessary in order to abate, prevent, mitigate or eliminate the threat posed by the release or substantial threat of release of these substances.

5.0 PROPOSED ACTIONS AND ESTIMATED COSTS

5.1 Description of Proposed Action

Construction Project

SCL is working through a contractor to conduct contaminated soil removal as a part of the construction project to replace treated wood saddles with cast-in-place concrete saddles to support the penstock. The main elements of the project include:

- Remove 52 Wood Penstock Saddles
- Excavate Contaminated Soil as Necessary for Saddle Work
- Place 52 New Cast-in-Place Concrete Penstock Saddles
- Load, Transport and Dispose of Contaminated Soil and Wood Debris

Removal of Impacted Soil and Wood Debris

In order to permit removal of the wooden saddles and construction of the new ones, soil must be removed from each saddle location. The amount of soil excavated at each location will depend on the depth of soil over bedrock and the total footprint required for construction of the new saddle. While replacement saddle types vary by location, an average saddle replacement may require approximately 6 cubic yards of soil excavation for construction of cast-in-place concrete footings. Based on the investigation results to date, which suggest that low-level metals contamination exceeding MTCA cleanup thresholds may exist along significant portions of the penstock, SCL is assuming that all soil removed as part of the saddle replacement project is contaminated and requires disposal.

Excavation and disposal will involve the removal of the contaminated materials, classification of the material as RCRA Subtitle D non-hazardous material, and subsequent disposal in a SCL-approved, USEPA-compliant landfill licensed to accept the material. Excavated soil will be containerized and samples will be collected and analyzed to determine proper disposal methods. All excavated material will be managed in accordance with all applicable federal, state and local requirements, as well as the City of Seattle's Standard Specifications and SCL's project-specific specifications. Wood waste generated from saddles designates as "state-only treated wood waste" that is excluded from Dangerous Waste Regulations (WAC 173-303-071(3)(g)(ii)), and as such may be disposed of in a municipal solid waste landfill permitted under chapter 173-351 WAC.

Factors Affecting Removal

In some cases, the project Site presents significant challenges to conventional soil removal methods due to its remote and steep nature and the prevalence of bedrock either under shallow soil or cropping out at the surface along most of the penstock alignment. SCL will require the contractor to devise appropriate methods and remove all materials from the Site and transport them to the approved disposal facility(s). The contractor is anticipated to remove the materials either over land or by air, or by using a combination of both.

Risks to Human Health and the Environment Associated with the Work

A small increase in short-term risk to human health may be encountered during the excavation and transport phase of this work. Impacts associated with construction activities are considered short term, and should not significantly impact human health. Additionally, short-term air quality impacts to the immediate environment may occur during excavation of contaminated soils. Control of fugitive dusts may be required on-Site and will be conducted by wetting soils as required. All soils will be transported in covered trucks and/or containers. Nearby trails such as the Trail of the Cedars and a flood escape route trail will remain accessible to the public during project activities. However, access from those trails to the project work area where contaminated soils are located will be prevented via fencing and no-entry signage.

Post-Construction Condition and Future Actions

Soil and debris removed from the Site will generally be limited to the material that must be displaced to remove the old saddles and construct the new ones. This work will occur at 52 saddle locations along nearly the entire penstock alignment, and is therefore expected to remove all of the residual PAH contamination and a significant amount, perhaps the majority, of the known metals contamination in soil at the Site. During the project SCL plans to collect confirmatory samples at up to 10 representative saddle excavations to verify that excavation bottoms are at or below cleanup levels.

Some residual lead and arsenic is anticipated to remain outside the excavation footprints after the project. Therefore, additional environmental assessment will be conducted by SCL after completion of the saddle replacement project. Through that effort the need for additional soil removal will be determined, as well as the need for temporary post-project institutional controls (ICs).

5.2 Contribution to Remedial Performance

In evaluating the appropriateness of a removal action, NPS must consider whether the removal action would contribute to the efficient performance of any anticipated long-term remedial action with respect to the release concerned [NCP 300.415(d)], as well as the availability of other appropriate federal or state response mechanisms to respond to the release of hazardous substances, [NCP Section 300.415(b)(2)(vii)]. This removal action will entail excavation and disposal of contaminated soils located around and below treated wooden saddles, thereby minimizing risks to human health and the environment and eliminating the source of the contamination. Future response costs at the Site are currently unknown; however, the proposed action will not impede future response action based upon available information.

5.3 Project Schedule

The saddle replacement project is currently scheduled to begin in August 2016, with field activities occurring approximately August through November, and potentially through spring 2017, depending on weather closure periods during the winter. Contaminated material removal and disposal activities will likely occur throughout the project period.

5.4 Estimated Costs

Projected project costs, including project design, contracting, oversight, and contingency, are estimated by SCL as \$375,000. This estimate does not include any cost of oversight by the NPS.

6.0 EXPECTED CHANGE IN SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the proposed TCRA project is delayed or not taken, hazardous substances will continue to be released, or there is a substantial threat of such release, at the Site, continuing to pose an exposure risk to the public.

7.0 OUTSTANDING POLICY ISSUES

No outstanding policy issues exist for this removal action.

8.0 RECOMMENDATION

This decision document presents the selected removal action for the Newhalem penstock Site, located within North Cascades National Park Service Complex, which was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP.

Conditions at the Site meet the NCP Section 300.415(b) criteria for a time-critical removal action and through this document, I am approving the proposed removal action.

On the basis of the evaluation conducted and the factors outlined in the NCP, NPS has determined that the release or threatened release of hazardous substances at the Site pose a risk to human health and the environment, and that a TCRA is necessary and appropriate. Because conditions at the Site meet all applicable CERCLA and NCP criteria for undertaking a TCRA, I recommend/concur/approve that NPS implement the TCRA as proposed herein.

Recommended: *Kerri L. Cook* Date: 8/22/16
Kerri L. Cook, PE
Facility Operations Specialist
North Cascades National Park Service Complex

Concurred: *Karen F. Taylor-Goodrich* Date: 8/22/16
Karen F. Taylor-Goodrich
Superintendent
North Cascades National Park Service Complex

Concurred: *Stephen J. Mitchell* Date: 8/24/16
Stephen J. Mitchell, PE
Operations/Environmental Programs Branch Chief
National Park Service, Pacific West Region

Approved: *Laura E. Joss* Date: 9/1/16
for Laura E. Joss
Regional Director
National Park Service, Pacific West Region