

NON-TIME-CRITICAL REMOVAL ACTION MEMORANDUM

SUBJECT: Request for Approval of Potentially Responsible Party (PRP)-Lead Removal Action at the Ross-Adams Mine Site, Prince of Wales Island, Alaska

FROM: Matthew D. York, On-Scene Coordinator (OSC) – Region 10

TO: Sam Carlson, Director of Engineering & Information Management – Region 10

THROUGH: Julie Creed, Environmental Engineering Program Lead
Matt Anderson, Craig District Ranger, Tongass National Forest
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I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed PRP-lead removal action described herein to mitigate potential threats to human health and the environment posed by radioactive hazardous substances at the Ross-Adams Mine Site (Site). The Site is a former uranium mine located in the Tongass National Forest near the southern end of Prince of Wales (POW) Island, Alaska.

The proposed removal of hazardous substances would be undertaken pursuant to Section 104(a)(1) of CERCLA, 42 U.S.C. 9604(a)(1) as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300.415(b)(2), and pursuant to the authority found in Executive Order 12580 and 7 CFR § 2.60(a)(39). The bases for the recommended action under the criteria of 40 C.F.R. § 300.415(b)(2) are:

- (i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;
- (iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate;
- (v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

On April 17, 2009, Newmont USA Limited and Dawn Mining Company LLC entered into an [Administrative Settlement Agreement and Order on Consent](#) (ASAOC) with the USDA Forest Service (USFS) to perform an Engineering Evaluation/Cost Analysis (EE/CA) for the Site. The recommended removal action(s) in this Action Memorandum reflect the recommended removal action alternatives from the EE/CA.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

1. Removal Site Evaluation

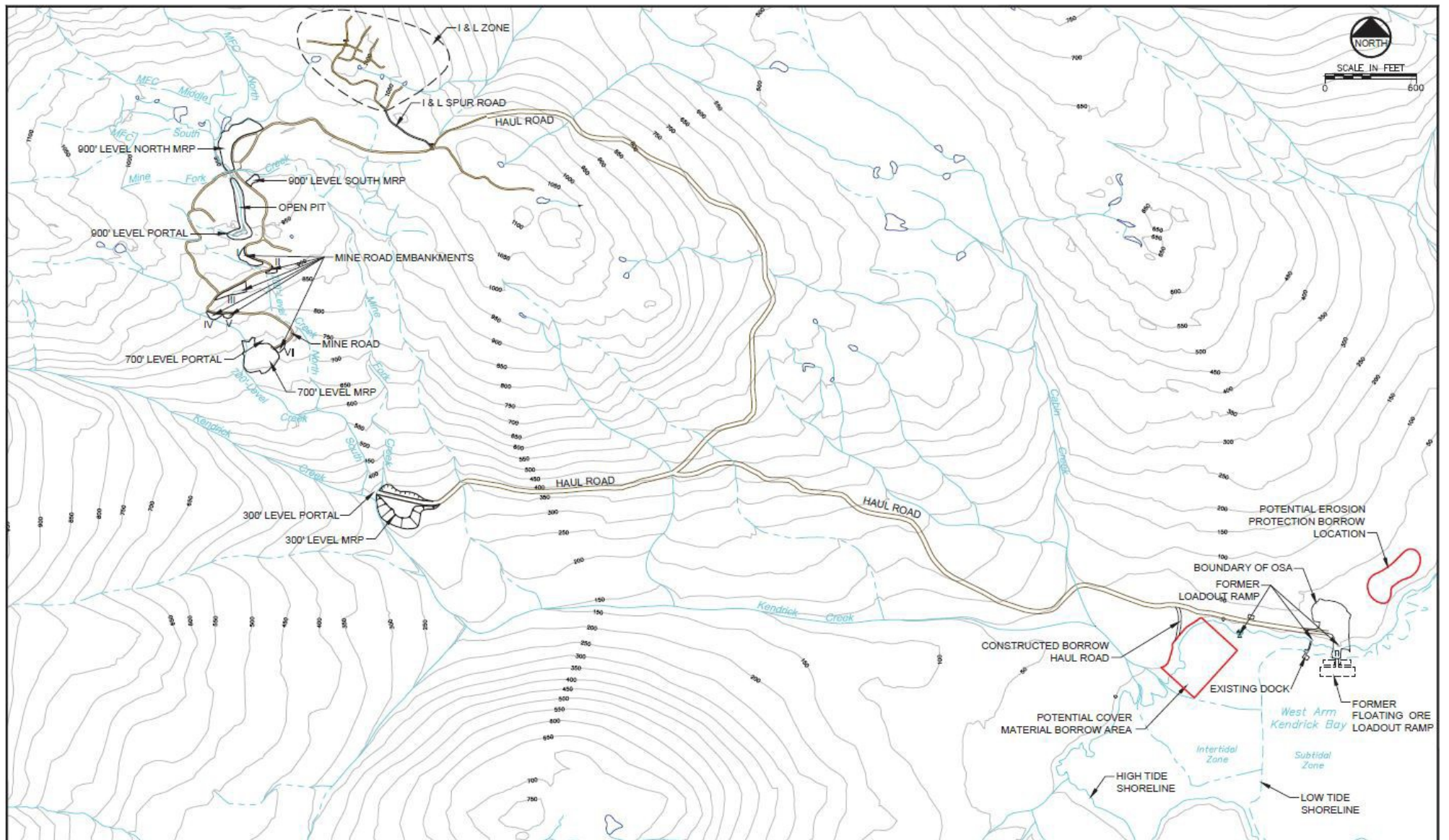
The Ross-Adams ore deposit outcropped at an elevation of approximately 970 feet on the south-eastern flank of Bokan Mountain. The uranium ore deposit was originally discovered by aerial survey; which is indicative of the high level of background radiation exposed at the surface. The mine was initially developed by open-pit mining in 1957 and later by underground operations from three portals. The mine has three major surface expressions, named after their approximate elevations: the “900-Foot Level”, the “700-Foot Level” and the “300-Foot Level.” After the surficial deposit was mined, ore was mined in the early 1960s by driving an approximately 500 foot long tunnel at the 700-Foot Level to intersect the ore deposit, with a raise connecting it to the Open Pit. An additional phase of underground mining occurred in 1971 by driving the 300- Foot Level adit tunnel. Mine rock, including rock developed in driving the 700-Foot Level and 300-Foot Level tunnels, was placed near the portals at all levels. Ore produced from all levels was transported via haul roads to ore staging areas and barge loading docks on the north shore of the West Arm of Kendrick Bay. All ore was shipped off-site for processing. No milling was conducted at the Site that would have generated tailings or other process materials.

The Bokan Mountain Intrusive Complex (BIC) (in which the Ross-Adams deposit is located) is comprised of rare rock types that are unique in Southeast Alaska. The BIC includes uranium, thorium and rare earth element mineralization. At the present time, active exploration for deposits of rare earth elements is occurring in the Kendrick Creek watershed under a USFS permit. More than 30 uranium and rare earth element occurrences have been identified at Bokan Mountain that are related to the BIC. The mineralization of the BIC rocks with uranium and thorium results in a radioactive signature distinctive from that of the surrounding non-mineralized rocks. The I&L Zone, which is a nearby smaller and lower grade deposit immediately to the northwest of the 900-Foot Level, represents similar conditions that potentially existed at the 900-Foot Level prior to mining. The I&L Zone represents a group of radioactive mineral prospects on the east flank of Bokan Mountain northwest of the Ross-Adams deposit, with ground surface exposed mineralization. Mineral exploration has been conducted on the I&L Zone, but it has never been mined and is not part of the Site as defined in the ASAOC.

The Site includes the mine, haul roads, ore staging area (OSA), former barge loading area, and downstream potentially impacted areas including the Kendrick Creek delta. An access road between the 900-Foot Level haul road and the I&L Zone was constructed at some point during regional exploration, using mine rock in some areas; the lower portion of the I&L (Spur) access road is included in the Site definition. (See map on the following page)

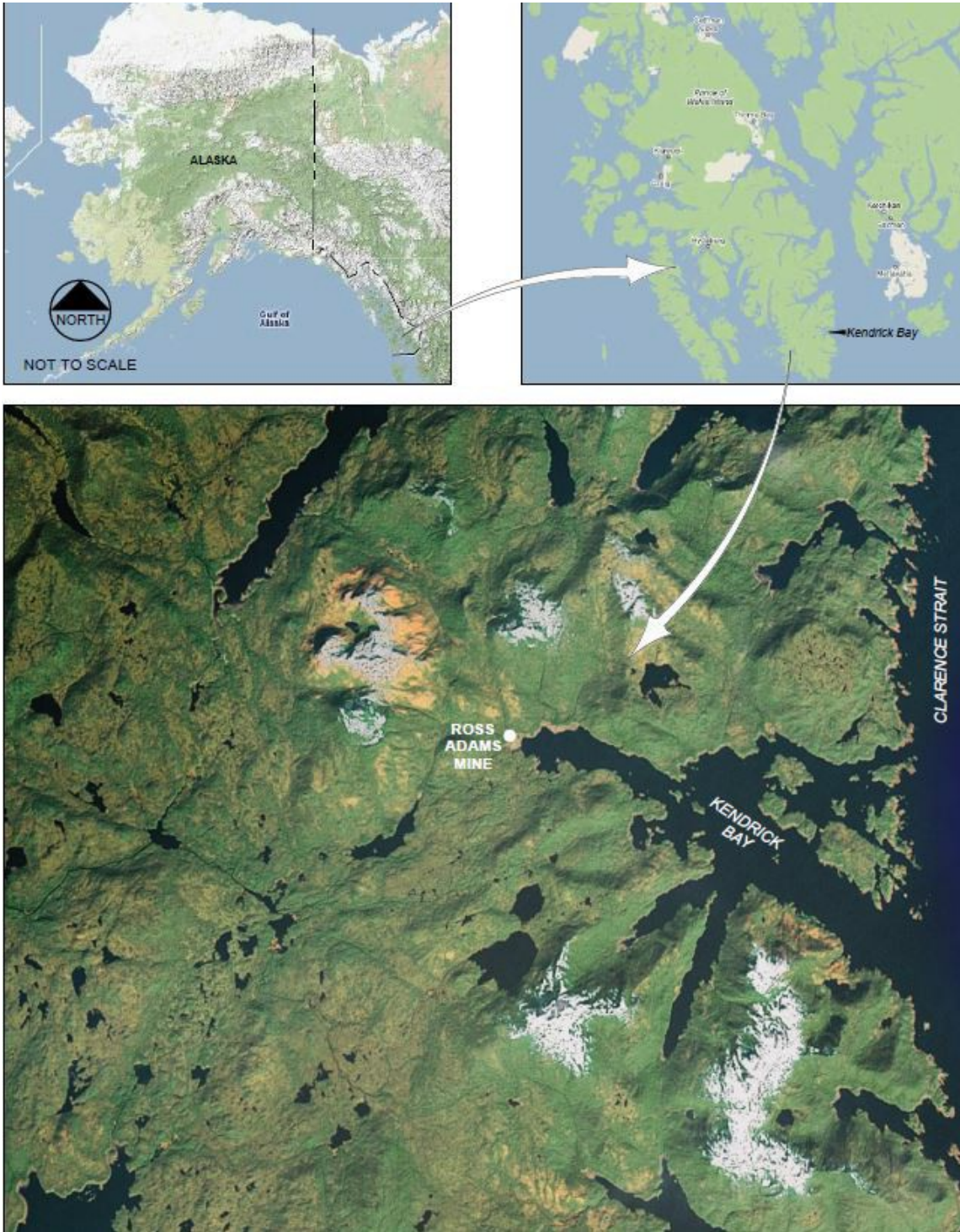
Additional Site evaluation(s) and characterization activities at the Ross-Adams Site are outlined in the following documents:

- [Preliminary Assessment/Site Inspection](#) (PA/SI) Report – Ross Adams Uranium Mine (Kent & Sullivan Inc., 2004)
- [Final Site Characterization Report](#) – (SCR) Ross Adams Mine Site (Tetra Tech, Inc, 2010)
- [Engineering Evaluation/Cost Analysis Ross-Adams mine Site](#) (Worthington Miller Environmental, LLC, 2015)



2. Physical Location

The Site is approximately 38 air miles southwest of Ketchikan, Alaska. The nearest towns are Metlakatla, 28 miles to the northeast across Clarence Strait and Hydaburg, 33 miles to the northwest on the western side of POW Island. The Site is located within the semi-remote recreational area of the Tongass National Forest within the Craig Ranger District. While access is unrestricted, the Site is remote and only accessible by float plane (or helo), boat, or overland hiking through many miles of trail-less, rugged terrain. A floating dock at the location of one of the historic barge loading docks remains functional. There are no established USFS roads or hiking trails connecting the Site to other communities or roads.



Site terrain varies from moderate slopes along the margin of the West Arm of Kendrick Bay shoreline and around the OSA to rugged, steep slopes with dense forest cover and incised stream channels that restrict access even by foot. Soil conditions at the Site are also variable, ranging from barren rock, rock rubble and thin patches of poorly drained soils at higher elevations (such as at the 700-Foot and 900-Foot Levels) to moderately deep, and well drained organic soil with forest litter cover at lower elevations.

Kendrick Creek and its main tributaries, Mine Fork Creek and Cabin Creek, drain the eastern side of Bokan Mountain. Mine Fork Creek originates above the 900-Foot Level and joins with Kendrick Creek at the 300-Foot Level. The 700-Foot Level Creek, a minor tributary to Kendrick Creek, originates near the 700-Foot Level. Kendrick Creek flows to the east into the West Arm of Kendrick Bay. Cabin Creek joins with Kendrick Creek near the West Arm of Kendrick Bay. Kendrick Bay is a five-mile long fjord that opens to Clarence Strait on the east side of POW Island. Typical of fjords in Southeast Alaska, Kendrick Bay is characterized by a steep, narrow intertidal zone between the low and high water lines, and a subtidal zone below the low water line.

The climate of the area is maritime due to the close proximity of the Pacific Ocean. The area experiences frequent and relatively heavy precipitation, with October through December usually being the wettest months. The annual total precipitation averages over 100 inches, with snow often occurring at higher elevations.

The Site is located within Alaska's Southeast Ecoregion and is comprised of subalpine, old growth western hemlock-spruce forest, marine intertidal, and marine subtidal habitats. No threatened or endangered species are expected at the Site. The subalpine habitat is characterized by barren rock and plants adapted to the colder and windier environment. Subalpine vegetation includes mountain hemlock, yellow cedar, and the dwarf form of the shore pine. Wildlife in the subalpine zone includes Sitka black-tailed deer, black bear, ptarmigan, and songbirds such as thrush and dark-eyed junco. The old-growth habitat is characteristically dominated by western hemlock and Sitka-spruce. Other common vegetation includes red alder, western red cedar, Devil's club, and a variety of ferns and berries. The old growth forest supports a variety of songbirds as well as mammals such as the Sitka black-tailed deer, black bear, and mink. The marine intertidal zone is bounded by the low and high tides and occupies approximately 27 acres at the head of the West Arm of Kendrick Bay. The intertidal vegetative community includes many species of plants and algae including rockweed, eelgrass, sugar kelp, and bull kelp. Marine and estuarine invertebrates are common and include a variety of clams, crabs, and starfish, as well as chitons, worms, amphipods, isopods, and sea cucumbers. Birds using the intertidal zone include gulls, shorebirds, waterfowl, crows, belted kingfisher, and bald eagle. Mink may be present in the intertidal zone and black bear and Sitka black-tailed deer inhabit the perimeter of this zone. Many of these plant and animal species extend into the contiguous subtidal waters. Wildlife in the subtidal zone includes sea otter, harbor seal, gulls, loons and a variety of fish and invertebrates.

The approximate geographic location of the Site is: 54°54'33.00"N and 132° 8'27.00"W.

3. Site Characteristics

Current Use of the Site: The most recent use of the Site is for mineral exploration on mining claims held by [UCore](#). Ucore has been conducting exploration and development studies at the Bokan site recently; focusing on the Dotson Ridge rare earth mineralized vein system. Support for the exploration and development work has utilized the float plane dock, the beach landing ramp, and the main access/haul road to the existing core logging facility and the top of the vein system only. The OSA, the mine portal areas, the access roads to the mine portals and the open pit have not been utilized. Housing for workers during these activities has been restricted to an accommodation barge moored on the south side of Kendrick Bay. An emergency shelter has been provided in the existing core logging facility for environmental study personnel who may become stranded at the site. The proposed camp, permitted in a recent Environmental Assessment has not been constructed. In the past, the Dotson Family ([claimant](#)) conducted mineral exploration and occasionally stayed in the cabin located approximately 200 yards from the OSA. Per information presented in the 2004 PA/SI, the Dotsons used the cabin seasonally for varying amounts of time. The cabin is no longer permitted and is slated to be removed at the time of the CERCLA removal action. The PA/SI stated that the Dotson family members were present during the 2004 Site investigation and one family member was present during Tetra Tech sampling in September 2009. The Site is designated for mineral exploration or timber production as permitted by the USFS. Other current uses of the Site could be mineral exploration workers, an occasional area visitor, or a USFS worker at the Site on a temporary basis for the purposes of wildlife or biota surveys, or other evaluations of the forest land.

Commercial fishing can occur in Kendrick Bay and an aquaculture facility is located in the South Arm of Kendrick Bay. A report by the Alaska Department of Natural Resources indicated that intense commercial harvest was occurring at the entrance to Kendrick Bay. Commercial sea cucumber harvesting, if conducted in the West Arm, would occur on a three-year rotational basis. However, marine waters at the head of the West Arm are relatively unproductive because of restricted circulation.

Future Site Use: The USFS Master Plan for the Tongass National Forest has designated the Site for mineral exploration or timber production, as well as being semi-remote recreational land. If the land is used for timber production purposes, it is unlikely that recreational visitors would simultaneously use the land, both for safety reasons and desirability of recreational experience. The USFS Master Plan for the Tongass does not include any other type of development for this Site. Based on the Master Plan, area visitors, mineral exploration workers, and USFS workers were selected as potential future receptors.

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

Site observations and the results of gamma surveys and soil sampling indicate that mine-affected material in specific locations extends beyond the physically defined boundaries of several mine features, particularly at the 300-Foot Level and OSA. Visual inspection and gamma survey results indicate that mine rock exists in discrete locations near the toe and adjoining the western boundary of the 300-Foot Level mine rock pile. Scattered mine rock also exists in discrete areas beyond the physical footprints of the mine rock piles at the 700-Foot and 900-Foot Levels. In addition to the mine rock embankments identified for the mine road between the 700-Foot and 900-Foot Levels,

gamma survey results indicate that scattered mine rock or ore spilled during hauling may exist on the surface of the mine road. At the OSA, the results of the gamma survey indicate that mine-affected materials exists in defined areas beyond the surveyed physical boundary of the OSA. Additionally, the presence of spilled ore rock likely extends from the loading ramps to the immediate vicinity surrounding the former floating dock within the subtidal zone. Segments of the haul roads exhibiting elevated gamma exposure rates are the result of ore rock spilled on the road surface during hauling to the OSA and probable use of mine rock for repair and maintenance of specific road segments.

Miscellaneous solid wastes and petroleum products are also present at the Site. As described in the [SCR](#), the miscellaneous solid wastes and petroleum products, include abandoned vehicles, empty and partially filled 55-gallon drums, two above-ground petroleum storage tanks, collapsed buildings, drill core, and other materials.

Radon and direct gamma radiation contribute the major portion of the estimated theoretical risk to occupational and recreational users of the Site, with inhalation of radon decay products accounting for approximately 90 to 95 percent of the potential radiation risk. Of particular note, risks to human receptors from radiation exposures due to background conditions in the naturally mineralized area exceed acceptable risk levels. Therefore, the “release” is focused on the identified areas and volumes denoted below in the following tables:

Source	Estimated Area (SY)	Estimated Volume (CY)	Comments and Assumptions
900-Foot Level			
North Mine Rock Pile	4,693	8,604	Surveyed/Ucore DTM, 5.5' Avg. Thickness
South Mine Rock Pile	588	588	Surveyed/Ucore DTM, 3' Avg. Thickness
Subtotal	5,281	9,192	
900-Foot Level Adjusted Subtotal		10,111	Volume inflated 10% for lateral variation
700-Foot Level			
700-Foot Level Mine Rock Pile	4,413	7,355	Surveyed/Ucore DTM, 5' Avg. Thickness
700-Foot Level Adjusted Subtotal		8,091	Volume inflated 10% for lateral variation
Mine Road Embankments 900 Ft Level to 700 Ft Level			
I	630	945	Surveyed/Ucore DTM, 4.5' Avg. Thickness
II	209	313	Surveyed/Ucore DTM, 4.5' Avg. Thickness
III	910	910	Surveyed/Ucore DTM, 3' Avg. Thickness
IV	269	448	Surveyed/Ucore DTM, 5' Avg. Thickness
V	149	248	Surveyed/Ucore DTM, 5' Avg. Thickness
VI	161	161	Surveyed/Ucore DTM, 3' Avg. Thickness
Subtotal	2,328	3,025	
Adjusted Subtotal		3,328	Volume inflated 10% for lateral variation
700-Foot/900-Foot Levels Subtotal	12,022	21,530	
300-Foot Level			
300-Foot Level Mine Rock Pile	5,929	28,854	KSI (2004) Fig. 9 & Ucore (2009) DTM
300-Foot Level Adit Development Rock		13,724	13' x 16' x 1,300' plus 8' x 8' x 600', 20% bulking factor

Subtotal		28,854	
300-Foot Level Adjusted Subtotal		31,739	Volume inflated 10% for lateral variation
Ore Staging Area			
OSA	6,000	3,000	2009 Survey/Ucore DTM, Assumed 1.5' Thick organic mat
OSA	6,758	4,500	2009 Survey/Ucore DTM, Assumed 2' cont. soil
OSA Subtotal	6,758	7,500	
OSA Adjusted Subtotal		8,250	Volume inflated 10% for lateral variation
Scattered Ore Rock in Intertidal Area		20	Estimated based on dock plots from Tetra Tech, 2010

Summary of Volumes of Mine Affected Materials (Continued)

Source	Estimated Area (SY)	Estimated Volume (CY)	Comments and Assumptions
Haul Road			
OSA to 300-Foot Level			
Section 1	1,544	514	Based on Gamma survey, 1' thick
Section 2	510	170	Based on Gamma survey, 1' thick
Section 3	657	219	Based on Gamma survey, 1' thick
Section 4	312	104	Based on Gamma survey, 1' thick
Section 5	99	33	Based on Gamma survey, 1' thick
Section 6	306	102	Based on Gamma survey, 1' thick
Section 7	466	155	Based on Gamma survey, 1' thick
Section 8	255	85	Based on Gamma survey, 1' thick
Section 9	215	71	Based on Gamma survey, 1' thick
Section 10	435	145	Based on Gamma survey, 1' thick
Subtotal	4,799	1,598	
Intersect. to 900-ft lvl			
Section 1	163	54	Based on Gamma survey, 1' thick
Section 2	625	208	Based on Gamma survey, 1' thick
Section 3	444	148	Based on Gamma survey, 1' thick
Section 4	684	228	Based on Gamma survey, 1' thick
Section 5	619	206	Based on Gamma survey, 1' thick
Section 6	150	50	Based on Gamma survey, 1' thick
Section 7	365	121	Based on Gamma survey, 1' thick
Section 8	97	32	Based on Gamma survey, 1' thick
Section 9	1,215	404	Based on Gamma survey, 1' thick
Subtotal	4,362	1,451	
Total Haul Road Material Volume	9,161	3,049	
I & L Spur	1,028	1,200	Based on Gamma survey, approx. 3.5' thick
Total Mine Affected Materials		65,788	900-Foot Level Mine Rock Piles (10,111 CY), 700-Foot Level Mine Rock Pile (8,091 CY), Mine Road Embankments (3,328 CY), 300-Foot Level Mine Rock Pile (31,739 CY), OSA (8,250 CY), Scattered Ore (20 CY), Haul Roads (3,049 CY) and I&L Spur (1,200 CY)

The [SCR](#), [Human Health Risk Assessment](#) (HHRA), and [Screening Level Ecological Risk Assessment](#) (SLERA) indicate that the influences of mining activities at the Site are limited to the vicinity of the mine feature areas. These mine features are:

- The open pit;
- The mine portals (mine tunnel openings) at the 900-Foot, 700-Foot and 300-Foot Levels, and the 900-Foot Level air vent shaft;
- The mine rock piles at the 900-Foot, 700-Foot and 300-Foot Levels, and adjacent soils;
- Specific segments of the haul roads, the mine road and embankments (between the 700-Foot and 900-Foot Levels), and the I&L Spur road;
- The Ore Staging Area;
- The rock loadout ramps due to ore spilled during former ore loading operations;
- The drainage from the 300-Foot Level portal.

Exposure pathways contributing the majority of potential risk to occupational and recreational users of the Site consist of external exposure to direct gamma radiation from mine rock and inhalation of radon decay products generated from mine rock and mine openings. Human health risks associated with background radiation exposures in the mineralized area also exceed established risk criteria; the removal action alternatives would not reduce exposure to the natural mineralized background radiation. Exposure pathways contributing potential risk for terrestrial plants, terrestrial invertebrates, and terrestrial wildlife consist of direct contact, ingestion, and food-chain exposure to a handful of metals and radionuclides in mine rock and localized areas of mine-affected soil.

The 300-Foot Level adit drains the entire Ross-Adams underground mine as well as surface water captured in the open pit. Mine water drainage from the 300-Foot Level portal flows to Mine Fork Creek a short distance (approximately 100 feet) upstream of its confluence with Kendrick Creek. Kendrick Creek subsequently flows along the 300-Foot Level mine rock pile. Drainage from the 300-Foot Level portal is believed to occur year-round. As presented in the [SCR](#), flow rates measured from the portal during the ESI sampling events in 2009 increased from 18 gpm during the dry season (June and July) to 91 gpm during the wet season (September) due to increased precipitation. Water quality of the drainage improves during the high flow period, which is characteristic of the non-reactive, non-acid generating, nature of the ore body and host rock geology. Water samples collected from the 300-Foot Level portal drainage had the highest metal and radionuclide concentrations of surface water quality samples collected at the Site. The drainage from the 300-Foot Level portal represents an exposure medium through which human and ecological receptors (terrestrial and freshwater aquatic) could be directly exposed to certain metals and radionuclide constituents through ingestion, direct contact, and food chain pathways. Using the maximum concentrations detected in the drainage from the 300-Foot Level portal, the total cumulative risk estimated for the area visitor from direct ingestion of radionuclides in surface water is greater than the defined acceptable risk level. The cumulative exposure to radium in surface water and stream sediments at the 300-Foot Level also represents a potential risk for riparian animals, with surface water of the 300-Foot Level portal accounting for the majority of the cumulative risk. Potential human health or ecological risks from ingestion or other exposure to waters in Kendrick Creek are projected to be substantially lower and within defined acceptable risk levels. Water quality in the 300-Foot Level portal generally meets Alaska chronic freshwater

criteria. Table 1 provides the range in metal and radionuclide concentrations from samples collected from the portal drainage during the 2009 ESI and a comparison to Alaska chronic freshwater criteria. All of the samples from the 300-Foot Level portal drainage met Alaska chronic freshwater criteria, except for the zinc concentration in one sample.

Table 1. Range in Metal and Radionuclide Concentrations of 300-Foot Level Portal Drainage

Parameter	Alaska WQC	300-Foot Level Portal Maximum
Aluminum	87	49 - 83
Arsenic	150	<10
Barium	na	21 - 28
Beryllium	na	0.17
Cadmium	0.1	0.041 - 0.075
Chromium	23	0.64 - <1.0
Copper	2.9	0.43 - 0.56
Iron	1000	11 - 39
Lead	0.54	0.072 - 0.28
Manganese	na	70 - 100
Mercury	0.77	0.0003 - <0.10
Molybdenum	na	4.3 - 6.2
Nickel	16	<0.5 - <5
Selenium	5	0.072 - <1
Thallium	na	0.0059 - 0.013
Uranium	na	110 - 240
Zinc	37	24 - 38
Total Thorium	na	0.39 - 1.68
Radium-226	na	4.3 - 7.8
Radium-228	na	3.4 - 7.2
Lead-210	na	<0.1 - 1.81

1. Metal concentrations in µg/L; radionuclide concentrations in pCi/L
2. Alaska Water Quality Criteria (WQC) shown are freshwater chronic values
3. na = criteria not available

Based on data presented in the [SCR](#), concentrations of metals and radionuclides in Kendrick Creek are higher adjacent to the 300-Foot Level mine rock pile, primarily due to the drainage from the 300-Foot Level portal drainage, and decrease downstream. Due to the steep gradient, the reach of Kendrick Creek to below the 300-Foot Level is considered negligible spawning and rearing habitat for all salmonids. In this reach of Kendrick Creek, metal concentrations (except aluminum) remain below Alaska chronic freshwater criteria. Although exceeding the criteria, aluminum concentrations in this reach of Kendrick Creek were less than the range of concentrations at background surface water locations. Concentrations of metals and radionuclides continue to decrease in the lower reaches of Kendrick Creek where habitat is physically more amenable to salmonid spawning and rearing, and remain below Alaska chronic freshwater criteria and/or background surface water quality. Although Kendrick Creek is not used as a drinking water supply, water quality in Kendrick Creek also meets Alaska drinking water standards.

5. National Priorities List (NPL) Status

The Ross-Adams Mine Site is not and has not been listed on the NPL.

6. Maps, Pictures and other Graphic Representations

Maps have been shared earlier in this document. Pictures and a graphic representation of an aerial radiological survey are included in the Supplemental Documents section.

B. Other Actions to Date

1. Previous Actions

There have been no previous CERCLA removal actions performed at the site.

2. Current Actions

There are no current removal actions being implemented at the Site.

C. Federal, State and Local Authorities Role

1. Federal, State and Local Actions to Date

The primary regulatory agency responsible for oversight of this removal action is the USFS. There is an established commitment for coordination with the Environmental Protection Agency (EPA) and the Alaska Department of Environmental Conservation (ADEC). The USFS will continue to engage collaborative participation of EPA and ADEC throughout this project.

The previous Region 10 On-Scene Coordinator held a public open-house at the Klawock School on April 28, 2015 from 7:00-9:00 PM and presented the EE/CA and the risk assessments as prelude to the 30 day public review and comment period commencing May 1, 2015. No written comments were received. A presentation was also given at the Prince of Wales Island-Wide Mining Symposium, sponsored by the Organized Village of Kasaan, in Klawock on April 29, 2015.

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

A. Threats to Public Health or Welfare or the Environment

The nature of the Site is such that risks to human health were assessed for non-radionuclide (chemical) exposures and radionuclide exposure through direct contact pathways as well as risks from inhalation of radon decay products, and direct gamma radiation exposures. Receptors of concern were identified as hypothetical mineral exploration worker, USFS worker, area visitor, and Subsistence receptor. Media of concern are soil, radon in air, and gamma radiation. The bases for the recommended removal action under the criteria of 40 C.F.R. § 300.415(b)(2) are:

- (i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.
- (iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate;
- (v) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;

IV. ENDANGERMENT DETERMINATION

Actual releases or threatened releases from this Site, if not addressed by implementing the response action proposed in this Removal Action Memorandum, may present an imminent and substantial endangerment to public health, welfare or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

Based on the results of the [Human Health Risk Assessment](#) and the [Screening-Level Ecological Risk Assessment](#) and the evaluation of 'Applicable or Relevant and Appropriate Requirements (ARARs) the following Removal Action Objectives (RAOs) were defined:

- Reduce risk for recreational users and occupational workers from exposure to direct gamma radiation from mine rock and mine openings;
- Reduce risk for recreational users and occupational workers from exposure due to inhalation of radon decay products from mine rock and mine openings;
- Reduce risk for recreational users from exposure due to potential ingestion of soil from the mine rock piles and potential ingestion of surface water drainage from the 300-Foot Level portal;
- Reduce or eliminate safety hazards related to the mine openings and access to the underground mine workings;
- Reduce risk or eliminate exposure pathways for terrestrial plants, terrestrial invertebrates, terrestrial wildlife from exposure to metals and radionuclides defined as constituents of concern in mine rock and soil associated with mine-affected areas via direct contact, ingestion, and food-chain exposure;
- Reduce risk or eliminate exposure pathways for riparian animals from exposure to radium in surface water at the 700-Foot/900-Foot Levels and the drainage from the 300-Foot Level portal.

Additionally, the following RAOs were identified based on land-use management plans for the Site and vicinity:

- Minimize disturbance to existing undisturbed areas;
- Minimize reliance on long-term active maintenance.

Quantitative preliminary removal action goals (RAGs) were established to address these RAOs. For evaluating the effectiveness of the removal action, these goals are expressed in terms of reducing the identified risks or eliminating the exposure pathways to human and ecological receptors. The overall goal of the removal action is to reduce human and ecological risk that is attributable to the mine-affected areas to an acceptable level. The primary goals are to:

- Reduce risk for recreational users and occupational workers from exposure to radon inhalation and direct gamma radiation attributable to mine rock and mine openings above background on a Site-wide basis to below the EPA excess dose criterion of 15 mrem/year or a cancer risk of less than 1E-5 above background.

- Reduce risks for terrestrial plants, invertebrates, and wildlife from exposure to metals and radionuclides defined as constituents of concern in mine rock and soil in mine-affected areas, and for riparian animals from exposure to radium in surface water to an acceptable risk-based level (defined as a HQ less than one) above background.

CERCLA cleanup levels are typically derived from risk-based evaluations or are established consistent with background concentrations where those concentrations exceed risk-based levels. CERCLA cleanup levels are not established at levels below background. Natural background exposure rates were assessed at the Site for non-mineralized areas that were not affected by historic mining activities. Evaluation of gamma survey data measured at the Site, as described in the [SCR](#), established that background gamma exposure rates range up to 25 micro-roentgens per hour ($\mu\text{R/hr}$) in undisturbed nonmineralized areas. The Removal Action Control and Confirmation Plan (Senes, 2013) proposed a gamma exposure rate cleanup goal of 20 $\mu\text{R/hr}$ for the mining-impacted non-mineralized areas, unless a different goal is supported by additional gamma survey data obtained during the removal action. Any requested change in the estimated background gamma cleanup goal would be documented and submitted to the USFS for review and approval prior to completion of removal action activities. The measured gamma exposure rate of 20 $\mu\text{R/hr}$ is instrument specific and corresponds to a direct gamma background dose rate of 8.4 μrem per hour. Gamma radiation at the Site is strongly correlated with respective activity concentrations of gamma emitting radionuclide decay products, most importantly with radium-226 (Ra-226) and radium-228 (Ra-228) in surface soils. Therefore, the gamma exposure rate cleanup goal will address Ra-226 and Ra-228 activity concentrations in surface soils. Neither EPA nor ADEC have promulgated radiation standards that are applicable or relevant and appropriate for cleanup of mine rock and mine-affected materials at the Site. EPA guidance requires that cleanup of radioactively contaminated CERCLA sites should generally achieve a cumulative 1E-4 to 1E-6 risk range based on the reasonable maximum exposure or to background radiation levels, whichever is higher. ADEC has defined a target risk level of 1E-5 as being protective for determining whether cleanup is necessary and in developing cleanup criteria. Exposure to background gamma exposure rates in the non-mineralized areas of the Site may exceed the defined risk range. Lifetime risk from exposure to average background radiation in the United States also exceeds the defined risk range, including the risk from direct radiation alone (terrestrial and cosmic radiation). Consequently, it is not possible to meet the EPA or ADEC risk-based criteria without subtracting the contribution from background radiation.

As described above, mine rock and mine-affected materials in the non-mineralized areas of the Site would be cleaned-up to achieve a gamma exposure rate of 20 $\mu\text{R/hr}$, unless a different goal is supported by additional background gamma survey data obtained during the removal action. The risk from radiation exposure to mine-affected, non-mineralized areas following cleanup would be indistinguishable from that of background within the removal action boundaries. Therefore, cleanup of the mine-affected areas to natural background levels is by definition protective of human health and consistent with CERCLA guidance.

Because of the characteristic appearance of areas disturbed by mining, the contrasting topographic and natural settings in which these areas are located, and the visually distinct appearance and physical characteristics of mine rock, visual observation will be used as the primary means to control excavation of mine rock. Visual indications will be especially crucial in areas of natural mineralization known to exist in the vicinity of the 900-Foot and 700-Foot Levels at the Site. Gamma radiation measurements will be used to support visual assessments and removal decisions based on visual evidence. In non-mineralized areas, gamma radiation measurements will be a more effective, and thus more important, tool for excavation control.

1. Proposed Action Description

The EE/CA identified, evaluated, and screened potentially applicable technologies for reducing identified human health and ecological risks posed by the mine-affected areas of the Site. The applicable technologies were then assembled into candidate removal action alternatives. Five removal action alternatives for mine rock areas and four removal actions for mine portals were evaluated. These alternatives represent well established and proven technologies that have been implemented at similar uranium mine sites to address similar conditions.

The removal action alternatives for mine rock include:

- Alternative M-1 – No Action
- Alternative M-2 – In-Place Stabilization with Stormwater and Institutional Controls
- Alternative M-3 – In-Place Covering of Mine Rock Piles
- Alternative M-4 – Excavation, Consolidation and Cover at Mine Affected Areas
- Alternative M-5 – Excavation, Consolidation and Cover at Open Pit Repository

The removal action alternatives for mine portals include:

- Alternative P-1 – No Action
- Alternative P-2 – Close Upper Mine Openings with 300-Foot Level Portal Gate
- Alternative P-3 – Close Upper Mine Openings with 300-Foot Level Portal Rock Backfill Closure
- Alternative P-4 – Close Upper Mine Openings and 300-Foot Level Portal Concrete Bulkhead

Based on the detailed and comparative analysis of the removal action alternatives, the combination of *Mine Rock Alternative M-5* and *Portal Alternative P-4* best satisfies the evaluation criteria. Both the mine rock and the mine portal alternatives are protective of human health and the environment in reducing or eliminating the exposure pathways and risks. Both alternatives are effective in reducing incremental radiation risks due to external gamma radiation and inhalation of radon decay products associated with mine rock and the inhalation of radon decay products associated with the mine openings. The alternatives also comply with State and Federal Applicable or Relevant and Appropriate Requirements (ARARs). However, the alternatives will not eliminate the Site-wide risk to human health, as radiation risks from background gamma radiation and radon in the naturally mineralized area exceed the acceptable human health risk and dose criteria.

Mine Rock Alternative M-5 includes of the following components:

- Removal of ore rock within the intertidal zone associated with former loading ramps and ore loading operations and consolidation at the Open Pit Repository.
- Removal of the miscellaneous solid waste and debris and transport for off-site recycling and disposal, except for drill core that would be consolidated at the Open Pit Repository;
- Excavating, transporting and consolidating the mine-affected material from the OSA, and the mine rock piles from the 300-Foot Level; 700-Foot Level, and 900-Foot Level (North and South) at the Open Pit Repository;
- Excavating and consolidating the I&L Spur road materials in the Open Pit and closing the road;
- Removing and consolidating the identified mine road (between the 700-Foot and 900-Foot Levels) surface and embankment material in the Open Pit and closing the mine road;
- Excavating the mine rock from the identified segments of the haul road and consolidating the material in the Open Pit;
- Placing a synthetic geomembrane barrier and 2-foot thick earthen cover on the mine rock materials consolidated at the Open Pit Repository from the on-site borrow source and constructing stormwater controls to protect the covered areas; and
- Implementing institutional controls, access controls, and/or land use restrictions to protect the integrity of the removal action.

The primary factors that resulted in selection of *Mine Rock Alternative M-5* as the recommended Removal Action included:

- Will be effective in achieving the RAOs for the removal action areas, including reducing the predicted mine rock incremental dose to less than 15 mrem/year and the lifetime risk to less than 1E-5 above background for occupational workers and recreational users of the Site;
- Will provide permanent containment of the mine-affected materials by consolidating mine rock and mine-affected materials in the Open Pit Repository, reducing the overall mine rock footprint and requiring less cover material;
- Will remove the OSA materials near the shoreline of the West Arm of Kendrick Bay, significantly reducing human health exposures to gamma radiation and radon for Site visitors and occupational workers;
- Will remove the 300-Foot Level mine rock pile located in the relatively steep area adjacent to Kendrick Creek, eliminating potential concerns with the long-term geotechnical and erosional stability and permanence of the 300-Foot Level mine rock pile;
- Will return all mine rock and mine-affected materials to the Open Pit Repository where the characteristics of the materials are consistent with the naturally mineralized area and where the flatter topography is more suitable for long-term mine rock containment and cover stability;
- Will reduce the gamma and radon emanation at the cover surface of the Open Pit Repository by placing the lower gamma activity material from the 300-Foot Level mine rock pile over the higher gamma activity mine rock;
- Will require closure of the I&L Spur road, the haul road to the 300-Foot Level, and the mine road from the 700-Foot Level to the 900-Foot Level, reducing human access to the 300-Foot and 700-Foot Levels;

- Will require that institutional and access controls and/or land use restrictions be implemented at only one isolated location, where access to the 900- Foot Level is already limited compared to other areas of the Site;
- Will consolidate mine rock and place a cover on the Open Pit, reducing the inflow of water into the underground mine via the 900-Foot Level portal; thereby reducing drainage from the 300-Foot Level portal;

Portal Alternative P-4 consists of the following components:

- Closure of the upper mine openings consisting of the 900-Foot Level portal, air vent shaft and 700-Foot Level portal;
- Constructing a concrete bulkhead at the 300-Foot Level portal, with a water collection and piping system to convey the drainage from the portal directly to Kendrick Creek;
- Implementing institutional controls, access controls, and/or land use restrictions to protect the integrity of the portal closures.

The primary factors that resulted in selection of *Portal Alternative P-4* as the recommended removal action included:

- Will significantly reduce radon exhalation from the mine openings, significantly reducing the human health exposure pathway and risk due to inhalation of radon decay products from the mine openings;
- Has the least uncertainty of alternatives in achieving the RAOs for protection of human health and the environment by significantly reducing radon exhalation from the mine openings;
- Will reduce human and ecological pathways associated with direct contact with the drainage water by collecting and piping the 300-Foot Level portal drainage to Kendrick Creek;
- Will eliminate the potential for water drainage from the 700-Foot Level portal.

2. Contribution to Remedial Performance

The proposed removal action is consistent with any long-term remedy.

3. Engineering Evaluation/Cost Analysis

The EE/CA is included as part of the Administrative Record for this Site and consists of two Volumes. Volume I consists of the [main report](#) while Volume II consists of:

- [Appendix A](#): Screening-Level Ecological Risk Assessment
- [Appendix B](#): Ecological Risk Based Preliminary Remediation Goals
- [Appendix C](#): Human Health Risk Assessment
- [Appendix D](#): RADON and MicroShield® Results
- [Appendix E](#): Cost Estimate Details for Mine Rock Alternatives 1 through 5 and Portal Alternatives 1 through 4
- [Appendix F](#): Detailed Dose/Risk Evaluation for Alternatives

4. ARARs

This removal action will attain to the extent practicable, considering the exigencies of the situation, applicable or relevant and appropriate requirements of federal environmental or more stringent state environmental laws. General regulatory conditions that apply to the Site are described in detail under (1) of the Supplemental documents at the end of this document.

5. Project Schedule

Depending on the construction force, including the availability of personnel and equipment, the recommended removal action could potentially be completed in two construction seasons. Two construction seasons would likely be required to complete Mine Rock Alternative M-5 due to logistical challenges associated with sequencing of multiple construction activities, including removing mine materials and rehabilitation of the existing haul and mine roads, excavating, transporting and consolidating mine rock, and transporting and placing cover materials using the same roads.

B. Estimated Costs

The total estimated PRP cost of the recommended removal action consists of the combined cost of Mine Rock Alternative M-5 and Portal Alternative P-4 and is approximately \$7,237,000. An additional cost for borrow material (to be determined) has been investigated and will add to this amount.

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

Given the Site conditions and the nature of the radiological hazardous substances documented on Site, the potential exposure pathways pose an imminent and substantial endangerment to public health, welfare or the environment. If this removal action is not implemented, the endangerment will exist in perpetuity.

VII. ENFORCEMENT

Newmont and/or its subsidiaries Newmont Exploration, Ltd. and Dawn Mining Co. are expected to fund and perform the proposed Removal Action under the terms of a Consent Decree.

VII. RECOMMENDATION

This decision document represents the Removal Action for the Ross-Adams Uranium Mine and was developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the Site

Conditions at the Site meet the NCP Section 300.415(b)(2) criteria for Removal, and I recommend your approval of this PRP-lead, Non-Time Critical Removal Action.

Recommended: _____ Date: _____
Julie Creed
Environmental Engineering Program Lead
Alaska and Pacific Northwest Regions

Recommended: _____ Date: _____
Matt Anderson
District Ranger
Craig Ranger District

Recommended: _____ Date: _____
Earl Stewart
Forest Supervisor
Tongass National Forest

Approve: _____ Date: _____
Sam Carlson
Director
Engineering and Information Management
Alaska and Pacific Northwest Regions

Disapprove: _____ Date: _____
Sam Carlson
Director
Engineering and Information Management
Alaska and Pacific Northwest Regions

SUPPLEMENTAL DOCUMENTS

1. ARAR Analysis
2. Bokan Radiometric Survey (2007)
3. Pictures

List of Federal and State ARARS and Guidance To Be Considered

Regulation	Description	ARAR		To Be Considered	Rationale
		Applicable	Relevant and Appropriate		
Chemical-Specific					
Resource Conservation and Recovery Act (40 CFR Part 261)	These regulations address the requirements for identification and characterization of solid and hazardous waste.	X			Miscellaneous solid waste debris present at the Site that is scheduled for off-site disposal would be characterized to determine whether it is subject to regulation as hazardous waste, unless the debris is excluded from regulation as a solid waste (e.g. scrap metal being recycled) or a hazardous waste. Solid waste from the extraction, beneficiation, and processing of ores and minerals (including mining of uranium ore) are exempt from regulation as a hazardous waste.
Alaska Water Quality Standards (18 AAC 70)	Water quality standards identify designated beneficial uses for surface and ground water in the State and establish ambient criteria for constituents to protect the designated uses.	X			Water quality standards are potentially relevant and appropriate to ambient surface water quality for protection of designated beneficial uses. Under 18 AAC 70.005, the provisions in these regulations applicable to groundwater do not apply to CERCLA response actions that meet the Alaska site cleanup rules at 18 AAC75.325 - 18 AAC 75.390.
Alaska Oil and Other Hazardous Substance Pollution Control Regulations (18 AAC 75)	These regulations include the Alaska "site cleanup rules," which establish standards for the cleanup of hazardous substance releases (18 AAC 75.325 to 18 AAC 75.390). These include requirements for site characterization, soil and groundwater cleanup levels, and requirements for conducting cleanup operations. Regulations establish a cumulative carcinogenic risk-based level of 1×10^{-5} and a cumulative non-carcinogenic hazard index of one across all exposure pathways in determining the applicable cleanup level.		X		May be relevant and appropriate in establishing criteria for cleanup of hazardous substances at the Site.

List of Federal and State ARARS and Guidance To Be Considered (Continued)

Regulation	Description	ARAR		To Be Considered	Rationale
		Applicable	Relevant and Appropriate		
Office of Solid Waste and Emergency Response (OWSER) Directive No. 9200.4-18 – Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination	This guidance presents clarifying guidance for establishing cleanup levels protective of human health for radioactive contamination at CERCLA sites. The cleanup levels are expressed as a risk, exposure, or dose level and not as a soil concentration level. The guidance provides that the appropriate risk range for radionuclides is 1E-4 to 1E-6. The acceptable risk level established for cleanup depends on the exposure pathways and land use at a site. The guidance concludes that levels of less than or equal to 15 mrem/yr effective dose equivalent are protective.			X	This EPA directive provides guidance to be considered in developing removal action alternatives to address exposure to radioactive materials at the Site.
Location-Specific					
2001 Roadless Area Conservation Rule	These regulations limit road construction and timber cutting on inventoried roadless areas within the National Forest System.	N/A			This rule does not constitute an ARAR since the Ross-Adams mine site is not within an inventoried roadless area based on the Alaska roadless inventory map. Moreover, under 36 CFR 294.12(b)(2), the prohibition on construction and reconstruction of roads in inventoried roadless areas does not apply where the responsible officer determines that road construction or reconstruction is needed to conduct a response action under CERCLA.
Protection of Wetlands (Executive Order No. 11990, 40 CFR Part 6)	Directs federal agencies to minimize the destruction, loss or degradation of wetlands, and to avoid construction in wetlands if a practicable alternative exists.			X	Guidance would be considered if Inventoried wetlands exist within Site boundaries.

List of Federal and State ARARS and Guidance To Be Considered (Continued)

Regulation	Description	ARAR		To Be Considered	Rationale
		Potentially Applicable	Potentially Relevant and Appropriate		
Section 404 of Clean Water Act (33 USC 1344; 33 CFR Parts 320 - 330, 40 CFR Part 230)	Prohibits discharge of dredged or fill material into jurisdictional waters and wetlands without a permit. Establishes substantive requirements for authorizing such discharges.		X		Permit requirements are not applicable to on-Site removal actions under CERCLA. The substantive requirements may be relevant and appropriate if there is a discharge of dredged or fill material into surface waters (including wetlands) that qualify as waters of the United States.
Section 10 of Rivers and Harbors Act (33 USC § 403, 33 CFR Part 322)	Requires permit for excavation and dredging in navigable waters of the United States, including waters of the United States that are subject to the ebb and flow of the tide.		X		Permit requirements are not applicable to on-Site removal actions under CERCLA. The substantive requirements may be relevant and appropriate if excavation or dredging occurs within Kendrick Bay.
Alaska Department of Natural Resources Land Use Planning (AS 38.04.065, 11 AAC 55)	Alaska Department of Natural Resources adopted a revision to the Prince of Wales Area Plan in 1998, which provides guidelines for managing State-owned uplands, submerged lands and tidelands in the planning area.		X		State lands within Kendrick Bay are covered by Management Unit 15 of the Prince of Wales Island Area Plan (ADNR, 1998). The plan does not apply to federal lands. The plan provides guidelines for management of state-owned lands in the planning area.
National Historic Preservation Act (32 CFR Part 229, 40 CFR § 6.301(b), 36 CFR Part 800)	Requires federal agencies to take into account the effect of federal undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historical Places.	X			Only applicable if Site features are eligible for inclusion in the National Register.
Alaska Historic Preservation Requirements (AS 41.35 and 11 AAC 16)	Provides for the protection of historic places on State lands, including tidelands and submerged lands.	X			Not applicable to federal lands at the Site. Would apply only to collection of historic, prehistoric or archaeological resources of the State, if any occur at the Site.

List of Federal and State ARARS and Guidance To Be Considered (Continued)

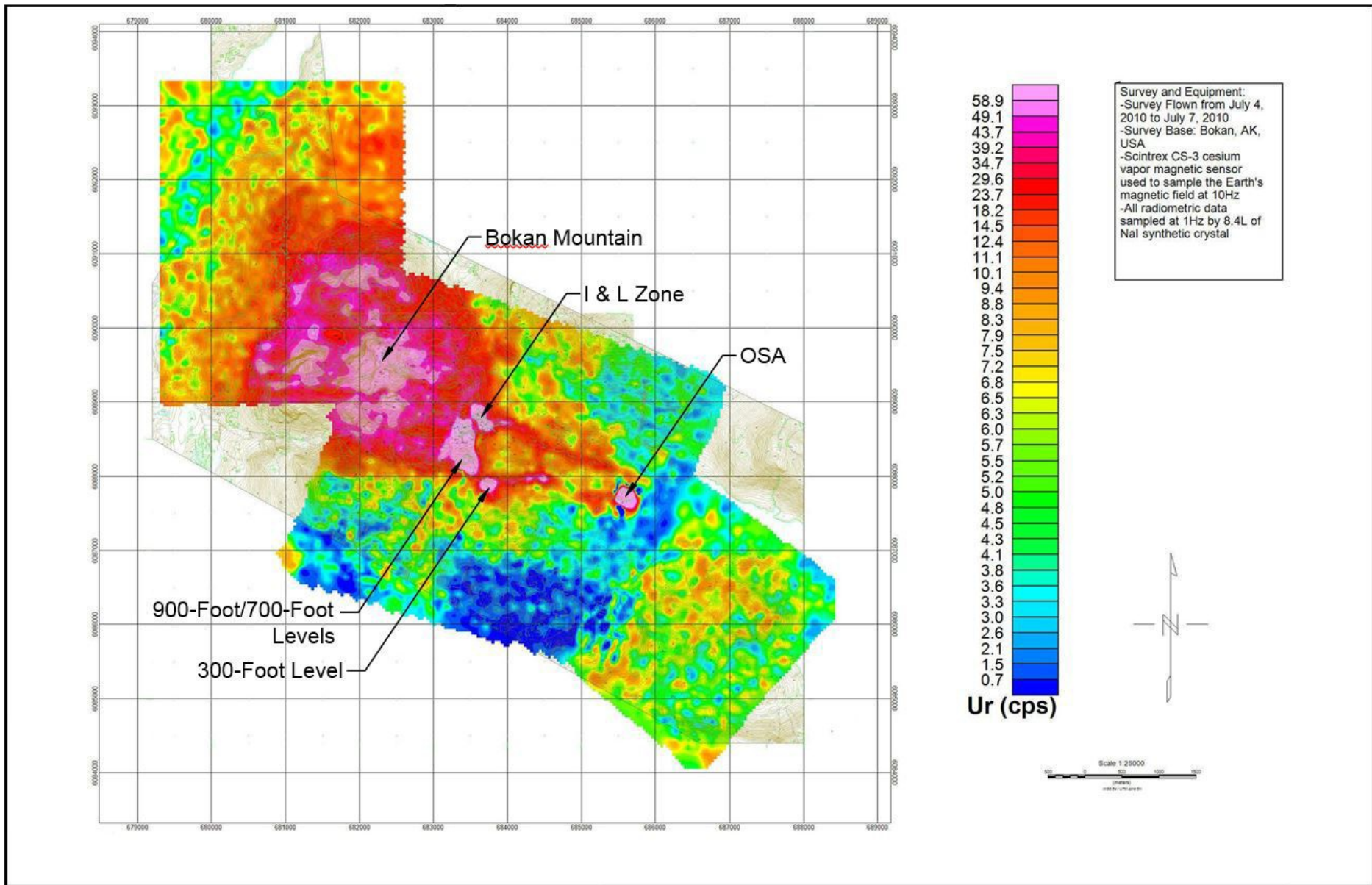
Regulation	Description	ARAR		To Be Considered	Rationale
		Applicable	Relevant and Appropriate		
Endangered Species Act (16 USC 1531-1544; 50 CFR Parts, 17, 222 and 402)	Provides for protection and conservation of listed threatened and endangered species and designated critical habitat.	N/A			The ESA would be applicable if the removal action would affect listed species or designated critical habitat. Listed threatened or endangered species were not identified as being present at the Site on species lists provided by the U.S. Fish and Wildlife Service, the National Marine Fisheries Service and Alaska Department of Game and Fish. Listed species were not observed at the Site during the 2009 Site investigation. Consequently the ESA is likely not an ARAR.
Bald Eagle and Golden Eagle Protection Act (16 USC 668 et seq.)	Establishes federal requirements for protection of bald and golden eagles.	X			Potentially applicable because areas of the Site are bald eagle habitat.
Migratory Bird Treaty Act (16 USC 703-712)	Governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests.	X			Potentially applicable ARAR as some species observed at the Site are on the migratory bird list.
Magnuson-Stevens Fishery Conservation and Management Act (50 CFR Part 600)	Requires federal agencies to consider the effect of federal actions on designated Essential Fish Habitat (EFH). Fishery Management Plans provide guidance for potential conservation recommendations to protect designated EFH.			X	The National Marine Fisheries Service (NMFS) has designated Kendrick Bay as EFH for salmon species. If the removal action is determined to adversely affect EFH, then conservation measures to protect the EFH would be considered, consistent with the existing Fishery Management Plan for the Salmon Fisheries and guidance for addressing impacts to EFH from non-fishing activities. The EFH conservation recommendations are advisory, non-binding, and may include measures to avoid or minimize adverse effects to EFH.

List of Federal and State ARARS and Guidance To Be Considered (Continued)

Regulation	Description	ARAR		To Be Considered	Rationale
		Applicable	Relevant and Appropriate		
Management of National Forest System Lands (36 USC § 1604) and Tongass National Forest Land and Resource Management Plan (2008) (LRMP)	National Forest System lands are to be managed in accordance with land management plans. The Tongass LRMP provides management direction, including prescriptions, standards and guidelines, for managing lands and resources within the Tongass National Forest. Kendrick Bay area is designated for timber production and mineral extraction.	X			Is applicable to the Site as it is located entirely within the Tongass National Forest.
Action-Specific					
Standards Applicable to Generators of Hazardous Waste (40 CFR Part 262)	Regulations establish standards for generators of hazardous waste and generators who transport or offer for transport a hazardous waste for off-site treatment, storage, or disposal.	X			Regulations apply to miscellaneous solid waste debris present at the Site intended for off-site disposal to the extent the debris is classified as hazardous waste.
Standards Applicable to Transporters of Hazardous Waste (40 CFR Part 263)	Establishes standards for off-site transport of hazardous waste.	X			Regulations apply to the off-site transport of miscellaneous solid waste debris present at the Site to the extent the debris is classified as hazardous waste.
Hazardous Materials Transportation Act (49 CFR Parts 107, 171-180, 383, 391-397)	Governs the transport of hazardous materials, including labeling, marking, placarding, using proper containers, and reporting discharges.	X			Requirements apply to the off-site transport of miscellaneous solid waste debris present at the Site to the extent the debris is classified as hazardous waste.
Land Disposal Restrictions (40 CFR Part 268)	Identifies certain hazardous wastes that are restricted from land disposal and provides standards for treatment of hazardous waste prior to land disposal.	X			Regulations potentially apply to off-site disposal of miscellaneous solid waste debris present at the Site to the extent the debris is classified as hazardous waste.
Standards for Management of Universal Wastes (40 CFR Part 273)	Provides requirements for the management, regeneration, reclamation or disposal of used batteries.	X			Batteries present at the Site will be managed and disposed at an off-site facility.

List of Federal and State ARARS and Guidance To Be Considered (Continued)

Regulation	Description	ARAR		To Be Considered	Rationale
		Applicable	Relevant and Appropriate		
CERCLA "Off-Site Rule" (40 CFR Part 300.440)	Establishes procedures for planning and implementing actions involving the off-site transfer of any hazardous substance pursuant to a CERCLA cleanup.	X			Regulations apply to the off-site transport and disposal of miscellaneous solid waste debris present at the Site to the extent the debris is classified as hazardous waste.
Alaska Solid Waste Regulations (18 AAC 60)	Regulations set forth standards for the transport, storage and disposal of solid wastes, including siting, construction, operational and monitoring requirements.	X			Sets standards governing management of solid waste. However, under 18 AAC 60.005(c), waste rock from mining operations is exempt from the requirements of these regulations unless mixed with nonexempt waste, there is a public health, safety or welfare threat or environmental problem associated with management of the waste, or the waste is managed in a manner that causes or contributes to a nuisance.
Alaska Pollutant Discharge Elimination System (APDES) Program (18 AAC 83)	Establishes permitting program and standards for the discharge of pollutants from a point source to waters of the U.S. within the State of Alaska, including storm water discharges.		X		Permit requirements are not applicable to removal actions under CERCLA. Provisions governing discharge conditions may be relevant and appropriate if there are on-Site point source discharges of pollutants, including any applicable storm water discharges.
Alaska Air Quality Control Regulations (18 AAC 50)	The regulation states that "A person who causes or permits bulk materials to be handled, transported, or stored, or who engages in an industrial activity or construction project shall take reasonable precautions to prevent particulate matter from being emitted into the ambient air."	X			This is a potentially applicable ARAR to handling and transporting bulk materials at the Site.
Invasive Species (Executive Order 13112)	Prohibits federal agencies from taking actions that are likely to cause the introduction or spread of invasive species.			X	A potential exists for the introduction of nonnative invasive species.





Aerial photograph of the 700-and 900-Foot Levels, illustrating the various surface cover conditions across the site. (For reference, the 700-Foot Level mine rock pile can be seen at the lower left and the Open Pit is seen in the upper center of the photo. Mine Fork Creek runs vertically down the right side of the photo).



Photograph Looking North Over the Long Axis of the Open Pit from the south end, showing colluvial deposits along the floor and dense brush vegetation



Photograph Looking Southwest Down into the Open Pit and 900-Foot Level portal showing the point at which surface runoff from the north and west (seen on the right side) enters the pit. (Note: Flow at the time the photo was taken was on the order of several gallons per minute.)



Photograph Looking South Over the North Mine Rock Pile (The pile is seen at the lower middle to left side of the photo, and borders the outside edge of the lower half of the loop in the road. The Open Pit is seen at the top center of the photo).



Photograph Looking Southwest at the 900-Foot Level Portal



Photograph Looking South in at the 900-Foot Level Portal, showing water flowing from the rock pile which partially blocks the portal. (The photo also shows the adit bending toward the right (west) approximately 100 feet inside the portal.)



Photograph of 700-Foot Level Portal



Photograph of 300-Foot Level Portal



Photograph Looking Northwest at the Two Rock Loadout Ramps. (The Ore Staging Area is just beyond the docks.)



Photograph Looking North at the Older and Westernmost Rock Loadout Ramp



Photograph of Ore Present in the Intertidal Area Adjacent to the Dock.