



THE STATE
of **ALASKA**
GOVERNOR MICHAEL J. DUNLEAVY

**Department of
Environmental Conservation**

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

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File: 300.38.314

March 29, 2020

Michel Diab
Director, Equipment and Infrastructure, Worley
949 E. 36th Ave Suite 500
Anchorage, AK 99508 USA

Re: Decision Document: CH2M Hill Base Operations Facility
Cleanup Complete Determination

Dear Mr. Diab:

The Alaska Department of Environmental Conservation, Contaminated Sites Program (ADEC) has completed a review of the environmental records associated with the CH2M Hill Base Operations Facility site, which is located in Deadhorse Alaska. Based on the information provided to date, it has been determined that the contaminant concentrations remaining on site do not pose an unacceptable risk to human health or the environment and no further remedial action will be required unless new information becomes available that indicates residual contaminants may pose an unacceptable risk.

This Cleanup Complete determination is based on the administrative record for the CH2M Hill Base Operations Facility site, which is located in the offices of the ADEC in Anchorage, Alaska. This decision letter summarizes the site history, cleanup actions and levels, and standard site closure conditions that apply.

Site Name and Location:

CH2M Hill Base Operations Facility
Containment Area 1: Tract 48
Lat: 70.222955
Long: -148.396467
Containment Area 2: Tract 28
Lat: 70.226324
Long: -148.399017

Name and Mailing Address of Contact Party:

Michel Diab, Equipment & Infrastructure Manager
Jacobs
949 East 36th Avenue, Suite 500
Anchorage, AK 99508

DEC Site Identifiers:

File No.: 300.38.314
Hazard ID.: 26248

Regulatory Authority for Determination:

18 AAC 75

Site Description and Background

Containment Area 1 and Containment Area 2 (hereafter referred to as CA1 and CA2) are located on ADL Lease Tracts 48 and 28 respectively. ADL Lease Tract 27 is sandwiched between Tracts 48 and 28. Combined, Lease Tracts 27, 28, and 48 make up an approximate 39-acre manmade gravel pad, with CA1 located roughly 1,200 feet south of CA2.

A site assessment was completed in September 2013 at CA1 and CA2 to determine if contamination was present prior to decommissioning. At the time of the assessment, CA1 was measured to be about 3,600 square feet and was bordered by a 4 feet high berm. A single above ground storage tank (AST) was present in the containment area. Additional metal supports were also present, where two former ASTs were housed. CA2 was measured to be roughly 800 square feet and was also bermed, however no tanks were present. Both CA1 and CA2 were lined and holding water at the time of the assessment.



Analytical soil samples were collected from both CA1 and CA2 to evaluate whether a release had occurred. Samples were submitted for laboratory analysis of diesel range organics (DRO), gasoline range organics (GRO), polycyclic aromatic hydrocarbons (PAHs), and benzene, toluene, ethylbenzene, and xylenes (BTEX). Analytical results revealed levels of DRO at CA1 up to 25,400 mg/kg and CA2 up to 1,150 mg/kg, both of which exceeded applicable cleanup levels. The site was added to the contaminated sites database following receipt of the 2013 site assessment sample analytical results.

Contaminants of Concern

During the site characterization and cleanup activities at this site, samples were collected from soil and groundwater, and were analyzed for one or more of the following: gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), polycyclic aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs). Based on these analyses, the following contaminants were detected above the applicable cleanup levels and are considered Contaminants of Concern at this site:

- Diesel Range Organics (DRO)
- Gasoline Range Organics (GRO)
- Xylenes

Cleanup Levels

The cleanup levels for petroleum hydrocarbon-contaminated soil on manmade gravel pads and roads in the Arctic Zone are established in 18 AAC 75.341 Method One, Table A2, and 18 AAC 75.341 Method Two Tables B1 and B2.

A number of factors are considered by ADEC when evaluating site specific cleanup levels in the Arctic Zone including:

- human health (ingestion/inhalation);
- ecological impacts (contamination impacting ecological species other than humans);
- groundwater and surface water quality;
- presence of free phase product; and
- any other factors that might cause a deleterious impact to the environment.

Seasonal groundwater (porewater) in the Arctic Zone is not considered a reasonably expected current or future source of drinking water. However, the groundwater can act as a transport medium to the surrounding soil; to sediment or surface water where it may pose a risk to ecological receptors; or to a subpermafrost aquifer or other zones of saturation that may have a current or reasonably expected potential future use as drinking water. These potential transport pathways and potential risks to ecological receptors in receiving waters must be taken into consideration when evaluating sites in the Arctic zone.

The migration to surface water pathway is evaluated as the primary migration pathway and as a possible risk to human health (via drinking water) and for compliance with Alaska Water Quality standards (18 AAC 70). The migration to surface water is evaluated as a possible exposure pathway for ecological receptors because of the tundra wetland ecosystem that exists throughout the Arctic region.

Potential future use of the property must also be taken into account when determining closure status. Differentiating between a “Cleanup Complete” and a “Cleanup Complete with Institutional Controls” determination will be based on site specific conditions and exposure pathways as determined by ADEC. For the purposes of this Cleanup Complete Determination, the following cleanup levels from 18 AAC 75 were used:

Table 1 – ADEC Soil Cleanup Levels

Contaminant	Method Two Table B2 (mg/kg)	Method Two Table B1 (mg/kg)	<i>Maximum Concentration Remaining (mg/kg)</i>
GRO	1,400	NA	440
DRO	12,500	NA	3,500
Xylenes	NA	57 (710)*	220

Legend

GRO = gasoline range organics; DRO = diesel range organics; RRO = residual range organics; mg/kg = milligrams per kilogram; NA = not applicable; * = The soil saturation concentration (C_{sat}) value is listed first, followed by the human health risk-based cleanup level in parentheses.

Characterization and Cleanup Activities

Following the 2013 site assessment activities, it was determined that excavation was necessary at CA1 and further site characterization was necessary at CA2.

Roughly 450 tons of impacted material was excavated from CA1 in August 2014. Excavation depth was limited to roughly one foot above the tundra (about 4 feet deep) to prevent pad pore water from infiltrating the excavation. A total of 17 confirmation soil samples were collected from the base and sidewalls of the excavation. Analytical results revealed that GRO, DRO, and xylenes remained at the base of the excavation and also in the subsurface soils in the surrounding area at concentrations up to 2,700 mg/kg, 3,600 mg/kg and 220 mg/kg, respectively. All excavated soil was transported to Alaska Interstate Construction (AIC) for thermal treatment?disposal.

In addition to the excavation at CA1, nine surface soil samples were collected from CA2. The samples were analyzed for GRO, DRO, and VOCs. Analytical results for GRO (up to 160 mg/kg) and DRO (up to 2,400 mg/kg) were present above Method One Table A2 cleanup levels.

In August of 2015, a total of 21 soil borings were advanced around the perimeter of CA1 in an effort to delineate the lateral and vertical extent of contamination to Table A2 levels. Soil samples were collected from the active layer in each boring. Results of the investigation indicated that contamination is not migrating to the north, west, or east. Contamination was not fully delineated to the south or southeast, as evident by Samples SB10 and SB10-B. Sample SB10-B exhibited concentrations of DRO and GRO at 1,800 mg/kg and 150 mg/kg, respectively, both of which exceed Method One soil cleanup levels. In a letter dated November 30, 2015 ADEC requested further delineation of CA1 and CA2.

An additional 24 soil borings were completed in July of 2016 to further delineate the contamination at CA1 and CA2. Results from the investigation revealed that the vertical and horizontal extent of contamination was delineated. One water sample was collected from the base of Boring 18, where water was observed and a sheen was noted. Volatile constituents detected in the water sample exceeded the naphthalene vapor intrusion (VI) target levels for groundwater. Because of the proximity of groundwater contamination to the Green Service Bays Building and the Beige Building, and because of the depth of groundwater, ADEC requested that the potential for VI exposure be evaluated. It should be noted that groundwater was only encountered in Boring 18, and not in any of the other bore holes.

A VI evaluation was completed in June 2017 to assess the vapor intrusion pathway at the Beige Building and the Green Service Bays Building. Site-specific porewater target levels were calculated using the EPA Johnson and Ettinger Vapor Intrusion Model. Based on information in the evaluation, it was determined that VI was not an issue.

Contamination remains in the surface and sub-surface soils at this site above Method One Table A2 cleanup levels, but below the human health risk-based cleanup levels listed in Method Two Tables B1 and B2; except xylenes. Xylenes remain at a maximum concentration of 220 mg/kg in the subsurface soils, which exceeds the Method Two cleanup level of 57 mg/kg. However, the xylenes cleanup level listed under Method Two Table B1 is capped at saturation, and is not based on human exposure. The concentration of xylenes remaining in the subsurface does not exceed the most conservative human health risk-based level for xylenes, not capped at saturation, which was calculated to be 710 mg/kg.

Cumulative Risk Evaluation

Pursuant to 18 AAC 75.325(g), when detectable contamination remains on-site following a cleanup, a cumulative risk determination must be made that the risk from hazardous substances does not exceed a cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways and does not exceed a cumulative noncarcinogenic risk standard at a hazard index of one across all exposure pathways.

Based on a review of the environmental record, ADEC has determined that residual contaminant concentrations meet the human health cumulative risk criteria for residential land use.

Exposure Pathway Evaluation

Following investigation and cleanup at the site, exposure to the remaining contaminants was evaluated using ADEC's Exposure Tracking Model (ETM). Exposure pathways are the conduits by which contamination may reach human or ecological receptors. ETM results show all pathways to be one of the following: De-Minimis Exposure or Pathway Incomplete. A summary of this pathway evaluation is included in Table 2.

Table 2 – Exposure Pathway Evaluation

Pathway	Result	Explanation
Surface Soil Contact	De-Minimis Exposure	Contamination remains in the surface soils at this site, but below the Arctic Zone cleanup levels listed in Method Two Tables B1 and B2.
Sub-Surface Soil Contact	De-Minimis Exposure	Contamination remains in the sub-surface soils at this site, but below the Arctic Zone cleanup levels listed in Method Two Tables B1 and B2; except xylenes. Xylenes remain at a maximum concentration of 220 mg/kg, which exceeds the Method Two cleanup level of 57 mg/kg, but is still below the risk based cleanup level of 710 mg/kg.
Inhalation – Outdoor Air	De-Minimis Exposure	Contamination remains in the surface and sub-surface soils at this site, but below the Arctic Zone cleanup levels listed in Method Two Tables B1 and B2; except xylenes. Xylenes remain at a maximum concentration of 220 mg/kg, which exceeds the Method Two cleanup level of 57 mg/kg, but is still below the risk based cleanup level of 710 mg/kg.
Inhalation – Indoor Air (vapor intrusion)	De-Minimis Exposure	Site-specific porewater target levels were calculated using the EPA Johnson and Ettinger Vapor Intrusion Model. Based on information in the evaluation, it was determined that the VI pathway was not a risk.
Groundwater Ingestion	Pathway Incomplete	Groundwater is not a potential drinking water source in the Arctic Zone.

Surface Water Ingestion	Pathway Incomplete	Surface water is not impacted.
Wild and Farmed Foods Ingestion	Pathway Incomplete	Wild foods are not collected in this area.
Exposure to Ecological Receptors	Pathway Incomplete	Contamination remains in the gravel pad material and the underlying tundra, and analytical results indicate a low potential for exposure to ecological receptors.

Notes to Table 2: “De-Minimis Exposure” means that in ADEC’s judgment receptors are unlikely to be adversely affected by the minimal volume or concentration of remaining contamination. “Pathway Incomplete” means that in ADEC’s judgment contamination has no potential to contact receptors.

ADEC Decision

Soil contamination at this site has been cleaned up to concentrations below the approved cleanup levels. This site will receive a “Cleanup Complete” designation on the Contaminated Sites Database, subject to the following standard conditions.

Standard Conditions

1. Any proposal to transport soil or groundwater from a site that is subject to the site cleanup rules or for which a written determination from the department has been made under 18 AAC 75.380(d)(1) that allows contamination to remain at the site above method two soil cleanup levels or groundwater cleanup levels listed in Table C requires DEC approval in accordance with 18 AAC 75.325(i). A “site” [as defined by 18 AAC 75.990 (115)] means an area that is contaminated, including areas contaminated by the migration of hazardous substances from a source area, regardless of property ownership.
2. Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited.
3. Groundwater throughout Alaska is protected for use as a water supply for drinking, culinary and food processing, agriculture including irrigation and stock watering, aquaculture, and industrial use. Contaminated site cleanup complete determinations are based on groundwater being considered a potential drinking water source. In the event that groundwater from this site is to be used for other purposes in the future, such as aquaculture, additional testing and treatment may be required to ensure the water is suitable for its intended use.

This determination is in accordance with 18 AAC 75.380 and does not preclude ADEC from requiring additional assessment and/or cleanup action if future information indicates that contaminants at this site may pose an unacceptable risk to human health, safety, or welfare or to the environment.

Appeal

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. Informal review requests must be delivered to the Division Director, 555 Cordova Street, Anchorage, Alaska 99501-2617, within 20 days after receiving the department’s decision reviewable under this section. Adjudicatory hearing requests must be delivered to the Commissioner

of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, P.O. Box 111800, Juneau, Alaska 99811-1800, within 30 days after the date of issuance of this letter, or within 30 days after the department issues a final decision under 18 AAC 15.185. If a hearing is not requested within 30 days, the right to appeal is waived.

If you have questions about this closure decision, please feel free to contact me at (907) 269-7691 or email at joshua.barsis@alaska.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Joshua Barsis', with a stylized flourish extending to the right.

Joshua Barsis
Project Manager

cc: Spill Prevention and Response, Cost Recovery Unit