THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Environmental Conservation

DIVISION OF SPILL PREVENTION & RESPONSE
Contaminated Sites Program

555 Cordova Street
Anchorage, Alaska 99501
Phone: 907.269.7503
Fax: 907.269.7649
dec.alaska.gov

File: 300.38.117

August 21, 2012

Ms. Renee Huntman
Halliburton Energy Services
6900 Arctic Blvd
Anchorage, AK 99518

Re: Decision Document; Halliburton Otis Engineering Fac.
Cleanup Complete Determination

Dear Ms. Huntman:

The Alaska Department of Environmental Conservation, Contaminated Sites Program (ADEC) has completed a review of the environmental records associated with the Halliburton Otis Engineering Fac. located at 2805 Spine Road 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 this site will be closed.

This decision is based on the administrative record and the Halliburton Otis Engineering Fac., project file which is located in the offices of the ADEC in Anchorage, Alaska. This letter summarizes the decision process used to determine the environmental status of this site and provides a summary of the regulatory issues considered in the Cleanup Complete determination.

Introduction

Site Name and Location
Halliburton Otis Engineering Fac.
2805 Spine Road
Deadhorse, AK

Name and Mailing Address of Contact Party:
Ms. Renee Huntman
Halliburton Energy Services
6900 Arctic Blvd
Anchorage, AK 99518

ADEC Site Identifiers:
Hazard ID #1972
CS file # 300.38.117

Regulatory authority under which the site is being cleaned up:
18 AAC 75

Background
The Halliburton Facility is located on Spine Road in Deadhorse on North Slope of Alaska. The property which is situated on land managed by the Alaska Department of Natural Resources (ADNR) is leased by Halliburton Energy Services (HES) and identified as Department of Lands (ADL) lease #47660. The site consists of a man-made gravel pad approximately four to seven feet thick built on top of the tundra surface.

Three areas of hydrocarbon contamination were first noted on the south side of Spine Road in the early 1990's at what was then the Otis Engineering Facility. Otis Engineering was then acquired by HES and remediation of these areas was conducted in 1997 with approximately 2,270 cubic yards of contaminated soil excavated and thermally treated at AIC. Confirmation soil samples collected from the bottom and sidewalls of the excavations contained DRO up to 4,180 mg/kg at the pad/tundra interface and up to 1,980 mg/kg in a sidewall sample near one of the buildings. Further excavation was limited at each of the areas by the presence of buildings.

Surface water sampling was conducted along the edge of the pad in 1999 and 2000. Contaminants were not detected at concentrations exceeding Alaska Water Quality Standards, and these source areas were closed with institutional controls in 2009. The April 30, 2009 Cleanup Complete Determination-Institutional Controls on file at the ADEC office in Anchorage can be referenced for additional details.

Three additional areas of contamination were identified on the north side of Spine Road in 2011during geotechnical and subsequent environmental investigations. Two areas of contamination were identified at the Bay #11 Building and one other area was identified surrounding test pit B-2 which was excavated at the location of a former concrete slab in the southwestern portion of the pad. The suspected source of contamination at the Bay #11 building is a former concrete sump; however, the source of contamination near test pit B-2 is unknown. Investigations were conducted at these locations in preparation for the construction of new buildings after the existing buildings were demolished. Based on the results of these investigations, the site was reopened by ADEC to document the investigation and cleanup of these source areas.

Contaminants of Concern
During the various investigations at this site, soil samples were analyzed for diesel range organics (DRO), residual range organics (RRO), gasoline range organics (GRO), polynuclear aromatic hydrocarbons (PAHs), and volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene, and xylenes (BTEX). Based on the results of these investigations, the following contaminants of concern were identified:

- DRO
- GRO

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.

In the Arctic Zone, the migration to surface water pathway is evaluated as the primary migration pathway because the migration to groundwater pathway is not considered applicable due to the presence of continuous permafrost. Impacted surface water can adversely affect both human and ecological receptors, depending on the location of the contaminant source, its proximity to surface waters, and water usage in the impacted area. Therefore the migration to surface water pathway is evaluated as a possible risk to human health (drinking water source) and/or for compliance with Alaska Water Quality standards (18 AAC 70).

In addition, 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.

Site Characterization and Cleanup

After contamination was identified at the Bay #11 Building and near test pit B-2, additional investigation was conducted to delineate the extent of contamination in these areas after the buildings were demolished. At the Bay #11 Building, DRO was detected up to 1,300 mg/kg and GRO was detected up to 180 mg/kg in test pit #5. DRO was detected up to 750 mg/kg in test pit #7. Two excavations were conducted in these areas, each approximately 30 feet by 30 feet wide with a depth of approximately 5 feet below ground surface (bgs). Approximately 260 cubic yards of contaminated soil were generated during these excavations, and the soil was transported to AIC for thermal treatment. Confirmation soil samples collected from the bottom and sides of the excavations contained DRO up to 81 mg/kg and GRO up to 18 mg/kg.

At the test pit B-2 area, DRO was detected up to 2,700 mg/kg and GRO was detected up to 1,600 mg/kg. Contaminated soil was excavated from an area approximately 70 feet by 150 feet wide with a depth of approximately 4 to 6 feet bgs. Approximately 1,580 cubic yards of contaminated soil were excavated and transported to AIC for thermal treatment. Confirmation soil samples collected from the bottom and sides of the excavation contained DRO up to 420 mg/kg and GRO up to 24 mg/kg.

Minor contamination was also noted at test pit B-11 with DRO at 530 mg/kg. This area of contamination was localized in nature and no remedial action was conducted. Excavations were backfilled with clean fill.

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, Exposure Controlled, or Pathway Incomplete. A summary of this pathway evaluation is included in Table 1.

Table 1 – Exposure Pathway Evaluation

Pathway	Result	Explanation
Direct Contact with Surface Soil	Pathway Incomplete	Contaminated soil has been removed from the surface.
Direct Contact with Sub-Surface Soil	De Minimis Exposure	The remaining contaminated soil is only slightly above the cleanup level and is de minimis in volume.
Inhalation-Outdoor Air	De Minimis Exposure	The remaining contamination is below inhalation cleanup levels and de minimis in volume.
Inhalation-Indoor Air	De Minimis Exposure	The remaining contamination is below inhalation cleanup levels and is de minimis in volume.
Groundwater Ingestion	Pathway Incomplete	Groundwater is not utilized as a drinking water source in this area.
Surface Water Ingestion	Pathway Incomplete	Surface water is not utilized as a drinking water source in this area
Wild Foods Ingestion	Pathway Incomplete	Wild foods are not collected in this area.
Exposure to Ecological Receptors	Pathway Incomplete	There are no complete exposure pathways to ecological receptors at the site.

Notes to Table 1: "De minimis exposure" means that in ADEC's judgment receptors are unlikely to be affected by the minimal volume of remaining contamination. "Pathway incomplete" means that in ADEC's judgment contamination has no potential to contact receptors. "Exposure controlled" means there is an administrative mechanism in place limiting land or groundwater use, or a physical barrier in place that deters contact with residual contamination.

ADEC Decision

Based on the information available, ADEC has determined no further assessment or cleanup action is required. There is no longer a risk to human health or the environment, and this site will be designated as closed on the Department's database.

Although a Cleanup Complete determination has been granted, ADEC approval is required for off-site soil disposal in accordance with 18 AAC 75.325(i). It should be noted that movement or use of

potentially contaminated soil in a manner that results in a violation of 18 AAC 70 water quality standards is unlawful.

This determination is in accordance with 18 AAC 75.380(d) and does not preclude ADEC from requiring additional assessment and/or cleanup action if future information indicates that this site may pose an unacceptable risk to human health or 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, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 15 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, Juneau, Alaska 99801, 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 contact ADEC Project Manager William O'Connell at (907) 269-3057.

Approved By,

Linda Nuechterlein
Environmental Manager

Recommended By,

William O'Connell
Environmental Program Specialist

cc: Melissa Head, ADNR Fairbanks