



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

**Department of Environmental
Conservation**

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

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DEC File No: 141.38.072

August 28, 2023

U.S. Army Garrison Alaska, Fort Greely
ATTN: Chief, Environmental Division, Directorate of Public Works (Crofford)
P.O. Box 31310
Fort Greely, Alaska 99731-1310

Re: Decision Document: Fort Greely Helicopter Refueling BRAC 121
Cleanup Complete Determination

Dear Mr. Crofford:

The Alaska Department of Environmental Conservation, Contaminated Sites Program (DEC) has completed a review of the environmental records associated with the Fort Greely Helicopter Refueling BRAC 121 site located at Fort Greely, 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 information becomes available that indicates residual contaminants may pose an unacceptable risk.

This Cleanup Complete determination is based on the administrative record for the Fort Greely Helicopter Refueling BRAC 121 site maintained by DEC. This decision letter summarizes the site history, cleanup actions and levels, and site closure conditions that apply.

Site Name and Location:

Fort Greely Helicopter Refueling BRAC 121
South of Allen Army Field, Helicopter Fuel Area
Fort Greely, AK 99731

Name and Mailing Address of Contact Party:

U.S. Army Garrison Alaska, Fort Greely
P.O. Box 31310
Fort Greely, Alaska 99731-1310

DEC Site Identifiers:

File No.: 141.38.072
Hazard ID.: 3701

Regulatory Authority for Determination:

18 AAC 75

Site Description and Background

The Former Helicopter Refueling Area is located in the Old Post area of Fort Greely (FGA) and was used in support of helicopter activities in the 1980s. It was the location of at least two spills of JP-4. The Army released 200 gallons in January 1981, and 20 gallons in November of that same year. Both releases were to pavement and cleaned up using sorbents at the time. Exceedances of cleanup levels in soil were observed during follow up investigations described below.

In 1995, the Base Realignment and Closure (BRAC) Commission listed Fort Greely for realignment and partial closure. Portions of the post were closed, with the land proposed for eventual transfer to the City of Delta Junction. To prepare for the land transfer, the main cantonment area and Allen Army Airfield (AAAF) were divided into parcels and allocated a BRAC designation and investigated to determine whether environmental issues would prohibit the land transfer. The Helicopter Refueling site was allocated BRAC 121.

Soils in the Fort Greely area are comprised of mainly shallow, well-drained silt loams with sandy to gravelly underlying material. Borings in the area show that sandy gravels dominate but are interlaced with discontinuous silt-rich zones that are less permeable and can slow migration of contaminants through the substrate. Groundwater at Fort Greely fluctuates, but typically sits at around 200 feet below ground surface (bgs). Site figures are attached to this cleanup letter.

Contaminants of Concern

During the site investigation and cleanup activities at this site, samples were collected from soil and groundwater and analyzed for gasoline, diesel, and residual range organics (GRO, DRO, RRO), benzene, toluene, ethylbenzene, and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), and semi-volatile organic compounds (SVOCs). Based on these analyses, the following contaminants were detected above the applicable cleanup levels and are considered Contaminants of Concern (COCs) at this site:

- DRO
- Ethylbenzene
- Naphthalene

Cleanup Levels

Soil cleanup levels applicable to the site are the most stringent Method 2 cleanup levels for the under 40-inches of precipitation climate zone found in 18 AAC 75.341(c), Table B1 and 18 AAC 75.341(d), Table B2. Groundwater cleanup levels applicable to this site are found in 18 AAC 75.345, Table C. Groundwater samples at the site never showed exceedances of Table C values for any COCs identified at the site, and so are not represented in Table 1.

Table 1 – Approved Cleanup Levels

Contaminant	Soil (mg/kg)
DRO	250
Ethylbenzene	0.13
Naphthalene	0.038

Notes:

1. mg/kg = milligrams per kilogram

Characterization and Cleanup Activities

In 1997, the Army conducted a limited investigation to the spills. No signs of contamination were observed, but two test pits were excavated on the east and west sides of a hardstand pad and sampled for GRO, DRO, RRO, BTEX, and SVOCs at depths up to 5.5 feet below ground surface (bgs). The only COCs detected above migration to groundwater cleanup levels were DRO at 600 mg/kg and ethylbenzene at 0.26 mg/kg.

In 1998, the Army conducted a further investigation to delineate the vertical and lateral extent. Three soil borings were advanced to a depth of 42 feet bgs. DRO was detected at 25-27 feet bgs at 2500 mg/kg, but deeper samples showed concentrations fell below the migration to groundwater cleanup level at depths well above the groundwater depth. Similarly, naphthalene was detected above the migration to groundwater cleanup level (0.088 mg/kg) at 30-32 feet bgs, but deeper samples showed clean soils well above the groundwater interface depth (See Table A2-1, attached).

The Army conducted a remedial investigation in 2010 to characterize perimeter soils surrounding the former refueling area. Two test pits were excavated, and three further soil borings were advanced. No COCs were detected above any cleanup criteria. The locations of these test pits and borings are identified on Figure 3.

Remaining Contamination

The maximum concentrations of contaminants remaining at the site are shown in Table 2. These concentrations are all below the human health cleanup levels, and any exceedances of migration to groundwater cleanup levels are vertically delineated and are not anticipated to impact groundwater. Sample locations referred to in Table 2 are shown in the attached site figures.

Table 2 – Maximum Contaminant Concentrations Remaining in Soil

Contaminant	Soil (mg/kg)	Sample Location	Date Sampled
DRO	2500	AP-891	1998
Naphthalene	0.088	AP-891	1998

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 (HI) of 1 across all exposure pathways.

Based on a review of the environmental record, DEC 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 DEC'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 either De Minimis Exposure or Pathway Incomplete. A summary of this pathway evaluation is included in Table 3.

Table 3 – Exposure Pathway Evaluation

Pathway	Result	Explanation
Surface Soil Contact	De Minimis Exposure	Contamination remains in the surface soil below human health (inclusive of direct contact) and ingestion levels in 18 AAC 75.341, Tables B1 and B2.
Subsurface Soil Contact	De Minimis Exposure	Contamination remains in the subsurface below human health (inclusive of direct contact) and ingestion levels in 18 AAC 75.341, Tables B1 and B2.
Inhalation – Outdoor Air	De Minimis Exposure	Contamination remains in the subsurface soil below human health and inhalation levels identified in 18 AAC 75.341, Tables B1 and B2.
Inhalation – Indoor Air (Vapor Intrusion)	De Minimis Exposure	The site background indicates there is clean fill material overlying and mitigating volatile petroleum related compounds from the residual soil contamination. No structures are present in the area of contamination and residual soil contamination is not above inhalation levels identified in 18 AAC 75.341, Tables B1 and B2.
Groundwater Ingestion	Pathway Incomplete	Subsurface sampling at depth indicated contamination is below migration groundwater cleanup levels identified in 18 AAC 75.341, Tables B1 and B2 beneath the source area. Contamination did not reach groundwater.
Surface Water Ingestion	Pathway Incomplete	Contaminants are not expected to migrate to surface water. The closest surface water to the site is roughly a ½ mile downgradient.
Wild and Farmed Foods Ingestion	Pathway Incomplete	Contaminants of concern do not have the potential to bioaccumulate in plants or animals.
Exposure to Ecological Receptors	Pathway Incomplete	The site is on an active military installation and there are no terrestrial or aquatic exposure routes.

Notes:

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

DEC Decision

Soil contamination at the site has cleaned up to concentrations below the approved cleanup levels suitable for residential land use. This site will receive a “Cleanup Complete” designation on the Contaminated Sites Database.

DEC approval is required for movement and disposal of soil and/or groundwater subject to the Site Cleanup Rules, in accordance with 18 AAC 75.325(i). Please contact DEC for information about applicable regulations and requirements. A “site”, as defined by 18 AAC 75.990, means an area that is

contaminated, including areas contaminated by the migration of hazardous substances from a source area, regardless of property ownership.

Movement or use of contaminated material in an ecologically sensitive area or in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited. Furthermore, 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. If, in the future, groundwater from this site is to be used for other purposes, 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 DEC from requiring additional assessment and/or cleanup action if information indicates that contaminants at this site may pose an unacceptable risk to human health, safety, or welfare or to the environment.

Informal Reviews and Adjudicatory Hearings

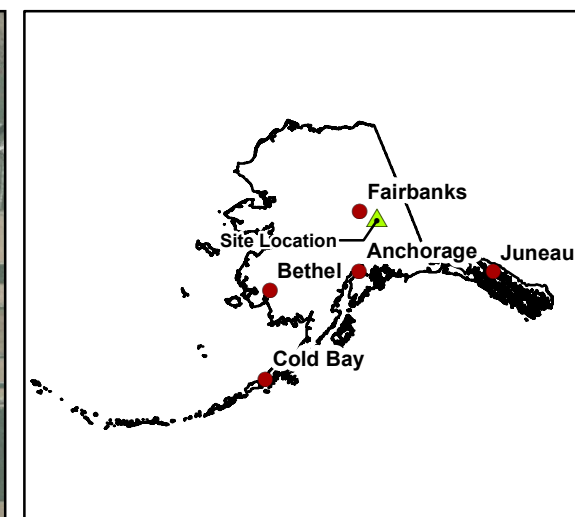
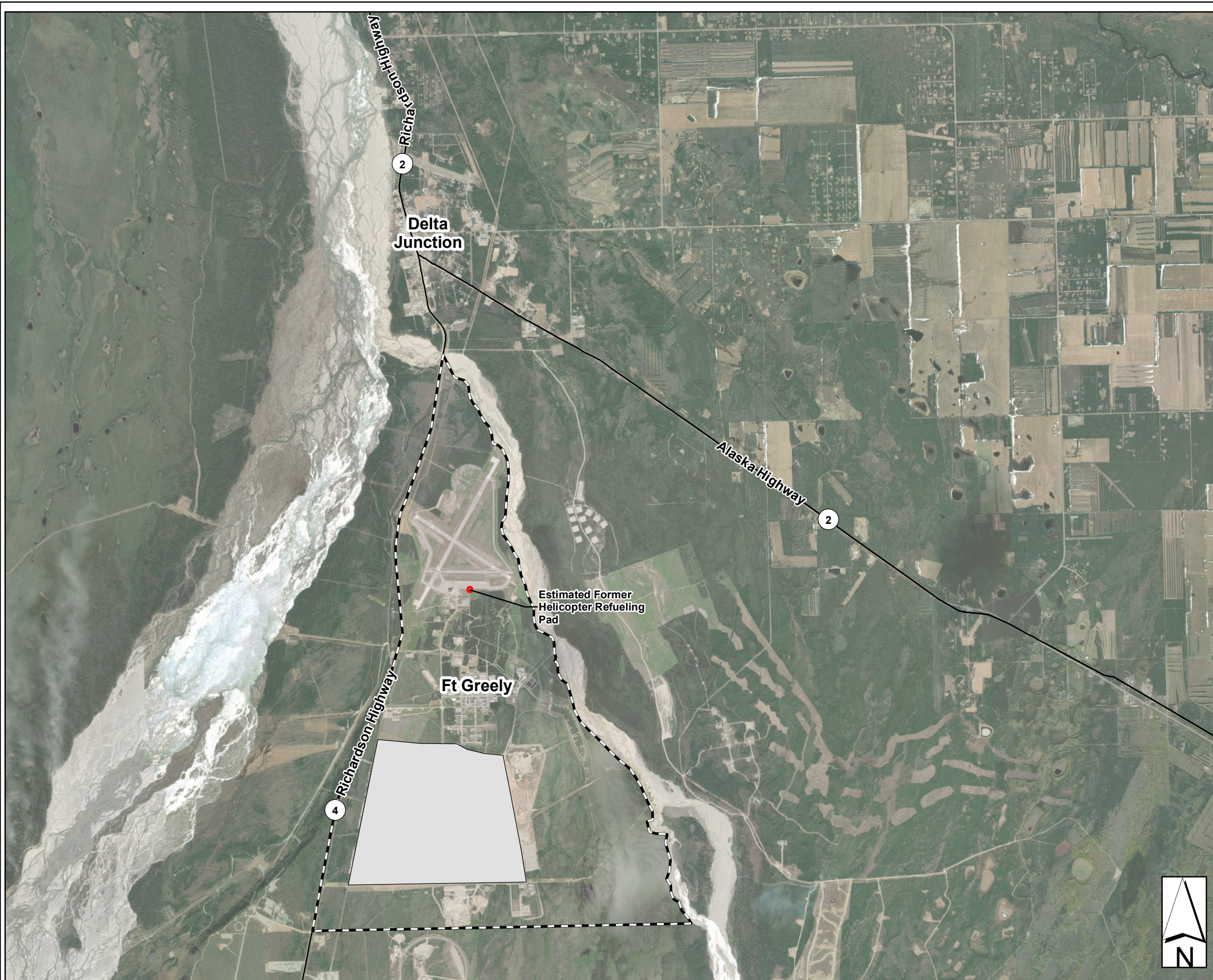
A person authorized under a provision of 18 AAC 15 may request an informal review of a contested decision by the Division Director in accordance with 18 AAC 15.185 and/or an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340. See DEC's "Appeal a DEC Decision" web page <https://dec.alaska.gov/commish/review-guidance/> for access to the required forms and guidance on the appeal process. Please provide a courtesy copy of the adjudicatory hearing request in an electronic format to the parties required to be served under 18 AAC 15.200. Requests must be submitted no later than the deadline specified in 18 AAC 15.

If you have questions about this closure decision, please feel free to contact me at (907) 451-2131, or email at tim.sharp@alaska.gov.

Sincerely,

Timothy Sharp
Project Manager

cc: DEC, Division of Spill Prevention and Response, Cost Recovery Unit
Dennis Shepard, DEC
Erica Blake, DEC
Sam Klein, USAEC
Justin Hogrefe, FGA ENVR
Chris Locke, FGA ENVR
Guy Warren, USACE



Legend

- FGLY-072 Estimated Former Helicopter Refueling Pad
- Fort Greely Installation Boundary
- Road

REFERENCES

Alaska Geospatial Office, USGS Basemap 2020.

MAP PROJECTION:

Coordinate System: NAD 1983 UTM Zone 6N
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter



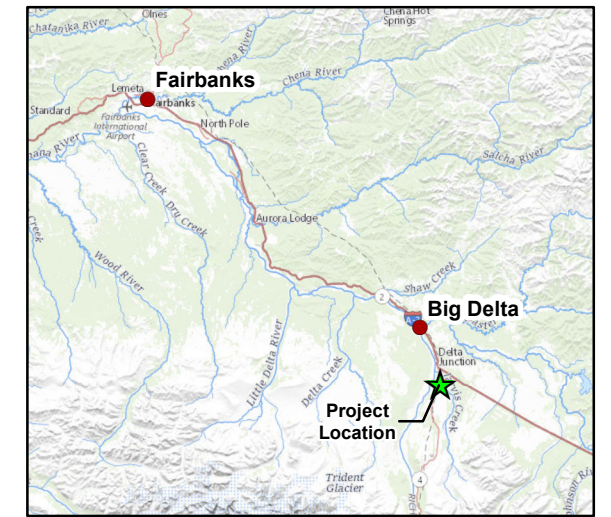
1 inch = 1 miles

1:63,500



Fort Greely and Delta Junction Vicinity

Date:
3/16/2023

FIGURE 1



Legend

-  Monitoring Wells
-  Estimated Former Helicopter Refueling Pad

REFERENCES

Alaska Geospatial Office, USGS Basemap 2020.

MAP PROJECTION:

Coordinate System: NAD 1983 UTM Zone 6N
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Meter



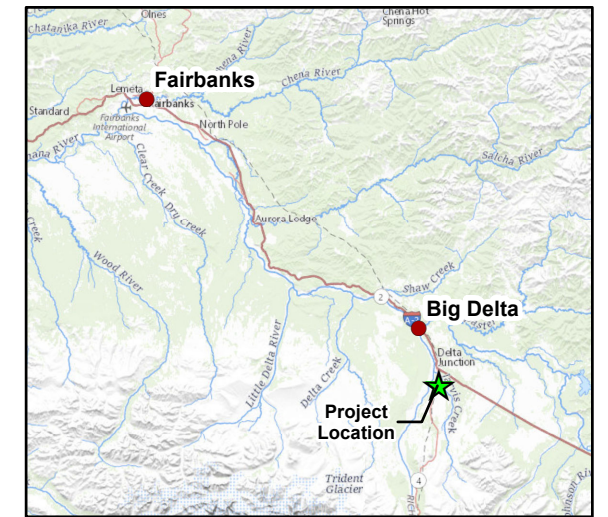
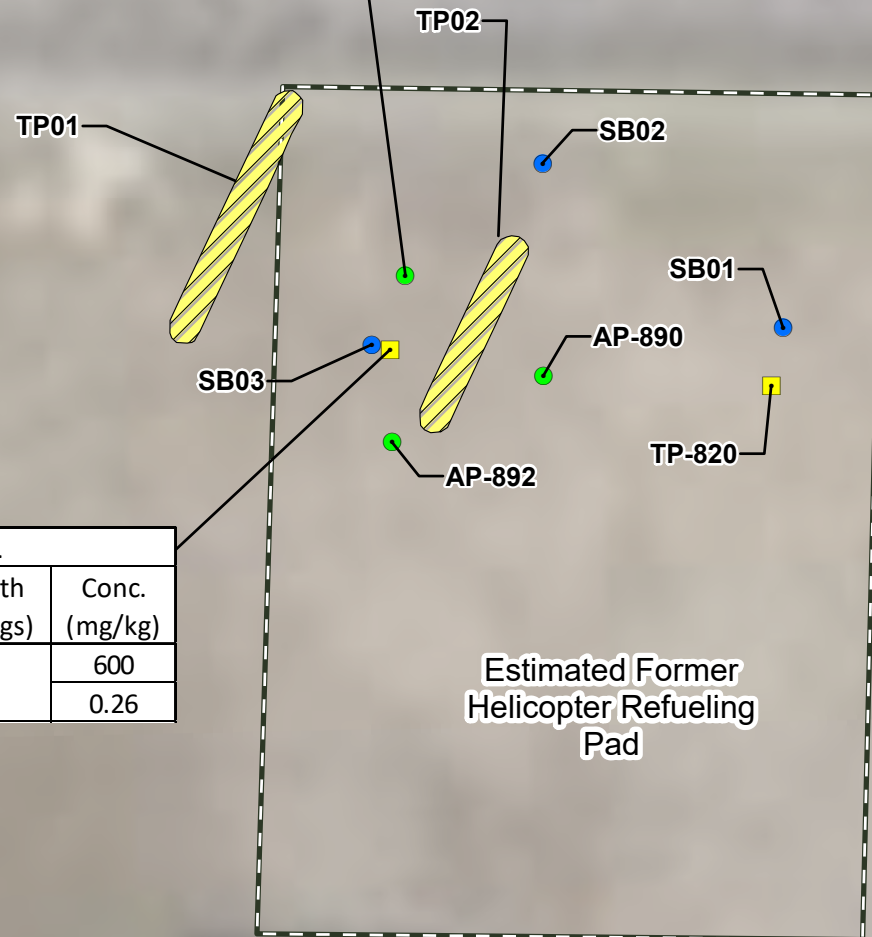
1 inch = 333.33 feet

1:4,000

FGLY-072
Helicopter Refueling Area
Site Location
Fort Greely, Alaska
FIGURE 2
 Date:
 3/16/2023

AP-891		
Analyte	Depth (ft. bgs)	Conc. (mg/kg)
DRO	25-27	2,500
Naphthalene	30-32	0.088
Benzo(a)pyrene		0.34

TP-821		
Analyte	Depth (ft. bgs)	Conc. (mg/kg)
DRO	5	600
Ethylbenzene		0.26



Legend

- Soil Boring, 1998
- Soil Boring, 2010
- Test Pit, 1997
- Test Pit Footprint (2010)
- Estimated Former Helicopter Refueling Pad

ACRONYMS

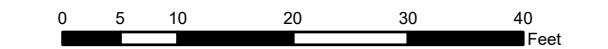
- ft. bgs = feet below ground surface
- DRO = diesel range organics
- mg/kg = milligram per kilogram

REFERENCES

Alaska Geospatial Office, USGS Basemap 2020.

MAP PROJECTION:

Coordinate System: NAD 1983 UTM Zone 6N
 Projection: Transverse Mercator
 Datum: North American 1983
 Units: Meter



1 inch = 16.67 feet

1:200

FGLY-072
Helicopter Refueling Area
Site Location
Fort Greely, Alaska
FIGURE 3
 Date:
 5/4/2023

Table A2 - 1. 1998 Soil Boring Soil Sample Analytical Detections

Analyte	Units	Cleanup Level ¹	Location	AP-891					AP-892		
			AP-890	121-002-SO	121-005-SO	121-003-SO	121-006QC-SO	121-007QA-SO	121-004-SO	121-008-SO	121-009-SO
			Sample ID	AP-891 S2	AP-891 S5	AP-891 S6	AP-891 S6**	AP-891 S6***	AP-891 S8	AP-892 S1	AP-892 S2
Depth (feet bgs)	20.0-22.0	10.0-12.0	25.0-27.0	30.0-32.0	30.0-32.0	30.0-32.0	40.0-42.0	5.0-6.0	10.0-11.5		
DRO	mg/kg	250	ND [42]	240	2,500	220	-	-	ND [4.1]	41	ND [4]
RRO	mg/kg	11,000	ND [100]	120	110 J	ND [100]	-	-	ND [100]	30 J	ND [100]
GRO	mg/kg	300	-	-	-	5.3	5	6.9	ND [4.6]	-	-
Benzene	mg/kg	0.022	-	-	-	ND [0.019]	ND (0.02)	ND [0.025]	ND [0.023]	-	-
Toluene	mg/kg	6.7	-	-	-	ND [0.019]	ND [0.02]	ND [0.025]	ND [0.023]	-	-
Ethylbenzene	mg/kg	0.13	-	-	-	0.026	0.025	0.015	ND [0.023]	-	-
Total Xylenes	mg/kg	1.5	-	-	-	0.076	0.065	0.055	ND [0.068]	-	-
Total BTEX	mg/kg	-	-	-	-	0.102	0.09	0.07	ND	-	-
2-Methylnaphthalene	mg/kg	1.3	-	-	-	0.28	0.39	-	ND [0.0017]	-	-
Acenaphthene	mg/kg	37	-	-	-	0.0043	0.13	ND [00093]	ND [0.0017]	-	-
Acenaphthylene	mg/kg	18	-	-	-	0.0088	0.01 I	0.0081	ND [0.0017]	-	-
Anthracene	mg/kg	390	-	-	-	0.0022	0.19	0.0084	ND [0.0017]	-	-
Benzo(a)anthracene	mg/kg	0.7	-	-	-	0.0056	0.37	0.013	ND [0.0017]	-	-
Benzo(a)pyrene	mg/kg	1.9	-	-	-	0.0054	0.34	0.014	ND [0.0017]	-	-
Benzo(b)fluoranthene	mg/kg	20	-	-	-	0.007	38	0.014	ND [0.0017]	-	-
Benzo(g,h,i)perylene	mg/kg	15,000	-	-	-	0.0037	0.17	0.013	ND [0.0017]	-	-
Benzo(k)fluoranthene	mg/kg	190	-	-	-	0.0029	0.14	0.014	ND [0.0017]	-	-
Chrysene	mg/kg	600	-	-	-	0.007	33	0.018	ND [0.0017]	-	-
Dibenzo(a,h)anthracene	mg/kg	6.3	-	-	-	0.00099 J	0.043	0.0047	ND [0.0017]	-	-
Fluoranthene	mg/kg	590	-	-	-	0.017	0.9	0.036	ND [0.0017]	-	-
Fluorene	mg/kg	36	-	-	-	0.007	0.13	0.014	ND [0.0017]	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	65	-	-	-	0.0041	0.21	0.01	ND [0.0017]	-	-
Naphthalene	mg/kg	0.038	-	-	-	0.017	0.088	0.0084 J	ND [0.0017]	-	-
Phenanthrene	mg/kg	39	-	-	-	0.083	1	0.1	ND [0.0017]	-	-
Pyrene	mg/kg	87	-	-	-	0.016	0.88	0.033	ND [0.0017]	-	-

Acronyms:
bgs = below ground surface; DRO = Diesel Range Organics; GRO = Gasoline Range Organics; mg/kg = milligram per kilogram; RRO = Residual Range Organics.

Notes:
Soil cleanup criteria based on 18 AAC 75, Tables B1 & B2, Method 2, Under 40-Inch Zone Migration to Groundwater (ADEC 2023).
J = Analyte was detected above the reported detection limit with a reported concentration as an estimated value.
ND = not detected above the laboratory Limit of Quantitation (LOQ); LOQ is provided in parenthesis
- = Not analyzed for or information not available
Bold/shaded text results exceed ADEC 18 AAC 75.341 Migration to Groundwater cleanup criteria for that constituent (ADEC 2023).

Table A2 - 2. 2010 Test Pit Soil Analytical Detections

				Location	TP01	TP02
				Depth (feet bgs)	15	15
				PID Reading (ppm)	1.5	4.2
Analyte	Method	Unit	Cleanup Level	Analytical Detections		
DRO	AK102	mg/kg	250	11.9 J	22.7	
RRO	AK103	mg/kg	11,000	22.5	48.9	
GRO	AK101	mg/kg	300	ND (0.78)	0.791 J	
Pyrene	8270D SIM	mg/kg	1,000	ND (0.003)	0.003 J	
Acronyms: bgs = below ground surface; DRO = Diesel Range Organics; GRO = Gasoline Range Organics; mg/kg = milligram per kilogram; PID = photoionization detector; ppm = parts per million; RRO = Residual Range Organics.						
Notes: Soil cleanup criteria based on 18 AAC 75, Tables B1 & B2, Method 2, Under 40-Inch Zone Migration to Groundwater (ADEC 2023). J = Analyte was detected above the reported detection limit with a reported concentration as an estimated value. ND = not detected above the laboratory Limit of Quantitation (LOQ); LOQ is provided in parenthesis						

Table A2 - 3. 2010 Soil Boring Sample Analytical Detections

				Location	SB01	SB01	SB02	SB03	SB03
				Depth (feet bgs)	25	50	55	60	60 (dup)
				Date	8/7/2010	7/31/2010	8/1/2010	8/1/2010	8/1/2010
				PID Reading (ppm)	2.2	2.6	2.4	3.4	3.4
Analyte	Method	Unit	Cleanup Level	Analyte Concentrations					
GRO	AK101	mg/kg	300	N/A	1.12 J	0.682 J	ND (1.408)	ND (1.432)	
DRO	AK102	mg/kg	250	14.4 J	ND (13.06)	ND (13.06)	ND (12.44)	ND (12.54)	
RRO	AK103	mg/kg	11,000	14.6 J	ND (13.06)	ND (13.06)	ND (12.44)	ND (12.54)	
Acronyms: bgs = below ground surface; DRO = Diesel Range Organics; dup = field duplicate sample; GRO = Gasoline Range Organics; mg/kg = milligram per kilogram; PID = photoionization detector; ppm = parts per million; RRO = Residual Range Organics.									
Notes: Soil cleanup criteria based on 18 AAC 75, Tables B1 & B2, Method 2, Under 40-Inch Zone Migration to Groundwater (ADEC 2023). J = Analyte was detected above the reported detection limit with a reported concentration as an estimated value. N/A = Not applicable; no sample analysis. ND = Not detected above the laboratory Limit of Quantitation (LOQ); LOQ is provided in parenthesis									