

2423.38,001

ADEC File No.



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## ALASKA ARMY NATIONAL GUARD

*Revised*

# Kotlik Federal Scout Readiness Center Record of Decision for Petroleum Contamination

DEC 18 2014

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# Acronyms and Abbreviations

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AAC	<i>Alaska Administrative Code</i>
ACL	alternative cleanup level
ADEC	Alaska Department of Environmental Conservation
ARNG	Alaska Army National Guard
bgs	below ground surface
DRO	diesel-range organics
FSRC	Federal Scout Readiness Center
GRO	gasoline-range organics
IC	institutional control
LTM	long-term monitoring
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MTGW	migration to groundwater
NA	not applicable



# 1 Site Name and Location

**Facility name:** Kotlik Federal Scout Readiness Center (FSRC), Kotlik, Alaska.

**Hazard ID:** 2822

**ADEC file number:** 2423.38.001

**AEDB-R number:** CCAK010940

**Site location:** Kotlik FSRC is located within the City of Kotlik, approximately 200 feet south of Kotlik Slough. The City of Kotlik is located on the southern bank of Kotlik Slough (a distributary channel of the Yukon River), 35 miles northeast of Emmonak in the Yukon-Kuskokwim Delta. Kotlik lies 165 air miles northwest of Bethel and 460 air miles west of Anchorage (Figure 1). (Figures are at the end of this Record of Decision.) Kotlik FSRC is located in Section 25 of Township 28 North, Range 26 West of the Kateel River Meridian, situated on a parcel of land legally described as Lots 1 and 2, Block 6 of Tract B, U.S. Survey 4497, being within Kotlik Townsite, containing 0.56 acre, more or less.

**Latitude and longitude:** Kotlik FSRC is located at 63.03280724 degrees north, -163.55647336 degrees west, based on the 1984 (revised 2004) World Geodetic System (WGS 84) datum.

**Facility owner and point of contact:** The facility owner is the Alaska Army National Guard (ARNG), and the point of contact is Lieutenant Colonel Joel Gilbert, CFMO/Environmental, Building 57024, Joint Base Elmendorf-Richardson, Alaska, 99505.

## 2 Contaminants of Concern and Affected Media

Historical practices have resulted in release of petroleum hydrocarbons to soil and groundwater at Kotlik FSRC, and the affected areas have been investigated. Based on results of sampling conducted during investigations, the following contaminants of concern and affected media have been identified (CH2M HILL, 2013):

**Soil:** Diesel-range organics (DRO) and gasoline-range organics (GRO) were detected at concentrations greater than Alaska Department of Environmental Conservation (ADEC) Method 2 cleanup levels presented in Table B2 of Title 18, Chapter 75 the *Alaska Administrative Code* (AAC), Section 341(d) (18 AAC 75.341[d]), for a site with annual precipitation less than 40-inches, in surface and subsurface soil to a depth of approximately 3 feet below ground surface (bgs). Benzene and ethylbenzene were detected at concentrations greater than ADEC Method 2 cleanup levels established in Table B1 of 18 AAC 75.341(c) for a site with annual precipitation less than 40 inches, in surface and subsurface soil to a depth of approximately 2 feet bgs.

**Groundwater:** Concentrations of DRO and benzene detected in samples of onsite suprapermafrost groundwater were greater than ADEC cleanup levels established in Table C of 18 AAC 75.345(b)(1).

**Surface Water:** Concentrations of total aromatic hydrocarbons and total aqueous hydrocarbons were detected greater than allowable limits established by ADEC for water supply sources for aquiculture under 18 AAC 70.0.2(b)(5)(A)(iii).

The maximum reported onsite concentrations for contaminants of concern by medium type are presented in Table 1.

## 3 Regulatory Authority

The agency with regulatory authority (ADEC) is identified in applicable State of Alaska regulations as promulgated in the Oil and Other Hazardous Substance Pollution Control, 18 AAC 75, revised April 8, 2012, and Water Quality Standards, 18 AAC 70, amended July 1, 2008.

TABLE 1  
**Summary of Contaminant Concentrations by Medium**  
*Kotlik Federal Scout Readiness Center*

Chemical of Concern	Maximum Concentration	Sample Depth (feet bgs)
<b>Soil</b>		
DRO	120,000 mg/kg	2.5 - 3
GRO	760 mg/kg	0.83
Benzene	0.414 mg/kg	0.83
Ethylbenzene	7.19 mg/kg	0.83
<b>Groundwater</b>		
DRO	56 mg/L	1 - 3
Benzene	0.0031 mg/L	1 - 3
<b>Surface Water</b>		
Total aromatic hydrocarbons	0.017 mg/L	N/A
Total aqueous hydrocarbons	0.017 mg/L	N/A

bgs = below ground surface  
 DRO = diesel-range organics  
 GRO = gasoline-range organics  
 mg/kg = milligrams per kilogram  
 mg/L = milligrams per liter  
 NA = not applicable

## 4 Relevant Guidance and Policy

The following ADEC guidance documents are applicable for this Record of Decision: *Policy Guidance to Developing Conceptual Site Models* (2010), *Cumulative Risk Guidance* (2008), *Ecoscoping Guidance* (2012), *Implementing Guidance for the Method 3 Hydrocarbon Risk Calculator* (2011b), *Guidance on Using Institutional Controls in Oil and Other Hazardous Substances Cleanups* (2011a), and *Site Closure Memorandum* (2009).

## 5 Confirmed Routes of Exposure

The conceptual model for primary routes of exposure at Kotlik FSRC (Figure 2) was developed in accordance with ADEC guidance (2010). Potentially affected media are surface and subsurface soil and groundwater. The model takes into account past and current sources of contamination, chemical release mechanisms, transport/exposure media, potential exposure points, potential exposure routes, and potential receptors. The assessed routes of exposure are as follows:

- Surface soil ingestion and direct contact pathways are considered complete under current and reasonably expected future conditions.
- Direct contact and ingestion of subsurface soil pathways are considered complete under current and reasonably expected future conditions.
- Ingestion of and direct contact with surface water on the property are not considered significant potential exposure pathways because the surface water is typically seasonal in nature and surface water is not likely to be used as a drinking water source.
- Outdoor and indoor inhalation pathways are considered complete for the purposes of this model; however, potential exposure through outdoor inhalation is limited because volatile chemicals are diffused and diluted in the breathing zone, and potential exposure through indoor inhalation is not considered significant because all buildings are constructed on floating (elevated) foundations, generally limiting the exposure pathway.



- All potentially complete ecological exposure pathways are considered insignificant because the compounds of concern for bioaccumulation are not present and because of the small size of the contaminated area (ADEC, 2012), the location of the site within the City of Kotlik, and the presence of a more optimal habitat nearby.
- Suprapermafrost groundwater exists beneath Kotlik FSRC seasonally, above the permafrost layer within a seasonal saturated zone. Though the ingestion pathway of suprapermafrost groundwater should be considered incomplete because of its proximity to the surface, its limited vertical extent, and its transient nature, the contaminated suprapermafrost groundwater is migrating offsite and may pose a risk to human health. Therefore, the suprapermafrost groundwater must be considered as a potential drinking water source and the ingestion pathway should be considered complete.
- Suprapermafrost groundwater at the FSRC is considered hydraulically connected to the surface water observed at the site. Although extensive human dermal contact with surface water is not likely—because, for the most part, wooden walkways are used to avoid human contact with surface water features—dermal contact with the surface water must be considered a potentially complete exposure pathway. Surface water ingestion on the property is complete, but also not considered a significant potential exposure pathway because the surface water is not likely to be used as a drinking water source.

## 6 Basis for Action

On the basis of findings of the cumulative risk assessment performed as part of the data gap investigation (CH2M HILL, 2013), it has been determined that, under current conditions, the petroleum-contaminated soil at Kotlik FSRC poses unacceptable risk to human health. Remedial actions are necessary to protect human health from the risk associated with ingestion of the petroleum-contaminated soil.

Because the contaminated suprapermafrost groundwater is migrating offsite, it is subject to the 18 AAC 75.345(h) and the Alaska Department of Environmental Conservation has determined that, long-term monitoring is required to ensure protection of human health, safety, or welfare as the groundwater and surface water contain residual concentrations of petroleum contamination above the cleanup levels.

## 7 Site-specific Cleanup Levels

As stated in 18 AAC 75.340(d), for each affected site, a responsible person shall propose soil cleanup levels for hazardous substances in soil for ADEC approval. The proposed soil cleanup levels must be based on an estimate of the reasonable maximum exposure expected to occur under current and future site conditions and must be developed using one or more of the following methods:

- ADEC Method 1 for petroleum hydrocarbon-contaminated soil in a non-Arctic zone, as set out in Table A1 of 18 AAC 75.341(a), or in an Arctic zone, as set out in Table A2 of 18 AAC 75.341(b)
- ADEC Method 2 for soil contaminated with chemicals other than petroleum hydrocarbons, as set out in Table B1 of 18 AAC 75.341(c), or with petroleum hydrocarbons, as set out in Table B2 of 18 AAC 75.341(d)
- ADEC Method 3 for developing site-specific alternative cleanup levels (ACLs)

For each contaminant detected in soil at a concentration above its ADEC cleanup level, the respective cleanup level provided under Method 1 or 2 applies at a contaminated site unless ADEC approves an ACL that has been proposed under Method 3.

For Kotlik FSRC, under Method 2, cleanup levels for soil contaminated with non-petroleum hydrocarbons, were obtained from Table B1 of 18 AAC 75.341(c), while cleanup levels for soil contaminated with petroleum hydrocarbons were initially obtained from Table B2 of 18 AAC 75.341(d). Under Method 2, a site-specific ingestion cleanup level for DRO and GRO were also developed. The site-specific ingestion cleanup levels for DRO and GRO and a proposed benzene concentration were confirmed, through use of an approved fate and transport model, to meet migration to groundwater (MTGW) criteria in the Kotlik Data Gap Investigation Report (CH2M HILL, 2013),

which has been approved by ADEC (ADEC, 2013). Table 2 summarizes cleanup levels for Kotlik FSRC that are deemed protective of human health.

As stated in 18 AAC 75.345, contaminated groundwater must meet the cleanup levels defined in Table C if the current use or the reasonably expected potential future use of the groundwater, as determined under 18 AAC 75.350, is a drinking water source. Table 3 summarizes the applicable groundwater cleanup levels for Kotlik FSRC, which are deemed protective of human health. In addition, 18 AAC 75.345(g) states that groundwater that is closely connected hydrologically to nearby surface water may not cause a violation of the water quality standards in 18 AAC 70 for surface water, which are summarized in Table 3.

TABLE 2  
**Site-specific Soil Cleanup Levels**  
*Kotlik Federal Scout Readiness Center*

Contaminant	Maximum Reported Soil Concentration	ADEC Method 2				Site-specific ACL <sup>c</sup>	Approved Site-specific Cleanup Level
		Table B1 Cleanup Level <sup>a</sup>		Table B2 Cleanup Level <sup>b</sup>			
		MTGW	Inhalation	MTGW	Ingestion		
DRO							
Aliphatics (84.91%)	101,894	--	--	7,200	10,000	--	10000
Aromatics (15.09%)	18,106	--	--	100	4,100	--	4100
Total	120,000	--	--	250	10,250	11,777	11,777
GRO							
Aliphatics (81.88%)	622	--	--	270	1,000	--	1000
Aromatics (18.12%)	98	--	--	150	1,000	--	1000
Total	760	--	--	300	1,400	1,221	1,221
Benzene	0.18	0.025	11	--	--	0.165	0.165
Ethylbenzene	7.19	6.9	110	--	--	--	6.9

Note: All values are in milligrams per kilogram.

<sup>a</sup>Method 2 cleanup levels obtained from 18 AAC 75.341(c), Table B1, under-40-inch zone

<sup>b</sup>Method 2 cleanup levels obtained from 18 AAC 75.341(d), Table B2, under-40-inch zone

<sup>c</sup>Site-specific ACLs obtained from *Data Gap Investigation Report, Kotlik Federal Scout Readiness Center* (CH2M HILL, 2013) and protective of human health

-- = not applicable

ACL = alternative cleanup level

ADEC = Alaska Department of Environmental Conservation

DRO = diesel-range organics

GRO = gasoline-range organics

MTGW = migration to groundwater

TABLE 3  
**Groundwater and Surface Water Cleanup Levels**  
*Kotlik Federal Scout Readiness Center*

Contaminant	Cleanup Level (mg/L)
<b>Groundwater</b>	
Diesel-range organics	1.5
Benzene	0.005
<b>Surface Water</b>	
Total aromatic hydrocarbons	0.010
Total aqueous hydrocarbons	0.015

Source: 18 AAC 75.345, Table C and 18 AAC 70.020(b)(5)(A)(iii)  
mg/L = milligrams per liter

## 8 Selected Remedies

Remedial alternatives selected for petroleum contamination at Kotlik FSRC are presented in the Kotlik Data Gap Investigation Report (CH2M HILL, 2013). The selected remedies will protect human health and meet applicable regulatory requirements by (1) preventing exposure through applying institutional controls (ICs) to limit potential exposure to residual contaminants or (2) by removing the petroleum contamination from the site.

ARNG is committed to implementing, monitoring, maintaining, and enforcing all components of the selected remedies to ensure that site conditions remain protective of human health.

**Petroleum-contaminated soil.** The remedy selected for petroleum-contaminated soil at Kotlik FSRC is source removal. The major components of the selected remedy for petroleum-contaminated soil are as follows:

- Excavation of contaminated soil that contains petroleum contaminants in concentrations greater than site-specific cleanup levels (Table 2).
- Shipment of the excavated soil offsite for either offsite thermal treatment or disposal in an approved offsite landfill.

**Petroleum-contaminated groundwater and surface water.** The remedy selected for petroleum-contaminated groundwater (and and hydraulically connected surface water) at Kotlik FSRC is long-term monitoring (LTM) with ICs. The major components of the selected remedy for petroleum-contaminated groundwater are as follows:

- LTM of petroleum-contaminated groundwater for DRO and benzene. The ARNG will submit an LTM sampling plan and subsequent monitoring reports to ADEC for approval.
- Implementation of site-specific ICs by ARNG, complying with State law restricting access and limiting human exposure to and use of petroleum-contaminated groundwater at Kotlik FSRC, and prevention of discharge and spread of petroleum contamination, including the following:
  - Restricting excavation, drilling, and dewatering in areas containing petroleum-contaminated groundwater without prior ADEC and ARNG approval
  - If petroleum-contaminated groundwater and surface water is used or removed from the site, characterizing and managing the groundwater by following regulations that are applicable at the time
  - Obtaining ADEC approval before removing or disposing of petroleum-contaminated soil, groundwater, or surface water at the site (as required by 18 AAC 75.325[i])

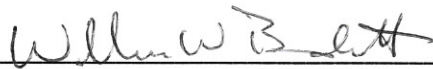
- Inclusion and documentation of ICs in ARNG property records for Kotlik FSRC and filing a Notice of Environmental Contamination with the Bethel Recording District for Lots 1 and 2, Block 6 of Tract B, U.S. Survey 4497 that states the prohibition on the use of groundwater.
- If the land is transferred the ARNG is responsible for assuring the use restrictions are included in the transfer documents and that the receiving party will maintain the use restrictions. The ARNG will provide notice to ADEC at least six (6) months prior to any transfer or sale of property containing ICs so that ADEC can be involved in discussions to ensure that appropriate provisions are included in the transfer or conveyance documents to maintain effective ICs. If it is not possible for the facility to notify ADEC at least 6 months prior to any transfer or sale, then the facility will notify ADEC as soon as possible but no later than 60 days prior to the transfer or sale of any property subject to ICs. The ARNG agrees to provide ADEC with such notice, within the same time frames, for federal-to-federal transfer of property accountability. The ARNG shall provide either access to or a copy of the executed deed or transfer assembly to ADEC.
- The ARNG shall notify ADEC of any violation of the ICs or any other activity that is inconsistent with the ICs or IC objectives. The ARNG will notify ADEC as soon as practicable, but no longer than 10 days after discovery, of any activity that violates or is inconsistent with the IC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs. The ARNG must take prompt measures to correct the violation or deficiency and prevent its recurrence. In this notification, the ARNG will identify any corrective measures it has taken, or any corrective measures it plans to take, and the estimated time frame for completing them. For corrective measures taken after the notification, the ARNG shall notify ADEC when the measures are complete.
- The ARNG will monitor and inspect all site areas subject to ICs and submit a performance report to ADEC every year, for the first 5 years after the date of the signed decision document. At that time, the frequency of inspections and reports may be reduced, if agreed upon by ARNG and ADEC.
- The ARNG will not modify or terminate ICs or modify land uses that may impact the effectiveness of the ICs without prior ADEC approval.
- LTM of the groundwater and surface water until the contaminant concentrations in the groundwater and surface water are shown to be stable or shrinking at which time the monitoring frequency may be reduced. Monitoring of the groundwater and surface water will continue to determine when cleanup levels are achieved, as shown in Table 3, at which time monitoring and ICs may be terminated with ADEC agreement.

## 9 Post-closure Remedial Review

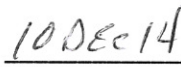
When the Kotlik FSRC site meets the applicable cleanup levels shown in Table 2 and Table 3, the remedial actions can be considered complete without ICs, in accordance with 18 AAC 75.380(d)(1) and the ADEC Site Closure Memorandum (ADEC, 2009), subject to the following conditions:

- In accordance with 18 AAC 75.325(i), at a site where DRO and GRO is present in soil at concentrations above the MTGW cleanup level established in 18 AAC 75.341(d), Table B2, any proposal to transport soil offsite will require ADEC approval.
- Soil containing residual contamination may not be placed in surface water or other environmentally sensitive areas, in accordance with 18 AAC 70.
- Under 18 AAC 75.380(d)(1), ADEC may require additional site characterization or remedial action if new information is discovered that leads ADEC to make a determination that the cleanup action described in this Record of Decision is not protective of human health, safety, and welfare and the environment.

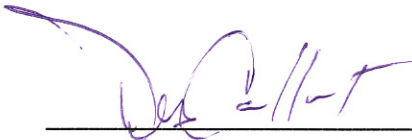
The undersigned parties concur with this Record of Decision for Kotlik FSRC.



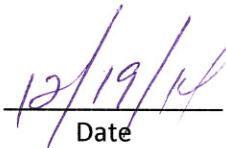
William W. Burdett, Lieutenant Colonel  
Alaska Army National Guard



Date



DEBRA CAILLOUET, Environmental Specialist  
Federal Facilities Section, Contaminated Sites Program  
Alaska Department of Environmental Conservation



Date

## 10 References

- Alaska Department of Environmental Conservation (ADEC). 2008. *Cumulative Risk Guidance*. June 9.
- Alaska Department of Environmental Conservation (ADEC). 2009. Site Closure Memorandum. July 24.
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- Alaska Department of Environmental Conservation (ADEC). 2012. *Approval letter of Final Data Gap Investigation Report for Kotlik FSRC*. August.
- CH2M HILL. 2013. *Final Data Gap Investigation Report, Kotlik Federal Scout Readiness Center*. Prepared for Alaska Army National Guard. March.

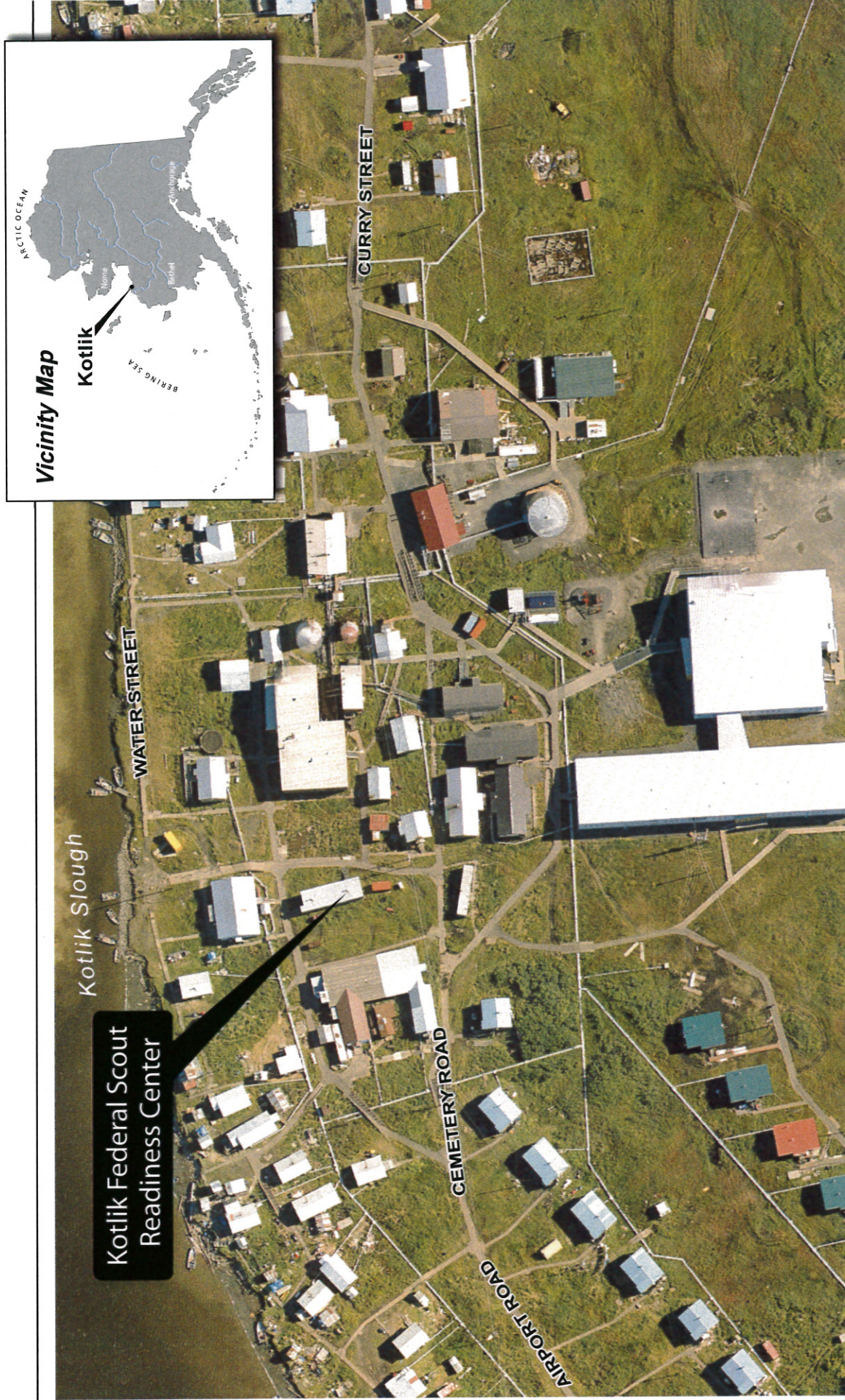






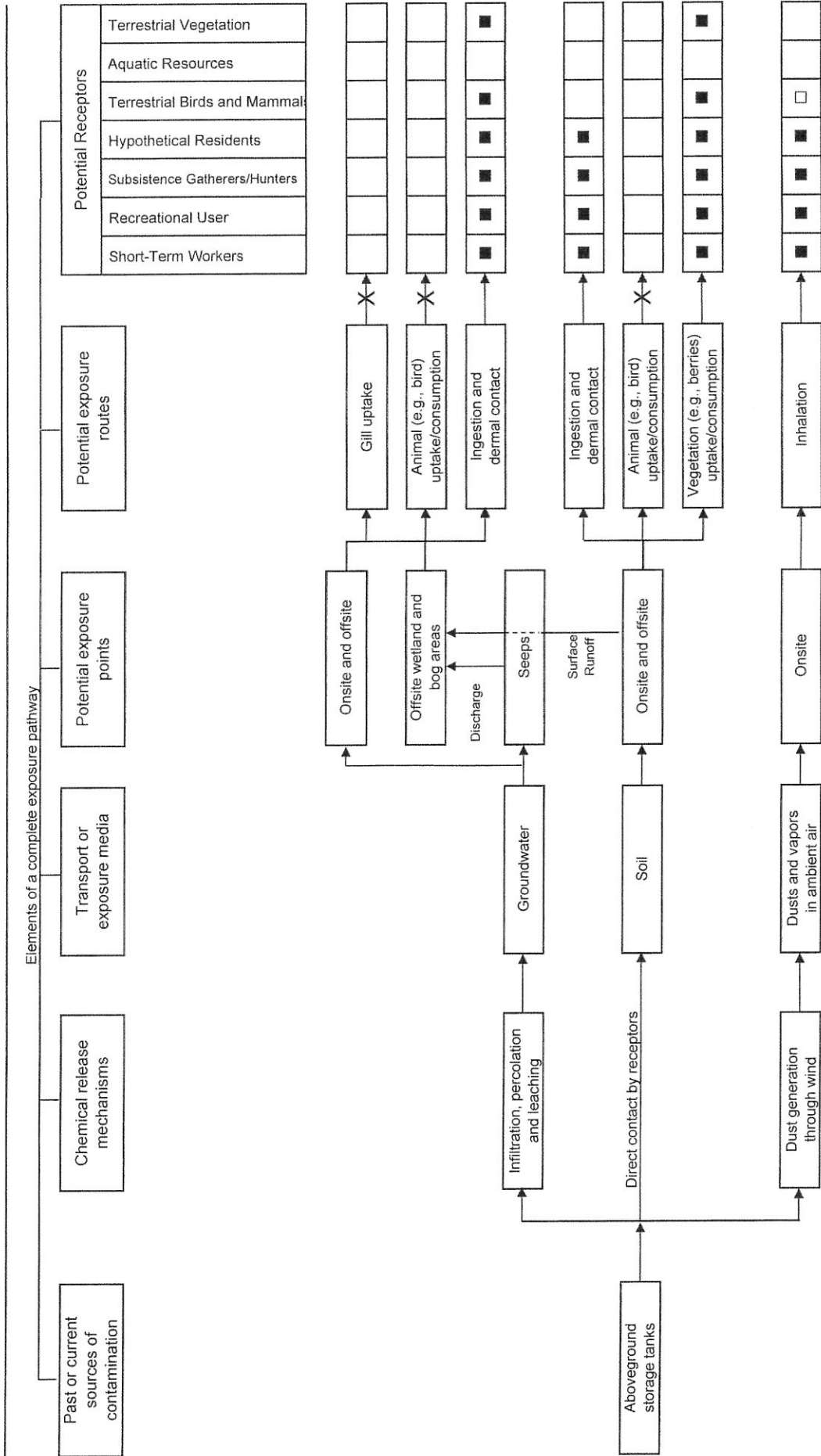
**Figures**

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**FIGURE 1**  
**Kotlik Location Map**  
 Kotlik FSRC Record of Decision  
 Kotlik, Alaska





■ = Potentially complete pathway (to be addressed quantitatively)  
 □ = Pathway considered minor (to be addressed qualitatively)  
 Blank = Incomplete pathway  
 X = Exposed route is not complete

Note: Exposure pathways assume current conditions of the site.

**FIGURE 2**  
**Conceptual Exposure Model**  
 Potential Human and Ecological Exposures  
 Kotlik FSR Record of Decision  
 Kotlik, Alaska