



**DEPARTMENT OF THE ARMY  
INSTALLATION MANAGEMENT COMMAND  
HEADQUARTERS, U.S. ARMY GARRISON, FORT WAINWRIGHT**

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**2012 FORMER COMMUNICATIONS SITE  
ACTION MEMORANDUM**

**FORT WAINWRIGHT, ALASKA  
FINAL  
DECEMBER 2012**

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U.S. Army Corps of Engineers, Alaska District  
Environmental Remediation Services  
Contract No. W911KB-06-D-0006  
Task Order No. 07

**JACOBS**

Prepared by  
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## ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ARAR	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	contaminants of concern
COPEC	contaminants of potential environmental concern
cy	cubic yards
DOD	Department of Defense
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
FCS	Former Communications Site
FFA	Federal Facility Agreement
FS	Feasibility Study
GRO	gasoline-range organics
HHRA	human health risk assessment
IDW	investigation-derived waste
Jacobs	Jacobs Engineering Group Inc.
MCL	maximum contaminant level
MD	munitions debris
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MW	monitoring well
NPL	National Priority List
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
PCP	pentachlorophenol
POL	petroleum, oil, and lubricants
PSE	Preliminary Source Evaluation
PSE I	First Phase Preliminary Source Evaluation
PSE II	Second Phase Preliminary Source Evaluation

## ACRONYMS AND ABBREVIATIONS (Continued)

RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RRO	residual-range organics
SF <sub>6</sub>	sulfur hexafluoride
SSL	soil screening level
SVOC	semivolatile organic compound
TCE	trichloroethylene
TCP	1,2,3-trichloropropane
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
VI	vapor intrusion
VOC	volatile organic compound

## **1.0 PURPOSE**

The purpose of this Action Memorandum is to summarize and briefly discuss the work performed after the completion of the Remedial Investigation (RI) and the Feasibility Study (FS) in December 2009 through December 2011 at the Former Communication Site (FCS) on Fort Wainwright, Alaska (Figure A-1). A more detailed history and description of work performed can be found in the reports listed in Section 11.0, References. Additionally, full reports detailing the work performed in 2010 and 2011 are provided on the CD included with this report.

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## 2.0 SITE CONDITIONS AND BACKGROUND

### 2.1 SITE BACKGROUND

In August 1990, Fort Wainwright was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL). Current environmental assessment and remediation activities at Fort Wainwright comply with CERCLA requirements, as amended by the Superfund Amendment and Reauthorization Act. Activities also comply with a March 1992 Federal Facilities Agreement (FFA) among U.S. Environmental Protection Agency (EPA), U. S. Department of Defense (DOD), and Alaska Department of Environmental Conservation (ADEC), as amended (U.S. Army 1992). The FFA identifies the authorities and responsibilities of the parties, and integrates CERCLA requirements with other relevant federal and state remedial programs, such as the Resource Conservation and Recovery Act of 1976 (RCRA). In April 2007, an amendment to the 1992 FFA was signed by DOD, EPA, and ADEC. This amendment established the FCS, also referred to as Taku Gardens, as Operable Unit 6 (OU6) (U.S. Army Garrison 2007).

The DOD has used Fort Wainwright for military operations since 1938. Originally known as Ladd Army Airfield, the Post was established for cold weather experimentation. During decades of military use at Fort Wainwright, routine operations and storage practices resulted in accidental releases of chemicals to the ground and underlying groundwater or nearby surface water. Former disposal practices were also responsible for other releases into the environment.

The U.S. military has occupied the general area of the FCS for over 70 years and there have been a wide variety of land uses during this time. Between the late 1940s and late 1950s, several areas in the northwestern corner were cleared for the construction of troop billets, motor pools, dining facilities, and other essential facilities. A significant portion of the eastern side of the FCS was used for equipment and vehicle disposal, salvage, and maintenance activities, as well as a staging area for railroad construction activities and a concrete batch plant. Some of these activities were likely associated with dumping solid waste and debris into the former slough as a convenient means of filling the historical river channel and other

various depressions located on the site. Unusable military equipment and hardware used by both the U.S. Army and the U.S. Air Force were discarded and buried within the FCS during this period. Temporary billets built for the arrival of the 3rd Battalion, 4th Infantry Regiment, as well as several Air Force units also occupied a portion of the site from 1951 to 1956. The historical uses of the area currently delineated as the FCS are summarized below:

- Barracks and company headquarters, extending into the northwestern corner of the site
- Equipment salvage and reclamation
- Debris and salvage material disposal in the Chena River oxbow that extends through the site, in trenches in the salvage yard area, and possibly in other local depressions
- Garden plots
- Concrete batch plant and railroad spur
- Communications and radar system installations
- Possible ammunition storage
- Possible firefighting training activities

Few written records describing specific activities occurring at the FCS during the course of its history are available. Much of what is known about the site has been inferred from examining and comparing historical photographs dating from 1947 to present, the 1958 Fort Wainwright “Master Plans,” past geographical surveys, and concurrent military operations with similar missions conducted at other locations.

Hoppe’s Slough, a former meander channel or oxbow, of the Chena River, used to curve through what is now the middle of the FCS (Appendix A, Figure A-2). The footprint of the slough and a second meander south of the slough were identified in historical aerial photographs from 1948 and were partially visible in the late 1960s (CH2M HILL 2010). A salvage yard was active in the northeastern portion of the FCS from the 1940s to the 1960s. During this time, the eastern portions of Hoppe’s Slough were filled, possibly with debris from the salvage yard, and accumulations of drums and debris were visible near the current locations of Buildings 11 through 19, 21 through 29, 31 through 33, 35, 47, 48, and 49 (Appendix A, Figure A-2). Photographs from 1960 show stockpiles of drums, fire training

burn areas, and the remains of a wrecked U.S. Air Force aircraft in the area between the current locations of Buildings 16, 21, and 49.

During the 1950s and 1960s, a concrete batch plant and railroad spur were active in the northeastern corner of the FCS in the area between the current locations of Buildings 15, 17, and 19 and the Post Exchange Service Station (gas station). Some former salvage yard stockpiling activities also occurred in this area (CH2M HILL 2010).

By 1956, the ground surface was cleared and a large white structure was constructed near the planned locations for Buildings 50 through 52 for operation of communication and radar systems. By 1967, the entire FCS was clear of structures, except for the School-Age Services building directly to the north, which was built in 1965 and opened in 1966 (CH2M HILL 2010).

The FCS was selected for military family housing in 2002 and 2003. Preconstruction geotechnical investigations and geophysical surveys were conducted in late 2003 and early 2004 by the U.S. Army Corps of Engineers. Results indicated numerous areas of surface and buried metallic debris across the site, with the largest concentration of debris near the former salvage yard. The site was deemed suitable for housing based on the results of initial sampling and surveys, and excavations for building foundations, utilities, and other infrastructure began on the Taku Gardens family housing development in April 2005. As part of the development, a sound berm was constructed along the east and south sides of the housing area to reduce noise from passing trains.

During construction in July 2005, equipment operators uncovered soil contaminated with polychlorinated biphenyls (PCB) and petroleum near Building 52, as well as an extensive array of buried debris including crushed drums, scrapped equipment, and munitions-related items across the site. Based on the results from the initial Building 52 foundation excavation sampling, a PCB Exclusion Zone was constructed around the vicinity of Building 52 and construction on ten buildings in the immediate area was stopped. The EPA and ADEC were

informed of the initial findings, and have been integrally involved in all site investigation activities since that time.

To date, the 110 housing units in the 55 completed buildings have been finished, with the exception of the installation of major appliances. The contractor has winterized the units by activating the electrical systems, steam mains, and glycol heat exchangers. There are currently no plans to complete the 20 housing units (in 10 buildings) that were originally planned for the southwestern portion of the FCS; their partially installed foundations were removed in 2009 after extensive sampling and analysis confirmed that residual contamination would not pose unacceptable risk to site workers.

## **2.2 PHYSICAL LOCATION AND CHARACTERISTICS**

Fort Wainwright is an active U.S. Army installation occupying a 1,577,095-acre military reservation located east of Fairbanks, Alaska. The FCS is located between Alder and Neely Roads, east of White Street and west of the Fort Wainwright Power Plant within Fort Wainwright, Alaska (Appendix A, Figure A-1).

The FCS currently consists of the completed Taku Gardens family housing development, which covers approximately 54 acres. A total of 110 housing units (55 buildings) have been constructed, but will not be released for occupancy until the U.S. Army Garrison, EPA, and ADEC provide their approval.

The FCS is characterized by relatively flat terrain, as is typical of the topographic area of Fort Wainwright. Topographic relief at the FCS is primarily related to the former Hoppe's Slough and several recently constructed man-made features, including sound berms and drainage swales.

The FCS is zoned and planned for future residential uses for Army families that will be stationed at the Post. The families typically reside in the housing units for approximately three years. The FCS is currently vacant and fenced, preventing public access. In addition to the individual yard areas near residential buildings, other planned common areas and open space

that could be used by all residents or other site visitors include recreational areas such as playgrounds, a sledding hill, and an ice skating rink.

Soil borings drilled during the RI and previous investigations indicate that soil at the FCS generally consists of sandy silt nearest the surface changing to sand and sand with silt and gravel at around 8 to 10 feet below ground surface (bgs). Permafrost and corresponding low subsurface temperatures have only been reported in borings advanced in the southeastern portion of the FCS.

Groundwater is the only source of potable water used at Fort Wainwright and in the Fairbanks area. Approximately 95 percent of the potable water on Fort Wainwright is currently supplied through a single distribution system fed by two large-capacity Post supply wells located on the northeastern edge of the site (Appendix A, Figure A-2). These wells are completed at a depth of approximately 80 feet bgs and provide between 1.6 million and 2.4 million gallons of water per day to the Fort Wainwright water treatment plant for processing and distribution. A detailed discussion regarding the climate, geology, hydrology, and ecological setting can be found in the RI report (CH2M HILL 2010).

### **2.3 PREVIOUS INVESTIGATIONS AND ACTIONS**

Since the identification of PCB contamination in the southwest corner of the site in July 2005, extensive investigation activities and removal actions have occurred at the FCS. These investigations were conducted in order to determine the nature and extent of contamination as well as assess the potential risk to future residents and site workers, and were completed with concurrence from EPA and ADEC. Initial removal actions were completed as a Time-Critical Removal Action (TCRA). Additional investigations resulted in contaminated soil disposal as investigation-derived waste (IDW). No PCB-contaminated soil greater than 1 milligrams per kilogram (mg/kg) remains on site. These investigations and removal actions are summarized below.

### **2.3.1 Preconstruction Activities**

Preconstruction investigations were conducted by the U.S. Army Corps of Engineers (USACE) in 2003 and 2004 prior to beginning construction. Activities included geophysical investigations, utilizing EM-31 and ground-penetrating radar (GPR), and the installation and sampling of 88 soil borings. Investigation activities indicated the presence of scrap metal and soil contaminated with petroleum, oil, and lubricants across the site.

### **2.3.2 Time-Critical Removal Action for Polychlorinated Biphenyls**

PCB-contaminated soil was discovered by construction crews in June 2005 while excavating the foundation for Building 52, which was located in the southwest corner of the FCS. The Army investigated this area further and found PCB concentrations in soil as high as 111,000 mg/kg. PCB contamination was primarily localized to soil at or near the surface in a 5-acre section of the southwest corner of the FCS site. To reduce potential threats to site workers and nearby residents, a TCRA of the most highly contaminated soil in this area was completed in September 2005. Applicable or Relevant and Appropriate Requirements (ARAR) identified for this action included Toxic Substances Control Act (TSCA) regulations [40 CFR Part 761], U.S. Department of Transportation (DOT) requirements [40 CFR Parts 171 through 180], and Title 18 of the Alaska Administrative Code, Section 62.310 (Transportation of Hazardous Materials). Approximately 215 tons of contaminated soil was transported to a permitted hazardous waste landfill for disposal (U.S. Army Garrison, Alaska, 2007).

### **2.3.3 Preliminary Source Evaluations I and II**

After identifying PCBs in soil near Building 52 and reviewing findings from initial construction support investigations, the Army and regulatory agencies agreed that a Preliminary Source Evaluation (PSE) was required at the FCS. The scope of the PSE was to evaluate releases or threatened releases of hazardous substances, pollutants, or contaminants from a source area with the potential to constitute a threat to public health and welfare or the

environment. The purpose of the PSE was not to fully characterize the FCS, but to provide sufficient information to determine if an RI was warranted.

A review of all existing historical information on FCS activities, waste disposal practices, and prior investigations was undertaken during the first phase of the PSE (PSE I), which was conducted during the winter of 2005 through 2006. The PSE I concluded that surface and subsurface soil in most areas of the FCS was potentially contaminated. Only the southeast portion of the FCS, where potential impacts could not be fully determined due to the presence of a large sand berm, was excluded from this general conclusion.

During summer and fall 2006, the second phase of the PSE (PSE II) was conducted that focused on buried debris, soil, soil gas, stockpiles, and groundwater at the FCS. The findings of the investigations are summarized below; detailed descriptions of PSE II activities are presented in the PSE II report (North Wind, Inc. 2007).

- **Soil Piles and Debris Piles** - In total, 3,600 cubic yards (cy) of soil comprising numerous soil and debris piles were systematically sorted, visually inspected, field screened, and subsampled during the PSE II to determine whether physical or chemical hazards were present. In general, volatile organic compounds (VOC), semivolatile organic compounds (SVOC), and metals were the most prevalent contaminants in the soil piles; however, explosive residues, PCBs, pesticides, and polynuclear aromatic hydrocarbons (PAH) were also detected.
- **Geophysical Studies** - As part of PSE II, electromagnetic, magnetometer, and ground-penetrating radar geophysical surveys of approximately 25 acres of the FCS were conducted to assist in buried debris investigation and test pit activities. Numerous metallic anomalies were detected across the site.
- **Test Pits** - Test pits were excavated behind the Service Station in the northeast portion of the FCS, where large, car-sized pieces of metallic and miscellaneous debris were identified and removed. Buried debris in the vicinity of the housing units was investigated as well. Significant effort was made to identify any items that had the potential to be a source of contamination or other hazard. Typical scrap items included heavy equipment parts, vehicle parts, airplane parts, structural steel, and empty and crushed steel drums. The debris investigation confirmed earlier observations by the USACE and the construction contractor that the majority of the material buried at the FCS was scrap metal. Five potential discarded military munitions items and numerous munitions-related scrap items were also identified and disposed of by U.S. Army explosive ordnance

disposal personnel. Disposal reports indicated that all of the items disposed of were inert and non-energetic.

- **Soil** - Soil samples were collected from soil borings distributed across the site to assist in characterization of possible petroleum and PCB contamination. Borings in the northwestern and north-central portions of the FCS confirmed the presence of petroleum contamination. The investigation found that the highest concentrations of PCB contamination were located in the southwestern portion of the site near Building 52, but that low levels of PCBs (below ADEC and EPA cleanup criteria) were present in soils across the FCS at depths ranging from 0 to 8 feet bgs. The 2006 PSE II included an additional investigation of three areas for PCBs. At the PCB Exclusion Zone, one large area of contamination was delineated near Building 52. Six smaller, isolated areas of contamination were found to the north and west of the large contamination area and in several small areas in the southeastern corner of the site. The PCB contamination was confined to the top 5 feet of the soil column in all soil samples.
- **Groundwater** - PSE II concluded that the groundwater contamination in the north-central portion of the FCS was composed primarily of diesel-range organics (DRO) and at least one VOC (p-isopropyltoluene).
- **Soil Gas** - The soil gas survey was limited to a relatively small area of the FCS in the vicinity of known VOC contamination near Building 7 and the buried drum cache near Building 49. Passive shallow soil gas samples were collected throughout the investigation area to a depth of 8 feet bgs. Three classes of analytes were detected in the soil gas: petroleum constituents, which were detected in almost every sample, chlorinated solvents, and chlorofluorocarbons, which were later determined to be a by-product of construction materials.

#### **2.3.4 Remedial Investigation and Feasibility Study**

Based on the findings of the PSE (I and II), an extensive RI took place between 2007 and 2009 at the FCS. The main objectives of the RI, performed by CH2M HILL, were to characterize the nature and extent of contamination, evaluate potential hazards from buried debris and munitions-related items, and assess potential risks to human and ecological receptors. Activities included soil and groundwater characterization/confirmation sampling, drum and debris investigations, PCB investigations/removals, soil gas investigations, drainage swale sediment sampling, a hydrogeological investigation, and geophysical surveys. Additionally, a small DDT excavation took place in March 2010 to complete the RI. A conceptual site model for contamination was utilized to guide the RI. The investigation efforts from 2007 through December 2009 covered nearly 8.5 acres and removed from the site included:

- 3,368 cy of PCB-contaminated soil
- 66 cy of pesticide-contaminated soil
- 1,430 cy of petroleum/solvent-contaminated soil
- 1,058 drums (1,050 of these drums were empty and crushed)

All debris, drums, and contaminated soil encountered during the investigation activities were removed and properly disposed of to protect the health of future residents and prevent future groundwater contamination. Figure A-2 depicts the investigation areas and removal actions that took place during the RI (CH2M HILL 2011).

A site-wide buried anomaly investigation was performed as part of the RI. This work targeted large metal anomalies identified during geophysical surveys that could represent a large dump site for debris or drums, and was not intended to rid the site completely of buried metallic debris. As part of this work, unexploded ordnance (UXO) personnel provided support to identify any munitions-related debris. A total of 2,923 items classified as inert munitions-related debris and two training rocket motors containing propellant residue were excavated and properly disposed of.

Subsequent to the RI, a FS was written to evaluate remedial alternatives that would be protective of human health and the environment and in compliance with the CERCLA process. The FS recommended monitored natural attenuation and institutional controls to restrict the use of groundwater and limit exposure to contaminated soil at the site. This preferred alternative was selected based on the results of the RI (CH2M HILL 2011). The Proposed Plan has not yet been released to the public.

### **2.3.5 Risk Assessments**

Under Sections 104 and 121 of CERCLA, the responsible party is required to assess the risks posed to human health, welfare, and the environment by uncontrolled potentially hazardous waste sites on the NPL. A risk assessment identifies the areas and media of concern due to the existence of hazardous substances, characterizes the potential hazards, and (if necessary) provides a calculation of health-based cleanup levels to evaluate the potential risks.

The human health risk assessment (HHRA) that accompanied the RI report evaluated three exposure cases:

- The reasonably anticipated future use (residential) scenario considers restrictions that preclude digging onsite and prevent use of shallow groundwater from areas outside the existing Fort Wainwright water supply wells.
- The hypothetical unrestricted exposure scenario uses conservative default assumptions regarding domestic use of shallow groundwater and direct contact with soil up to 15 feet bgs anywhere across the site, regardless of the existence of current or future measures precluding exposure to these media.
- The potential exposure to recreational/site visitors, maintenance workers, and excavation workers who may use the site in the future.

The results of the HHRA under the reasonably anticipated future use scenario indicate that even if cumulative exposure occurs to the highest levels at any surface soil and sub-slab soil gas locations, and is combined with exposure from domestic use of Fort Wainwright-supplied water, the resulting risk estimates do not exceed the EPA and ADEC risk threshold values. The results of the HHRA under the unrestricted use scenario indicate that resulting risk estimates exceed the EPA and ADEC risk thresholds.

The ecological risk assessment was conducted in accordance with ADEC and EPA guidance, focusing on contaminants of potential ecological concern (COPEC), receptors, and areas where the greatest potential for ecological exposure might be expected. The risk to offsite terrestrial wildlife and offsite aquatic resources potentially exposed to the COPECs occurring in the drainage swale and groundwater is considered to be low. Given these findings, no COPECs or areas were identified that would require additional sampling and evaluation from the drainage swale or perimeter well points to protect ecological resources potentially using the FCS (CH2M HILL 2010).

### **3.0 THREATS TO HUMAN HEALTH, WELFARE, AND THE ENVIRONMENT**

#### **3.1 CONTAMINANTS OF CONCERN**

After the completion of the RI, select contaminants of concern (COC) remained in the groundwater and subsurface soil.

Thirty-four contaminants were detected in samples collected between 5 and 15 feet bgs at concentrations exceeding the cleanup levels established for the site. These exceedances tend to be concentrated beneath and around portions of the FCS where contaminated soil and debris were removed during investigation activities. The results indicate that the remaining contamination is residual, with the exception of subsurface diesel contamination in the north-central portion of the site.

In addition to the various locations where COCs exceeded cleanup levels, three areas were identified with contaminant concentrations above the ADEC cumulative (multi-chemical) risk threshold in the subsurface soil. These areas included subsurface soil located near: Building 24 contaminated with 1,2,3-trichloropropane (TCP) at 4 feet bgs; Building 48 contaminated with n-nitrosodimethylamine, dibenzo(a,h)anthracene, and benzo(a)pyrene at 8 feet bgs; and monitoring well 62 (MW62) contaminated with benzo(a)pyrene and dibenzo(a,h)anthracene at 3 feet bgs. Table 3-1 presents the cleanup levels for all COCs in subsurface soil.

In addition to low-level contamination in soil, four COCs were identified in the shallow groundwater in three separate plumes including a large DRO/RRO plume on the northern edge of the site, a small low-level trichloroethylene (TCE) plume located just north of Building 49 in the center of the site, and a small low-level TCP plume located on the eastern edge of the site. The TCE and DRO plumes are not located near the capture zone of the Fort Wainwright drinking water well. The TCP plume is located near the Fort Wainwright drinking water well; however, three deep sentry wells have been installed and are sampled semi-annually to ensure that contamination is not migrating towards the supply well. Table 3-2 presents the cleanup levels for the COCs in the groundwater.

Cleanup levels are based primarily on the most stringent 2009 ADEC Method Two cleanup levels in 18 AAC 75, for soil (Table B1 and Table B2) and groundwater (Table C). For those substances that do not have Method Two cleanup levels, the most stringent EPA Regional Screening Level is utilized. Background metals concentrations are utilized as cleanup levels for metals that have background concentrations higher than the ADEC and EPA risk-based cleanup levels.

**Table 3-1  
Cleanup Levels for Contaminants of Concern in the Soil**

Contaminant	Project Cleanup Level (mg/kg)
1,1,2-Trichloroethane (TCA)	0.018
1,2,4- Trichlorobenzene	0.85
1,2-Dichloroethane	0.016
1,2,3-Trichloropropane (TCP)	0.00053
1,2-Dichloropropane	0.018
1,2-Dibromoethane	0.00016
Benzene	0.025
Chloroform	0.46
Dibromochloromethane	0.032
Methylene Chloride	0.016
Tetrachloroethylene	0.024
Trichloroethylene (TCE)	0.02
Vinyl Chloride	0.0085
2-Hexanone	0.011
Gasoline-Range Organics (GRO)	300
Diesel-Range Organics (DRO)	250
4-Chloroaniline	0.057
4-Nitroaniline	0.0014
2,4-Dinitrotoluene	0.0093
2,6-Dinitrotoluene	0.0094
Hexachlorobenzene	0.047
n-Nitrosodimethylamine	0.000053
n-Nitrosodi-n-propylamine	0.0011
Pentachlorophenol	0.047
bis-(2-Chloroethoxy)methane	0.025
bis-(2-Chloroethyl)ether	0.0022
bis(2-Chloroisopropyl)ether	0.00012

**Table 3-1  
Cleanup Levels for Contaminants of Concern in the Soil (Continued)**

Contaminant	Project Cleanup Level (mg/kg)
beta-BHC	0.022
gamma-BHC (Lindane)	0.0095
2,4,5-Trichlorophenoxyacetic acid	0.15
Arsenic	8.46
Aluminum	77,000
Copper	4,100
Manganese	1,800

**Note:**  
For definitions, see the Acronyms and Abbreviations section.

**Table 3-2  
Cleanup Levels for Contaminants of Concern in Groundwater**

Contaminant	Project Cleanup Level (µg/L)
Trichloroethylene (TCE)	5
1,2,3-trichloropropane (TCP)	0.12
Diesel-Range Organics (DRO)	1,500
Residual-Range Organics (RRO)	1,100

**Note:**  
For definitions, see the Acronyms and Abbreviations section.

### 3.2 ENDANGERMENT DETERMINATION

The human health risk assessment identified three areas of subsurface soil with contaminant concentrations above the ADEC excess lifetime cumulative risk threshold: TCP-contaminated soil near Building 24; n-nitrosodimethylamine-, dibenzo(a,h)anthracene-, and benzo(a)pyrene-contaminated soil near Building 48; and benzo(a)pyrene- and dibenzo(a,h)anthracene-contaminated soil near MW62. The 2011 construction plan required these areas to be excavated. A delay in action or no action presented an imminent or substantial endangerment to human health or the environment by increasing potential health risks to construction workers and allowing contaminated areas to continue being a potential source of groundwater contamination.

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#### **4.0 ACTION COMPLETED FOLLOWING THE REMEDIAL INVESTIGATION**

Multiple removal, investigation, and monitoring activities have taken place at the FCS since the completion of the RI in December 2009. These actions were taken to ensure the safety and health of workers at the site and to prevent the further spread of contamination. This section summarizes these activities. More detailed information is available in the following documents:

- Final 2010 FCS After-Action Report (USACE 2012e)
- Final 2010 FCS Groundwater Data Report (USACE 2012d)
- Final 2011 FCS After-Action Report (USACE 2012c)
- Final 2011 FCS Groundwater Data Report (USACE 2012b)
- Screening and Evaluation of Remediation Technologies and Process Options, Former Communications Site, Fort Wainwright, Alaska (CH2M HILL 2011a)
- Final FCS Ground Water Summary Report (USACE 2012a)

#### **4.1 GROUNDWATER MONITORING**

Groundwater sampling has occurred semi-annually since the completion of the RI. Ninety monitoring wells and three sentry wells have been installed since 2006 at the FCS. The monitoring program currently samples 42 of the monitoring wells and two sentry wells. The third sentry well was installed and sampled in the spring of 2012 and will be added to the monitoring program. Groundwater sampling data are used to support the preferred alternative of monitored natural attenuation and to ensure that a complete set of groundwater data is available for decisions related to possible site closure. The *FCS Groundwater Summary* (USACE 2012a) discussed the current trends of each plume at the FCS and determined that currently only one small TCP plume, and one large and two small DRO plumes exist onsite. Figure A-4 shows the plumes as determined by the RI and Figure A-5 shows the plumes as they currently exist based on sampling results through 2011. Solid lines on these figures identify the inferred extent of contaminant concentrations above ADEC groundwater cleanup levels (18 AAC 75, Table C Migration to Groundwater); dotted lines represent the extent of contaminant concentrations detected, but at concentrations below ADEC cleanup levels.

#### **4.1.1 Consistency with Preferred Alternative**

Groundwater has been and will continue to be monitored semi-annually until the Record of Decision is signed and final sampling frequency has been determined. This is consistent with the preferred alternative of monitored natural attenuation and institutional controls for groundwater at the site.

#### **4.2 SOIL REMOVAL ACTIVITIES**

In 2011, three sample locations identified with contaminant concentrations above the ADEC cumulative (multi-chemical) risk threshold in the subsurface soil during the RI were excavated and properly disposed of to ensure that workers would not come in contact with contaminants during construction efforts and to ensure proper handling and disposal of these soils. These removals included the following:

- Approximately 25 cy of benzo(a)pyrene and dibenzo(a,h)anthracene-contaminated soil around MW62, located north of Building 11
- Approximately 14 cy of TCP-contaminated soil west of Building 24
- Approximately 9 cy of benzo(a)pyrene, dibenzo(a,h)anthracene, and n-nitrosodimethylamine-contaminated soil east of Building 48

All confirmation soil sample results were below ADEC Method Two cleanup criteria and the multi-chemical risk threshold for gasoline-range organics (GRO), DRO, residual-range organics (RRO), VOCs, SVOCs, PAHs, RCRA metals, PCBs, herbicides, and pesticides. All sample results were also below EPA maximum contaminant level (MCL)-based soil screening levels (SSL). The contaminated soil was segregated, containerized in Super Sacks<sup>®</sup>, and properly disposed of. Figure A-3 shows the locations of the removals in 2011.

#### **4.2.1 Consistency with Preferred Alternative**

These soil removals took place to ensure the health and safety of construction workers at the site. This is consistent with the preferred alternative of institutional controls to ensure that workers and future residents do not come in contact with potential contamination in the subsurface soil.

## 4.3 CONSTRUCTION SUPPORT

In 2010 and 2011, Jacobs Engineering Group Inc. (Jacobs) conducted environmental activities to support the final construction of the Taku Housing Development at the FCS. These activities included soil and debris removal, UXO support, and support for general maintenance activities. These activities are detailed in the sections below and are shown in Figure A-3.

### 4.3.1 Soil Removal

Several locations with contaminated soil were identified during site grading and swale construction activities in 2011. These areas were investigated using excavation to determine the lateral and vertical extent of contamination. Excavation activities were conducted using field screening devices such as photoionization detectors and Schonstedt<sup>®</sup> metal detectors. Locations and IDW produced from each investigation included the following:

- Approximately 1,430 cy of petroleum, oil, and lubricant (POL)-contaminated soil were excavated in response to DRO contamination identified during 2011 construction activities near Building 08. Confirmation soil samples were analyzed for GRO, DRO, RRO, VOC, SVOC, PAH, RCRA metals, herbicides, and pesticides and compared to ADEC Method Two cleanup criteria. Soil samples from the POL excavation activities and soil borings indicate remaining DRO contamination onsite. All other sample results were below EPA MCL-based SSLs.
- Approximately 34 cy of potentially contaminated soil were excavated in response to the discovery of a large metal pile containing oxidized charcoal from discarded gas mask canisters near Building 27. Confirmation soil samples were analyzed for VOC, SVOC, RCRA metals, and explosives. One confirmation sample result indicated pentachlorophenol (PCP) contamination above ADEC Method Two cleanup criteria. Based on current construction activities, the soil will remain undisturbed under the new sidewalk and paved roadway. All other sample results were below ADEC cleanup levels and EPA MCL-based SSLs. Investigation activities produced approximately 2,000 pounds of metal debris, three 90-gallon overpacks of charcoal filters, and 34 cy of potentially contaminated soil.
- Approximately 65 cy of POL and solvent-contaminated soil were excavated in response to DRO, TCE, and tetrachloroethylene (PCE) contamination identified by the onsite contractor during 2011 construction activities near Building 38. All final confirmation sample results were below ADEC Method Two cleanup criteria and EPA MCL-based SSLs for GRO, DRO, RRO, VOC, SVOC, PCBs, RCRA metals, herbicides, and pesticides.

- Approximately 330 cy of POL and VOC-contaminated soil were excavated in response to DRO and carbon tetrachloride contamination identified by the onsite construction contractor during 2011 construction activities near Building 42. All final confirmation soil sample results were below ADEC Method Two cleanup criteria and EPA MCL-based SSLs for GRO, DRO, RRO, VOC, SVOC, PCB, RCRA metals, mercury, herbicides, and pesticides.
- Approximately 30 cy of glycol-contaminated soil were excavated in response to excess amounts of glycol in the bottom of a manhole identified by the onsite contractor during 2011 construction activities near Building 49. Characterization sample results indicated high levels of propylene glycol. Excavation was conducted in order to prevent workers from coming into contact with excess amounts of the chemical. Confirmation sample results indicate low levels of propylene glycol remain in the area. All confirmation soil sample results were below ADEC Method Two cleanup criteria and EPA MCL-based SSLs for GRO, DRO, RRO, VOC, SVOC, PAH, RCRA metals, herbicides, and pesticides and indicated propylene glycol concentrations were less than the assumed cleanup level of 1,910 mg/kg.

IDW from each site was either stockpiled at the Chipbarn Stockpile site on Fort Wainwright or containerized in Super Sacks<sup>®</sup> and stored at the Chipbarn Stockpile site. Waste characterization samples were collected from each waste stream for proper disposal. Based on waste characterization, none of the IDW produced was regulated by RCRA. Soil disposed of at the Fort Wainwright Landfill was confirmed to be uncontaminated through waste characterization samples prior to disposal. Table 4-1 lists the disposal locations of the IDW from each location.

**Table 4-1  
Disposal Location for Investigation-Derived Waste Generated During 2011**

Location	Potential Contaminant	Volume of Soil (cy)	Disposal Destination
Area B08	POL	1,430	Thermal treatment at Organic Incineration Technology, Inc.
Area B24	1,2,3-Trichloropropane	14	Fort Wainwright Landfill
Area B27	Filter material	34	Fort Wainwright Landfill
	Large metal debris	NA	C& R Pipe (Recycling)
Area B38	POL/Solvent	65	Thermal treatment at Organic Incineration Technology, Inc.
Area B42	POL/Solvent	330	Fort Wainwright Landfill
Area B48	SVOC	9	Fort Wainwright Landfill
Area B49	Propylene Glycol	30	Emerald Services, Arlington, Oregon
Monitoring Well 62	SVOC	25	Fort Wainwright Landfill

**Notes:**

NA = not applicable

For definitions, see the Acronyms and Abbreviations section.

### 4.3.2 UXO Support

In 2011, UXO technicians provided onsite support due to the potential for the discovery of munitions-related items. A minimum of one UXO technician was onsite to help the construction contractor identify and remove buried metal debris uncovered during soil-disturbing activities. Additionally, UXO technicians were onsite to conduct a Schonstedt<sup>®</sup> magnetometer-assisted surface investigation prior to any Jacobs' groundbreaking investigation activities. Twelve pieces of inert non-hazardous munitions debris (MD) and ten pieces of range-related debris were identified. A complete list of MD identified is provided in Table 4-2. In addition to the munitions-related debris approximately 4,240 pounds of scrap metal was unearthed during 2011 construction and investigations activities. All munitions-related items were inspected and declared inert and non-hazardous prior to being sent to the recycling facility with the scrap metal.

**Table 4-2  
Munitions Debris Encountered During 2011 Construction Support**

Type of MD Encountered	Quantity
M29 Practice Rockets	3
40mm Cartridge Case	1
81mm M68 Training Mortars	3
Tellermine 43 trainers	5

**Note:**  
For definitions, see the Acronyms and Abbreviations section.

### 4.3.3 Leaking Glycol Valves

In 2010, routine inspections at the FCS of the glycol line valves located in manholes with dirt floors were conducted by American Mechanical, Inc. The inspections indicated that some valves were leaking and glycol-contaminated soil could be present in the bottom of the manholes. Between 16 July and 10 August 2010, Jacobs used a vacuum truck to remove potentially contaminated soil from the manholes onsite. Approximately 45 cy of soil were removed, and a single sample was sent to the laboratory to characterize the removed soil for disposal. All results were below ADEC cleanup levels, no glycol was present, and the soil was subsequently disposed of at the Fort Wainwright Landfill.

### 4.3.4 Consistency with Preferred Alternative

All of the construction support activities that have taken place after the completion of the RI are consistent with the preferred alternative of institutional controls to ensure the safety and health of future residents and workers. By investigating potential contamination and providing support during intrusive activities, the institutional control policy requirements are being met at Fort Wainwright.

## 4.4 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Compliance with state and federal regulations, to the extent practical, is an overall requirement for this project. A comprehensive table discussing the applicability of the Applicable or Relevant and Appropriate Requirements (ARAR) for site-specific actions and

concerns is presented in the FS. Table 4-3 summarizes the chemical-specific ARARs and Table 4-4 summarizes the action-specific ARARs that were considered during work at the FCS.

**Table 4-3  
Potential Chemical-Specific Applicable or Relevant and Appropriate Requirements**

Source	Standard, Requirement, or Criterion
Alaska Water Quality Standards	18 AAC 70
Alaska Oil and Hazardous Substances Pollution Control	18 AAC 75.300 to 75.396
Alaska Drinking Water Regulations	18 AAC 80.300 to 80.375
Alaska Site Cleanup Rules	18 AAC 75.325
Alaska Off-Site Transport and Disposal of Soil	18 AAC 75.370

**Note:**  
For definitions, see the Acronyms and Abbreviations section.

**Table 4-4  
Potential Action-Specific Applicable or Relevant and Appropriate Requirements**

Action	Standard, Requirement, or Criterion
Cleanup of releases to the environment	18 AAC 75.300 to 75.396
Remediation of contaminated media	40 CFR 63 Subpart G
Managing contaminated soil	18 AAC 60
Management and identification of wastes	40 CFR Part 261
Offsite disposal of contaminated waste	40 CFR 268
Transportation of hazardous waste	49 CFR 171-177
Planning and implementing offsite response action	40 CFR 300.440
Occupational safety and health standards	8 AAC 61

**Note:**  
For definitions, see the Acronyms and Abbreviations section.

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## **5.0 COST ANALYSIS AND COMMUNITY PARTICIPATION**

### **5.1 COST ESTIMATE**

Multiple support activities and response actions occurred in 2010 and 2011, since the completion of the RI in 2009. The cost of these actions is approximately \$1.98 million.

### **5.2 COMMUNITY PARTICIPATION**

Annual Fort Wainwright community meetings have been held since 2005 through 2011. These meetings provide updates on the site including actions taken over the past year and the current status of the site. A community newsletter is also released at this time.

In addition to the annual meetings, as part of CERCLA requirements, an Administrative Record is being developed and will be made available to the public both online and at the local libraries. A Proposed Plan is also being developed and is scheduled to be released in December 2012 at which time a public meeting will be scheduled to inform the public of the Preferred Alternative chosen for the FCS.

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## **6.0 STATUTORY AND REGULATORY AUTHORITY**

The U.S. Army undertook the removal actions and support activities, as lead agency pursuant to CERCLA, Section 104(a). In accordance with 40 Code of Federal Regulations (CFR) 300.415(j), the onsite removal actions conducted under CERCLA were required to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release of substances hazardous to public health, welfare, and the environment. ADEC under 40 inch zone migration to groundwater cleanup levels were used to indicate when substantial endangerment to public health, welfare, and the environment had been mitigated, and were referenced in regard to CERCLA hazardous substances. The U.S. Army followed CERCLA guidance to evaluate these time-critical removal actions that took place after the completion of the RI in 2009.

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## **7.0 EXPECTED CHANGE IN SITUATION SHOULD ACTION HAVE BEEN DELAYED OR NOT TAKEN**

Action was taken in 2010 and 2011 to protect site workers and ensure that there was sufficient data to support the Preferred Remedial Alternative as presented in the 2011 FS. A delay in action or no action would have increased the potential for endangerment to workers and would have allowed contaminated areas to continue being a potential source of groundwater contamination.

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## **8.0 OUTSTANDING POLICY ISSUES**

There are no outstanding policy issues associated with this site.

(intentionally blank)

## **9.0 RECOMMENDATION**

The U.S. Army, ADEC, and EPA agreed upon the removal actions and support activities conducted as presented in this Action Memorandum.

This document provides an abbreviated discussion of the actions conducted at the FCS since the completion of the RI in 2009. Documents providing greater detail of these actions and other actions in the past are listed in the references section and can be found in the Administrative Record. This Action Memorandum will be incorporated into the Administrative Record.

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## 10.0 APPROVAL

Based on the facts presented above, the time-critical removal actions and support activities described in Section 4.0 above are hereby acknowledged and approved.

Approved:

*For the Army:*

\_\_\_\_\_ Date: \_\_\_\_\_

RONALD JOHNSON  
Colonel, U.S. Army  
Commander, U.S., Army Garrison, Alaska

*For the EPA:*

\_\_\_\_\_ Date: \_\_\_\_\_

RICHARD ALBRIGHT  
Director, Office of Environmental Cleanup  
U.S. Environmental protection Agency, Region 10

*For the ADEC:*

\_\_\_\_\_ Date: \_\_\_\_\_

JENNIFER ROBERTS  
Federal Facilities Section Manager, Contaminated Sites Program  
Alaska Department of Environmental Conservation

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## 11.0 REFERENCES

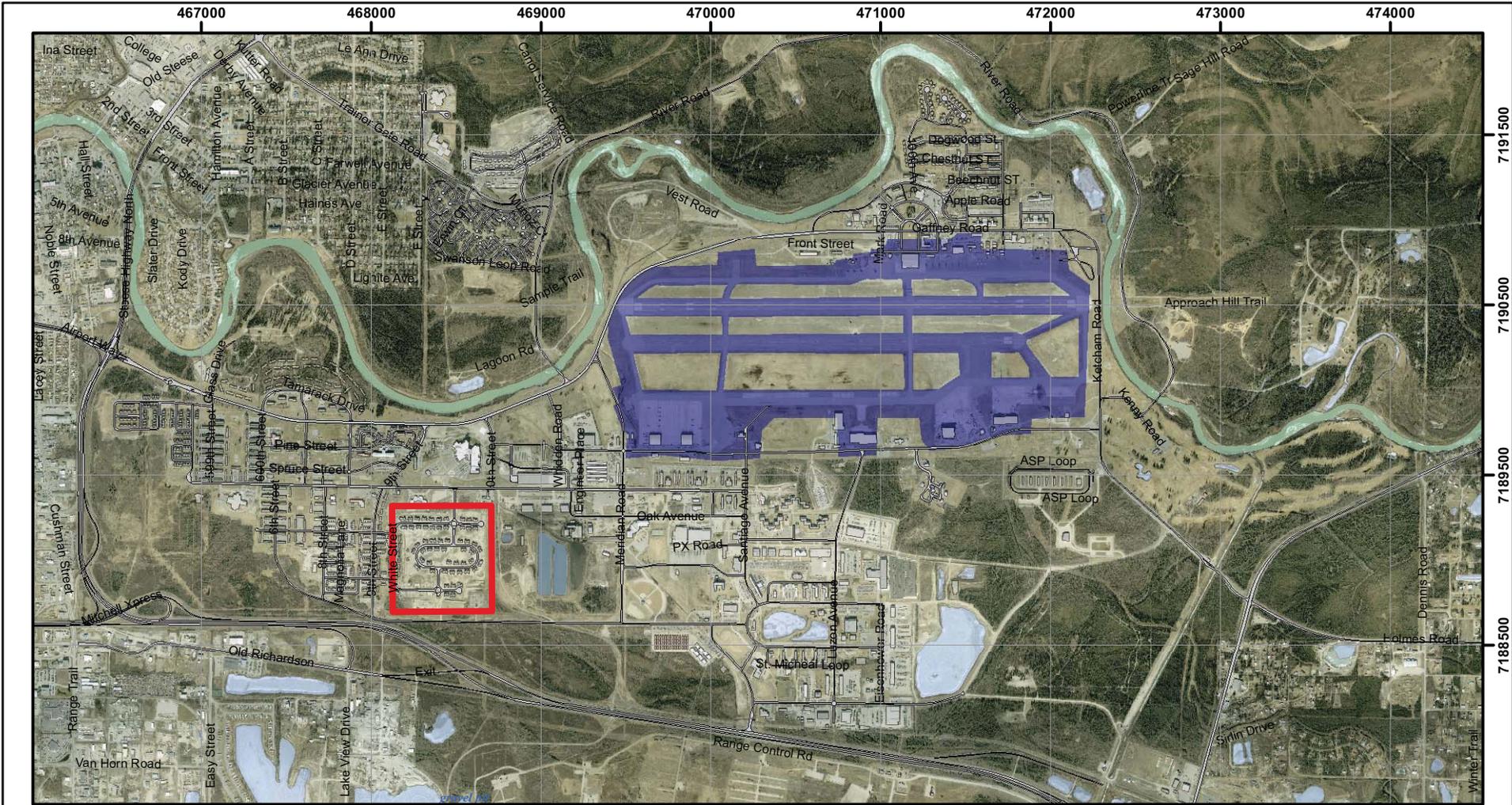
- ADEC. 2008 (October). *Oil and Other Hazardous Pollution Control Regulations—Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances*. 18 AAC 75.
- CH2M HILL. 2011a (December) *Screening and Evaluation of Remediation Technologies and Process Options, Former Communications Site*. Fort Wainwright, Alaska
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- EPA (U.S. Environmental Protection Agency). 2010 (May). *Regional Screening Levels for Chemical Contaminants at Superfund Sites*.
- North Wind, Inc. 2007. *Preliminary Source Evaluation II Report Taku Gardens (Final)*. Fort Wainwright, Alaska.
- USACE (U.S. Army Corps of Engineers). 2012a (July). *Former Communications Site Groundwater Summary (Draft)*. Fort Wainwright, Alaska. Prepared by Jacobs Engineering Group, Inc.
- USACE. 2012b (July). *Final Former Communications Site 2011 Groundwater Data Report*. Fort Wainwright, Alaska. Prepared by Jacobs Engineering Group, Inc.
- USACE. 2012c (July). *Final Former Communications Site 2011 Construction Support After-Action Report*. Fort Wainwright, Alaska. Prepared by Jacobs Engineering Group, Inc.
- USACE. 2012d (May). *Final Former Communications Site 2010 Groundwater Data Report*. Fort Wainwright, Alaska. Prepared by Jacobs Engineering Group, Inc.
- USACE. 2012e (March). *Final Former Communications Site 2010 Field Activities Report*. Fort Wainwright, Alaska. Prepared by Jacobs Engineering Group, Inc.
- U.S. Army Garrison, Alaska. 2007 (April). *Federal Facility Agreement as amended under CERCLA Section 120*, Administrative Docket Number: 1092-04-10-120.

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## **APPENDIX A**

### **Figures**

- Figure A-1 Location and Vicinity Map
- Figure A-2 Overview of Investigation Activities at the FCS – 2007 to 2010
- Figure A-3 2011 Areas of Investigation
- Figure A-4 2007 to 2009 FCS In-Plume Boundaries
- Figure A-5 2011 FCS In-Plume Boundaries



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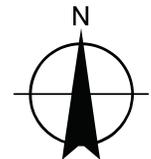


### Legend

- Taku Gardens Site
- Existing Buildings
- Ladd Airfield
- Chena River
- Lakes
- Roads



WGS 1984 UTM Zone 6N Transverse Mercator



### FORMER COMMUNICATIONS SITE LOCATION AND VICINITY MAP

FORT WAINWRIGHT, FAIRBANKS, ALASKA

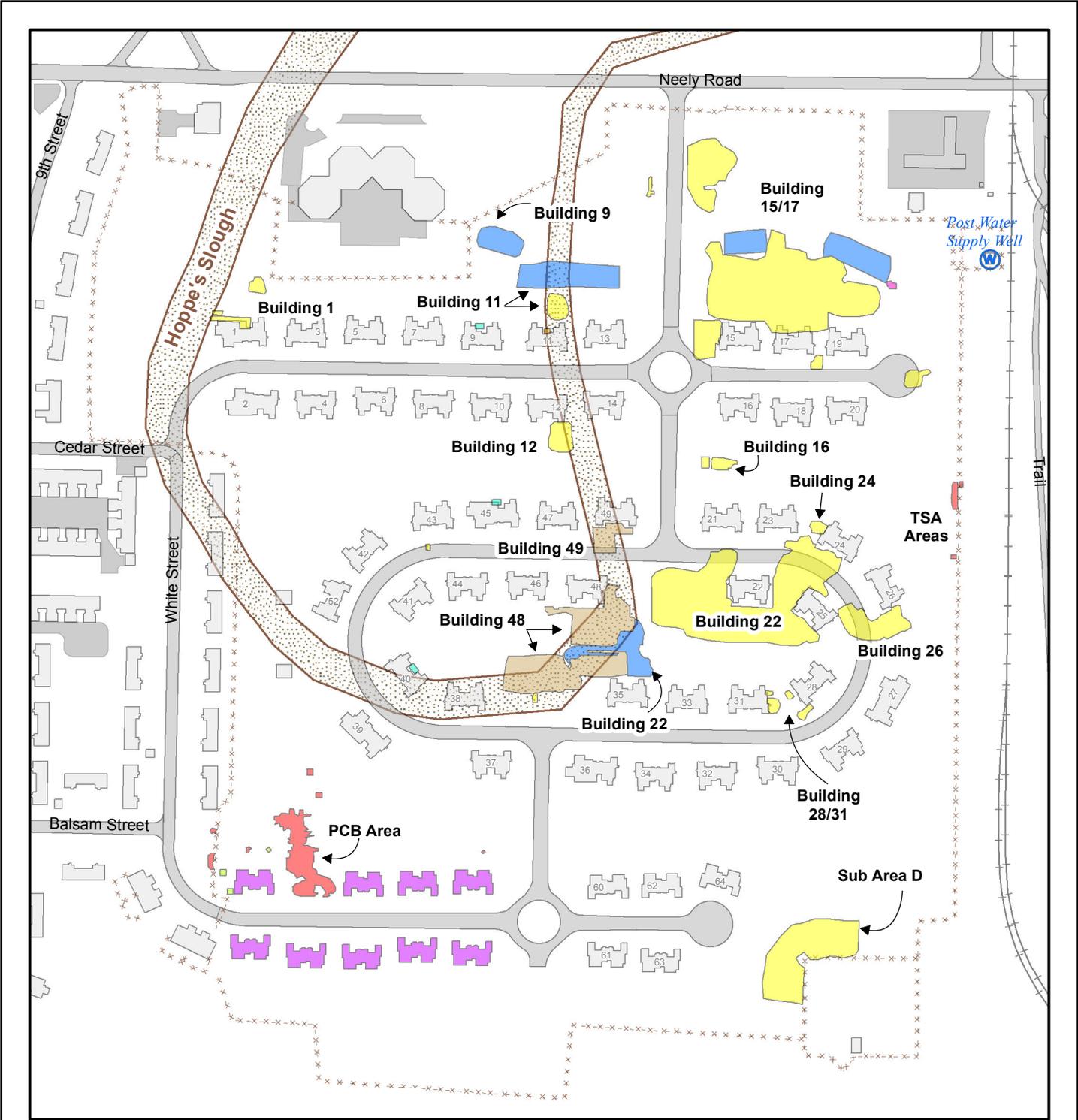
**JACOBS**

DATE:  
16 Jan 2012

PROJECT MANAGER:  
T. HEIKKILA

FIGURE NO.:  
A-1

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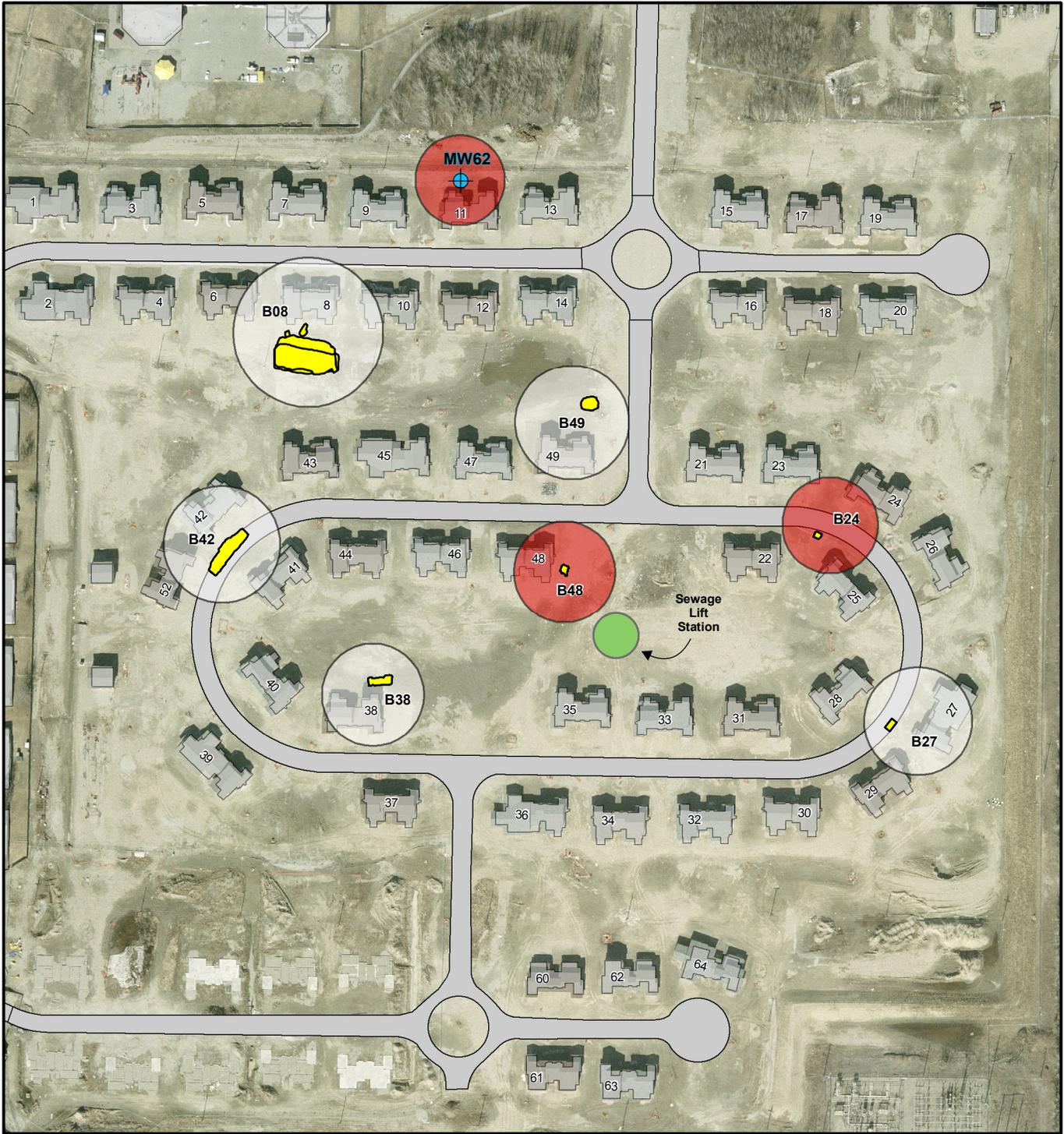


- 2007 EM61
- 2007 PCB
- 2008 DDT
- 2008 EM61
- 2008 PCB
- 2008 POL
- 2009 EM61
- 2009 PCB
- 2010 DDT
- Well
- Fence Line
- Railroad
- Building
- Road or Trail

All Locations Are Approximate  
 0 100 200 300 400  
 Feet  
 WGS 1984 UTM Zone 6N



<b>FORMER COMMUNICATION SITE          OVERVIEW OF INVESTIGATION ACTIVITIES          2007 TO 2010          FT. WAINWRIGHT, FAIRBANKS, ALASKA</b>			
	DATE: <b>01 NOV 2012</b>	PROJECT MANAGER: <b>T. HEIKKILIA</b>	FIGURE NO.: <b>A-2</b>

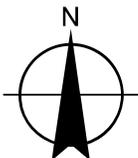


- Monitoring Well
- Construction Support Locations
- Soil Removal Locations

- 2011 Excavations
- Paved Road
- Building

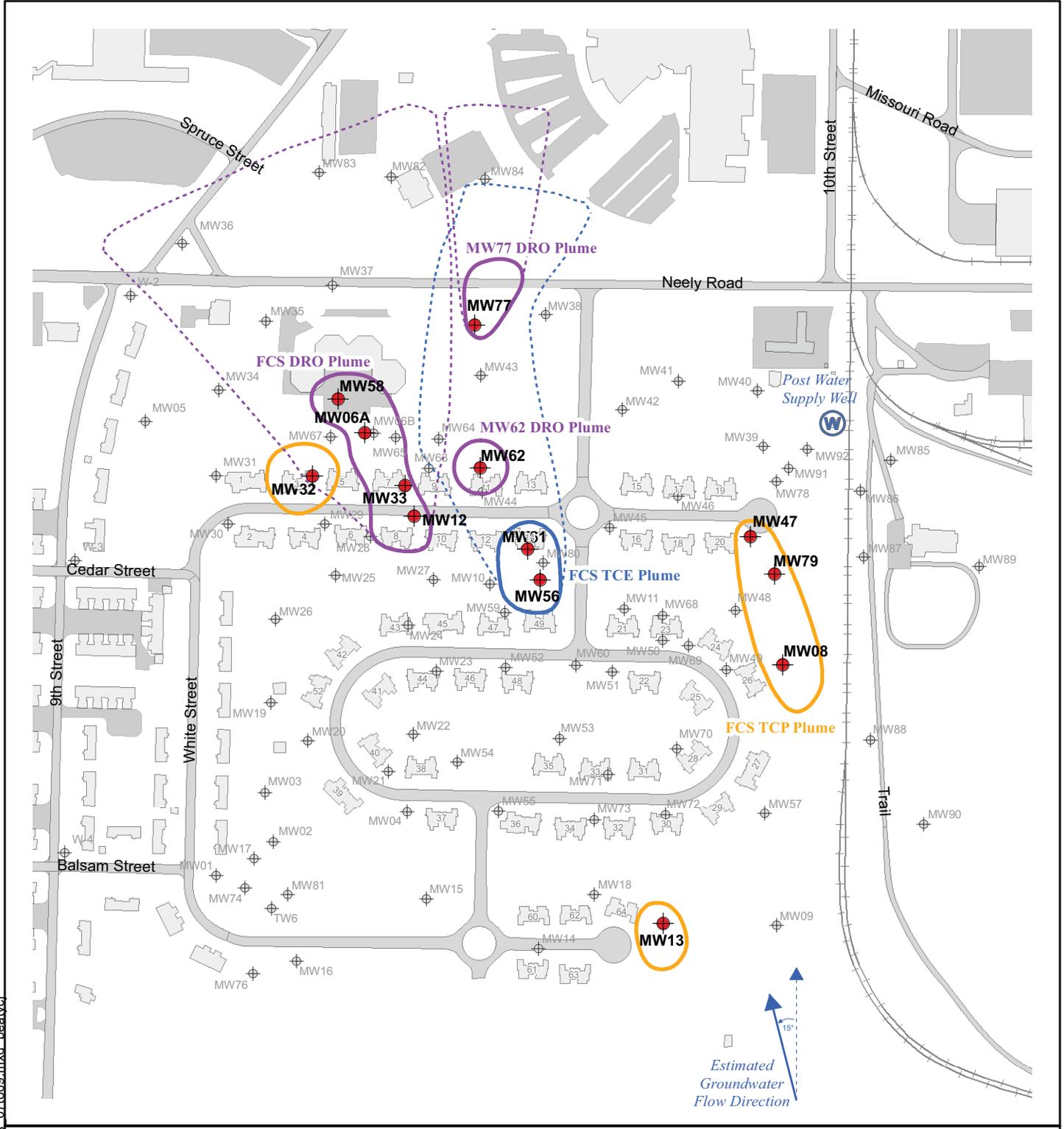
All Locations Are Approximate

UTM Zone 6N



<b>FORMER COMMUNICATIONS SITE 2011 AREAS OF INVESTIGATION</b>		
FORT WAINWRIGHT, FAIRBANKS, ALASKA		
<b>JACOBS</b>	DATE: 01 NOV 2012	PROJECT MANAGER: T. HEIKKILA
		FIGURE NO: A-3

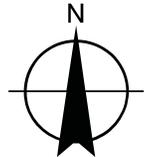
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- DRO Above ADEC Criteria (Plume Area)
- TCE Above ADEC Criteria (Plume Area)
- TCP Above ADEC Criteria (Plume Area)
- - - DRO Below ADEC Criteria (Leading Plume Edge)
- - - TCE Below ADEC Criteria (Leading Plume Edge)
- Monitoring Well Sampled 2007-2009 - Exceedance
- W Post Water Supply Well
- + Monitoring Well
- Building
- Railroad
- Road or Trail

All Locations Are Approximate

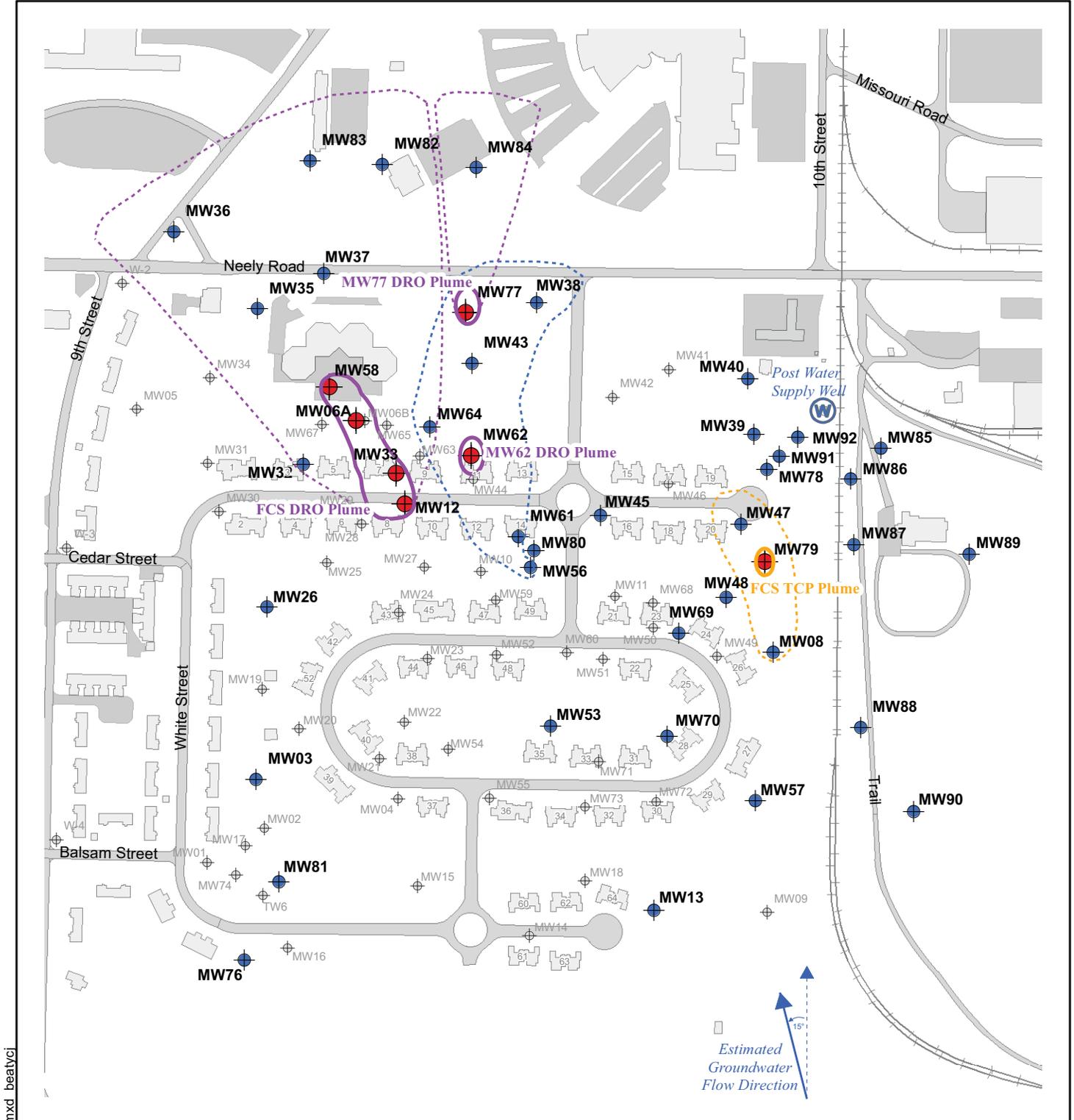
WGS 1984 UTM Zone 6N Transverse Mercator



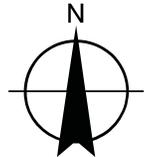
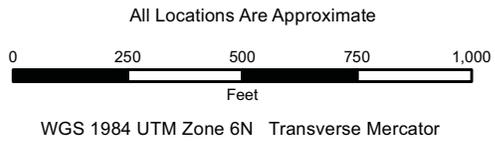
**2007 to 2009 FORMER COMMUNICATIONS SITE  
IN-PLUME BOUNDARIES**  
FORT WAINWRIGHT, FAIRBANKS, ALASKA

<b>JACOBS</b>	DATE: 18 JUN 2012	PROJECT MANAGER: T. HEIKKILA	FIGURE NO.: A-4
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\* TCP: 1,2,3-Trichloropropane



- DRO Above ADEC Criteria (Plume Area)
- TCP Above ADEC Criteria (Plume Area)
- - - DRO Below ADEC Criteria (Leading Plume Edge)
- - - TCE Below ADEC Criteria (Leading Plume Edge)
- - - TCP Below ADEC Criteria (Leading Edge of Plume)
- Monitoring Well Sampled in 2011 - Exceedance
- Monitoring Well Sampled in 2011 - No Exceedance
- ⊕ Monitoring Well
- W Post Water Supply Well
- Building
- Railroad
- Road or Trail



**2011 FORMER COMMUNICATIONS SITE  
IN-PLUME BOUNDARIES**

FORT WAINWRIGHT, FAIRBANKS, ALASKA

\* TCP: 1,2,3-Trichloropropane

<b>JACOBS</b>	DATE:	PROJECT MANAGER:	FIGURE NO.:
	18 JUN 2012	T. HEIKKILA	A-5

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**APPENDIX B**  
**Reference Documents**

*Provided as separate PDFs on the accompanying CD.*

*Final Former Communications Site 2010 Field Activities Report (USACE 2012e)*

*Final Former Communications Site 2010 Groundwater Data Report (USACE 2012d)*

*Final Former Communications Site 2011 Construction Support After-Action Report  
(USACE 2012c)*

*Final Former Communications Site 2011 Groundwater Data Report (USACE 2012b)*

*Screening and Evaluation of Remediation Technologies and Process Options, Former  
Communications Site (CH2M HILL 2012)*

*Former Communications Site Groundwater Summary (Final) (USACE 2012a)*

**APPENDIX C**  
**Comments and Responses**

REVIEW  
COMMENTS

PROJECT: FCS ACTION MEMORANDUM

LOCATION: FORT WAINWRIGHT

U.S. ARMY		DATE: 11/30/2012 REVIEWER: U.S. Army PHONE:	ACTION TAKEN ON COMMENT BY: JACOBS ENGINEERING GROUP INC.	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	USACE/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1	p. 2-6	During discussion of the comments provided EPA and ADEC, the Army recognized that the Time Critical Removal Action in 2005 was omitted from the Site History.	<p>A discussion of the 2005 TCRA has been added as Section 2.3.2 and subsequent sections have been renumbered, as appropriate.</p> <p><b>2.3.2 Time-Critical Removal Action for Polychlorinated Biphenyl (PCB)</b></p> <p>PCB-contaminated soil was discovered by construction crews in June 2005 while excavating the foundation for Building 52, which is located in the southwest corner of the FCS. The Army investigated this area further and found PCB concentrations as high as 111,000 mg/kg. PCB contamination was primarily localized to soil at or near the surface in a 5-acre section of the southwest corner of the FCS site. To reduce potential threats to site workers and nearby residents, a Time-Critical Removal Action (TCRA) of the most highly contaminated soil in this area was completed in September 2005. Applicable or Relevant and Appropriate Requirements (ARAR) identified for this action included Toxic Substances Control Act (TSCA) regulations [40 CFR Part 761], U.S. Department of Transportation (DOT) requirements [40 CFR Parts 171 through 180] and 18 AAC 62.310 (transportation of hazardous materials). Approximately 215 tons of PCB-contaminated soil was transported to a permitted hazardous waste landfill for disposal. (U.S. Army Garrison, 2007).</p>	
2	Section 3.1, 2 <sup>nd</sup> paragraph	<p>The following sentence is incorrect:</p> <p>Thirty-one contaminants were detected in samples collected between 5 and 15 feet bgs at concentrations exceeding the cleanup levels established for the site.</p>	<p>It has been revised:</p> <p>Thirty-<i>four</i> contaminants were detected in samples collected between 5 and 15 feet bgs at concentrations exceeding the cleanup levels established for the site.</p>	
3	Section 3.1, 2 <sup>nd</sup> paragraph	<p>The location of the diesel-contaminated area is incorrect.</p> <p>“The results indicate that the remaining contamination is residual, with the exception of subsurface diesel contamination in the northwestern corner of the site.”</p>	<p>“...<i>northwestern corner</i> of the site” will be changed to “...<i>north-central portion</i> of the site.”</p>	

**REVIEW  
COMMENTS**

**PROJECT: FCS ACTION MEMORANDUM**

**LOCATION: FORT WAINWRIGHT**

U.S. ARMY		DATE: 11/30/2012 REVIEWER: U.S. Army PHONE:	ACTION TAKEN ON COMMENT BY: JACOBS ENGINEERING GROUP INC.	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	USACE/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
4	Section 3.1, 3 <sup>rd</sup> paragraph	The following sentence is not clear: Table 3-1 presents the cleanup levels for all contaminants detected in subsurface soil.	The sentence has been corrected:  Table 3-1 presents the cleanup levels for all COCs in subsurface soil.	
5	p. 3-2	The COC table mistakenly included Aroclor 1260 as a contaminant of concern.	No soil with PCB concentrations greater than 1 mg/kg exists at the FCS site. COCs at the FCS have been defined as:  <i>“Contaminants in the soil and groundwater at concentrations exceeding the project cleanup levels. The cleanup levels are based primarily on the most stringent 2009 ADEC 18 AAC Method 2 cleanup levels. The most stringent EPA Regional screening levels were used for analytes that do not have Method 2 cleanup levels.”</i>  The PCB congener Aroclor 1260 does not fit this definition and has been removed from the list of COCs.	

**REVIEW  
COMMENTS**

**PROJECT: FCS ACTION MEMORANDUM LOCATION: FORT WAINWRIGHT**

ADEC		DATE: 10/30/2012 REVIEWER: Deb Caillouet PHONE:	ACTION TAKEN ON COMMENT BY: JACOBS ENGINEERING GROUP INC.	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	USACE/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1.	Section 2.1	Section 2.1 in the first paragraph has a reference U.S. Army 1992 that is not included in Section 11. Also this should probably refer to the FFA amendment to add OU6 in 2007 and not the original FFA.	Accepted. The following reference to the amended FFA will be added. U.S. Army Garrison Fort Wainwright (USAG FWA). 2007. (April). <i>Federal Facility Agreement as amended under CERCLA Section 120</i> , Administrative Docket Number 1092-04-10-120.  The following sentence has been added to the end of the first paragraph in Section 2.1:  “In April 2007, an amendment to the 1992 FFA was signed by DOD, EPA, and ADEC. This amendment established the Former Communications Site (FCS), also referred to as Taku Gardens, as Operable Unit 6 (OU6) (U.S. Army 2007).”	
2.	Section 2.1 Page 2-2	On page 2-2 of Section 2.1 (and other sections) references are provided to Attachment A, Figure XX. There is no Attachment A included with this document and no figures matching the description are included. Please revise.	Accepted. All references to “Attachment A” will be updated to say Appendix A.  Accepted. Figure A-2 will be updated to include the outline of the former slough.	
3.	Page 2-3	The first paragraph on this page and the last paragraph should be updated to the current status of the site.	The statements will be updated to indicate the current status of the site. Additionally, the entire document will be checked to ensure that the current status is discussed throughout.	
4.	Figure A-3	Figure A-3. There are three locations identified as “planned” that have already occurred and there is some action that has not been included in the text indicated at MW14. Please review and revise as needed.	Accepted. The “planned” label refers to the areas that were known about and planned for prior to the field season as opposed to the areas that came up only when the construction contractor encountered them. These areas will be changed to reference the “Soil Removal Locations” and “Construction Support Locations” respectively.  MW14 was a monitoring well that was converted to flush mount prior to paving activities. Since it does not affect the remediation at the site, it will be removed from the figure.	

**REVIEW  
COMMENTS**

**PROJECT: Fort Wainwright FCS  
DOCUMENT: Draft Final Action Memorandum, December 2012**

<b>ADEC</b>		<b>DATE: 12/28/2012</b> <b>REVIEWER: Deb Caillouet</b> <b>PHONE: (907) 269-0298</b>	<b>Action taken on comment by:</b> <b>Jacobs</b>		
<b>Item No.</b>	<b>Drawing Sheet No., Spec. Para.</b>	<b>COMMENTS</b>	<b>REVIEW CONFERENCE</b> A - comment accepted W - comment withdrawn (if neither, explain)	<b>CONTRACTOR RESPONSE</b>	<b>ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)</b>

1	4.3.3	Please explain why the sewage lift station was sampled and what was dewatered and where the material was disposed.	--	The text in this section states that the sewage lift station was sampled "to determine if contamination was present prior to dewatering." "Dewatering" refers to removal of water from the flooded manhole at the lift station. At the time, it was not clear where the water came from and the Army was concerned that broken glycol lines may have been the cause so Jacobs was directed to sample the standing water. Dewatering the sewage lift station was a construction-related concern and was not actually within the scope of the Time-Critical Removal Action. This paragraph will be removed from the Action Memo to avoid further confusion.	
2	4.3.4	The last sentence should be revised to say "By investigating potential contamination and providing support during intrusive activities, the institutional control policy requirements are being met at Fort Wainwright."	A	The sentence will be changed as suggested.	
3	Table 4-3	Guidance is not usually an ARAR unless adopted into regulation. It can be considered a TBC, but what is this guidance?	A	SPAR Guidance 2001-2 is <i>Off-Site Transport and Disposal of Soil Not Requiring DEC Approval and/or Institutional Controls</i> , providing guidance for the application of 18 AAC 75.325(i); 18 AAC 75.370(b) and 18 AAC 78.274(b). The reference to the Guidance will be deleted and replaced with 75.325 and 75.370.	
4	Table 4-4	For managing contaminated soil add 75.325 and 75.370.	A	See previous comment.	

**REVIEW  
COMMENTS**

**PROJECT: FCS ACTION MEMORANDUM**

**LOCATION: FORT WAINWRIGHT**

EPA		DATE: 10/30/2012 REVIEWER: Jacques Gusmano PHONE:	ACTION TAKEN ON COMMENT BY: JACOBS ENGINEERING GROUP INC.	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	USACE/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
1		I agree with ADEC, the FFA Amendment should be referenced with regards to this Site.	<p>Accepted. The following reference to the amended FFA will be added: U.S. Army Garrison Fort Wainwright (USAG FWA). 2007. (April). <i>Federal Facility Agreement as amended under CERCLA Section 120</i>, Administrative Docket Number 1092-04-10-120.</p> <p>The following sentence has been added to the end of the first paragraph in Section 2.1:  In April 2007, an amendment to the 1992 FFA was signed by DOD, EPA, and ADEC. This amendment established the Former Communications Site (FCS), also referred to as Taku Gardens, as Operable Unit 6 (OU6) (U.S. Army Garrison, 2007).</p>	
2	Section 3.2	Endangerment Determination is incorrect. The Army took this Time-Critical Removal Action because "Actual or threatened exposure to contaminant releases from this site, if not addressed by implementing the response action selected in this memorandum, may have presented an imminent and substantial endangerment to construction workers at this site." This is why you did not prepare an EECA and why this Memorandum is being completed after the fact.	<p>Accepted. The Endangerment Determination has been revised as follows:</p> <p>The human health risk assessment identified three areas of subsurface soil with contaminant concentrations above the ADEC excess lifetime cumulative risk threshold: TCP-contaminated soil near Building 24; n-nitrosodimethylamine-, dibenzo(a,h)anthracene-, and benzo(a)pyrene-contaminated soil near Building 48; and benzo(a)pyrene- and dibenzo(a,h)anthracene-contaminated soil near MW62. The 2011 construction plan required these areas to be excavated. A delay in action or no action presented an imminent or substantial endangerment to human health or the environment by increasing potential health risks to construction workers and allowing contaminated areas to continue being a potential source of groundwater contamination.</p>	

**REVIEW  
COMMENTS**

**PROJECT: FCS ACTION MEMORANDUM**

**LOCATION: FORT WAINWRIGHT**

EPA		DATE: 10/30/2012 REVIEWER: Jacques Gusmano PHONE:	ACTION TAKEN ON COMMENT BY: JACOBS ENGINEERING GROUP INC.	
Item No.	Drawing Sheet No., Spec. Para.	COMMENTS	CONTRACTOR RESPONSE	USACE/ADEC RESPONSE ACCEPTANCE (A-AGREE) (D-DISAGREE)
3	Figures A-4 and A-5	I also recommend that we discontinue the use of graphics such as A-4 and A-5 that show artificial plume dimensions. This served its purpose in the RI and in this Memorandum it demonstrates decrease in the plume over time. However, I doubt that the DRO plume, which was the shape of a kidney bean (MW58-MW12) in A-4, actually morphed into a paramecium shape in A-5, or the DRO plume in MW62 went from a perfect circle in A-4 to a very small squished pea in A-5. These ad-libbed plume dimensions definitely emphasize decrease but are not totally based on hard data. It is O.K. for this memorandum, but for monitoring purposes in the future, we need to know which wells were sampled, what the contaminant level was, and how it compares to historic data. I think we have gotten all the mileage out of the graphics we can.	Accepted. Figures A-4 and A-5 will continue to be used for this memorandum, however they will be re-evaluated prior to use in future documents such as the ROD and the 2012 Groundwater Data Report.  The following sentence will be added to the end of the first paragraph in Section 4.1:  Solid lines on these figures identify the inferred extent of contaminant concentrations above ADEC groundwater cleanup levels (18 AAC 75, Table C Migration to Groundwater); dotted lines represent the extent of contaminant concentrations detected, but at concentrations below ADEC cleanup levels.	
4		On a positive note, this was a great overview of the history of work done at this site. Good Job.	Thank you.	