

2408.38.001

FINAL INTERIM REMOVAL ACTION REPORT

HAZARDID: 2609

**Federal Scout Armory
Chefornak, Alaska**

R E C E I V E D

JAN 03 2002

DEPARTMENT OF
ENVIRONMENTAL CONSERVATION



**Alaska Army National Guard
Environmental Section
Fort Richardson, Alaska
Contract No. DAHA51-99-C-0004**

Prepared by:
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December 2001

CLOSED 2002
BARLOVE #587248

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R E C E I V E D

JAN 03 2002

DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

INTERIM REMOVAL ACTION CHEFORNAK FEDERAL SCOUT ARMORY

EXECUTIVE SUMMARY

Clearwater Environmental, Inc. (Clearwater), under authorization from the Alaska Army National Guard (AKNG) Contract No. DAHA51-99-C-0004 performed an interim removal action (IRA) at the Federal Scout Armory (FSA) in Chefornak, Alaska. The IRA is a continuation of previous investigations and remedial efforts conducted by other AKNG contractors. This IRA report presents the results of the 2000 remediation activities.

Reports from two previous assessments and investigations (1998 and 1999) identified between 40 and 50 cubic yards of hydrocarbon contaminated soil. The nature of the contamination was diesel range organics (DRO). This IRA was conducted to implement the remedial actions recommended in the previous reports and included the following actions at the Chefornak FSA:

- A total of 47 cubic yards of DRO contaminated soil was excavated from four excavation areas and placed in 186 55-gallon drums.
- The 186 drums of DRO contaminated soil were transported to Bethel, Alaska, via a commercial air carrier for thermal treatment and disposal by an AKNG contractor (Bethel Native Corporation, Inc. [BNCI]).
- Soil samples were collected from the sidewalls and floors of the excavation areas and delivered to an off site laboratory for analysis.
- The excavated areas were returned to original grades with clean backfill material and revegetated with native species of grass.

The IRA was performed with Alaska Department of Environmental Conservation (ADEC) Matrix Level D cleanup goals for DRO and gasoline range organics (GRO). In addition, ADEC Method Two cleanup goals for benzene, toluene, ethyl benzene, and xylenes (total) (BTEX) were established for this site. Based on analytical data results, these cleanup goals were achieved in the four excavation areas. In addition, data from two soil samples collected to support a leachate assessment indicated that groundwater at this site would not likely be impacted by residual contamination in concentrations greater than the current ADEC groundwater cleanup levels. The ultimate goal of this IRA, to protect public health and the environment, was accomplished.

INTERIM REMOVAL ACTION CHEFORNAK FEDERAL SCOUT ARMORY

1.0 INTRODUCTION

1.1 Site Background Information and History

The Chefornak Federal Scout Armory (FSA), built in 1960, is located on the south bank of the Kinia River near its junction with the Keguk River. The FSA is located within the Chefornak city limits. A site location map is provided as Figure 1.

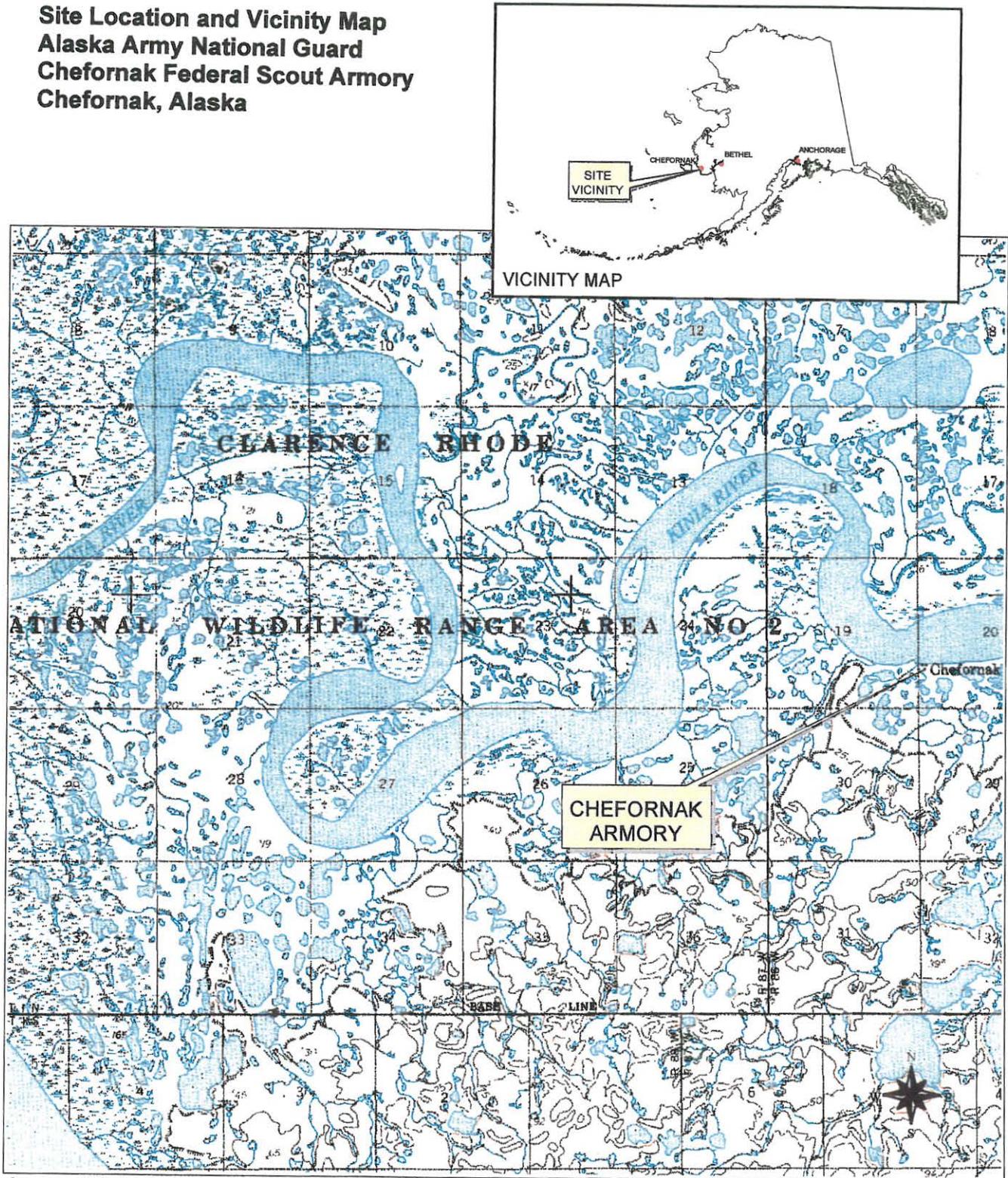
Diesel fuel for heating was provided to the armory by a single walled 3,000-gallon aboveground storage tank (AST). Fuel was provided to the AST by means of a heating oil pipeline. In September 1996, the Alaska Department of Environmental Conservation (ADEC) identified three leaking joints from the pipeline. The estimated volume of heating oil released was 20 gallons. The ADEC spill number for this site is 1996-2501-256-01. A preliminary site assessment performed in 1998 by ERM-West/Hart Crowser indicated that hydrocarbon contaminated soil at the site was the result of releases from the heating oil pipeline.

ERM-West, Inc., and Hart Crowser, Inc., performed a remedial investigation in 1999 to confirm and expand upon the findings of the 1998 site assessment. The 1999 remedial investigation recommended the cleanup standards provided in ADEC Method Two (ERM-West/Hart Crowser, 1999). The petroleum cleanup levels for Method Two were calculated resulting in a risk-based ingestion cleanup standard of 12,500 milligrams per kilogram (mg/kg) DRO. The volume of impacted soil exceeding the Method Two cleanup level was estimated to be between 40 and 50 cubic yards. A map showing the sampling locations and DRO sampling results of the 1999 remedial investigation is provided in Figure 2.

Clearwater Environmental, Inc. (Clearwater), prepared the *Corrective Action Plan, Federal Scout Armory, Chefornak* (Clearwater, 2000) to remove up to 50 cubic yards of DRO contaminated soil. The corrective action plan (CAP) was approved by ADEC on May 24, 2000. A cleanup goal of Matrix Level D was the basis for this ADEC-approved interim removal action (IRA). This IRA report presents the results of remedial actions performed between July 26, 2000, through August 16, 2000.

Figure 1

**Site Location and Vicinity Map
Alaska Army National Guard
Chefornak Federal Scout Armory
Chefornak, Alaska**



Source: USGS 1:63,360
Baird Inlet (A-7), Alaska, 1954

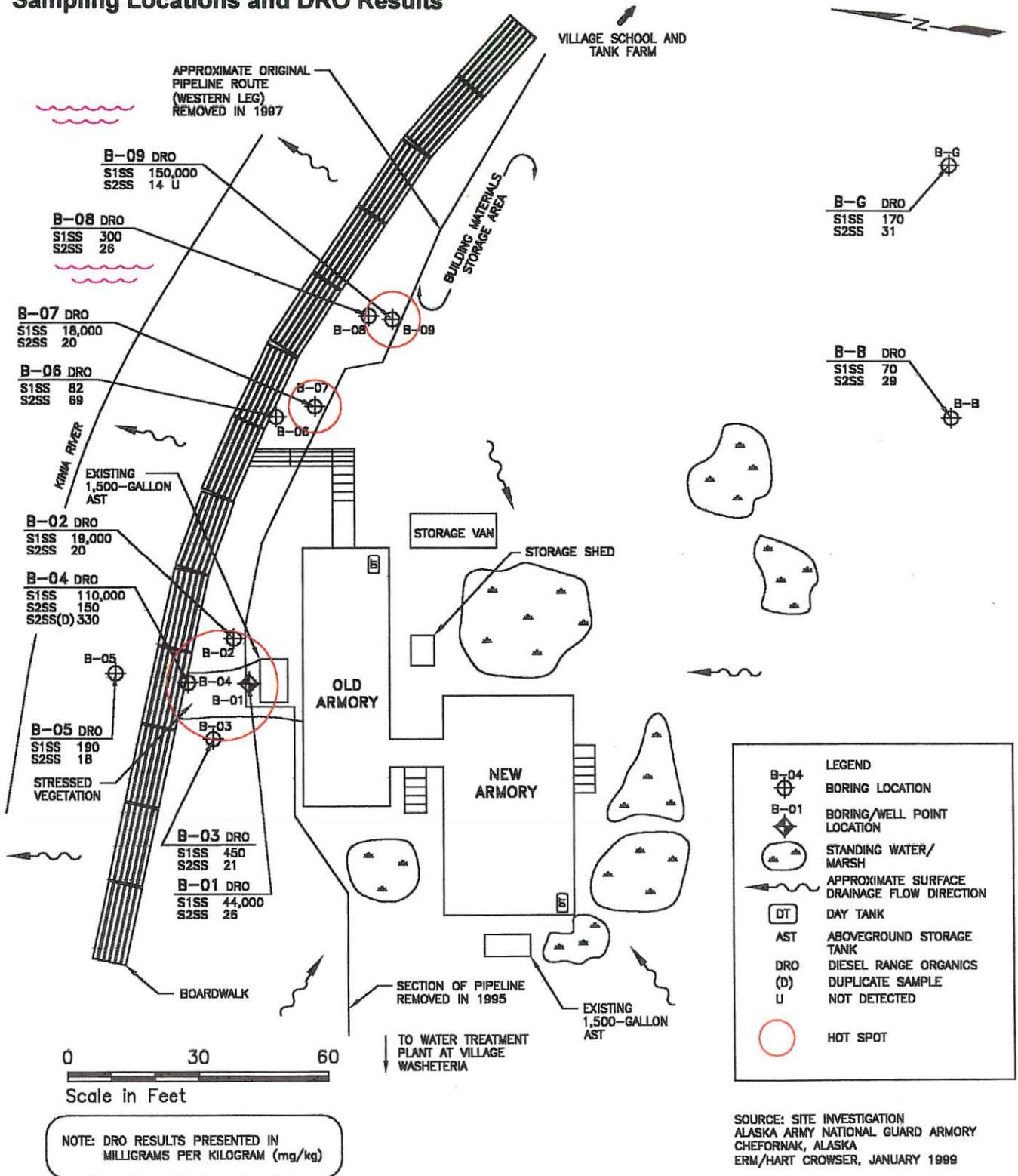
Filename: SiteLocations.apr

0.5 0 0.5 1 1.5 Miles

Clearwater
ENVIRONMENTAL, INC.
1760 Abbott Road
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Figure 2

**1999 Remedial Investigation
 Sampling Locations and DRO Results**



2.0 FIELD ACTIVITIES

Work activities for this project were conducted in accordance with the project scope of work as presented in *Corrective Action Plan, Federal Scout Armory, Chefornak* (Clearwater, 2000) approved by ADEC on May 24, 2000. Field operations at the Chefornak FSA occurred between July 26, 2000, and August 16, 2000.

2.1 Excavation

Field operations began with the mobilization of equipment and personnel to the Chefornak FSA via commercial air carrier on July 26, 2000. In accordance with the CAP, an exclusion zone was constructed with barriers and staging areas. Excavation areas were delineated by re-acquiring the 1999 remedial investigation sample locations shown in Figure 2.

DRO contaminated soil was removed at four areas identified as Area A, Area B, Area C, and Area D. Soil was removed using a small excavator and hand shovels. The DRO contaminated soil was removed to a maximum depth of 3 feet below ground surface (bgs). The depth of the excavations varied due to the presence or permafrost or when field screening sample results indicated that cleanup levels had been achieved. The lineal extent of the excavation areas progressed until field screening sample results indicated cleanup levels had been achieved or if the edge of an excavation was within 4 feet of an adjacent building. A total of 47 cubic yards of DRO contaminated soil was removed from the site and placed in 186 55-gallon open top drums. Site photographs depicting excavation activities are included in Appendix A.

Field screening procedures used to direct excavation and sampling activities included the use of a photoionization detector (PID) and PetroFLAG[®] quantitative field screening test kits. The PID was used to perform headspace analysis of soil samples collected in Ziploc[®] plastic bags. The highest meter reading was recorded for each sample, and an action level of 25 parts per million (ppm) was established to determine if cleanup levels had been achieved. The PetroFLAG[®] field screening test kit is useful for a quantitative determination of total hydrocarbons in soil. The PetroFLAG[®] test kits, set for detection of diesel fuel at 2,000 ppm, were used to supplement data obtained from headspace analysis with the PID. If the field screening procedures indicated cleanup levels had been obtained, excavation activities were stopped in a particular area. If the field screening procedures indicated that cleanup levels had not been achieved, excavation activities would continue until permafrost was encountered or the edge of an excavation was within 4 feet of a building or adjacent structure.

Upon removal of the contaminated soil, confirmation soil samples for analysis at an off-site ADEC-approved laboratory were collected from the sidewalls and bottoms of the excavation areas. Soil samples were collected from locations with the highest reported field screening results. Refer to Section 3 for a discussion of sampling and analysis methods and procedures.

2.2 Site Restoration

Site restoration activities included the placement of backfill materials and the application of seed and fertilizer to restore disturbed areas. The excavated areas were backfilled with clean fill and returned to original grade. Large rocks were used as subgrade fill material in the excavation at Area C to stabilize the soil where the AST is positioned. Other backfill material was cleared of large rocks and protuberant roots and compacted to avoid trip hazards and minimize subsidence. Backfill operations were conducted between August 11 and August 13, 2000.

Excavation areas were fertilized using a 20:20:10 fertilizer at a ratio of 1.7 ounces per square yard (oz/yd²). This was followed by seeding with a grass seed mixture designed to produce grasses that can survive Alaskan conditions. The grass seed mixture was composed of 40% Arctic Red Fescue, and 60% Northcoast Bering Hairgrass. The grass seed mixture was spread at a ratio of 0.2 oz/yd². Fertilizer and grass seed mixtures were applied to the disturbed areas on August 15, 2000.

2.3 Transport

Approval for transport of the contaminated soil was obtained from ADEC as required by 18 AAC 78.274. A copy of the Transport Authorization Letter is included in Appendix B.

The contaminated soil was transported via commercial air carrier from the Chefornak FSA to a thermal desorption facility, BNCI, in Bethel, Alaska. The DRO contaminated soil was shipped as a non-hazardous waste in full compliance with United States Department of Transportation (DOT) and International Air Transport Association (IATA) regulations. Thermal treatment and disposal of the soil was conducted under a separate contract between AKNG and BNCI.

3.0 SAMPLING AND ANALYSIS

Soil samples were collected following excavation activities for characterizing site conditions and to support future investigations and/or studies pertaining to the site. This section describes the methodology, procedures, and types of samples collected. A review of the data quality is also provided to determine the usefulness of the laboratory data.

3.1 Field Sampling Activities

Eight soil samples (including one quality control field duplicate) were collected from the sidewalls and bottoms of the excavation areas to determine if the ADEC Matrix Level D cleanup goals for this IRA had been achieved and to characterize concentrations of residual petroleum contamination that may remain at the site. These sample locations were selected based on field screening techniques (i.e., PID headspace analysis and PetroFLAG® immunoassay test kits). Field screening sample locations that indicated petroleum contamination above the cleanup goals were sampled to characterize a worst case scenario.

In addition to the soil samples collected for verifying the achievement of cleanup levels, four soil samples were collected to support decisions to be made by AKNG and ADEC in relation to the possible need for future remedial actions at the site. The four additional samples included a background soil sample collected from an area outside the excavation area (Sample location was presumed to be free of petroleum contamination.) for total organic carbon (TOC) analysis, two soil samples collected within the excavation areas (Sample locations were presumed to be contaminated with petroleum products.) to support a leaching assessment, and one soil sample for bulk density analysis.

Samples were collected in the field following standard sampling procedures on August 10, 2000. Immediately prior to sample collection, a clean pair of sampling gloves was donned, and a minimum of six inches of soil was uncovered from the surface of the sampling location. Grab samples were collected with disposable plastic sampling spoons, and sample containers were filled in descending order of volatility for the analyses required. Sample preservatives, if required by the specific analytical method, were added to the sample containers, and the samples were immediately placed in a cooler with ice to keep the sample temperatures within required limits until the samples could be shipped off site to the designated laboratory. Following the collection of a sample, sampling gloves were removed, and a clean pair was donned prior to the collection of the next sample.

Prior to shipment of the samples to the laboratory, the contents of the sample cooler were verified to correspond with the chain-of-custody (COC) documents. Once verified, the samples were packed in the cooler with ice, and the COC documents were secured to the top of the lid on the inside of the cooler. The cooler lid was closed, and one custody seal was placed across the cooler lid prior to taping the cooler shut. The

sample cooler was shipped via commercial air carrier from the project site on August 10, 2000, and was delivered to CT&E Environmental Services, Inc. (CT&E), an ADEC-approved laboratory, on August 11, 2000. The samples arrived at the laboratory intact at a recorded temperature of 2.6 degrees Celsius (°C).

3.2 Laboratory Sample Analysis

The eight excavation confirmation soil samples were analyzed for the following petroleum constituents:

- Benzene, toluene, ethyl benzene, and xylenes (BTEX) by U.S. Environmental Protection Agency (EPA) Method 8021B
- Gasoline range organics (GRO) by State of Alaska Method AK101
- DRO by State of Alaska Method AK102

Data obtained from these samples were used to determine if the cleanup levels were achieved and to characterize residual contamination that may remain at the site.

The soil samples collected to support a leachate assessment were analyzed with the following methods:

- Synthetic precipitation leaching procedure (SPLP) by EPA Method 1312 in combination with EPA Method 8021B or State of Alaska Method AK102

The data obtained from these samples will be used by AKNG and ADEC to evaluate the need for additional remedial actions at the site. The intent of the SPLP samples was to characterize the solubility and potential for migration of residual contamination to groundwater.

3.3 Data Quality Assurance

Data obtained from an analytical laboratory must be reviewed to verify the precision, accuracy, representativeness, comparability, and completeness of the results. This is achieved through a method review process that includes the following:

- Chain-of-custody procedures
- Proper sample preservation methods and temperature check
- Holding times
- Surrogate recoveries and instrument calibration
- Comparison of relative percent difference (RPD) of duplicate samples
- Trip blanks that are free of contamination

Following a review of these parameters, several anomalies were detected in the laboratory data package. These included the following:

- The field surrogate recovery for Sample CHE002, Sample CHE005, and Sample CHE006 GRO/BTEX analysis is biased low due to high moisture content in the samples.
- The trip blank for GRO/BTEX analyses did not contain the field surrogate 4-bromofluorobenzene. The bench surrogate met quality control goals. The results may be biased low.
- The surrogate in two GRO/BTEX/DRO and one SPLP lab control samples and lab control sample duplicates is biased high due to interference by the method required petroleum spike.
- The relative percent difference for the SPLP lab control sample and lab control sample duplicate is biased high.

These anomalies do not significantly affect the reported laboratory data, and the data are deemed acceptable for the intended purposes. A data quality assurance review was prepared for this IRA and is included in *Interim Removal Action Laboratory Data and Quality Assurance Data Review, Federal Scout Armory, Chefornak, Alaska* (Clearwater, December 2001).

4.0 SAMPLE RESULTS DISCUSSION

This section discusses the analytical results obtained from the soil samples collected at the site following the completion of excavation activities. Laboratory data reports are included in *Interim Removal Action Laboratory Data and Quality Assurance Data Review, Federal Scout Armory, Cheformak, Alaska* (Clearwater, December 2001). Sampling locations are shown in Figure 3.

4.1 Excavation Confirmation Soil Samples

The excavation confirmation sample results are summarized in Table 1. These results were compared to ADEC Matrix Level D cleanup goals stated in the Cheformak CAP for GRO and DRO. The GRO and DRO cleanup levels were established at 1,000 mg/kg and 2,000 mg/kg, respectively. The BTEX data generated from the excavation confirmation samples were compared to the ADEC soil cleanup levels contained in 18 AAC 75.341, Table B1 (Method Two—Soil Cleanup Levels [Under 40 Inch Zone, Migration to Groundwater]). The ADEC soil cleanup levels for benzene, toluene, ethyl benzene, and xylenes (total) are 0.02 mg/kg, 5.4 mg/kg, 5.5 mg/kg, and 78 mg/kg, respectively.

Table 1—GRO, DRO, BTEX, and TOC Laboratory Analytical Results

SAMPLE ID	Percent Moisture	AK101	AK102	EPA 8021B				CT&E TOC SOP
		GRO (mg/kg)	DRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl benzene (mg/kg)	Total xylenes (mg/kg)	TOC (mg/kg)
CHE001	36.7%	14.6	53.0	0.0242 U	0.0966 U	0.0966 U	0.164	NA
CHE002	59.6%	8.98 U	359	0.0449 U	0.180 U	0.180 U	0.180 U	NA
CHE003	29.2%	4.21 U	70.8	0.0210 U	0.0841 U	0.0841 U	0.328	NA
CHE004	24.0%	3.75 U	40.0	0.0188 U	0.0751 U	0.0751 U	0.0751 U	NA
CHE005	37.0%	4.77 U	189	0.0239 U	0.0955 U	0.0955 U	0.0955 U	NA
CHE006	36.4%	5.15 U	82.1	0.0258 U	0.103 U	0.103 U	0.103 U	NA
CHE007	37.5%	13.1	112	0.0242 U	0.0967 U	0.0967 U	0.195	NA
CHE008*	38.8%	7.99	47.7	0.0209 U	0.0838 U	0.0838 U	0.0946	NA
CHE011	37.0%	NA	NA	NA	NA	NA	NA	8,941
Trip Blank	0.0%	2.67 U	NA	0.0133 U	0.0534 U	0.0534 U	0.0534 U	NA

NOTES:

"GRO" indicates gasoline range organics.

"DRO" indicates diesel range organics.

"TOC" indicates total organic carbon.

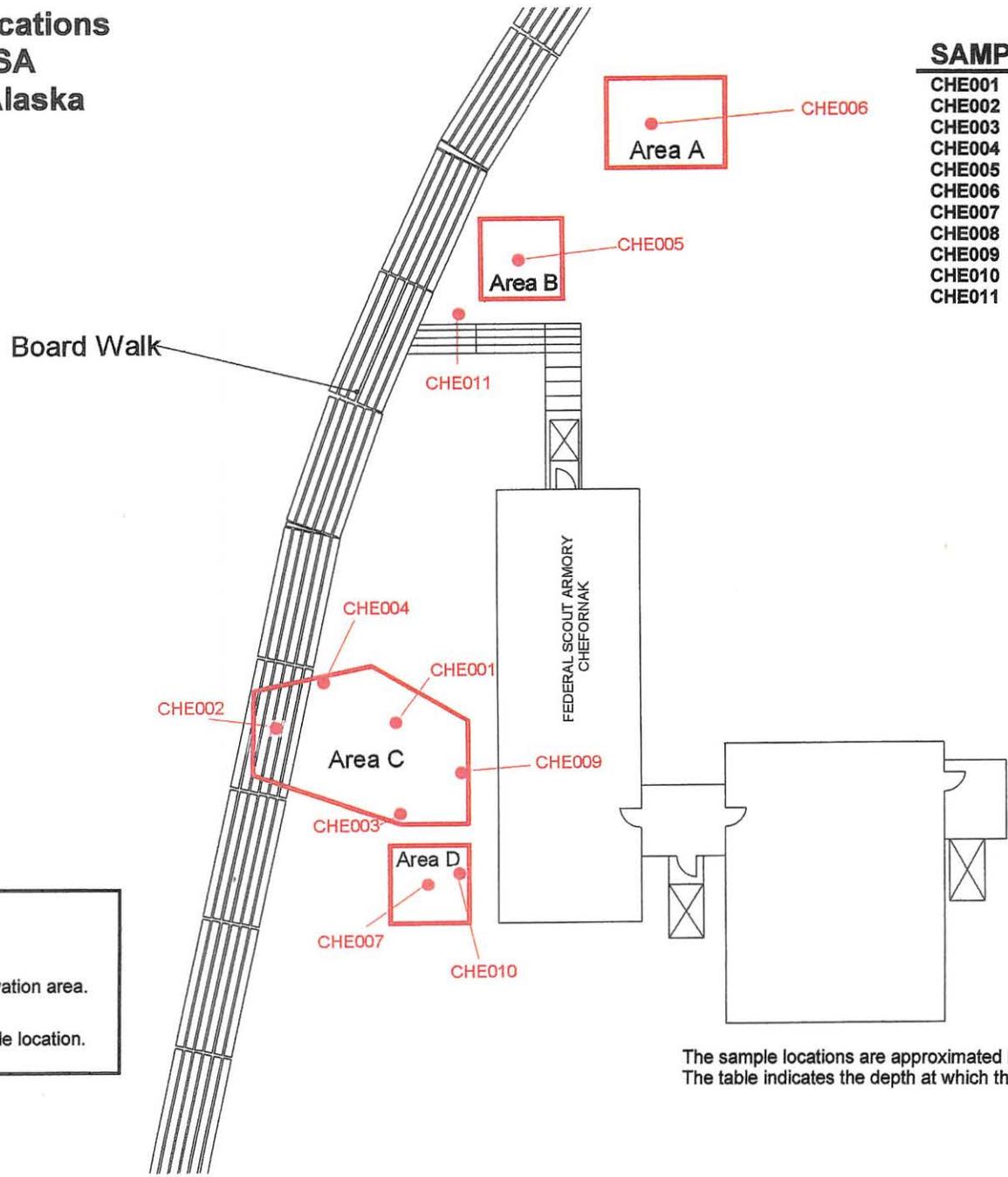
"mg/kg" indicates milligrams per kilogram.

"U" indicates that analyte of concern was not detected above the practicable quantitation limit for the specific method.

"NA" indicates the analyte was not analyzed.

* indicates that Sample CHE008 was a quality control field duplicate of Sample CHE001.

Figure 3
Sampling Locations
Chefornak FSA
Chefornak, Alaska



SAMPLE ID	DEPTH
CHE001	32 inches
CHE002	24 inches
CHE003	12 inches
CHE004	12 inches
CHE005	8 inches
CHE006	10 inches
CHE007	24 inches
CHE008	32 inches
CHE009	16 inches
CHE010	15 inches
CHE011	8 inches

LEGEND

- Approximate excavation area.
- Approximate sample location.

The sample locations are approximated based on field notes.
 The table indicates the depth at which the samples were collected.

4-2

One sample (CHE006) was collected from the floor of the excavation at Area A at an approximate depth of 32 inches bgs. The analytical results for this sample show that ADEC Matrix Level D cleanup levels for DRO and GRO were achieved and that the ADEC soil cleanup levels for BTEX were achieved.

One sample (CHE005) was collected from the floor of the excavation at Area B at an approximate depth of 24 inches bgs. The analytical results for this sample show that ADEC Matrix Level D cleanup levels for DRO and GRO were achieved and that the ADEC soil cleanup levels for BTEX were achieved.

Three samples (CHE001, CHE002, and CHE008 [field duplicate of CHE001]) were collected from the floor of the excavation at Area C. Samples CHE001 and CHE008 were collected approximately 32 inches bgs, and Sample CHE002 was collected approximately 24 inches bgs. Two samples (CHE003 and CHE004) were collected from sidewalls in the excavation at Area C. The samples were collected approximately 12 inches bgs. The analytical results for these samples indicate that ADEC Matrix Level D cleanup levels for DRO and GRO were achieved and that ADEC soil cleanup levels for BTEX were achieved.

One sample (CHE007) was collected from the floor of the excavation at Area D approximately 24 inches bgs. The analytical results for this sample show that ADEC Matrix Level D cleanup levels for DRO and GRO were achieved and that ADEC soil cleanup levels for BTEX were achieved.

4.2 SPLP Samples

The SPLP sample results are summarized in Table 2. These results were compared to ADEC groundwater cleanup levels contained in 18 AAC 75.345, Table C (Groundwater Cleanup Levels). The ADEC groundwater cleanup levels for benzene, toluene, ethyl benzene, xylenes (total), GRO, and DRO are 0.005 milligrams per liter (mg/L), 1.0 mg/L, 0.7 mg/L, 10.0 mg/L, 1.3 mg/L, and 1.5 mg/L, respectively. These cleanup levels assume that the groundwater is currently used or could be potentially used in the future as a drinking water source.

Table 2—SPLP Laboratory Analytical Results

SAMPLE ID	EPA 1312/8021					EPA 1312/AK102
	GRO (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethyl benzene (mg/L)	Total Xylenes (mg/L)	DRO (mg/L)
CHE009	0.139	0.000500 U	0.00644	0.00200 U	0.00905	0.361 U
CHE010	0.0900 U	0.00050 U	0.00424	0.00200 U	0.00551	0.330 U

NOTES:

"GRO" indicates gasoline range organics.

"DRO" indicates diesel range organics.

"mg/L" indicates milligrams per liter.

"U" indicates that analyte of concern was not detected above the practicable quantitation limit (PQL) for the specific method.

Sample CHE009 was collected approximately 16 inches bgs from a sidewall in the excavation at Area C. Sample CHE010 was collected approximately 15 inches bgs from a sidewall in the excavation at Area D. Concentrations of BTEX, GRO, and DRO soluble fractions for these samples were reported as being below the practicable quantitation limits for each analyte indicating that residual contamination that may be present would not leach into the groundwater at concentrations above the current ADEC groundwater cleanup levels.

4.3 Soil Density Sample

The soil density sample (not assigned a field identification number) was analyzed by Alaska Testlab located in Anchorage, Alaska. The sample was collected in an 8-inch brass sleeve. Soil density in and around the excavation areas at the Chefornak FSA was reported as 58.4 pounds per cubic foot (1,577 pounds per cubic yard) with 60% moisture.

5.0 INVESTIGATION DERIVED WASTE

Minimal quantities of investigation derived wastes (IDW) were produced during the performance of this IRA. All IDW was mixed with the DRO contaminated soil.

Non hazardous wastes such as used personal protective equipment, plastic sheeting, and other miscellaneous materials were disposed of in the local landfill. No hazardous wastes were generated during the performance of this IRA.

6.0 CONCLUSIONS

This IRA was performed to remove up to 50 cubic yards of DRO contaminated soil (47 cubic yards were removed) present at the Chefornak FSA as a result of heating oil spills from an aboveground storage tank pipeline system. The ultimate goal of this IRA was to remove the most contaminated soil from the site in order to protect human health and the environment by eliminating the potential for direct human contact with contaminated media and removing the source area of contamination.

Analytical results for the soil samples collected from the sidewalls and bottoms of the excavation areas demonstrated that contaminant concentrations were below the ADEC Matrix Level D cleanup levels for GRO and DRO established for this IRA. The ADEC Method Two cleanup levels for BTEX were also achieved as a result of this IRA. In addition, the SPLP data indicate that residual contamination at the site would not likely impact surface water or groundwater sources at concentrations greater than the current ADEC groundwater cleanup levels.

Based on the analytical results, it is concluded that the original goal of this IRA was achieved. The threat to public health and the environment has been eliminated following the removal of DRO contaminated soil and the DRO contamination source area from the site. Although residual contamination remains at the site, it poses no immediate threat to public health or the environment.

7.0 REFERENCES

Clearwater Environmental. 2000. *Corrective Action Plan, Federal Scout Armory, Chefomak*. Prepared for Alaska Army National Guard, Contract No. DAHA51-99-C-0004.

Clearwater Environmental. 2001. *Interim Removal Action Laboratory Data and Quality Assurance Data Review, Federal Scout Armory, Chefomak, Alaska*. Prepared for Alaska Army National Guard, Contract No. DAHA51-99-C-0004.

ERM-West, Inc., and Hart Crowser, Inc. 1998. *Preliminary Assessment (PA) Records Review, Army National Guard Scout Armory, Chefomak, Alaska*.

ERM-West, Inc., and Hart Crowser, Inc. 1999. *Site Investigation, Alaska Army National Guard Armory, Chefomak, Alaska*.

Alaska Department of Environmental Conservation. 1999. *18 AAC 75, Oil and Other Hazardous Substances Pollution Control*. October.

Alaska Department of Environmental Conservation. 1999. *18 AAC 78, Underground Storage Tanks*. August.

Alaska Department of Environmental Conservation. 1999. *Underground Storage Tanks Procedures Manual*. March.

8.0 ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AKNG	Alaska Army National Guard
AST	aboveground storage tank
bgs	below ground surface
BNCI	Bethel Native Corporation, Inc.
BTEX	benzene, toluene, ethyl benzene, and total xylenes
CAP	Corrective Action Plan
Clearwater	Clearwater Environmental, Inc.
COC	chain-of-custody
CT&E	CT&E Environmental Services, Inc.
DOT	United States Department of Transportation
DRO	diesel range organics
EPA	United States Environmental Protection Agency
FSA	Federal Scout Armory
GRO	gasoline range organics
IATA	International Air Transport Association
IDW	investigation derived waste
IRA	interim removal action
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
oz/yd ²	ounces per square yard
PID	photoionization detector
ppm	parts per million
RPD	relative percent difference
SPLP	synthetic precipitation leaching procedure
TOC	total organic carbon

Appendix A

Site Photographs



Area A excavation following removal of DRO contaminated soil. Photograph taken by Denise Daggett.



Area B excavation (middle of photo) and Area A excavation (right side of photo) following the removal of DRO contaminated soil. Photograph taken by Denise Daggett.



Area C and Area D excavations prior to the removal of DRO contaminated soil. Photograph taken by Denise Daggett.



Area C excavation following removal of DRO contaminated soil. Photograph taken by Denise Daggett.



Area C excavation backfill activities. Photograph taken by Denise Daggett.



Area C and Area D excavations following backfill activities. Photograph taken by Denise Daggett.

Appendix B

ADEC-Approved Transport Authorization Letter for DRO Contaminated Soil

Clearwater

Tak'as

ENVIRONMENTAL, INC.

1012.003

August 1, 2000

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Mr. Scott Pexton
Department of Environmental Conservation
Anchorage Office

RE: AKNG - Chefornek CAP.

Dear Mr. Pexton,

This letter is a request for approval to transport diesel-contaminated soil excavated during the Chefornek FSA CAP. The contaminated soil will be transported from Chefornek to Bethel via aircraft where it will then be transported to the BNCL disposal facility in Bethel utilizing local trucking. Transport of the soil is scheduled to occur sometime during the period from August 2 through 12, 2000. These dates are subject to change due to weather and other unexpected conditions that could cause a delay in transport. During the transport the soil will be contained in 55 gal. drums. Yute air will transport the contaminated soil in a CASA 212-200 airplane. Clearwater will ensure all placards, documentation, and packaging is in compliance with 49 CFR Part 172. This will include the preparation of typed-printed non-hazardous manifests for all shipments.

It would be sincerely appreciated if approval can be granted to coincide with field activities. If you could sign and remit to Clearwater Environmental at (907)-522-6228 (fax) it would be greatly appreciated. Thank you for your time and consideration.

Thank you,

Phil Larsen
Clearwater Environmental

Approval Signature

Date 8/1/2000

Scott Pexton.

Alaska Department of Environmental Conservation

Do not delete this section break or logo and address will disappear.
Cc: Norm Straub - AKNG Anchorage

