THE STATE of ALASKA
GOVERNOR BILL WALKER

Department of Environmental Conservation

Division of Spill Prevention and Response
Contaminated Sites Program

610 University Ave.
Fairbanks, Alaska 99709-3643
Main: 907.451.2131
Fax: 907.451.5105

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May 12, 2015

Aemon Wetmore
FAA Alaska Region
222 West 7th Ave., #14
Anchorage, AK 99513-7587

Re: FAA Tanana Station – Summary of Evaluations and Determinations

Dear Mr. Wetmore:

The Alaska Department of Environmental Conservation (DEC) has completed a review of the environmental records associated with the Federal Aviation Administration (FAA) Tanana Station sites in response to tank closure requests for 8 areas of concern (AOCs) at the FAA Tanana Station (letters dated April 8 and 11, 2008), and a multiple AOC closure request (letter dated January 21, 2014). Based on the information provided to date, DEC has determined the site status of each area of concern (AOC). Closure determinations for multiple tanks and AOCs are below.

In addition, remedial and characterization work remains at several FAA Tanana Station sites. Following our discussion of these sites during an April 13, 2015 teleconference meeting, it is recommended that a sitewide post-removal re-characterization effort be conducted to confirm and/or delineate soil and groundwater contamination at areas where historical releases have been observed and have not been issued a "cleanup complete" determination. The current status for each AOC at the FAA Tanana Station is listed below, and the body of the letter summarizes the history of each site and explains the site status determination.

Finally, please note- because of the extensive monitoring well, monitoring probe, and sample boring network at the Tanana FAA Station, DEC recommends providing GIS data with future report submittals involving the FAA Tanana station. This should include all sample boring, monitoring probe/well locations and associated results in a file geodatabase. Utility and former pipeline and structure diagrams, if available, should also be provided.

Comprehensive Site Status Summary for All FAA Tanana Station Areas of Concern

The following identifies DEC site status determinations for all Areas of Concern (AOCs) at the FAA Tanana Station. Specific details for each AOC and file references are available within the text. Please note that additional AOCs may be discovered in the course of site investigations following this letter.

Table 1. Tanana FAA Station Site Status Summary

Area of Concern	Site Status
Visual Approach Slope Indicator (VASI) Facility	Cleanup Complete
Direction Finder (DF) Facility	Cleanup Complete
Log Cabin Site	Cleanup Complete
VORTAC	Cleanup Complete
15-A-1 UST (ADEC Tank 0-001406.1)	Cleanup Complete
15-B-1 UST (ADEC Tank 0-001406.3)	Cleanup Complete
15-B-3 UST	Cleanup Complete
15-B-7 UST	Cleanup Complete
15-B-12 AST	Cleanup Complete
15-B-11 UST	Cleanup Complete
15-B-17 UST	Cleanup Complete
15-B-18 UST	Cleanup Complete
15-C-1 UST (ADEC Tank 0-001406.2)	Cleanup Complete
15-C-2 UST	Cleanup Complete
15-D-1 AST	Cleanup Complete
Building 105 Tank 15-B-8 and Pipeline leaks	Further Action Required
Building 103 Pipeline leak	Further Action Required
Building 102 Tank 15-B-4	Further Action Required
Building 101 Tank 15-B-5	Further Action Required
Building 100 Tank 15-B-6	Further Action Required
Water Treatment and Pumphouse Building 602 Pipeline leak	Further Action Required
Engine Generator Building 600 - Tanks 15-B-9 and 15-B-10	Further Action Required
Former Fuel Storage Site – South of Engine Generator Building 600	Further Action Required
15-B-2 - North of Shop Building 205	Further Action Required
Unknown UST – West of Shop Building 205	Further Action Required
Pipeline West and Northwest of Shop B205	Further Action Required
Recreation Building 30 Pipeline leak	Further Action Required
Former Greenhouse/Building 107 - Tank 15-B-13	Further Action Required
MW015 Upgradient Source	Unconfirmed
Non-Directional Beacon (NDB) Facility	Unconfirmed
Former Landfill Site North of Log Cabin Site	Unconfirmed

To determine if additional remedial work is needed at these areas of concern at the Tanana FAA Station, we reviewed the following reports:

- Environmental Compliance Investigation Report (1992)
- FAA Tanana Station Decommissioning Assessments, Volume 1 and 2 (1997)
- Site Cleanup and Investigation Report (May 1999)
- Release Investigation Report (May 1999)
- Additional Release Investigation Report (July 2000)
- Tanana FAA Facility Groundwater Monitoring, August 2000 (October 2000)
- Product Baildown Tests and Groundwater Sampling Near Yukon River at FAA Tanana Site, Alaska (April 2002)
- September-October 2004 Groundwater Monitoring Report, Groundwater Monitoring, Various Sites, Alaska (November 2005)
- Summary of Available Information in Support of a NFRAP Determination, FAA Tanana Site, Alaska (May 2006)
- FAA Flight Service Station Building Demolition Tanana, AK (April 2007)
- Final Report FAA UST Decommissioning and Soil Remediation (December 2007)
- Tanana Field Site LBP & ACM Abatement, Tanana, AK (2008)
- Tanana Building And Infrastructure Demolition, FAA Tanana Station, Alaska (January, 2015)

Site Description

The FAA Tanana Station is located on the north side of the Yukon River 2 miles west of the confluence of the Tanana and Yukon Rivers, near the community of Tanana (population 258). FAA facilities at the Tanana Station include:

- VORTAC (very-high frequency omnidirectional-range tactical air navigation) facility, 2 miles west of the Tanana runway
- Direction Finder (DF) Facility - 0.2 miles east of VORTAC facility
- Non-Directional Beacon (NDB) Facility, 3 miles west of the Tanana runway
- Flight Service Station (FSS) facility, at the Tanana runway
- Visual Approach Slope Indicator (VASI) Facility - west end of Tanana runway
- Former Quarters Facility, 1/4 mile east of the Tanana runway

Soil in this area consists of 5 to 15 feet silt, sandy silt and silty sand overlaying gravel sediments. Depth to groundwater is 15 to 30 feet below ground surface; seasonal groundwater table fluctuations of up to 16 feet have been recorded. Average annual precipitation is 13 inches, with 50 inches of snowfall.

The primary drinking water source for the residents of Tanana is the watering point at the community washeteria. The nearest drinking water well is offsite, located near the Tanana clinic, approximately 1/4 mile east of the former Living Quarters site. The general groundwater flow direction is generally south, towards the Yukon, not east towards the water supply well.

Cleanup Levels

For AOCs that have been or will be evaluated under 18 AAC 75.340 Method Two, the applicable soil cleanup levels are those in the "Under 40 Inch Zone" under the "Direct Contact", "Outdoor Inhalation", "Ingestion", "Inhalation", and "Migration to Groundwater" columns of Tables B1 and B2

in 18 AAC 75.341. The "Under 40 Inch Zone" refers to the number of inches of rainwater the area receives each year. The applicable groundwater cleanup levels are those in 18 AAC 75.345 Table C. In addition to the COCs listed below, per 18 AAC 75.340(k), for a cleanup conducted under methods two and three, any chemical that is detected at one-tenth or more of the Table B1 direct contact and inhalation cleanup levels must be included when calculating cumulative risk.

Table 2. Tanana FAA Station Contaminants of Concern Cleanup Levels

Contaminants	Method 2 Under 40 Inch Zone Cleanup Levels (mg/kg)						Groundwater Cleanup Levels (mg/L)
	Migration to Groundwater	Ingestion	Inhalation	Direct Contact	Outdoor Inhalation	Maximum Allowable Concentrations	
Gasoline Range Organics (GRO)	300	1,400	1,400	-	-	1,400	2.2
Diesel Range Organics (DRO)	250	10,250	12,500	-	-	12,500	1.5
Residual Range Organics (RRO)	11,000	10,000	22,000	-	-	22,000	1.1
Benzene	0.025	-	-	150	11	-	0.005
Toluene	6.5	-	-	8,100	220	-	1
Ethylbenzene	6.9	-	-	10,100	110	-	0.7
Xylenes	63	-	-	20,300	63	-	10
Lead*	-	-	-	400	-	-	0.015

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

* = Lead cleanup levels are based on land use; for residential land use, the soil cleanup level is 400 mg/kg.

Summary of Tank Decommissioning and Remedial Activities

In 1997, FAA decommissioned fifteen USTs, 7 ASTs, and the associated fuel pipelines at the Tanana Station. Petroleum contamination above department cleanup levels was encountered during these decommissioning activities. Contaminated soil excavated during tank and pipeline decommissioning was stockpiled on site, and thermally treated in 2006.

Additional release investigations were performed in 1998 and 1999 to quantify the nature and extent of the remaining soil and groundwater contamination. During the release investigations, free product was documented at the former Quarters area. Based on the information gathered, groundwater contamination plumes and areas of remaining soil contamination were defined.

Groundwater monitoring was conducted facility-wide from 1999-2004 and summarized in 2005. A follow-up facility-wide summary of available soil and groundwater information was completed in 2006.

In 2006, FAA demolished the FSS building and decommissioned the tank located underneath. Contaminated soil from USTs 15-C-2 and UST 15-C-1 was removed, and stockpiles remaining from previous excavation efforts were thermally treated.

Lead paint, asbestos-containing materials, and several transformers were removed from the facility in 2008.

In 2015, several buildings were removed from the facility along with concrete pads, sidewalks, power poles, sewer lines, and other miscellaneous debris.

Summary of AOCs and Determinations

AOCs with a Cleanup Complete Determination

Visual Approach Slope Indicator (VASI) Facility - west end of Tanana runway
The VASI facility consists of two pairs of VASI light boxes. 1 transformer was identified at this site and was tested for PCBs (1992). All sample results were non-detect (ND). No additional action is needed at this AOC.

Direction Finder (DF) Facility - 0.2 miles east of VORTAC facility
No ASTs or USTs were identified at this facility in 1992. No sampling was conducted. No action is needed at this AOC.

Log Cabin Site - northeast of Building 205
Remains of a former FAA log cabin and stick framed building were located north of Building 205. In 2014, the remains of the log cabin and stick framed building were removed and transported them to the City of Tanana Landfill. The remains of the log cabin and stick framed building included: dimensional lumber, fiberglass insulation and logs. The eight 55-gallon drums labeled "FAA Tanana" that were present in this area in 1992 were not observed at the site in 2014. No additional action is needed at this AOC.

VORTAC
In 1992, one sample was taken at the transclosure for PCBs (non-detect), and one composite sample was taken from the VOR antenna area for chlorinated herbicides, organophosphorus pesticides, and pesticides/PCBs (0.013 mg/kg 4,4-DDD and 0.037 mg/kg 4,4-DDE, all other analytes non-detect). One transformer was identified on site and was determined to be a non-PCB transformer. UST 15-A-1, formerly located at the VORTAC, was closed in 2004. No additional action is needed at this AOC.

15-A-1 UST (ADEC Tank 0-001406.1)

Location	east side VORTAC facility
Date Removed	August 1997
Product	diesel and gasoline
Capacity	1,000 gallons

Confirmation Sampling

Number Collected	6
Analyses	DRO, GRO, BTEX, Lead
Results	below cleanup levels/detection limits

Excavation

Dimensions	9' wide, 18' long, 5' deep
Soils	silt and sandy gravel
Groundwater	not encountered
Thermal Conditions	no frozen soils

Contaminated Soil

Quantity Stockpiled	2 cubic yards
Treatment	thermal remediation (2006)

Determination:
This tank was closed in December 2004 (see enclosed letter). Benzene is below the detection limit; however the detection limit is slightly higher than the current cleanup level. No additional action is needed at this tank.

15-B-1 UST (ADEC Tank 0-001406.3)

Location	45 ft. south of building 205
Date Removed	August 1997
Product	unleaded gasoline
Capacity	515 gallons

Confirmation Sampling

Number Collected	6
Analyses	GRO, BTEX
Results	below cleanup levels/detection limits

Excavation

Dimensions	11' wide, 13' long, 12' deep
Soils	silt/silty sand, gravel at 8.5'
Groundwater	not encountered
Thermal Conditions	no frozen soils

Contaminated Soil

Quantity Stockpiled	60 cubic yards
Treatment	thermal remediation (2006)

Determination:
This tank was closed in December 2004 (see enclosed letter). Benzene is below the detection limit; however the detection limit is slightly higher than the current cleanup level. No additional action is needed at this tank. However, contamination remains at adjacent areas of concern.

15-B-3 UST

Location	North side of building 204
Date Removed	August 1997
Product	Heating oil
Capacity	515 gallons

Confirmation Sampling

Number Collected	6
Analyses	6 DRO, 1 BTEX
Results	DRO 480 mg/kg at east wall of excavation

Excavation

Dimensions	12' wide, 12' long, 6' deep
Soils	silt, sandy gravel, and gravel
Groundwater	not encountered
Thermal Conditions	permafrost at bottom of excavation - west floor

Contaminated Soil

Quantity Stockpiled	35 cubic yards
Treatment	thermal remediation (2006)

Determination:
No additional action is needed at this tank. Additional soil borings near this tank indicate the presence of low-level DRO contamination is limited in extent and is not leaching to groundwater. The remaining low-level DRO contamination does not pose an adverse risk to human health or the environment.

15-B-7 UST

Location	north side of building 300
Date Removed	August 1997
Product	heating oil
Capacity	515 gallons

Confirmation Sampling

Number Collected	6
Analyses	6 DRO, 1 BTEX
Results	Below cleanup levels/detection limits

Excavation

Dimensions	11' wide, 13' long, 9' deep
Soils	silt/silty sand
Groundwater	not encountered
Thermal Conditions	no frozen soils

Contaminated Soil

Quantity Stockpiled	20 cubic yards
Treatment	thermal remediation (2006)

Determination:
No additional action is needed at this tank. Benzene is below the detection limit; however, the detection limit is slightly higher than the current cleanup level.

15-B-12 AST

Location	North of building 602 - pump house
Date Removed	August 1997
Product	Heating oil
Capacity	285 gallons

Confirmation Sampling

Number Collected	N/A
Analyses	N/A
Results	N/A

Excavation

Dimensions	N/A
Soils	Silty, loamy sands
Groundwater	N/A
Thermal Conditions	N/A

Contaminated Soil

Quantity Stockpiled	N/A
Treatment	N/A

Determination:
AST 15-B-12 was removed in 1997. Field screening and observations indicated no release had occurred below the AST. The AST decommissioning report (1997), mistakenly indicated that there was a spill at this site. This was corrected in 2004, when it was clarified that the pipeline leading to the AST had been the source of the leak and the contaminated soil had apparently not reached the AST's location. Further action may be required at the site of the pipeline leak. However, no further action is required at the location of AST-B-12.

15-B-11 UST

Location	West of storage building 30
Date Removed	August 1997
Product	Heating oil
Capacity	515 gallons

Confirmation Sampling

Number Collected	6
Analyses	6 DRO, 2 BTEX
Results	Below cleanup levels/detection limits

Excavation

Dimensions	10' wide, 19' long, 8.5' deep
Soils	Silt/silty sand
Groundwater	Not encountered
Thermal Conditions	No frozen soils

Contaminated Soil

Quantity Stockpiled	45 cubic yards
Treatment	thermal remediation (2006)

Determination:
No additional work needed at this location. Benzene at the excavation bottom was below the detection limit; however, the detection limit is slightly higher than the current cleanup level. There was evidence of a pipeline leak just northeast of the UST location which was sampled in 1999. Further action may be required at the site of the pipeline leak (Samples SB039 and SB065-66). However, no further action is required at the location of 15-B-11.

15-B-17 UST

Location	Southwest of building 103
Date Removed	August 1997
Product	Heating oil
Capacity	515 gallons

Confirmation Sampling

Number Collected	6
Analyses	6 DRO, 1 BTEX
Results	Below cleanup levels/detection limits

Excavation

Dimensions	9' wide, 13' long, 5.5' deep
Soils	Silt/silty sand
Groundwater	Not encountered
Thermal Conditions	No frozen soils

Contaminated Soil

Quantity Stockpiled	20 cubic yards
Treatment	Thermal remediation (2006)

Determination:
No additional work needed at this location. 20 cubic yards of contaminated soil were removed during the UST decommissioning and were thermally remediated in 2006. All analytes were non-detect at the excavation bottom. Benzene was below the detection limit; however the detection limit is slightly higher than the current cleanup level. There was evidence of a pipeline leak just south of the UST location which was observed during the decommissioning. Further action may be required at the site of the pipeline leak (Sample 048QP). However, no further action is required at the location of 15-B-17.

15-B-18 UST

Location	Southwest of building 104
Date Removed	August 1997
Product	Heating oil
Capacity	515 gallons

Confirmation Sampling

Number Collected	5 (1997); 6 (1999)
Analyses	DRO (5), BTEX (1) (1997); DRO (6), BTEX (4) (1999)
Results	8,400 and 860 mg/kg DRO (1997); ND (1999)

Excavation

Dimensions	12' wide, 17' long, 10.5' deep
Soils	Silty/loamy sands
Groundwater	Not encountered
Thermal Conditions	No frozen soils

Contaminated Soil

Quantity Stockpiled	80 cubic yards
Treatment	Thermal remediation (2006)

Determination:
Following the 1997 decommissioning and soil removal of ~80 cubic yards, contamination underlying the location of UST 15-B-18 remained at 10.5' bgs above the Method 2 migration to groundwater cleanup level. The soil stockpile was remediated in 2006. Groundwater monitoring following the excavation, from 1999-2004, at monitoring probe MP010 has indicated that the remaining contamination is not leaching into groundwater. Borings placed to the west, northwest, and southwest of the contaminated area were non-detect from 0-~30' bgs, indicating that the remaining soil contamination is very isolated in area and de minimis in mass. Therefore, this site will be given a "cleanup complete" determination.

15-C-1 UST (ADEC Tank 0-001406.2)

Location	east of FSS building
Date Removed	August 1997
Product	heating oil
Capacity	1,000 gallons

Confirmation Sampling

Number Collected	6 (1997), 5 (2007)
Analyses	6 DRO, 1 BTEX (1997), 5 GRO, DRO, BTEX (2007)
Results	DRO at 11,000 mg/kg in south wall sample (1997), all below cleanup levels (2007)

Excavation

Dimensions	11' wide, 13' long, 12' deep
Soils	silt/silty sand
Groundwater	not encountered
Thermal Conditions	no frozen soils

Contaminated Soil

Quantity Stockpiled	60 cubic yards; Contamination left in place due to proximity of FSS building.
Treatment	thermal remediation (2006)

Determination:
No additional work needed at this location. Contamination left in place was removed when the adjacent tank 15-C-2 was decommissioned in 2006 and the FSS was demolished.

15-C-2 UST

Location	under FSS building
Date Removed	September 2006
Product	heating oil
Capacity	8,000 gallons

Confirmation Sampling

Number Collected	9
Analyses	DRO, RRO, GRO, and BTEX
Results	Below cleanup levels

Excavation

Dimensions	18 to 27 feet wide, 24 to 30 feet long, and 4 to 11 feet deep
Soils	silt/silty sand
Groundwater	not encountered
Thermal Conditions	no frozen soils

Contaminated Soil

Quantity Stockpiled	165 cubic yards
Treatment	thermal remediation (2006)

Determination:
No additional work needed at this location.

15-D-1 AST

Location	west of Quarters area
Date Removed	August 1997
Product	gasoline
Capacity	8,000 gallons

Confirmation Sampling

Number Collected	1
Analyses	GRO, BTEX
Results	Below cleanup levels

Excavation

Dimensions	N/A
Soils	N/A
Groundwater	N/A
Thermal Conditions	N/A

Contaminated Soil

Quantity Stockpiled	N/A
Treatment	N/A

Determination:
No additional work needed at this location. Benzene was not detected above the detection limit; however the detection limit was slightly higher than the current cleanup level.

Pursuant to 18 AAC 75.325(g), when detectable contamination remains on-site following a cleanup, a cumulative risk determination must be made that the risk from hazardous substances does not exceed a cumulative carcinogenic risk standard of 1 in 100,000 across all exposure pathways and does not exceed a cumulative noncarcinogenic risk standard at a hazard index of one across all exposure pathways. Based on a review of the environmental record, DEC has determined that residual contaminant concentrations do not pose a cumulative human health risk for any of the above sites.

Following investigation and cleanup at the above sites, exposure to the remaining contaminants was evaluated using DEC's Exposure Tracking Model (ETM). Exposure pathways are the conduits by which contamination may reach human or ecological receptors. ETM results show all pathways to be one of the following: De-Minimis Exposure, Exposure Controlled, or Pathway Incomplete. A summary of this pathway evaluation is included in the Table below.

Table 3. Exposure Pathway Evaluation for Tanana FAA Station Sites Closed in 2015

Pathway	Result	Explanation
Surface Soil Contact	De-Minimis Exposure	Contamination is present in surface soil at some sites (0 to 2 feet below ground surface), but it is below ingestion/direct contact cleanup levels.
Sub-Surface Soil Contact	De-Minimis Exposure	Contamination remains in the sub-surface at some of the above sites, but is below ingestion/direct contact cleanup levels.
Inhalation – Outdoor Air	De-Minimis Exposure	Contamination remains in the sub-surface at some sites, but is below inhalation cleanup levels.
Inhalation – Indoor Air (vapor intrusion)	De-Minimis Exposure	DEC has determined that this pathway is de minimis because the remaining concentrations at some sites are not a risk to human health or the environment.

Groundwater Ingestion	Pathway Incomplete	Groundwater contamination is not present at these sites.
Surface Water Ingestion	Pathway Incomplete	Surface water is not present at the above sites, and any contamination remaining is below concentrations that would cause a surface water risk.
Wild and Farmed Foods Ingestion	De-Minimis Exposure	The contaminants of concern present at some of the above sites which have the potential to bioaccumulate in plants or animals are not present in concentrations high enough to cause an ecological risk.
Exposure to Ecological Receptors	De-Minimis Exposure	The few contaminants of concern which remain in areas accessible to ecological receptors at some of the above sites are not present in concentrations high enough to cause an ecological risk.

The tanks and AOCs summarized above will receive a "Cleanup Complete" designation on the Contaminated Sites Database, subject to the following standard conditions.

Standard Conditions

1.Any proposal to transport soil or groundwater off-site requires DEC approval in accordance with 18 AAC 75.325. A "site" [as defined by 18 AAC 75.990 (115)] means an area that is contaminated, including areas contaminated by the migration of hazardous substances from a source area, regardless of property ownership.

2.Movement or use of contaminated material in a manner that results in a violation of 18 AAC 70 water quality standards is prohibited.

This determination is in accordance with 18 AAC 75.380 and does not preclude DEC from requiring additional assessment and/or cleanup action if future information indicates that this site may pose an unacceptable risk to human health or the environment.

Appeal

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340 or an informal review by the Division Director in accordance with 18 AAC 15.185. Informal review requests must be delivered to the Division Director, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99811-1800, within 15 days after receiving the department's decision reviewable under this section. Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99811-1800, within 30 days after the date of issuance of this letter, or within 30 days after the department issues a final decision under 18 AAC 15.185. If a hearing is not requested within 30 days, the right to appeal is waived.

AOCs with Further Action Required

Building 105 Tank 15-B-8 and Pipeline leaks

This site is composed of a comingled soil and groundwater plume stemming from several sources: a potential release at Tank 15-B-8, a release from the pipeline junction northwest of former Building 105, and a release from the pipeline south of former Building 105. Benzene, DRO and GRO groundwater contamination is present below the location of the former UST and the two pipeline leaks as indicated by several monitoring probes. Contamination between 0-10 feet is present at the location of both pipeline leaks, and a subsurface soil contamination plume extends from the northwest pipeline leak to the south pipeline leak. The soil in the area of the UST to a depth of 6.5 feet is composed of clean backfill and should not be resampled. The extent of soil contamination has not been characterized, and it is unknown if the groundwater contamination has reached monitoring well MW003 downgradient. The upgradient and lateral boundaries of groundwater contamination have not been determined.

Location	Southwest corner Building. 105
Date Removed	August 1997
Product	Heating oil
Capacity	515 gallons

Confirmation Sampling

Number Collected	6
Analyses	6 DRO, 1 BTEX
Results	Below cleanup levels/detection limits

Excavation

Dimensions	11' wide, 22' long, 6.5' deep
Soils	Silt/silty sand
Groundwater	Not encountered
Thermal Conditions	No frozen soils

Contaminated Soil

Quantity Stockpiled	25 cubic yards
Treatment	thermal remediation (2006)

Determination:

Additional work is needed at this site. The surface soil, subsurface soil, and groundwater contamination at this site must be characterized. Previous characterization efforts were incomplete.

Building 103 Pipeline leak

Soil contamination was noted in 1998 along the pipeline directly to the southeast of UST 15-B-17. The soil was excavated, though contaminated was detected above DEC cleanup levels at the bottom of the excavation (5,200 mg/kg DRO, sample 048QP, 1998). Monitoring Probe MP009, located directly downgradient of the spill location, did not detect any groundwater contamination from 1999-2004.

Determination:

To determine if contamination remains in this area, confirmation screening/sampling should be conducted in the soil adjacent to sample location 048QP, and confirmation groundwater sampling should be conducted at MP009.

Building 102 Tank 15-B-4

Subsurface soil contamination was detected at this site following the removal and excavation of UST 15-B-4. Groundwater (GW) contamination at the site has been variable from 1999-2004 in monitoring well MW014, and in monitoring probe MP018. No groundwater contamination was detected in 2003-04, but 19 mg/L DRO was detected in 2000 at MW014. Free product was observed in MP018 in 1999, though in later sampling events DRO was non-detect. DRO is present below the former tank location above maximum allowable concentrations (MAC) at 20-25' bgs (18,000 mg/kg).

Determination

Characterize and remediate the remaining soil contamination. Seasonal or biannual sampling of MW014 and MP018 will be required to capture seasonal variation.

Building 101 Tank 15-B-5

Surface and subsurface soil contamination was detected at this site following the removal and excavation of UST 15-B-5. Subsurface contamination likely comingles with the soil contamination plume from 15-B-13 and 15-B-6. Groundwater in the source area has not been sampled. Monitoring probe MP017, 70 feet downgradient of the former UST location, was 5 mg/L DRO in September 2003. There is no other apparent upgradient source for this contamination.

Determination

Sample groundwater in the source area of UST 15-B-5, determine groundwater contamination extent, and characterize the surface and subsurface soil contamination in the comingled plume.

Building 100 Tank 15-B-6

Surface and subsurface soil contamination was detected at this site following the removal and excavation of UST 15-B-6. Subsurface contamination likely comingles with the soil contamination plume from 15-B-13 and 15-B-5. DRO contamination in the groundwater above cleanup levels was detected in monitoring probe MP008, adjacent to the former UST location.

Determination

Characterize the surface and subsurface soil contamination in the comingled plume. Characterize the extent of groundwater DRO contamination with the next sampling event.

Water Treatment and Pumphouse Building 602 Pipeline leak

A Pipeline leak was noted east of tank 15-B-12 in 1997. Five (5) cubic yards of contaminated soil were removed from the area in 1997, though no confirmation samples are noted in the removal report.

Determination

Confirmation sampling should be conducted in the area of the former pipeline leak to determine if contamination remains at the AOC.

Engine Generator Building 600 - Tanks 15-B-9 and 15-B-10
Two 600-gallon ASTs holding diesel and heating oil, 15-B-9 and 15-B-10, were located directly south of Building 600. Following their removal, contamination was detected in surface and subsurface soil. Groundwater was contaminated with GRO, DRO, and free product was observed in the source area monitoring probe MP012 in 2000. The soil contamination apparently comingles with the contamination from the former fuel storage area, which extends to the Yukon River. Undelineated contamination has also been detected in soil to the north of the former tank locations at soil boring SB067. It is unknown if this contamination stemmed from the tanks or if another upgradient source is present in the area.

Determination
Delineate the soil contamination in the comingled plume with the fuel storage site and continue groundwater monitoring to determine the current nature and extent of contamination.

Former Fuel Storage Site – South of Engine Generator Building 600
Tanks 15-B-14, 15-B-15, 15-B-16 were located together in a fuel storage area south of the Engine Generator Building 600. Upon their removal, it was discovered that surface and subsurface soil contamination was present in the area. Further characterization indicated that the soil contamination extends to the Yukon River and comingles with that of the upgradient sources associated with Building 600. Groundwater contamination under the fuel storage area is apparently part of large DRO-contaminated groundwater plume extending south from Building 600. Free product was observed in the downgradient monitoring probe MP029 in in 1999, and 19 mg/L DRO was detected in MP029 in 2004.

Determination
Delineate the soil contamination in the apparently comingled plume with Building 600 and continue groundwater monitoring to determine the current nature and extent of contamination.

15-B-2 - North of Shop Building 205
Extensive surface and subsurface soil contamination was detected around this site following the tank removal.
A large plume of groundwater contamination with benzene, GRO, and DRO above DEC cleanup levels is present in the area, with free product observed in 2004 at source area monitoring probe MP002, and the comingled DRO groundwater plume extending south to at least MW018 (150 feet+ from the source areas).

Determination
Complete the delineation of soil and groundwater contamination. Determine the southern extent of groundwater contamination, and delineate the boundaries of soil contamination.

Unknown UST – West of Shop Building 205
DEC records do not have a designation for this former UST. Extensive surface and subsurface soil contamination was detected around this site. A large plume of groundwater contamination with benzene, GRO, and DRO above DEC cleanup levels is present in the area, with free product observed in 2004 at MP003, and the comingled DRO groundwater plume extending south to at least MW018 (150 feet+ from the source areas).

Determination
Complete delineation of soil and groundwater contamination. Determine southern extent of groundwater contamination, and delineate the boundaries of soil contamination.

Pipeline West and Northwest of Shop B205
Several pipeline leaks adjacent to building 205 are apparently source areas for soil and groundwater contamination observed at monitoring probe MP006 (which contained free product in 2004), and in soil boring SB010, where the pipeline splits to east and west. In 1999, soil borings SB15 and SB16 were advanced at the south end of where the pipeline was left in place, south of MP006. DRO was detected above DEC cleanup levels from 10 to 25 feet bgs. The highest concentration in the area was 2,100 mg/kg DRO (SB16, 20-25 ft.). BTEX was below cleanup levels. Also in 1999, 7 borings (SB09, 10, 12, 18, 59, 68, and 69) were advanced at the location of the decommissioned pipeline north of Building 205. DRO was detected at concentrations up to 11,000 mg/kg (SB10, 5-10 ft.). Benzene was also detected above cleanup levels. These pipeline leaks are possibly additional sources to the large comingled soil and groundwater contamination around Building 205.

Determination
Complete the delineation of soil and groundwater contamination. Determine southern extent of Groundwater contamination, and delineate the boundaries of soil contamination.

Recreation Building 30 Pipeline Leak
Following the removal of UST 15-B-11, DRO contamination was indicated in samples taken along the pipeline northeast of the former UST location (2100 mg/kg DRO in 1999). Groundwater sampling at MW004, downgradient of the pipeline leak, has ranged from 1.5 mg/L (2003), to ND.

Determination
Delineate the remaining soil contamination at the pipeline leak and continue groundwater monitoring at MW004.

Former Greenhouse/Building 107 - Tank 15-B-13
Surface and subsurface soil contamination was detected at this site following the removal and excavation of UST 15-B-13. Subsurface contamination from this site likely comingles with the plume from 15-B-5 and 15-B-6 in the living quarters area. No groundwater contamination has been observed in the well closest to the source area (MW013), though the well may be upgradient.

Determination
Delineate soil contamination in the surface and in the comingled area. Continue groundwater monitoring downgradient, and evaluate any seasonal or biannual variation at MW013.

Unconfirmed Areas of Concern

MW015 Upgradient Source

Monitoring well MW015 is located ~60 feet northwest of shop building 205. Benzene and DRO contamination has been detected above cleanup levels in this well. DRO and benzene generally increased between monitoring events from 2000-2004, with benzene exceeding groundwater cleanup levels for the first time in 2004. It is unknown if this contamination is from an unidentified upgradient source or from one of the previously documented downgradient releases from pipelines and tanks. MW019, crossgradient to the northeast, was clean from 2000-2004.

Determination

Sample subsurface soil and groundwater upgradient of MW015 to determine the extent of subsurface soil and groundwater contamination – upgradient sampling, in conjunction with concurrent sampling at MW015, should indicate if an unidentified, upgradient source is present.

Non-Directional Beacon (NDB) Facility

During the 1960's a storage shed, a generator, and 2 fuel storage tanks were removed from the NDB facility. It is unlikely that confirmation samples were taken following the removal. The only structure currently located at the facility is an antenna and associated transformer. The transformer oil sampled in 1992 contained 320 mg/kg PCBs. Two (2) soil samples were collected from the NDB facility in 1992- one composite sample for chlorinated herbicides, organophosphorus pesticides, and pesticides/PCBs and one near the transclosure for PCBs. 4,4-DDD (0.012 mg/kg), 4,4-DDE (0.026 mg/kg), and 4,4-DD (0.010 mg/kg) were detected in the composite sample. All other analytes were non-detect. Current FAA records show a non-PCB transformer located at the NDB numbered J96C5765, so it is presumed that the transformer containing PCBs was swapped out.

Determination

During the next field effort the area should be observed for any signs of contamination, transformer J96C5765 should be confirmed as the only transformer in the area, and a confirmation sample should be taken in the area below the bottom of the two former storage tanks.

Former Landfill Site North of Log Cabin Site

According to a Tanana resident, this area, located across the trail to the north of the log cabin site, was formerly used as a landfill. Obvious debris observed in 1992 included: insulation, cable spools, pipe, and a bulldozer track. This property was formerly owned by FAA. Debris was removed north of the log cabin site and a visual inspection of the area was performed during site visits before and then during the 2014 field effort. However, none of the items observed in 1992 were observed or removed and it is possible that the 2014 investigation did not go as far north as the trail.

Determination

A more extensive investigation of the area will be performed during the next field effort.

Please sign and return *Attachment A* to ADEC within 30 days of receipt of this letter. If you have any questions, please do not hesitate to contact me at (907) 451-2131, or by email at monte.garroutte@alaska.gov.

Sincerely,

Recommended By

Monte Garroutte
Environmental Program Specialist

Approved By

Fred Vreeman
Project Manager

Enclosure: Attachment A - Record of Decision Agreement and Signature Page
2004 Site Closure Letter for 15-A-1 and 15-B-1
Summary of Soil Boring Results and Figures, Tanana FAA Station
1998-2004 Groundwater Monitoring Results and Figures
2000-2004 Continuous Water Level Monitoring Results, Tanana FAA Station

Attachment A: Record of Decision Agreement and Signature Page

The Federal Aviation Administration agrees to the terms and conditions of this Summary of Evaluations and Determinations, as stated in decision letter for the FAA Tanana Station, dated May 12, 2015.

Signature of Authorized Representative, Title
Federal Aviation Administration

9/17/15
Date

Aemon Wetmore, Env. Engineer
Printed Name of Authorized Representative, Title
Federal Aviation Administration

Note to Responsible Person (RP):
After making a copy for your records, please return a signed copy of this form to the ADEC project manager at the address on this correspondence within 30 days of receipt of this letter.

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
CONTAMINATED SITES PROGRAM

FRANK MURKOWSKI, GOVERNOR

610 University Avenue
Fairbanks, AK 99709-3643
PHONE: (907) 451-2158
FAX: (907) 451-5105
http://www.state.ak.us/dec/

File: 780.26.001

December 3, 2004

Mr. Jim Swalling
Federal Aviation Administration
222 West Seventh Avenue, #14
Anchorage, AK 99513-7587

Re: FAA Tanana VORTAC

Dear Mr. Swalling:

The Alaska Department of Environmental Conservation (ADEC or the Department) has reviewed the tank decommissioning reports for two underground storage tanks (USTs) previously located at the FAA Tanana VORTAC facility. This site is located at the airport in the village of Tanana on the shore of the Yukon River. Soil in this area consists of sand, gravel, and silt and depth to groundwater is greater than 20 feet below ground surface. Groundwater at this site is not used for drinking water and groundwater was not encountered during the removal of these tanks. Tank 15-A-1 was a 1,000-gallon diesel UST that was formerly used to store gasoline and tank 15-B-1 was a 515-gallon gasoline UST. Both tanks were decommissioned on August 28, 1997. Approximately 2 cubic yards of soil from the UST 15-A-1 excavation and approximately 60 cubic yards of soil from the UST 15-B-1 excavation were stockpiled based upon results of field screening. Three soil samples were collected from the UST 15-A-1 stockpile and analyzed for gasoline-range organics (GRO), benzene, toluene, ethylbenzene, and xylenes (BTEX), diesel-range organics (DRO), and lead. GRO and BTEX were not detected in any sample. Low levels of DRO and lead were detected in all samples but concentrations were well below the ADEC cleanup levels. Seven soil samples were collected from the UST 15-B-1 stockpile and analyzed for GRO and BTEX. Low levels of various BTEX compounds and GRO were detected in all samples but concentrations were also well below ADEC cleanup levels. Two samples and a duplicate were collected from the bottom of the UST 15-A-1 excavation; four samples were collected from the sidewalls of the excavation. Concentrations of GRO, DRO, BTEX, and lead were either below ADEC cleanup levels or not detected. Two floor samples and four sidewall samples were collected from the UST 15-B-1 excavation. Concentrations of GRO and various BTEX compounds were either below ADEC cleanup levels or not detected. The detection limit for benzene in all samples slightly exceeded the ADEC Method Two, Table C cleanup level of 0.02 mg/kg. Detection limits were between 0.03 mg/kg and 0.05 mg/kg, however, benzene was not detected in any sample.

Approved Cleanup Levels
The approved soil cleanup levels listed below are for Method Two, Under 40 Inch Zone. These cleanup levels can be found at 18 AAC 75.341(c), Tables B1 and B2.

Contaminant	Cleanup Level (mg/kg)
Diesel-Range Organics (DRO)	250
Gasoline-Range Organics (GRO)	300
Benzene	0.02
Toluene	5.4
Ethylbenzene	5.5
Xylenes	78
Lead	400

Exposure Pathways
The ingestion, inhalation, and migration to groundwater pathways are incomplete for GRO, DRO, BTEX, and lead because all measured concentrations were below cleanup levels. Although the detection limits for benzene slightly exceeded the ADEC cleanup level, benzene was not detected in any sample. If benzene was present at levels between 0.02 and 0.05 mg/kg, it would likely not pose an ingestion risk because it is buried and groundwater at this site is not used as a drinking water source. Likewise, it would not pose an inhalation risk because there are no structures over the former excavations to trap potential vapors.

Determination
The investigation and cleanup at the FAA Tanana VORTAC facility have met all requirements specified in 18 AAC 75 Article 3 - Discharge, Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances and 18 AAC 78, Underground Storage Tanks. The Department has determined that **No Further Action** is required at this site. This site will be formally closed in the ADEC leaking Underground Storage Tank database.

Closure
In accordance with 18 AAC 75.380(d)(1) and 18 AAC 78.276, additional investigation and cleanup may be required if new information is discovered which leads ADEC to make a determination that the cleanup described in this decision is not protective of human health, safety, and welfare or the environment.

Appeal
Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 — 18 AAC 15.310 or an informal review by the Division Director in accordance with 18 AAC 185 — 18 AAC 15.190. Informal review requests must be delivered to the Director of the Division of Spill Prevention and Response, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 15 days of receipt of this letter. Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 30 days after the issuance of this letter or within 30 days after the Department issues a final decision under 18 AAC 15.185. If a hearing is not requested within 30 days, the right to appeal is waived.

If you have any questions or concerns, please contact me at (907) 451-2158 or via email at sharon_richmond@dec.state.ak.us.

Sincerely,

Sharon Richmond
Environmental Specialist

LEGEND

- 1997 DECOMMISSIONING ASSESSMENT SAMPLE
- 1997 TEST PIT (PID RESULTS ONLY)
- 1998 MONITORING PROBE LOCATION
- 1998 SOIL BORING LOCATION
- 1999 MONITORING WELL LOCATION
- 1999 SEDIMENT SAMPLE LOCATION
- 1999 SURFACE WATER SAMPLE LOCATION
- INTERMITTENT STREAM
- FUEL LINE REMOVED
- FUEL LINE REMAINING
- LIMITS OF UST EXCAVATION
- FREE PRODUCT OBSERVED IN MONITORING WELL OR PROBE, OCTOBER 2004

- SHALLOW DRO > 250 mg/Kg
- SHALLOW BENZENE > 0.02 mg/Kg
- SHALLOW TOLUENE > 5.4 mg/Kg
- SHALLOW ETHYLBENZENE > 5.5 mg/Kg
- SHALLOW XYLENES > 78 mg/Kg

NOTE:
ALL FAA FUEL STORAGE TANKS IN THE FORMER LIVING QUARTERS AREA HAVE BEEN REMOVED

SB121, MW019, SB115, MW015, SB059, SB012, 137S to 142S, MP001, SB119, MW020, SB069, SB068, SB010, 091QP, MP002, SB009, SB008, SB120, SB018, SB060, SB011, SB061, SB058, 085Q10, BLDG #204 (REMOVED), STATE, MP006, SB014, SHOP #205, MP003, SB015, 129S to 135S, SB072, MP004, SB016, SB017, 086QP, SB013, 087QP, MP005, APPROXIMATELY 200' TO STATE AIRPORT PROPERTY BOUNDARY, PAINT HOUSE (STATE), MW012, BLM, STATE GARAGE, FL, TO AIRPORT AND FSS BLDG, MW009, SD-04, MW010, 207 BLM, MP015, COMSERFAC #300 (REMOVED), SB067, 143S to 148S, ENG-GEN #600, MP012, SB034, SB035, SB032, MP023, MW011, 106P13, SB037, SB062, MP016, MP018, SD-03/SD-05, SW-02/SW-03, SD-02, MW016, SB029, SB033, SB030, SB031, MW008, TP-4, TP-6, SB028, MP025, TP-5, SB063, SB038, MP013, TP-2, TP-7, SB064, MP014, MP017, SB025, SB026, SB027, SB024, 11216, SB023, TP-3, TP-1, MW017, SB022, MP011, SB021, SB122, SD-01, SW-01, MP028, MW007, MW006, MP029, MW005, SB066, SB039, SB065, #30 (REMOVED), MW004, MW003, MW002, FORMER GREENHOUSE (REMOVED), MW013, SB049, SB057, SB001, SB056, 090QP2, SB048, 014Q3 to 020Q3, 077QP, BLM #106, SB041, SB042, SB044, SB043, 075P, MP008, 074P, MP007, SB040, SB019, SB050, MW014, SB070, SB054, SB055, SB071, SB020, 076P, SB047, SB053, SB052, SB051, QTRS #100 (REMOVED), SB045, SB046, 037Q6, QTRS #101 (REMOVED), 021Q4, QTRS #102 (REMOVED), ROAD, MW018, LS, S, QTRS #105 (REMOVED), QTRS #104 BLM, QTRS #103 BLM, SB003, SB004, SB006, 051Q8, 050Q8, SB007, MP024, SB005, MP010, SB002, 048QP, TO TANANA, MP009, (REMOVED) #602, (REMOVED) MW001, YUKON RIVER

0 30 60 90
SCALE: 1"=60'

CH2MHILL

Figure 6
Interpreted Extent of Contamination
Above Cleanup Goals in Shallow Soils
(0 to 10 Feet Deep)
Former Living Quarters and Shop Building Areas
Tanana FAA Station, Alaska

LEGEND

- 1997 DECOMMISSIONING ASSESSMENT SAMPLE
- 1998 MONITORING PROBE LOCATION
- 1998 SOIL BORING LOCATION
- 1999 MONITORING WELL LOCATION
- 1999 SEDIMENT SAMPLE LOCATION
- 1999 SURFACE WATER SAMPLE LOCATION
- INTERMITTENT STREAM
- FUEL LINE REMOVED
- FUEL LINE REMAINING
- LIMITS OF UST EXCAVATION
- FREE PRODUCT OBSERVED IN MONITORING WELL OR PROBE, OCTOBER 2004

- DEEP DRO > 250 mg/Kg
- DEEP BENZENE > 0.02 mg/Kg
- DEEP TOLUENE > 5.4 mg/Kg
- DEEP ETHYLBENZENE > 5.5 mg/Kg
- DEEP XYLENES > 78 mg/Kg

NOTE:
ALL FAA FUEL STORAGE TANKS IN THE FORMER LIVING QUARTERS AREA HAVE BEEN REMOVED

SCALE: 1"=60'

Figure 7
Interpreted Extent of Contamination Above Cleanup Goals in Deep Soils (Greater than 10 Feet Deep)
Former Living Quarters and Shop Building Areas
Tanana FAA Station, Alaska

Table 4-2
Summary of Field Data and Laboratory Results for Soil
Former Living Quarters Area, Tanana FAA Station

Depth	5' - 10' bgs										10' - 15' bgs										15' - 20' bgs										20' - 25' bgs										25' - 30' bgs										30' - 35' bgs									
	Field Data		Laboratory Data								Field Data		Laboratory Data								Field Data		Laboratory Data								Field Data		Laboratory Data								Field Data		Laboratory Data								Field Data		Laboratory Data							
Boring	Headspace	Odor	DRO	Benzene	Toluene	Ethylbenzene	Xylene	PAH			Headspace	Odor	DRO	Benzene	Toluene	Ethylbenzene	Xylene	PAH			Headspace	Odor	DRO	Benzene	Toluene	Ethylbenzene	Xylene	PAH			Headspace	Odor	DRO	Benzene	Toluene	Ethylbenzene	Xylene	PAH			Headspace	Odor	DRO	Benzene	Toluene	Ethylbenzene	Xylene	PAH			Headspace	Odor	DRO	Benzene	Toluene	Ethylbenzene	Xylene	PAH		
1. Decommissioned Fuel Pipeline Southeast of State Building																																																								
SB015	114	strong									123	strong	1100								113										32	strong	6.3	ND	0.014	0.017	0.11				4	slight									0	slight								
SB016	0	slight									0	slight									472	slight	940								562		2100	ND	1.6	2	14																						
2. Stained Soil Area West of Building 205																																																						
SB013	96	slight									140		2300								82										74		47	0.023	0.012	0.11	0.68																						
SB014	163	heavy									153		5500								127										181	slight	3400	0.19	1.3	3.7	23				10	slight																	
SB017	13	slight									11	slight	11	ND	0.021	0.01	0.11				395	strong	7200	0.69	11	15	86	22.0			26	slight																																				
SB061	23.2										167		3500								45.2										950	strong	4700	0.21	0.59	7.8	30																						
SB072	2.7	none									2.8	none	ND								2.4	none									2.9	none	ND	ND	0.026	0.018	0.063				7.3	fuel																	
3. UST 15-B-2, Northwest Corner of Shop Building 205																																																						
SB008	0	none									1										164	strong	1900								151		2900	0.038	0.018	1.2	3.5																						
SB011	0										0										0										0		4.7	ND	ND	ND	0.012																						
SB060											224.1		270	ND	0.027	0.15	0.77				514.2	strong	2800								729.4	strong	2900	ND	0.87	5.3	29				629.2	strong																	
4. UST 15-B-3, North Side of Post Building 204																																																					
SB058	79		ND								115										110										156		ND	ND	0.018	ND	0.05				167																		
5. UST 15-B-4, Northeast Side of Quarters Building 102																																																					
SB051	25.4										3.6		1000								1.6										1.5		4.8	ND	ND	ND	ND				1.2		4.8	ND	ND	ND	ND										
SB052			ND										ND	ND	ND	ND	0.015														0		ND	ND	ND	ND	ND				0		ND	ND	ND	ND	ND										
SB053																					0		ND																																		
SB054	7.2										160										96										259		18000	ND	ND	ND	0.012				99		ND	ND	ND	ND	0.012										
SB055	2000	fuel	86	ND	ND	ND	11				>2000										420	slight	400								252	none	8200	ND	ND	ND	ND				215	none																	
SB070											4		ND																		5.3		ND	ND	0.028	0.017	0.086				5																		
SB071	3.2	none									2.1	none	ND								4.2	none									3.9	none	ND	ND	0.022	0.021	0.1				2.9	none	ND	ND	0.022	0.021	0.1										
6. UST 15-B-5, Northeast Side of Quarters Building 101																																																						
SB050											0		6600								€										0		7900	ND	ND	ND	0.023				0																		
7. UST 15-B-6, Northeast Side of Quarters Building 100																																																					
SB046											7.3	mild	140								6.3	slight									4.8	slight	ND	ND	ND	ND	ND				4.8																		
SB047	0	none	160								0	slight									€	none									0		ND	ND	0.024	ND	0.061				0		ND	ND	0.024	ND	0.061										
8. AST 15-B-9 and AST 15-B-10, South of Engine Generator Building 600																																																					
SB032	1	none									7	slight	ND								0	slight									2	slight	ND	ND	ND	ND	ND				1	slight																	
SB033		fuel									33	fuel	ND								160	strong									140	strong	ND	ND	ND	ND	0.013				64																		
SB034	800	heavy									99	heavy									64	fuel	3000								108	strong	2000	ND	ND	0.31	2.4				106																		
SB035	99	strong									67	strong									35	strong	1900								64	strong	1300	ND	ND	ND	1.1				39	strong																	
9. UST 15-B-11, West of Former Storage Building 30																																																					
SB039	1105	strong	12000								64.4	strong									95.6	fuel									188	slight	ND	ND	ND	ND	0.077				110	none																	
SB065	1092	strong									13	strong	12								36	strong									11.3	none	13	ND	0.022	ND	0.063				11.3	none																	
SB066	625	fuel									20	none									53.8	slight	4.5								13	slight	ND	ND	0.6	0.03	0.15				12.4	none																	
10. UST 15-B-13, East of Former Greenhouse																																																					
SB048																					€		2000								0		1600	ND	ND	ND	ND				0		1600	ND	ND	ND	ND										
SB049	0		9600								0										€										0		4.3	ND	0.02	ND	0.039				0																		
11. AST 15-B-14, AST 15-B-15, and AST 15-B-16, South of Engine Building 600 (Former Tank Farm																																																					
SB021	1	none									0	slight	ND								€	none									0	slight	ND	ND	ND	ND	0.018																						
SB022	0	slight									0	none									€	none									0	slight	ND	ND	ND	ND	0.025																						
SB023	2	none	8.2								2	none									€	none									2	none	ND	ND	ND	ND	ND				1	none																	
SB024	118	slight	870								6	none									3	slight									6	heavy	7.2	ND	ND	0.011	0.017																						
SB025	57	slight	92								4	none									3	none									3	none	ND	ND	ND	ND	ND																						
SB026	4	slight									2	none									3	none									4	none	ND	ND	ND	ND	ND																						
SB027	5	slight	85								3	slight									3	none									8	slight	ND	ND	ND	ND	0.008				8	slight																	
12. UST 15-B-18, Southwest of Quarters Building 104																																																					
SB003	2	none									4	none	ND								2										4		ND	ND	ND	ND	ND				4																		
SB004	1	none									1	none									2	none									4		ND	ND	ND	ND	ND				3																		
13. Former Fuel Barge Location, South of Engine Generator Building 600 and North of Former Tank Farm																																																					
SB028	25	fuel									212	fuel	2100								19	strong									114	strong	490	ND	0.016	0.11	0.52																						
SB029	27	strong									10	strong	7.8								6	slight									5	strong	ND	ND	ND	ND	0.025																						
SB030	15	fuel									3	strong	ND								2	slight									7	slight	ND	ND	0.0096	ND	0.014				7	slight																	
SB031	2	slight									2	none									2	none									4	none	ND	ND	ND	ND	ND				4	none																	
14. Stained Soil Area, West of Engine Generator Building 600																																																				
SB067	3.3										3.7	none									185	strong	5100								144	heavy	2800	ND	ND	ND	0.45				144	heavy																	
15. UST 15-B-19, Southwest Corner of BLM Building 106																																																				
SB041																					16	slight									8	slight	5.8	ND	ND	ND	0.025				5.4	slight																	
SB042	186.4	none									214	fuel									68	slight	27								130.4	slight	6	ND	0.03	0.015	0.09				17	none																	
SB043	816										855	fuel	25000								162	fuel									167	slight	ND	ND	0.021	ND	0.063				136		ND	ND	0.021	ND	0.063										
SB044	40.6	none									155	slight									60.2	none	64								13.4	none	4.1	ND	0.042	0.017	0.097				54		4.1	ND	0.042	0.017	0.097										
16. Decommissioned Fuel Pipeline, South of Quarters Buildings 103, 104, and 105																																																					
SB002	4	none									3	none	ND																		4		ND	ND	ND	ND	0.007				3		ND	ND	ND	ND	0.007										
SB005		none	ND								0		ND								0	none									0		ND	ND	0.0079	ND	ND				0																		
SB006		none									0		ND								0										0		ND	ND	ND	ND	ND																						
SB007	158	fuel	3400	ND	ND	0.065	1.2					none	ND																		0		ND	ND	ND	ND	ND				0																		
17. Decommissioned Fuel Pipeline, North of State Building and Shop Building 205																																																				
SB009	8	none	9.4	ND	ND	ND	ND				116	fuel									126		5600								167		6200	0.29	0.33	5.3	26																						
SB010	186	fuel	11000								180										120										98		7.4	ND	ND	ND	0.05				4																		
SB012		none									8										107		3400								7	slight	6.8	0.018	ND	0.051	0.16																						
SB018	20	slight	160	0.027	0.019	0.058	0.34				191	strong									201	strong									104																												
SB059	11.2										87.2										277.1		2000								94.5		230	ND	0.02	0.022	0.13				13.2																		
SB068	106	fuel	55	ND	ND	ND	0.092				278										259																																				
SB069	10	none	9.6	ND	ND	ND	ND				267	heavy									129	heavy																																				
18. Decommissioned Fuel Pipeline at "T" Junction, North of Quarters Building 102																																																					
SB001	5	fuel									6										6										8		ND																				4.4	ND	ND	ND	ND
SB056											1062	slight	58	ND	0.023	ND	0.062				65	none									140		ND	ND	ND	ND	0.031				125																		
SB057	162		8.4								136										99										91																				183	ND	ND	ND	ND	0.034
19. Decommissioned Fuel Pipeline, North of Quarters Building 100																																																					
SB019	91										5	slight	38								1	slight									0	none	ND	ND	ND	ND	ND																				0				
SB020	112	strong	14000	ND	0.1	0.054	5				185		7700								104										147		2200	ND	0.099	0.18	4.1				114																		
SB040	141	strong	12000	ND	0.93	ND	11				242	strong									868	strong	990								78	fuel	4.8	ND	ND	ND	0.014				43	slight																	
SB045	227	strong									174										805	strong									174		880	ND	ND	ND	1.5				174		880	ND	ND	ND	1.5										
20. Decommissioned Fuel Pipeline "T" Junction, Northeast of Tank Farm																																																					
SB036	321	strong	18000	0.7	1.1	18	95				207	strong	5300							19.0	164	strong									257		2700	1.5	16	11	66				267																		
SB037	182	strong									124	strong									186	strong	1300								223	strong	3300	0.99	14	12	69				159	strong																	
SB038	142	strong									812	strong	2800	0.31	6.4	10	55				620	strong	1900								959	strong	790	ND	0.65	2.5	16				959	strong																	
SB062	1215		28000								854	strong									618	strong									1014	strong	1500	ND	ND	3.6	28				941.2	strong																	
SB063	61.9	slight	48								7.3	none									3.3	none									2.4	none									2.2	none	ND	ND	0.035	0.026	0.14										
SB064	3	none									1.8	none	11								2.8	none									2.9	none									1130	heavy	7900	ND	6.5	48	290										

Note: Shaded cells indicate PID headspace values > 50 ppm, fuel odors that were observed, and laboratory values that exceed ADEC Soil Cleanup Standards as follows:
DRO - 250 mg/kg
Benzene - 0.02 mg/kg
Toluene - 5.4 mg/kg
Ethylbenzene - 5.5 mg/kg
Xylenes (total) - 78 mg/kg
PAHs (naphthalene) - 43 mg/kg

LEGEND

- MP001 — Monitoring probe location
- MW001 — Monitoring well location
- GW01 — Near-river groundwater sample, October 2001
- Fuel line removed
- Fuel line remaining
- Shaded areas indicate estimated depth to top of permafrost (feet bgs) as shown at left, 1998 and 1999 Remedial Investigations (0 10 20)
- Extent of Benzene in Groundwater Exceeding ADEC Cleanup Standards of 5 µg/L
- Free product observed in monitoring well or probe, October 2004 sampling event
- Limits of UST excavation

Notes:
1) All FAA fuel storage tanks in the former living quarters area have been removed.
2) Groundwater concentrations based on October 2004 monitoring results.

MW019 located 75' northeast of MW015
MW015
Pipeline Intact
MP002
MP001
MW020
MP006
Pipeline Intact
Shop Bldg. #205
State Airport Property Boundary Approximately 200'
MP003
MP004
MP005
State
Stream
MW012
Paint House (State)
BLM
Garage (State)
Bldg. #204 (Removed)
MW013
Former Greenhouse (Removed)
To Airport and FSS Building
MW009
MW010
BLM Bldg. #106
MP007
Bldg. #207
MP015
MP008
MW014
MW018
COMSERFAC #300 (Removed)
Quarters #100 (Removed)
Quarters #101 (Removed)
Quarters #102 (Removed)
ENG-GEN #600
MP023
MP018
MP012
MW011
MP016
Wooded Area
MW016
MW008
MP013
MP025
MP017
MP014
Quarters #105 (Removed)
Quarters #104
Quarters #103
Stream
MW017
MP011
MP024
MP010
MP028
To Tanana
MP009
MP029
Bldg. #30 (Removed)
MW007
MW004
MW001
MW006
MW003
MW002
MW005
Bldg. #602 (Removed)
N
0 30 60 90 120
SCALE: 1" = 60'
GW01
GW02
GW03
Yukon River

CH2MHILL Constructors, Inc.

321396 E042005001ANC tana_ben_r4 01/17/05 cls

Figure 2

Approximate Extent of Benzene Contamination in Groundwater Former Living Quarters and Shop Building Areas

Tanana FAA Station, Alaska

LEGEND

- MP001 — Monitoring probe location
- MW001 — Monitoring well location
- GW01 — Near-river groundwater sample, October 2001
- Fuel line removed
- Fuel line remaining
- Shaded areas indicate estimated depth to top of permafrost (feet bgs) as shown at left, 1998 and 1999 Remedial Investigations (0 10 20)
- Extent of GRO in Groundwater Exceeding ADEC Cleanup Standards of 1,300 µg/L
- Free product observed in monitoring well or probe, October 2004 sampling event
- Limits of UST excavation

Notes:
1) All FAA fuel storage tanks in the former living quarters area have been removed.
2) Groundwater concentrations based on October 2004 monitoring results.

MW019 located 75' northeast of MW015
MW015
Pipeline Intact
MP001
MW020
MP002
MP006
Pipeline Intact
Shop Bldg. #205
State Airport Property Boundary Approximately 200'
State
MW012
Paint House (State)
BLM
Garage (State)
Bldg. #204 (Removed)
MP003
MP004
MP005
Stream
To Airport and FSS Building
MW009
MW013
Former Greenhouse (Removed)
BLM Bldg. #106
MW010
Bldg. #207
MP007
MP015
MP008
MW014
MW018
COMSERFAC #300 (Removed)
Quarters #100 (Removed)
Quarters #101 (Removed)
Quarters #102 (Removed)
Wooded Area
ENG-GEN #600
MP023
MP012
MP018
MW011
MW016
MP016
MW008
MP013
MP025
MP017
MP014
Quarters #105 (Removed)
Quarters #104
Quarters #103
Stream
MW017
MP011
MP024
MP010
MP028
To Tanana
MP009
MP029
Bldg. #30 (Removed)
MW007
MW004
MW001
MW006
MW005
MW003
MW002
Bldg. #602 (Removed)
N
0 30 60 90 120
SCALE: 1" = 60'
GW01
GW02
GW03
Yukon River
CH2MHILL Constructors, Inc.
321386 E042005001ANC tana_gro_c3 01/17/06 cs

Figure 3

Approximate Extent of GRO Contamination in Groundwater Former Living Quarters and Shop Building Areas

Tanana FAA Station, Alaska

LEGEND

- MP001 — Monitoring probe location
- MW001 — Monitoring well location
- GW01 — Near-river groundwater sample, October 2001
- Fuel line removed
- Fuel line remaining
- Shaded areas indicate estimated depth to top of permafrost (feet bgs) as shown at left, 1998 and 1999 Remedial Investigations (0 10 20)
- Extent of DRO in Groundwater Exceeding ADEC Cleanup Standards of 1,500 µg/L
- Free product observed in monitoring well or probe, October 2004 sampling event
- Limits of UST excavation

Notes:
1) All FAA fuel storage tanks in the former living quarters area have been removed.
2) Groundwater concentrations based on October 2004 monitoring results.

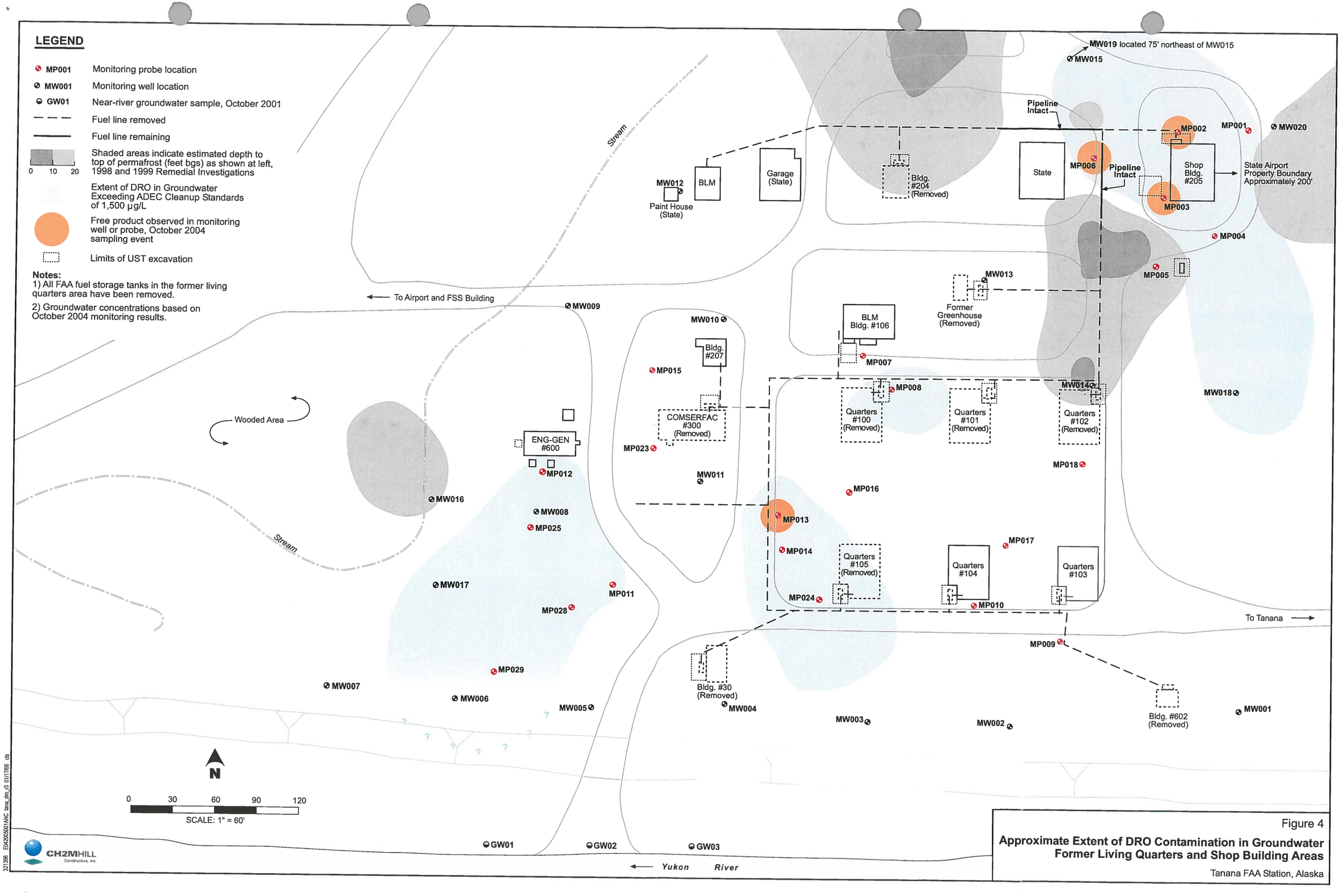

Figure 4

Approximate Extent of DRO Contamination in Groundwater Former Living Quarters and Shop Building Areas

Tanana FAA Station, Alaska

CH2MHILL Constructors, Inc.

321396 EM2005001ANC tana_dro_f3 01/17/06 cls

TABLE 12-3
Summary of Groundwater Results
Tanana FAA Station, Alaska

Well ID	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	Total BTEX (µg/L)	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	Carbon Dioxide (mg/L)	Alkalinity (mg/L)	pH	ORP (+/- mv)	Temp (°C)	Conductivity (Note 1)
Groundwater Samples Collected October 1998																			
MP001	**1,700**		ND	ND	ND	ND	ND												
MP002	**85,000**		**190**	ND	250	1,100	1,540												
MP003	**260,000**		**420**	180	360	2,200	3,160												
MP004	Probe not sampled - dry																		
MP005	Probe not sampled - dry																		
MP006	**620,000**		**230**	ND	400	1,900	2,530												
MP008	**3,900**		1	ND	1.1	14	16.1												
MP009	310		ND	ND	ND	ND	ND												
MP010	290		ND	ND	ND	1.5	1.5												
MP011	Probe not sampled - dry																		
MP012	Probe not sampled - free product present (0.09')																		
MP013	**480,000**		**310**	360	**820**	5,900	7,390												
MP014	**110,000**		**200**	220	**1,000**	6,100	7,520												
MP015	280		ND	ND	ND	ND	ND												
MP016	Probe not sampled - free product present (0.02')																		
MP017	ND		ND	ND	ND	ND	ND												
MP018	800		ND	ND	ND	5.5	5.5			1.2	ND				866	6.8			
MP023	ND		ND	ND	ND	ND	ND												
MP024	**110,000**		**50**	15	280	980	1,325												
MP025	**74,000**		ND	ND	23	71	94												
MP028	Probe not sampled - free product present (0.02')																		
MP029	Probe not sampled - free product present (0.02')																		
Groundwater Samples Collected June 1999																			
MP001	Probe not sampled - insufficient water volume																		
MP002	Probe not sampled - free product present																		
MP003	Probe not sampled - free product present																		
MP006	Probe not sampled - free product present																		
MP007	Probe not sampled (may have been due to insufficient water)																		
MP008	1,100	ND	ND	ND	ND	ND	ND												
MP009	270	ND	ND	ND	ND	ND	ND												
MP010	220	ND	ND	ND	ND	ND	ND												
MP011	Probe not sampled - insufficient water volume																		
MP012	Probe not sampled - free product present																		
MP013	Probe not sampled - free product present																		
MP014	Probe not sampled - free product present																		
MP015	200	ND	ND	ND	ND	ND	ND												
MP016	Probe not sampled - free product present																		
MP017	270	ND	ND	ND	ND	ND	ND												
MP018	730	ND	ND	ND	ND	ND	ND												
MP023	210	ND	ND	ND	ND	ND	ND												
MP024	Probe not sampled - free product present																		
MP025	Probe not sampled - free product present																		
MP028	Probe not sampled - free product present																		
MP029	**11,000**	ND	ND	ND	ND	ND	ND												
Groundwater Samples Collected October 1999																			
MP001	950	ND	ND	ND	ND	ND	ND												

TABLE 12-3
Summary of Groundwater Results
Tanana FAA Station, Alaska

Well ID	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	Total BTEX (µg/L)	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	Carbon Dioxide (mg/L)	Alkalinity (mg/L)	pH	ORP (+/- mv)	Temp (°C)	Conductivity (Note 1)
MP002	Probe not sampled - floating product present (0.05')																		
MP003	Probe not sampled - insufficient water volume																		
MP006	**410,000**	**3,800**	**150**	7.6	120	300	577.6												
MP007	Probe not sampled - insufficient water volume																		
MP008	**3,600**	ND	ND	ND	ND	ND	ND												
MP009	200	ND	ND	ND	ND	ND	ND												
MP010	150	ND	ND	ND	ND	ND	ND												
MP011	Probe not sampled - insufficient water volume																		
MP012	**270,000**	1,200	ND	ND	9.2	43	52.2												
MP013	Probe not sampled - floating product present (0.70')																		
MP014	**92,000**	**10,000**	**120**	490	**2,800**	**92,000**	95,410												
MP015	ND	ND	ND	ND	ND	ND	ND												
MP016	Probe not sampled - floating product present (0.02')																		
MP017	600	ND	ND	ND	ND	ND	ND												
MP018	Probe not sampled - floating product present (0.01')																		
MP023	ND	ND	ND	ND	ND	ND	ND												
MP024	**46,000**	**3,700**	**37**	5	180	563	785												
MP025	**110,000**	**4,000**	ND	ND	15	54	69												
MP028	**29,000**	1,000	ND	ND	11	19.5	30.5												
MP029	Probe not sampled - floating product present (0.01')																		
MW001	110	170	ND	ND	ND	ND	ND												
MW002	280	ND	ND	ND	ND	ND	ND												
MW003	770	ND	4.8	ND	11	8.2	24												
MW004	390	ND	ND	ND	ND	ND	ND												
MW005	530	ND	ND	ND	ND	ND	ND												
MW006	**4,700**	380	ND	ND	5.7	11	16.7												
MW007	ND	ND	ND	ND	ND	1.1	1.1												
MW008	**4,900**	670	ND	ND	10	25.2	35.2												
MW009	ND	ND	ND	ND	ND	ND	ND												
MW010	ND	ND	ND	ND	ND	ND	ND												
MW011	ND	ND	ND	ND	ND	ND	ND												
MW012	ND	ND	ND	ND	ND	ND	ND												
MW013	320	ND	ND	ND	ND	ND	ND												
MW014	**19,000**	ND	ND	ND	ND	1	1												
MW015	**4,000**	160	ND	ND	ND	ND	ND												
MW016	110	ND	ND	ND	ND	ND	ND												
MW017	**11,000**	**1,500**	ND	ND	11	39.2	50.2												
MW018	**7,100**	100	**7.4**	ND	ND	ND	7.4												
MW019	130	ND	ND	ND	ND	ND	ND												
MW020	Well not sampled - insufficient water volume																		
Groundwater Samples Collected February 2000																			
MW001	150	ND	ND	ND	ND	ND	ND	3.9								7	103	1	105
MW002	350	ND	ND	ND	ND	ND	ND	4.3								7.3	158	0.7	88
MW003	400	ND	ND	ND	ND	ND	ND	4.6								7.5	148	0.9	69.7
MW004	140	ND	ND	ND	ND	ND	ND	3.4								7.7	158	0.8	26.8
MW005	Well not sampled - floating product present (0.03')																		
MW006	Well not sampled - floating product present (0.02')																		

TABLE 12-3
Summary of Groundwater Results
Tanana FAA Station, Alaska

Well ID	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	Total BTEX (µg/L)	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	Carbon Dioxide (mg/L)	Alkalinity (mg/L)	pH	ORP (+/- mv)	Temp (°C)	Conductivity (Note 1)
MW007	350	ND	ND	ND	ND	ND	ND	4.8								8.4	-95	0.4	
MW008	210	1,200	ND	ND	15	44	59	4.2								7.1	208	0.7	168
MW009	140	ND	ND	ND	ND	ND	ND	7.1								7.1	174	1.6	55.6
MW010	180	ND	ND	ND	ND	ND	ND	8.2								7.5	200	1.1	73.2
MW011	170	ND	ND	ND	ND	ND	ND	2								7.6	212	0.9	33.2
MW012	210	ND	ND	ND	ND	ND	ND	5.2								6.5	170	1.1	47.8
MW013	Well not sampled - dry																		
MW014	**11,000**	ND	ND	ND	ND	ND	ND	1.5								7.8	-18	0.6	16.2
MW015	1,200	ND	ND	ND	ND	ND	ND	4.6								6.9	-45	0.3	109
MW016	**34,000**	ND	ND	ND	ND	ND	ND	5.8								7.7	-14	0.9	
MW017	Well not sampled - floating product present (0.02')																		
MW018	**7,200**	ND	**5.5**	ND	ND	ND	5.5	4.8								7.1	-40	0.6	117
MW019	200	ND	ND	ND	ND	ND	ND	4.2								7.3	-86	0.7	98.6
MW020	Well not sampled - dry																		
Groundwater Samples Collected April 2000																			
MW001	ND	ND	ND	ND	ND	ND	ND	0.8								7	46		109
MW002	370	ND	ND	ND	ND	ND	ND	2.4								7.1	73		91.2
MW003	310	ND	ND	ND	ND	ND	ND	4.1								7.2	69		79.6
MW004	130	ND	ND	ND	ND	ND	ND	8								7.2	79		86.2
MW005	340	ND	ND	ND	ND	ND	ND	2								7	-51		60.1
MW006	**3,700**	290	ND	ND	1.5	4	5.5	4.9								6.9	-65		46.4
MW007	230	ND	ND	ND	ND	ND	ND	3.2								7.1	-23		35.2
MW008	**11,000**	430	ND	ND	ND	3.5	3.5	0.7								6.8	-97		71.8
MW009	130	ND	ND	ND	ND	ND	ND	3.8								7.2	66		62.1
MW010	120	ND	ND	ND	ND	ND	ND	12.6								7	102		76.8
MW011	ND	ND	ND	ND	ND	ND	ND	5.7								7	106		80.2
MW012	140	ND	ND	ND	ND	ND	ND	4.2								7.6	27		60.4
MW013	Well not sampled - insufficient water volume																		
MW014	**19,000**	ND	ND	ND	ND	ND	ND	1.1								6.9	-77		149
MW015	Well not sampled - insufficient water volume																		
MW016	Well not sample - surrounding surface area flooded																		
MW017	**16,000**	1,200	ND	ND	6.7	26	32.7	2.1								6.9	-90		41.9
MW018	**8,100**	ND	1.7	ND	ND	ND	1.7	2.6								6.6	-75		158
MW019	170	ND	ND	ND	ND	ND	ND	4.9								6.8	-96		166
MW020	Well not sampled - insufficient water volume																		
Groundwater Samples Collected August 2000																			
MP001	440	ND	1.2	ND	3.9	4.9	10	3.4								6.6		1.3	145
MP002	Probe not sampled - floating product present (0.66')																		
MP003	**60,000**	**5,500**	**250**	40	15	1,300	1605	1.0								6.8		1.5	168
MP006	**49,000**	**4,700**	**170**	11	150	440	771	0.9								6.9		1.3	171
MP007	Probe not sampled due to obstruction																		
MP008	400	ND	ND	ND	ND	ND	ND	5.7								6.8		1.3	96
MP009	ND	ND	ND	ND	ND	ND	ND	4.4								7.0		1.4	100
MP010	ND	ND	ND	ND	ND	ND	ND	1.8								7.0		1.3	90.0
MP011	**3,800**	180	ND	ND	ND	2.1	2.1									6.8		3.7	64.7
MP012	**40,000**	**11,000**	ND	ND	22	160	182									6.8		4.4	75.4
MP013	Probe not sampled - floating product present (1.02')																		

TABLE 12-3
Summary of Groundwater Results
Tanana FAA Station, Alaska

Well ID	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	Total BTEX (µg/L)	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	Carbon Dioxide (mg/L)	Alkalinity (mg/L)	pH	ORP (+/- mv)	Temp (°C)	Conductivity (Note 1)
MP014	**19,000**	**5,700**	**58**	14	240	1,400	1,712									7.0		2.3	96.2
MP015	ND	ND	ND	ND	ND	ND	ND	1.9								6.9		3.7	73.1
MP016	ND	ND	ND	ND	ND	3.1	3.1									6.9		2.5	100
MP017	110	ND	ND	ND	ND	ND	ND	2.8								6.9		1.6	104
MP018	170	ND	ND	ND	ND	ND	ND	1.6								6.9		1.6	124
MP023	130	ND	ND	ND	ND	ND	ND									7.0		3.4	72.6
MP024	**10,000**	**2,100**	**8.7**	ND	100	210	318.7									6.8		2.1	100
MP025	**2,800**	**1,900**	ND	ND	6.4	25	31.4									6.9		4.2	47.2
MP028	1,300	620	ND	ND	6.3	16	22.3	1.3								6.8		3.3	63.5
MP029	930	630	ND	ND	ND	10	10	1.5								6.9		3.3	57.6
MW001	1,100	ND	ND	ND	ND	ND	ND	2.4								6.9		1.9	85
MW002	ND	ND	ND	ND	ND	ND	ND	1.3								7.1		2.4	83.9
MW003	320	ND	ND	ND	ND	ND	ND	1.8								7.0		2.8	77.4
MW004	ND	ND	ND	ND	ND	ND	ND	4.3								7.0		2.7	82.4
MW005	150	ND	ND	ND	ND	ND	ND	5.5								6.5		3.6	76.5
MW006	450	180	ND	1.7	1.4	5.3	6.7	1.5								6.5		4.9	50.4
MW007	110	ND	ND	ND	ND	ND	ND	0.7								6.6		2.9	50.2
MW008	1,400	650	ND	ND	8.3	22	30.3									6.8		4.9	53.3
MW009	ND	ND	ND	ND	ND	ND	ND	4.1								6.8		3.3	65.1
MW010	140	ND	ND	ND	ND	ND	ND	0.3								6.9		2.6	77.7
MW011	220	ND	ND	ND	ND	ND	ND									7.0		4.0	83.8
MW012	ND	ND	ND	ND	ND	ND	ND	0.6								6.8		3.1	65.0
MW013	240	ND	ND	ND	ND	ND	ND	3.3								6.6		0.7	138
MW014	150	ND	ND	ND	ND	ND	ND	0.3								6.6		1.4	133
MW015	**4,100**	ND	ND	ND	ND	ND	ND	0.3								6.5		1.3	154
MW016	Well not sample - surrounding surface area flooded																		
MW017	**3,800**	810	ND	ND	3.4	15	18.4	2.2								6.5		4.1	83.2
MW018	170	ND	1.9	ND	ND	ND	1.9	0.3								6.5		1.4	130
MW019	120	ND	ND	ND	ND	ND	ND	0.2								6.4		1.3	157
MW020	Well not sampled - dry																		
Groundwater Samples Collected October-November 2000																			
MP001	500	ND	ND	ND	ND	ND	ND	0.5								6.5		0	151
MP002	Probe not sampled - floating product present (1.17')																		
MP003	**67,000**	**5,700**	**250**	34	ND	1,100	1,384	0.01								6.8		0	163
MP006	**40,000**	**7,400**	**200**	ND	200	630	1,030	0.3								6.9		0.1	152
MP007	Probe not sampled - dry																		
MP008	**3,900**	ND	ND	ND	ND	ND	ND	7.2								6.4		0.6	138
MP009	120	ND	ND	ND	ND	ND	ND	6.7								7.0		0.4	113
MP010	110	ND	ND	ND	ND	ND	ND	3.2								6.9		0.5	83.8
MP011	Probe not sampled - dry																		
MP012	**89,000**	980	ND	ND	9.4	60	69.4	1.9								6.2		2.9	26
MP013	Probe not sampled - floating product present (0.86')																		
MP014	**25,000**	**7,400**	**120**	62	250	1,700	2,132	1.2								6.8		1.6	100
MP015	ND	ND	ND	ND	ND	ND	ND	1.5								6.0		2.7	56
MP016	210	ND	ND	ND	ND	ND	ND	3.9								6.7		1.4	100
MP017	190	ND	ND	ND	ND	ND	ND	3.3								6.9		1.2	114
MP018	200	ND	ND	ND	ND	2	2	3.6								6.7		0.4	121

TABLE 12-3
Summary of Groundwater Results
Tanana FAA Station, Alaska

Well ID	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	Total BTEX (µg/L)	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	Carbon Dioxide (mg/L)	Alkalinity (mg/L)	pH	ORP (+/- mv)	Temp (°C)	Conductivity (Note 1)
MP023	ND	ND	ND	ND	ND	2.2	2.2	0.8								6.9		2.4	53
MP024	**7,700**	**2,000**	**19**	ND	160	510	689	0.8								6.8		1.0	113
MP025	**11,000**	720	ND	ND	11	18	29	1.4								6.4		3.2	39
MP028	**3,700**	330	ND	ND	12	18	30	1.6								6.2		2.6	45
MP029	**2,900**	500	ND	ND	4.5	17	21.5	3.9								6.5		2.9	29
MW001	ND	ND	ND	ND	ND	ND	ND	2.3								6.6		1.3	79
MW002	140	ND	ND	ND	ND	ND	ND	7.6								6.7		2.1	87
MW003	200	ND	2.6	ND	3.7	6.5	12.8	0.9								7.1		0.1	76
MW004	ND	ND	ND	ND	ND	ND	ND	8.2								7.1		1.2	101
MW005	210	ND	ND	ND	ND	ND	ND	3.3								6.6		3.4	57
MW006	**2,500**	160	ND	ND	2.4	5.5	7.9	1.6								6.0		5.0	38
MW007	ND	ND	ND	ND	ND	ND	ND	4.8								6.7		4.9	46
MW008	**4,100**	560	ND	ND	13	30	43	0.5								6.6		2.6	65
MW009	ND	ND	ND	ND	ND	ND	ND	0.8								6.5		2.2	40
MW010	ND	ND	ND	ND	ND	ND	ND	0.4								6.2		2.6	61
MW011	ND	ND	ND	ND	ND	ND	ND	2.2								6.6		2.0	95
MW012	ND	ND	ND	ND	ND	ND	ND	1.4								7.6		2.2	32.0
MW013	180	ND	ND	ND	ND	ND	ND	0.6								7.7		0.0	106
MW014	1,200	ND	ND	ND	ND	ND	ND	0.6								6.9		0.0	116
MW015	**3,800**	ND	3.4	ND	3.5	5.7	12.6	0.2								6.9		0.2	132
MW016	ND	ND	ND	ND	ND	ND	ND	0.8								7.3		2.2	17
MW017	**1,800**	**1,900**	ND	ND	4.6	22	26.6	0.4								6.5		4.2	52
MW018	**4,200**	ND	4.5	ND	4.4	9	13.4	0.3								5.7		1.2	128
MW019	110	ND	ND	ND	ND	ND	ND	0.9								6.4		0.3	143
MW020	Well not sampled - dry																		
Groundwater Samples Collected September 2003																			
MP001	**1,700**	ND	1.5	ND	ND	ND	1.5	0.9						35		6.3	18	0.5	1,660
MP002	**34,000**	**1,900**	**60**	ND	67	280	407	1.2						50		6.6	-103	0.3	1,910
MP003	**54,000**	**5,600**	**280**	28	190	1,200	1,698	1.4	ND	7.4	46	6.06	0.0088	50	1080	6.3	-103	0.3	1,890
MP004	Probe could not be located																		
MP005	Probe could not be located																		
MP006	**23,000**	**3,800**	**200**	ND	200	650	1,050	1.1	ND	20	79	0.488	ND		980	6.6	-115	1.9	1,820
MP007	Probe could not be sampled due to obstruction																		
MP008	**3,100**	ND	ND	ND	ND	ND	ND	2.1						25		6.6	-35	1.9	1,050
MP009	190	ND	ND	ND	ND	ND	ND	7.0	4.7	ND	0.32	26.1	ND	16	510	6.9	132	2.3	1,080
MP010	170	ND	ND	ND	ND	ND	ND	3.2						11		7.0	-28	1.5	861
MP011	**1,500**	52	ND	ND	ND	ND	ND	2.4						17		6.6	-84	3.4	576
MP012	**1,600**	170	ND	ND	3.9	20	23.9	3.4						ND		6.2	-77	4.4	252
MP013	**13,000**	**4,900**	**92**	55	150	1,200	1497	2.3						22		7.1	-150	2.7	488
MP014	**7,600**	**6,100**	**78**	43	210	1,300	1,631	3.0						12		6.8	-127	2.7	787
MP015	ND	ND	ND	ND	ND	ND	ND	3.3						17		6.9	109	4.0	748
MP016	380	94	ND	ND	ND	ND	ND	2.1								6.7	41	2.4	930
MP017	**5,000**	ND	ND	ND	ND	ND	ND	4.1	3.2	0.18	2	14.7	0.0029	23	515	6.9	22	2.4	1,050
MP018	450	ND	ND	ND	ND	ND	ND	3.0	2.3	0.25	3.5	36.3	0.0029	19	598	6.7	-48	1.5	1,290
MP023	150	ND	ND	ND	ND	4.4	4.4	2.6						ND		6.9	18	3.7	480
MP024	**3,000**	**2,500**	**11**	ND	100	390	501	3.4						22		7.0	-142	2.0	860
MP025	**1,500**	370	ND	ND	5.8	9.3	15.1	3.4						ND		6.5	-90	4.0	349

TABLE 12-3
Summary of Groundwater Results
Tanana FAA Station, Alaska

Well ID	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	Total BTEX (µg/L)	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	Carbon Dioxide (mg/L)	Alkalinity (mg/L)	pH	ORP (+/- mv)	Temp (°C)	Conductivity (Note 1)
MP028	**7,500**	240	ND	ND	15	23	38	2.1						16		6.4	-79	3.2	583
MP029	1,200	98	ND	ND	1.9	8.7	10.6	1.5						ND		6.9	-122	3.9	240
MW001	ND	ND	ND	ND	ND	ND	ND	9.2						23		6.3	325	2.2	678
MW002	180	ND	ND	ND	ND	ND	ND	7.0	1.2	0.042	0.18	33.1	ND	26	500	8.2	237	2.6	776
MW003	290	ND	ND	ND	ND	ND	ND	6.0						19		6.0	160	1.8	741
MW004	1,500	ND	ND	ND	ND	ND	ND	9.7						26		6.1	378	2.2	919
MW005	210	ND	ND	ND	ND	ND	ND	8.4						25		6.4	339	6.2	597
MW006	**4,200**	110	ND	ND	ND	ND	ND	1.2						24		8.0	82	3.3	238
MW007	ND	ND	ND	ND	ND	ND	ND	3.2						18.5		8.1	317	4.1	541
MW008	**9,200**	460	ND	ND	12	23	35	1.7						29		8.0	-59	3.9	421
MW009	130	ND	ND	ND	ND	ND	ND	1.7						15		8.3	304	5.4	406
MW010	ND	ND	ND	ND	ND	ND	ND	3.7						26		8.1	347	2.1	617
MW011	ND	ND	ND	ND	ND	ND	ND	5.2						39		6.2	327	3.5	1,000
MW012	ND	ND	ND	ND	ND	ND	ND	1.9						13.5		8.3	281	2.8	250
MW013	ND	ND	ND	ND	ND	ND	ND	4.8						42		8.0	341	0.4	939
MW014	ND	ND	ND	ND	ND	ND	ND	4.4	3.9	0.037	ND	12	ND	50	735	8.0	305	1.0	1,160
MW015	**9,800**	ND	1.7	ND	1.5	ND	3.2	2.9						60		5.9	153	0.7	1,330
MW016	Well not sampled - broken																		
MW017	**4,100**	530	ND	ND	3	7.6	10.6	1.3						12.5		5.1	-38	6.9	186
MW018	**6,800**	ND	ND	ND	ND	ND	ND	3.5						40		6.0	294	1.5	815
MW019	ND	ND	ND	ND	ND	ND	ND	1.6	0.13	0.73	0.36	111	0.0079	41	784	7.9	226	0.2	1,320
MW020	Well not sampled - dry																		
Groundwater Samples Collected October 2004																			
MP001	**2,200**	100	ND(0.15)	ND(0.24)	1.9	3.3	5.2							35		6.5	-34	0.8	1,500
MP002	**17,000**	**4,000**	**86**	ND(2.4)	160	820	1,066							80		6.61	-79	1.0	1,700
MP003	**78,000**	**5,500**	**280**	24	220	1,300	1,824	1.16	ND(0.095)	6.6	59	5.41	ND(0.005)	25		6.2	-57	0.8	1,600
MP008	**5,900**	ND(3)	ND(0.15)	ND(0.24)	ND(0.18)	ND(0.63)	ND							38		6.3	-32	2.0	1,300
MP011	**74,000**	190	ND(0.15)	1.1	ND(0.18)	ND(0.63)	1.1							25		6.5	-6	2.5	750
MP012	**120,000**	**1,400**	ND(0.15)	3.9	13	64	80.9	1.16						16		6.4	-40	3.1	630
MP013	**67,000**	**6,800**	**100**	66	240	2,000	2,406							30		6.59	-84	2.1	1,100
MP014	**23,000**	**5,600**	**84**	62	220	1,600	1966							50		6.48	-68	2.0	1,300
MP024	**200,000**	**1,700**	4.0	2.8	84	170	260.8	1.53	ND(0.095)	4.1	62	1.86	0.12	30		6.4	-57	1.6	1,200
MP025	**73,000**	850	1.1	3.9	9.8	23	37.8	0.7						25		6.4	-50	3.7	640
MP028	**10,000**	430	ND(0.15)	1.7	6.1	12	19.8	5.62						30		6.3	-27	3.1	750
MP029	**19,000**	340	ND(0.15)	2.2	6.0	14	22.2	0.75						12.5		6.7	-75	3.1	500
MW004	170	ND(3)	ND(0.15)	ND(0.24)	ND(0.18)	ND(0.63)	ND							18		5.8	171	2.10	1,000
MW006	**2,600**	140	ND(0.15)	ND(0.24)	3.6	4.3	7.9	0.80						15		6.4	-12	3.6	420
MW008	**160,000**	430	ND(0.15)	1.4	14	33	48.4							35		6.3	-61	6.3	850
MW013	400	ND(3)	ND(0.15)	ND(0.24)	ND(0.18)	ND(0.63)	ND							18		6.5	183	0.1	1,200
MW014	610	ND(3)	ND(0.15)	ND(0.24)	ND(0.18)	ND(0.63)	ND		2.83	0.19	ND(0.0027)	12.0	ND(0.005)	17		6.8	128	0.6	1,300
MW015	**20,000**	200	**16**	ND(0.24)	13	16	45		ND(0.095)	1.9	7.7	6.97	0.012			6.1	3	0.0	1,400
MW017	**7,500**	310	ND(0.15)	2.2	3.8	11	17	1.25						20		6.6	-67	4.3	600
MW018	**6,600**	ND(3)	ND(0.15)	ND(0.24)	ND(0.18)	ND(0.63)	ND	1.40	ND(0.095)	2.0	8.2	43.4	ND(0.005)	25		6.5	7	0.4	1,200
MW019	490	ND(3)	ND(0.15)	ND(0.24)	ND(0.18)	ND(0.63)	ND	3.34	ND(0.095)	1.3	0.068	143	ND(0.005)	27		6.5	32	1.0	1,600

TABLE 12-3
Summary of Groundwater Results
Tanana FAA Station, Alaska

Well ID	DRO (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	Total BTEX (µg/L)	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)	Methane (mg/L)	Carbon Dioxide (mg/L)	Alkalinity (mg/L)	pH	ORP (+/- mv)	Temp (°C)	Conductivity (Note 1)

Notes: 1. Conductivity values for samples taken prior to 2003 are reported in milliSiemens per meter (mS/m). Conductivity values for samples taken in 2003 and 2004 are reported in micromhos per centimeter (µmhos/cm).
Values shown in **BOLD** denote readings above ADEC cleanup goals (per 18 AAC 75.345, Table C)
BTEX = benzene, toluene, ethylbenzene, xylenes mg/L = milligrams per liter
°C = degrees Celsius mV = millivolts
DRO = diesel-range organics ND = not detected at or above the method detection limit shown in parentheses
GRO = gasoline-range organics NS = not sampled
µg/L = micrograms per literORP = oxidation-reduction potential
µmhos/cm = micromhos per centimeter

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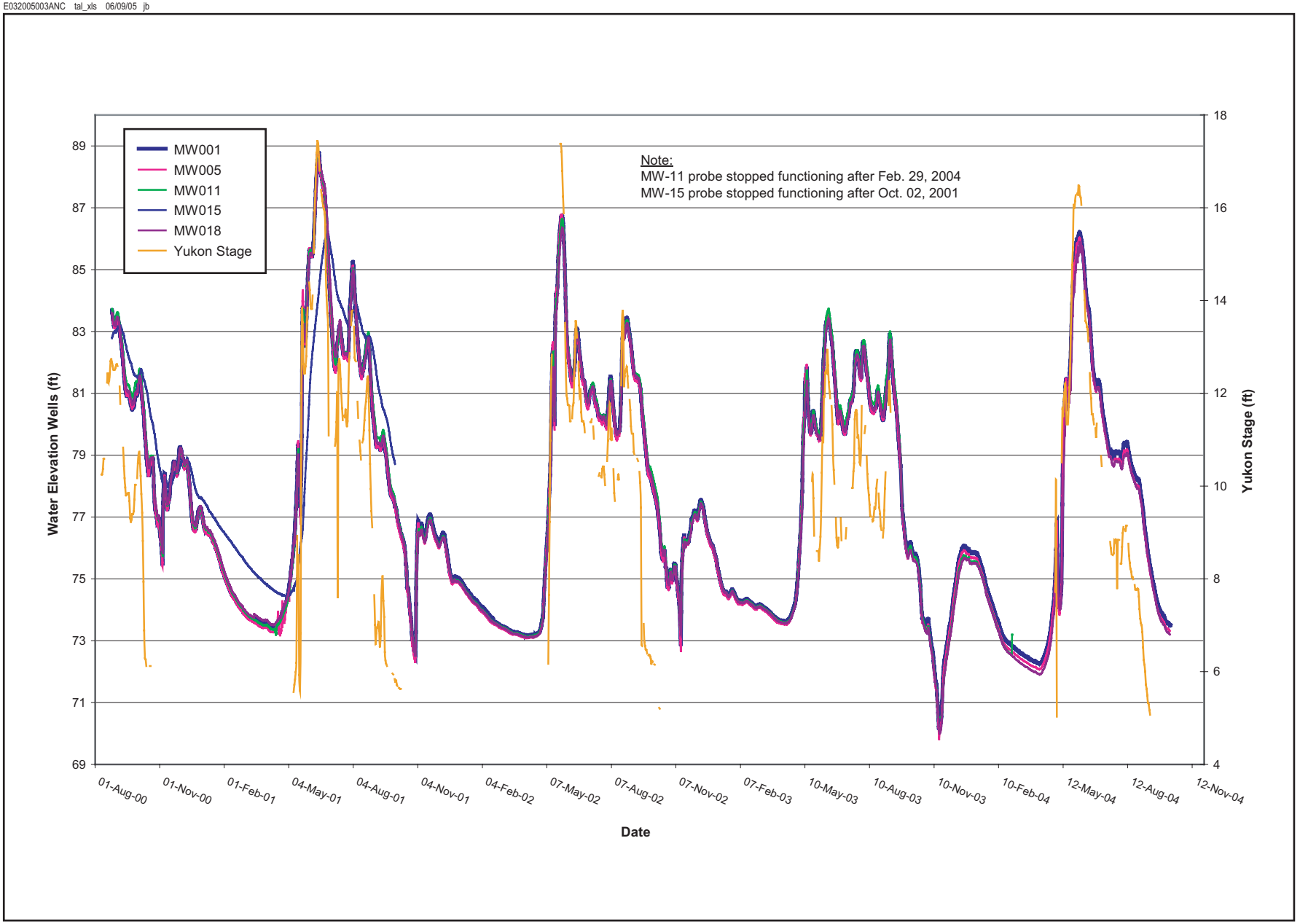

Figure 12-6

Continuous Water Level Monitoring Results

Tanana FAA Station, Alaska