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Technical Memorandum

Date 24 May 2012

To Bob Brock (USACE), Joe Malen (DPW), Debra Caillouet (ADEC), Jacques Gusmano (EPA)

From Terry Heikkila, PE, PMP

Subject **2012 FCS Groundwater Monitoring Work Plan Addendum (Final)**

The objective of this Work Plan Addendum is to describe groundwater sample collection procedure updates to the *Fort Wainwright Post Wide Work Plan* (U.S. Army Corps of Engineers [USACE] 2011) and describe the location of the new monitoring well that will be installed in 2012 at the Former Communications Site (FCS), commonly known as Taku Gardens, on Fort Wainwright, Alaska.

Groundwater Sample Collection Procedure

Groundwater sampling procedures will adhere to the *Fort Wainwright Post Wide Work Plan* (USACE 2011) including the Field Sampling Plan (Appendix B) and the Quality Assurance Project Plan (Appendix C) except as noted in this section.

It is critical to record information pertaining to well purging and sample collection by completely filling out a Groundwater Sampling Data Sheet (Attachment 1) for each sampling location. Additional observations and explanations will be recorded in a field logbook. All meters used during groundwater sampling will be calibrated and in good working order. Malfunctioning equipment will be removed from service. Groundwater sampling will utilize a peristaltic pump or a submersible pump for deep screened wells as the preferred equipment. The use of other equipment such as bailers or inertial pumps for groundwater sampling will not be allowed unless prior written approval is obtained from the USACE chemist.

Groundwater sampling will proceed in the following manner:

- Don new personal protective equipment (PPE) (gloves, etc.) before beginning sample collection.
- Remove the inner casing well cap and record volatile organic compound (VOC) levels at the top of the well casing and in the breathing zone near the well using a photoionization detector (PID). Elevated levels of VOCs in the breathing zone (greater than 10 parts per

million [ppm]) may require additional vapor sampling. The PID will be ca librated to yield "total organic vapors" in ppm to a benzene equivalent (100 ppm isobutylene standard).

- Measure depth to product (if any) and depth to groundwater from the top (north side) of the internal well casing using an oil-water interface probe and record the information on the Groundwater Sampling Data Sheet. Depth measurements will be recorded to an accuracy of 0.01 feet. If no product is detected record "none" on the groundwater data sheet. Trace levels of product can be difficult to discern from false product signals from the interface probe. If trace product is suspected, lower an unused bailer into the well until it reaches 2 inches below the groundwater interface. Withdraw the bailer and inspect it for signs of product. Consult the lead sampler if questions arise regarding trace signals from the interface probe.
- Ensure that the intake end of tubing depth is at the appropriate depth in the water column. For wells screened above the water table, the intake will be placed within the top 2 feet of the water column. For wells screened below the water table, the intake will be placed within the monitoring well screened interval near the mid-point. Document the tubing depth on the Groundwater Sampling Data Sheet (Attachment 1).
- Low-flow purging and sampling techniques will be used to ensure representative groundwater samples are collected. Low-flow protocol emphasizes that minimal drawdown is the primary criterion for evaluating whether predominantly horizontal flow to the well has been achieved. Measured draw down in the well must not exceed 0.3 feet and the groundwater flow rate must not exceed 1.0 liter per minute (0.264 gallons per minute) during purging.
- Adjust the sampling pump speed to meet drawdown and flow-rate criteria then begin recording field parameters using the multi-meter and flow-through cell. Significant changes to the pumping rate should be avoided once the initial pumping rate adjustments are made. Measuring the water volume accurately is critical for the calculation of purge flow rates. Water volume will be measured at the outlet of the flow cell using a graduated 3-liter bucket. Purge water measurements will be recorded to an accuracy of 0.1 liters.

Field parameters (temperature, conductivity, pH, dissolved oxygen, redox potential, and turbidity) will be measured and recorded approximately every 5 minutes during well purging. All field parameters will be recorded for all monitoring cycles. Field parameters are indicators used to determine whether water in the well is in equilibrium with the surrounding aquifer.

Low-flow purging will continue until one of the following conditions occurs:

- Stabilization criteria in Table 1 have been met for the field parameters for three consecutive readings; or
- A total of three well-casing volumes have been purged.

Due to the volatility of some target analytes, sample containers will be filled in the following order: low-level VOCs, VOCs, ethylene dibromide (EDB), methane, and gasoline-range organics (GRO). Note that sample containers for low-level VOCs, VOCs, EDB, and methane

require the vials to be filled to zero headspace. The remainder of the target analytes are considered semivolatiles; therefore, the rest of the containers may be filled in any order.

Once all containers are filled for laboratory analysis, collect an aliquot for ferrous iron testing. Ferrous iron will be analyzed in the field using a Hach® test kit Model IR-18C. Record ferrous iron results on the Groundwater Sampling Data Sheet.

For low producing wells that exceed drawdown criteria and purge dry before three well-casing volumes can be removed, allow the well to re-charge (re-fill) prior to sampling. Whenever possible, delay sampling until the well is 80-percent recovered, but wait no more than 24 hours between purging and sampling.

Groundwater sampling locations and their associated list of analysis, sample containers, preservatives, and hold times are provided in Table 2. The analytical suite selected for each sampling location is based on the findings of the *Remedial Investigation FWA 102 Former Communications Site* (USACE 2010). Additional natural attenuation parameters (alkalinity, ammonia, sulfate, phosphorus, potassium, nitrate/nitrite, manganese, and methane) are added to select locations based on the proximity to the FCS groundwater plumes. Site data will be evaluated according to the *Fort Wainwright Post Wide Work Plan (USA*CE 2011). Figure 1 presents the current monitoring locations.

Monitoring Well Installation

One additional monitoring well will be added in 2012 to the current network of wells. The new groundwater monitoring well, designated as MW93, will be installed in the area between monitoring well MW79 and the Post Water Supply Well. MW93 will be installed within the capture zone of the Post Water Supply Well. The final location of installation must be agreed upon by the U.S. Army Corps of Engineers (USACE), the Fort Wainwright Directorate of Public Works (DPW), the Alaska Department of Environmental Conservation (ADEC), and the U.S. Environmental Protection Agency (EPA). Figure 2 shows the proposed well location.

The borehole will be drilled via air rotary or hollow stem auger to allow for the installation of a permanent 2-inch groundwater monitoring well. Based on previous drilling activities in the area, difficult drilling conditions are not anticipated. Groundwater is anticipated to be encountered between 10 and 15 feet below ground surface (bgs).

Soil in the core will be logged based on the Unified Soil Classification System and standard description procedures (American Society for Testing and Materials [ASTM] 2006), which matches soil coloration to the nearest standard soil color. Visual and PID screening of the soil core will be conducted every 2.5 feet starting with the first soil core and continuing to 3 feet below the water table. If screening indicates significant contamination may be present, a soil sample will be collected from the core and analyzed for diesel-range organics (DRO) and VOCs.

Monitoring well construction will meet the specifications provided in the ADEC *Monitoring Well Guidance* (ADEC 2011). The casing of the well will be approximately 75 feet long and extend into the production zone of the aquifer. A 20-foot screen will be installed between 50 and 70 feet bgs. Groundwater monitoring well development activities will follow well installation procedures and meet the specifications described in the ADEC *Monitoring Well Guidance* (ADEC 2011) and the *Fort Wainwright Post Wide Work Plan (USA*CE 2011).

References

ADEC (Alaska Department of Environmental Conservation). 2011 (November). M*onitoring Well Guidance*. Division of Spill Prevention and Response. Contaminated Sites Program.

ADEC. 2012 (April). *Oil and Hazardous Pollution Control*. 18 Alaska Administrative Code (AAC) 75.

ASTM (American Society for Testing and Materials). 2006. *Standard Practice for Classification of Soils for Engineering Purposes*. D2487-06e1.

USACE (U.S. Army Corps of Engineers). 2011 (April). *Fort Wainwright Post Wide Work Plan*. Fort Wainwright, Alaska. Prepared by Jacobs Engineering Group Inc.

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Tables

Table 1 Groundwater Stabilization Parameters

Table 2 Sample Containers, Preservatives, and Hold Times for Analytical Sampling

Table 3 2012 Groundwater Monitoring Sampling Plan

Figures

Figure 1 2012 Groundwater Sample Locations

Figure 2 Potential Site for Deep Groundwater Monitoring Well

Attachments

Attachment 1 Updated Field Data Form

TABLES

Table 1
Groundwater Stabilization Parameters

Parameter	Acceptable Variation
Temperature	±0.2 degree Celsius
Conductivity	±3%
pH	±0.1 pH units
Dissolved Oxygen	±10%
Redox Potential	±10 millivolts (mV)
Turbidity	±10% (1 NTU if reading is less than 10 NTUs)

Table 2
Sample Containers, Preservatives, and Hold Times for Analytical Sampling

Parameter	Analytical Method	Container	Preservative	Maximum Holding Times
Surface Water and Groundwater Samples				
Total Metals	SW6020/7470	One 500-mL polyethylene bottle	Nitric acid	180 days/28 days
GRO	AK101	Three 40-mL VOA vials	HCL, 4°C ± 2°C, zero headspace	14 days
DRO/RRO	AK102/103	Two 1-L amber glass bottles	HCl, 4°C ± 2°C	7 days to extract, 40 days to analyze
SVOC	SW8270/SW8270 SIM	Two 1-L amber glass bottles	4°C ± 2°C	7 days to extract, 40 days to analyze
VOC/Low Level VOC	SW8260	Three 40-mL VOA vials	HCL, 4°C ± 2°C, zero headspace	14 days
Herbicides	SW8151	Two 1-L amber glass bottles	4°C ± 2°C	7 days to extract, 40 days to analyze
Pesticides	SW8081	Two 1-L amber glass bottles	4°C ± 2°C	7 days to extract, 40 days to analyze
PCB	SW8082	Two 1-L amber glass bottles	4°C ± 2°C	30 days to extract, 40 days to analyze
Explosives	SW8321	Two 500 mL amber glass bottles	4 °C ± 2 °C	7 days to extract, 40 days to analyze
Glycol	SW8015M	One 40-mL VOA vial	4°C ± 2°C	7 days
Sulfate	E300	Three 40-mL VOA vials	4°C ±– 2°C	28 days
Nitrate/Nitrite	E353.2	One 40-mL VOA vial	H2SO4, 4°C ± 2°C	28 days
Ammonia	E350.1	One 500-ml Polyethylene	H2SO4, 4°C ± 2°C	28 days
Phosphorus	SW6020	One 500-mL polyethylene bottle	Nitric acid	180 days/28 days
Potassium	SW6020	One 500-mL polyethylene bottle	Nitric acid	180 days/28 days
Alkalinity	E310.1	One 500 mL Poly	4°C ± 2°C	14 days
Manganese	SW6020	One 500-mL polyethylene bottle	Nitric acid	180 days/28 days
Methane	RSK175	Three 40-mL VOA vials	HCL, 4°C ± 2°C, zero headspace	14 days
EDB	504.1	Three 40-mL VOA vials	Sodium thiosulfate, zero headspace, 4°C ± 2°C	14 days

Notes:
Actual containers and hold times will be specified by the contracted analytical laboratory and may differ from this table.
L = liter; mL = milliliter; °C = degrees Celsius; VOA = volatile organic analysis

Table 3
2012 Groundwater Monitoring Sampling Plan

Location ID	Sample ID	Field QA/QC	GRO AK101	DRO/RRO 102/103	Metals SW6010/SW6020/ SW7470	Glycol SW8015M	Pesticides SW8081A	PCB SW8082	Herbicides SW8151	VOC SW8260	Low-level VOC SW8260 SIM[a]	SVOC SW8270C	PAH SW8270 SIM	Explosives SW8321	E300A (Sulfate)	E353.2 (Nitrate/Nitrite)	E350.1 (Ammonia)	E365.3 (Phosphorus)	SW6010B (Potassium)	(Alkalinity)	RSK 175 (Methane)	Manganese	Field Parameters (pH, ORP, DO)	Ferrous Iron
MW08	12FWAMW08-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW39	12FWAMW39-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW40	12FWAMW40-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW43	12FWAMW43-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW45	12FWAMW45-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW47	12FWAMW47-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW47	12FWAMW47X-GWS	field dup	X	X	X		X		X	X	X	X	X	X									X	
MW47	12FWAMW47-GWS	Matrix spike	X	X	X		X		X	X	X	X	X	X									X	
MW47	12FWAMW47-GWS	Matrix spike dup	X	X	X		X		X	X	X	X	X	X									X	
MW48	12FWAMW48-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW53	12FWAMW53-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW56	12FWAMW56-GWS		X	X	X	X	X		X	X	X	X	X	X									X	
MW56	12FWAMW56X-GWS	field dup	X	X	X	X	X		X	X	X	X	X	X									X	
MW56	12FWAMW56-GWS	Matrix spike (glycol only)				X																	X	
MW56	12FWAMW56-GWS	Matrix spike dup (glycol only)				X																	X	
MW57	12FWAMW57-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW61	12FWAMW61-GWS		X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW62	12FWAMW62-GWS		X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 3
2012 Groundwater Monitoring Sampling Plan (Continued)

Location ID	Sample ID	Field QA/QC	GRO AK101	DRO/RRO 102/103	Metals SW6010/SW6020/ SW7470	Glycol SW8015M	Pesticides SW8081A	PCB SW8082	Herbicides SW8151	VOC SW8260	Low-level VOC SW8260 SIM[a]	SVOC SW8270C	PAH SW8270 SIM	Explosives SW8321	E300A (Sulfate)	E353.2 (Nitrate/Nitrite)	E350.1 (Ammonia)	E365.3 (Phosphorus)	SW6010B (Potassium)	(Alkalinity)	RSK 175 (Methane)	Manganese	Field Parameters (pH, ORP, DO)	Ferrous Iron
MW69	12FWAMW69-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW70	12FWAMW70-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW78	12FWAMW78-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW79	12FWAMW79-GWS		X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW80	12FWAMW80-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW06A	12FWAMW06A-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW12	12FWAMW12-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW12	12FWAMW12X-GWS	field dup	X	X	X		X		X	X	X	X	X	X									X	
MW26	12FWAMW26-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW28	12FWAMW28-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW33	12FWAMW33-GWS		X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW35	12FWAMW35-GWS		X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW36	12FWAMW36-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW37	12FWAMW37-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW38	12FWAMW38-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW58	12FWAMW58-GWS		X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW58	12FWAMW58X-GWS	field dup	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW58	12FWAMW58-GWS	Matrix spike	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW58	12FWAMW58-GWS	Matrix spike dup	X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 3
2012 Groundwater Monitoring Sampling Plan (Continued)

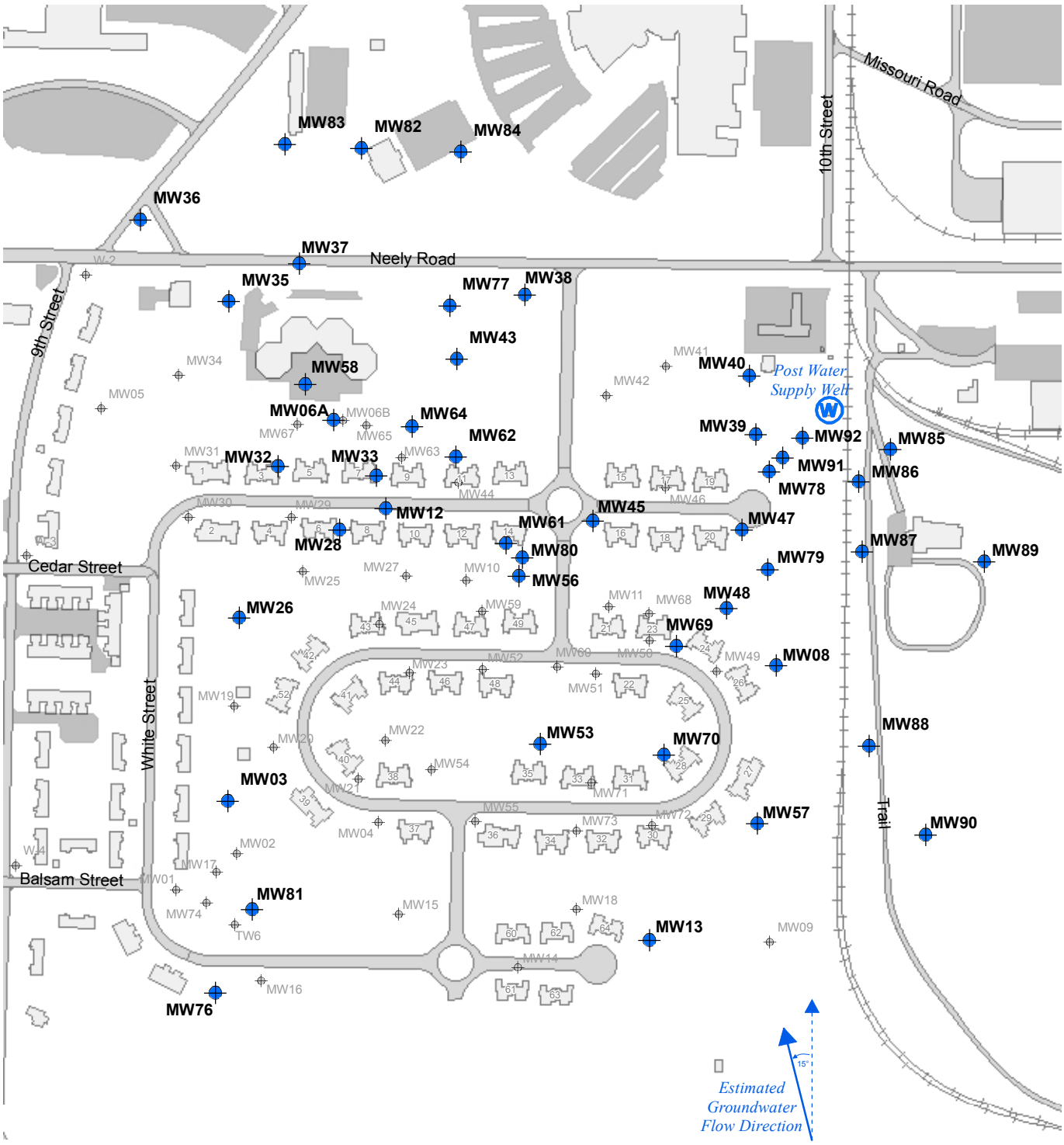
Location ID	Sample ID	Field QA/QC	GRO AK101	DRO/RRO 102/103	Metals SW6010/SW6020/ SW7470	Glycol SW8015M	Pesticides SW8081A	PCB SW8082	Herbicides SW8151	VOC SW8260	Low-level VOC SW8260 SIM[a]	SVOC SW8270C	PAH SW8270 SIM	Explosives SW8321	E300A (Sulfate)	E353.2 (Nitrate/Nitrite)	E350.1 (Ammonia)	E365.3 (Phosphorus)	SW6010B (Potassium)	(Alkalinity)	RSK 175 (Methane)	Manganese	Field Parameters (pH, ORP, DO)	Ferrous Iron
MW64	12FWAMW64-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW77	12FWAMW77-GWS		X	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW32	12FWAMW32-GWS		X	X	X		X		X	X	X	X	X	X									X	
MW13	12FWAMW13-GWS		X	X	X		X	X	X	X	X	X	X										X	
MW03	12FWAMW03-GWS		X	X	X		X	X	X	X	X	X	X										X	
MW03	12FWAMW03X-GWS	field dup (PCB only)						X															X	
MW03	12FWAMW03-GWS	Matrix spike (PCB only)						X															X	
MW03	12FWAMW03-GWS	Matrix spike dup (PCB only)						X															X	
MW76	12FWAMW76-GWS		X	X	X		X	X	X	X	X	X	X										X	
MW81	12FWAMW81-GWS		X	X	X		X	X	X	X	X	X	X										X	
MW82	12FWAMW82-GWS			X						X	X		X		X	X	X	X	X	X	X	X	X	X
MW83	12FWAMW83-GWS			X						X	X		X										X	
MW84	12FWAMW84-GWS			X						X	X		X		X	X	X	X	X	X	X	X	X	X
MW85	12FWAMW85-GWS			X						X	X		X										X	
MW85	12FWAMW85X-GWS	field dup		X						X	X		X										X	
MW85	12FWAMW85-GWS	Matrix spike		X						X	X		X										X	
MW85	12FWAMW85-GWS	Matrix spike dup		X						X	X		X										X	
MW86	12FWAMW86-GWS			X						X	X		X										X	
MW87	12FWAMW87-GWS			X						X	X		X										X	

Table 3
2012 Groundwater Monitoring Sampling Plan (Continued)

Location ID	Sample ID	Field QA/QC	GRO AK101	DRO/RRO 102/103	Metals SW6010/SW6020/ SW7470	Glycol SW8015M	Pesticides SW8081A	PCB SW8082	Herbicides SW8151	VOC SW8260	Low-level VOC SW8260 SIM[a]	SVOC SW8270C	PAH SW8270 SIM	Explosives SW8321	E300A (Sulfate)	E353.2 (Nitrate/Nitrite)	E350.1 (Ammonia)	E365.3 (Phosphorus)	SW6010B (Potassium)	(Alkalinity)	RSK 175 (Methane)	Manganese	Field Parameters (pH, ORP, DO)	Ferrous Iron
MW88	12FWAMW88-GWS			X						X	X		X										X	
MW89	12FWAMW89-GWS			X						X	X		X										X	
MW90	12FWAMW90-GWS			X						X	X		X										X	
MW91	12FWAMW91-GWS			X						X	X		X										X	
MW92	12FWAMW92-GWS			X						X	X		X										X	
MW92	12FWAMW92X-GWS	field dup		X						X	X		X										X	
MW93	12FWAMW93-GWS			X						X	X		X										X	

Notes:
GRO = gasoline-range organics
DRO = diesel-range organics
RRO = residual-range organics
The last letter in the Sample ID is S for the spring 2012 event, and will be changed to F for the 2012 fall sampling event.
This table represents the sampling program as of 2012. The sample locations and types of analysis may differ from this list for sampling events after 2012.

FIGURES



- Monitoring Well
- Groundwater Sample Locations
- Post Water Supply Well
- Railroad
- Building
- Road or Trail
- Parking Area

All Locations Are Approximate

0 250 500 750 1,000
Feet

WGS 1984 UTM Zone 6N Transverse Mercator

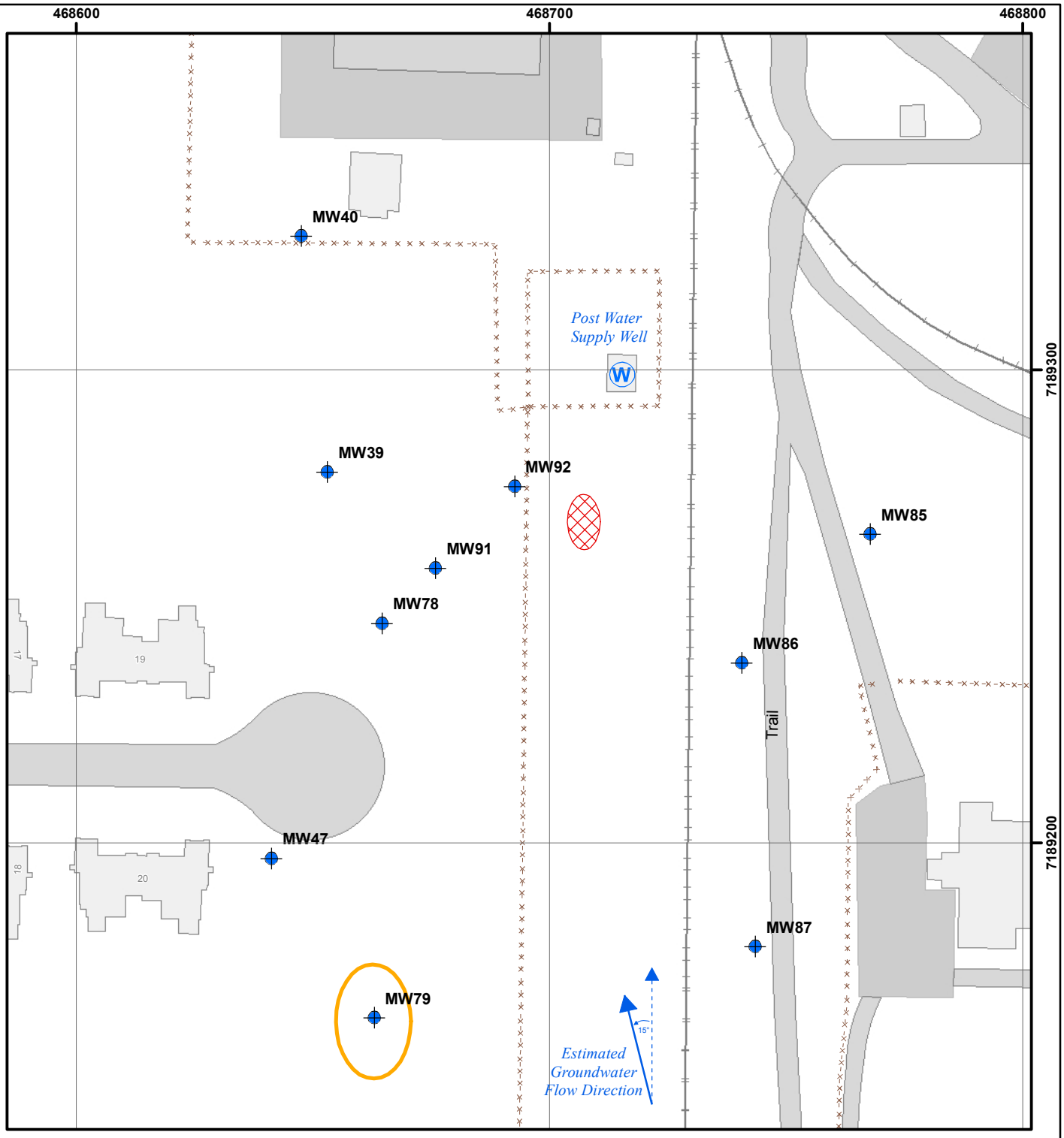
N

2012 GROUNDWATER SAMPLE LOCATIONS

FORT WAINWRIGHT, FAIRBANKS, ALASKA

JACOBS	DATE:	PROJECT MANAGER:	FIGURE NO:
	17 May 2012	T. HEIKKILA	1

P:\Taku_Gardens\MXD\2012GroundwaterSampleLocations.mxd beatyg



1,000 gpm Pumping Rate Water Supply Capture Zone

1,700 gpm Pumping Rate Water Supply Capture Zone

Monitoring Well to Sample in 2012 for MNA Parameters

Post Water Supply Well

Potential Well Location (Pending Subsurface Utility Clearance)

TCP Above ADEC Criteria (Plume Area)

Building

Railroad

Fence Line

0 50 100 150 200
Feet

WGS 1984 UTM Zone 6N Transverse Mercator

N

* TCP: 1,2,3-Trichloropropane

POTENTIAL SITE FOR DEEP GROUNDWATER MONITORING WELL

FORT WAINWRIGHT, FAIRBANKS, ALASKA

JACOBS	DATE:	PROJECT MANAGER:	FIGURE NO:
	24 May 2012	T. HEIKKILA	2

P:\Taku_Gardens\MXD\2012_PotentialWellSite.mxd beatycj

ATTACHMENT 1

Updated Field Data Form

Groundwater Sampling Data Sheet

Groundwater Sampling Data Sheet

JACOBS

Site Name	Event	Well ID	Project Number
Weather Conditions	**In Well (IW) and Breathing Zone (BZ) PID Reading**	**Date**	**Sampler Initials**

Well Information

Well Integrity	Well Type	Well Casing Material	Casing Diameter(in) / Gallons per linear foot(g)
Good Fair Poor	Monitor Extraction	PVC	1 / 0.041 2 / 0.163 4 / 0.653 6 / 1.469
Depth to Product (ft)	**Depth to GW (ft)**	**Total Depth of Casing (ft)**	**Amount of Product = Depth to GW – Depth to Product**

Max purge volume (3 well casing volumes) = [total depth of casing (ft) – depth to water (ft)] x gallons per linear foot of casing x 3

SHOW WORK Max Purge Volume = [(ft) – (ft)] X (g/ft) X (3) = gallons

Well Purging Information

Start Time	Finish Time	Depth of Tubing (ft)		Equipment Used for Purging
				Bailer Peristaltic Pump Submersible Pump
Color	**Odor**	**Sheen**	**Purged Dry**	**Meter Used During Purging**
Clear Cloudy Brown Other:	None Faint Moderate Strong	Yes No	Yes No	YSI Multi Meter Hach Turbidimeter

Water generated during purging was: Treated Stored Other:

Maximum Pumping Rate = 0.264 gallons per minute (1 liter per minute) 1 gallon = 3.785 liters
Maximum Water Level Drawdown = 0.3 ft

		Acceptable Range for Field Parameter to Demonstrate Stability						
		± 0.1 S.U.	**± 3%**	**± 0.2 °C**	**±10% (±1 NTU if < 10 NTUs)**	**± 10%**	**± 10 mV**	
Time (HH:mm)	Volume (Gallons)	pH (S.U.)	Conductivity (µS/cm)	Temperature (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Water Level (feet btoc)

Sample Collection Information

Start Time	Finish Time / Date	Depth of Tubing	Equipment Used for Sampling
			Peristaltic Pump Submersible Pump
Container/Preservative	**Analysis Requested**	**Notes**	Ferrous Iron (Fe 2+) mg/L =

____See reverse side of this form for additional field parameter measurements

Groundwater Sampling Data Sheet (Continued)

JACOBS

Site Name	Event	Well ID	Project Number
		Date	Sampler Initials

Maximum Pumping Rate = 0.264 gallons per minute (1 liter per minute) 1 gallon = 3.785 liters
Maximum Water Level Drawdown = 0.3 ft

		Acceptable Range for Field Parameters to Demonstrate Stability						
		± 0.1 S.U.	**± 3%**	**± 0.2 °C**	**±10% (±1 NTU if < 10 NTUs)**	**± 10%**	**± 10 mV**	
Time (HH:mm)	Volume (Gallons)	pH (S.U.)	Conductivity (µS/cm)	Temperature (°C)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	Water Level (feet btoc)