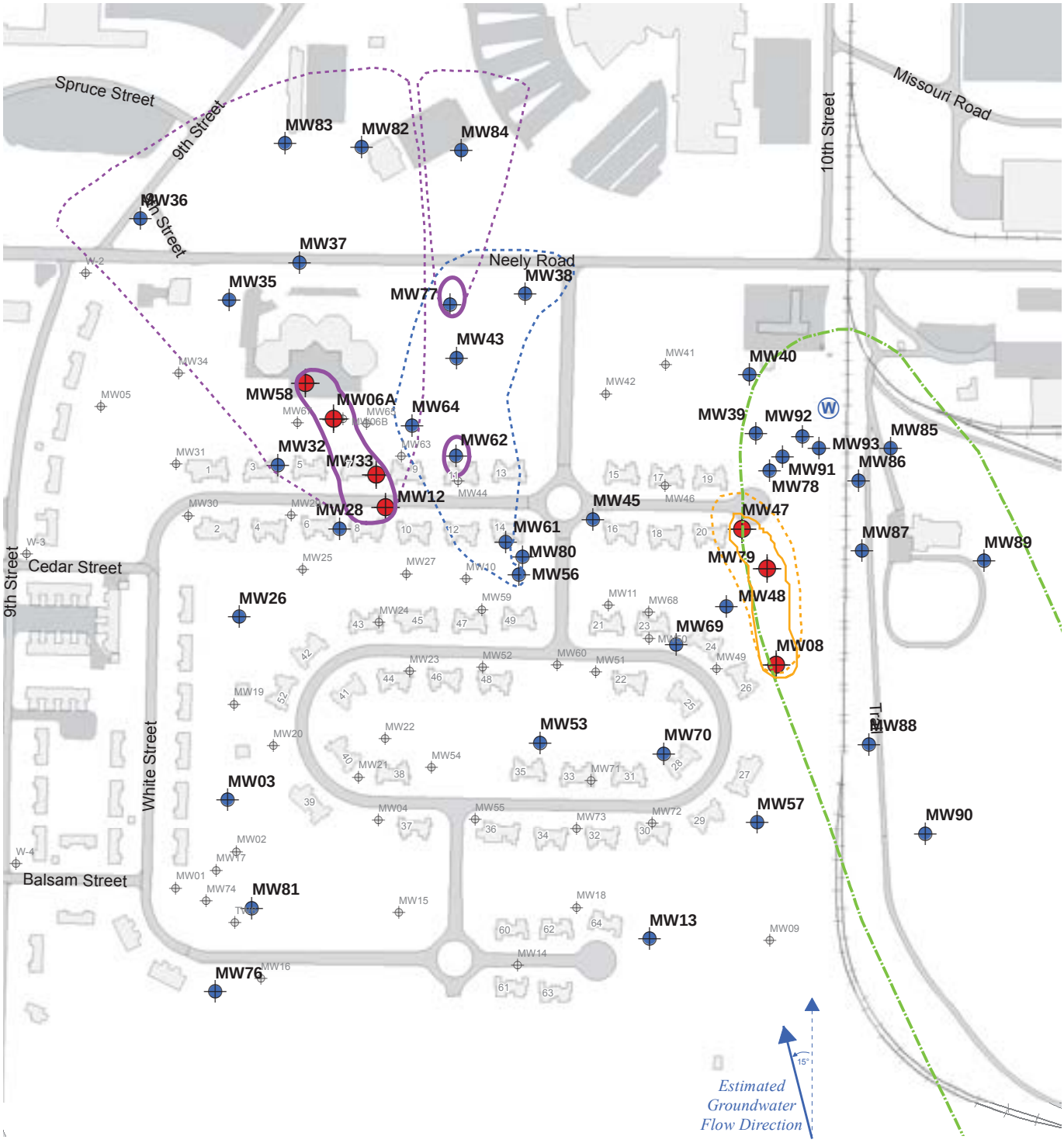


Post Water Supply Well Capture Zone*

DRO above project cleanup level (plume area)

TCP above project cleanup level (plume area)

DRO below project cleanup level (leading plume edge)

TCE below project cleanup level (leading plume edge)

TCP below project cleanup level (leading plume edge)

Monitoring Well Sampled in 2012 - Exceedance

Monitoring Well Sampled in 2012 - No Exceedance

Onsite Well

Post Water Supply Well

Building

Railroad

Road or Trail

TCP: 1,2,3-Trichloropropane

*Modeled by CH2M HILL (UACE 2010 Appendix B), for a pumping rate of 1,700 gpm.

All Locations Are Approximate

0 250 500 750 1,000

Feet

WGS 1984 UTM Zone 6N

N

2012 FORMER COMMUNICATIONS SITE IN-PLUME BOUNDARIES

FORT WAINWRIGHT, FAIRBANKS, ALASKA

JACOBS	DATE: 20 MAR 2013	PROJECT MANAGER: T. HEIKKILA	FIGURE NO: A-13

P:\Taku_Gardens\MXD\2012_GWMP\MXD\Taku_GWMP_2012_Plumes.mxd beatycj

468000

468500

7189500

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products			
						1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW82									
Screen	JUL 2010	10FWAMW82-GWS	431.41	0.000024	0.00004	**0.00051**	ND (0.0002)	ND (0.00015)	ND (0.00002)
Interval	OCT 2010	10FWAMW82-GWF	430.82	0.000067	0.00012	**0.00087**	ND (0.00045)	ND (0.00045)	ND (0.00002)
(Ft bgs)	JUL 2011	11FWAMW82-GWS	433.00	0.000029	ND (0.00005)	**0.00069**	ND (0.00045)	ND (0.00045)	**0.000048**
10.5-20	OCT 2011	11FWAMW82-GWF	432.23	ND (0.00005)	ND (0.00005)	**0.0008**	ND (0.00045)	ND (0.00045)	ND (0.00002)
	JUL 2012	12FWAMW82-GWS	434.35	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)
	SEP 2012	12FWAMW82-GWF	434.08	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products			
						1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW83									
Screen	OCT 2010	10FWAMW83-GWF	430.68	ND (0.00045)	0.00012	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
Interval	JUL 2011	11FWAMW83-GWS	432.87	ND (0.00045)	ND (0.0005)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
(Ft bgs)	OCT 2011	11FWAMW83-GWF	432.10	ND (0.00045)	ND (0.0005)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
10-20	JUL 2012	12FWAMW83-GWS	434.29	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)
	SEP 2012	12FWAMW83-GWF	434.09	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products			
						1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW37									
Screen	OCT 2007	07FWBMW37-GW(F)	432.07	ND (0.00031)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
Interval	MAY 2008	08FWTMW37-GWF	432.03	ND (0.000014)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.00005)
(Ft bgs)	OCT 2008	08FWTMW37-GW(S)	432.66	ND (0.000014)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.00005)
7-17	JUN 2009	09FWTMW37-GW(S)	432.35	ND (0.00031)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
	SEP 2009	09FWTMW37-GWF	432.23	ND (0.000014)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	**0.000015**
	JUL 2010	10FWAMW37-GWF	431.53	ND (0.00005)	ND (0.001)	ND (0.001)	**0.00042**	ND (0.001)	ND (0.001)
	OCT 2010	10FWAMW37-GWS	431.05	ND (0.00015)	ND (0.001)	ND (0.001)	**0.00032**	ND (0.001)	ND (0.001)
	JUL 2011	11FWAMW37-GWS	433.41	ND (0.00005)	ND (0.001)	ND (0.001)	**0.00036**	ND (0.001)	ND (0.001)
	OCT 2011	11FWAMW37-GWF	433.05	ND (0.00005)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
	JUL 2012	12FWAMW37-GWS	434.65	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)
	SEP 2012	12FWAMW37-GWF	434.38	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products			
						1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW43									
Screen	OCT 2007	07FWAMW43-GW(F)	432.14	0.0013	ND (0.000088)	ND (0.000098)	**0.00046**	**0.00018**	ND (0.00018)
Interval	MAY 2008	08FWAMW43-GW(S)	430.20	0.0021	ND (0.0001)	ND (0.00014)	ND (0.0001)	ND (0.00011)	ND (0.0000097)
(Ft bgs)	OCT 2008	08FWAMW43-GWF	432.85	0.001	ND (0.0001)	ND (0.00014)	**0.00041**	**0.00012**	ND (0.0000097)
7-17	MAY 2009	09FWAMW43-GW(S)	432.53	0.00153	ND (0.00031)	ND (0.00031)	**0.00066**	ND (0.00031)	**0.000034**
	SEP 2009	09FWAMW43-GWF	432.35	0.00112	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.0000097)
	JUL 2010	10FWAMW43-GWS	431.73	0.0008	ND (0.00005)	**0.00026**	**0.0006**	**0.00034**	**0.000053**
	OCT 2010	10FWAMW43-GWF	431.29	0.002	0.00011	**0.00023**	**0.00027**	ND (0.00045)	**0.000014**
	JUL 2011	11FWAMW43-GWS	433.40	0.0019	0.00005	**0.00034**	**0.00074**	**0.00038**	**0.000063**
	OCT 2011	11FWAMW43-GWF	432.70	0.00077	ND (0.00005)	**0.0002**	**0.00019**	ND (0.00045)	**0.00002**
	JUL 2012	12FWAMW43-GWS	434.95	0.00091	ND (0.0005)	ND (0.0005)	**0.00028**	ND (0.0005)	ND (0.0005)
	SEP 2012	12FWAMW43-GWF	434.66	0.00061	ND (0.0005)	ND (0.0005)	**0.00015**	ND (0.0005)	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products			
						1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW77									
Screen	OCT 2008	08FWBMW77-GWF	436.69	0.0012	ND (0.0001)	ND (0.00014)	**0.00046**	**0.00018**	ND (0.0000097)
Interval	JUN 2009	09FWBMW77-GW(S)	437.15	0.00181	ND (0.00031)	ND (0.00031)	**0.00038**	ND (0.00031)	ND (0.00031)
(Ft bgs)	SEP 2009	09FWBMW77-GWF	436.04	0.00128	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.0000097)
11.5-21.5	JUL 2010	10FWAMW77-GWS	435.87	0.001	0.00041	ND (0.00015)	**0.00026**	ND (0.00015)	ND (0.00002)
	OCT 2010	10FWAMW77-GWF	435.21	0.0012	0.00013	**0.00019**	**0.00035**	ND (0.00045)	ND (0.00002)
	JUL 2011	11FWAMW77-GWS	437.28	0.001	ND (0.00005)	**0.00018**	**0.0003**	ND (0.00045)	**0.000028**
	OCT 2011	11FWAMW77-GWF	435.62	0.00093	0.000029	**0.00024**	**0.00032**	ND (0.00045)	**0.000026**
	JUL 2012	12FWAMW77-GWS	433.74	0.0013	ND (0.0005)	ND (0.0005)	**0.00032**	**0.00009**	ND (0.0005)
	SEP 2012	12FWAMW77-GWF	434.43	0.0011	ND (0.0005)	ND (0.0005)	**0.0003**	ND (0.0005)	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products			
						1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW84									
Screen	JUL 2010	10FWAMW84-GWS	431.62	ND (0.00045)	0.000047	**0.0012**	ND (0.0002)	ND (0.00015)	ND (0.00002)
Interval	OCT 2010	10FWAMW84-GWF	430.87	0.000055	0.00011	**0.0029**	ND (0.00045)	ND (0.00045)	ND (0.00002)
(Ft bgs)	JUL 2011	11FWAMW84-GWS	433.29	ND (0.00005)	ND (0.00005)	**0.0026**	ND (0.00045)	ND (0.00045)	**0.000062**
9-19	OCT 2011	11FWAMW84-GWF	432.56	ND (0.00005)	ND (0.00005)	**0.0035**	ND (0.00045)	ND (0.00045)	**0.000083**
	JUL 2012	12FWAMW84-GWS	434.43	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)
	SEP 2012	12FWAMW84-GWF	434.19	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products			
						1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW38									
Screen	OCT 2007	07FWBMW38-GW(F)	432.50	ND (0.00031)	ND (0.00038)	ND (0.00036)	ND (0.0001)	ND (0.00011)	ND (0.00012)
Interval	MAY 2008	08FWTMW38-GW(S)	432.45	0.00022	ND (0.0001)	ND (0.00014)	ND (0.0001)	ND (0.00011)	**0.000012**
(Ft bgs)	OCT 2008	08FWTMW38-GWF	433.05	0.00017	ND (0.0001)	ND (0.00014)	**0.00016**	ND (0.00011)	ND (0.0000097)
7.2-17.2	JUN 2009	09FWAMW38-GW(S)	432.66	0.00053	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)
	SEP 2009	09FWTMW38-GWFR	432.45	0.00021	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)
	JUL 2010	10FWAMW38-GWS	431.94	0.0004	ND (0.00005)	**0.000029**	**0.00012**	ND (0.00015)	ND (0.00002)
	OCT 2010	10FWAMW38-GWF	431.43	0.00021	0.00012	**0.000068**	**0.00017**	ND (0.00045)	ND (0.00002)
	JUL 2011	11FWAMW38-GWS	433.81	0.00015	ND (0.00005)	**0.000036**	ND (0.00045)	ND (0.00045)	**0.000017**
	OCT 2011	11FWAMW38-GWF	432.96	0.00017	ND (0.00005)	**0.000034**	ND (0.00045)	ND (0.00045)	ND (0.00002)
	JUL 2012	12FWAMW38-GWS	434.86	0.00022	ND (0.0005)	ND (0.0005)	**0.00019**	**0.0001**	ND (0.0005)
	SEP 2012	12FWAMW38-GWF	434.60	0.00019	ND (0.0005)	ND (0.0005)	**0.00016**	**0.00008**	ND (0.0005)

MW83
MW82
MW84
MW37
MW77
MW38
MW43
MW58
MW41
MW42
MW40
SAS
Trail
Estimated Groundwater Flow Direction
15°

- Onsite Well
- 2012 Sample -No Exceedance
- Ⓦ Post Water Supply Well

Notes:

Units: mg/L
ND: not detected
Ft bgs: feet below ground surface
Trichloroethene (TCE) project cleanup level = 0.005 mg/L
cis-1,2-Dichloroethene ADEC action level = 0.07 mg/L
1,1-Dichloroethene ADEC action level = 0.007 mg/L
trans-1,2-Dichloroethene ADEC action level = 0.1 mg/L
Vinyl chloride ADEC action level = 0.002 mg/L
Tetrachloroethene (PCE) ADEC action level = 0.005 mg/L

The F or S at the end of the sample ID indicates the spring or fall sampling event.
(F) or (S) is appended to the sample ID where the original sample ID did not include an F or an S.
Results are presented without qualifiers.
BOLD indicates detections of degradation products.

All Locations Are Approximate

0 150 300 450 600
Feet

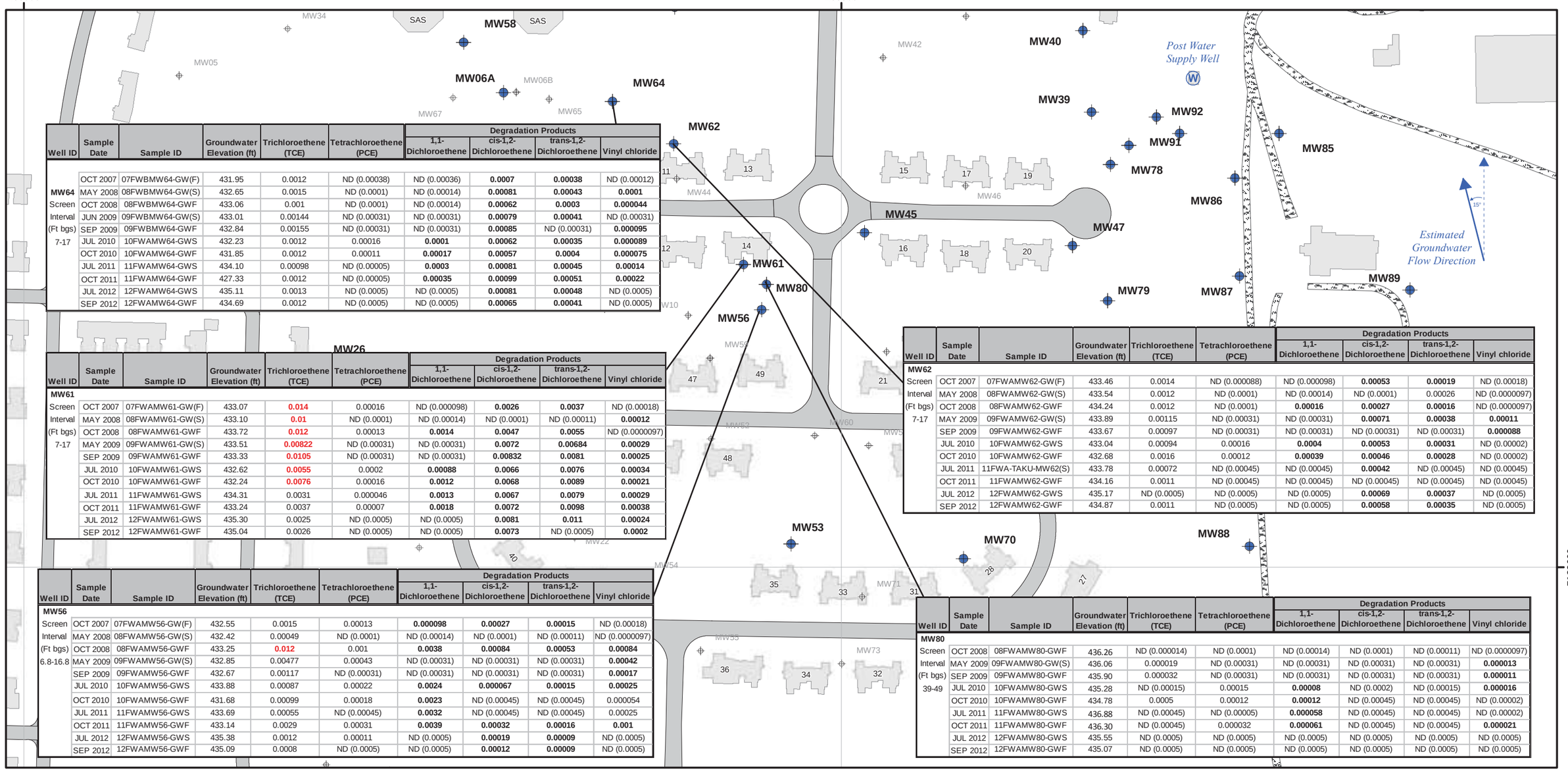
WGS 1984 UTM Zone 6N

N

FORMER COMMUNICATIONS SITE (NORTH)
HISTORICAL TRICHLOROETHENE RESULTS
FOR IN-PLUME AND SURROUNDING WELLS
FORT WAINWRIGHT, FAIRBANKS, ALASKA

JACOBS | DATE: 26 DEC 2013 | PROJECT MANAGER: T. HEIKKILA | FIGURE NO: A-14

P:\Taku_Gardens\MXD\2013_GWMP\2013_Taku_GWMP_TCE_Con_N.mxd beatycj



Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products 1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW64	OCT 2007	07FWBMW64-GW(F)	431.95	0.0012	ND (0.00038)	ND (0.00036)	**0.0007**	**0.00038**	ND (0.00012)
Screen	MAY 2008	08FWBMW64-GW(S)	432.65	0.0015	ND (0.0001)	ND (0.00014)	**0.00081**	**0.00043**	**0.0001**
Interval	OCT 2008	08FWBMW64-GWF	433.06	0.001	ND (0.0001)	ND (0.00014)	**0.00062**	**0.0003**	**0.000044**
(Ft bgs)	JUN 2009	09FWBMW64-GW(S)	433.01	0.00144	ND (0.00031)	ND (0.00031)	**0.00079**	**0.00041**	ND (0.00031)
7-17	SEP 2009	09FWBMW64-GWF	432.84	0.00155	ND (0.00031)	ND (0.00031)	**0.00085**	ND (0.00031)	**0.000095**
	JUL 2010	10FWAMW64-GWS	432.23	0.0012	0.00016	**0.0001**	**0.00062**	**0.00035**	**0.000089**
	OCT 2010	10FWAMW64-GWF	431.85	0.0012	0.00011	**0.00017**	**0.00057**	**0.0004**	**0.000075**
	JUL 2011	11FWAMW64-GWS	434.10	0.00098	ND (0.00005)	**0.0003**	**0.00081**	**0.00045**	**0.00014**
	OCT 2011	11FWAMW64-GWF	427.33	0.0012	ND (0.00005)	**0.00035**	**0.00099**	**0.00051**	**0.00022**
	JUL 2012	12FWAMW64-GWS	435.11	0.0013	ND (0.0005)	ND (0.0005)	**0.00081**	**0.00048**	ND (0.0005)
	SEP 2012	12FWAMW64-GWF	434.69	0.0012	ND (0.0005)	ND (0.0005)	**0.00065**	**0.00041**	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products 1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW61									
Screen	OCT 2007	07FWAMW61-GW(F)	433.07	0.014	0.00016	ND (0.000098)	**0.0026**	**0.0037**	ND (0.00018)
Interval	MAY 2008	08FWAMW61-GW(S)	433.10	0.01	ND (0.0001)	ND (0.00014)	ND (0.0001)	ND (0.00011)	**0.00012**
(Ft bgs)	OCT 2008	08FWAMW61-GWF	433.72	0.012	0.00013	**0.0014**	**0.0047**	**0.0055**	ND (0.0000097)
7-17	MAY 2009	09FWAMW61-GW(S)	433.51	0.00822	ND (0.00031)	ND (0.00031)	**0.0072**	**0.00684**	**0.00029**
	SEP 2009	09FWAMW61-GWF	433.33	0.0105	ND (0.00031)	ND (0.00031)	**0.00832**	**0.0081**	**0.00025**
	JUL 2010	10FWAMW61-GWS	432.62	0.0055	0.0002	**0.00088**	**0.0066**	**0.0076**	**0.00034**
	OCT 2010	10FWAMW61-GWF	432.24	0.0076	0.00016	**0.0012**	**0.0068**	**0.0089**	**0.00021**
	JUL 2011	11FWAMW61-GWS	434.31	0.0031	0.000046	**0.0013**	**0.0067**	**0.0079**	**0.00029**
	OCT 2011	11FWAMW61-GWF	433.24	0.0037	0.00007	**0.0018**	**0.0072**	**0.0098**	**0.00038**
	JUL 2012	12FWAMW61-GWS	435.30	0.0025	ND (0.0005)	ND (0.0005)	**0.0081**	**0.011**	**0.00024**
	SEP 2012	12FWAMW61-GWF	435.04	0.0026	ND (0.0005)	ND (0.0005)	**0.0073**	ND (0.0005)	**0.0002**

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products 1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW56									
Screen	OCT 2007	07FWAMW56-GW(F)	432.55	0.0015	0.00013	**0.000098**	**0.00027**	**0.00015**	ND (0.00018)
Interval	MAY 2008	08FWAMW56-GW(S)	432.42	0.00049	ND (0.0001)	ND (0.00014)	ND (0.0001)	ND (0.00011)	ND (0.0000097)
(Ft bgs)	OCT 2008	08FWAMW56-GWF	433.25	0.012	0.001	**0.0038**	**0.00084**	**0.00053**	**0.00084**
6.8-16.8	MAY 2009	09FWAMW56-GW(S)	432.85	0.00477	0.00043	ND (0.00031)	ND (0.00031)	ND (0.00031)	**0.00042**
	SEP 2009	09FWAMW56-GWF	432.67	0.00117	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)	**0.00017**
	JUL 2010	10FWAMW56-GWS	433.88	0.00087	0.00022	**0.0024**	**0.000067**	**0.00015**	**0.00025**
	OCT 2010	10FWAMW56-GWF	431.68	0.00099	0.00018	**0.0023**	ND (0.00045)	ND (0.00045)	0.000054
	JUL 2011	11FWAMW56-GWS	433.69	0.00055	ND (0.00045)	**0.0032**	ND (0.00045)	ND (0.00045)	0.00025
	OCT 2011	11FWAMW56-GWF	433.14	0.0029	0.00031	**0.0039**	**0.00032**	**0.00016**	**0.001**
	JUL 2012	12FWAMW56-GWS	435.38	0.0012	0.00011	ND (0.0005)	**0.00019**	**0.00009**	ND (0.0005)
	SEP 2012	12FWAMW56-GWF	435.09	0.0008	ND (0.0005)	ND (0.0005)	**0.00012**	**0.00009**	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products 1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW62									
Screen	OCT 2007	07FWAMW62-GW(F)	433.46	0.0014	ND (0.000088)	ND (0.000098)	**0.00053**	**0.00019**	ND (0.00018)
Interval	MAY 2008	08FWAMW62-GW(S)	433.54	0.0012	ND (0.0001)	ND (0.00014)	ND (0.0001)	0.00026	ND (0.0000097)
(Ft bgs)	OCT 2008	08FWAMW62-GWF	434.24	0.0012	ND (0.0001)	**0.00016**	**0.00027**	**0.00016**	ND (0.0000097)
7-17	MAY 2009	09FWAMW62-GW(S)	433.89	0.00115	ND (0.00031)	ND (0.00031)	**0.00071**	**0.00038**	**0.00011**
	SEP 2009	09FWAMW62-GWF	433.67	0.00097	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)	**0.000088**
	JUL 2010	10FWAMW62-GWS	433.04	0.00094	0.00016	**0.0004**	**0.00053**	**0.00031**	ND (0.00002)
	OCT 2010	10FWAMW62-GWF	432.68	0.0016	0.00012	**0.00039**	**0.00046**	**0.00028**	ND (0.00002)
	JUL 2011	11FWA-TAKU-MW62(S)	433.78	0.00072	ND (0.00045)	ND (0.00045)	**0.00042**	ND (0.00045)	ND (0.00045)
	OCT 2011	11FWAMW62-GWF	434.16	0.0011	ND (0.00045)	ND (0.00045)	ND (0.00045)	ND (0.00045)	ND (0.00045)
	JUL 2012	12FWAMW62-GWS	435.17	ND (0.0005)	ND (0.0005)	ND (0.0005)	**0.00069**	**0.00037**	ND (0.0005)
	SEP 2012	12FWAMW62-GWF	434.87	0.0011	ND (0.0005)	ND (0.0005)	**0.00058**	**0.00035**	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	Trichloroethene (TCE)	Tetrachloroethene (PCE)	Degradation Products 1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl chloride
MW80									
Screen	OCT 2008	08FWAMW80-GWF	436.26	ND (0.000014)	ND (0.0001)	ND (0.00014)	ND (0.0001)	ND (0.00011)	ND (0.0000097)
Interval	MAY 2009	09FWAMW80-GW(S)	436.06	0.000019	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)	**0.000013**
(Ft bgs)	SEP 2009	09FWAMW80-GWF	435.90	0.000032	ND (0.00031)	ND (0.00031)	ND (0.00031)	ND (0.00031)	**0.000011**
39-49	JUL 2010	10FWAMW80-GWS	435.28	ND (0.00015)	0.00015	**0.00008**	ND (0.0002)	ND (0.00015)	**0.000016**
	OCT 2010	10FWAMW80-GWF	434.78	0.0005	0.00012	**0.00012**	ND (0.00045)	ND (0.00045)	ND (0.00002)
	JUL 2011	11FWAMW80-GWS	436.88	ND (0.00045)	ND (0.00005)	**0.000058**	ND (0.00045)	ND (0.00045)	ND (0.00002)
	OCT 2011	11FWAMW80-GWF	436.30	ND (0.00045)	0.000032	**0.000061**	ND (0.00045)	ND (0.00045)	**0.000021**
	JUL 2012	12FWAMW80-GWS	435.55	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)
	SEP 2012	12FWAMW80-GWF	435.07	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)

- Onsite Well
- 2012 Sample -No Exceedance
- Post Water Supply Well

Note:

Units: mg/L
ND: not detected
Ft bgs: feet below ground surface
Trichloroethene (TCE) project cleanup level = 0.005 mg/L
cis-1,2-Dichloroethene ADEC action level = 0.07 mg/L
1,1-Dichloroethene ADEC action level = 0.007 mg/L
trans-1,2-Dichloroethene ADEC action level = 0.1 mg/L
Vinyl chloride ADEC action level = 0.002 mg/L
Tetrachloroethene (PCE) ADEC action level = 0.005 mg/L

The F or S at the end of the sample ID indicates the spring or fall sampling event.
(F) or (S) is appended to the sample ID where the original sample ID did not include an F or an S.
Results are presented without qualifiers.
RED exceeded the project cleanup level.
BOLD indicates detections of degradation products.

All Locations Are Approximate

0 150 300 450 600
Feet

WGS 1984 UTM Zone 6N

N

FORMER COMMUNICATIONS SITE (SOUTH) HISTORICAL TRICHLOROETHENE RESULTS FOR IN-PLUME AND SURROUNDING WELLS

FORT WAINWRIGHT, FAIRBANKS, ALASKA

JACOBS | DATE: 26 DEC 2013 | PROJECT MANAGER: T. HEIKKILA | FIGURE NO: A-15

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Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW39				
Screen	OCT 2007	07FWAMW39-GW(F)	432.29	ND (0.0003)
Interval	MAY 2008	08FWAMW39-GW(S)	432.28	ND (0.000016)
(Ft bgs)	OCT 2008	08FWAMW39-GWF	432.99	ND (0.000014)
9.6-29.6	MAY 2009	09FWAMW39-GW(S)	432.45	ND (0.000014)
	SEP 2009	09FWAMW39-GWF	432.45	ND (0.000015)
	JUL 2010	10FWAMW39-GWS	431.7	ND (0.0003)
	OCT 2010	10FWAMW39-GWF	431.41	ND (0.00045)
	JUL 2011	11FWAMW39-GWS	433.53	ND (0.0001)
	OCT 2011	11FWAMW39-GWF	432.85	ND (0.0001)
	JUL 2012	12FWAMW39-GWS	435.07	ND (0.0002)
	SEP 2012	12FWAMW39-GWF	434.01	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW92				
Screen	OCT 2010	10-FWA-TAKU-WG-DMW2	NM	ND (0.0002)
Interval	JUL 2012	12FWAMW92-GWS	434.81	ND (0.0002)
(Ft bgs)	SEP 2012	12FWAMW92-GWF	434.77	ND (0.0005)
40-60				

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW78				
Screen	OCT 2008	08FWAMW78-GWF	434.3	ND (0.000014)
Interval	JUN 2009	09FWAMW78-GW(S)	434.08	ND (0.000014)
(Ft bgs)	SEP 2009	09FWAMW78-GWF	434.02	ND (0.000014)
27.5-37.5	JUL 2010	10FWAMW78-GWS	433.15	ND (0.0003)
	OCT 2010	10FWAMW78-GWF	432.82	ND (0.00045)
	JUL 2012	12FWAMW78-GWS	435.11	ND (0.0002)
	SEP 2012	12FWAMW78-GWF	435.02	ND (0.0002)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW91				
Screen	OCT 2010	10-FWA-TAKU-WG-DMW1	NM	ND (0.0002)
Interval	JUL 2012	12FWAMW91-GWS	435.21	ND (0.0002)
(Ft bgs)	SEP 2012	12FWAMW91-GWF	435.02	ND (0.0005)
50-70				

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW32				
Screen	OCT 2007	07FWCMW32-GW	432.73	ND (0.0003)
Interval	MAY 2008	08FWCMW32-GW	432.41	0.00012
(Ft bgs)	OCT 2008	08FWCMW32-GWF	433.02	ND (0.000014)
9-19	MAY 2009	09FWCMW32-GW	432.69	ND (0.000014)
	SEP 2009	09FWBMW32-GWF	432.50	ND (0.000014)
	JUL 2010	10FWAMW32-GWS	431.87	ND (0.0003)
	OCT 2010	10FWAMW32-GWF	431.47	ND (0.00045)
	JUL 2011	11FWAMW32-GWS	433.55	ND (0.00045)
	OCT 2011	11FWAMW32-GWF	432.89	ND (0.00045)
	JUL 2012	12FWAMW32-GWS	435.08	ND (0.0002)
	SEP 2012	12FWAMW32-GWF	434.78	ND (0.0002)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW47				
Screen	OCT 2007	07FWAMW47-GW(F)	432.80	0.00054
Interval	MAY 2008	08FWAMW47-GW(S)	NM	0.00058
(Ft bgs)	OCT 2008	08FWAMW47-GWF	433.50	0.00039
7-17	MAY 2009	09FWAMW47-GW(S)	433.15	0.0004
	SEP 2009	09FWAMW47-GWF	432.98	0.00065
	JUL 2010	10FWAMW47-GWS	431.92	0.00043
	OCT 2010	10FWAMW47-GWF	432.11	0.0004
	OCT 2011	11FWAMW47-GWF	433.35	0.000087
	JUL 2012	12FWAMW47-GWS	436.32	0.0004
	SEP 2012	12FWAMW47-GWF	434.99	0.00019

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW79				
Screen	OCT 2008	08FWAMW79-GWF	442.79	0.0008
Interval	MAY 2009	09FWAMW79-GW(S)	442.40	0.0003
(Ft bgs)	SEP 2009	09FWAMW79-GWF	442.47	0.0012
11.5-21.5	JUL 2010	10FWAMW79-GWS	441.56	0.0003
	OCT 2010	10FWAMW79-GWF	441.25	0.0005
	JUL 2011	11FWAMW79-GWS	443.31	0.0003
	OCT 2011	11FWAMW79-GWF	441.56	0.0004
	JUL 2012	12FWAMW79-GWS	435.62	0.0002
	SEP 2012	12FWAMW79-GWF	435.33	0.0004

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW48				
Screen	OCT 2007	07FWAMW48-GW(F)	433.16	ND (0.00011)
Interval	MAY 2008	08FWAMW48-GW(S)	NM	0.000026
(Ft bgs)	OCT 2008	08FWAMW48-GWF	433.71	ND (0.000014)
7.5-17.5	MAY 2009	09FWAMW48-GW(S)	433.35	ND (0.000014)
	SEP 2009	09FWAMW48-GWF	433.18	ND (0.000014)
	JUL 2010	10FWAMW48-GWS	432.52	ND (0.0003)
	OCT 2010	10FWAMW48-GWF	432.20	ND (0.00045)
	JUL 2011	11FWAMW48-GWS	434.30	ND (0.0001)
	OCT 2011	11FWAMW48-GWF	433.47	ND (0.0001)
	JUL 2012	12FWAMW48-GWS	435.64	ND (0.0002)
	SEP 2012	12FWAMW48-GWF	435.34	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW13				
Screen	OCT 2007	07FWDMW13-GW	433.57	ND (0.0003)
Interval	MAY 2008	08FWDMW13-GW	NM	0.00021
(Ft bgs)	OCT 2008	08FWDMW13-GWF	434.17	ND (0.000014)
7-17	MAY 2009	09FWDMW13-GW	433.42	ND (0.000014)
	SEP 2009	09FWDMW13-GWF	433.37	ND (0.000014)
	JUL 2010	10FWAMW13-GWS	432.6	ND (0.0003)
	OCT 2010	10FWAMW13-GWF	432.25	ND (0.00045)
	JUL 2011	11FWAMW13-GWS	433.94	ND (0.00045)
	OCT 2011	11FWAMW13-GWF	433.46	ND (0.00045)
	JUL 2012	12FWAMW13-GWS	436.26	ND (0.0002)
	SEP 2012	12FWAMW13-GWF	435.91	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW08				
Screen	OCT 2007	07FWAMW08-GW(F)	432.90	ND (0.0003)
Interval	MAY 2008	08FWAMW08-GW(S)	NM	0.000023
(Ft bgs)	OCT 2008	08FWAMW08-GWF	433.60	0.00026
9-19	MAY 2009	09FWAMW08-GW(S)	433.15	0.000024
	SEP 2009	09FWAMW08-GWF	433.05	0.000034
	JUL 2010	10FWAMW08-GWS	432.45	ND (0.0003)
	OCT 2010	10FWAMW08-GWF	428.85	ND (0.00045)
	JUL 2011	11FWAMW08-GWS	434.08	ND (0.0001)
	OCT 2011	11FWAMW08-GWF	433.40	0.000057
	JUL 2012	12FWAMW08-GWS	435.82	0.00013
	SEP 2012	12FWAMW08-GWF	435.52	ND (0.0005)

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	TCP Result
MW87				
Screen	JUL 2010	10FWAMW87-GWF	432.66	ND (0.00045)
Interval	OCT 2010	10FWAMW87-GWS	432.05	ND (0.0003)
(Ft bgs)	JUL 2011	11FWAMW87-GWS	434.23	ND (0.0001)
9.5-19.5	OCT 2011	11FWAMW87-GWF	433.59	ND (0.0001)
	JUL 2012	11FWAMW87-GWS	435.63	ND (0.0002)
	SEP 2012	12FWAMW87-GWF	435.41	ND (0.0005)

2012 Sample - Exceedance
Onsite Well
2012 Sample -No Exceedance
Post Water Supply Well

Notes:
Project cleanup level: 0.00012
Units: mg/L
Method: SW8260, SW8260SIM
The F or S at the end of the sample ID indicates Spring or fall sampling.
RED exceeded the project cleanup level.
TCP: 1,2,3-Trichloropropane
Results are presented without qualifiers.
ND = not detected

All Locations Are Approximate
0 250 500 750 1,000
Feet
WGS 1984 UTM Zone 6N

FORMER COMMUNICATIONS SITE
HISTORICAL 1,2,3-TRICHLOROPROPANE
RESULTS FOR IN-PLUME AND SURROUNDING WELLS
FORT WAINWRIGHT, FAIRBANKS, ALASKA

JACOBS	DATE:	PROJECT MANAGER:	FIGURE NO:
	26 DEC 2013	T. HEIKKILA	A-16

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468000

468500

7189500

7189000

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW83				
Screen	JUL 2010	10FWAMW83-GWS	431.27	0.077
Interval	OCT 2010	10FWAMW83-GWF	430.68	0.049
(Ft bgs)	JUL 2011	11FWAMW83-GWS	432.87	0.39
10-20	OCT 2011	11FWAMW83-GWF	432.10	0.055
	JUL 2012	12FWAMW83-GWS	434.29	0.028
	SEP 2012	12FWAMW83-GWF	434.09	0.033

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW82				
Screen	JUL 2010	10FWAMW82-GWS	431.41	0.15
Interval	OCT 2010	10FWAMW82-GWF	430.82	0.09
(Ft bgs)	JUL 2011	11FWAMW82-GWS	433	0.16
10.5-20	OCT 2011	11FWAMW36-GWF	432.23	0.068
	JUL 2012	12FWAMW82-GWS	434.35	0.036
	SEP 2012	12FWAMW82-GWF	434.08	0.036

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW58				
Screen	OCT 2007	07FWBMW58-GW(F)	435.23	3.2
Interval	MAY 2008	08FWTMW58-GW(S)	NM	2.2
(Ft bgs)	OCT 2008	08FWTMW58-GWF	435.82	1.0
9-19	JUN 2009	09FWTMW58-GW(S)	435.45	2.3
	SEP 2009	09FWTMW58-GWF	435.32	2.8
	JUL 2010	10FWAMW58-GWS	434.66	3.3
	OCT 2010	10FWAMW58-GWF	434.14	1.2
	JUL 2011	11FWAMW58-GWS	436.44	2.2
	OCT 2011	11FWAMW58-GWF	435.58	1.3
	JUL 2012	12FWAMW58-GWS	434.93	2.6
	SEP 2012	12FWAMW58-GWF	434.67	2

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW37				
Screen	OCT 2007	07FWBMW37-GW(F)	432.07	0.13
Interval	MAY 2008	08FWTMW37-GW(S)	432.03	0.36
(Ft bgs)	OCT 2008	08FWTMW37-GWF	432.66	0.09
7-17	JUN 2009	09FWTMW37-GW(S)	432.35	0.35
	SEP 2009	09FWTMW37-GWF	432.23	ND (0.24)
	JUL 2010	10FWAMW37-GWS	431.53	0.70
	OCT 2010	10FWAMW37-GWF	431.05	0.30
	JUL 2011	11FWAMW37-GWS	433.41	0.40
	OCT 2011	11FWAMW37-GWF	433.05	0.18
	JUL 2012	12FWAMW37-GWS	434.65	0.2
	SEP 2012	12FWAMW37-GWF	434.38	0.12

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW84				
Screen	JUL 2010	10FWAMW84-GWS	431.62	0.27
Interval	OCT 2010	10FWAMW84-GWF	430.87	0.15
(Ft bgs)	JUL 2011	11FWAMW84-GWS	433.29	0.084
9-19	OCT 2011	11FWAMW36-GWF	432.56	0.1
	JUL 2012	12FWAMW84-GWS	434.43	0.03
	SEP 2012	12FWAMW84-GWF	434.19	0.031

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW06A				
Screen	OCT 2007	07FWBMW06A-GW(F)	431.99	8.2
Interval	MAY 2008	08FWBMW06A-GWF	431.98	4.5
(Ft bgs)	OCT 2008	08FWBMW06A-GW	432.68	5.5
10.5-20.5	MAY 2009	09FWBMW06A-GW	432.3	3.0
	JUL 2010	10FWAMW06A-GWF	431.1	7.2
	OCT 2010	10FWAMW06A-GWS	431.05	9.0
	JUL 2011	11FWAMW06A-GWS	433.36	3.2
	OCT 2011	11FWAMW06A-GWF	432.56	5.2
	JUL 2012	12FWAMW06A-GWS	435.05	7.6
	SEP 2012	12FWAMW06A-GWF	434.74	4.8

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW36				
Screen	OCT 2007	07FWBMW36-GW(F)	432.29	0.05
Interval	MAY 2008	08FWTMW36-GW(S)	431.71	0.031
(Ft bgs)	OCT 2008	08FWTMW36-GWF	432.25	0.026
7-17	JUN 2009	09FWTMW36-GW(S)	432.02	ND (0.8)
	SEP 2009	09FWTMW36-GWF	431.79	ND (0.784)
	JUL 2010	10FWAMW36-GWS	429.42	0.077
	OCT 2010	10FWAMW36-GWF	427.98	0.075
	JUL 2011	11FWAMW36-GWS	431.11	0.052
	OCT 2011	11FWAMW36-GWF	430.42	0.057
	JUL 2012	12FWAMW36-GWS	434.30	0.021
	SEP 2012	12FWAMW36-GWF	434.01	0.027

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW77				
Screen	OCT 2008	08FWBMW77-GWF	436.69	2.7
Interval	JUN 2009	09FWBMW77-GWS	437.15	1.1
(Ft bgs)	SEP 2009	09FWBMW77-GWF	436.04	0.271
11.5-21.5	JUL 2010	10FWBMW77-GWF	435.87	1.0
	OCT 2010	10FWBMW77-GWS	435.21	1.8
	JUL 2011	11FWBMW77-GWS	437.28	1.6
	OCT 2011	11FWBMW77-GWF	435.62	4.2
	JUL 2012	12FWAMW77-GWS	433.74	0.71
	SEP 2012	12FWAMW77-GWF	434.43	0.46

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW64				
Screen	OCT 2007	07FWBMW64-GW(F)	431.95	0.1
Interval	MAY 2008	08FWBMW64-GW(S)	432.65	0.088
(Ft bgs)	OCT 2008	08FWBMW64-GWF	433.06	0.066
7-17	JUN 2009	09FWBMW64-GW(S)	433.01	ND (0.25)
	SEP 2009	09FWBMW64-GWF	432.84	ND (0.25)
	JUL 2010	10FWAMW64-GWS	432.23	0.39
	OCT 2010	10FWAMW64-GWF	431.85	0.26
	JUL 2011	11FWAMW64-GWS	434.10	0.14
	OCT 2011	11FWAMW64-GWF	427.33	0.34
	JUL 2012	12FWAMW64-GWS	435.11	0.14
	SEP 2012	12FWAMW64-GWF	434.69	0.13

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW35				
Screen	OCT 2007	W35-	427.155	0.062
Interval	MAY 2008	35-GW(S)	431.865	0.062
(Ft bgs)	OCT 2008	35-GWF	432.575	0.044
6.4-16.4	JUN 2009	35-GW(S)	432.175	ND (0.025)
	SEP 2009	35-GWF	432.075	ND (0.024)
	JUL 2010	W35-GWS	431.445	0.18
	OCT 2010	W35-GWF	431.005	0.14
	JUL 2011	W35-GWS	433.275	0.14
	OCT 2011	W35-GWF	432.405	0.11
	JUL 2012	W35-GWS	434.74	0.071
	SEP 2012	W35-GWF	434.47	0.068

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW32				
Screen	OCT 2007	07FWCMW32-GW(F)	432.73	0.057
Interval	MAY 2008	08FWCMW32-GW(S)	432.41	0.052
(Ft bgs)	OCT 2008	08FWCMW32-GWF	433.02	0.063
9-19	MAY 2009	09FWCMW32-GW(S)	432.69	ND (0.25)
	SEP 2009	09FWBMW32-GWF	432.50	ND (0.25)
	JUL 2010	10FWAMW32-GWS	431.87	0.12
	OCT 2010	10FWAMW32-GWF	431.47	0.23
	JUL 2011	11FWAMW32-GWS	433.55	0.11
	OCT 2011	11FWAMW32-GWF	432.89	0.58
	JUL 2012	12FWAMW32-GWS	435.08	0.18
	SEP 2012	12FWAMW32-GWF	434.78	0.16

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW12				
Screen	MAY 2008	08FWBMW12-GW(S)	435.27	5.6
Interval	OCT 2008	08FWBMW12-GWF	436.00	11
(Ft bgs)	MAY 2009	09FWBMW12-GW(S)	435.63	7.4
8.5-18.5	SEP 2009	09FWBMW12-GWF	435.43	4.9
	JUL 2010	10FWAMW12-GWS	434.82	5.3
	OCT 2010	10FWAMW12-GWF	434.35	6.5
	JUL 2011	11FWAMW12-GWS	436.45	9.8
	OCT 2011	11FWAMW12-GWF	435.86	12
	JUL 2012	12FWAMW12-GWS	435.19	12
	SEP 2012	12FWAMW12-GWF	434.89	9.2

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW33				
Screen	OCT 2007	07FWBMW33-GW(F)	432.53	28
Interval	MAY 2008	08FWBMW33-GW(S)	432.34	10
(Ft bgs)	OCT 2008	08FWBMW33-GWF	433.11	29
8-18	MAY 2009	09FWBMW33-GW(S)	432.76	13
	SEP 2009	09FWBMW33-GWF	432.57	13
	JUL 2010	10FWAMW33-GWS	431.94	10
	OCT 2010	10FWAMW33-GWF	431.47	31
	JUL 2011	11FWAMW33-GWS	433.59	6.7
	OCT 2011	11FWAMW33-GWF	433.02	22
	JUL 2012	12FWAMW33-GWS	435.16	12
	SEP 2012	12FWAMW33-GWF	434.87	19

Well ID	Sample Date	Sample ID	Groundwater Elevation (ft)	DRO Result
MW62				
Screen	OCT 2007	07FWAMW62-GW(F)	433.46	0.61
Interval	MAY 2008	08FWAMW62-GWS	433.54	0.041
(Ft bgs)	OCT 2008	08FWAMW62-GWF	434.24	7.7
7-17	MAY 2009	09FWAMW62-GWS	433.89	ND (0.8)
	SEP 2009	09FWAMW62-GWF	433.67	ND (0.784)
	JUL 2010	10FWAMW62-GWS	433.04	0.38
	OCT 2010	10FWAMW62-GWF	432.68	29
	JUL 2011	11FWAMW62-GWS	433.78	0.22
	OCT 2011	11FWAMW62-GWF	434.16	18
	JUL 2012	12FWAMW62-GWS	435.17	0.092
	SEP 2012	12FWAMW62-GWF	434.87	0.14

MW83 MW82 MW84 MW36 MW37 MW35 MW58 MW06A MW64 MW32 MW33 MW12 MW77 MW62

Cedar Street

Balsam Street

Trail

Estimated Groundwater Flow Direction

- 2012 Sample - Exceedance
- Onsite Well
- 2012 Sample -No Exceedance
- (W) Post Water Supply Well

Notes:
Project cleanup level: 1.5
Units: mg/L
Method: AK102

The F or S at the end of the sample ID indicates spring or fall sampling.

RED exceeded the project cleanup level.
DRO: Diesel-range organics (C10-C25)
Results are presented without qualifiers.
ND = not detected

All Locations Are Approximate

0 250 500 750 1,000
Feet

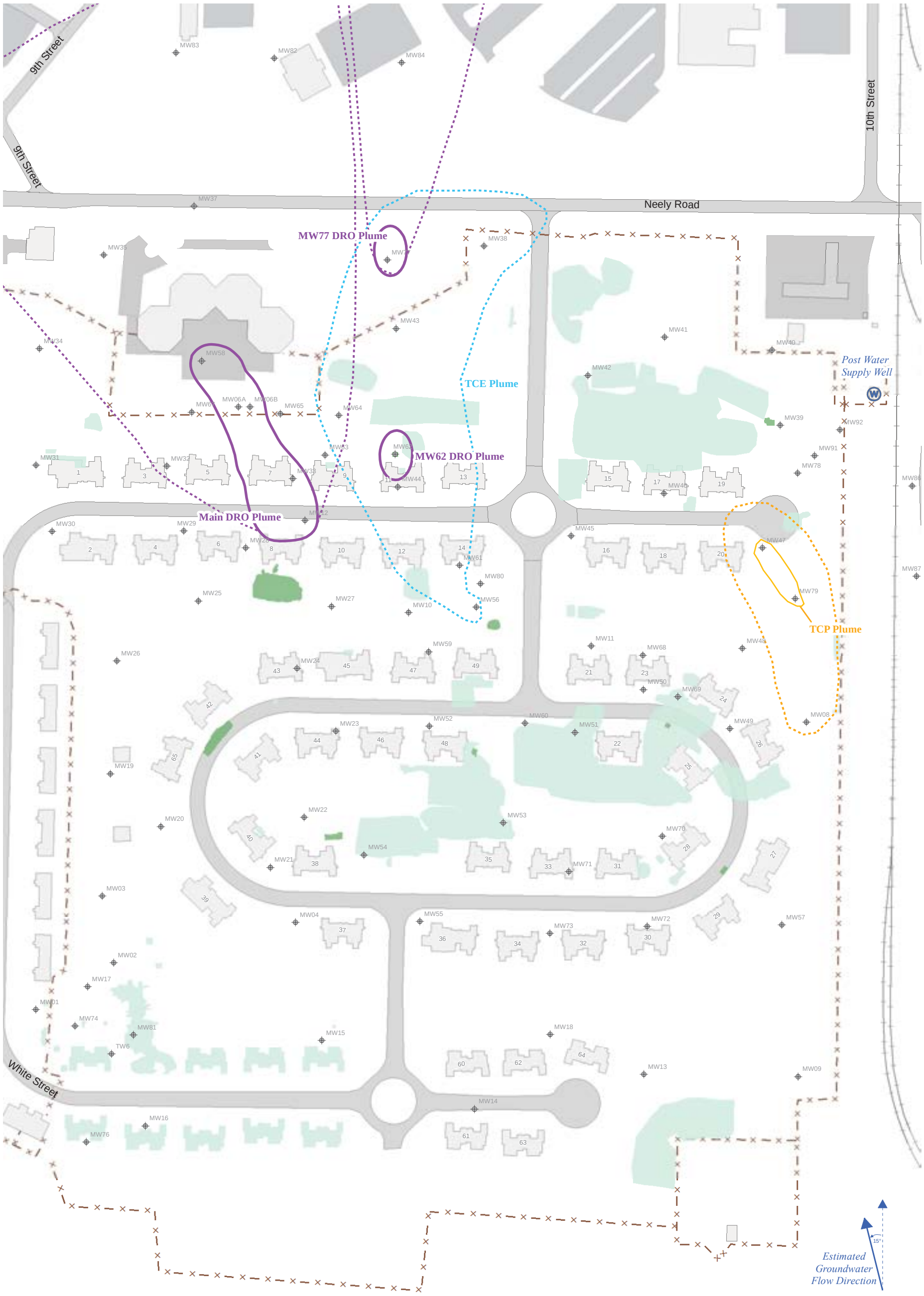
WGS 1984 UTM Zone 6N

N

FORMER COMMUNICATIONS SITE
HISTORICAL DIESEL RANGE ORGANICS
RESULTS FOR IN-PLUME AND SURROUNDING WELLS
FORT WAINWRIGHT, FAIRBANKS, ALASKA

JACOBS	DATE:	PROJECT MANAGER:	FIGURE NO:
	31 DEC 2013	T. HEIKKILA	A-17

P:\Taku_Gardens\MXD\2013_GWMP\2013_Taku_GWMP_DRO.mxd beatycj



2007-2009 Removal Area
2010-2011 Removal Area
DRO Above Project Cleanup Level (Plume Area)
TCP Above Project Cleanup Level (Plume Area)
DRO Below Project Cleanup Level (Leading Plume Edge)
TCE Below Project Cleanup Level (Leading Plume Edge)
TCP Below Project Cleanup Level (Leading Edge of Plume)

Building
Railroad
Road or Trail
Well
Monitoring Well
Fence Line

* TCP: 1,2,3-Trichloropropane

All Locations Are Approximate

0 125 250 375 500
Feet

WGS 1984 UTM Zone 6N

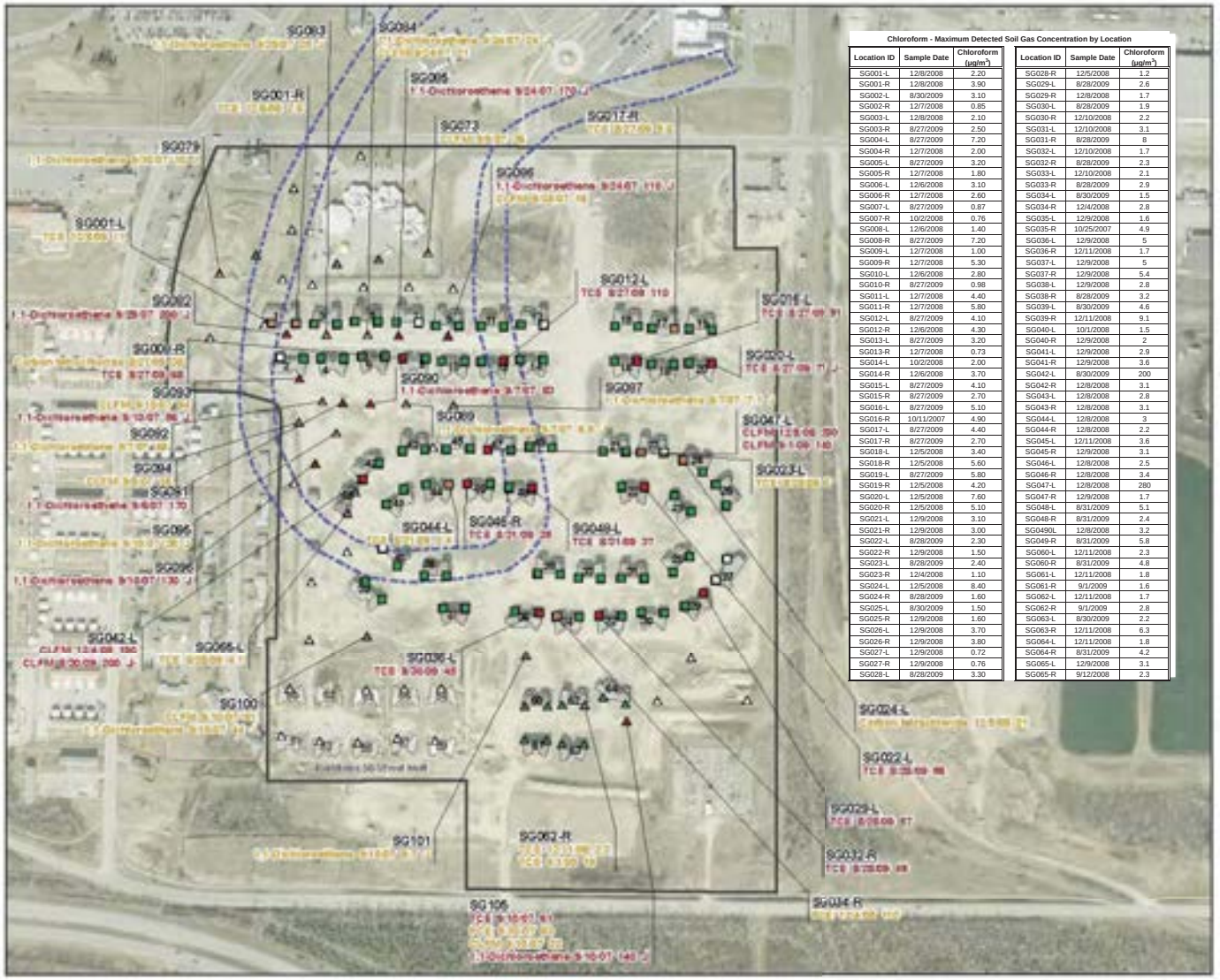
N

SOURCE REMOVAL AREAS
2007 - 2011

FORT WAINWRIGHT, FAIRBANKS, ALASKA

JACOBS	DATE:	PROJECT MANAGER:	FIGURE NO:
	16 SEP 2013	T. HEIKKILA	A-18

P:\Taku_Gardens\MXD\SourceRemovalAreas2007to2011_update.mxd jaroniti



Chloroform - Maximum Detected Soil Gas Concentration by Location

Location ID	Sample Date	Chloroform ($\mu g/m^3$)
SG001-L	12/8/2008	2.20
SG001-R	12/8/2008	3.90
SG002-L	8/30/2009	3.10
SG002-R	12/7/2008	0.85
SG003-L	12/8/2008	2.10
SG003-R	8/27/2009	2.50
SG004-L	8/27/2009	7.20
SG004-R	12/7/2008	2.00
SG005-L	8/27/2009	3.20
SG005-R	12/7/2008	1.80
SG006-L	12/6/2008	3.10
SG006-R	12/7/2008	2.60
SG007-L	8/27/2009	0.87
SG007-R	10/2/2008	0.76
SG008-L	12/6/2008	1.40
SG008-R	8/27/2009	7.20
SG009-L	12/7/2008	1.00
SG009-R	12/7/2008	5.30
SG010-L	12/6/2008	2.80
SG010-R	8/27/2009	0.98
SG011-L	12/7/2008	4.40
SG011-R	12/7/2008	5.80
SG012-L	8/27/2009	4.10
SG012-R	12/6/2008	4.30
SG013-L	8/27/2009	3.20
SG013-R	12/7/2008	0.73
SG014-L	10/2/2008	2.00
SG014-R	12/6/2008	3.70
SG015-L	8/27/2009	4.10
SG015-R	8/27/2009	2.70
SG016-L	8/27/2009	5.10
SG016-R	10/11/2007	4.90
SG017-L	8/27/2009	4.40
SG017-R	8/27/2009	2.70
SG018-L	12/5/2008	3.40
SG018-R	12/5/2008	5.60
SG019-L	8/27/2009	5.80
SG019-R	12/5/2008	4.20
SG020-L	12/5/2008	7.60
SG020-R	12/5/2008	5.10
SG021-L	12/9/2008	3.10
SG021-R	12/9/2008	3.00
SG022-L	8/28/2009	2.30
SG022-R	12/9/2008	1.50
SG023-L	8/28/2009	2.40
SG023-R	12/4/2008	1.10
SG024-L	12/5/2008	8.40
SG024-R	8/28/2009	1.60
SG025-L	8/30/2009	1.50
SG025-R	12/9/2008	1.60
SG026-L	12/9/2008	3.70
SG026-R	12/9/2008	3.80
SG027-L	12/9/2008	0.72
SG027-R	12/9/2008	0.76
SG028-L	8/28/2009	3.30
SG028-R	12/5/2008	1.2
SG029-L	8/28/2009	2.6
SG029-R	12/8/2008	1.7
SG030-L	8/28/2009	1.9
SG030-R	12/10/2008	2.2
SG031-L	12/10/2008	3.1
SG031-R	8/28/2009	8
SG032-L	12/10/2008	1.7
SG032-R	8/28/2009	2.3
SG033-L	12/10/2008	2.1
SG033-R	8/28/2009	2.9
SG034-L	8/30/2009	1.5
SG034-R	12/4/2008	2.8
SG035-L	12/9/2008	1.6
SG035-R	10/25/2007	4.9
SG036-L	12/9/2008	5
SG036-R	12/11/2008	1.7
SG037-L	12/9/2008	5
SG037-R	12/9/2008	5.4
SG038-L	12/9/2008	2.8
SG038-R	8/28/2009	3.2
SG039-L	8/30/2009	4.6
SG039-R	12/11/2008	9.1
SG040-L	10/1/2008	1.5
SG040-R	12/9/2008	2
SG041-L	12/9/2008	2.9
SG041-R	12/9/2008	3.6
SG042-L	8/30/2009	200
SG042-R	12/8/2008	3.1
SG043-L	12/8/2008	2.8
SG043-R	12/8/2008	3.1
SG044-L	12/8/2008	3
SG044-R	12/8/2008	2.2
SG045-L	12/11/2008	3.6
SG045-R	12/9/2008	3.1
SG046-L	12/8/2008	2.5
SG046-R	12/8/2008	3.4
SG047-L	12/8/2008	280
SG047-R	12/9/2008	1.7
SG048-L	8/31/2009	5.1
SG048-R	8/31/2009	2.4
SG0490L	12/8/2008	3.2
SG049-R	8/31/2009	5.8
SG060-L	12/11/2008	2.3
SG060-R	8/31/2009	4.8
SG061-L	12/11/2008	1.8
SG061-R	9/1/2009	1.6
SG062-L	12/11/2008	1.7
SG062-R	9/1/2009	2.8
SG063-L	8/30/2009	2.2
SG063-R	12/11/2008	6.3
SG064-L	12/11/2008	1.8
SG064-R	8/31/2009	4.2
SG065-L	12/9/2008	3.1
SG065-R	9/12/2008	2.3

LEGEND

- Site Boundary
- Former Hopper's Slough

Explanation of Results

- No detected exceedances of PSLs
- One or more exceedance of PSL; detected result >1 and ≤10 x PSL
- One or more exceedance of PSL; detected result >10 and ≤100 x PS
- One or more exceedance of PSL; detected result >100 and ≤1,000 x PSL

Explanation of Label

Location ID
Analyte Result ($\mu g/m^3$) Qualifier

*Font color indicates magnitude of exceedence

Analyte	Screening Level
1,1,2,2-Tetrachloroethane	0.42 ug/m^3
1,1,2-Trichloroethane	1.5 ug/m^3
1,1-Dichloroethene	0.49 ug/m^3
1,2-Dichloroethane	0.94 ug/m^3
1,2-Dichloropropane	1.3 ug/m^3
1,2,4-Trichlorobenzene	4.2 ug/m^3
Carbon tetrachloride	1.6 ug/m^3
Chloroform	1.1 ug/m^3
cis-1,2-Dichloroethene	37 ug/m^3
Hexachlorobutadiene	1.11 ug/m^3
Tetrachloroethene (PCE)	4.1 ug/m^3
Trichloroethene (TCE)	0.22 ug/m^3
Vinyl chloride	0.61 ug/m^3

NOTE:
Vadose Zone sample locations shown as triangles

N

Feet

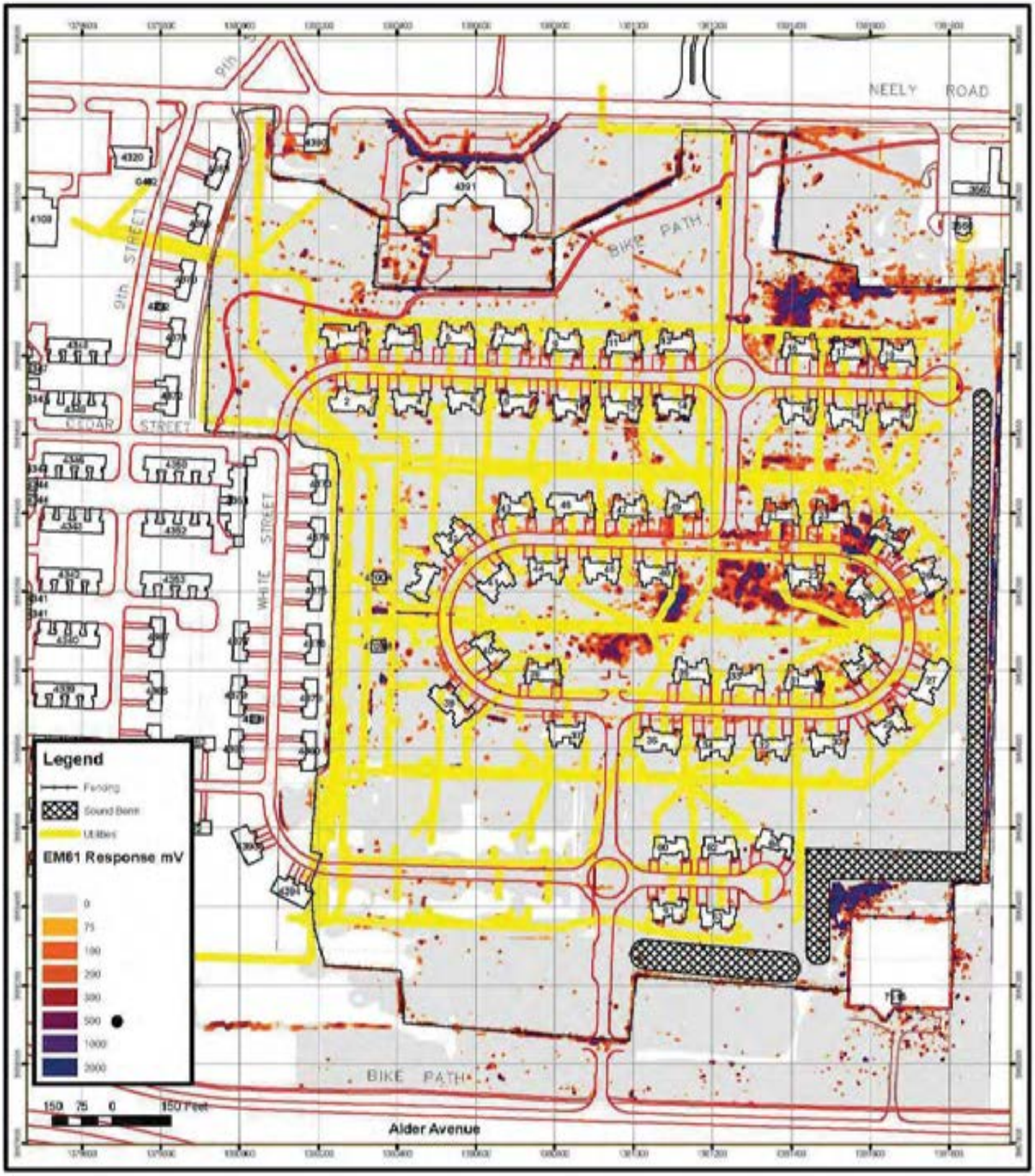
SOURCE: CH2M HILL, 2010 (DECEMBER)

FORMER COMMUNICATION SITE DISTRIBUTION OF CHLORINATED VOCs IN SOIL GAS

FORT WAINWRIGHT, ALASKA

JACOBS®	DATE: 13 Feb 2013	PROJECT MANAGER: T. HEIKKILA	FIGURE NO. : A-19

\\anc\fil03\Projects\ERS-UR\TO07-Taku Gardens RAWP\ROD\Figures\Figure 2-16 Distribution of Chlorinated VOCs in Soil Gas.dwg Figure 2-16 Distribution of Chlorinated VOCs in Soil Gas 13 February 2013 - jaronitj



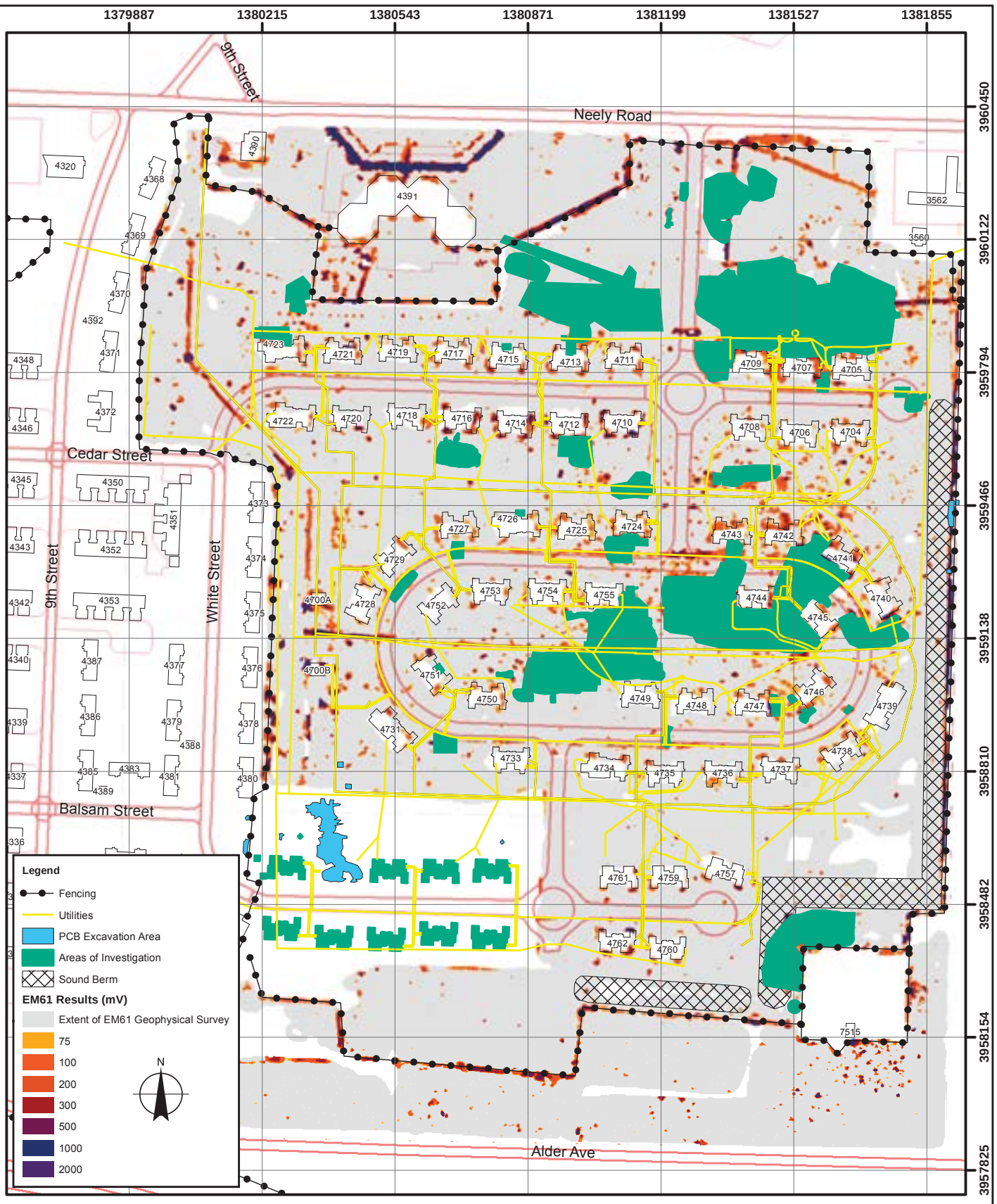
SOURCE: CH2M HILL, 2010 (DECEMBER)

FORMER COMMUNICATION SITE GEOPHYSICAL SURVEY RESULTS 2007

FORT WAINWRIGHT, ALASKA

JACOBS®	DATE: 13 Mar 2013	PROJECT MANAGER: T. HEIKKILA	FIGURE NO. : A-20

\\anch\03\Projects\ERS-UR\TO07-Taku Gardens RAWP\ROD\Figures\Figure 2-17 Geotechnical Investigation Results, 31 October 2011.dwg Figure 2-17 Geotechnical Investigation Results 31 October 2011 13 February 2013 - jaronit]



All Locations Are Approximate

0 250 500 750 1,000

Feet

NAD 1983 StatePlane Alaska 3 FIPS 5003 Feet

FORMER COMMUNICATIONS SITE
GEOPHYSICAL SURVEY RESULTS AND AREAS OF INVESTIGATION
2007-2011

FORT WAINWRIGHT, ALASKA

JACOBS	DATE: 14 MAR 2013	PROJECT MANAGER: T. HEIKKILA	FIGURE NO: A-21

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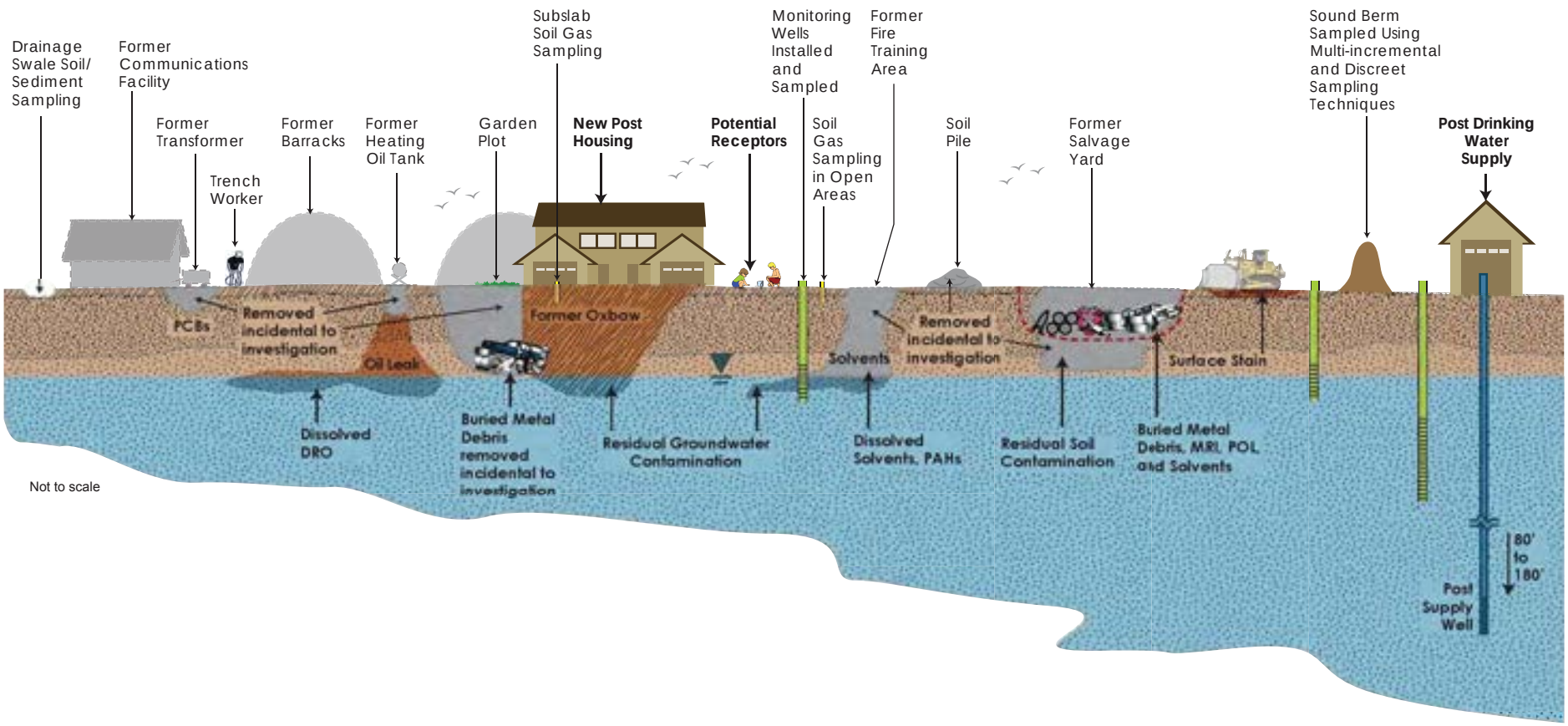
SOURCE: CH2M HILL, 2010 (DECEMBER)

FORMER COMMUNICATION SITE BUILDINGS WITH POSSIBLE DEBRIS BENEATH FOUNDATION

FORT WAINWRIGHT, ALASKA

JACOBS®	DATE: 13 Feb 2013	PROJECT MANAGER: T. HEIKKILA	FIGURE NO. : A-22

\\anchf03\Projects\ERS-URITO07-Taku Gardens RA\WP\ROD\Figures\Figure 2-19 Buildings with Possible Debris Beneath Foundation.dwg Figure 2-19 Buildings with Possible Debris Beneath Foundation 13 February 2013 - jaronltj



Historical Activity (grayed out)

Groundwater

Soil

Fill

Sandy Silt/Silty Sand

Sand

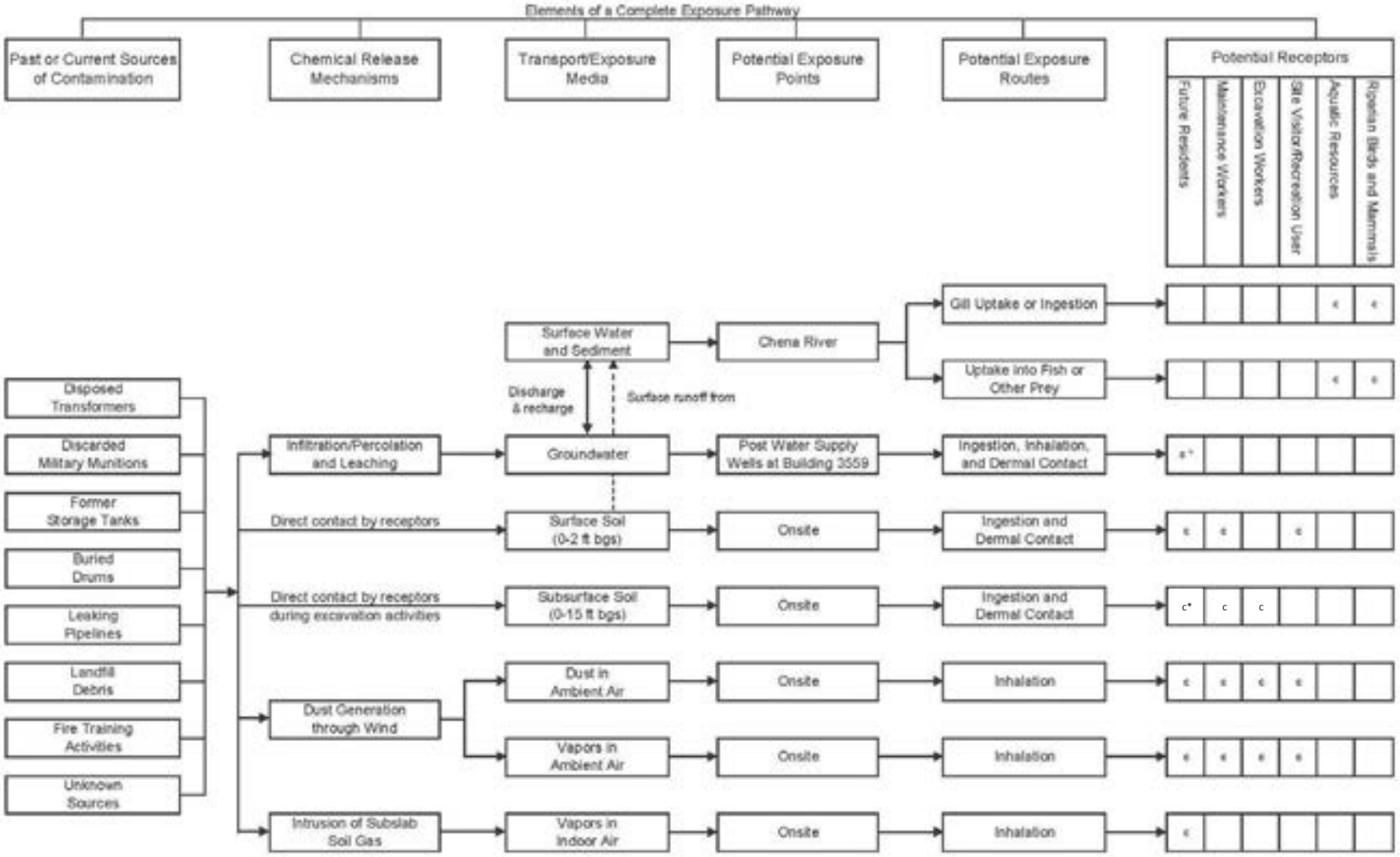
SOURCE: CH2M HILL, 2010 (DECEMBER)

FORMER COMMUNICATION SITE

CONCEPTUAL SITE MODEL FOR POTENTIAL HUMAN AND ECOLOGICAL EXPOSURES

FORT WAINWRIGHT, ALASKA

JACOBS	DATE: 22 FEB 2013	PROJECT MANAGER: T. HEIKKILA	FIGURE NUMBER: A-23



Notes:
c = Potentially complete pathway (addressed quantitatively)
Blank = incomplete pathway
* = Soil from 0-15 ft bgs and groundwater from wellpoints outside the potential capture zone of the Post Supply well were evaluated under the hypothetical unrestricted use exposure scenario.

SOURCE: CH2M HILL, 2010 (DECEMBER)

FORMER COMMUNICATION SITE CONCEPTUAL SITE MODEL FOR POTENTIAL HUMAN AND ECOLOGICAL EXPOSURES

FORT WAINWRIGHT, ALASKA

JACOBS®	DATE: 13 Feb 2013	PROJECT MANAGER: T. HEIKKILA	FIGURE NO. : A-24

Image Source: Fort Wainwright DPW - ENV, 2012

- Fence
- OU6 Institutional Control Boundary
- Buildings 50-59 Not Built
- Building
- Paved Road
- Unpaved Road

All Locations Are Approximate

0 100 200 300 400

Feet

Alaska State Plane Zone 3
Transverse Mercator

N

OPERABLE UNIT 6 SOIL AND GROUNDWATER
INSTITUTIONAL CONTROL BOUNDARY

FORT WAINWRIGHT, ALASKA

JACOBS	DATE: 31 DEC 2013	PROJECT MANAGER: T. HEIKKILA	FIGURE NO: A-25

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APPENDIX B

Applicable or Relevant and Appropriate Requirements

Table B-1
Chemical-Specific Applicable and Relevant and Appropriate Requirements
Former Communications Site, Fort Wainwright, Alaska

Standard, Requirement, Criterion, or Limitation		ARAR Status	Description
Alaska Oil and Other Hazardous Substances Pollution Control	18 AAC 75.345	Applicable	Table C establishes groundwater cleanup levels for the site (i.e., DRO, RRO, and 1,2,3-TCP).
National Primary Drinking Water MCLs	40 CFR 141	Relevant and Appropriate	Establishes primary drinking water standards (MCLs) pursuant to section 1412 of the Public Health Service Act, as amended by the Safe Drinking Water Act (Pub. L. 93-523) and establishes the MCL for TCE.

Notes:
AAC = Alaska Administrative Code
ARAR = Applicable or relevant and appropriate requirement
CFR = Code of Federal Regulations
MCLs = maximum contaminant levels
TCE = trichloroethene
U.S.C = United States Code
1,2,3-TCP = 1,2,3-trichloropropane

Table B-2
Action-Specific Applicable and Relevant and Appropriate Requirements
Former Communications Site, Fort Wainwright, Alaska

Standard, Requirement, Criterion, or Limitation		ARAR Status	Description
Alaska Oil and Other Hazardous Substances Pollution Control	18 AAC 75.355(b)	Applicable	ADEC requirement that sampling and analysis be conducted or supervised by a qualified, objective person.
	18 AAC 75.360	Applicable	ADEC requirement that the site cleanup be conducted or supervised by a qualified person .
	18 AAC 75.375(c)	Applicable	ADEC requirements for selection and implementation of institutional controls.
Implementation of Institutional Controls	SPAR Guidance 2011	TBC	Describes steps to create, remove, and track institutional controls.

Notes:
AAC = Alaska Administrative Code
ADEC = Alaska Department of Environmental Conservation
ARAR = Applicable or relevant and appropriate requirement
TBC = To be considered
1,2,3-TCP = 1,2,3-trichloropropane

APPENDIX C

Public Participation

PUBLIC NOTICE
THE UNITED STATES ARMY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN AND AFTER ACTION MEMORANDUM FOR THE FORMER COMMUNICATIONS SITE (TAKU GARDENS), FORT WAINWRIGHT, ALASKA

PUBLIC MEETING ON JANUARY 15, 2013 AT THE FAIRBANKS PRINCESS HOTEL

The U.S. Army Garrison Fort Wainwright, as lead agency for environmental response actions on the installation, in partnership with the U.S. Environmental Protection Agency and the Alaska Department of Environmental Conservation, has developed a Proposed Plan and After Action Memorandum for the Former Communications Site (FCS). The U.S. Army is soliciting public review and comment on the recommendation to implement monitored natural attenuation and institutional controls for this site.

After January 2, 2013, copies of the Proposed Plan, After Action Memorandum, Remedial Investigation/Feasibility Study, subsequent reports and supporting documentation contained in the Administrative Record will be available for public review at the Fort Wainwright Public Library, Bldg 3700 Santiago Avenue, Fort Wainwright, Alaska, 99703, the Noel Wien Public Library, 1215 Cowles Street, Fairbanks, Alaska, 99701 and the U.S. Army Directorate of Public Works, Environmental Office, Building 3023, Engineer Place, Fort Wainwright, Alaska.

Individuals interested in reviewing the documents on post should allow additional waiting time in line to get the pass. Access to the Post requires non-residents/employees to get a pass at the Visitor's Center at the Main Gate on Gaffney Road. The U.S. Army encourages the public to participate in the decision-making process by offering comments on the Proposed Plan and After Action Memorandum.

The public comment period is January 14, 2013 through February 12, 2013. A public meeting will be held January 15, 2013 from 7:00 PM to 9:00 PM at the Fairbanks Princess Hotel, 4477 Pikes Landing Rd., Fairbanks, Alaska. Questions, comments, and responses on the Proposed Plan and After Action Memorandum will be recorded by a court reporter during the public meeting. Written comments will be accepted throughout the public comment period. Comments may also be submitted via a toll-free number (1-877-243-6974) or by sending an email to FCS-

Comments@jacobs.com. Individuals wishing to receive a response to their comments should indicate so in their message.

The FCS is located between Alder and Neely Roads, on Fort Wainwright, Alaska, and covers an area of approximately 54 acres. The site is the current location of the unoccupied Taku Gardens housing development, which the U.S. Army intends to open for residential occupation with EPA and ADEC concurrence. Soil and groundwater at the FCS were contaminated as a result of historical use and disposal activities during the 1950s. Soil at the site was contaminated with polychlorinated biphenyls (PCBs), petroleum, and volatile and semivolatile organic compounds. Groundwater was contaminated with petroleum and volatile organic compounds. Extensive site investigation and removal actions were conducted between 2005 and 2012. Potentially hazardous debris and contaminated soil above risk-based cleanup levels was removed to the greatest extent practicable. Diesel in subsurface soil is the only contaminant present above risk-based cleanup levels but does not pose an unacceptable risk to future residents provided they abide by the Institutional Controls.

The After Action Memorandum documents the removal of residual contaminated soil and debris encountered during earlier investigations and removal actions between 2005 and 2012. The Proposed Plan also documents all site investigation and removal actions of contaminated soil and buried munitions-related debris between 2005 and 2012, describes the remedial alternatives considered, and presents the Preferred Alternative. The Army, EPA, and ADEC evaluated the following remedial alternatives for addressing contaminated soil and groundwater at the site:

- Soil
- No Action
- Institutional Controls to Restrict Excavation
- Groundwater
- No Action
- Monitored Natural Attenuation and Institutional Controls to Prohibit Groundwater Use
- In Situ Chemical Oxidation and Institutional Controls to Prohibit Groundwater Use
- Permeable Reactive Barrier, Monitored Natural Attenuation, and Institutional Controls to Prohibit Groundwater Use.

Interested individuals should refer to the Remedial Investigation Report and other contents of the Administrative Record file for further information on all remedial alternatives considered. Electronic copies of these records will be available at the aforementioned locations after January 2, 2013.

The Preferred Alternative for the FCS is monitored natural attenuation and institutional controls for soil and groundwater. Groundwater monitoring will confirm that groundwater contaminant concentrations are naturally decreasing. Institutional controls limiting excavation of soil and prohibiting groundwater use at the FCS will continue to promote the ongoing protection of human health and the environment. Although this is the Preferred Alternative at the present time, the Army welcomes the public's comments on all of the remedial alternatives listed above. At the conclusion of the public comment period, the Army, in cooperation with the EPA and ADEC, will review all comments and select the best alternative based on the Evaluation Criteria and public input. The Final Remedy for the FCS will be chosen after the public comment period ends and after taking public comments into account.

The Army invites all residents of Fort Wainwright, the Fairbanks North Star Borough and other Stakeholders to attend a public meeting designed to provide attendees with a brief overview of the environmental cleanup and allow them the opportunity to ask questions and interact with representatives from the Army, the EPA and ADEC. Participants will have the opportunity to hear a briefing describing the work that has been accomplished at this site; look at static displays of the types of materials found during the remedial investigation; the types of sampling that were conducted on the site, and posters that chronicle the work completed at Taku Gardens. The doors will open at 6:00 PM. A short presentation will begin at 7:00 PM with questions and topics of discussion to follow immediately after the presentation.

For more information regarding this public meeting, the Proposed Plan, the After Action Memorandum, or the Administrative Record please contact Joe Malen at 907-361-4512 or Cliff Seibel at 907-361-6220.

UNITED STATES ARMY ALASKA
U.S. ARMY GARRISON, FORT WAINWRIGHT

PROPOSED PLAN FOR FORMER COMMUNICATIONS SITE (TAKU GARDENS) FORT WAINWRIGHT, ALASKA

BEFORE JOSEPH MALEN,
Remedial Project Manager

Fairbanks, Alaska
Princess Hotel, Jade Room
4477 Pikes Landing Road
Fairbanks, Alaska 99709
January 15, 2013
7:00 p.m.

P R O C E E D I N G S

JOSEPH MALEN: Good evening, everyone. Like I said, my name is Joe Malen and I'm the remedial project manager for the Operable Unit 6 Taku Gardens site out on Fort Wainwright. I'd like to thank you all for coming and I would like to recognize a few of our distinguished visitors or attendees at the moment, and I would like to leave opening remarks to Col. Johnson, who is the Garrison commander, to give opening stuff. If you want to do it from there or here, it's up to you, sir.

COL. JOHNSON: No, I can come up there. Okay. How are you doing? I'm Col. Johnson. So I'm the commander of Fort Wainwright. So how many folks here aren't part of either federal regulators, state regulators, or somebody that has something to do with Fort Wainwright? How many are just interested citizens? Okay. The reason I'm asking is so I'd rather spend my time focusing on you guys and have our guys focus on you because everyone else has been involved with this for a long time because of what's going on.

So what we're doing today and I -- this evening, and Joe will get into it -- is there anyone else presenting besides you?

JOSEPH MALEN: No, sir.

COL. JOHNSON: Okay. So Joe will run through a whole bunch of stuff for you, but what this is, is part of the process that we have to do. There's a thing called CERCLA, and

it's a big acronym, but basically the CERCLA process is a process that is basically focused on law, but, you know, we are required to go through a process that talks about our remediation and there's a whole bunch of steps and things we have to do. But to make it simple, what we're doing tonight as part of that is the public comment process.

So the whole intent tonight is to kind of present, hey, here's what happened, here's what we found, here's what we did. These were some of the things that were required, this is the way ahead and what the future has for us. But as you go through all of this, we are required by law to give the public an opportunity to (1) get smart about what's going on and (2) have some comments and ask some questions.

So we've got -- there's federal regulators here. Jack is from EPA, there are folks from ADEC, Alaska state regulators; there's a whole bunch of environmental folks from the Garrison. So after Joe has gone through and given you all this information, if you haven't already, feel free to go around and look at these different boards, look at some of the stuff here and ask any questions that you have, because there's a lot of really smart people in the room that have been working on this since around 2005. And I just happened to be the commander at Fort Wainwright back in 2005 when this all started. In fact, it was like week into my command. I took command and like four days later we figured out what was going

on; that we had an issue at Taku Gardens.

So I've got a lot of personal knowledge of what happened for three years, and then I was gone and I just came back about a year and a half ago and, you know, all this stuff was supposed to be taken care of by the time I got back, but here we are.

So, really, this is the one thing I want to say and then I'll get out of here, is to me this is a good-news story, Taku Gardens. And I don't know if Joe is going to get into that as far as the process of what we've done, but as far as the Army goes, and this is my own personal opinion, what I think is good about this whole process is that, you know, we were trying to build Army family housing on the installation and during that time we saw that we had environmental issues. So one of the things that could have happened is we could have just shut the project down, stop construction, and probably lost the project. What we did instead is we worked with federal regulators and state regulators and we found a way to figure out -- do site exploration and really find out, what do we have? While we're doing that, continue with the construction as we could.

So once we kind of searched and looked to see what was going on, in those areas where we didn't have problems, we kept the project going, and we also were allowed to do some remediation at the same time. So we'd find something -- find a

mess, clean it up, keep building and keep going so that the process didn't just stop. It kept going and that allowed us to get where we're at today, which is an important part of that whole CERCLA process, and I'll let Joe talk more about that.

But this, to me, is a good news story that we're actually here today with the houses done, remediation done, and we're ready to transfer assets from -- the Corps of Engineers has already passed them back to us at Fort Wainwright; we're ready to pass them to our privatized housing partner, and we're ready to put families in those houses, in a safe environment and take advantage of great houses that we really need.

So thank you very much, and we'll hang out afterwards; if you've got questions, you can ask us.

JOSEPH MALEN: The other thing -- one of the things that the colonel brought up was that this is -- the public meeting is a requirement of public law. One of the other things that's a requirement is that we're supposed to take a verbatim transcript of the stuff that happens here. That's why we have our court reporter that's over to my right, your left, in the corner, and she's going to be taking the transcript of all that's said during this meeting.

The other thing is, if you would like to make an official public comment and you don't want to write it, you don't want to send an e-mail, you can come up and she will record you as a verbatim transcript. If you have a comment, if

you have a question, if you have a request, that's the nice lady that you would go to and make that known.

As we are going along and as I will be answering questions, I would like to ask your indulgence that I could carry a little pocket recorder so that questions, answers, and responses can be recorded as well, and then I just turn them over to her and it becomes a part of the record. If you don't want to be recorded, we don't have to take your name, we don't have to take anything like that; it can be an anonymous comment, it can be an anonymous question, but please let me know so that, you know, we turn -- I don't take the recorder with me and, you know, stick it up under your nose. So if you have a question, you have a concern and you don't want to go on official record or be recorded, please just let us know and we can accommodate that need.

We will make the com -- we will record the comment as "someone asked," you know, and that will go in the record, but you don't have to be officially there.

So I'd also like to recognize the other RPMs that are part of this project. The colonel already spoke of Jacques Gusmano. Mr. Gusmano is from Region 10 EPA. He has been with the project since 2005 and is here currently with us. Ms. Deb Caillouet, which -- who is from the State of Alaska, is right there in the back of the room, making sure that she makes faces at me to make me laugh during the presentation. She's been

with the program since 2008.

We had to switch RPMs for the state, in the middle, but Deb has caught herself up for everything that has happened in '05 all the way up to present day. So she is as knowledgeable as any of us to ask questions. We have regulators from the EPA and the State of Alaska as a requirement; it's part of our Federal Facility Agreement and it is part of the law of CERCLA. And CERCLA stands for the Comprehensive Environmental Response Compensation Liability Act. That's the great big thing, why we say CERCLA instead of the actual name of the act.

So if you have any questions, if you have any concerns, I'd like to ask if you could wait until after the presentation, but if something just jumps up and you've just got to ask a question, I'll entertain questions during the presentation. Just remember that the more questions you ask, the longer I blather on. So if you want to get me to sit down and shut up, you know, just wait till the end. But I will entertain, if you have something that you would really like to have.

Okay. The reason that we are here, we are talking about the former communication site, otherwise known as Taku Gardens, and we want to give you a brief history of everything that has happened, what was done there in the past, what we found out, what we encountered during our construction, during our investigations, tell you where we are today, and where we think we're going.

We also, again like we talked in the beginning, we want to give you, the public, the opportunity to have your comments known, ask your questions, and get the answers out to the public that we can. We have also -- in our public notices, we have put up a web site. Every piece of paperwork that we have attached to this is in what is called the Administrative Record, which is basically a record of every document, everything that we did that led to a decision for where we are today. And that is available online. It's part of the newspaper ad that we did. If you'd like to have it afterward, please let me know and we can get it to you so that you can download it.

Okay. Any questions about what we're here for, what we want to do before I jump into this? Okay. Here we go. Roller coaster ride.

This is Taku Gardens back in the forties and fifties. You can see that there's a lot going on in here. And what we did is we superimposed where the houses are today over what was there back in the forties and fifties. Up in the -- well, I have a pointer; I can do this. Up here in this upper area -- upper center area, this is what we call brigade and wing section. That's where the troops were living, it's where their company stuff was, their storage, their equipment was all stored in that area. We also had -- if I can get this thing to move, you know, another offshoot over here. No one is quite

sure what that was, but, you know, they're there.

What we have in this area right here is what's called Hoppe's Slough. It was a slough that came off the Chena River at one time. It was basically filled over time as the troops were putting more and more things in the area. The antenna farm area is this area in here and we had what was called the Air Force Secret Security Service that was stationed in there. One of the unique things about all of the aerial photos that we have is this area right here in the bottom, and it's always obscured and we could never figure out how they always took a picture with a cloud over top of it. And it's kind of like, duh, they obscured it on purpose so that you couldn't see what was going on because it was a secret.

We also have a few other things that we care about today. There's an asphalt batch plant and a concrete batch plant up in that corner. We have a bunch of drums and what have you that are stored over here on the far right-hand side of the picture. And then, you know, down here is what we call a "cannibalization yard." It was a bunch of equipment, like a junkyard for the Army, and they would, you know, take pieces and parts from different equipment and would use it and return equipment to serviceable condition.

So there's a whole lot that we have going on around here. So, you know, we go back in history as best we can. You know, the problem is there's no absolute document as to what

was happening out there in a specific spot. I mean, back then, they did what they were supposed to do and no one was expecting that we were going to be here today doing what we're doing. So we have to go and make our best guess as far as what we need to look for and where we need to look for it.

The area that started the whole thing is down here in the southwest corner. It is the old Building 52 site which is down here. That's where we found PCBs during the initial excavation of the foundation. We had several contractors working, a lot of heavy equipment going on, and one of the -- the operator of the piece of equipment smelled something funny, stopped his equipment, went through his chain and we ended up, after sampling, found that there was PCB contamination.

It's not that big an area as far as where the main PCBs were located, but what we did have, as the guy was pushing up dirt, making his foundation hole, the soil pile that was generated from that is where the PCB oils had gotten pushed up into. The environmental office folks at the time said, hey, we have this issue out here; we need to make it go away. And as -- and what normally the rule is, as you're loading stuff from the ground into a box to make it go away, you're supposed to use water -- you know, a water misting spray to keep the dust down. The contractor said, well, you know, if a couple gallons is good, a thousand gallons is better. And what he ended up doing was spraying a whole bunch of water over top of

that and made a mess, and we'll talk more about that later.

What we end up doing is we have a whole bunch of metal that was found during the investigation and it was scrap metal mostly, crushed up drums, pieces of equipment, beds, lockers. Yes, we actually found a locomotive engine and, yes, we did find a forklift that was buried on site. They were there. It was a place where they were burying junk; we found it. There were tank treads, there was Marsden Matting, which is a hasty airfield material. All sorts of stuff that was out there.

Unfortunately, a couple of the drums had some petroleum in it; it was not a big deal. We had to go and segregate that stuff. There was a little bit of petroleum-contaminated soil. That was segregated off in separate piles and then everything that was not known to be contaminated was pushed off into other piles within the compound.

So after we go through all of this stuff of what's happening, and we decided that we needed to go and do further investigation, we went and ran EM61, Electromagnetic 61, is the name of the equipment that goes and generates this map that we're seeing right here. And everywhere that you see dark spots, that says that there's a lot of metal that's buried in that place and we care about that because metal equates possibly to drums and drums we cared about because if there was something in it, we wanted to make it go away.

So what we ended up doing as the RPMs, we sat down and

said, okay, this is a big site. The contractor who was building the housing has already removed a whole bunch of stuff that was underneath and in and around the houses to get them out of his way so that he could build his utilities and put the houses up.

This is the stuff that was left afterward that we needed to go back and find. This was done in 2007 and what I'm going to lead you over to is my left, your right, we have yet the large posters over there that kind of give you an idea -- a better idea of the type of stuff that was looked at. When you look at the original housing, there were 88 borings that the Corps of Engineers did before we even started shovel 1. And all they found was junk and they found a little bit of petroleum. And Alaska, and especially up at Fort Wainwright, that's something that we find every day and we weren't really concerned. There was no contamination found other than the petroleum, with the exception of one PCB hit and when we went back to look to see if there was anything there, we couldn't replicate it, so we said we must have got it with the sample.

And we have over here on the far side, you know, you can actually see where the samples happened, where we stepped out, if you're interested.

And so with all the information that we had from our initial start in 2004 and we come out here to 2006 and we're at the point where we're saying, hey, we keep hitting this metal,

there's a possibility for stuff in the drums, but we said we need to go and look at the places that had the most heavily -- you know, heavily concentrations -- heavy concentrations of metal, which are the areas that we see here and down in here, and look at see what's there.

Well, your normal CERCLA process is you go in and you do some borings and you say, okay, this is what we think is in the soil, groundwater based on the information we have. Well, it's a pretty big site and that's a lot -- you know, those are very big areas here that we're looking at when you look at how much metal is there. So what we said was, you know, you're not going to be able to do this with soil borings; let's get the excavators in. And so what we did is investigation by excavator, which, in our process, is probably the best way to do it because you're getting a whole lot of dirt, you're getting a great big picture instead of this very little, tiny thing that you normally deal with.

So, again, these areas here that you see, the heavier concentrations, that's where we focused our initial investigations on. It expanded from there, and I'll go into that a little bit later. Fine.

The EM61 map that you just saw, that's how we generate that thing. There's actually a guy that walked the entire compound, all 54 acres, just like that on a line. Some of it was towed when we had big open areas. And that's how the map

was generated. The guys are looking like they're having all sorts of fun, don't they?

Okay. What was accomplished? You know, you start looking at stuff, you try and put words, you know, to all this stuff and you start thinking, oh, my gosh, we've really done a whole bunch of work. And, you know, when you start talking about 345,000 square feet, you're starting to talk eight acres of area that we actually went and put backhoe into it, dug it up, and made sure that there was nothing in the soil or, if there was something in the soil, it went away.

So we know that after we dug, we took samples at the bottoms of the holes and the side walls of the holes. If we found anything in the holes that was a contamination, we dug it out, put it in a box, made it go away. If it was clean, we'd cite it as clean and moved on to the next area. The munitions-related debris, that's the stuff that's on my right, your left; it's laying on the floor and I invite you to go and look at that after the presentation. We also have UXO technicians that are available, that can explain to you what it is that you're looking at, if you're interested.

Two rocket motors were found. We have a rocket motor sitting there, you know, of what we had found. In the tail end, in the rocket part of the motor, there was some residual propellent and it's called residual propellent because it was all water-logged and basically degraded. But because the

propellant was there and it was still inside the cup for the rocket motor, those two things get classified as discarded military munitions, meaning that there was an energetic source within the device itself, which were taken to the range, blown up and made go away.

Of the other items that you will see over here on display, whenever they were found, they were treated as live munitions until we could prove that there was nothing in them. And the way that you find that there's nothing in them, either they're opened and you can see inside or we take them out to the range and we put what's called a small donor charge and we try and initiate an explosion. If all you do is make a hole in the thing or dent it up and mangle it up a little bit, it's not full of energetic material and is considered munitions debris, and that's what we have over here. And that was the majority of the stuff we found with the exception of the two rocket motors.

You know, lots of -- you know, 389 tons. We have pictures of it over there on the wall that you can see and I'll flip it up here in a second. But that's a lot of metal, you know, and what we have in the picture over there is basically from one investigation, not all of them.

Nonservicable material that was hauled off: basically, when you have sandy silt, you can't build on it, it's not good for your gardens or anything like that. So 11,000 cubic yards

went over to our landfill to be used as landfill cover, which is about the best thing for it. 1,061 drums dug up; 608 empty, meaning there was absolutely nothing in it; 445 had detectible residue, meaning you could tell what was in it based on the residue there, mostly oil. Eight had measurable liquid that could be sampled. It came out mostly petroleum hydrocarbon and one of them had something else added into it that was kind of strange, but it was still mostly just fuel; nothing else was hazardous.

Okay. The PCB-contaminated soil: 3,300 cubic yards is a lot of soil and, again, the reason that that had to be dug up that way is after I told you about the water being splashed on the top of the pile, it made the soil run away from the pile and out into the area around it. So we had to clean all of that stuff up, which is why this number gets to be so huge. The 3,300 cubic yards of petroleum-contaminated soil, again, petroleum is something that we encounter all the time. We get it out of the way, we dig it up, we take it to OIT downtown, down in North Pole, and have them burn it, and then they bring that soil back and we put it in the landfill. The asbestos and solid waste, you know, again, it's just stuff that we normally encounter. It's not a big deal. Well, it's a big deal as far as we've got to make it go out of there, but it's now all gone, no longer an issue. We have none of that stuff left that we know of.

This is a picture -- this is building -- what are we doing? Oh, okay. That's right in the middle of 15, 17, and 19, which is in the northern side of the northeast corner of the compound. This is what we were dealing with and what you're looking -- right here at the bottom, those are the -- what the drums look like. Some of them actually look like they were intact; others were all crushed up and mangled like we have here and over in here. We dug the stuff out, had to unearth utilities, we came as close to the buildings as we could without compromising the foundations, and if we found, you know, drums or containers like this out there, when we were all done cleaning the solids out, we went and did lab samples to make sure that there was nothing from that drum and history left in the soil. If it was, it was dug up and made go away.

This is the same excavation that you just saw. They basically -- you know, what you were seeing was right along here and we had to go and do this backfill because, as you can see, we have utility poles that we had to go and replace. So this excavation actually went all the way against the house and, as you can see, this excavation down here, that's actually 18 feet deep. We were right over top of groundwater and when -- we have that picture over there on the -- your right-hand side there, you'll actually see orange pin flags and that's where we took our samples to prove that we were actually clean. So that is a huge hole and everybody gets excited when

I say this, but that hole is clean. We have sampled that hole. We have looked at that -- we've pulled everything out, we went down to groundwater, there's nothing in the groundwater over there and there's nothing in the soil. It's clean. You know, and that was the object of the drill; that when we got to those sort of things, we could actually go back and tell everybody who shows up, "That's clean."

I was telling you about the junk that was pulled out. That's part of that 296 tons that we pulled out. We actually -- this is just from building 15, 17, and 19, that area that you just saw exhumed. That's the stuff that we pulled out. That's an actual house behind it, so it'll give you an idea of the scale of just how big that pile of stuff was. And it's basically just a whole bunch -- a potpourri of Marsden Matting and commo wire and tank treads and drums and just metal, junk.

This here -- we actually only had one building that we observed drums underneath the building. This is building 49L, the left side of building 49. And as you can see here in this center part, those are the sidewalls of drums and they look like they're intact. So we said, you know, there are drums under the buildings, we are not leaving drums under the buildings, so we actually went and dug -- this thing right here that you see on the top, that's the underside of the garage. That's the garage floor that you see there. And the garage

floor is held up. We had our eng -- or Jacobs Engineering consultants go through there and they engineered a way to keep everything in place while they dug underneath.

That'll kind of give you a better scale of what's going on, you know, and these little things that you see that are drums, every one of them came out. Nothing was left in place. And when they got them all dug out, they were all empty. So, a good news story that they're all gone. Nothing in them is even a better good news story. And then when we were all said and done, because there's no way to compact soil underneath that thing to keep the house from moving, they used an expanding concrete that they pumped underneath the thing and it -- so we had this great big hunk of concrete underneath that one particular house. So it's not going anywhere.

Again, this is the area of investigation. If you see a color on here, this is where we dug. The blue that we see right down in here, this is the PCB area. Right where the dot is now is the main area where we had to go down to groundwater to dig it all out. The rest of it was just because of where the water smeared and we had to go and go after it. Now, after the water smeared, we had some -- there's construction still going on. We had some little spots here, you know, little drabs, dibs over here, and then one little place right here on the side of the sound berm had PCBs in it and that was dug up and made go away.

So anything that we found that had PCBs in it, it's gone if it was over 1; 1 part per million is the requirement by state and EPA for residential housing. There is not one 1 part per million anywhere on that site that -- you know, that we know of. And we've looked pretty much everywhere you can imagine to go look. And, again, everything that's got color to it, that's where we dug. When you go compare that to the map over there on the far side, that's pretty much everywhere where we had heavy concentrations and then some. So eight acres -- you know, if you guys have an appreciation for size of an acre, here's eight of them that we went and dug up and at times down to 18 feet. We stopped when we didn't find anything anymore, and we checked, but we didn't stop until we were all done.

What you see down in here, this -- these were the 10 houses where the construction was stopped because we had the PCB in the one area and we were concerned about the rest. So after we were all done, all this stuff up here, we said, you know, we might as well go and dig out these foundations out here and check underneath the foundations just to make sure there was nothing under there. Good news is there was nothing under there. That whole area that was considered the PCB exclusion zone is clean based on our lab analyses. We even came over to the side of the sound berm over here. Again, it was just a place that we saw a lot of metal and we made the metal go away, and nothing extraordinary was found over here.

And we can talk about additional stuff after the thing -- after the briefing.

This little area here is just south of building 8. As they were digging one of the drainage swails, we found all sorts of diesel fuel in the soil and we tried digging out of it. We were not able to completely dig out of it, so we do have the diesel -- it's weathered diesel left in the soil, but it's five feet below the surface of where people are walking. So there's no way for people to come in contact with the stuff that was left behind.

Throughout this entire investigation, we have trace amounts of chemicals that exceed State of Alaska migration to groundwater levels. And what that basically says, if you exceed this level and yet you're still below an action level, that if you ever go to dig that out, you have to make sure that you don't put that dirt anywhere within 100 yards of a surface water body, a drinking water well, or a wetland. You know, so that's why we have to care about that and, again, that's considered contamination left in place

What do we know? We know that we moved all sorts of stuff out. We removed the drums, debris. All the contamination that we found, except for some diesel fuel, was put in a box or was treated or moved away from the site. It is not there today. Groundwater monitoring wells: there are 93 groundwater monitoring wells because, as we were going through

our investigation, we said, well, you know, we don't know what's here; we don't know what's there. So we would put a well in, sample the soil as we went down, and sample the groundwater to make sure that we had a full characterization of the site and we knew what was left in place.

The soil samples, like I said before, we took them -- if we found drums, if we found indications, smelly soil, stained soil, anything didn't look right, we took a sample just to make sure there was nothing left behind. The -- we have some shallow groundwater contamination, which I'll talk about here in a little bit, but again no one is drinking the water, it is low-level stuff that we're talking about that I'll go into in a little bit more detail later.

The DRO is the diesel-range organic, and that's basically weathered diesel fuel, is what we're dealing with there. The whole -- what we're planning to do out there with putting residents back in is we've installed -- we have established institutional controls. Institutional controls are a means by which we are stopping people from becoming exposed to contamination. The rule that basically the institutional control says: you don't disturb the soil greater than six inches without getting a dig permit and without having a work plan to make sure that you're not digging in any place that we had something left behind. You're not going to be able to put a potable water well on site to use either for drinking or for

irrigation. And then the other: we have to go and tell all the residents all the stuff that we have done out there so that they have an informed choice as to whether they want to live there or not.

Living in this compound is optional. If people decide they do not want to live on here based on the information that they receive, they do not get dropped to the bottom of the housing list that normally happens when you refuse a house somewhere else. You get -- you stay right where you are on the list and you get the next available house. So these houses were designed for three-, four-, and five-bedroom families. If you want one, they will be made available. If not, you get the next thing available that they have down within the installation.

The CERCLA actions, again, we had to -- we started this thing with an action memorandum that basically said we found contamination, we did a removal, now we need to do some further investigation. We established the ICs that said nobody lives here until we've gone through and evaluated everything that's out there; that we're also going to do monitoring the soil gas, groundwater, and -- yeah. And then the other thing that comes at the bottom, two preliminary source investigations. Before we started the remedial investigation, we basically had a contractor going out and taking samples all across the area. And in 2005, 2006, we went back through the history with a

fine-toothed comb; we talked -- we went through all of the comments and stuff that was established by the contractors. Shannon & Wilson was the consultant, who is sitting right here. This is the young lady that got to be there throughout the entire construction as the houses were being built. She documented everything. If someone said, "I had a headache from standing here," we marked that down and we put that in our investigation. "It smelled funny over here." We put that down and we went and did an investigation based on that. So all the comments that we had, all the information we had was brought together in the PSE I and PSE II for our beginning evaluation for how to proceed with the investigation. The remedial investigation starts in 2007. I told you earlier, in 2005 we went and we dug the PCB soil that was on the surface. In 2007, we dug the rest of it. We went down to groundwater and we took it all out. So the first batch was 146 yards that was laying on the ground. The rest of the 3300-plus came out from '07 and '08.

The other part of the investigation -- the remedial investigation was a very dynamic thing, and over here to my left, your right, over in the front, you'll see a chart, and basically what that does, it takes -- you know, how did we develop the steps? How did we know to go from point A to point B? Where do we go look next? And that chart there kind of describes the whole thing and we can answer questions, if you

have any, as you're looking at it.

After we finished doing our remedial investigation and we took everything out, the contractor who was doing the human health risk assessment made an assumption that was rather unusual, but because of the notoriety the site had and the fact that we were going to have people living here, they took every site where we had found something and assumed that we found everything in that one place. So of all the places that we found something, they were all considered that we had everything there, even though it wasn't, and they calculated the risk based on that. And even after they did that extreme kind of calculation, there is still no unacceptable risk to people living in these areas. And, again, based on the fact that you're not going to drink the groundwater and you're not going to dig a hole that's five feet deep in the back yard.

So the human health risk assessment says there is no unacceptable risk to human health or the environment, and then with -- based on that information, we proceed to say we're ready to go and start our final check to putting people in these houses.

Feasibility study basically says what do you need to do out there? And so we thought about it, we thought about it, and we said, you know, we do need to monitor the groundwater because there is some contamination left on site and we need to make sure we know what's happening with it at all times, and we

need to make sure the institutional controls remain in place and are enforced and we need to meet on a regular basis, the RPMs, to go through all the information and figure out what, if anything, if there's a next step.

We are currently at the Proposed Plan Phase. The Proposed Plan -- I have copies over here on the table if anyone needs. Basically, what it says, it tells everything that we did. From 2005 to current, it says this is what we did. This is all the stuff that came out, this is where it went, this is what's left, and we say that we're ready to put people in here.

Again, we have -- there's three major institutional controls. We're going to monitor -- we have sampling ports in every single garage with the exception of 49L and basically what we do is we sampled the soil gas underneath the house. We're sampling to see if there are any vapors or fumes coming up, and we have found nothing that is out of the ordinary, nothing that would pose an unreasonable risk underneath the houses.

We have prepared the Proposed Plan for Public Comment. When public comment period is over on the 12th, basically, everybody who made comment, all those comments get put in what's called a Responsiveness Summary; that summary gets put into the Record of Decision. And basically what it says, if there is something that is brought up by the public that needs to be addressed, it's addressed before we can go any further

with the RoD. Once we get everything addressed, we can move the Record of Decision forward and get it signed and we can -- we will complete the investigation process under CERCLA.

So, again, the Record of Decision goes up. The Army, EPA, and State of Alaska have to sign the document, depending on how much the final costs are for, the Record of Decision decides at what level these things get signed within each agency.

I told you about the soil gas sampling that we're talking about. There's a plan inside the Proposed Plan that says for five years -- up to five years, we are going to look at the sub-slab soil gas underneath the houses and we're going to monitor that to make sure that there is not something that we missed. There was a concern that there were some drums left underneath. We said the only way that we can check to see if there's something happening after we dug and didn't find anything was to go and sample the soil gas. And so that's basically a picture of what it looks like. The probe gets drilled into the concrete. You can see it happening here. We have another picture over off on the side, and we go and -- there's a whole elaborate operation as to how they go and sample that. We can talk about that later if you have questions.

Okay. I'm done, or at least half-baked. So is there anything that I can answer right now?

JULIE KEENER: It is true that debris remains under the structures except for four -- debris remains under some structures except for building 49?

JOSEPH MALEN: Correct. There are 12 buildings that we saw debris that was still on the side wall when we did our investigation, but it basically looks like, you know, bedposts or tank tracks or something like that that it's junk metal. And, again, junk metal has no risk. It doesn't do anything to anybody's health. It's just there. The fact that the contractor promised that after his compaction and his construction technique that the house would not move, you know, that's when the Army said, okay, you can leave stuff underneath the house provided it does not provide an opportunity for the house to shift later on.

Sir?

COL. JOHNSON: Joe, when you talked about making stuff go away, could you be a little more specific? Primarily, with the soil that contained PCBs, you know, once that was contained and identified, could you just talk about the process of what you did with it?

JOSEPH MALEN: Sure. You know, the colonel is asking me to go into a little more detail on the PCB removal operation. What happens is the excavators will come out to the site and they're -- hopefully with a light misting of water, the excavators will go into the dirt, they move the dirt from

the pile into a 20-yard roll-on/roll-off metal container, a giant box, and there's a liner inside the box so that you can reuse the box afterward. And you basically fill the box up, you put a seal on it after you've sampled it and then the boxes get shipped down through the haz-waste process and goes to a toxic substance disposal facility, the closest of which is in Oregon. Columbia, Oregon.

And so everything that we dug up went to Columbia, Oregon, if you ever want to visit it. And that happened with everything that we found that had a hazardous nature. If it had to go and be disposed of Outside, it went in to a 20-yard roll-on/roll-off box that had a little burrito -- what we call a burrito inside; they fill the box up to the weight limit of the box itself, they get sampled, they get sealed and we put them out under a manifest to the hazardous waste facility. And then we get a piece of paper back that says it made it to the facility so that there's no chance that the stuff got lost in place -- you know, in transit and went somewhere else.

So we know where that stuff went to, we know that -- everything that we moved out of there, we know where it went to and we can -- we have the documentation to go and back up the stuff that went Outside.

So, again, it's a fairly simple process. The excavator comes in -- and the other thing with the excavators, the contractors who do that, they put down tarps all over the place

so that as the bucket comes down and reaches up and you have the dirt going from here to there, anything that would normally drip, drips on top of the plastic and then when they're all said and done, they go and wrap the plastic up and throw it in the last box, and then they sample underneath the plastic to make sure that nothing got through the plastic.

So it's a very involved process as far as the contractor goes; fairly simple for me to say it. But it's a very long process. It's a very serious process. And all the time that the contractors are working this stuff, they're in Tyvek suits with respirators, they have gloves, and the reason that they do that -- you know, because of their career choice, they come in contact with contamination on a regular basis. All that is, is to make sure that there is no cumulative effect of them always going out and being in contact with contamination and them getting hurt.

This whole thing was done so that everybody was safe. The contractors were safe, who were doing it; the people are safe who are going to live there. So that's how that process went.

COL. JOHNSON: Thank you.

JOSEPH MALEN: Anything else? Sir?

GENE KUHN: I'm wondering if the dirt that's been dumped out by the landfill, is that part of your project?

JOSEPH MALEN: Right now? The stuff that's being

dumped today or.....

GENE KUHN: Well, this summer -- last summer?

JOSEPH MALEN: No. That soil that got dumped off to the side came from other construction projects on post. We had -- I forget how many millions of dollars of construction. And so basically everything that was dug out of the hole to make room for foundations and what have you, had to go somewhere and we decided to go and build a clean soil cell that is just south of the landfill.

GENE KUHN: Okay. Well, that's -- I was wondering if I should be wearing my hazmat suit out there.

JOSEPH MALEN: No.

GENE KUHN: Since that's a wood-cutting area.

JOSEPH MALEN: That's correct.

GENE KUHN: And I thank Colonel Johnson for giving us that opportunity to cut wood. Thank you.

COL. JOHNSON: I'm not through with you. Yes, that's a good point, though, because it -- Joe mentioned a little bit of that during the brief, but deciding where anything that came off of that site, a lot of time and energy goes into where does it go, what's the proper disposition of it. So if it had any contamination, then it went -- as you said, it went down south.

JOSEPH MALEN: Went into a box and went somewhere else.

COL. JOHNSON: If it had fuel in it, then it went and got burned and then it got dumped in a dump. So it got treated

before it got put in our landfill. And correct me if I'm wrong, but none of that dirt went off the installation to a landfill here in Alaska.

JOSEPH MALEN: That's correct.

COL. JOHNSON: Our -- it either went our landfill on post or it got sent down to the Lower 48 to be treated and.....

JOSEPH MALEN: That is correct.

COL. JOHNSON: .....do whatever they do with it in Oregon.

JOSEPH MALEN: Yep. Ma'am?

JULIE KEENER: Excuse me. And that soil was less than 10 parts per million PCB that went in -- or is to be used as cover on Fort Wainwright landfills.

JOSEPH MALEN: That is correct. We did.....

JULIE KEENER: It's between 1 and 10.

JOSEPH MALEN: Correct. The landfill -- the Fort Wainwright landfill allows less than 10 parts per million; it's considered clean soil or how -- how does it go? It is not contaminated soil if it's less than 10. And that's how -- and then we asked permission from the State of Alaska because we have a permit for our landfill. We said, it's less than 10 -- it's actually way less than 10 that we put it in, and we were able to get permission to move a significant portion of the soil there, thus saving the taxpayers a significant chunk of money.

Mr. Adams, who is sitting here at the computer, is our land -- well, still is for the moment, our landfill manager and I think he has something to add to that?

BRIAN ADAMS: No, I was just going to say the permit for the landfill at Fort Wainwright is such that we are not allowed to take contaminated soils into the landfill. So there's a limit. If you -- that's why we had to go to the state and ask the state if we could actually put that stuff into the landfill. It's the same with the diesel fuel contaminated soils. It gets burned. It automatically just comes back to the landfill and it's used as cover material.

JULIE KEENER: With limited exposure.

BRIAN ADAMS: Correct.

JULIE KEENER: I mean, it's obviously not a residential scenario.

BRIAN ADAMS: Correct.

JOSEPH MALEN: See, the other nice thing about the stuff that was moved to the landfill, as soon as we moved the soil that was not contaminated but could not be left on Taku, as soon as we moved it in there, we went and took cover soil and we covered that stuff back up. So there was no chance for dust to be blowing off of the landfill and outside it.

So, again, as many precautions as we could take, the installation took to make sure that everyone is safe and we have a good operation throughout the installation.

Yes, ma'am?

JULIE KEENER: The debris that we initially removed during construction, was that stockpiled somewhere and later inventoried and gone through, or.....

JOSEPH MALEN: In 2005, the contractor that was building the buildings, as they were digging up the waste material.....

JULIE KEENER: Excavation.

JOSEPH MALEN: .....the solid waste, the crushed drums, the tank treads, and all the other metal that they found, and some wood and some other items that were found, they would stockpile them in great big piles and then after they had a certain sized pile, then they would load everything into a truck and they would haul it out to the landfill.

Well, in 2006 as we were going through the stuff, one of the contractors that we had -- one of the environmental contractors said, you know, we really need to go through this metal and look for this kind of stuff, the discarded -- the munitions debris. And so what we ended up having -- what we ended up doing is we stopped the first contractor from hauling stuff just directly to the landfill and had UXO technicians actually go through each and every scrap pile and they pulled out anything that was considered munitions debris.

A couple of the items that we had, the contract folks were basically saying, hey, they never made a training device

for this type of bomb or this piece of munitions, and so everybody was treating it as this is a live real-deal thing. As we took them to the range and we blew them up, we found out that that was not true; they actually did make training devices for darn near every piece of munitions that the Army used during World War I, II, and the Korean War.

So what you see over here is what we basically found. Some of the stuff was more intact when they dug it up; others are -- you know, they're obviously dismantled now to prove that there's nothing in it. So we did have a scare at first and then when we had, you know, the second contractor come through with their UXO techs and they took it over to the range, we found out that they were actually just training devices.

So with the exception of the two rocket motors that had the residual -- or the residue, the propellent residue, everything else was inert, had no energetic piece to it. There were no fuses, there were no hunks of explosive; just that propellant residue is the only thing that we had to be concerned about. And that was taken care of, too, at the range.

Anything else?

JULIE KEENER: Can you give us a quick rundown of the groundwater remediations?

JOSEPH MALEN: Okay. Within the Proposed Plan, we talk about that there are certain areas of groundwater

contamination. The main -- the players that we have that are still -- that we are tracking is 1,2,3-trichloropropane which is a solvent; trichloroethane, which is another solvent; and diesel fuel. So those are the three main things that we really have to track.

When we first started doing the investigation in 2006, we detected elevated levels. Some of them were above the clean-up levels for EPA and so we kind of focused in those areas and we tried to make sure what was going on. We have sampled these wells in the areas of concern twice a year since 2006. And as we go through the years and as we're watching the samples, the levels of the contaminants are going down on a -- very significantly through what's called natural attenuation. You know, we're not doing any pumping, treating, or anything like that. The lab results are indicating the stuff is breaking down biologically or just through the dilution process of the groundwater moving through the aquifer.

We've made special effort to ensure that that water is not moving towards the drinking water wells, the production wells on Fort Wainwright. We have intercept wells or sentry wells between Taku and the drinking water source and those wells are still coming up as absolutely clean. There's nothing in them. So -- and we're going to continue monitoring, we're going to continue watching, you know, because we care about, you know, the drinking water on post.

JULIE KEENER: And can you point out the location of source for the supply wells.

JOSEPH MALEN: Well, from here, let's see.....

JULIE KEENER: Or a distance and a direction.

JOSEPH MALEN: Well, it's in the northeast corner -- it's outside the northeast corner of the compound. It's basically behind the PX gas station.

JULIE KEENER: Oh, so they're right there.

JOSEPH MALEN: Huh?

JULIE KEENER: If I may? They're there.

JOSEPH MALEN: Right there.

JULIE KEENER: Right there, yes.

JOSEPH MALEN: Is where the drinking water protection wells are. Right there.

JULIE KEENER: And groundwater flows?

JOSEPH MALEN: And groundwater flows to the northwest, which is basically from here to here. North to northwest. And the reason that -- the way that they find that out is they measure the water levels across all the wells, and the water -- you know, the high point is where the water starts, the low point is where the water is going, and so what they do is they take measurements to one-tenth or one-hundredth?

AUDIENCE MEMBER: Hundredth.

JOSEPH MALEN: One-hundredth of an inch to.....

JULIE KEENER: A foot.

JOSEPH MALEN: Or of a foot, rather. I'm sorry. You're right. One-hundredth of a foot to see which way the water is moving, and it was clearly moving north/northwest. More northwest than north. So -- and it's -- we're seeing that evidence based on where we have the known contamination that the -- the diesel fuel that we see here, it's actually moving to the northwest. The solvents that we saw here, they were moving to the northwest. The TCP that we saw that was right down in here is also moving to the northwest. And we see that based on, again, the water levels and which way the direction the water is going. Okay? Anything else?

AUDIENCE MEMBER: Looks like you did a good job. No one has got any questions.

JOSEPH MALEN: Well, thank you very much for coming, on behalf of the Garrison. The Garrison commander, Garrison Command Sergeant Major. Thank you very much for coming out. Again, if you would like to make public comment, if you have a question, you can come over here to the court reporter and she can go and take your questions, comments, whatever it is that you have. I'm going to be here. We also have, you know, Mr. Adams right here, we have Mr. Gusmano to the far back over there, Ms. Caillouet over here.

So if you want to get the answer from the agency and not from the Army, those are the two people that you go see. And if there's anything that I can answer, please come and see

me. Thank you very much for being here.

(Off record)

(END OF PROCEEDINGS)

* * * *

C E R T I F I C A T E

UNITED STATES OF AMERICA)
) ss.
STATE OF ALASKA)

I, Elizabeth D'Amour, Notary Public in and for the State of Alaska, residing at Fairbanks, Alaska and court reporter for Liz D'Amour & Associates, do hereby certify:

That the annexed and foregoing PROPOSED PLAN FOR FORMER COMMUNICATIONS SITE (TAKU GARDENS) PUBLIC MEETING, held in Fairbanks, Alaska at the Princess Hotel, Jade Room, 4477 Pikes Landing Road, Fairbanks, Alaska, was digitally recorded and transcribed by me, pursuant to a request to do so;

That said transcript is a true and correct transcription contained on said digital recording;

That I am not a relative nor employee nor attorney nor counsel of any of the parties, nor am I financially interested in this action.

That the original of said transcript has been retained by me for the purpose of filing with Sarah Belway, Project Manager, Jacobs, 3437 Airport Way, Suite 201, Fairbanks, Alaska 99709.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal this 4th day of February, 2013.

Elizabeth D'Amour
Notary Public in and for the
State of Alaska
My Commission Expires: 12/28/2014

(S E A L)

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances
and Disease Registry
Atlanta GA 30333

February 6, 2013

Mr. Joseph Malen
Remedial Project Manager
US Army Garrison, Fort Wainwright
1060 Gaffney Road #4500
Fort Wainwright, Alaska 99703

Dear Mr. Malen,

The Agency for Toxic Substances and Disease Registry (ATSDR) has reviewed the *Proposed Plan for Former Communications Site (Taku Gardens) Fort Wainwright, Alaska* (dated December 2012) that was issued for public comment from January 14, 2013 to February 12, 2013. We are in the process of completing a Health Consultation evaluating the potential for vapor intrusion at the proposed housing complex. We have submitted a data validation version to the Army for review. The data validation version includes a number of recommendations to protect public health of residents who will occupy the property in the summer or fall of 2013. We wish to outline these recommendations during the public comment period, so that they may be considered during finalization of the proposed plan.

ATSDR has reviewed the environmental information gathered about the site and concluded that, while the probability of a health hazard occurring from vapor intrusion is low, the lines of evidence presented do not completely eliminate the vapor intrusion pathway. Subsurface containers that could contain volatile chemicals may remain undetected beneath homes on-site. Based on the conclusions in the data validation version of the Health Consultation, our recommendations to protect the future health of families residing at Taku Gardens concentrate on two areas:

(1) implementing measures to prevent possible exposures to hazardous air pollutants in homes that may be constructed over containers of hazardous materials in the subsurface, and,
(2) continued and additional precautionary sampling and monitoring of the properties.

Specifically, ATSDR recommends:

(1) that the Army consider implementing measures to prevent possible exposures to hazardous air pollutants in homes, such as installing sub-slab depressurization systems in the buildings identified as having observed and possible debris beneath them prior to occupancy as a precautionary measure. NOTE: The Proposed Post-construction Subslab Soil Gas Monitoring Program only considers installation of the system after vapor intrusion has been detected by quarterly or annual monitoring. However, the release of volatile or semi-volatile chemicals from a container could occur rapidly and migrate into homes at hazardous levels that are below olfactory detection. Subslab depressurization systems could prevent such exposures that may cause a health hazard and would likely go undetected during quarterly or annual monitoring.

(2) that the following additional sampling and monitoring is conducted, including:

a. monitoring at appropriate intervals following any changes to the site that may affect vapor flow, such as earthquake, building renovation, construction, or landscaping. This applies to future changes as long as contamination may remain onsite above screening or background levels.
b. monitoring semi-volatile organic compounds and 1,2-dibromo-3-chloropropane in all monitoring plans.
c. performing continued sub-slab gas and indoor air monitoring of units where screening levels were exceeded (i.e. a clean round of sampling shouldn't be used to eliminate the building from future study). NOTE: This would result in sampling more units than the 12 houses selected for monitoring in the Proposed Post-construction Subslab Soil Gas Monitoring Program.
d. sampling sub-slab gas in at least three locations, as advised in ADEC guidance, for a representative number of residences to characterize the spatial variability of contaminant vapors in the sub-slab space.
e. sampling during spring for all residences to capture conditions during the spring thaw and snow melt (the dates for future sampling plans are not specified in the proposed plan).
f. performing at least one of the comprehensive sub-slab soil gas sampling events after construction is complete (the dates for construction completion and future sampling plans are not specified in the proposed plan).
g. sampling of soil-gas collocated within a representative number of utility lines and sampling within utility line access ports (manholes) to provide evidence for or against this as an active vapor migration pathway.

We hope that you will find this information useful. We appreciate the opportunity to comment on the Proposed Plan and look forward to releasing our Health Consultation in the near future. If you have any questions please contact Dr. Tonia Burk, Environmental Health Scientist, at 770-488-0764 or email at TBurk@cdc.gov.

Sincerely,

Tina Forrester, PhD, M.S.
Acting Director
Division of Community Health Investigations
Agency for Toxic Substances and Disease Registry

cc:
Ms. Ronie Shackelford, US Army
Ms. Doris Anders, US Army

DEPARTMENT OF THE ARMY
INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, U.S. ARMY GARRISON FORT WAINWRIGHT
1060 GAFFNEY ROAD #6000
FORT WAINWRIGHT, ALASKA 99703-6000

REPLY TO
ATTENTION OF:

Directorate of Public Works

SUBJECT: Response to ATSDR Review of Taku Gardens Proposed Plan

Dr. Tina Forrester
Acting Director
Division of Community Health Investigations
Agency for Toxic Substances and Disease Registry
1600 Clifton Road (F-09)
Atlanta, GA 30333

Dear Dr Forrester:

The U.S. Army has received your letter dated February 6, 2013 outlining ATSDR's review comments for the *Proposed Plan for Former Communications Site (Taku Gardens) Fort Wainwright, Alaska,* dated December 2012, hereinafter referred to the Proposed Plan. The comments were received within the public review period of 14 January through 12 February 2013. This letter provides official response to your comments.

The U.S. Army Garrison Fort Wainwright Alaska appreciates the time and effort ATSDR expended on this review. The ATSDR review is very clear and concise. The review comments address the entire plan with particular emphasis on two main topics: 1) implementing measures to prevent possible exposures to hazardous air pollutants in homes that may be constructed over containers of hazardous materials in the subsurface and 2) continued and additional precautionary sampling and monitoring of sub-slab soil gas.

We agree with ATSDR's statement that "the probability of a health hazard occurring from vapor intrusion is low," but take exception as to how the statement that "Subsurface containers that could contain volatile chemicals may remain undetected beneath homes on-site" is used in the context of your letter. The weight of evidence gathered during the Remedial Investigation (RI) and subsequent construction support activities suggest that if intact drums exist, they most likely contain relatively small quantities of petroleum hydrocarbons or tar. This is based on the fact that of the 1,061 mostly crushed and empty drums found during the RI and subsequent construction support activities, only eight (less than 0.5 percent) had enough liquid to allow for sampling and analysis. Liquids in the 8 drums were characterized primarily as fuel and water mixtures, with few volatile organic compounds (VOCs). None of the drums contained chlorinated VOCs, which tend to be more of a concern in terms of volatility, migration, and toxicity. The remainder of the drums with contents contained tar, asphalt, and other non-hazardous solid and semi-solid materials. The types of material found in the subsurface at this site suggest that it is unlikely any debris that might be present under any structure contains intact drums with volatile liquids. As evidenced by the predominantly empty and crushed drums, and limited volume of contaminated soil recovered from areas where the few partially filled drums were encountered, the presence of buried metal and drums does not directly correlate with chemical contamination.

The Army has conducted extensive investigations and concurrent cleanup activities between 2004 (during preliminary investigations by the Alaska District Corps of Engineers for the pre-construction assessment) and 2011. The Army, in cooperation with the U.S. Environmental Protection Agency (EPA) and the Alaska Department of Environmental Conservation (ADEC) expended considerable time and resources to ensure that every reasonable method and approach was used to delineate the nature and extent of contamination at this site. The approach taken during the investigations and removal actions has been extremely conservative; all material suspected of presenting even a possible unacceptable risk has been removed to the greatest extent practicable.

Small, isolated areas of non-petroleum contamination were excavated to the point that there was no physical evidence of contamination and then, the floors and sidewalls of the excavated areas were sampled and analyzed. If additional contamination was detected by the laboratory analyses, the excavation continued until the contaminants of potential concern were not detected or concentrations were below conservative project screening levels. The only area where subsurface contamination is present at concentrations above health-based screening levels is in the north-central portion of the site. DRO in this area was removed to the greatest extent practicable without damaging structures or utilities but, due to its highly weathered nature, remaining DRO is not expected to pose a risk to indoor air quality, future site workers or visitors.

Following completion of the RI, only five structures are suspected to have debris beneath the building foundation. To investigate the unlikely possibility that debris remaining under structures might present an unacceptable risk, the Army tasked the Corps of Engineers to execute a highly complex engineered excavation project to remove debris from beneath Building 49L. Debris was encountered between 7 and 11 feet below ground surface and extended 15 feet beneath the garage foundation. Materials removed from the excavation included 42 crushed and empty drums; 3 drums containing water with a sheen, and 3 yd^3 of grease-affected soil. The excavation continued vertically and horizontally until the natural soil horizon or uncontaminated soil was reached. Results of this investigation provide additional support that metal debris at this site is not necessarily correlated with contamination.

The risk assessment was based on the location and amount of residual contamination remaining after the RI investigation. Risk calculations considered the toxicity of each contaminant, the current and potential future uses of the site, and the pathways by which people could be exposed to contaminants. The risk assessment used a highly conservative approach which calculated risk using the highest sample results of each contaminant from across the site and assumed that future residents would be regularly exposed to all of these contaminants over a 30-year period. The results indicate that, under the reasonably anticipated future use scenario, the cumulative multimedia hazard index for non-carcinogenic chemicals due to exposure to soil, vapor intrusion and use of the post water supply is 0.5, which is below EPA and ADEC threshold value of 1. Results of the cumulative excess lifetime cancer risk are within the EPA's acceptable risk of 1 in 10,000 to 1 in 100,000 and below the ADEC risk threshold of 1 in 100,000. This shows there is no unacceptable risk to residents who use the Post drinking water supply wells and do not come into contact with subsurface soil. It is important to note that potential risks due to vapor intrusion were negligible, and the primary contributors to calculated risk estimates were removed during post-RI construction support activities. Consequently, the risk estimates provided in the Proposed Plan (as taken from the risk assessment) actually overestimate risk.

The Risk Assessments and related data are available within the *December 2010 Final Remedial Investigation, FWA 102, Former Communications Site, Fort Wainwright, Alaska* report and the *Final Feasibility Study Former Communications Site, Fort Wainwright, Alaska, July 2011 Revision*. The Army also has all of the follow-on documentation and datasets available online if ATSDR would like to see them again.

The Army has carefully considered ATSDR's two major recommendations for the site: (1) measures to prevent possible exposures to hazardous air pollutants in homes that may be constructed over containers of hazardous materials in the subsurface; and (2) continued and additional precautionary sampling and monitoring. Specific responses area as follows:

Installation of sub-slab depressurization (1) was carefully considered during the Remedial Investigation/Feasibility Study (RI/FS) phase of the work, but based on the results of the RI/FS, the Army, EPA, and ADEC concluded that there is no unacceptable risk from sub-slab soil-gas and no additional remedies were necessary. Based on the results of all the investigations, there is no reason to install sub-slab depressurization units under each building duplex.

To address ATSDR's comment (2) a: the Army is statutorily required to periodically review the effectiveness of all implemented remedies. If site conditions change substantially, due to construction activities or natural disasters like earthquakes (as mentioned in the review) the Army will take appropriate action to ensure the safety of occupants in all of the housing areas on Post. Please note that construction and landscaping at this development is nearly complete. The only remaining task is installation of cable TV lines in the housing area. The installation contractor will use a special trenching tool to install these lines 3 to 4 inches below the existing surface, and the cable lines will be covered with the original surface material (i.e. gravel, concrete, or asphalt). This utility installation will not significantly alter site conditions.

In comment (2b), the ATSDR recommended that semi-volatile organic compounds (SVOCs) and 1,2-dibromo-3-chloropropane (DBCP) be added to the target analyte list. The method selected for indoor air and soil gas analysis at this site (EPA TO-15) includes analysis for DBCP. Although DBCP was detected at a low concentration in one sample collected during the October 2008 RI vapor intrusion evaluation, additional samples collected on March 9 and 10, 2009 were submitted to two different laboratories for analysis and DBCP was not detected in any of the samples. Given that this chemical was used for commercial agricultural and manufacturing purposes, it is highly unlikely that it was ever used at the Former Communications Site. Additionally, no SVOCs are present at this site above human health-based cleanup levels. The current list of analytes, and the analytical method selected for continued monitoring, was developed in consultation with the EPA and ADEC and the Army believes it is sufficient and capable of producing the necessary data to protect human health.

Comments (2)c through (2)f recommends a more aggressive sub-slab soil-gas sampling schedule than the schedule presented in the Proposed Plan. Please be assured that the current protocols and locations of the sampling ports were established in cooperation with the EPA and ADEC. The current plan will establish a post-construction baseline for the chemicals of potential concern at every unit (comment 2f), account for spatial variability (2d), account for seasonal variations (2e) and focus on the areas in close proximity to the ground water plumes, and where previous sampling results were greater than the project screening levels, but less than applicable clean-up levels. There are four sampling events scheduled in the first year, and the initial sampling event as stated in the Proposed Plan will include sample collection at (item 2 c) each of 109 residential units. Note that the void under Building 49L caused by the

investigation was completely filled with expanding concrete so sub-slab sampling at this residential unit is not possible.

The Army appreciates the fact that utility lines may sometimes provide preferential flow-paths for vapor migration (ATSDR comment [2f]), however, the Garrison believes that the current strategy to sample sub-slab vapor provides the most conservative means to assess vapor intrusion into residential units. Additional sampling of utility lines will not provide the Army with information that can be directly applied to vapor intrusion within any single residential unit. As described in detail in the RI and post-RI reports, all contaminated soil has been removed to the greatest extent practicable. Concentrations of residual volatile contaminants remaining in the subsurface between 5 and 15 feet below ground surface do not exceed human health-based cleanup levels; instead, these chemicals of concern are identified as such only because they are present at concentrations that potentially threaten groundwater quality. DRO is the only COC that remains above human health-based cleanup levels.

Again, the Army sincerely appreciates ATSDR's thoughtful and helpful review of the Proposed Plan, and the recommendations provided. Should you wish further information or clarification of Fort Wainwright's comments, please contact my POC for this effort, Mr. Joe Malen, at 907-361-4512 or email him @ joseph.s.malen@mail.mil.

Sincerely,

Clifford A. Seibel
Chief, Environmental Resources Division
FWA Public Works