

**Former Fort Ord Operable Unit (OU)-1 – Base Closure Team (BCT) Meeting
Status Update
Groundwater Remediation, Well Destruction, and Treatment Plant Decommissioning
Marina, California
20 January 2016**

OU-1 On-Post Activities for 12 November 2015 through 15 January 2016

Prepared by HydroGeoLogic, Inc., Roy Evans, Project Manager

Attendees: (to be revised after meeting)

Individual	Attended?	Individual	Attended?
James Specht, USACE		Grant Himebaugh, RWQCB	
Teresa Rodgers, USACE		Edward Ticken, AMEC	
Alex Kan, USACE		Jeff Fenton, AMEC	
Bonnie McNeill, USACE		Derek Lieberman, Ahtna	
Cory Koger, USACE		Brad Clark, Ahtna	
Jonathan Whipple, USACE		Holly Dillon, Ahtna	
William Collins, BRAC		Megan Gehrke, Ahtna	
Tom Ghigliotto, Chenega ¹		Kevin Ghalambor, Burleson	
Melissa Broadston, Chenega ¹		Peter Kelsall, CB&I	
Bart Kowalski, Chenega ¹		Steve Crane, Kemron	
Cary Stiebel, Chenega ¹		Erin Caruso, Gilbane	
Judy Huang, EPA		Larry Friend, Gilbane	
Martin Hausladen, EPA		Kevin Siemann, Gilbane	
Kimberly Gettman, DTSC		Monique Perry, Gilbane	
Min Wu, Ph.D., DTSC		Roy Evans, HGL	
Steve Sterling, DTSC		Kevin Wierengo, HGL	
Edward Walker, DTSC		Gage Dayton, Ph.D., UCSC	
X = attended in person or by telephone; blank indicates absent from the meeting			

Notes:

¹Chenega staff supporting the BRAC
Ahtna = Ahtna Engineering Services
BRAC = Base Realignment and Closure
Fort Ord Office
CB&I = Chicago Bridge & Iron, Inc.
DTSC = California Department of Toxic
Substances Control
EPA = U.S. Environmental Protection
Agency
HGL = HydroGeoLogic, Inc.
RWQCB = Regional Water Quality Control
Board
UCSC = University of California, Santa
Cruz
USACE = U.S. Army Corps of Engineers

OU-1 Treatment Plant Operations

The northwest treatment system (NWTS) remains offline in accordance with the OU-1 Exit Strategy. Since system startup in 2006, the NWTS has pumped approximately 212 million gallons of groundwater and removed approximately 6.0 pounds of total volatile organic compounds, primarily trichloroethene (TCE). We experienced intermittent alarms and automatic shutdowns from voltage spikes but no evident damage. The system was restored after each shutdown and the sump pump has functioned properly.

Reporting/Federal Facility Agreement Schedule

The status of ongoing and anticipated reports for OU-1 is summarized in Table 2. Ongoing efforts are as follows:

- The Draft 2015 Annual Groundwater Monitoring Report and the Draft UFPP-QAPP Revision 2 were accepted as final without comment. These final reports were sent out on 03 December 2015.
- The Technical Memorandum summarizing the results of Attainment Monitoring events 1 through 4 is being prepared for submittal by 29 January 2016.

OU-1 Groundwater Sampling and Analytical Results

Attainment Monitoring event #4 was performed from 10 - 14 December 2015. Table 1 presents the validated analytical results for the Attainment Monitoring program to date for trichloroethene (TCE), perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). All analytical results show that chemical concentrations in OU-1 groundwater for all compounds tested have remained well below the aquifer cleanup levels (ACLs) established in the Record of Decision (ROD) or the screening values established in the Exit Strategy. The attached Figures 9 and 10 (from the Technical Memorandum in preparation) show the TCE and the perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) concentrations, respectively, for each well.

The next sampling effort is scheduled to occur 18 – 23 February 2016. Execution of this event is subject to regulatory comments on the Army recommendation in the Technical Memorandum summarizing the results of Attainment Monitoring events to date.

OU-1 Exit Strategy Implementation

The exit strategy states that if concentrations for all chemicals of concern (COCs) specified in the ROD are below the aquifer cleanup targets in all wells for the first four consecutive sampling events and TCE concentration trends are not increasing, the data will be

submitted to the regulatory agencies for review. If the regulatory agencies concur after review of the data from the first four attainment monitoring events that the attainment monitoring period is complete, then the site closure process will be initiated. If not, then the attainment monitoring period will be extended as mutually agreed.

Except for TCE, all COCs have been either not detected (ND) or found at concentrations well below their respective ACLs in all groundwater samples since 2008. As evident in Table 1, TCE concentrations during the Attainment Monitoring period has been stable (results varied by less than 0.5 micrograms per liter [$\mu\text{g/L}$] during the four events and less than 0.3 $\mu\text{g/L}$ between the first and fourth samples) at wells EW-OU1-53-A, IW-OU1-02-A, MW-OU1-26-A, MW-OU1-88-A, and PZ-OU1-49-A1. The maximum TCE concentration at these five wells in any sample during the period was 4.0 $\mu\text{g/L}$.

At the remaining three wells, TCE concentrations decreased or remained the same during each successive sampling event and decreased by 0.9 $\mu\text{g/L}$ to 1.7 $\mu\text{g/L}$ between the first and fourth events. The maximum TCE concentration at these three wells (EW-OU1-52-A, PZ-OU1-10-A1, and MW-OU1-61-A) in the fourth sample was 3.5 $\mu\text{g/L}$.

Statistical analysis of TCE concentrations at all 8 Attainment Monitoring wells from the start of NWTs operation in 2006 through the December 2015 sampling event showed strongly decreasing trends with a high degree of confidence in the result.

PFOA and PFOS were not identified in the OU-1 ROD, consequently, no ACLs were specified for these compounds. The exit strategy stated that the attainment monitoring sampling program must include these potential contaminants to evaluate the case for OU-1 closure and that four rounds of PFOA and PFOS sampling would be conducted if these chemicals were detected in any sample during the initial attainment monitoring event. EPA's Preliminary Health Advisory (PHA) standards for concentrations in groundwater were selected as screening criteria. The PHA for PFOA is 400 nanograms per liter (ng/L) and for PFOS it is 200 ng/L. The Attainment Monitoring program showed:

- PFOA was detected in every well during each event with a maximum concentration of 270 ng/L (potentially biased low) at MW-OU1-88-A.
- PFOA concentrations varied by no more than 10 ng/L during the period at any well with the exception of MW-OU1-88-A where the range was 90 ng/L.
- The next greatest PFOA concentration was 120 ng/L (potentially biased low) with no other result greater than 44 ng/L.
- PFOS was not detected in any sample from 6 of the 8 wells but was detected in every sample at wells MW-OU1-26-A and MW-OU1-88-A.

- The maximum PFOS concentration at the latter well (MW-OU1-88-A) was 72 ng/L and 15 ng/L at the former (MW-OU1-26-A).
- PFOS concentrations varied by no more than 8 ng/L at MW-OU1-26-A and 39 ng/L at MW-OU1-88-A.

Based on these results and the accepted exit strategy process, the Army recommends that attainment monitoring be discontinued and closure activities begin. Additional supporting information will be included in the Technical Memorandum summarizing the results of Attainment Monitoring.

OU-1 Weed Control and Rare Plant Monitoring

The 2015 Fort Ord Natural Reserve Impact Assessment Report was submitted in late December to the BRAC office, the Army, and UCSC.

New Action Items:

- Review the Technical Memorandum and respond to Army recommendations.

Ongoing:

- Submit draft minutes for previous BCT meeting(s)—complete through December 2015.
- Submit final minutes for previous BCT meeting(s)—complete through December 2015.

Table 1
OU-1 Attainment Monitoring Results for TCE, PFOA, and PFOS

Analyte	TCE				PFOA				PFOS			
Aquifer Cleanup Level or Screening Value	5 µg/L				400 ng/L				200 ng/L			
Sample Event #	1	2	3	4	1	2	3	4	1	2	3	4
Sample Date(s)	5/8/2015	7/17/2015	10/2/2015	12/11/2015	5/11/2015	7/20/2015	10/5/2015	12/14/2015	5/11/2015	7/20/2015 & 7/24/15	10/5/2015	12/14/2015
Well Identification	Groundwater Concentration: TCE in µg/L; PFOA and PFOS in ng/L											
EW-OU1-53-A	1.6	1.8	1.3	1.4	14 J-	13.0	9	13	UJ-	ND	ND	ND
EW-OU1-52-A	3.8	3.7	3.0	2.9	3 J-	4.0	4	5	UJ-	ND	ND	ND
PZ-OU1-10-A1**	3.3	2.5	2.0	1.6	120 J-	Not sampled			UJ-	Not sampled		
IW-OU1-02-A	1.8	1.8	1.8	1.9	9 J-	10.0	7	9	UJ-	ND	ND	ND
MW-OU1-26-A	2.5	2.5	2.3	2.2	34 J-	44.0	42	39	7 J-	12.0	15	12
MW-OU1-88-A	4.0	3.2 J-	3.9	3.9	270 J-	230.0	180	210	64 J-	62.0	37	33
						260.0*	200*	200*		72.0*	44*	36*
PZ-OU1-49-A1	1.8	2.0	2.2	1.9	7 J-	8.0	9	11	UJ-	ND	ND	ND
MW-OU1-61-A	3.9	4.4	3.7	3.4	3 J-	3.0	2 J	2	UJ-	ND	ND	ND
	4.4*	4.3*	3.7*	3.5*	4* J-				UJ-			

Notes:

µg/L = micrograms per liter
 * = Duplicate
 ND = Not detected
 ng/L = nanograms per liter

OU1 = Operable Unit 1
 TCE = trichloroethene
 PFOA = perfluorooctanoic acid
 PFOS = perfluorooctane sulfonate

U = Not detected
 J- = Potential low bias in reported result

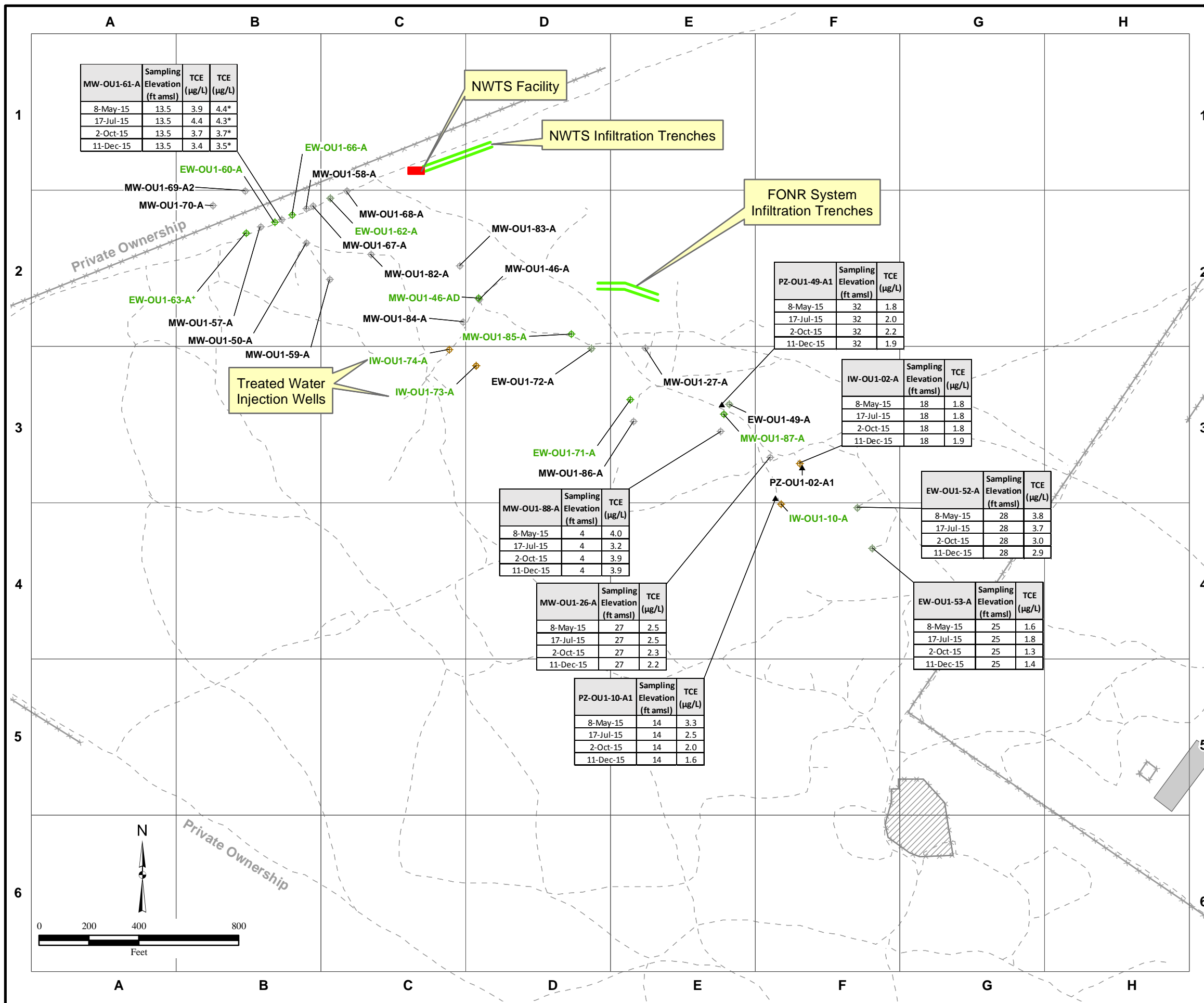
** PZ-OU1-10-A1 was deleted from the sampling network for PFOA and PFOS after Event #1

Table 2
Current Deliverable Schedule
Former Fort Ord, Marina, CA – 20 January 2016

Deliverable Title	Submittal	Review Comments Due	Status/Remarks
<i>Primary Deliverables</i>			
None Pending			
<i>Secondary Deliverables</i>			
Draft PFOA/PFOS Sampling Results Technical Memorandum Attainment Monitoring Events 1 - 4	29 January 2016	29 February 2016	In preparation
Draft 2015 Annual Groundwater Monitoring Report ¹	15 October 2015	16 November 2015	Draft Accepted without comment; final submitted 03 December 2015.
Final UFP-QAPP Revision 2	14 October 2015	16 November 2015	
<i>Completed Recent Submittals</i>			
Final Exit Strategy Technical Memorandum	March 2015	April 2015	Draft Final approved without comment. Change pages distributed 12 May 2015
Site Safety and Health Plan Update	March 2015	Not Applicable	Army approved revisions
Final UFP-QAPP Revision 1	March 2015	April 2015	Draft Final approved without comment. Change pages distributed 14 May 2015
2015 Semiannual Groundwater Monitoring Report ¹	07 August 2015	10 September 2015	Accepted without comment

¹ The Semiannual Groundwater Monitoring Report is submitted as a final document but review comments are accepted. Any comments are addressed in the Annual Groundwater Monitoring Report.

Figure 9
Attainment Monitoring Summary
TCE Concentrations in
OU-1 A-Aquifer
Former Fort Ord, CA



Legend

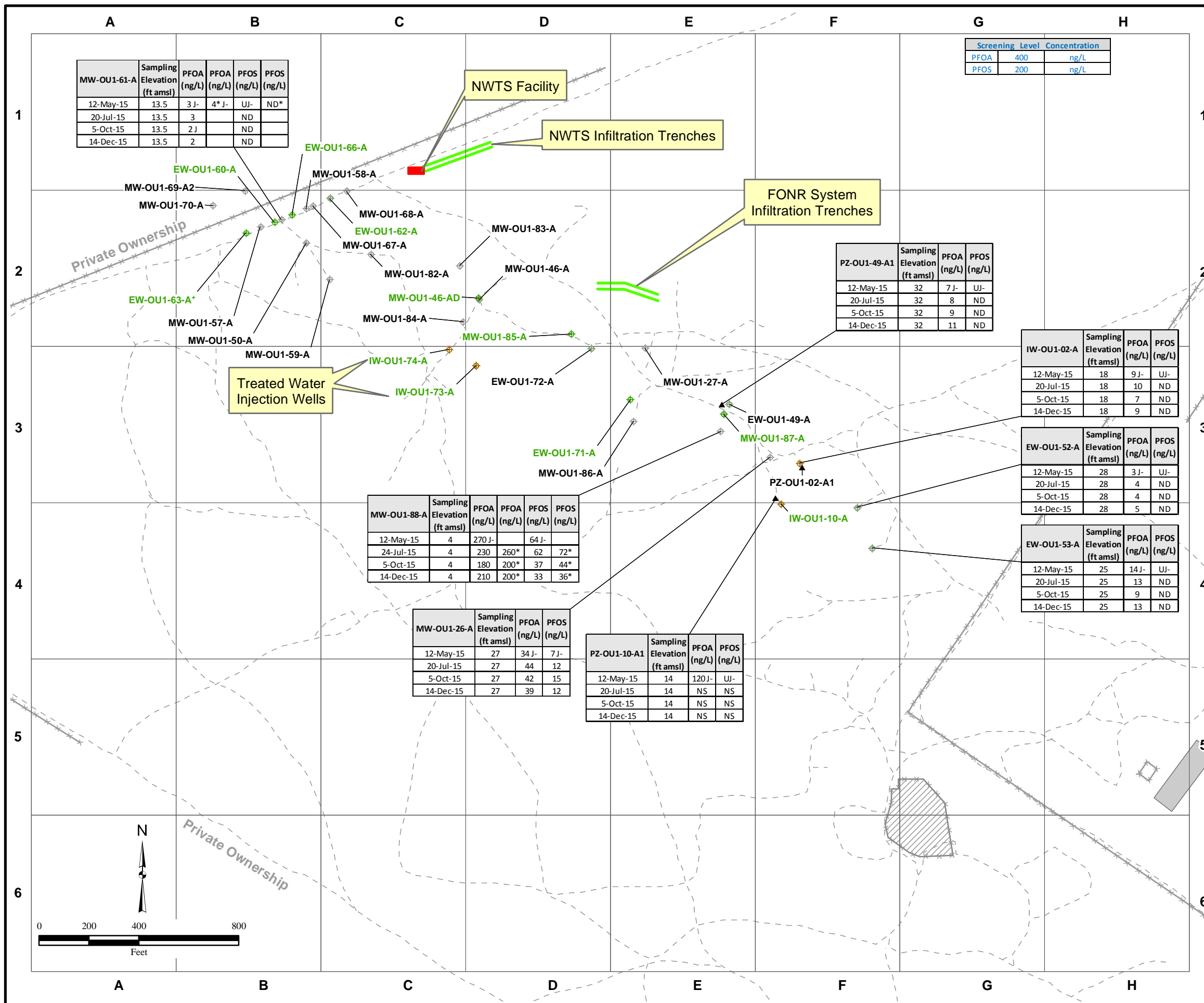
- ⊕ Monitoring Well
- ⊕ Extraction Well
- ⊕ Injection Well
- ▲ Piezometer or 2-Inch Well
- MW-OU1-70-A Well Identification
- - - Trail/Unimproved Road
- ⋯ Fence
- Treated Water Infiltration Trench
- ▨ Former Fire Drill Area
- Structure
- NWTS Facility

Notes:
Well labels in green font indicate extraction or injection well.
Wells not sampled are not part of Attainment Monitoring Network.
* = Duplicate Sample
† = Indicates disconnected extraction well. No longer operable.
ft amsl = feet above mean sea level
µg/L = micrograms per liter
NWTS = Northwest Treatment System
FONR = Fort Ord Natural Reserve

\\gst-srv-01\HGLGIS\Ft_Ord_MSIW\OU-1_AME_1-4_RS_TM\
(09)AttainMS_TCE_OU1_A-Aq.mxd
1/6/2016 TB
Source: HGL



Figure 10
Attainment Monitoring Summary
PFOA and PFOS Concentrations
in OU-1 A-Aquifer
Former Fort Ord, CA



Legend

- Monitoring Well
- Extraction Well
- Injection Well
- Piezometer or 2-Inch Well
- MW-OU1-70-A Well Identification
- Trail/Unimproved Road
- Fence
- Treated Water Infiltration Trench
- Former Fire Drill Area
- Structure
- NWTS Facility

Notes:
Well labels in green font indicate extraction or injection well.
Wells not sampled are not part of Attainment Monitoring Network.
*=Duplicate Sample
+Indicates disconnected extraction well. No longer operable.
ft amsl=feet above mean sea level
FONR=Fort Ord Natural Reserve
J=Sample result estimated value potentially biased low
J=Sample result estimated value
ND=Nondetect
NS=Not Sampled
ng/L=nanograms per liter
NWTS=Northwest Treatment System
PFOA=Perfluorooctanoic Acid
PFOS=Perfluorooctane Sulfonate
UJ=Not detected; Sample result biased low

\\gst-srv-01\HGLGIS\Ft_Ord_MSIW\OU-1_AME_1-4_RS_TM
(10)PFOA_PFOS_Concens_Mon_Summary_Prelim.mxd
1/8/2016 TB
Source: HGL

