Former Fort Ord Operable Unit (OU)-1 – Base Closure Team (BCT) Meeting
Status Update
Groundwater Remediation, Well Destruction, and Treatment Plant Decommissioning
Marina, California
18 June 2015

OU-1 On-Post Activities for 15 May through 12 June 2015

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 McNeil, USACE		Derek Lieberman, Ahtna	
Cory Koger, USACE		Brad Clark, Ahtna	
William Collins, BRAC		Holly Dillon, Ahtna	
Tom Ghigliotto, Chenega[1]		Kevin Ghalambor, Burleson	
Melissa Broadston, Chenega[1]		Peter Kelsall, CB&I	
Bart Kowalski, Chenega[1]		Steve Crane, Gilbane	
Cary Stiebel, Chenega[1]		Erin Caruso, Gilbane	
Lewis Mitani, EPA		Lindsay Alexander, Gilbane	
Martin Hausladen, EPA		Larry Friend, Gilbane	
Kimberly Gettman, DTSC		Kevin Siemann, 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			

[1]Chenega 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

HGL was on site on 27 May 2015 to inspect the Northwest Treatment System (NWTS). There was no significant rainfall accumulation in the NWTS containment basin. HGL plans to replace the variable frequency drive (VFD) for the transfer pump (connecting the influent holding tank to the treatment vessels) during the week of 15 to 19 June. After the transfer pump VFD is replaced and made operable, HGL will determine if there was any other damage and schedule the necessary repairs to restore operability.

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).

OU-1 Groundwater Sampling and Analytical Results

Tables 1A and 1B show the validated TCE and cis-1,2-dichloroethene concentrations, respectively, found in the extraction wells and treatment system in the September 2014 sampling event—the NWTS has been off-line during subsequent groundwater sampling events.

COC Results

Groundwater sampling for Attainment Event #1 was performed on 07-08 May 2015 for the chemicals of concern (COCs) listed in the OU-1 Record of Decision (ROD). Unvalidated analytical results for the ROD COCs are presented in Table 2. The reported groundwater concentration of all COCs remained below the cleanup values specified in the ROD.

PFOA / PFOS Results

Groundwater sampling for Attainment Event #1 was performed on 11-12 May 2015 for the emerging contaminants perfluorooctanoic acid (PFOA) and perfluorooctanesulfonate (PFOS). The concentration values used as screening criteria for PFOA and PFOS results were adopted from the Preliminary Health Advisory (PHA) concentrations adopted by the EPA. These values are 400 nanograms per liter (ng/L) for PFOA and 200 ng/L for PFOS.

Validated PFOA and PFOS results are shown on Figure 4 in Attachment 1 and in the table below:

Attainment Event #1		
(All results in nanograms per liter)		
Analyte	**PFOA**	**PFOS**
Screening Value	**400**	**200**
Well Identification	**Sample Result**	
EW-OU1-53-A	14 J-	UJ-
EW-OU1-52-A	3 J-	UJ-
PZ-OU1-10-A1	120 J-	UJ-
IW-OU1-02-A	9 J-	UJ-
MW-OU1-26-A	34 J-	7 J-
MW-OU1-88-A	270 J-	64 J-
PZ-OU1-49-A1	7 J-	UJ-
MW-OU1-61-A	3 J-	UJ-

J- indicates possible sample bias low U indicates not detected

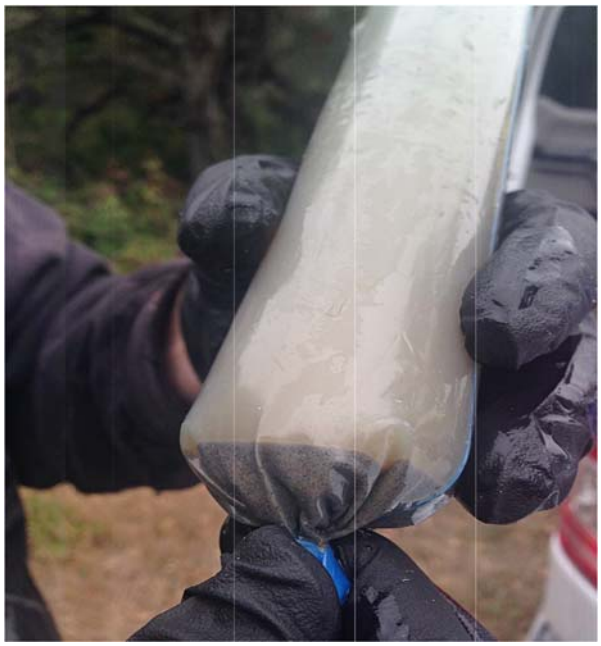
All concentrations were less than the corresponding PHA value for both analytes. PFOA was detected in all 8 wells in the monitoring network. The greatest PFOA concentrations occurred

at 2-inch well PZ-OU1-10-A1 (120 J- ng/L) and at well MW-OU1-88-A (270 J- ng/L). The J- qualifier was assigned because the holding time for extracting the sample for analysis was exceeded by the laboratory by 4 days. This qualifier indicates the possibility that the analytical results may be biased low. All other PFOA results were less than 35 J- ng/L.

PFOS was detected at only 2 of the 8 monitoring wells. The maximum concentration of 64 J- ng/L was found at MW-OU1-88-A (this well also showed the highest PFOA concentration in this sampling event). The other detection (7 J- ng/L) was found at the closest upgradient well (MW-OU1-26-A) from MW-OU1-88-A.

Well PZ-OU1-10-A1

As reported at last month's BCT meeting, the measured total depth at PZ-OU1-10-A1 and aquifer formation material observed in the bottom of the Hydrasleeve™ sample bag (see photograph below) indicated that the well casing and /or well screen may be damaged. The HGL field team took extra care to minimize disturbance in handling the Hydrasleeve™ bag and extracted the PZ-OU1-10-A1 sample only from the uppermost part of the Hydrasleeve™ bag to minimize suspended material in the sample. The sample submitted for analysis was visually clear. Nevertheless, HGL recommended at the May 2015 BCT meeting that PZ-OU1-10-A1 be considered for removal from the Attainment Monitoring well network for future PFOA and PFOS analysis after reviewing the overall data.



The laboratory did not consider it necessary to filter or centrifuge the sample and analyzed it as submitted. The laboratory reported PFOA of 120 J- ng/L and PFOS was UJ- at PZ-OU1-10-A1. These results were consistent with the overall results from the entire well network and with the expected groundwater migration path from the source area. A decision to maintain or exclude this well from future PFOA/PFOS sampling should consider the following questions / factors:

- Given uncertainty on potential impact of suspended material within well casing or sample, will analytical data from this well be acceptable in support of decision making regarding site closure or the need, if any, for additional action concerning PFOA / PFOS? The field team also noted that the water in the Hydrasleeve™ sample bags from MW-OU1-88-A also indicated some suspended material in the well casing but much less than that observed in PZ-OU1-10-A1. This is attributed to the disturbance from collecting 3 samples at this location (parent, MS, and MSDS).

- Is PFOA / PFOS data from PZ-OU-10-A1 needed to support decision making, given that 6 other wells will be sampled in the central part of OU-1? The upgradient well (EW-OU1-53-A) and downgradient 2-inch diameter well (PZ-OU1-49-A1) are separated by approximately 870 feet (see Figure 4) with PZ-OU1-10-A1 near the middle of this area.

- If PZ-OU1-10-A1 is removed from the PFOA / PFOS network, would it be necessary to add another well to keep the total number of network wells at 8? Because VOC samples are collected using passive diffusion bags that are unaffected by the suspended material, PZ-OU1-10-A1 would continue to be sampled for the COCs.

Use of J- Qualified Data

In accordance with the decision logic presented in the OU-1 Exit Strategy, three additional rounds of PFOA / PFOS sampling will be conducted in response to the detection of PFOA / PFOS in OU-1 groundwater. As noted earlier, there is a possibility that the analytical results from this initial round of sampling are biased low. Because these are the first sample results for PFOA and PFOS, there is no context in which to assess the existence or significance of this possible bias. HGL recommends that the usability of these results be determined after all four sample events have been completed and reviewed.

Reporting/Federal Facility Agreement Schedule

All scheduled submittals have been made and the status of submitted and anticipated reports for 2015 is summarized in Table 3.

OU-1 Weed Control and Rare Plant Monitoring

The Army sent the 2014 Fort Ord Natural Reserve Impact Assessment and Habitat and Rare Plant Species Survey Results Report to the U.S. Fish and Wildlife Service in April. UCSC is observing weed populations in selected areas to evaluate the overall effectiveness of past weed control activities. The Draft 2015 Fort Ord Natural Reserve Impact Assessment and Habitat and Rare Plant Species Survey Results Report is being prepared.

Action Items:

- Need to make decision regarding the status of 2-inch well PZ-OU1-10-A1 concerning continued sampling for PFOA / PFOS and COCs before the next scheduled sampling event in early July.

Ongoing:

- Submit draft minutes for previous BCT meeting(s)—draft minutes for May 2015 were submitted for regulatory agency review. Thus far, RWQCB approved the minutes without comment.
- Submit final minutes for previous BCT meeting(s) — complete through April 2015.

Fort Ord HTW BCT Meeting
18 June 2015

Fort Ord Operable Unit 1
Groundwater Remediation, Well Destruction, and Treatment Plant Decommissioning

ATTACHMENT 1

Reference Table(s) and Figure(s)

Table 1A
TCE in OU-1 FONR Groundwater Remediation System – Performance Monitoring
BCT for Former Fort Ord – 18 June 2015

	FONR Extraction Well (listed from south to north)										Boundary Extraction Well (from west to east)								NWTS					
Began:	**Nov-10**		**Oct-07**								**Jul-06**													
Date	**IW-10**		**MW-87**		**EW-71**		**MW-85**		**MW-46AD**		**EW-63**		**EW-60**		**EW-66**		**EW-62**		**INFLUENT**		**MIDPOINT**		**EFFLUENT**	
TCE (µg/L)																								
11/9/07	Used as monitoring well until pump installed in October 2010. Pumping began 03 November 2010.		**16**		**13**		**19**		**14**		ND		ND		1.7		ND		**11**		ND		ND	
1/18/08			**11**		**11**		**8.9**		**8.2**		ND		ND		1.2		ND		**6.0**		ND		ND	
3/18/08			**11**		**14**		**6.7**		**5.8**		ND		0.29		1.5		ND		**5.6**		ND		ND	
5/27/08			**9.7**		**18**		2.5		**6.1**		ND		ND		1.8		ND		3.9		ND		ND	
7/21/08			**9.1**		**14**		4.4		3.4		ND		0.78		1.4		ND		3.6		ND		ND	
9/29/08			**9.3**	J	**15**	J	4.3	J	2.9	J	ND		0.90	J	1.7	J	ND		3.8	J	0.19	J	ND	
12/1/08			**5.8**		**11**		2.6		1.6		ND		0.82		0.91		ND		2.7		0.35	J	ND	
1/26/09			**5.9**		**10**		2.2		1.2		ND		0.48	J	0.78		ND		2.4		ND		ND	
3/9/09			**5.8**		**9.9**		2.1		1.2		ND		0.95		0.86		ND		2.7		ND		ND	
6/11/09			**6.9**		**11**		2.4		1.5		ND		0.88		1.7		ND		2.6		0.14	J	ND	
9/15/09			**6.8**		**9.4**		1.7		0.78		ND		inactive		1.1		0.036	J	2.3		0.35	J	ND	
12/14/09			**6.9**		**7.5**		0.84		not sampled		not sampled		inactive		0.94		not sampled		2.3		0.65	J	ND	
3/22/10			**7.2**		**8.5**		0.62		0.55		inactive		ND		0.90		inactive		2.3		ND		ND	
6/21/10			**7.4**		**6.5**		0.90		0.40	J	inactive		0.86		0.58		inactive		2.1		ND		ND	
9/20/10			**7.7**		**6.6**		0.83		0.35	J	discontinued		0.63		0.49	J	inactive		2.3		not sampled		ND	
12/16/10	**5.2**		**6.9**		**5.2**		0.58		0.28	J	discontinued		0.72		0.42	J	inactive		2.6		0.18	J	ND	
3/7/11	**5.1**		**6.0**		4.6		0.55		0.60		discontinued		0.87		0.42	J	inactive		2.5		0.59		ND	
6/7/11	4.2		**6.1**		4.0		0.78		0.63		discontinued		0.76		0.36	J	inactive		2.6		1.0		ND	
9/20/11	4.5		**6.2**		4.2		1.10		0.38	J	discontinued		0.57		0.36	J	inactive		2.5		1.7		ND	
12/7/11	3.8		**5.1**		3.7		not sampled				discontinued		inactive		0.27	J	inactive		1.8		2.1		0.13	J
3/15/12	3.7		**5.5**		3.8		0.70		0.23	J	discontinued		inactive		0.38	J	inactive		0.81		0.32	J	ND	
9/25/12	--		**5.3**		4.4		--		--		discontinued		inactive		0.19	J	inactive		1.8		0.72	J	ND	
1/8/13	--		**5.4**		--		--		--		discontinued		ND		0.19	J	inactive		1.5		--		ND	
3/27/13	--		4.8		--		--		--		discontinued		ND		0.23	J	inactive		1.5		--		ND	
6/26/13	--		4.4		--		--		--		discontinued		--		--		inactive		1.7		--		ND	
9/18/13	--		4.7		1.9		--		--		discontinued		0.17	J	0.31	J	inactive		2.0		--		ND	
12/17/13	2.8		4.2		--		--		--		discontinued		--		--		inactive		2.1		--		--	
3/27/14	--		3.4	A	0.89	A	--		--		discontinued		0.22	J/A	0.29	J/A	inactive		1.7		0.92	J/A	ND	A
6/27/14	--		3.7		--		--		--		discontinued		--		--		inactive		0.28		0.39	J	ND	
9/2/14	2.2		4.2		0.88		--		--		discontinued		0.25	J	0.26	J	inactive		1.0		0.41	J	ND	

Notes:

Italics (if used) indicate data not yet validated

Bold font indicates concentration > ACL

ACL - aquifer cleanup level

-- - Not sampled

µg/L - micrograms per liter

J - Data qualified as estimated

ND - nondetect

TCE - trichloroethene

NWTS - Northwest Treatment System

FONR - Fort Ord Natural Reserve

Blue font indicates the concentration is calculated using the weighted average of the active pumping wells.

Table 1B
cis-1,2-DCE in OU-1 FONR Groundwater Remediation System – Performance Monitoring
BCT for Former Fort Ord – 18 June 2015

	FONR Extraction Well (listed from south to north)																Boundary Extraction Well (from west to east)								NWTS					
Began:	**Nov-10**		**Oct-07**														**Jul-06**													
Date	**IW-10**		**MW-87**		**EW-71**		**MW-85**		**MW-46AD**		**EW-63**		**EW-60**		**EW-66**		**EW-62**		**INFLUENT**		**MIDPOINT**		**EFFLUENT**	
cis-1,2-DCE (µg/L)																														
11/09/07	Used as monitoring well until pump installed in October 2010. Pumping began 03 November 2010.		1.9		1.6		2.3		1.70		ND		ND		ND		ND		1.3		ND		ND	
01/18/08			1.20		1.40		1.00		1.20		ND		ND		0.11		ND		0.66		ND		ND	
03/18/08			1.20		1.50		0.74		0.63		ND		ND		ND		ND		0.59		0.11		ND	
05/27/08			0.88		2.10		0.26		0.74		ND		ND		ND		ND		0.36		0.21		ND	
07/21/08			0.80		1.50		0.52		0.37		ND		ND		ND		ND		0.41		0.34		ND	
09/29/08			0.99		1.60		0.54		0.30		ND		ND		0.13		ND		0.42		0.42		0.12	
12/01/08			0.67		1.30		0.33		0.21	J	ND		ND		ND		ND		0.27	J	0.37	J	0.19	J
01/26/09			0.63		1.20		0.29	J	0.12	J	ND		ND		ND		ND		0.26	J	0.24	J	ND	
03/09/09			0.62		1.20		0.29	J	0.13	J	ND		ND		ND		ND		0.23	J	0.26	J	ND	
06/11/09			0.71		1.10		0.30	J	0.13	J	ND		ND		0.14	J	ND		0.24	J	0.28	J	ND	
09/15/09			0.80		1.00		0.22	J	0.08	J	ND		inactive		0.03	J	ND		0.22	J	0.37	J	0.03	J
12/14/09			0.67		0.65		0.10	J	not sampled		not sampled		inactive		ND	J	not sampled		0.21	J	0.30	J	0.11	J
03/22/10			0.67		0.79		ND		ND		inactive		ND		ND		inactive		0.20	J	0.11	J	0.13	J
06/21/10			0.67		0.53		0.14	J	ND		inactive		ND		ND		inactive		0.20	J	0.23	J	ND	
9/20/10			0.66		0.46	J	ND		ND		discontinued		ND		ND		inactive		0.23	J	not sampled		ND	
12/16/10	0.55		0.66		0.35	J	ND	J	ND		discontinued		ND		ND		inactive		0.27	J	0.28	J	ND	
3/7/11	0.37	J	0.52		0.28	J	0.11	J	ND		discontinued		ND		ND		inactive		0.23	J	0.30	J	ND	
6/7/11	0.35	J	0.55		0.29	J	ND		ND		discontinued		ND		ND		inactive		0.18	J	0.31	J	0.15	J
9/20/11	0.25	J	0.46	J	0.21	J	ND		ND		discontinued		ND		ND		inactive		0.17	J	0.19	J	0.30	J
12/7/11	0.27	J	0.48	J	0.19	J	not sampled				discontinued		inactive		ND		inactive		0.16	J	0.17	J	0.23	J
3/15/12	0.15	J	0.40	J	0.22	J	0.15	J	ND		discontinued		inactive		ND		inactive		ND		0.24	J	ND	
9/25/12	--		0.39	J	0.23	J	--		--		discontinued		inactive		ND		inactive		ND		0.24	J	ND	
1/8/13	--		0.35	J	--		--		--		discontinued		ND		ND		inactive		0.12		--		--	
3/27/13	--		0.34	J	--		--		--		discontinued		ND		ND		inactive		0.12		--		--	
6/26/13	--		0.31	J	--		--		--		discontinued		--		--		inactive		0.27		--		--	
9/18/13	--		ND		ND		--		--		discontinued		ND		ND		inactive		ND		--		ND	
12/17/13	ND		0.19	J	--		--		--		discontinued		--		--		inactive		0.23		--		--	
3/27/14	--		0.16	J/A	--		--		--		discontinued		ND	A	ND	A	inactive		0.21		ND	A	ND	A
6/27/14	--		ND		--		--		--		discontinued		--		--		inactive		ND		0.43	J	0.17	J
9/2/14	ND		0.21	J	ND		--		--		discontinued		ND		ND		inactive		ND		0.48	J	ND	

Notes:

Italics (if used) indicate data not yet validated

Bold font indicates concentration > ACL

ACL - aquifer cleanup level

-- - Not sampled

µg/L - micrograms per liter

J - Data qualified as estimated

ND - nondetect

TCE - trichloroethene

NWTS - Northwest Treatment System

FONR - Fort Ord Natural Reserve

NA - Not Available

Blue font indicates the concentration is calculated using the weighted average of the active pumping wells.

Table 2
OU-1 Attainment Monitoring Results - Unvalidated TCE Concentrations

Monitoring Well Identification	Most Recent Pre-AttainmentTCE Concentration			Attainment Event #1 (8 May 2015)	Initial Sample	Total Number of Samples Collected	Number Samples with TCE > MCL	Date Last TCE > MCL
	µg/L	Qualifier	Sample Date	TCE (µg/L)				
EW-OU1-53-A	1.9		09/02/2014	*1.6*	9/13/2007	15	12	6/7/2011
EW-OU1-52-A	2.9		09/02/2014	*3.8*	9/13/2007	14	8	9/21/2011
PZ-OU1-10-A1	2.4		09/02/2014	*3.3*	9/22/2010	19	7	3/15/2012
IW-OU1-02-A	3.8		09/21/2011	*1.8*	3/15/2006	13	2	9/16/2009
MW-OU1-26-A	2.7		09/02/2014	*2.5*	3/15/2006	26	19	9/27/2012
MW-OU1-88-A	4.7		09/02/2014	*4.0*	11/7/2006	33	28	12/17/2013
	4.1		12/22/2014					
PZ-OU1-49-A1	1.2		09/02/2014	*1.8*	3/15/2006	24	12	3/20/2008
MW-OU1-61-A	4.7		09/02/2014	*3.9*	5/18/2006	56	49	6/27/2014
	4.2		12/22/2014					
	4.0*		09/02/2014	*4.4**				
	4.6*		12/22/2014					

Notes: Italic font indcates preliminary, unvalidated data

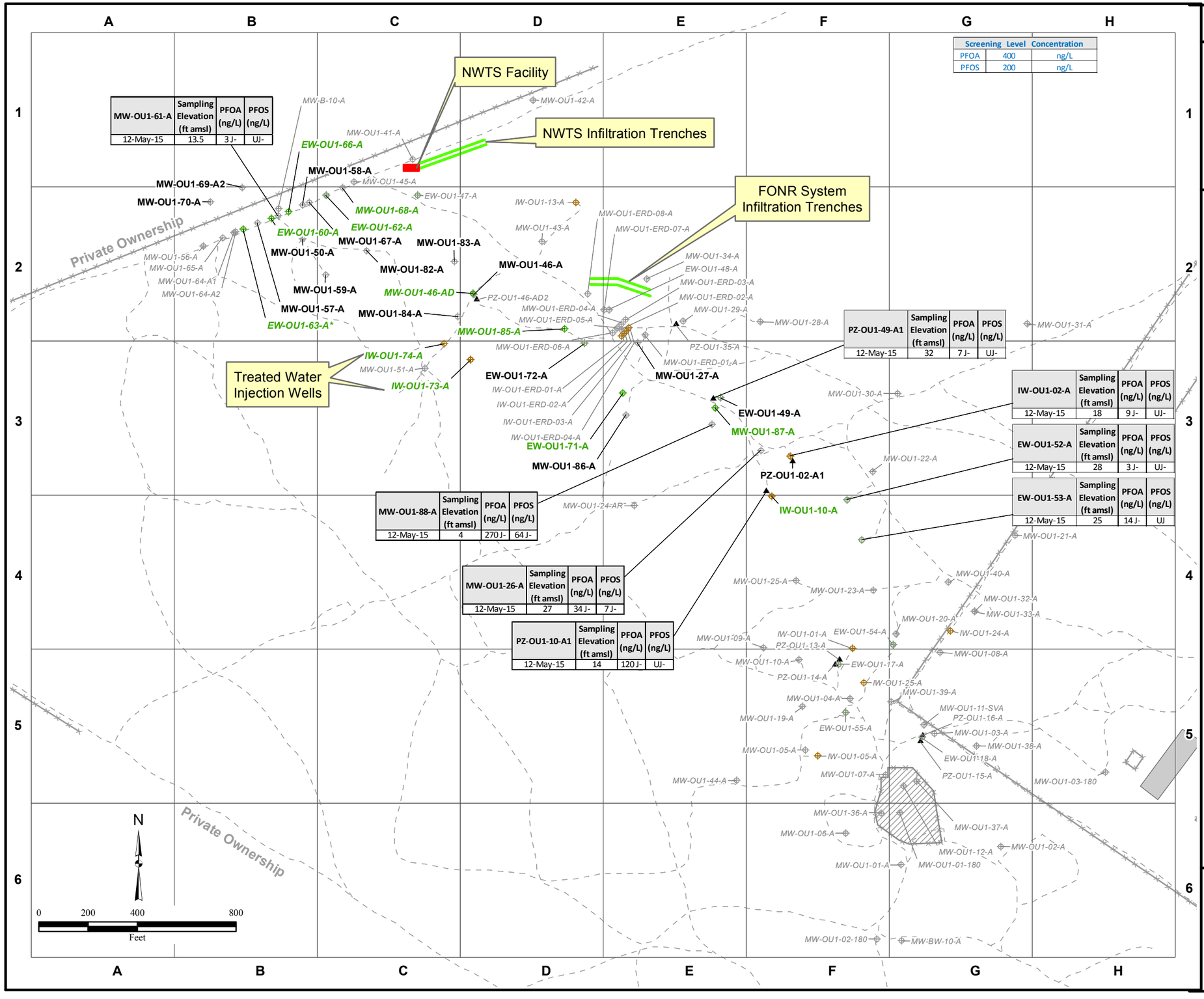
µg/L = micrograms per liter
MCL = Maximum Contaminant Level
* = Duplicate
OU1 = Operable Unit 1
RL = reporting limit
TCE = trichloroethene

Table 3
Current Deliverable Schedule
Former Fort Ord, Marina, CA – 18 June 2015

Deliverable Title	Submittal	Review Comments Due	Status/Remarks
Primary Deliverables			
None Pending			
Secondary Deliverables			
2015 Semi-Annual Groundwater Monitoring Report[1]	August 2015	September 2015	In progress
Preliminary Draft PFOA/PFOS Sampling Results Technical Memorandum	August 2015	September 2015	In progress
Completed Recent Submittals			
Draft UFP-QAPP	March 2014	May 2014	Submitted 04 March 2014
Final UFP-QAPP	May 2014	Received	Submitted 29 May 2014
Final 2013 Annual and 3rd Quarter Groundwater Monitoring Report	April 2014	NA	Submitted 04 April 2014
Final Work Plan for Well Destruction and Treatment Plant Demolition	April 2014	NA	Submitted 04 April 2014
Draft Health & Safety Plan – OU-1 O&M/LTM	May 2014	Received	Draft accepted as Final
Draft Well Destruction and Treatment Plant Demolition Completion Report	August 2014	September 2014	Draft accepted as Final Submitted 03 October 2014
Draft Exit Strategy Technical Memorandum	December 2014	February 2015	Comments received 20 February 2015
Draft 2014 Annual Groundwater Monitoring Report	December 2014	January 2015	Accepted as Final without Comment
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.

[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 4
May 2015 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 Name
- MW-OU1-31-A — Well Destroyed
- Trail/Unimproved Road
- Fence
- Treated Water Infiltration Trench
- Former Fire Drill Area
- NWTS Facility

Notes:
Well labels in green font indicate extraction or injection well.
Italicized font shows pumping suspended.
Wells not sampled are not part of Attainment Monitoring Network.
ft amsl=feet above mean sea level
J-=Sample result biased low
ND=Nondetect
ng/L=nanograms per liter
NWTS=Northwest Treatment System
PFOA=Perfluorooctanoic Acid
PFOS=Perfluorooctane Sulfonate
UJ-=Not detected; Sample result biased low

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6/12/2015 SS
Source: HGL