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

OU-1 On-Post Activities for December 2014

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	
Franklin Mark, DTSC		Roy Evans, HGL	
Min Wu, Ph.D., DTSC		Kevin Wierengo, HGL	
Edward Walker, DTSC		Gage Dayton, Ph.D., UCSC	
Steve Sterling, DTSC			
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

PG&E informed HGL that electric power to the Northwest Treatment System will be restored on Friday 16 January. HGL will determine if there was any damage to the NWTS electrical equipment and/or process control system and make any necessary repairs to restore operability after power is restored.

Because of the power outage, rainwater accumulated in the NWTS containment basin. HGL inspected the NWTS and removed standing water (up to a few inches) from the containment

basin on 1, 4, 15, 17, and 22 December 2014. The water was pumped into the NWTS influent holding tank.

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 Quality Data

HGL collected samples from monitoring wells MW-OU1-61-A and MW-OU1-88-A on 22 December 2014. The unvalidated December results showed that TCE concentrations did not exceed the Aquifer Cleanup Level (ACL) of 5.0 micrograms per liter (µg/L) in any of the samples collected. The unvalidated December TCE concentrations are:

- MW-OU1-61-A = 4.2 µg/L (Duplicate sample= 4.6 µg/L)
- MW-OU1-88-A = 4.1 µg/L

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. Figure 5.2 from the 2014 Annual Groundwater Monitoring Report shows the September 2014 TCE concentrations and is included for reference in Attachment 1. The next planned sampling event is scheduled for March 2015.

Reporting/Federal Facility Agreement Schedule

All scheduled submittals have been made for primary and secondary deliverables. The status of submitted and anticipated reports for 2014 is summarized in Table 2. The Draft 2014 Annual Groundwater Monitoring Report was submitted on 23 December 2014 for regulatory agency review—comments are due by 27 January.

The Draft Exit Strategy Technical Memorandum was submitted on 26 December and is discussed separately in this update. A revision providing flexibility in selecting the analytical method and replacing low flow sampling with the Hydrasleeve™ method was distributed to the regulatory agencies by email on 14 January.

OU-1 Weed Control and Rare Plant Monitoring

The 2014 Fort Ord Natural Reserve Impact Assessment and Habitat and Rare Plant Species Survey Results Report was submitted to the Army for distribution on 10 October 2014. The meeting to present the findings of this report to the U.S. Fish and Wildlife Service (USFWS) is scheduled for 27 January 2015. HGL submitted a preliminary draft of the presentation for Army review on 08 January 2015.

Site Exit/Closure Strategy

Based on data from the validated September and un-validated December sampling events, TCE concentrations have met the aquifer cleanup level at all OU-1 monitoring wells. The exit strategy is based on demonstrating that the cleanup objectives of the Record of Decision (ROD) regarding

human health protectiveness have been met and, therefore, the ROD cleanup goals have been attained. The human health risk corresponding to Chemical of Concern concentrations observed at the site have met the human health protectiveness objectives for several years.

The Draft OU-1 Exit Strategy Technical Memorandum describes the proposed attainment sampling well location network and sampling schedule for the chemicals of concern identified in the ROD and for emerging contaminants perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). During conversations with potential analytical laboratories after the Draft was submitted, it was determined that other sampling and analytical methods may provide equivalent or more accurate results. The revision submitted on 14 January 2015 allowed flexibility to consider HPLC/MS methodology (EPA Method 537, SW-846 Method 8321, or an equivalent method) with method detection limits less than the PHA concentrations. The selected method will be determined in consultation with the analytical laboratory and the Army and with the approval of the regulatory agencies.

Many impeller or bladder pumps used in low-flow sampling contain internal components made with fluoropolymers such as Teflon® and Viton®. Sample tubing is often coated with PFAS-containing materials as well. Thus, there is the potential to introduce fluoropolymer contamination to the samples that could then be incorrectly attributed to the OU-1 site, especially at the low concentration levels that will be used in reporting these compounds. HydraSleeve™ samplers are made from 4-mil polyethylene that are uncoated. Consequently, the revision submitted on 14 January specified using the HydraSleeve™ sampling technique to minimize the potential for false positive analytical results. This method is also more efficient and more directly comparable than low flow sampling methods to the passive diffusion bag method that has been employed at OU-1 for more than a decade.

Well Destruction and Treatment Plant Demolition

Well destruction within OU-1 is complete pending review of attainment monitoring results.

Action Items:

- HGL will respond to agency and public comments on the draft OU-1 Exit Strategy Technical Memorandum.

Ongoing:

- Submit draft minutes for previous BCT meeting(s)—draft minutes for October through November 2014 were submitted for review.
- Submit approved final minutes for previous BCT meeting(s) — complete through September 2014.

Fort Ord HTW BCT Meeting
22 January 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 – 22 January 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 – 22 January 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

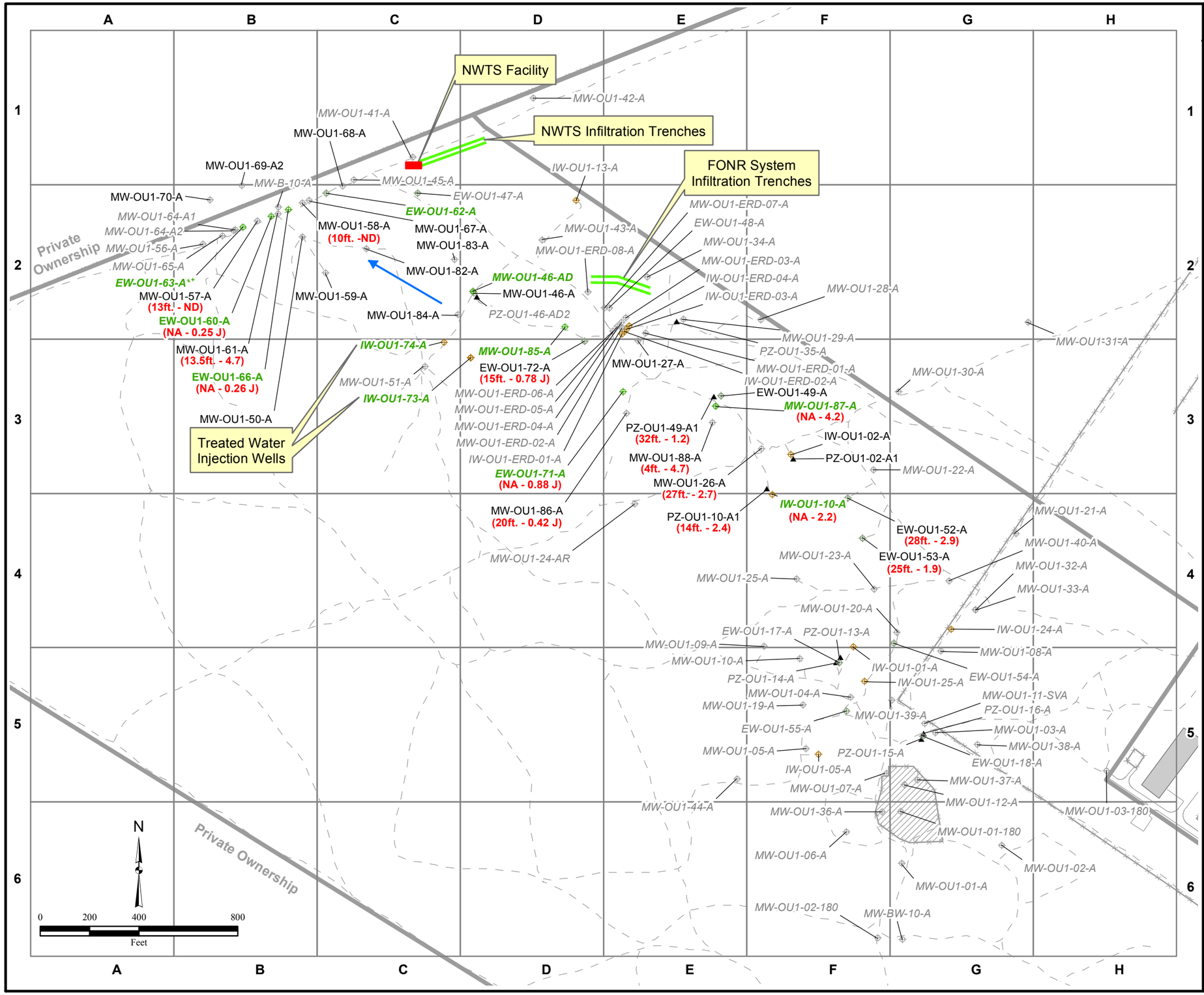
Blue font indicates the concentration is calculated using the weighted average of the active pumping wells.

Table 2
Current Deliverable Schedule
Former Fort Ord, Marina, CA – 22 January 2015

Deliverable Title	Submittal	Review Comments Due	Status/Remarks
Primary Deliverables			
Final UFP-QAPP	May 2014	Received	Submitted 29 May 2014
Secondary Deliverables			
Final 2014 Semiannual Groundwater Monitoring Report	June 2014	August 2014[1]	Submitted 25 June 2014
Draft 2014 Annual Groundwater Monitoring Report	December 2014	January 2015	Submitted 23 December 2014
Draft Exit Strategy Technical Memorandum	December 2014	February 2015	Submitted 26 December 2014 (revision to last paragraph on page 12 was submitted on 14 January 2015)
Site Safety and Health Plan Update	September 2014	TBD	To be scheduled after determination of cleanup attainment monitoring sampling requirements
UFP-QAPP 2014 Update	TBD	TBD	
Completed Recent Submittals			
Preliminary Draft Health & Safety Plan – OU-1 O&M / LTM	5 November 2013	19 November 2013	Army comments addressed
Draft 2013 Annual and 3rd Quarter Groundwater Monitoring Report	January 2014	March 2014	Submitted 17 January 2014
Draft UFP-QAPP	March 2014	May 2014	Submitted 04 March 2014
Draft Work Plan for Well Destruction and Treatment Plant Demolition	February 2014	April 2014	Submitted 11 February 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

[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 5.2
OU-1 FONR A-Aquifer TCE Concentration in Groundwater, September 2014, Former Fort Ord, CA



Legend

- Well
- Extraction Well
- Injection Well
- Piezometer or 2-Inch Well
- Groundwater Flow Direction
- MW-OU1-21-A — Well Destroyed
- MW-OU1-57-A — Well ID
- (13.5ft. - 6.7) — September 2014 TCE Result (µg/L) / Sample Elevation (ft amsl)
- Trail/Unimproved Road
- Fence
- Treated Water Infiltration Trench
- Property Boundary
- Building
- Former Fire Drill Area
- NWTS Facility

Notes:
Wells for which no data are posted were not sampled.
Well labels in green font indicate extraction or injection well.
Italicized font shows pumping suspended.
ft amsl= feet above mean sea level
µg/L=micrograms per liter
Units of TCE concentration are in µg/L
FONR=Fort Ord Natural Reserve
NWTS=Northwest Treatment System
ACL=Aquifer Cleanup Level
ND=nondetect
NA=Depth is not applicable - sample is from pumping well
J=Estimated value
*=Indicates wells not used for contouring
+=Indicates disconnected extraction well. No longer operable.

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12/8/2014 SS
Source: HGL

HGL HydroGeoLogic, Inc