SUBJECT: HTW – BCT Meeting
April 22, 2009
9:00 a.m Awhanee Hotel Tudor Room

Check (✓)	Name	Organization	Phone	E-mail address
KB	**Kate Burger**	DTSC	916/255-6537	kburger@dtsc.ca.gov
FM	**Franklin Mark**	DTSC	916/255-3584	FMark@dtsc.ca.gov
MH	**Martin Hausladen**	U.S. EPA	415/972-3007	Hausladen.martin@epamail.epa.gov
LM	**Lewis Mitani**	U.S. EPA	415/972-3032	Mitani.lewis@epa.gov
DGH	**Grant Himebaugh**	RWQCB	805/542-4636	Ghimebaugh@waterboards.ca.gov
✓	**Bill Mabey**	TechLaw Inc	415/281-8730	bmabey@techlawinc.com
GY	**Gail Youngblood**	Fort Ord BRAC	831/242-7918	gail.youngblood@us.army.mil
DSL	**Derek Lieberman**	Ahtna	831/242-4873	dlieberman@ahtnaes.com
✓	**Bill Collins**	Fort Ord BRAC	831/242-7920	William.K.Collins@us.army.mil
RR	**Rob Robinson**	Fort Ord BRAC	831/242-7900	clinton.w.robinson@us.army.mil
	George Siller	COE	916/557-7418	George.L.Siller@usace.army.mil
✓	**David Eisen**	COE	831/393-9692	David.Eisen@usace.army.mil

SUBJECT: HTW – BCT Meeting
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Check (✓)	Name	Organization	Phone	E-mail address
	Mark Eldridge	AEC	410/436-6325	Mark.h.eldridge@us.army.mil
	Peter Kelsall	Shaw E&I	831/883-5810 ext. 810	Peter.Kelsall@shawgrp.com
	David Kelly	Shaw E&I	925/288-2321	David.kelly@shawgrp.com
	Jen Moser	GEM/Shaw E&I	831/883-5812	Jen.moser@shawgrp.com
	Eric Schmidt	Shaw E&I	831/883-5809	Eric.Schmidt@shawgrp.com
	Ed Ticken	MACTEC E&C	707/793-3882	ejticken@mactec.com
	Marc Edwards	COE	831/242-4828	Marc.A.Edwards@usace.army.mil
	Michael Taraszki	MACTEC E&C	510/628-3222	mdtaraski@mactec.com
✓	**Chuck Holman**	Ahtna	916/372-2000	cholman@ahtnagov.com
	Kelly O'Meara	Ahtna	916/372-2000	komeara@ahtnaes.com
	Christopher Prescott	USACE	916/557-7227	Christopher.E.Prescott@usace.army.mil
	Melissa Broadston	Fort Ord BRAC	831/393-1284	Melissa.broadston@us.army.mil
	Roy Evans	HGL	303/984-1167 xt. 5	revans@hgl.com
C.S.	Cary Stiebel	COE		
✓	KATE BERGEN	ATSC		

HTW BCT Meeting
April 2009

Item	Action	Comment
OU1 Groundwater Remediation	Status Update	HGL
OU1 Off-Site	Status Update	
OU2 and 2/12 Treatment Systems	Status Update	
Other Groundwater Issues	Status Update	Quarterly sampling
OUCTP	Status Update	RD/RA Work Plan
Groundwater Treatment System Optimization	Status Update	Exit Strategy Report Comments
OU2 Landfill	Status Update	
Basewide Range Assessment	Status Update	HA-161 Interim Action memo No Action Memos
Site 39 ROD Amendment/RDRA Work Plan	Status Update	
FFA Schedule	Status Update	
FOST/FOSET Issues	Status Update	
Calendar Update	Update	

Property Transfer Update 04-21-09

FOSET 5 deeds:

1. March 17 – Mr. Houlemard (FORA) signed deeds.
2. March 19 – Mr. Calcara (DASA (I&H)) signed deeds, signed documents sent to Army Office of General Counsel (OGC).
3. March 31 – Army OGC sent documents to USACE HQ.
4. April 9 – deed package collected from USACE by Kutak Rock (KR, FORA legal counsel) courier. KR forwarded to FORA, who submitted to Chicago Title.
5. April 16 – Chicago Title attempted to record deeds with Monterey County, but deeds were rejected:
    a. Need "zero transfer tax" statement on first pages.
    b. Legal descriptions not dark enough/legible.
    c. CRUPs – wrong notary acknowledgement and notary seal is illegible/smeared.

FOST 10 deeds:

1. Eight of ten deeds negotiated and were to be submitted to Army OGC by April 21 to review for legal sufficiency (pre-signature approval), but are still in the possession of KR. USACE estimates completing review of KR changes by April 24.
2. Deed for Parcel L3.2 is on hold pending agreement between York School (recipient), FORA and Monterey County.
3. May 8 – deadline for DASA (I&H) to sign deeds.
4. Notary acknowledgement on CRUP signature pages corrected.

FOSET 2 deed amendments:

1. Five deed amendments were issued to FOSET 2 property recipients for signature:
    a. Monterey-Salinas Transit – signed and returned to USACE.
    b. City of Marina – reviewed by Kutak Rock, comments submitted to USACE.
    c. City of Seaside – reviewed by Kutak Rock, comments submitted to USACE.
    d. University of California (UC) – comments submitted to USACE.
    e. CSUMB – tabled pending completion of FOSET 5 deed.
2. Sixth deed amendment for Parcel L37 is pending.
3. USACE is working to resolve "hold harmless" provision issue with recipients. All deed amendments may be reissued depending on outcome.

FOSET 4 deed amendments:

1. ROD for Del Rey Oaks MRA complete and signed.
2. One deed amendment issuing the CERCLA Warranty drafted, but finalization pending completion of FOSET 2 deed amendments.

FOSET 5 deed amendments:

1. ROD for Parker Flats MRA complete and signed, Draft Final LUCI and O&M Plan complete.
2. Three deed amendments issuing the CERCLA Warranty for Parker Flats area drafted, but finalization pending completion of FOSET 2 deed amendments and transfer of FOSET 5 Parker Flats parcels (FORA schedule indicates deed amendments to be recorded by October 5, 2009).

Parcel F7.1 (FO-30, FOST 6):

1. Army/UC MOA states this parcel to be transferred to University of California (UC), but may have been transferred to Marina Coast Water District (MCWD). Transfer status is uncertain because incorrect legal description was included in the deed.
2. USACE and KR drafted correction deeds and are working with UC, FORA and MCWD to resolve this.
3. When correction deed is recorded, MCWD should be able to deed directly to UC.

OPERABLE UNIT CARBON TETRACHLORIDE PLUME
A-AQUIFER REMEDIAL ACTION

STATUS – April 22, 2009

FIELD WORK

- Installation and development of wells at Areas 1A and 1B complete – January 16
- Well vault and pipeline installation in Preston Park (Area 1B) complete – March 17

SCHEDULE

- Subsequent quarterly monitoring for EISB pilot study conducted under Groundwater Monitoring Program.
- Draft EISB Pilot Study Report (Agency Review) – March 19. Comments due May 7
- Draft RA Work Plan/RD (Appendix A – A-Aquifer) – Comments received from DTSC, RWQCB, EPA, FOEJN, and UCSC. RTC submitted for DTSC Comments with additional questions received on February 26. Meeting conducted to discuss DTSC concerns on March 5. Comments on RTC received from DTSC on March 9. Preparing RTC and red-line/strike-out version for Agency concurrence – April 24.
- Well vault and pipeline installation in Deployment Area 1A ongoing.

DATA (Preliminary)

- None

PROBLEMS/CHANGES

- Drill casing locked up while installing injection well IW-BW-90-A (Deployment Area 1A). Approximately 60 feet of drill casing was lost in the boring. Boring (with steel casing) was grouted to ground surface. New well was installed adjacent to proposed location.

OPERABLE UNIT 1
OFF-SITE GROUNDWATER EXTRACTION PILOT STUDY

STATUS – April 22, 2009

FIELD WORK

- Well construction complete – December 21
- Draft Final OU1 Pilot Study Work Plan distributed – April 22
- Baseline sampling and analysis – June 14
- System construction completed – July 16
- Monitoring well (City of Marina) installation – July 28
- System start-up – August 5
- Extraction Well EW-OU1-92-A shut off – December 11.
- July to September 2008, Quarterly Report Issued – January 20. Comments received from DTSC and FOEJN. Notice from FOEJN that they disagree with system shutdown.
- Field Work Variance issued to document system shut-off – February 16.
- Groundwater extraction system shut off and rebound testing initiated – February 17.
- Quarterly sampling of monitoring and extraction wells – March 16.
- Sampled GAC for waste profiling – March 24.
- System restarted (EW-OU1-93-A operating) – April 7.

SCHEDULE

- Preliminary Draft Quarterly Report, October to December (USACE review) – April 13.
- Continue system operation.
- Continue monthly sampling and analysis through June 2009 (MW-OU1-78-A, MW-OU1-79-A, and MW-OU1-94-A) (sampled April 14).

DATA (Preliminary)

- Preliminary March quarterly data.

PROBLEMS/CHANGES

- Treated groundwater is being discharged to a discharge basin within the MCWD property. An injection well was not installed.
- One monitoring well has been installed in the City of Marina to determine the downgradient extent of the plume. Well number and location is based on the decision criteria in the Draft Work Plan.
- Extraction Well EW-OU1-92-A shut off due to concerns of potential impact to OU1 On-Site GWETS plume capture.
- GWETS was shut off and rebound testing initiated because concentrations of TCE in all off-site wells are below Aquifer Cleanup Levels.
- GWETS restarted because TCE concentration in EW-OU1-93-A rebounded to 7.4 µg/L. TCE concentration in all other monitoring wells below detection limit.

Summary of Operable Unit 1 Process System
Trichlorethene Analytical Results

Date	Sample Location									
	Extraction Wells				Granular Activated Carbon Beds					
	OU1PS-EW-92		OU1PS-EW-93		OU1PS-INF		OU1PS-BTW		OU1PS-EFF	
August 5, 2008[a]	1.2	µg/L	14[b]	µg/L						
August 11, 2008[a]	3.4	µg/L	8.7[c]	µg/L	5.4	µg/L	<0.5	µg/L	<0.5	µg/L
August 18, 2008[a]	3.7	µg/L	6.1[d]	µg/L	4.7	µg/L	<0.5	µg/L	<0.5	µg/L
August 25, 2008[a]	3.8	µg/L	not operating		3.6	µg/L	<0.5	µg/L	<0.5	µg/L
September 2, 2008[a]	3.3	µg/L	6.8[e]	µg/L	4.7	µg/L	<0.5	µg/L	<0.5	µg/L
September 8, 2008[a]					4.1	µg/L	<0.5	µg/L	<0.5	µg/L
September 15, 2008[a]	2	µg/L	4.9[f]	µg/L	3.5	µg/L	<0.5	µg/L	<0.5	µg/L
September 22, 2008[a]	1.4	µg/L	3.4	µg/L	1.3	µg/L	<0.5	µg/L	<0.5	µg/L
September 29, 2008[a]	1.4	µg/L	3.5	µg/L	1.5	µg/L	<0.5	µg/L	<0.5	µg/L
October 6, 2008[a]	1.4	µg/L	3.7	µg/L	2.5	µg/L	<0.5	µg/L	<0.5	µg/L
October 13, 2008[a]	0.98	µg/L	3.7	µg/L	2.0	µg/L	<0.5	µg/L	<0.5	µg/L
October 22, 2008[a]	0.90	µg/L	2.6	µg/L	1.6	µg/L	<0.5	µg/L	<0.5	µg/L
October 27, 2008	0.68	µg/L	1.9	µg/L	1.2	µg/L	<0.5	µg/L	<0.5	µg/L
November 3, 2008	0.74	µg/L	1.9	µg/L	1.3	µg/L	<0.5	µg/L	<0.5	µg/L
November 17, 2008					1.1	µg/L	<0.5	µg/L	<0.5	µg/L
November 24, 2008					1.2	µg/L	<0.5	µg/L	<0.5	µg/L
December 1, 2008					1.3	µg/L	<0.5	µg/L	<0.5	µg/L
December 8, 2008	0.62	µg/L	2.1	µg/L	1.3	µg/L	<0.5	µg/L	<0.5	µg/L
December 16, 2008					2.8	µg/L	<0.5	µg/L	<0.5	µg/L
December 22, 2008					2.2	µg/L	<0.5	µg/L	<0.5	µg/L
December 29, 2008					2.2	µg/L	<0.5	µg/L	<0.5	µg/L
January 5, 2009					2.1	µg/L	<0.5	µg/L	<0.5	µg/L
January 12, 2009					2.2	µg/L	<0.5	µg/L	<0.5	µg/L
January 19, 2009					2.1	µg/L	<0.5	µg/L	<0.5	µg/L
January 27, 2009					2.2	µg/L	<0.5	µg/L	<0.5	µg/L
February 3, 2009					2.2	µg/L	<0.5	µg/L	<0.5	µg/L
February 10, 2009					2.0	µg/L	<0.5	µg/L	<0.5	µg/L
February 17, 2009	1.3	µg/L	2.1	µg/L	2.2	µg/L	<0.5	µg/L	<0.5	µg/L
March 16, 2009	1.4	µg/L	7.4[g]	µg/L						

[a] *Low level detections of benzene, bromoform, chloromethane, disbromochloromethane, isopropylbenzene and/or acetone in several samples.*

[b] *additional compounds detected: cis-1,2-dichloroethylene - 0.43J µg/L*

[c] *additional compounds detected: cis-1,2-dichloroethylene - 0.31J µg/L*

[d] *additional compounds detected: cis-1,2-dichloroethylene - 0.21J µg/L*

[e] *additional compounds detected: cis-1,2-dichloroethylene - 0.21J µg/L*

[f] *additional compounds detected: cis-1,2-dichloroethylene - 0.26J µg/L*

[g] *additional compounds detected: cis-1,2-dichloroethylene - 0.34J µg/L*

Detections are shown in bold.
µg/L denotes micrograms per liter.
Data qualified as "J" is estimated.

Summary of Operable Unit 1 Off-Site Monitoring Well Analytical Results

Well Identification	Elevation (ft amsl)	TCE[a] March 28-30, 2006 (µg/L)	TCE May 4, 2006 (µg/L)	TCE May 23, 2006 (µg/L)	TCE September 25, 2006 (µg/L)	TCE Feb 2 & 6, 2007 (µg/L)	TCE April 3, 2007 (µg/L)	TCE May 22, 2007 (µg/L)	TCE September 25, 2007 (µg/L)
MW-OU1-75A	35.87		2.1	1.7	0.28J	<0.5	<0.5	<0.5J	<0.5
MW-OU1-75A	30.87		14	9.8	2.4	0.64	1.6	0.82	0.69
MW-OU1-75A	25.87	18.6	15	9.5	2.5	0.58	1.7	0.9	0.75
MW-OU1-75A	20.87		17	9.5	2.6	15	1.6	0.69	0.76
MW-OU1-75A	15.87		20	25/26	18/18	0.75	11	12	3.1
MW-OU1-76A	32.33		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-76A	27.33		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-76A	22.33	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-76A	17.33		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-76A	12.33		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-77A	29.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5J[c]	<0.5
MW-OU1-77A	24.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5J	<0.5
MW-OU1-77A	19.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-78A	29.91		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5J	0.54
MW-OU1-78A	24.91	1.9	3.2	2.1J-[b]	1.4	1.5	0.85	0.6J	0.56
MW-OU1-78A	19.91		2.7	2.3/2.1	1.1/1.2	1.7	0.94	0.81J	0.91
MW-OU1-79A	29.72		<0.5	<0.5J[c]	<0.5	<0.5	<0.5	<0.5J	<0.5
MW-OU1-79A	24.72	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5J	<0.5
MW-OU1-79A	19.72		<0.5	<0.5	0.59	0.67/0.85	3.5/3.6	3.8J/4.0J	2.9/4.5
MW-OU1-80A	25.32		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-80A	20.32	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-80A	15.32		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-80A	10.32		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-81A	21.39		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-81A	16.39		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-81A	11.39	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-81A	6.39		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-81A	1.39		<0.5	<0.5	<0.5	<0.5	<0.5/<0.5	<0.5	<0.5
MW-OU1-89A	31.18	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-89A	24.68	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-89A	18.18	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-90A	27.31	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-90A	22.31	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-90A	17.31	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-90A	12.31	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-90A	7.27	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-91A	26.72	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-91A	21.8	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-91A	16.89	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-91A	11.97	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-91A	7.01	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-94-A	18.6	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-94-A	13.5	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-94-A	8.3	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-94-A	3.1	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-94-A	-2.1	NS	NS	NS	NS	NS	NS	NS	NS
MW-OU1-94-A	-7.3	NS	NS	NS	NS	NS	NS	NS	NS

[a] There is no associated descrete depth with the well development samples. These are composites.

[b] Data qualified as "J-" is estimated with low bias.

[c] Data qualified as "UJ" is estimated non-detect due to quality control outliers.

[d] An estimated concentration of carbon disulfide detected in this sample (0.75J).

[e] cis-1,2-dichloroethylene also detected at 0.26J µg/L

[f] cis-1,2-dichloroethylene also detected at 0.35J µg/L

[g] tetrachloroethylene also detected at 0.27J µg/L.

Detections are shown in bold.

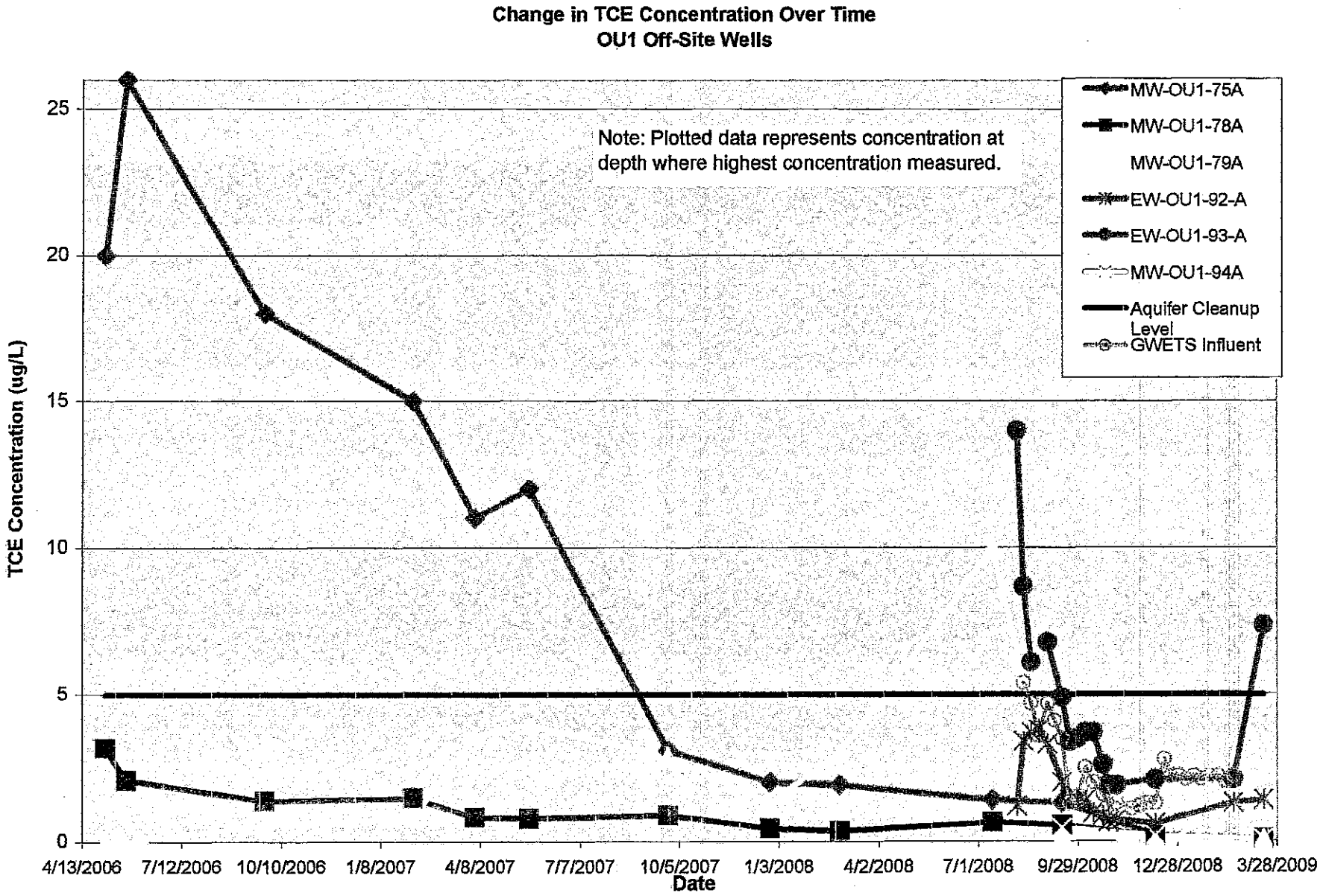
ft amsl denotes feet above mean sea level.

µg/L denotes micrograms per liter.

TCE denotes trichloroethene.

Summary of Operable Unit 1 Off-Site Monitoring Well Analytical Results

Well Identification	Elevation (ft amsl)	TCE December 26, 2007 (µg/L)	TCE February 27, 2008 (µg/L)	TCE July 14, 2008 (µg/L)	TCE September 15, 2008 (µg/L)	TCE December 8, 2008 (µg/L)	TCE March 16, 2009 (µg/L)
MW-OU1-75A	35.87	<0.5	NS	NS	NS	NS	NS
MW-OU1-75A	30.87	0.45J	NS	NS	NS	NS	NS
MW-OU1-75A	25.87	0.46J	NS	NS	NS	NS	NS
MW-OU1-75A	20.87	0.47J	NS	NS	NS	NS	NS
MW-OU1-75A	15.87	2	1.9	1.4	1/1.3	0.21J/0.22J	<0.5
MW-OU1-76A	32.33	<0.5	NS	NS	NS	NS	NS
MW-OU1-76A	27.33	<0.5	NS	NS	NS	NS	NS
MW-OU1-76A	22.33	<0.5	NS	NS	NS	NS	NS
MW-OU1-76A	17.33	<0.5	NS	NS	NS	NS	NS
MW-OU1-76A	12.33	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-77A	29.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-77A	24.1	<0.5	NS	NS	NS	NS	NS
MW-OU1-77A	19.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-78A	29.91	0.36J	NS	NS	NS	NS	NS
MW-OU1-78A	24.91	0.46J	NS	NS	NS	NS	NS
MW-OU1-78A	19.91	0.47J	0.37J	0.67	0.56	0.21J	<0.5
MW-OU1-79A	29.72	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-79A	24.72	<0.5	NS	NS	NS	NS	NS
MW-OU1-79A	19.72	1.3/1.9	3.0/4.1[a]	10/2.0[f]	0.22J	<0.5	<0.5
MW-OU1-80A	25.32	<0.5	NS	NS	NS	NS	NS
MW-OU1-80A	20.32	<0.5	NS	NS	NS	NS	NS
MW-OU1-80A	15.32	<0.5	NS	NS	NS	NS	NS
MW-OU1-80A	10.32	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-81A	21.39	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-81A	16.39	<0.5	NS	NS	NS	NS	NS
MW-OU1-81A	11.39	<0.5	NS	NS	NS	NS	NS
MW-OU1-81A	6.39	<0.5	NS	NS	NS	NS	NS
MW-OU1-81A	1.39	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-89A	31.18	NS	<0.5[c]	<0.5	NS	NS	NS
MW-OU1-89A	24.68	NS	<0.5	<0.5	NS	NS	NS
MW-OU1-89A	18.18	NS	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-90A	27.31	NS	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-90A	22.31	NS	<0.5	<0.5	NS	NS	NS
MW-OU1-90A	17.31	NS	<0.5	<0.5	NS	NS	NS
MW-OU1-90A	12.31	NS	<0.5	<0.5	NS	NS	NS
MW-OU1-90A	7.27	NS	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-91A	26.72	NS	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-91A	21.8	NS	<0.5	<0.5	NS	NS	NS
MW-OU1-91A	16.89	NS	<0.5	<0.5	NS	NS	NS
MW-OU1-91A	11.97	NS	<0.5	<0.5	NS	NS	NS
MW-OU1-91A	7.01	NS	<0.5	<0.5	<0.5	<0.5	<0.5
MW-OU1-94-A	18.6	NS	NS	NS	0.33J	0.21J	<0.5
MW-OU1-94-A	13.5	NS	NS	NS	0.36J	NS	NS
MW-OU1-94-A	8.3	NS	NS	NS	0.36J	NS	NS
MW-OU1-94-A	3.1	NS	NS	NS	0.38J	NS	NS
MW-OU1-94-A	-2.1	NS	NS	NS	0.36J	NS	NS
MW-OU1-94-A	-7.3	NS	NS	NS	0.47J	<0.5	<0.5


Change in TCE Concentration Over Time
OU1 Off-Site Wells
Note: Plotted data represents concentration at depth where highest concentration measured.
MW-OU1-75A
MW-OU1-78A
MW-OU1-79A
EW-OU1-92-A
EW-OU1-93-A
MW-OU1-94A
Aquifer Cleanup Level
GWETS Influent
TCE Concentration (ug/L)
0
5
10
15
20
25
4/13/2006
7/12/2006
10/10/2006
1/8/2007
4/8/2007
7/7/2007
10/5/2007
1/3/2008
4/2/2008
7/1/2008
9/29/2008
12/28/2008
3/28/2009
Date

Thermal Treatment Unit
Operation Summary

TREATMENT SYSTEM	
Treatment System Start Date:	**6/4/2001**
TTU Start Date:	**4/4/2006**
Last Reading Date/Time:	**4/17/2009**
Historical through 2008:	
Total TTU Hours:	24,048
Total TTU Hours Operated:	9,743
% TTU Operation:	40.5%
Total Pounds of Methane Removed	1,331,231
Total Pounds of VOCs Removed (thru 2007)	142
Current Year 2009:	
Total Hours:	2560
Total Hours Operated:	974
% Operation:	38.0%
Pounds of Methane Removed	39,395
Cumulative:	
% TTU Operation (since 4/4/2006):	40.3%
Total Pounds of Methane Removed (since 6/4/2001):	1,370,626

EXTRACTION SYSTEM (2009)

Location	Methane	(%)	Flow Rate (scfm)	% Operational
MIXED-TTU	**40**		**97**	**38.0%**
Area F				
EW-30	26		5	15.8
EW-31	38		5	32.5
EW-32	42		9	38.0
EW-33	42		13	38.0
EW-34	40		23	38.0
Area D				
EW-35	28		17	38.0
Area E				
Collector Trench	46		25	6.3

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Former Fort Ord Groundwater Treatment Systems Operational Data and Status

BCT Meeting, April 22, 2009

Table 1: OU2 and Sites 2/12 GWTP Treatment Statistics.

	Volume Treated (gallons)	Average Flow (gpm)	Percent of Time Online	COC Mass Removed (lbs)
OU2				
March 2009	25,853,950	534	100	2.40
Total since October 1995	4.466 billion			621.76
Sites 2/12				
March 2009	9,286,100	208	96	1.38
Total since May 1999	1.193 billion			413.56

Table 2: OU2 and Sites 2/12 GWTP Calendar of Events.

Key Events for OU2 and Sites 2/12 for March 2009

***There were 34 USAN Notices during the month of March. One of these alerts required the personal attention of the Senior GWTP Operator.**

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	**2**	**3** Installed VFD at EW-12-07-180M.	**4** Heavy rain triggered a leak alarm and shut down 2/12 GWTP.	**5**	**6** Sediment removed from OU2 backwash tanks.	**7**
8	**9** GWTP Process sampling at OU2.	**10** Corroded areas of OU2 GAC vessels painted.	**11**	**12**	**13** 2/12 effluent Pump/Motor 5490A replaced.	**14**
15	**16**	**17** Level switch replaced at EW-12-07-180M.	**18**	**19**	**20**	**21**
22	**23**	**24** 2/12 GWTP shut down for electrical work in MCC; Restarted OK.	**25** GWTP Process sampling at OU2.	**26** 2/12 GWTP roof repairs completed (gutter cleaning).	**27** Eastern Network breaker panel (Marina Heights) replaced.	**28**
29	**30** OU2 and 2/12 communication net upgraded to 5.8 Mhz.	**31** Replaced reducer bushing on EW-OU2-12-A. VFDs installed at 4 OU2 wells. 2/12 electrical surge suppression completed.				

Table 3: March 2009 OU2 Analytical Results at TS-OU2-INJ.

COC	Discharge Limit (µg/L)‡	Sample Date / Analytical Results	
		03/09/2009	03/25/2009
1,1-DCA	5.0*	0.54	0.45 J
1,2-DCA	0.50	ND	ND
1,2-DCP†	0.50	ND	ND
Benzene	0.50	ND	ND
Carbon Tetrachloride	0.50	ND	ND
Chloroform	2.0*	0.25 J	0.23 J
Cis-1,2-DCE	6.0*	0.72	0.62
Methylene Chloride	0.50	ND	ND
PCE	0.50	ND	ND
TCE	0.50	0.11 J	ND
Vinyl Chloride	0.10	0.071 J	ND

Table 4: March 2009 Sites 2/12 Analytical Results at TS-212-INJ.

COC	Discharge Limit (µg/L)‡	Sample Date / Analytical Results
1,1-DCE	6.0	In accordance with the sampling schedule in the SAP, no GWTP process sampling was performed in March.
1,2-DCA	0.50	
1,3-DCP †	0.50	
Chloroform	2.0	
Cis-1,2 DCE	6.0	
PCE	3.0	
TCE	5.0	
Vinyl Chloride	0.10	

NOTES:

J The analyte was positively identified, but the associated numerical value is an approximate concentration greater than the Method Detection Limit (MDL) but less than the Practical Quantitation Limit (PQL).

ND The analyte was not detected above MDL.

* Discharge limits for low carbon affinity compounds were increased to the Aquifer Cleanup Level (ACL).

‡ Discharge limits are the ACLs for injection over the plume.

† The reported value is the sum of both cis- and trans-isomers.

J± Data are qualified as estimated, with a high (+) or low (-) bias likely to have occurred. False positives or false negatives are unlikely to have been reported.

U The analyte was not detected above the PQL (in parentheses) which is elevated due to blank contamination.

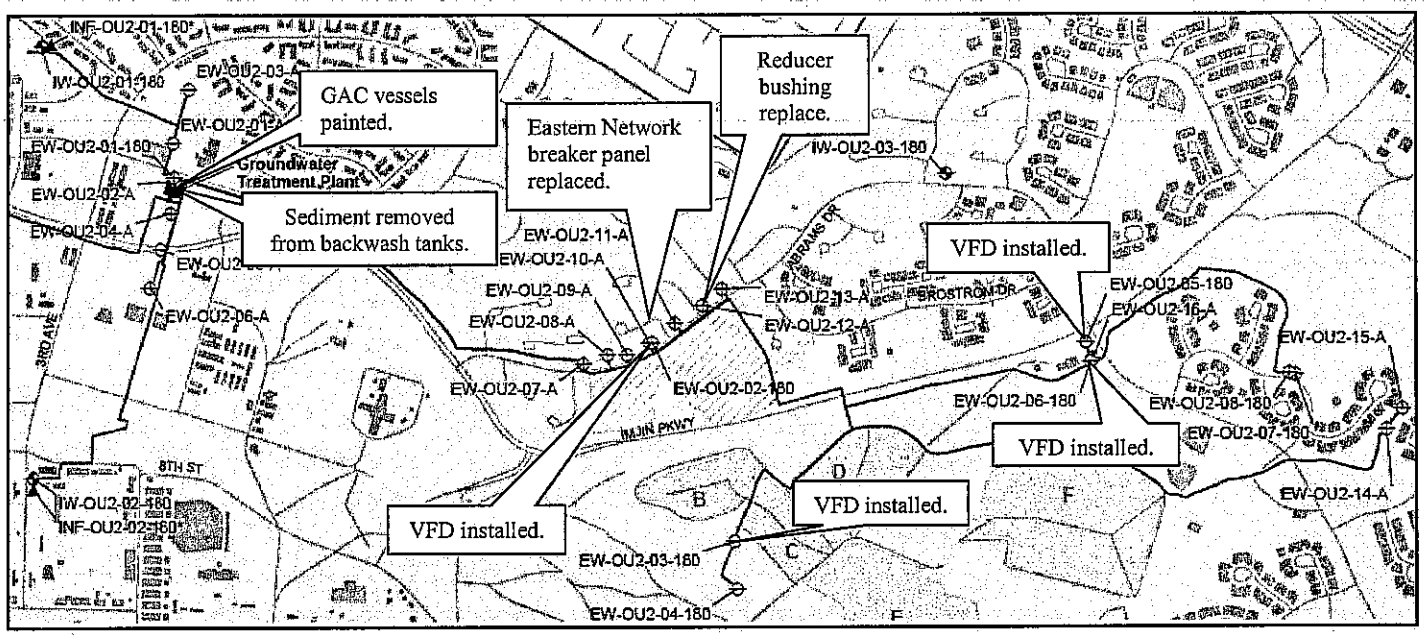

Figure 1: OU2 GWTP Treatment Events March 2009.

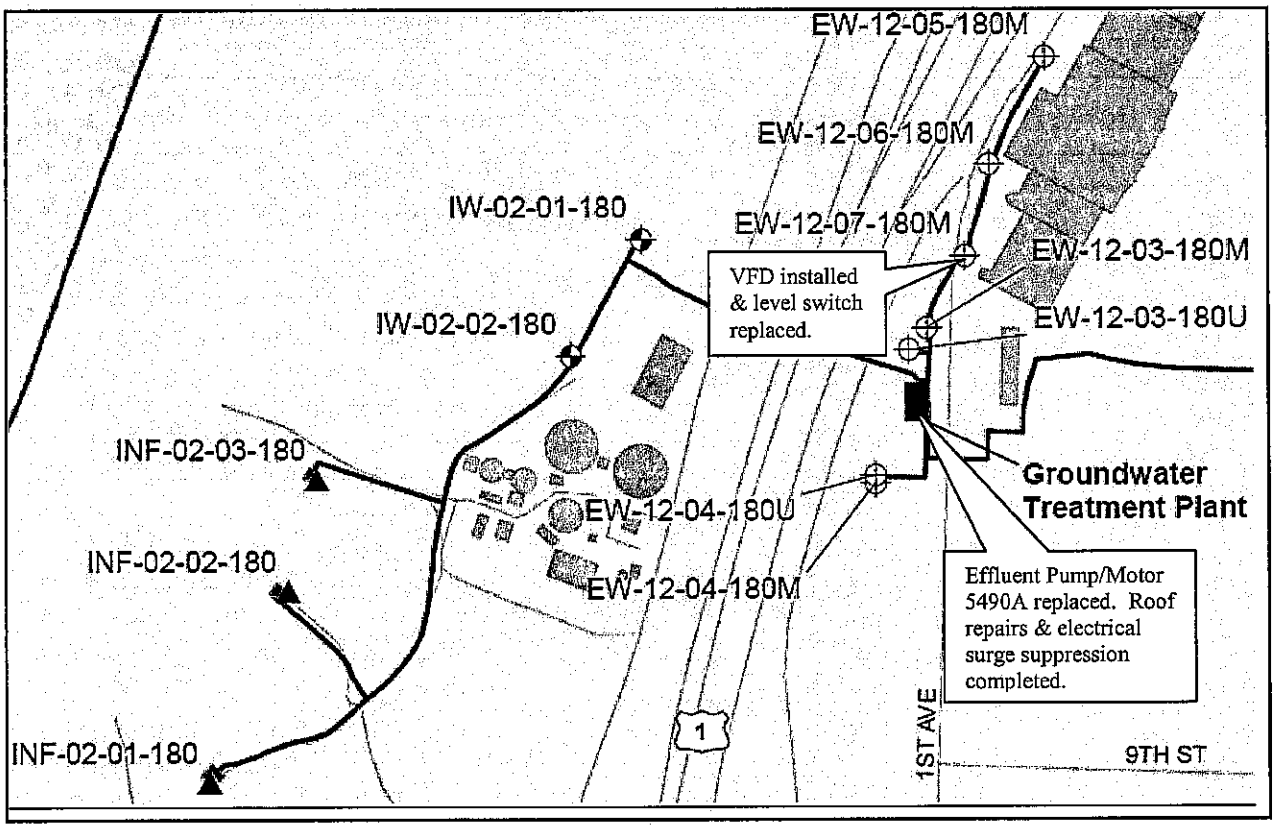

Figure 2: Sites 2/12 GWTP Treatment Events March 2009.

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Table 5: March 2009 OU2 and Sites 2/12 Extraction Well Status.

Well Identification	% On	Avg. gpm	Total Gallons	% of Total	Comments	TCE (µg/L) Feb 2009
Site 12 Extraction Wells						
EW-12-05-180M	95.8	68.2	3,045,700	32.8		9.8
EW-12-06-180M	95.8	80.1	3,573,600	38.5		7.8
EW-12-07-180M	48.8	12.6	563,700	6.1		3.2
EW-12-03-180U	0	0	0	0	Well offline due to low concentrations	0.21
EW-12-03-180M	72.9	47.1	2,103,100	22.6		9.0
EW-12-04-180U	0	0	0	0	Well offline due to low concentrations.	1.3
EW-12-04-180M	0	0	0	0	Ceased operating on 11/21/2005.	not sampled
Total 2/12 gallons treated:			*9,286,100*	*100.0*		
OU2 Extraction Wells						
Western Network						
EW-OU2-01-A	0	0	0	0	Well offline due to low concentrations.	not sampled
EW-OU2-02-A	34.0	19.2	855,430	3.6		0.64
EW-OU2-03-A	0	0	0	0	Well offline due to low concentrations.	0.82
EW-OU2-04-A	64.7	33.1	1,476,190	6.2		1.3
EW-OU2-05-A	100	51.0	2,274,940	9.5		2.3
EW-OU2-06-A	100	36.7	1,637,940	6.9		5.0
EW-OU2-01-180	0	0	0	0	No pump in well.	9.8
Total gallons extracted:			*6,244,500*	*26.2*		
Eastern Network						
EW-OU2-07-A	0	0	0	0	Well offline due to low concentrations.	ND
EW-OU2-08-A	76.0	14.9	664,660	2.8		1.1
EW-OU2-09-A	100	13.6	609,120	2.6		4.5
EW-OU2-10-A	99.9	14.3	639,290	2.7		3.6
EW-OU2-11-A	0.2	<1	40	<0.1	Low flow due to biofouling.	3.0
EW-OU2-12-A	6.5	<1	880	<0.1	Well offline due to area construction.	9.4
EW-OU2-13-A	100	21.7	966,460	4.1		9.5
EW-OU2-02-180	59.6	18.1	807,000	3.4	New VFD installed.	1.8
Total gallons extracted:			*3,687,450*	*15.5*		
Sloppette						
EW-OU2-05-180	73.5	106	4,713,800	19.8		5.4
EW-OU2-06-180	15.1	13.1	582,900	2.4		2.3
EW-OU2-16-A	47.0	9.1	405,000	1.7		7.9
Total gallons extracted:			*5,701,700*	*23.9*		
CSUMB						
EW-OU2-14-A	14.9	4.4	194,300	0.8		4.4
EW-OU2-15-A	0	0	0	0	Well offline due to low concentrations.	not sampled
Total gallons extracted:			*194,300*	*0.8*		
Landfill						
EW-OU2-03-180	79.6	125	5,596,000	28.6		22.9
EW-OU2-04-180	0	0	0	0	Well offline due to low concentrations.	0.16
Total gallons extracted:			*5,596,000*	*28.6*		
Bunker Hill						
EW-OU2-07-180	0	0	0	0	No pump in well.	4.9
EW-OU2-08-180	100	54.4	2,430,000	10.2		0.61
Total gallons extracted:			*2,430,000*	*10.2*		
Total OU2 gallons treated:			*23,853,950*	*100.0*		

not occurring, groundwater flow modeling will be initiated to determine whether adjustment of either extraction or recharge flow rates will improve capture or whether additional extraction wells or recharge points are required. Based on this analysis, system reconfiguration may be recommended.

5.5.4 Decision Rules Applicable to Plume Remediation

Assessment of the progression of aquifer cleanup during operation of each remediation system will be conducted through a groundwater monitoring program that allows for evaluation of plume migration and COC fluctuations. The decision rules for determining the operational status for groundwater extraction wells are:

- Extraction wells will be sampled quarterly when operating as part of the extraction system. Extraction well monitoring data will be used for evaluating the operational status of individual extraction wells and for statistical evaluations of remediation progress.
- An extraction well will continue to be operated if any COC detected is greater than the corresponding ACL (Table 1).
- An extraction well will continue to be operated if the extraction well flow rate data and analytical data from nearby wells, in conjunction with groundwater flow modeling, indicate operation of the extraction well is necessary for hydraulic containment of the plume.
- An extraction well will be shut off if all COCs detected are less than the ACL for two consecutive quarterly monitoring events, and if the extraction well flow rate data and analytical data from nearby wells, in conjunction with groundwater flow modeling, indicate operation of the extraction well is no longer necessary for hydraulic containment of the plume.
- Following termination of pumping at an extraction well, the well will be incorporated into the groundwater monitoring program.

The decision rules for determining the sampling frequency and monitoring status for groundwater extraction wells following termination of operation are:

- If four consecutive quarters of monitoring data show concentrations of all COCs are below their respective practical quantitation limits (PQLs, Table 5) or below 10% of their respective ACLs (Table 1), whichever is greater, then the well may be proposed for annual monitoring.
- If two annual monitoring results show concentrations of all COCs are below their respective PQLs or below 10% of their respective ACLs, whichever is greater, then the well may be proposed to be removed from the sampling program.
- If wells adjacent to a well sampled annually show detections of COCs greater than their respective PQLs or greater than 10% of their respective ACLs, whichever is larger, then the annual well may be added to the quarterly monitoring schedule.

5.6 Specification of Limits of Decision Errors

Because decisions pertaining to remediation system operation and assessment of aquifer

Deleted: Decision rules for determining when ACLs have been achieved, and therefore, when treatment operations may be concluded and site closure status granted, are presented in this section. In addition, decision rules that apply to instituting a variable frequency monitoring program, which provides for flexibility as the groundwater plume is remediated, are also presented in this section. The decision rules for determining when remediation system operation may be concluded are: ¶
If the most recent groundwater monitoring results collected during operation of the remediation system indicate ACLs have not been achieved, then system operation will continue.¶
If the most recent groundwater monitoring results collected during operation of the remediation system indicate ACLs have been achieved, then system operation will be terminated and a post-termination monitoring period will be initiated with regulatory agency concurrence.¶
If recent groundwater monitoring results collected during operation of the remediation system indicate COC concentrations remain unchanged over time, the groundwater remediation system may be proposed for shutdown or intentional groundwater extraction cycling (e.g., pulsing or cycling of the extraction wells).¶
Once shutdown or uptime variability is implemented, the groundwater monitoring program for the site will be reevaluated and a new schedule proposed. Conclusions regarding site compliance and system shutdown will be supported by statistical trend analyses and require the concurrence of all regulating parties.¶
The decision rules for determination of

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<#>If groundwater monitoring results collected during the post termination monitoring period indicate all ACLs have been met, then the aquifer will be deemed fully restored and a closure report will be issued.¶
<#>If groundwater monitoring results collected during the post termination monitoring period indicate at any time an ACL has been exceeded, then the remediation system will be restarted and operated under the decision processes presented above.¶

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Deleted: non-detects for

Deleted: non-detects for all COCs

Deleted: the reporting limit

COC is not met, then the affected GWTS will be shut down, and operating conditions and GAC loading re-evaluated. Following operational changes, the affected GWTS will be restarted and resampled to verify compliance.

5.5.2 Decision Rules Applicable to GAC Change-out

The decision rules for determining when a GAC change-out is necessary are described in this section for each remediation system.

5.5.2.1 GAC Change-out at OU2

The average concentration of each COC in the lead GAC vessel effluent will be calculated based on analytical results from process samples collected immediately downstream of the lead GAC vessel (upstream of the lag GAC vessel) during each process sampling event (where such samples are collected). Decision rules for determining when a GAC change-out at the OU2 GWTP is necessary are:

- If the average concentration of each COC is less than 90% of its respective ACL (Table 1), then a change-out is not necessary. The OU2 system can continue in operation, and the final effluent stream will continue to be recharged to the aquifer.
- If the average concentration of any COC is equal to or greater than 90% of its ACL, a GAC change-out will be scheduled.

5.5.2.2 GAC Change-out at Sites 2/12

The decision rules for determining when a GAC change-out at the Sites 2/12 GWTP is necessary include the following:

- If the analytical results for TCE from a process sample collected immediately downstream of the lag GAC vessel (upstream of the air stripper) are less than or equal to 4.5 µg/L (90% of the ACL), then a change-out is not necessary. The Sites 2/12 system can continue in operation, and the final effluent stream will continue to be recharged to the aquifer.
- If the analytical results for TCE from a process sample collected immediately downstream of the lag GAC vessel (upstream of the air stripper) are greater than 4.5 µg/L (90% of the ACL), a GAC change-out will be scheduled.

5.5.3 Decision Rules Applicable to Hydraulic Containment

During remediation system operation, specific decision rules must be followed to demonstrate COC plume capture. The decision rules are:

- If groundwater monitoring and/or groundwater flow modeling demonstrate plume capture is occurring, then system operation will continue as currently configured. During operation, adjusting/reducing extraction well flow rates may be assessed to determine whether O&M costs can be reduced while maintaining plume capture.
- If the system flow rate data, in conjunction with the groundwater flow model, indicate the plume is being hydraulically contained, then the system will continue to operate.
- If groundwater monitoring and/or groundwater flow modeling indicate plume capture is

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Deleted: from process samples collected from the effluents of the lead GAC vessels

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Linda S. Adams
Secretary for
Environmental
Protection

Department of Toxic Substances Control

Maziar Movassaghi
Acting Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Arnold Schwarzenegger
Governor

MEMORANDUM

TO: Franklin Mark
Project Manager
Office of Military Facilities

FROM: Kate Burger, PG, PhD
Senior Engineering Geologist
Geological Services Unit

REVIEWED BY: Mark Vest, PG, CEG
Senior Engineering Geologist
Geological Services Unit

DATE: DRAFT FOR DISCUSSION ONLY (April 20, 2009)

SUBJECT: REVIEW OF DRAFT OPERABLE UNIT CARBON TETRACHLORIDE PLUME, ENHANCED IN SITU BIOREMEDIATION PILOT STUDY COMPLETION REPORT, FORMER FORT ORD, CALIFORNIA (DATED MARCH 17, 2009)

ACTIVITY REQUESTED

The Department of Toxic Substances Control (DTSC) Geological Services Unit (GSU) has reviewed the document entitled *Draft Operable Unit Carbon Tetrachloride Plume Enhanced In Situ Bioremediation Pilot Study Completion Report, Former Fort Ord, California* (Report). The document (dated March 17, 2009) was prepared for the U.S. Department of the Army, Corps of Engineers (Army) by Shaw Environmental, Inc. (Shaw) of Marina, California.

REVIEW ACTIVITIES

GSU reviewed the above-referenced Report describing the results of an enhanced *in situ* bioremediation (EISB) pilot study conducted within the downgradient portion of a carbon tetrachloride plume (adjacent to the former base boundary with the City of Marina). The pilot study data were used to design the full-scale system for remediating the Operable Unit Carbon Tetrachloride Plume (OUCTP) within the A-Aquifer at the former Fort Ord. The A-Aquifer remedial design was presented in the *Draft Operable*

Unit Carbon Tetrachloride Plume Remedial Action Work Plan (Shaw, September 18, 2008). Portions of the A-Aquifer remedy have already been constructed.

The following discussion, comments and recommendations are provided for your information and use. If you have any questions about the enclosed comments and recommendations, please contact me at (916) 255-6537 or at kburger@dtsc.ca.gov.

GENERAL COMMENTS AND RECOMMENDATIONS

1. Discussion of the A-Aquifer remedy presesented in the *Draft Operable Unit Carbon Tetrachloride Plume Remedial Action Work Plan* have noted that the treatment zone generated by the pilot study may be used to remediate impacted groundwater flowing beneath the Fort Ord Natural Reserve (FONR) between System 2b of the final remedy and the pilot study area. It would appear that this approach would necessitate adequate monitoring, and potentially additional injections, to ensure that ground water chemistry within the pilot study area treatment zone persists for an appropriate period of time.

   Recommendations: The OUCTP Remedial Action Work Plan should include an estimated timeframe that the pilot study area treatment zone will need to be maintained. Quarterly monitoring reports should include a section that specifically discusses the status of the treatment zone (i.e., presence of reducing conditions, continuity of the treatment zone) and whether additional injection is needed.

2. The highest carbon tetrachloride concentrations in the baseline data set were measured in extraction wells (EISB-EW-02, EISB-EW-03, and EISB-EW-04) located near the northeastern edge of the pilot study area. The effects of the EISB treatment were observed in well EISB-EW-03, but not in wells EISB-EW-02 and EISB-EW-04.

   The absence of treatment effects in well EISB-EW-02 is of particular concern because the treatment zone did not extend into this area of the plume. Although some groundwater in the area of EISB-EW-02 flows toward well EISB-EW-01, the reducing conditions observed at EISB-EW-01 between weeks 7 and 25 of the pilot study appear to have dissipated (carbon tetrachloride concentrations were 6.5 µg/L in September 2008 and 1.2 µg/L in December 2008).

   Recommendations: Please clarify why the pilot study treatment effects are considered adequate to address the groundwater impacts observed in the vicinity of well EISB-EW-02. For full scale implementation, please indicate how adequate treatment will be demonstrated near plume edges if treatment effects are not observed in an extraction well and other monitoring wells are not available to make this determination.

3. The pilot study results indicate some variability in the treatment effectiveness. The lack of response in wells EISB-EW-02 and EISB-EW-04 is discussed in Comment 2. The relatively weak response observed in well EISB-EW-15 is notable because it is located in the vicinity of three injection wells. The disparate effects observed in

wells EISB-MW-04 and EISB-MW-05 also indicate heterogeneity and/or preferential flow paths within the treatment area.

Recommendations: Please clarify how evidence of aquifer heterogeneity will be addressed during full-scale implementation (e.g., additional extraction/injection well installation, denser well spacing). In addition, it seems appropriate to come to an understanding as to how "successful treatment zone deployment" will be determined during full-scale implementation, particularly for treatment zones that are intended to remediate upgradient groundwater impacts (see Comment 1).

4. Injection well EISB-IW-04 failed during the fourth week of the pilot study and was no longer used. The Report does not indicate why this well was permanently shut down while a well which had a similar failure (EISB-IW-03) was restarted. On pages 3-15 and 4-1, the Report indicates that injection was stopped because it was thought that a sufficient amount of substrate had been injected.

   Recommendations: Please clarify why the amount of substrate was adequate given that the other injection wells were operated for an additional four weeks and subsequent analytical data from nearby wells indicated that additional substrate was needed. Please clarify why well EISB-IW-03 was restarted whereas well EISB-IW-04 was permanently shut down.

5. The Report interprets indicator parameter data for well EISB-MW-04 during July 2008 (the final data set presented in the Report) as suggesting the potential arrival of reducing conditions. Subsequent carbon tetrachloride concentrations measured in this well (3.8 and 1.2 µg/L in September and December 2008, respectively) suggest that the effects of the treatment zone never reached the area monitored by this well. The absence of treatment effects at well EISB-MW-04 indicates that the treatment zone is not continuous along the base boundary and that impacted groundwater continues to migrate from the pilot study area toward the City of Marina.

   Recommendations: Please consider data collected since July 2008 when reporting on the success of the pilot study.

6. To reduce the reproduction costs for future versions of the Report, DTSC is amenable to receiving the appendices solely in electronic format.

SPECIFIC COMMENTS AND RECOMMENDATIONS

7. Although pages 2-13 and 2-14 discuss the flow rates in extraction and injection wells during the pilot study, the Report does not quantify the actual flow rates. Please provide a table summarizes the actual extraction and injection well flow rates achieved during the pilot study.

8. Page 2-13 indicates that the flowmeters provided inaccurate readings and that the flow rates were estimated based on other system operating parameters. Please

clarify how this problem will be addressed by the full-scale design (i.e., what flow meter options are available).

9. Page 2-15. Injection well EISB-IW-03 was cleaned out on March 12, 2008, but failed on March 13, 2008 when "the injection solution flowed under pressure to the ground surface". The well was then restarted at a reduced injection rate. Please indicate what injection pressure caused the failure (20 gpm?) and what injection pressure was subsequently used for this well.

10. Page 3-2. Please elaborate on the last paragraph which indicates that "efforts were made during the substrate injection to ensure sufficient substrate was injected in this area." See also Comment 2.

11. Page 3-13. The text indicates that arsenic concentrations throughout the pilot study ranged between 6.25 and 50.3 micrograms per liter (µg/L). This statement is inconsistent with data presented in Table 7 which indicates that arsenic was detected at a concentration of 62.4 µg/L in well EISB-EW-03 (week 21) and at a concentration of 243 µg/L in well EISB-EW-07 (week 3).

12. Page 3-13. The third full paragraph on this page states that "The aquifer will become more oxidized as the substrate is used up and fresh groundwater migrates into the area." Please indicate the likely timeframe for the aquifer to return to oxidizing conditions. See also Comment 1.

13. Page 3-15. The last paragraph states that "care will be taken in the design and installation of injection wells for full-scale operation to minimize well failure. If a well fails during full-scale operation, attempts will be made to continue substrate injection into that well at a lower flow rate and pressure." If injection well failure occurs during full-scale implementation, another contingency should be to replace the well.

14. Page 4-1. The Report identifies seven wells to be used for on-going monitoring of the treatment zone and that other wells in the pilot study area are also monitored as part of the quarterly groundwater monitoring program. It would be helpful if the Report included a figure showing all wells that will be monitored in the pilot study area. Because the pilot study treatment zone may be used to justify no additional remedial action beneath the City of Marina, it seems appropriate to sample all wells located along the former base boundary. Hence, wells EISB-EW-03, EISB-EW-07, and EISB-EW-10 should also be monitored to evaluate the continuity of the treatment zone at this boundary.