Former Fort Ord Operable Unit Carbon Tetrachloride Plume Data and Status

HTW BCT, March 14, 2019

CTP-SGP-49 in garage on Lexington Court.

February 2019 Key Events for OUCTP

- February 8: One sub-slab soil gas probe (CTP-SGP-49) was decommissioned on Lexington Court, final location for this set of wells/probes.
- February 27: Survey of new well MW-BW-94-AR.

March 2019 Key Events for OUCTP

- March 4-9: First Quarter 2019 GWM sampling.

Survey of MW-BW-94-AR.

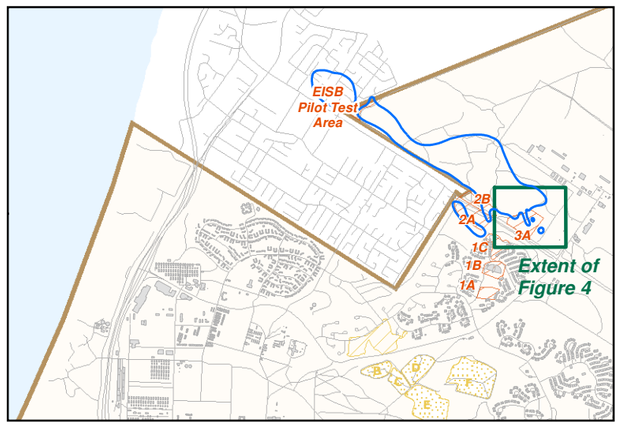
Ahtna

Table 1. OUCTP EISB 3A VOC Results

Analyte:	Carbon Tetrachloride													
ACL:	0.5 µg/L													
Well Identification	Baseline	Month 1	Month 2	Month 3	Month 5	Month 6	Month 7	3Q 2017	4Q 2017	1Q 2018	2Q 2018	3Q 2018	4Q 2018	Schedule
EW-BW-160-A	**1.1 J+**	**0.86**	**0.66**	**0.60**	**1.3**	**1.0**	**1.0**	**0.64**	**0.83**	**0.91**	**1.2**	**1.2**	**1.0**	Quarterly~
EW-BW-161-A	**0.84 J+**	**0.67**	**0.51**	0.48 J	**0.69**	0.47 J	0.47 J	0.38 J	0.19 J	0.15 J	0.15 J	0.13 J	0.11 J	NS
EW-BW-162-A	**1.0 J+**	**0.72**	**0.59**	**0.56**	0.41 J	0.28 J	0.18 J	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	NS^	NS^	NS
EW-BW-163-A	**1.2 J+**	**1.2**	**0.94**	**0.89**	0.31 J	0.25 J	0.25 J	0.16 J	0.13 J	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	NS
EW-BW-164-A	**0.92 J+**	**0.73**	**0.61 J-**	**0.59**	**0.78**	**0.71**	**0.89**	**0.64**	0.47 J	0.32 J	0.47 J	0.36 J	0.30 J	NS
EW-BW-165-A	**1.2 J+**	**1.1**	**0.83**	**0.82**	0.13 J	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	Annual
EW-BW-166-A	**1.7 J+**	**1.4**	**1.2**	**1.2**	**1.4**	**1.1**	**1.3**	**1.5**	0.35 J	**1.4**	**1.3**	**1.0**	**0.67**	Quarterly~
EW-BW-167-A	**1.7 J+**	**1.4**	**1.1**	**1.4**	**1.1**	**0.71**	**0.66**	0.43 J	0.22 J	0.16 J	0.16 J	NS^	NS^	Annual
EW-BW-168-A	**1.3 J+**	**1.1**	**0.82**	**0.77**	**0.84**	**0.72**	**0.80**	**0.55**	**0.53**	0.48 J	0.46 J	0.35 J	0.27 J	Annual
EW-BW-169-A	**1.0 J+**	**0.68**	**0.63**	**0.67**	**0.73**	0.42 J	**0.80**	**0.51**	0.38 J	0.23 J	0.25 J	0.15 J	0.12 J	Annual
MW-BW-16-A	**0.60 J+**	**0.75**	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	NS
MW-BW-57-A	0.45 J+	ND (0.25)	0.26 J	0.32 J	0.26 J	0.24 J	0.31 J	0.17 J	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.25)	NS
MW-BW-87-A	0.17 J+	ND (0.25)	0.29 J	**0.65**	**0.61**	0.34 J	**1.6**	0.16 J	0.42 J	0.13 J	0.10 J	0.41 J	**0.76**	Quarterly~
MW-BW-91-A	ND (0.25)	**1.3**	**0.84**	**2.3**	0.50	0.28 J	**0.55**	**0.59**	**4.3**	**3.4**	**3.3**	**2.9**	**2.2**	Quarterly~

Notes:
There were no detections for either methylene chloride or trichloroethene
ACL: Aquifer Cleanup Level
ND: The analyte was not detected at or above the detection limit
NS: not sampled
µg/L: micrograms per liter
J: Estimated result with a possible low (-) or high bias (+)
Results in **bold** and shaded are concentrations above the ACL
Results in gray are ND
^ Pump failure, sample not collected
~ Including quarterly DO/ORP monitoring

Ahtna



MW-BW-90-A
12/11/2018 1.4

MW-BW-87-A
12/11/2018 0.79

MW-BW-87-A
12/11/2018 0.76

MW-BW-88-A
12/11/2018 1.5

MW-BW-58-A
12/11/2018 0.21 /J

MW-BW-86-A
12/11/2018 0.19 /J

EW-BW-163-A

EW-BW-165-A

EW-BW-164-A
12/12/2018 0.30 /J

0.5

2B

EW-BW-166-A
12/12/2018 0.67

MW-BW-16-A

EW-BW-160-A
12/12/2018 1.0

EW-BW-168-A
12/12/2018 0.27 /J

MW-BW-91-A
12/11/2018 2.5

MW-BW-91-A
12/11/2018 2.2

3A

EW-BW-169-A
12/12/2018 0.12 /J

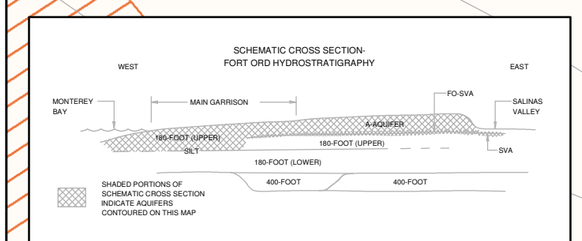
EW-BW-161-A
12/12/2018 0.11 /J

MW-BW-57-A

MW-BW-85-A
12/11/2018 0.94

1C

RESERVATION RD



N
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Feet

EXPLANATION

- Monitoring Well with CT Detection
- Extraction Well with CT Detection
- Well ID - Bold When ACL Exceeded (* Indicates: Sample result not used for contouring)
- EW-BW-161-A 09/18/2018 0.13 A/J } Baseline and/or quarterly monitoring concentration (µg/L) with validation/lab qualifier. Bold when exceeds the ACL.
- Monitoring Well CT Not Detected
- Extraction Well CT Not Detected
- Monitoring Well Not Sampled This Quarter
- Extraction Well Not Sampled This Quarter

Chemical of Concern (COC) Aquifer Cleanup Level (ACL) Exceedance Contour in µg/L

- 0.5 — Carbon tetrachloride (CT)
- General Groundwater Flow Direction
- Enhanced In Situ Bioremediation (EISB) Deployment Area
- Approximate Location of a Groundwater Divide
- Roads
- Facilities
- Former Fort Ord Boundary

Approximate extent of Fort Ord Landfill Areas

- OU2 Landfill Areas B through F
- Area A (clean closed)

NOTES:

(1) Quarterly samples at EISB Deployment Area 3A extraction wells were collected on December 11 and 12, 2018. Samples at OUCTP monitoring wells were collected between December 10 and 13, 2018.

(2) Contours are based on one interpretation of the data that were available at the time this report was prepared; other interpretations may be possible.

(3) Contours based on highest value obtained from multiple bags where applicable.

(4) Contours near wells not sampled this quarter are inferred from previous analytical data.

CT CONCENTRATIONS
EISB DEPLOYMENT AREA 3A, A-AQUIFER
Operable Unit Carbon Tetrachloride Plume
Fourth Quarter 2018
Groundwater Monitoring and Treatment System Report
Former Fort Ord, California

wood.

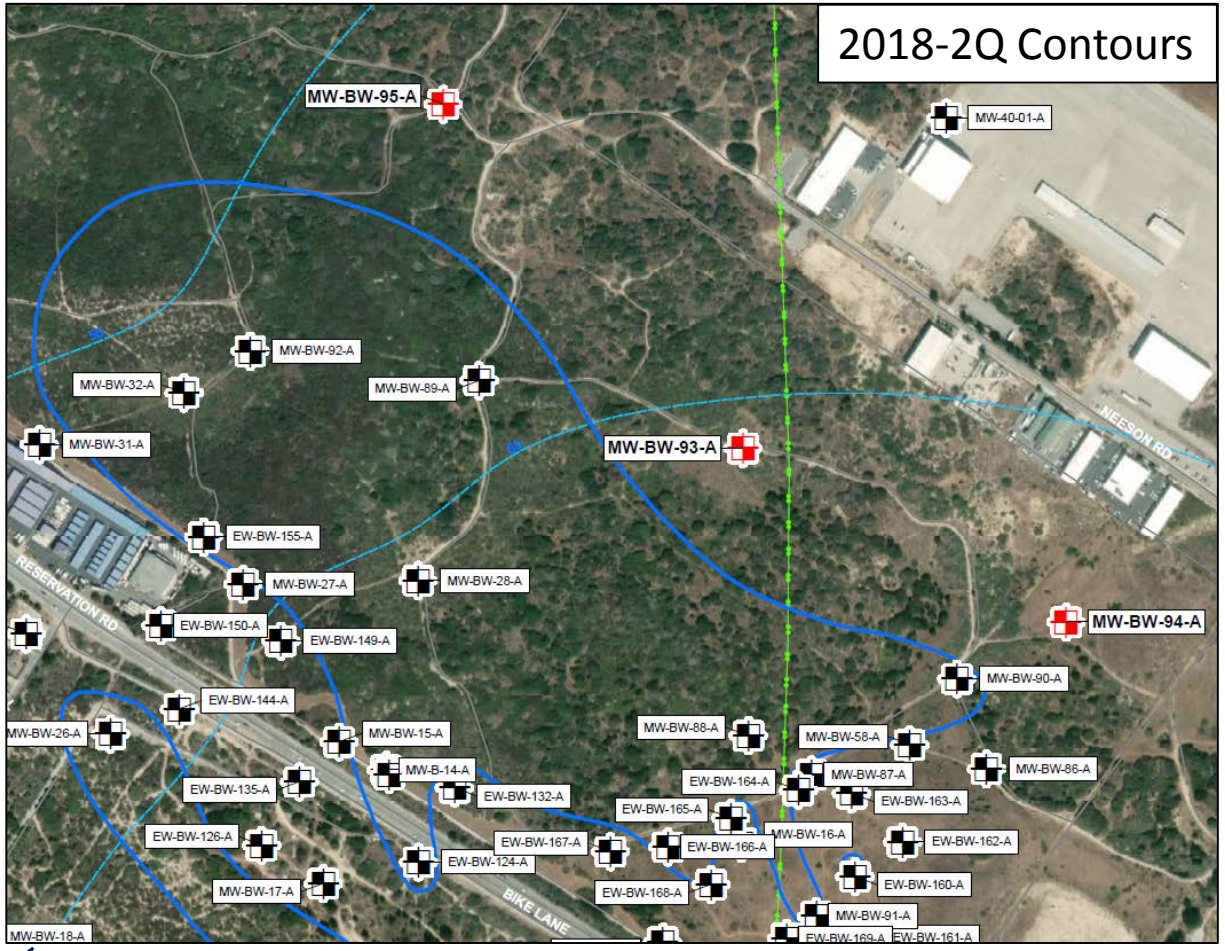
By: TJH
Date: 02/22/2019
Project No. 8418191360
Figure 4

Friday, February 22, 2019 11:26:14 AM thomas.hunt
P:\8418191360_FortOrd\GIS\4Q18\OUCTP_GMTSR\Figure04_CT_OUCTP_A_EISB3A_18Q4.mxd

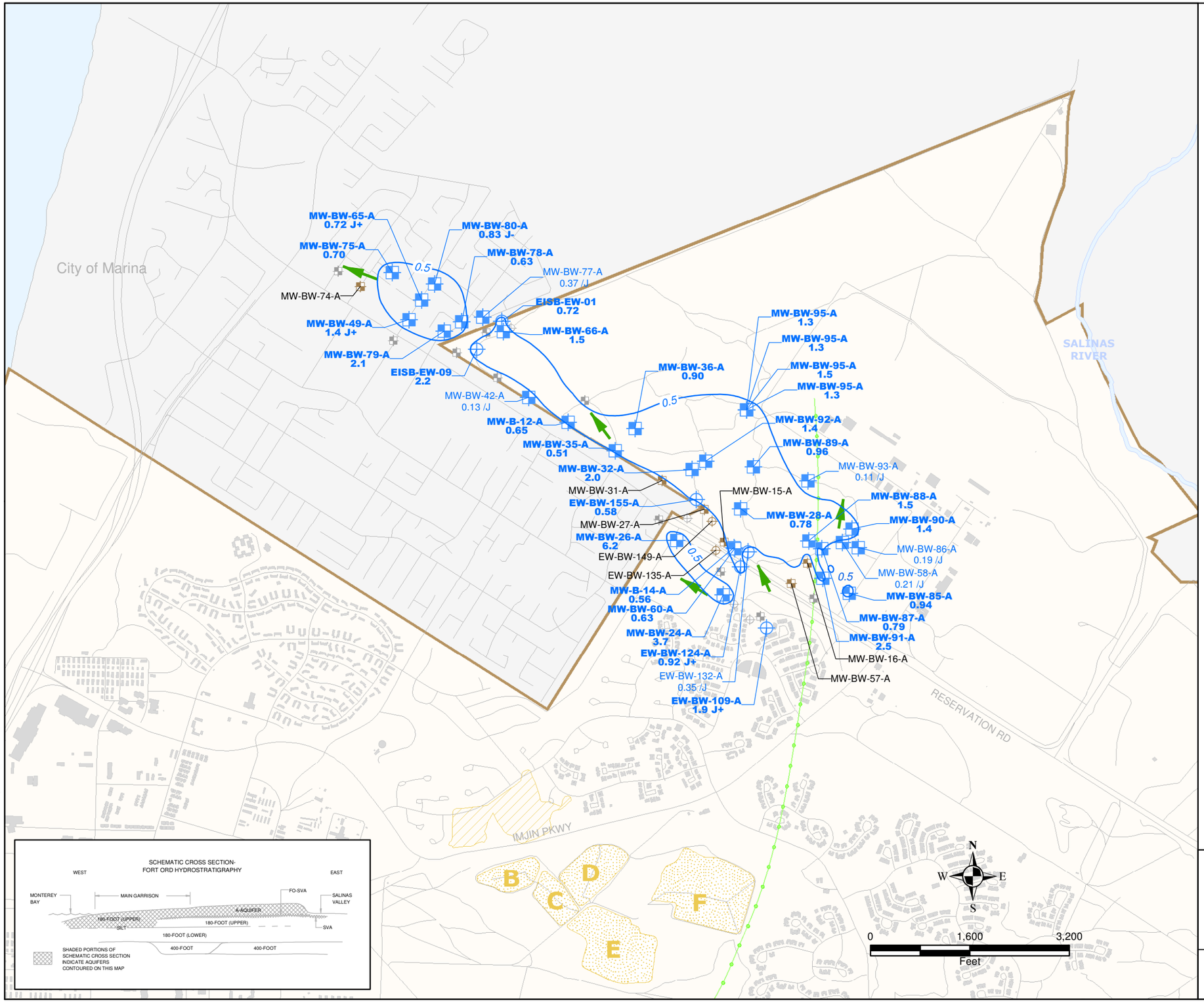
Table 2. OUCTP A-Aquifer Select Monitoring Well Data

OUCTP Hydraulic Zone[1]	EISB Deployment Area	Well Identification	COC Concentrations (µg/L)	
			3Q 2018	4Q 2018
			CT	
		ACL:	0.5	
1	1C	EW-BW-109-A	**1.6**	**1.9 J+**
1	N/A	MW-BW-24-A	**3.8**	**3.7**
2	3A	MW-BW-58-A	0.31 J	0.21 J
2	3A	MW-BW-87-A	**0.57**	**0.79**
2	3A	MW-BW-91-A	**2.8**	**2.5**
N/A	3A	MW-BW-90-A	**1.2**	**1.4**
3	3A	MW-BW-16-A	ND (0.25)	ND (0.25)
3	3A	MW-BW-57-A	ND (0.25)	ND (0.25)
3	N/A	MW-BW-88-A	**1.4**	**1.5**
3	N/A	MW-BW-93-A	NEW WELL (NS)	0.11 J
3	N/A	MW-BW-95-A	NEW WELL (NS)	**1.5**
4	2A	EW-BW-124-A	**0.90**	**0.92 J+**
4	N/A	MW-B-12-A	0.23 J	**0.65**
4	2B	MW-B-14-A	**1.8**	**0.56**
4	2B	EW-BW-155-A	**1.1**	**0.58**
4	2A	MW-BW-26-A^	**5.8**	**6.2**
4	N/A	MW-BW-31-A	ND (0.25)	ND (0.25)
4	N/A	MW-BW-32-A	**2.3**	**2.0**
4	N/A	MW-BW-36-A	**0.59**	**0.90**
4	N/A	MW-BW-42-A	0.15 J	0.13 J
4	N/A	MW-BW-89-A	**1.1**	**0.96**
4	N/A	MW-BW-92-A	**1.4**	**1.4**
5	Pilot	EISB-EW-01	**0.67**	**0.72**
5	Pilot	EISB-EW-09	**2.6**	**2.2**
5	N/A	MW-BW-65-A	0.21 J	**0.72 J+**
5	Pilot	MW-BW-66-A	**1.4**	**1.5**
5	N/A	MW-BW-74-A	ND (0.25) [ND (0.25)]	ND (0.25) [ND (0.25)]
5	N/A	MW-BW-49-A	**1.2**	**1.4 J+**
5	N/A	MW-BW-78-A	**0.59** [0.50]	**0.63 [0.59]**
5	N/A	MW-BW-80-A	**0.89**	**0.83 J-**

Notes:
CT: carbon tetrachloride
µg/L: micrograms per liter
ND: The analyte was not detected above the detection limit
NS: not sampled
J: Estimated result with a low (-) or high (+) bias
[1] Hydraulic zones are identified in the Groundwater QAPP.
Results in **bold** and shaded are concentrations above the ACL
Results in gray are ND
COC: chemical of concern
[Results in brackets are from a second deeper passive diffusion bag]
^ Downgradient monitoring well MW-BW-30-A sampled annually: ND.



Ahtna



EXPLANATION

- Monitoring Well with CT Detection
- Extraction Well with CT Detection
- Well ID - Bold When CT Exceeds the ACL (* Indicates: Sample result not used for contouring)
  - MW-BW-91-A
  - 2.8 A
- CT Concentration (µg/L) and validation/lab qualifier. Bold when CT exceeds the ACL.
- Monitoring Well CT Not Detected, and No Other COC ACL Exceedances
- Extraction Well CT Not Detected
- Monitoring Well Not Sampled This Quarter
- Extraction Well Not Sampled This Quarter

Chemical of Concern (COC) Aquifer Cleanup Level (ACL) Exceedance Contour in µg/L

- 0.5 — Carbon tetrachloride (CT)
- General Groundwater Flow Direction

Approximate Extent of Landfill Areas

- OU2 Landfill Areas B through F
- Area A (clean closed)
- Approximate Location of a Groundwater Divide
- Roads
- Facilities
- Former Fort Ord Boundary

NOTES:

(1) Samples were collected between December 13 and 27, 2018.

(2) Contours are based on one interpretation of the data that were available at the time this report was prepared; other interpretations may be possible.

(3) Contours based on highest value obtained from multiple bags and/or multiple ports where applicable.

(4) Contours near wells not sampled this quarter are inferred from previous analytical data.

*Well not used for contouring.

CT CONCENTRATIONS
A-AQUIFER
Operable Unit Carbon Tetrachloride Plume
Fourth Quarter 2018
Groundwater Monitoring and Treatment System Report
Former Fort Ord, California

wood.

By: TJH

Date: 03/05/2019

Project No. 8418191360

Figure 3

Tuesday, March 05, 2019 11:04:31 AM
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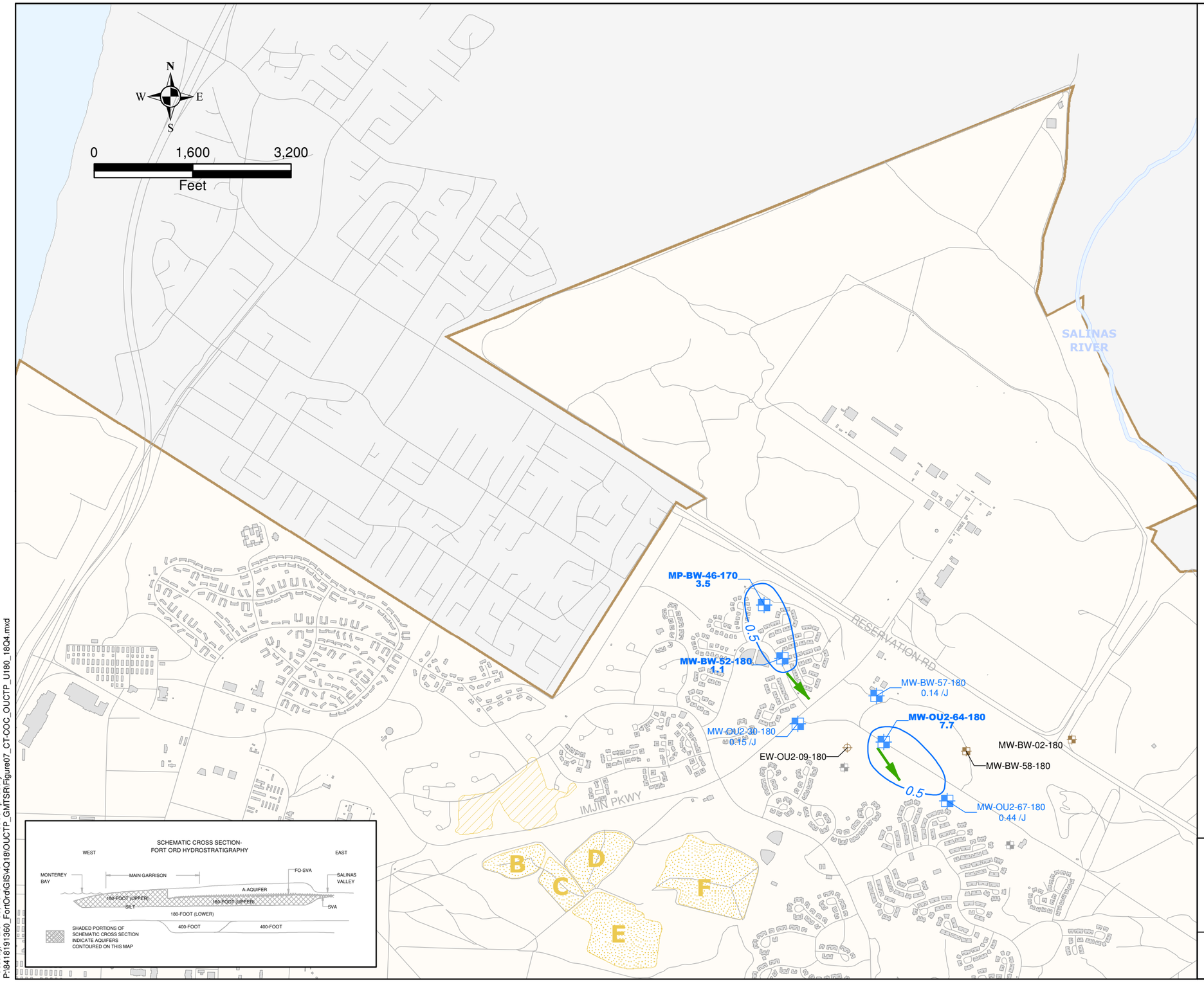
Table 3. OUCTP Upper 180-Foot Aquifer Select Monitoring Well Data

OUCTP Hydraulic Zone[1]	Well Identification	CT Concentration (µg/L)[2]	
		3Q 2018	4Q 2018
	ACL:	**0.5**	
6	EW-OU2-09-180[3]	ND (0.25)	ND (0.25)
6	MP-BW-46-170	**5.7**	**3.5**
6	MW-BW-52-180	**0.90**	**1.1**
6	MW-BW-57-180	NEW WELL (NS)	0.14 J
6	MW-BW-58-180	NEW WELL (NS)	ND (0.25)
6	MW-OU2-64-180	**7.4**	**7.7**
6	MW-OU2-67-180[5]	ND (0.25)	0.44 J

Table 4. OUCTP Lower 180-Foot Aquifer Select Monitoring Well Data

OUCTP Hydraulic Zone[1]	Well Identification	Select COC Concentrations (µg/L)[2]			
		3Q 2018	4Q 2018	3Q 2018	4Q 2018
		CT		TCE[4]	
	Limit:	**ACL 0.5**		**MCL 5.0**	
7	MP-BW-49-316	**1.2**	**1.0**	ND (0.25)	ND (0.25)
7	MP-BW-49-400	ND (0.25)	ND (0.25)	4.2	4.2
7	MP-BW-50-339	**0.89**	0.26 J	ND (0.25)	0.14 J
7	MP-BW-50-384	0.12 J	ND (0.25)	2.2	1.7
7	MP-BW-51-405	0.16 J	0.13 J	1.6	1.2
7	MW-OU2-69-180	**0.55**	**0.83**	0.13 J	ND (0.25)
8	AIRFIELD	**0.59**	0.47 J	ND (0.25)	ND (0.25)
N/A	EW-OU2-07-180	ND (0.25)	ND (0.25)	2.8	2.2
N/A	FO-29	0.12 J	0.17 J	2.1	1.7
N/A	FO-30	0.20 J	0.13 J	0.48 J	0.51
N/A	FO-31	ND (0.25)	0.10 J	ND (0.25)	0.95
N/A	MP-BW-41-353	ND (0.25)	ND (0.25)	1.3	1.8
N/A	MW-BW-04-180	0.45 J	NS	ND (0.25)	NS
N/A	MW-BW-59-180	NEW WELL (NS)	ND (0.25)	NEW WELL (NS)	**8.6**
N/A	MW-OU2-72-180	ND (0.25)	ND (0.25)	1.4	1.3
N/A	MW-OU2-78-180	ND (0.25)	ND (0.25)	2.2	2.0
N/A	MW-OU2-82-180	ND (0.25)	ND (0.25)	**6.3**	4.9

Notes:
ACL: aquifer cleanup level
COC: chemical of concern
CT: carbon tetrachloride
MCL: maximum contaminant level
ND: The analyte was not detected at or above the detection limit
NS: not sampled
TCE: trichloroethene
µg/L: micrograms per liter
J: Estimated result with a low (-) or high (+) bias
[1] Hydraulic zones are identified in the Groundwater QAPP.
[2] Concentration in **bold** and shaded cell exceeds the Aquifer Cleanup Level (ACL) for CT and the Maximum Contaminant Level (MCL) for TCE. Results in gray are ND.
[3] EW-OU2-09-180 is operated as part of the remedy for the OUCTP Upper 180-Foot Aquifer and is connected to the OU2 GWTP. cis-1,2-DCE was detected in this well at 8.4 µg/L in 2Q17 and 5.3 µg/L in 2Q18.
[4] TCE is not a COC in the OUCTP Lower 180-Foot Aquifer (reported for Lower 180-Foot Aquifer with respect to protection of supply wells)
[5] Downgradient well MW-OU2-70-180 sampled annually: ND.



EXPLANATION

- Monitoring Well with CT Detection
- Extraction Well with CT Detection
- Well ID - Bold When Concentration Exceeds the ACL (* Indicates: Sample result not used for contouring)
- MW-BW-57-180 / 0.14 /J — CT Concentration (µg/L) and validation/lab qualifier (red indicates TCE; blue indicates CT) Bold when exceeds the ACL.
- Monitoring Well CT Not Detected
- Extraction Well CT Not Detected
- Monitoring Well Not Sampled This Quarter

Chemical of Concern (COC) Aquifer Cleanup Level (ACL) Exceedance Contour in µg/L

- 0.5 — Carbon tetrachloride (CT)
- General Groundwater Flow Direction

Approximate extent of Landfill Areas

- OU2 Landfill Areas B through F
- Area A (clean closed)
- Roads
- Facilities
- Former Fort Ord Boundary

NOTES:

(1) Samples were collected between December 11 and 13, 2018.

(2) Contours are based on one interpretation of the data that were available at the time this report was prepared; other interpretations may be possible.

(3) Contours based on highest value obtained from multiple bags and/or multiple ports where applicable.

(4) Contours near wells not sampled this quarter are inferred from previous analytical data.

CT CONCENTRATIONS
UPPER 180-FOOT AQUIFER
Operable Unit Carbon Tetrachloride Plume
Fourth Quarter 2018
Groundwater Monitoring and Treatment System Report
Former Fort Ord, California

wood.

By: TJH
Date: 03/05/2019
Project No. 8418191360
Figure 7

Tuesday, March 05, 2019 11:18:14 AM reuben.pillsbury
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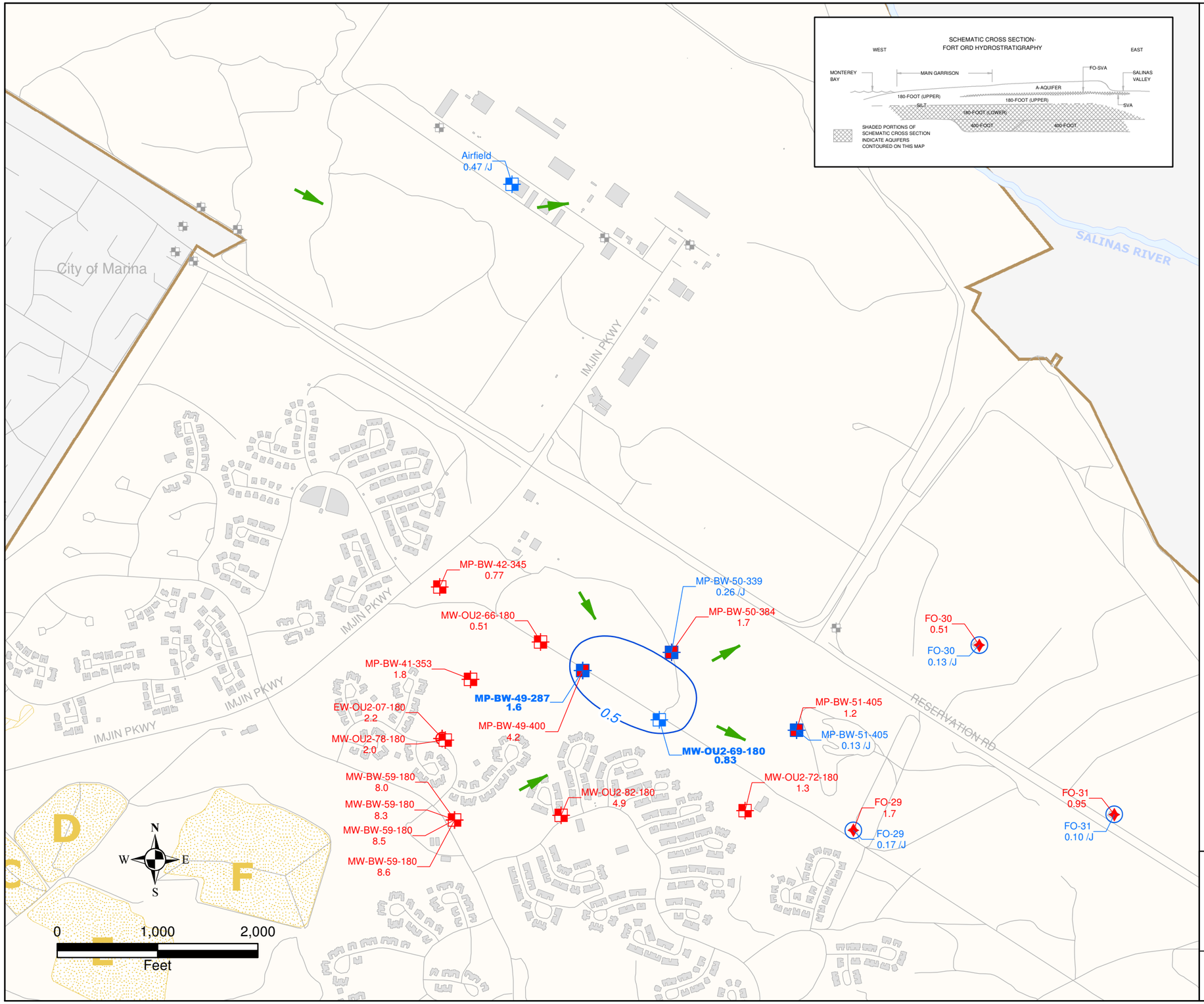

EXPLANATION

- Monitoring Well with CT Detection
- Monitoring Well with TCE Detection
- Remediation Extraction Well with TCE Detection
- Active Supply Well TCE and CT Detections
- Monitoring Well with TCE and CT Detections
- Well ID - Bold When Concentration Exceeds ACL
  # Indicates: Multi-port well sampled at more than one depth with no detections.
  MP-BW-51-405
  2.1 A
  Concentration in µg/L and validation/lab qualifier (red indicates TCE; blue indicates CT)
  Bold when exceeds the ACL.
- Monitoring Well CT Not Detected
- Active Supply Well CT Not Detected
- Monitoring Well Not Sampled This Quarter
- Supply Well Not Sampled This Quarter

Chemical of Concern (COC) Aquifer Cleanup Level (ACL) Exceedance Contour in µg/L

- 0.5 — Carbon tetrachloride (CT)
- General Groundwater Flow Direction

Approximate Extent of Landfill Areas

- OU2 Landfill Areas B through F
- Area A (clean closed)
- Approximate Location of a Groundwater Divide
- Roads
- Facilities
- Former Fort Ord Boundary

NOTES:

(1) Samples were collected between December 11 to 18, 2018.

(2) Contours are based on one interpretation of the data that were available at the time this report was prepared; other interpretations may be possible.

(3) Contours based on highest value obtained from multiple bags and/or multiple ports where applicable.

(4) Supply wells FO-29, FO-30 and FO-31 have been renamed as 29(A), 30(B) and 31(C) respectively. The wells are referred to by the original names in this report for consistency.

(5) TCE is not a chemical of concern in the OUCTP Lower 180-Foot Aquifer.

CT AND TCE CONCENTRATIONS
LOWER 180-FOOT/400-FOOT AQUIFERS
Operable Unit Carbon Tetrachloride Plume
Fourth Quarter 2018
Groundwater Monitoring and Treatment System Report
Former Fort Ord, California

wood.

By: TJH

Date: 02/21/2019

Project No. 8418191360

Figure 9

Thursday, February 21, 2019 11:48:52 AM
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Table 5. OUCTP New Monitoring Well Data

OUCTP Hydraulic Zone[1]	Well Identification	Sample Depth (ft btoc)	CT Concentration (µg/L)[2]	TCE Concentration (µg/L)[2]
			4Q 2018	4Q 2018
		ACL/MCL:	0.5	5.0
3	MW-BW-93-A	86	ND (0.25)	ND (0.25)
		91	ND (0.25)	ND (0.25)
		96	0.11 J	ND (0.25)
		101	ND (0.25)	ND (0.25)
		106	ND (0.25)	ND (0.25)
		111	ND (0.25)	ND (0.25)
3	MW-BW-95-A	97	**1.3**	0.31 J
		102	**1.3**	0.28 J
		107	**1.3**	0.24 J
		112	**1.3**	0.27 J
		117	**1.5**	0.30 J
6	MW-BW-57-180	188	ND (0.25)	NS
		193	0.14 J	NS
		198	ND (0.25)	NS
		203	ND (0.25)	NS
6	MW-BW-58-180	160	ND (0.25)	NS
		165	ND (0.25)	NS
		170	ND (0.25)	NS
		175	ND (0.25)	NS
7	MW-BW-59-180	345	ND (0.25)	**8.5**
		350	ND (0.25)	**8.6**
		355	ND (0.25)	**8.0**
		360	ND (0.25)	**8.3**

Notes:
ACL: aquifer cleanup level
COC: chemical of concern
CT: carbon tetrachloride
Ft btoc: feet below top of casing
MCL: maximum contaminant level
ND: The analyte was not detected at or above the detection limit
NS: not sampled
TCE: trichloroethene
µg/L: micrograms per liter
J: Estimated result with a low (-) or high (+) bias
[1] Hydraulic zones are identified in the Groundwater QAPP.
[2] Concentration in **bold** and shaded cell exceeds the Aquifer Cleanup Level (ACL) for CT and the Maximum Contaminant Level (MCL) for TCE in the Lower 180-Foot Aquifer. Results in gray are ND.