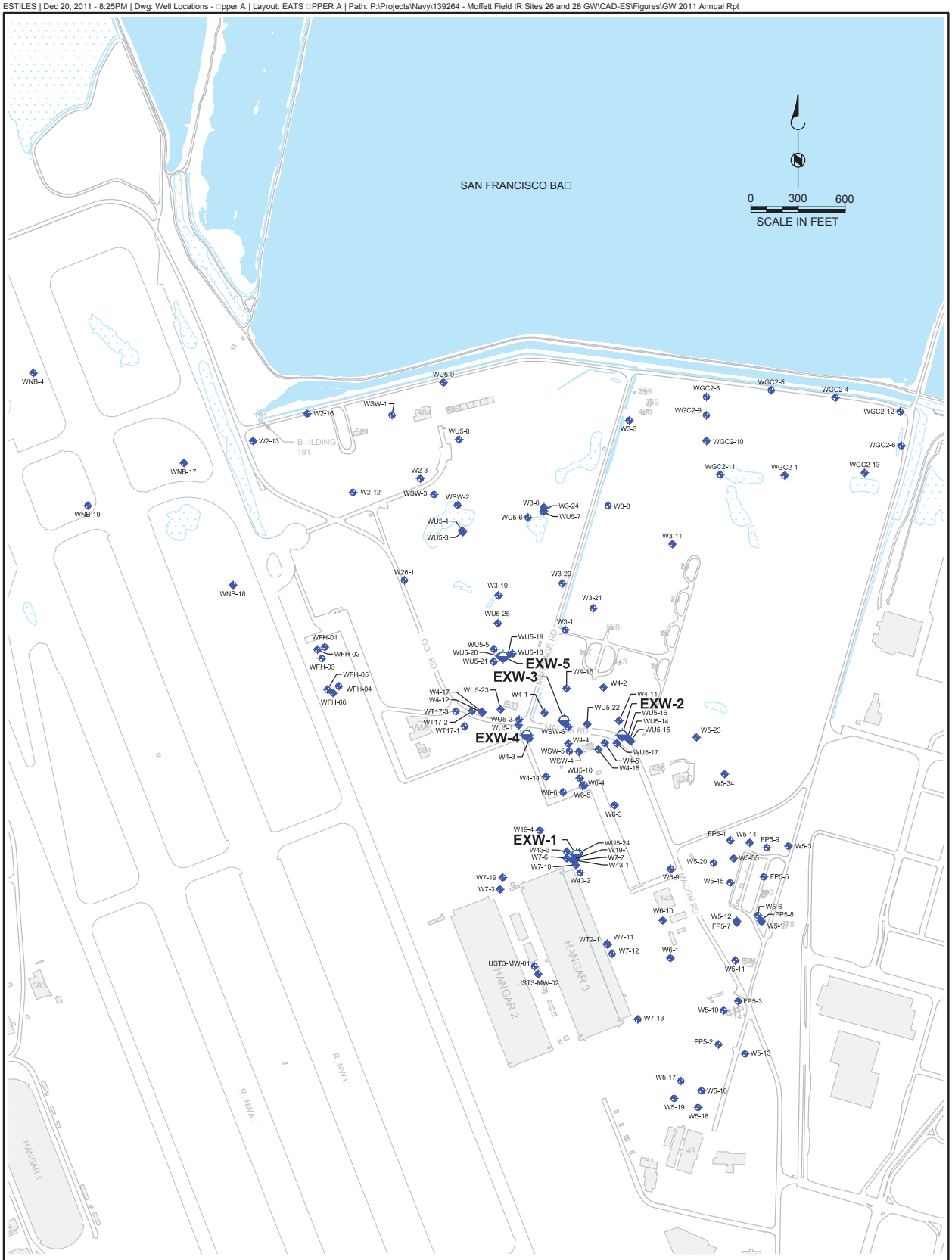
ESTILES | Dec 20, 2011 - 8:25PM | Dwg: Well Locations - □pper A | Layout: EATS □PPER A | Path: P:\Projects\Navy\139264 - Moffett Field IR Sites 26 and 28 GW\CAD-ES\Figures\GW 2011 Annual Rpt



EXPLANATION

EA1-2 NAV□ EXTRACTION WELL

W89-10 NAV□ MONITORING WELL

ROAD

WETLAND

Brown AND Caldwell

2011 ANNUAL GROUNDWATER REPORT FOR IR SITES 26 AND 28

Figure 3-1

MONITORING AND EXTRACTION WELL LOCATION MAP, IR SITE 26, UPPER PORTION OF THE A AQUIFER

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA

FIGURES 3- 2 THROUGH 3- 5
HYDROGRAPHS
IR SITE 26

Figure 3- 2 W4-3 (Upper Portion of the A Aquifer)

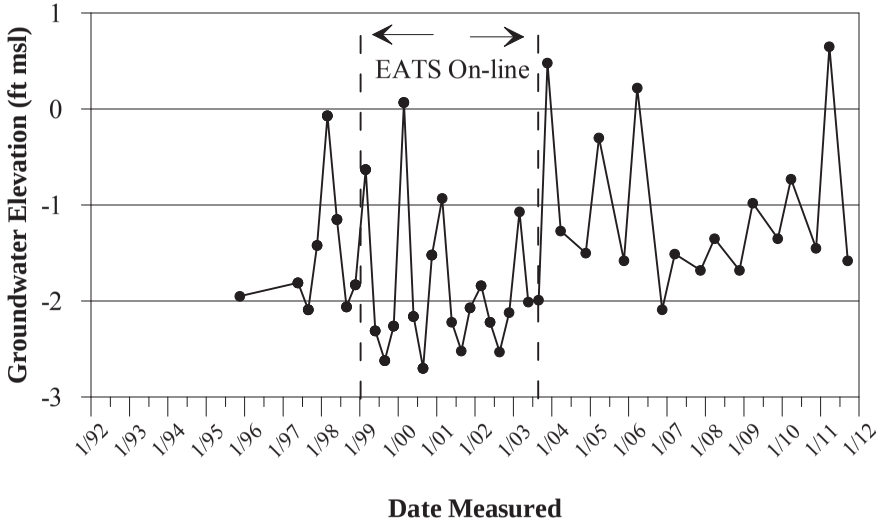


Figure 3- 3 W7-10 (Upper Portion of the A Aquifer)

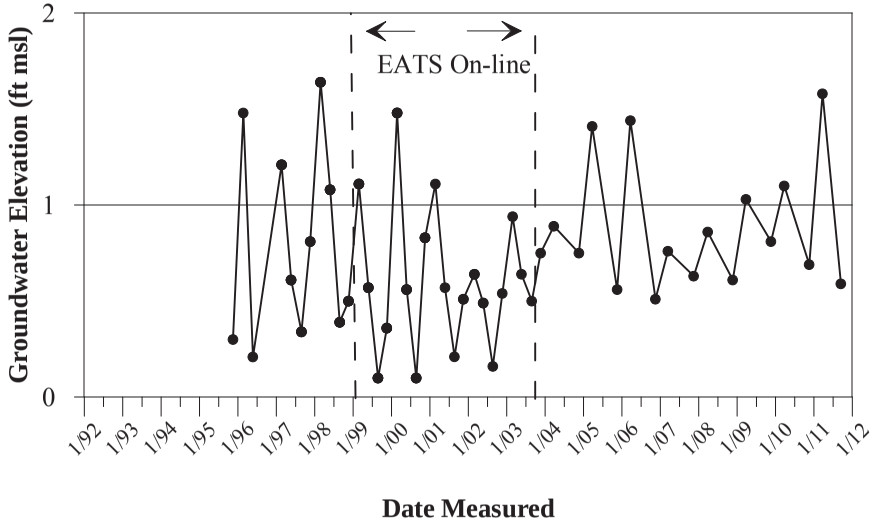


Figure 3- 4 WSW-6 (Upper Portion of the A Aquifer)

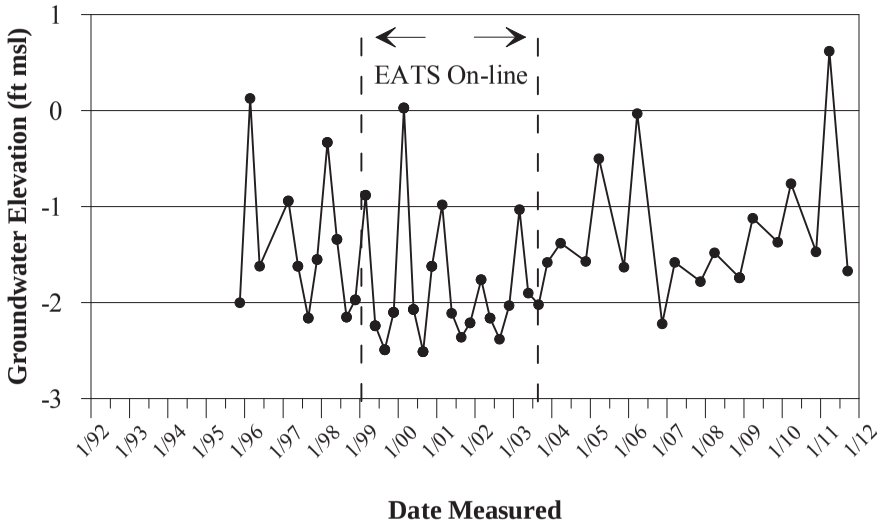
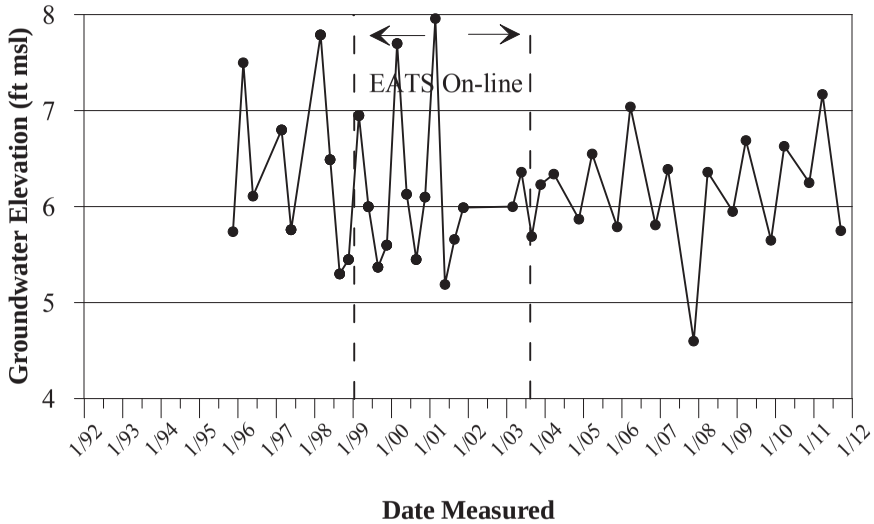


Figure 3- 5 W5-18 (Upper Portion of the A Aquifer)



Notes:
ft msl - feet mean sea level

FIGURES 3- 6 THROUGH 3- 9
HYDROGRAPHS
IR SITE 26

Figure 3- 6 W5-23 (Upper Portion of the A Aquifer)

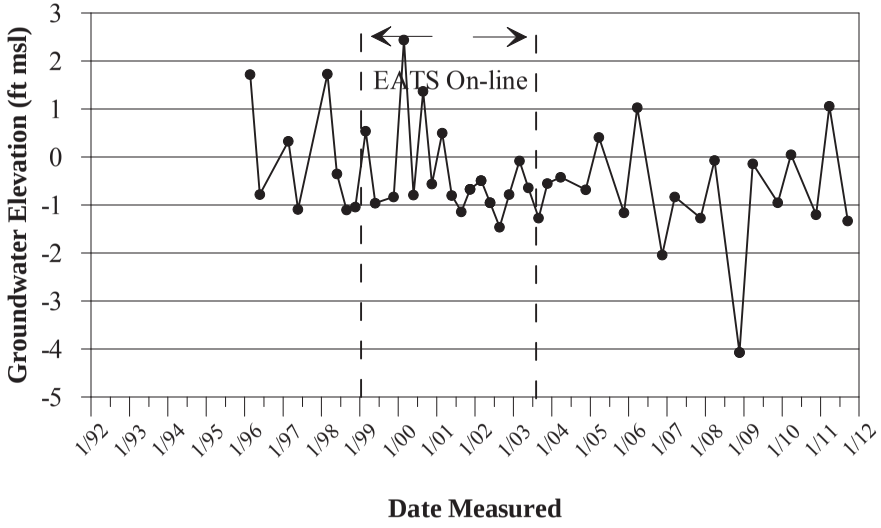


Figure 3- 7 W10-2 (Upper Portion of the A Aquifer)

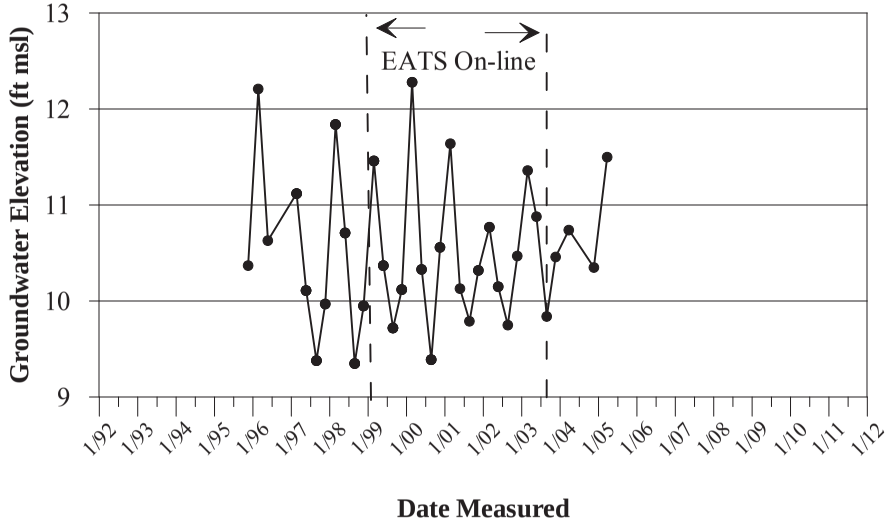


Figure 3- 8 W19-4 (Upper Portion of the A Aquifer)

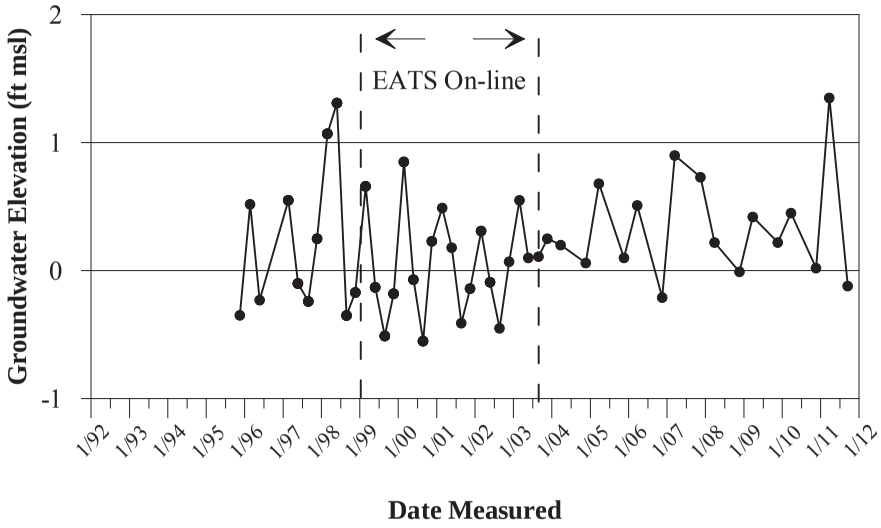
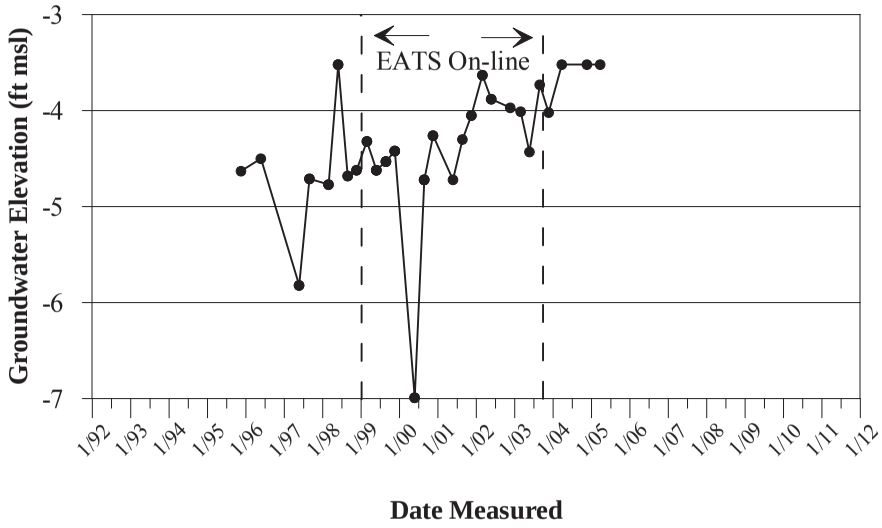


Figure 3- 9 W3-12 (Lower Portion of the A Aquifer)



Notes:
ft msl - feet mean sea level

FIGURES 3-10 THROUGH 3-13
HYDROGRAPHS
IR SITE 26

Figure 3-10 W3-13 (Lower Portion of the A Aquifer)

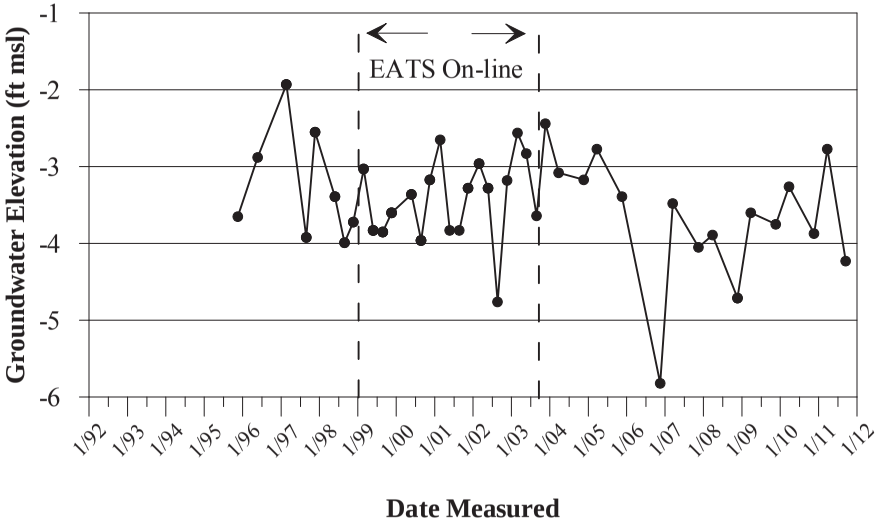


Figure 3-11 W5-7 (Lower Portion of the A Aquifer)

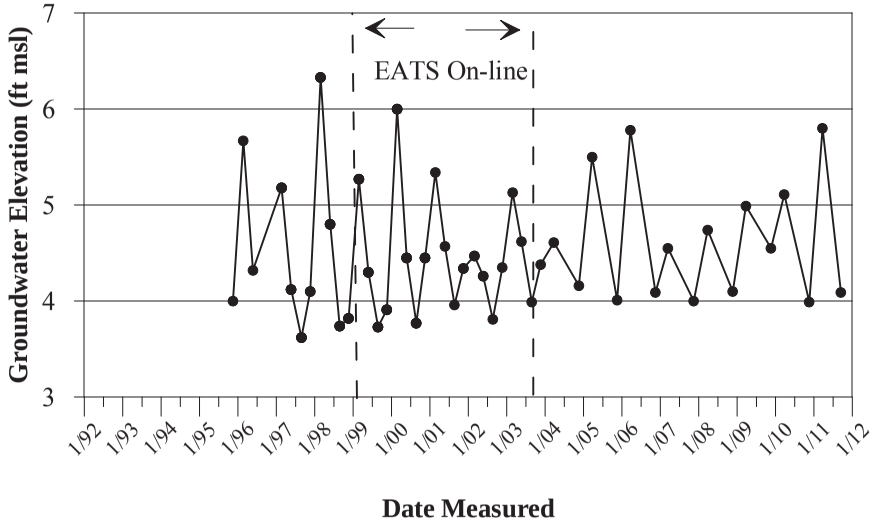


Figure 3-12 W5-8 (Lower Portion of the A Aquifer)

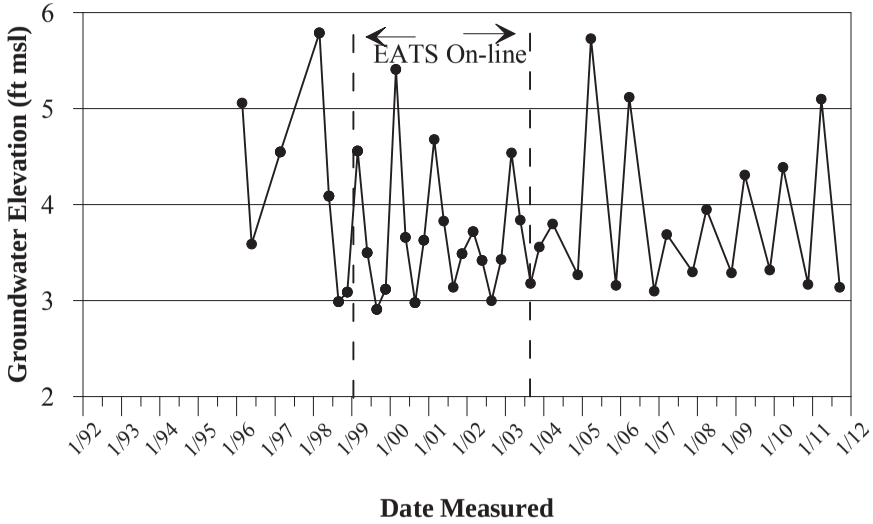
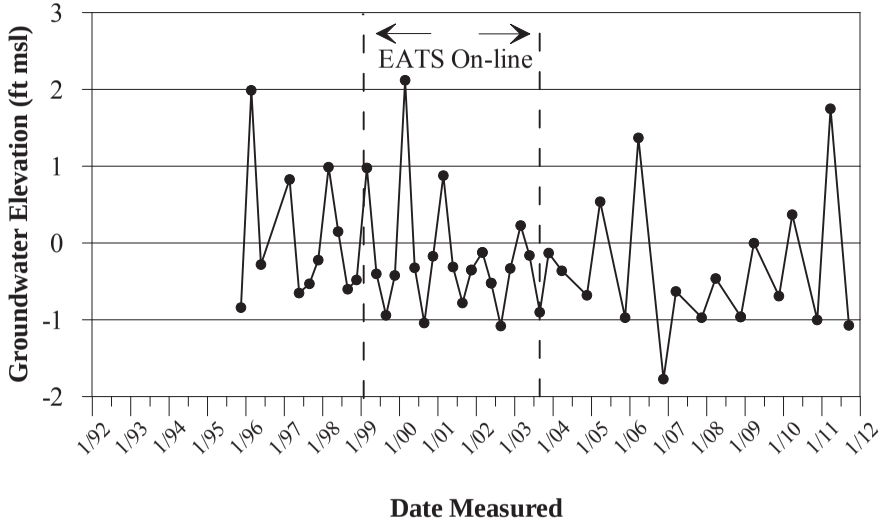


Figure 3-13 W5-25 (Lower Portion of the A Aquifer)



Notes:
ft msl - feet mean sea level

FIGURES 3-14 THROUGH 3-17
HYDROGRAPHS
IR SITE 26

Figure 3-14 W19-2 (Lower Portion of the A Aquifer)

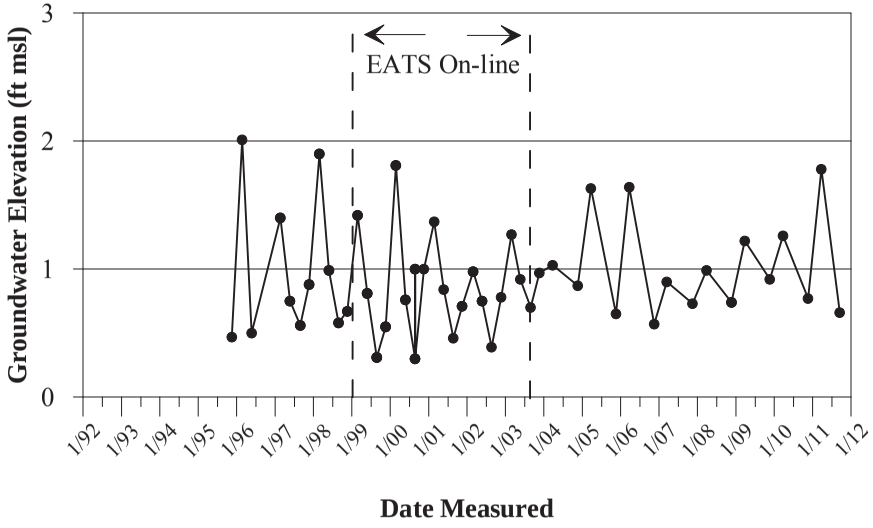


Figure 3-15 W19-3 (Lower Portion of the A Aquifer)

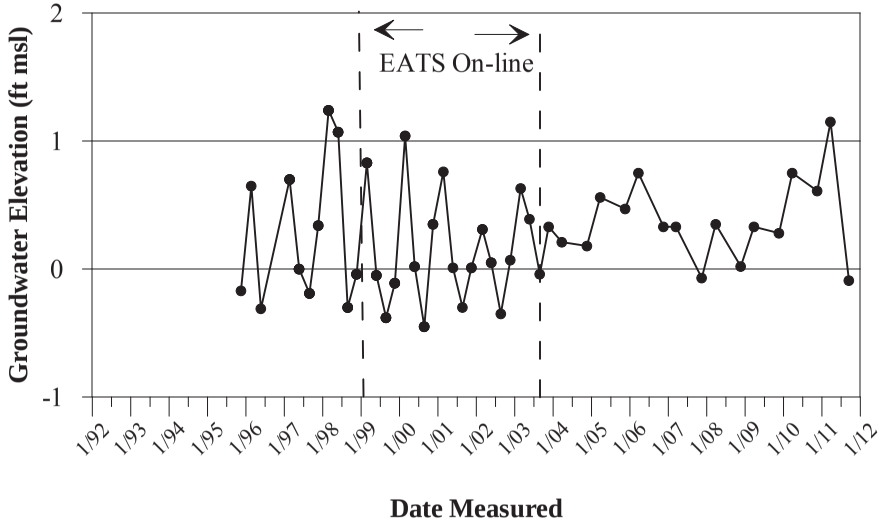


Figure 3-16 W4-13 (B Aquifer)

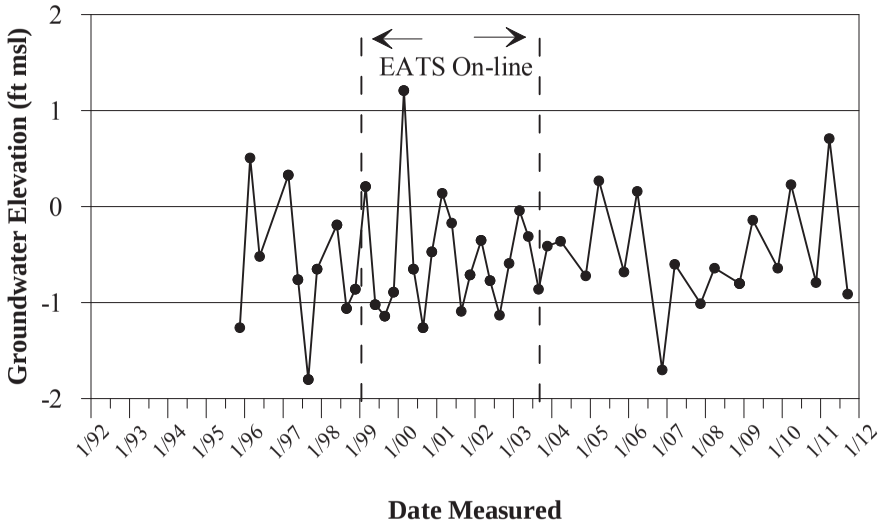
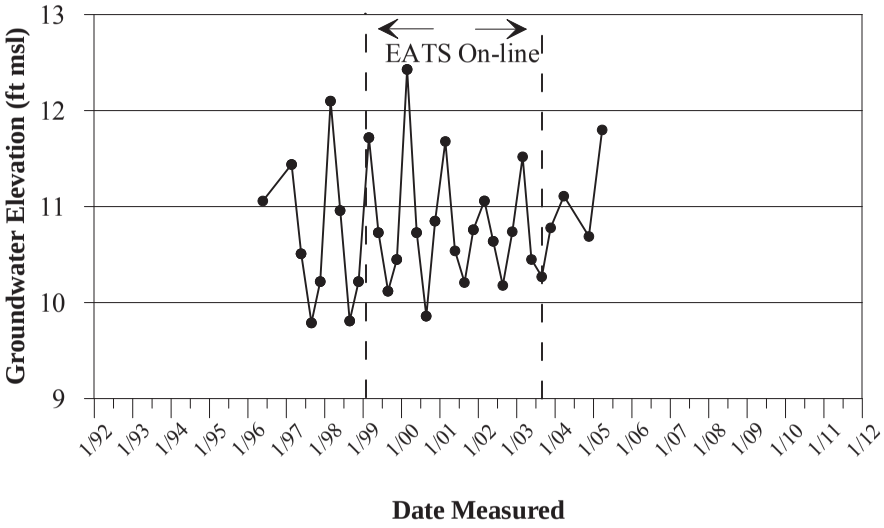
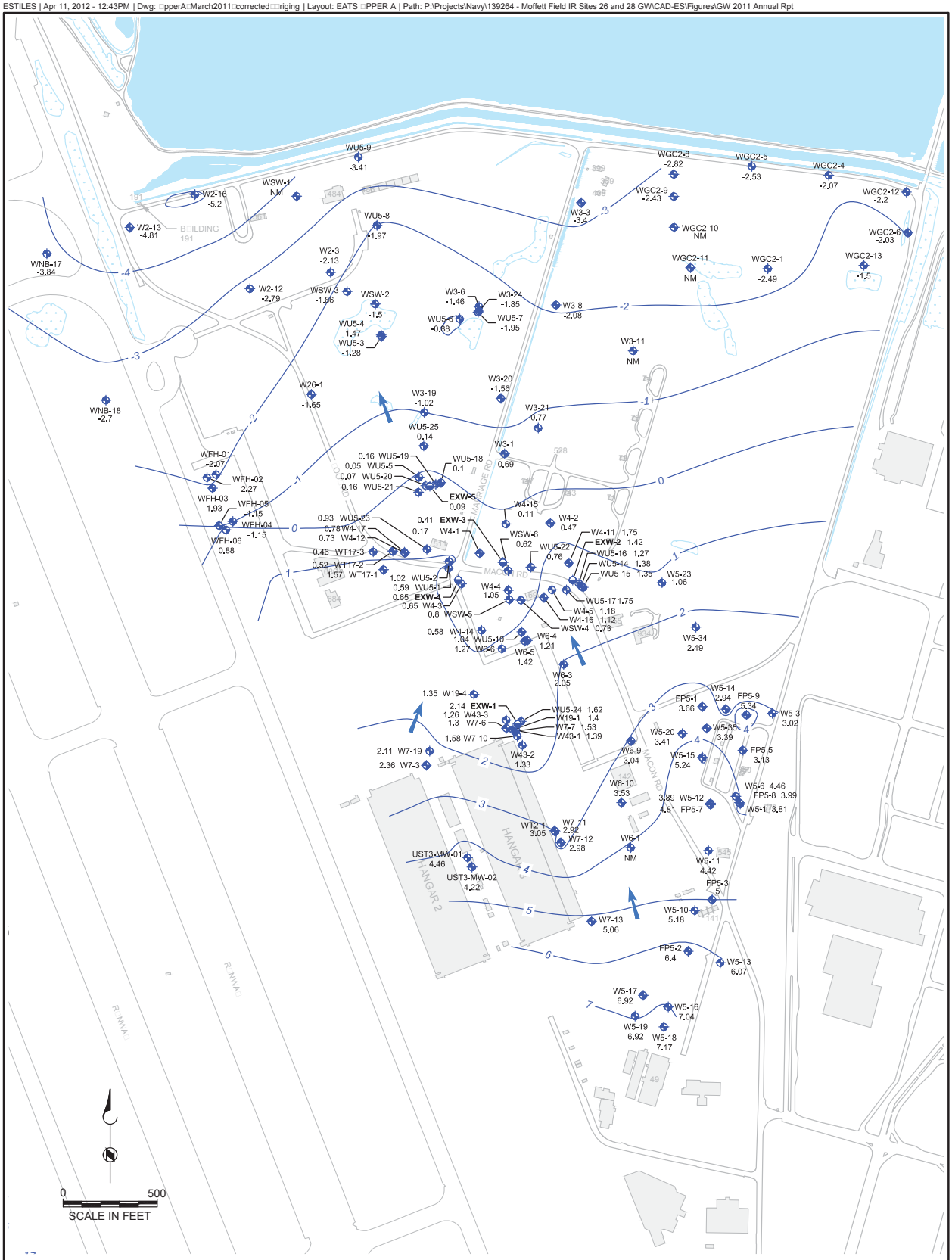


Figure 3-17 W10-3 (B Aquifer)



Notes:
ft msl - feet mean sea level



EXPLANATION

EXW-4 13.93	NAV□ EXTRACTION WELL WATER ELEVATION IN FEET (MSL)
W89-10 10.54	NAV□ MONITORING WELL WATER ELEVATION IN FEET (MSL)
NM	NOT MEAS□RED
26	GRO□NDWATER CONTO□R
	GRO□NDWATER FLOW DIRECTION
	ROAD
	WETLAND

NOTE:
GRO□NDWATER LEVELS MEAS□RED ON MARCH 24, 2011.

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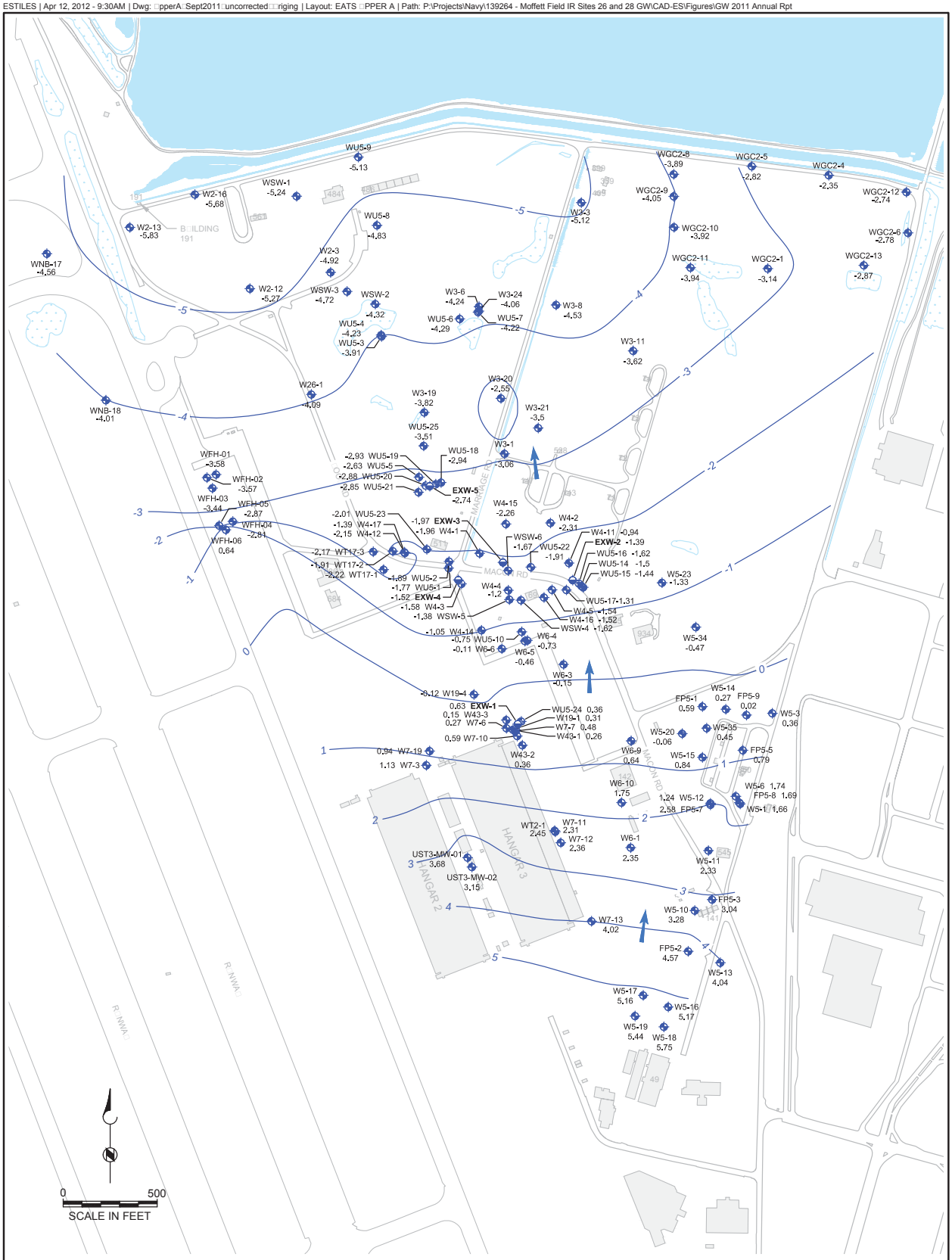
2011 ANNUAL GROUNDWATER REPORT FOR IR SITES 26 AND 28

Figure 3-18

POTENTIOMETRIC SURFACE MAP, IR SITE 26, UPPER PORTION OF THE A AQUIFER MARCH 24, 2011

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA



EXPLANATION

EXW-4 13.93	NAV□ EXTRACTION WELL WATER ELEVATION IN FEET (MSL)
W89-10 10.54	NAV□ MONITORING WELL WATER ELEVATION IN FEET (MSL)
NM	NOT MEAS□RED
26	GRO□NDWATER CONTO□R
	GRO□NDWATER FLOW DIRECTION
	ROAD
	WETLAND

NOTE:
GRO□NDWATER LEVELS MEAS□RED ON SEPTEMBER 15, 2011.

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2011 ANNUAL GROUNDWATER REPORT FOR IR SITES 26 AND 28

Figure 3-19

POTENTIOMETRIC SURFACE MAP, IR SITE 26, UPPER PORTION OF THE A AQUIFER SEPTEMBER 15, 2011

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA

FIGURES 3-20 THROUGH 3-23
TIME SERIES OF VOCs CONCENTRATION PLOTS
IR SITE 26

Figure 3-20 W4-3 (Upper Portion of the A Aquifer)

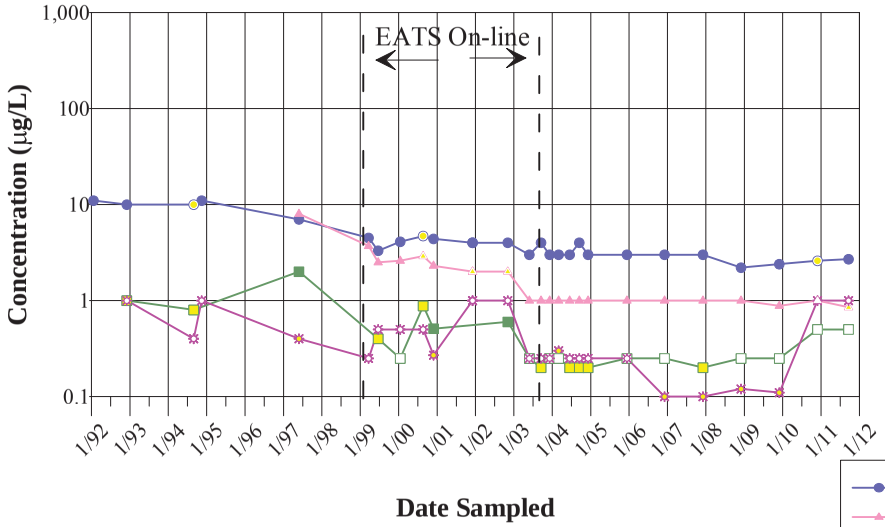
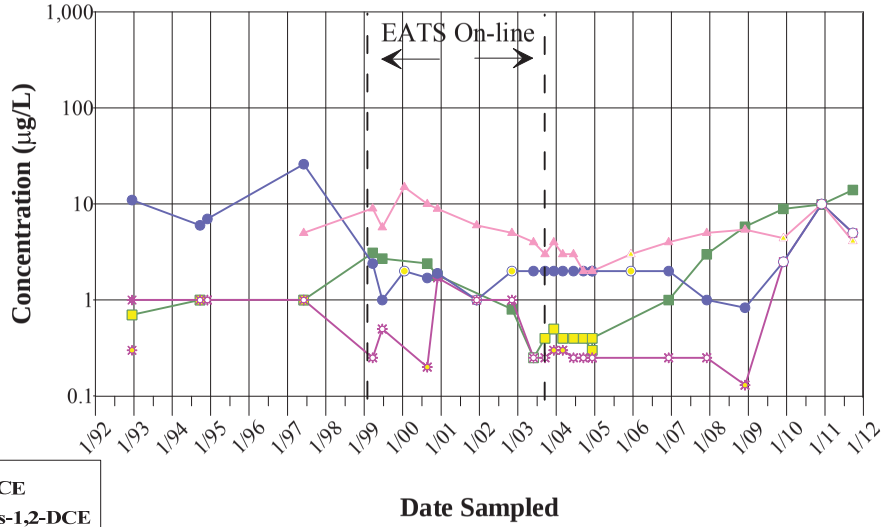


Figure 3-21 W4-14 (Upper Portion of the A Aquifer)



TCE
cis-1,2-DCE
PCE
VC

Figure 3-22 W4-15 (Upper Portion of the A Aquifer)

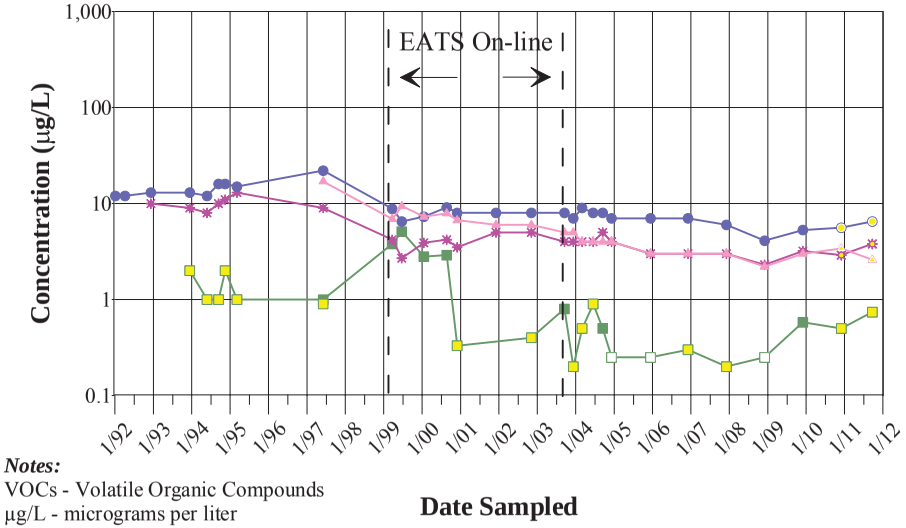
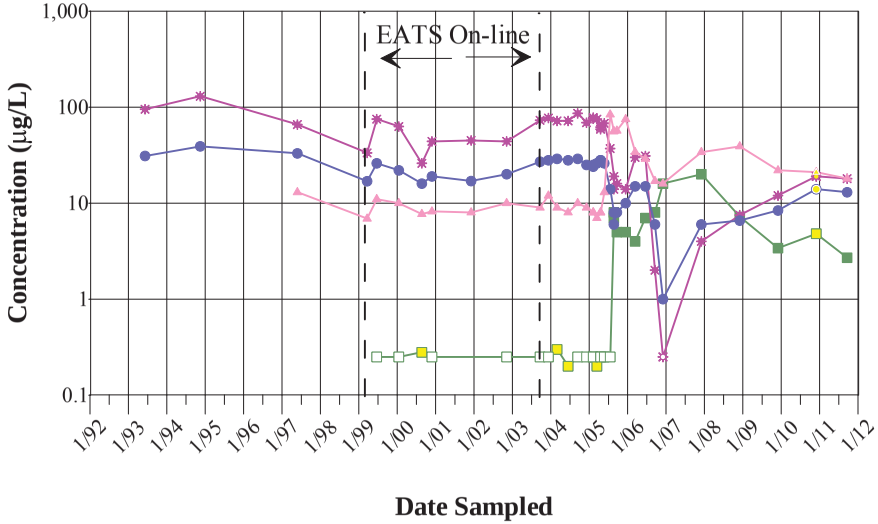


Figure 3-23 W7-10 (Upper Portion of the A Aquifer)



Notes:
VOCs - Volatile Organic Compounds
µg/L - micrograms per liter
TCE - trichloroethene; cis-1,2-DCE - cis-1,2,-dichloroethene; PCE - tetrachloroethene; VC - vinyl chloride
Open symbols indicate non-detect values. Yellow symbols indicate estimated values. Closed-line colored symbols indicate concentrations detected.
Non-detects are plotted at the reporting limits.

FIGURES 3-24 THROUGH 3-27
TIME SERIES OF VOCs CONCENTRATION PLOTS
IR SITE 26

Figure 3-24 WSW-6 (Upper Portion of the A Aquifer)

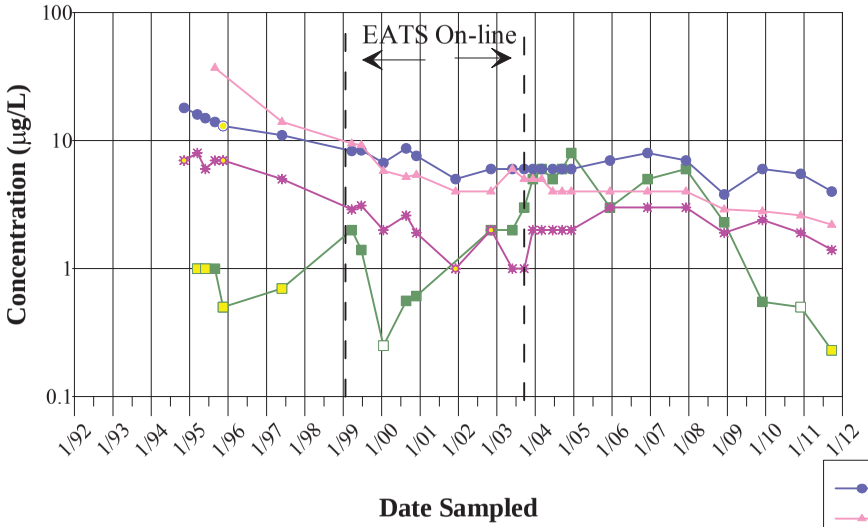
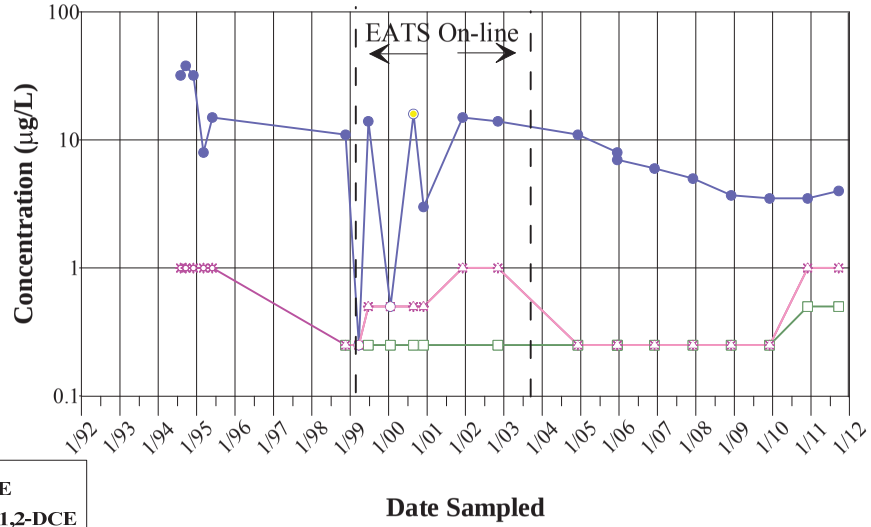


Figure 3-25 WU5-4 (Upper Portion of the A Aquifer)



TCE
cis-1,2-DCE
PCE
VC

Figure 3-26 WU5-10 (Upper Portion of the A Aquifer)

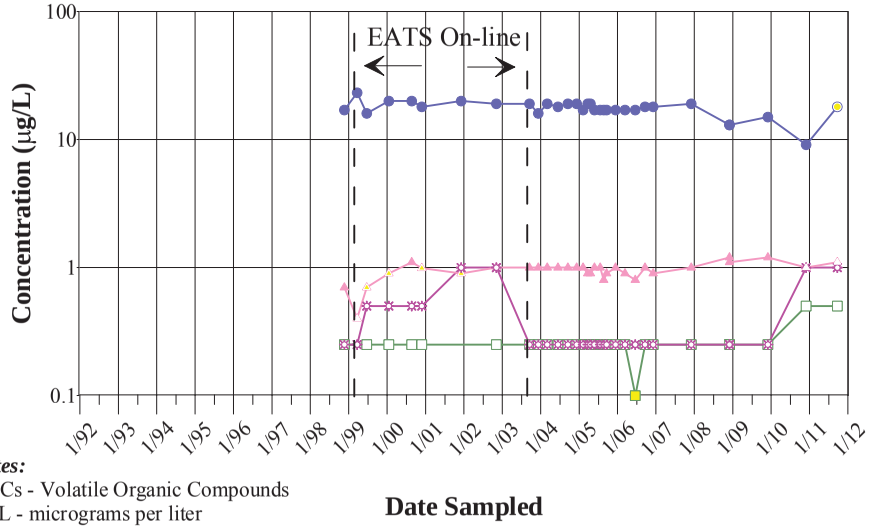
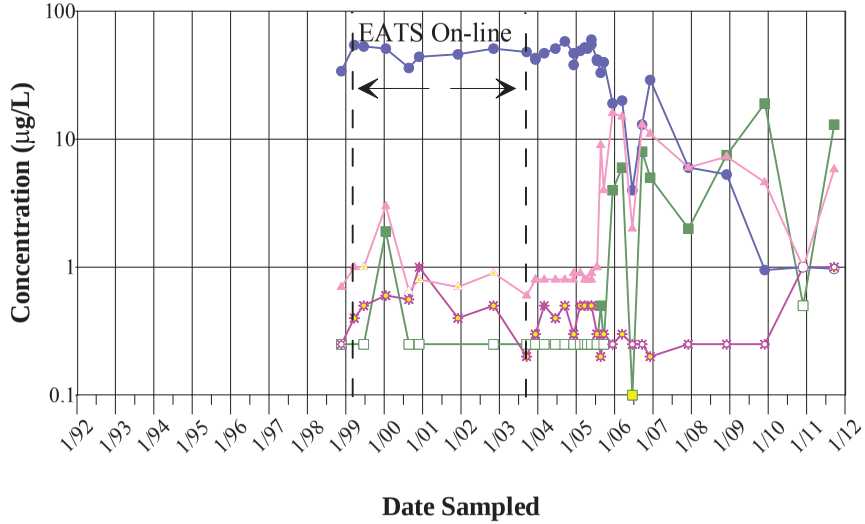


Figure 3-27 WU5-14 (Upper Portion of the A Aquifer)



Notes:
VOCs - Volatile Organic Compounds
µg/L - micrograms per liter
TCE - trichloroethene; cis-1,2-DCE - cis-1,2,-dichloroethene; PCE - tetrachloroethene; VC - vinyl chloride
Open symbols indicate non-detect values. Yellow symbols indicate estimated values. Closed-line colored symbols indicate concentrations detected.
Non-detects are plotted at the reporting limits.

FIGURES 3-28 THROUGH 3-29
TIME SERIES OF VOCs CONCENTRATION PLOTS
IR SITE 26

Figure 3-28 WU5-21 (Upper Portion of the A Aquifer)

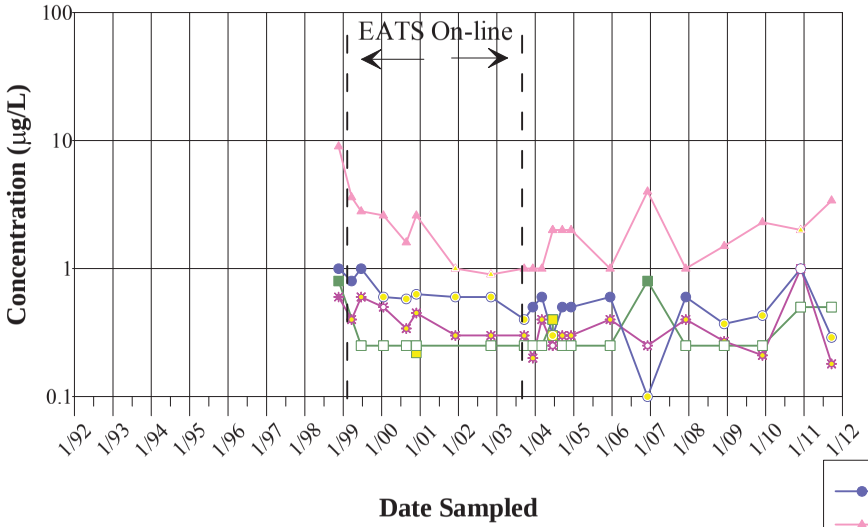
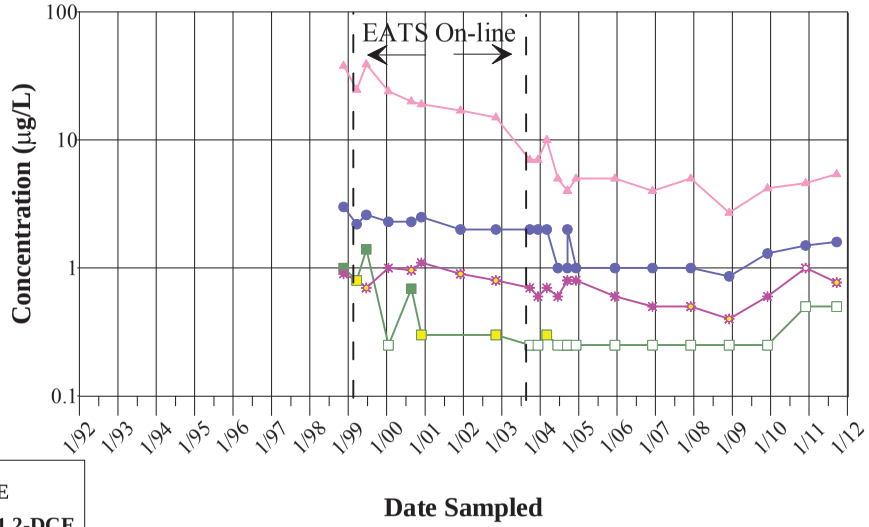
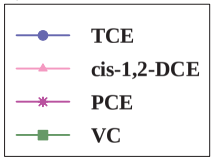
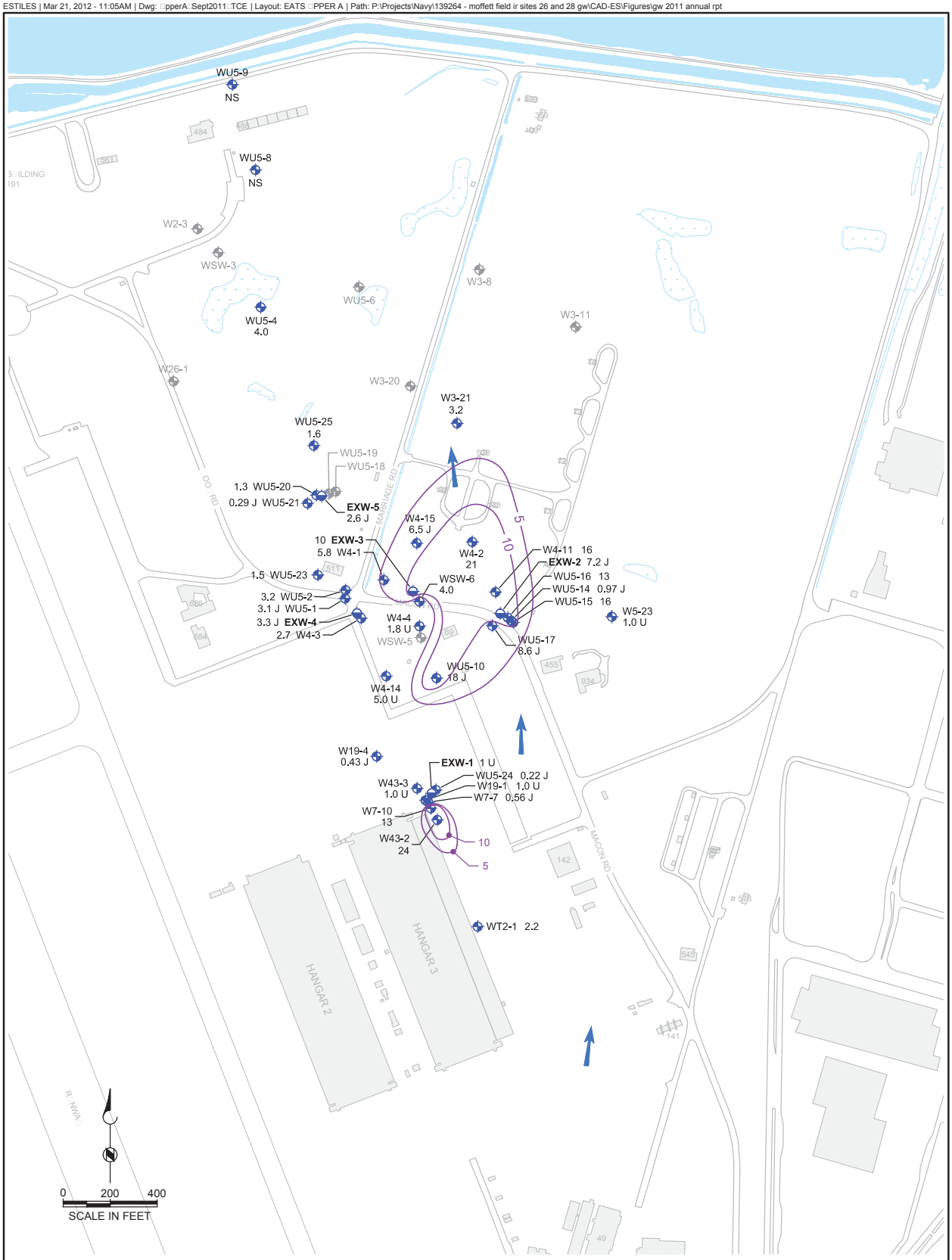


Figure 3-29 WU5-25 (Upper Portion of the A Aquifer)





Notes:
VOCs - Volatile Organic Compounds
µg/L - micrograms per liter
TCE - trichloroethene; cis-1,2-DCE - cis-1,2,-dichloroethene; PCE - tetrachloroethene; VC - vinyl chloride
Open symbols indicate non-detect values. Yellow symbols indicate estimated values. Closed-line colored symbols indicate concentrations detected.
Non-detects are plotted at the reporting limits.



EXPLANATION

EXW-5 2.3 J — NAV□ EXTRACTION WELL TCE CONCENTRATION (µg/L)

W7-10 14 J — NAV□ MONITORING WELL TCE CONCENTRATION (µg/L)

GRO□NDWATER FLOW DIRECTION

WSW-5 — REMOVED FROM SAMPLING SCHEME BASED ON APPROVED SCHED□LE IN SAP

5 — TCE ISOCONCENTRATION CONTO□R

ROAD

□ ESTIMATED VAL□E

□ NOT REPORTED AT OR ABOVE REPORTING LIMIT

NS NOT SAMPLED □WELLS SAMPLED BIANN□ALL□

NOTE:
- GRO□NDWATER SAMPLES COLLECTED BETWEEN SEPTEMBER 21 AND 22, 2011
- FOR WELLS WITHIN 20ft APART THE HIGHEST CONCENTRATION WAS CONTO□RED

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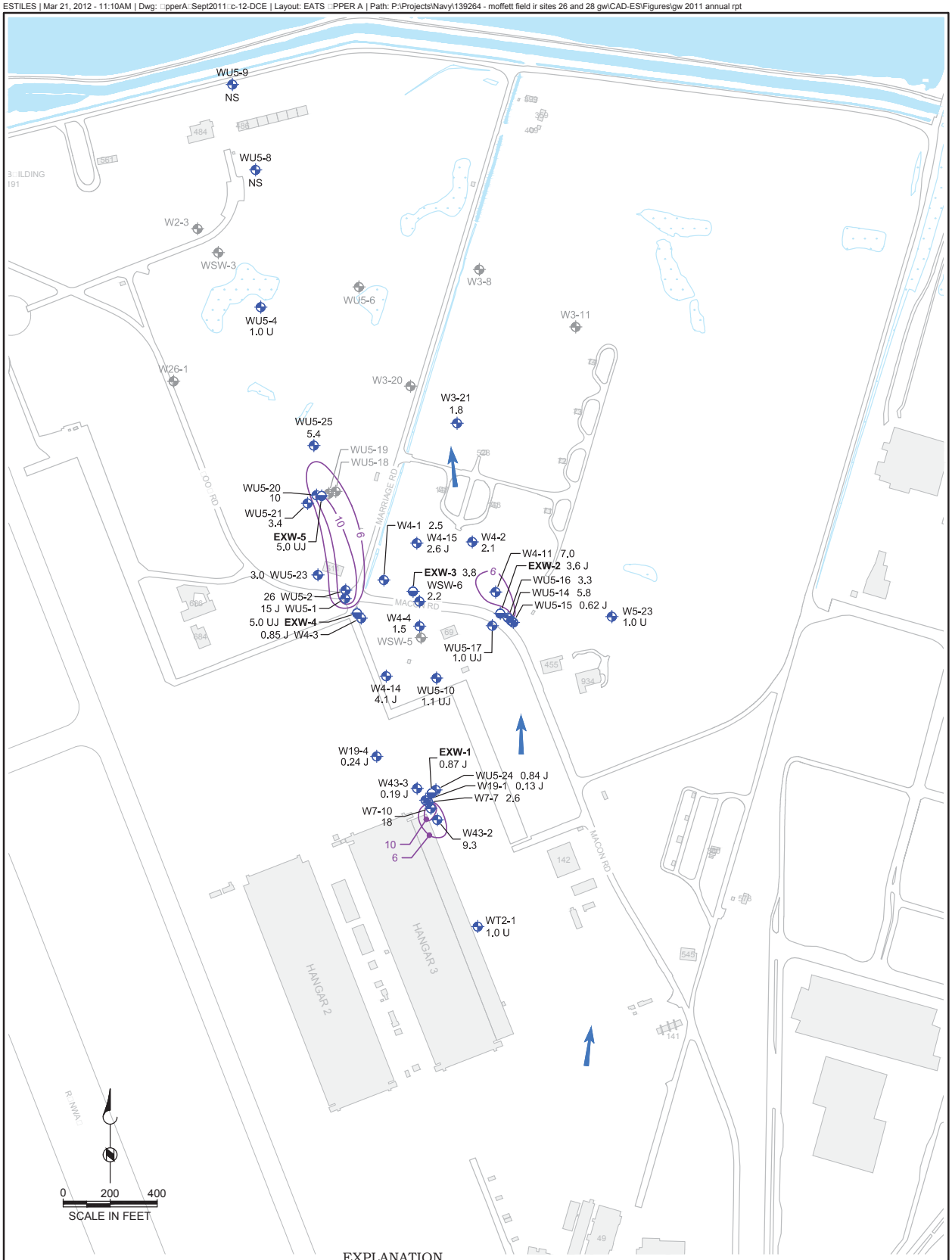
2011 ANNUAL GROUNDWATER REPORT FOR IR SITES 26 AND 28

Figure 3-30

TRICHLOROETHENE (TCE) DISTRIBUTION, IR SITE 26, UPPER PORTION OF THE A AQUIFER SEPTEMBER 2011

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA

ESTILES | Mar 21, 2012 - 11:10AM | Dwg: □pperA□Sept2011□c-12-DCE | Layout: EATS □PPER A | Path: P:\Projects\Navy\139264 - moffett field ir sites 26 and 28 gw\CAD-ES\Figures\gw 2011 annual rpt



EXPLANATION

EXW-5 2.3 J — NAV□ EXTRACTION WELL cis-1,2-DCE CONCENTRATION (µg/L)

W7-10 14 J — NAV□ MONITORING WELL cis-1,2-DCE CONCENTRATION (µg/L)

GRO□NDWATER FLOW DIRECTION

WSW-5 — REMOVED FROM SAMPLING SCHEME BASED ON APPROVED SCHED□LE IN SAP

6 — cis-1,2-DCE ISOCONCENTRATION CONTO□R

ROAD

□ ESTIMATED VAL□E

□ NOT REPORTED AT OR ABOVE REPORTING LIMIT

NS NOT SAMPLED □WELLS SAMPLED BIANN□ALL□

NOTE:
- GRO□NDWATER SAMPLES COLLECTED BETWEEN SEPTEMBER 21 AND 22, 2011
- FOR WELLS WITHIN 20ft APART THE HIGHEST CONCENTRATION WAS CONTO□RED

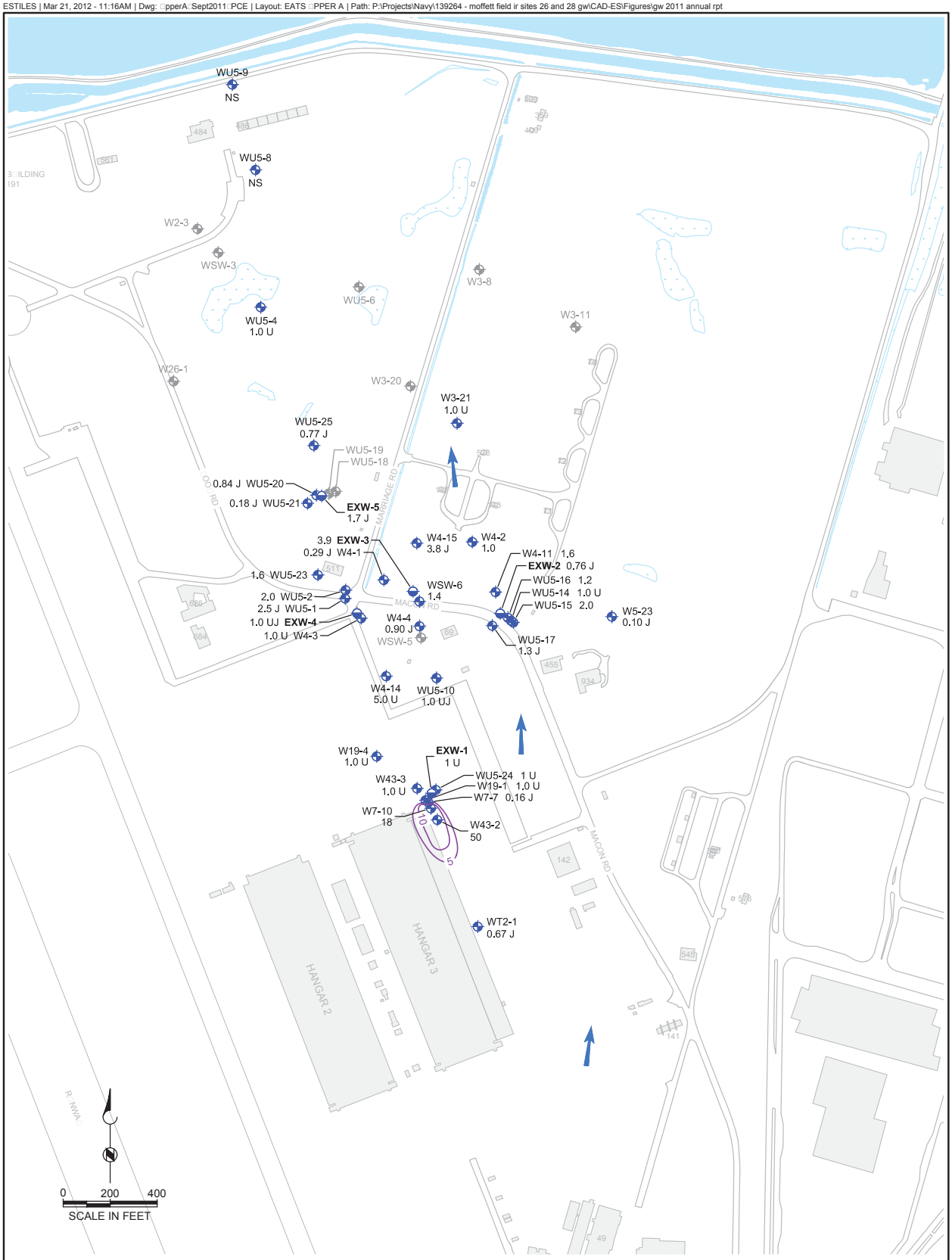
Brown AND Caldwell

2011 ANNUAL GROUNDWATER REPORT FOR IR SITES 26 AND 28

Figure 3-31

cis-1,2-DICHLOROETHENE (cis-1,2-DCE) DISTRIBUTION, IR SITE 26, UPPER PORTION OF THE A AQUIFER SEPTEMBER 2011

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA



EXPLANATION

EXW-5 2.3 J — NAV□ EXTRACTION WELL LOCATION PCE CONCENTRATION (µg/L)

W7-10 14 J — NAV□ MONITORING WELL LOCATION PCE CONCENTRATION (µg/L)

GRO□NDWATER FLOW DIRECTION

WSW-5 — REMOVED FROM SAMPLING SCHEME BASED ON APPROVED SCHED□LE IN SAP

5 — PCE ISOCONCENTRATION CONTO□R

ROAD

□ ESTIMATED VAL□E

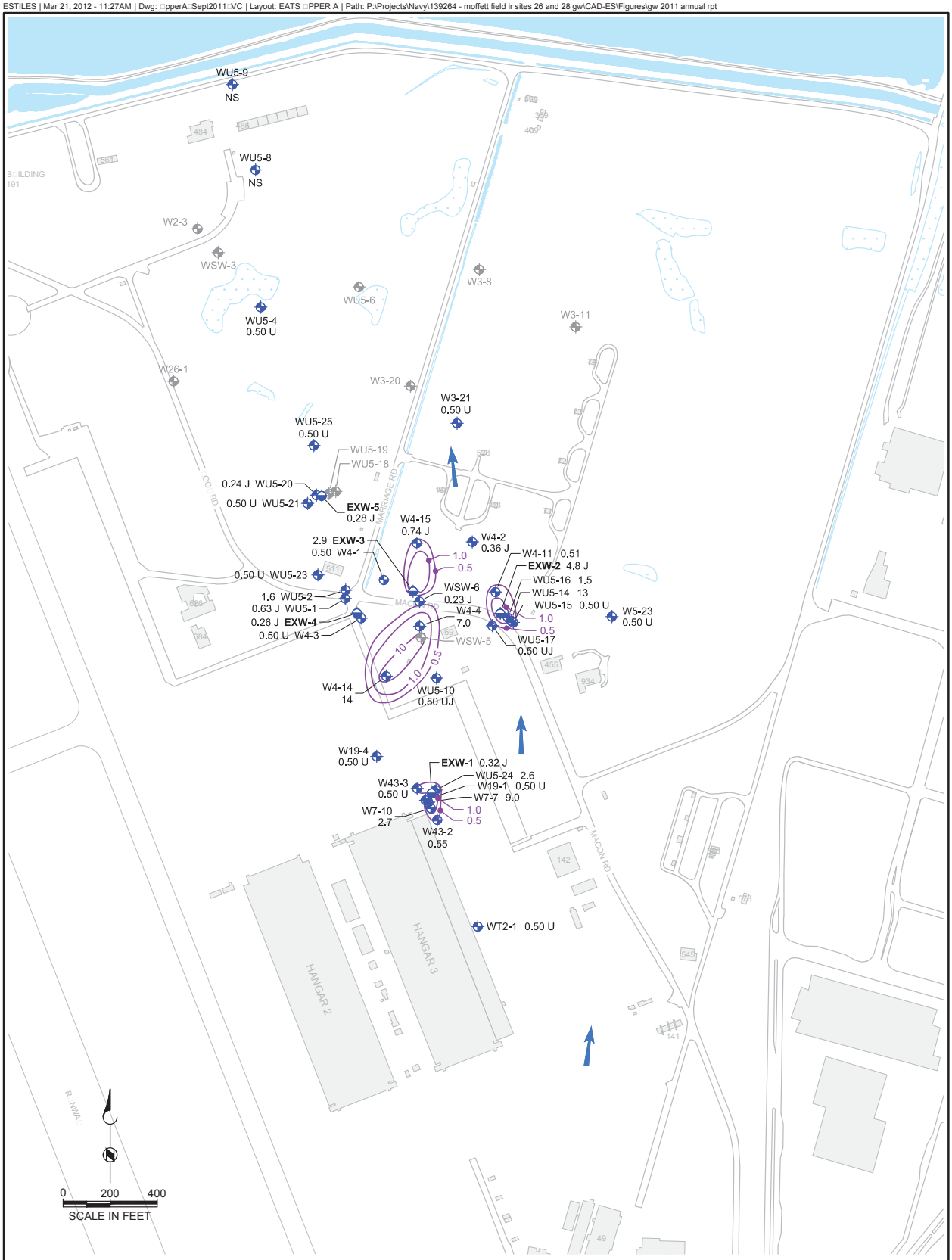
□ NOT REPORTED AT OR ABOVE REPORTING LIMIT

NS NOT SAMPLED □WELLS SAMPLED BIANN□ALL□

NOTE:
- GRO□NDWATER SAMPLES COLLECTED BETWEEN SEPTEMBER 21 AND 22, 2011
- FOR WELLS WITHIN 20ft APART THE HIGHEST CONCENTRATION WAS CONTO□RED

Brown AND Caldwell

2011 ANNUAL GROUNDWATER REPORT FOR IR SITES 26 AND 28
Figure 3-32
TETRACHLOROETHENE (PCE) DISTRIBUTION, IR SITE 26, UPPER PORTION OF THE A AQUIFER SEPTEMBER 2011
FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA



EXPLANATION

EXW-5 2.3 J — NAV□ EXTRACTION WELL VC CONCENTRATION (µg/L)

W7-10 14 J — NAV□ MONITORING WELL VC CONCENTRATION (µg/L)

GRO□NDWATER FLOW DIRECTION

NOTE:
- GRO□NDWATER SAMPLES COLLECTED BETWEEN SEPTEMBER 21 AND 22, 2011
- FOR WELLS WITHIN 20ft APART THE HIGHEST CONCENTRATION WAS CONTO□RED

WSW-5 — REMOVED FROM SAMPLING SCHEME BASED ON APPROVED SCHED□LE IN SAP

0.5 — VC ISOCONCENTRATION CONTO□R

ROAD

□ ESTIMATED VAL□E

□ NOT REPORTED AT OR ABOVE REPORTING LIMIT

NS NOT SAMPLED □WELLS SAMPLED BIANN□ALL□

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2011 ANNUAL GROUNDWATER REPORT FOR IR SITES 26 AND 28

Figure 3-33

VINYL CHLORIDE (VC) DISTRIBUTION, IR SITE 26, UPPER PORTION OF THE A AQUIFER SEPTEMBER 2011

FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA

Figure 4-1a
2011 Low-Flow and PDB RPD Versus VOC Concentration

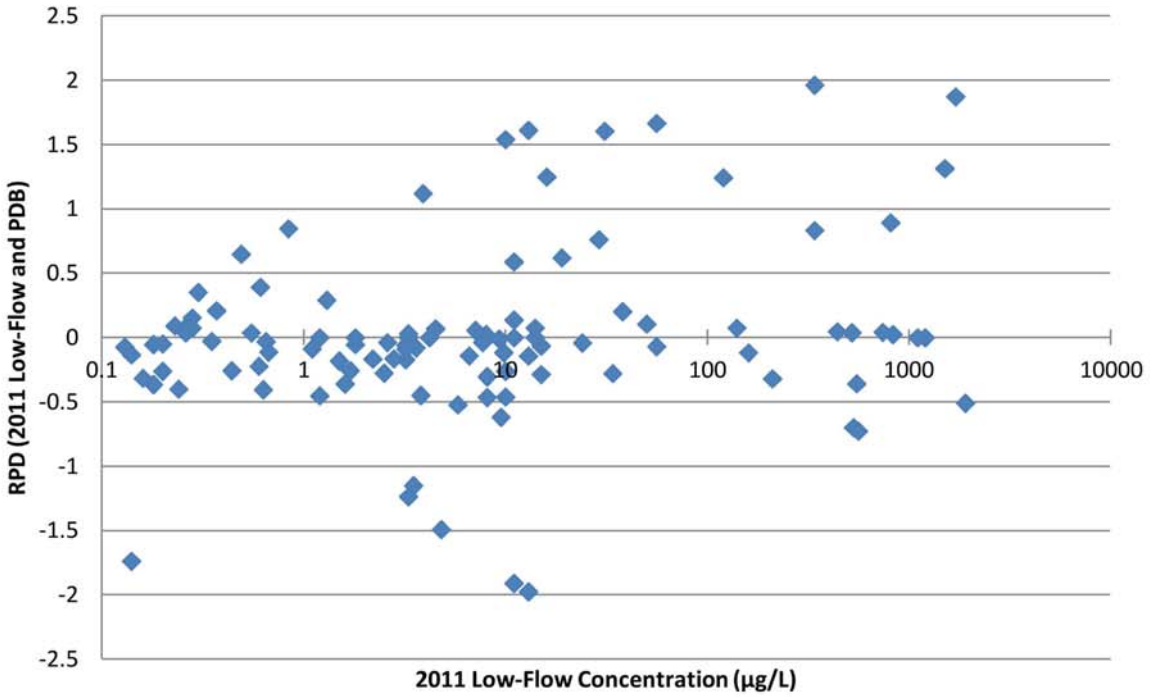
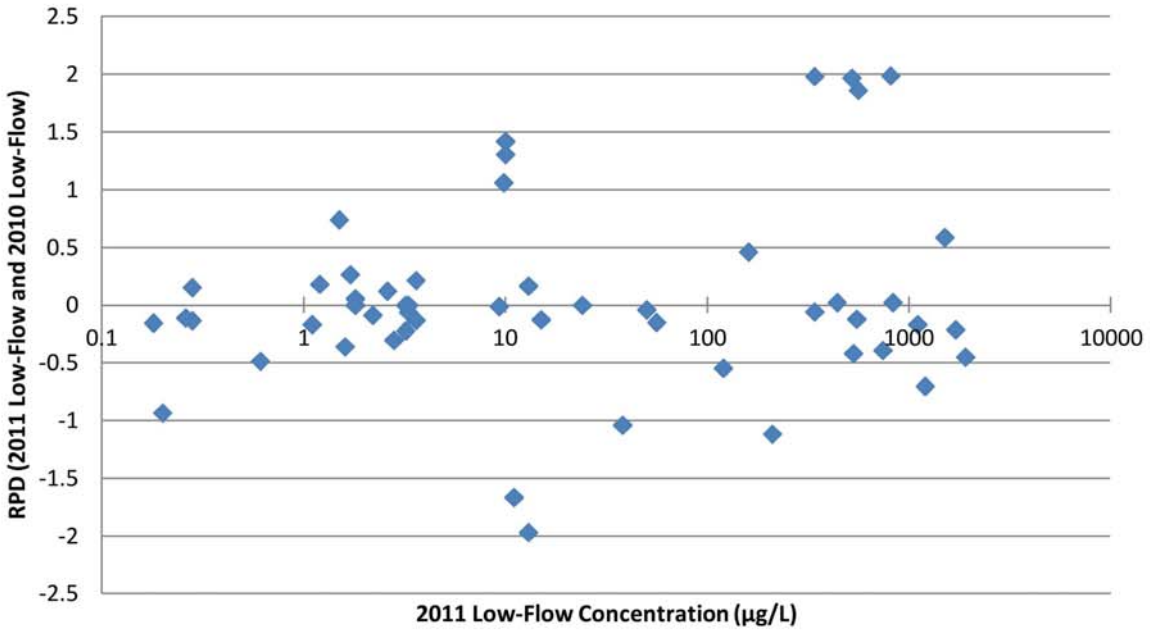


Figure 4-1b
2011 and 2010 Low-Flow RPD Versus VOC Concentration

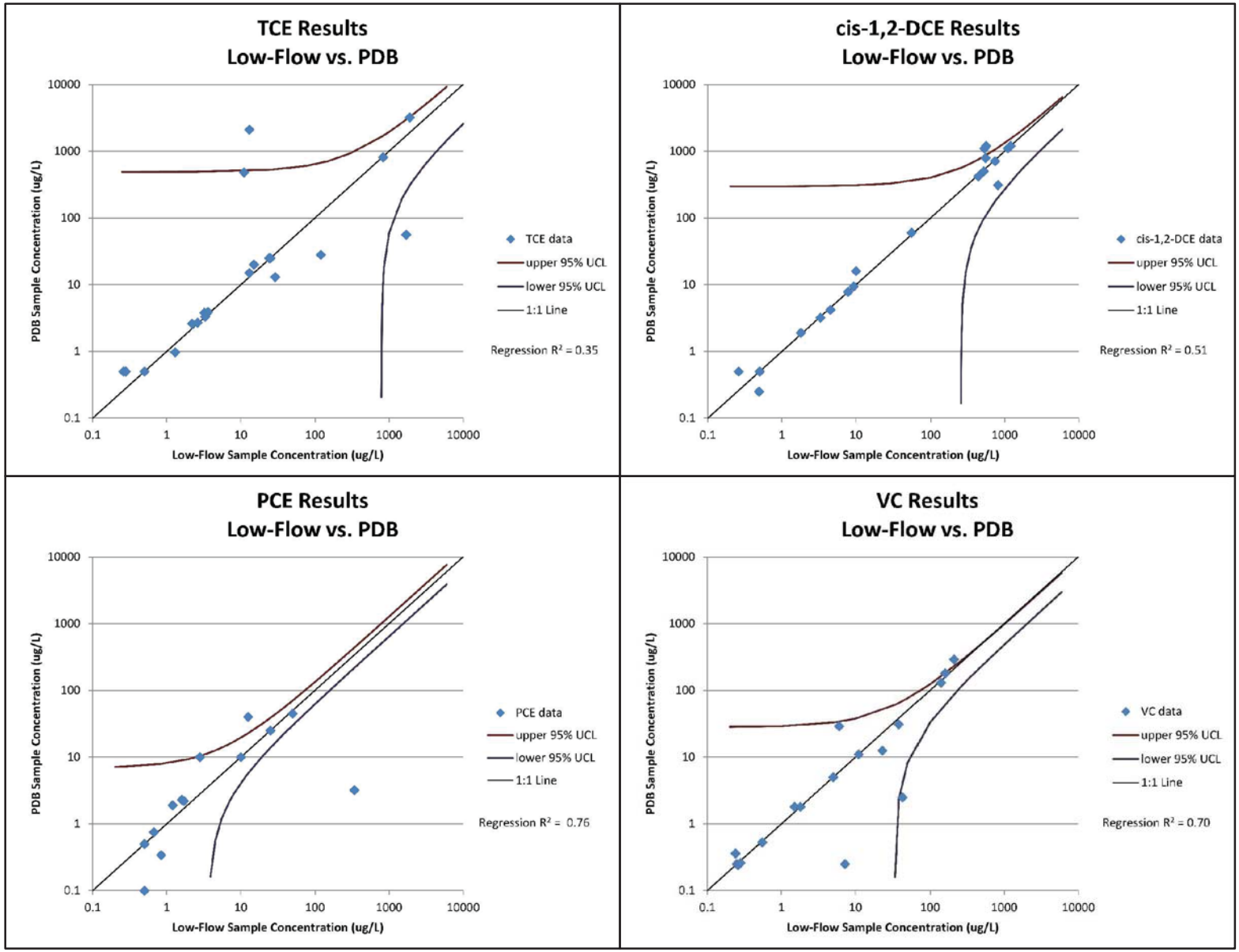


Brown AND Caldwell

EXPLANATION

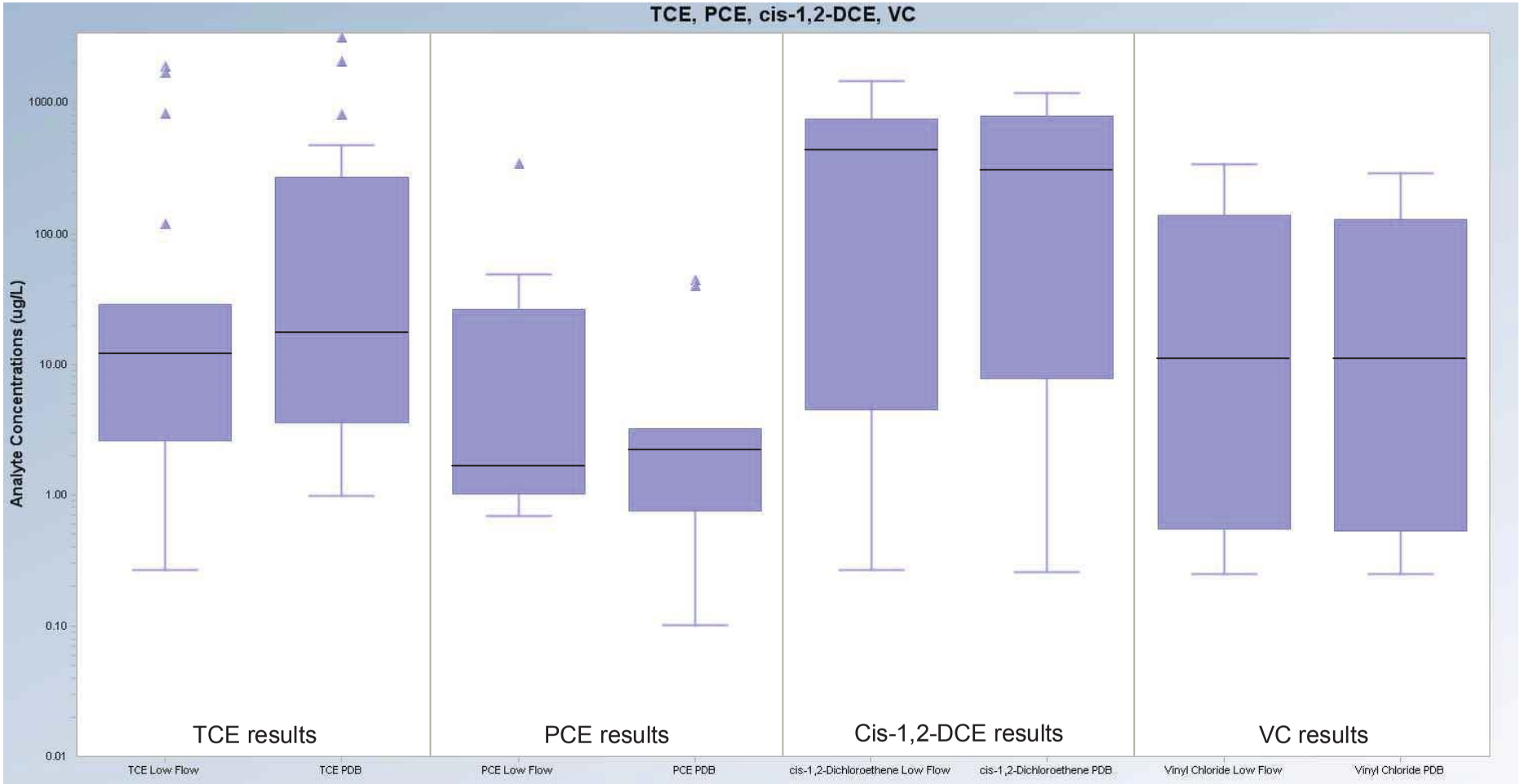
PDB	Passive diffusion bag
VOC	Volatile organic compounds
RDP	Relative percent difference

Figure 4-1
COMPARISON OF PDB
VERSUS LOW FLOW PAIRS
FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA

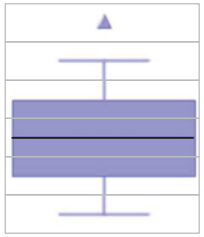


Brown AND Caldwell

Figure 4-2
PDB VERSUS LOW-FLOW RESULTS - REGRESSION PLOTS
FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA



EXPLANATION



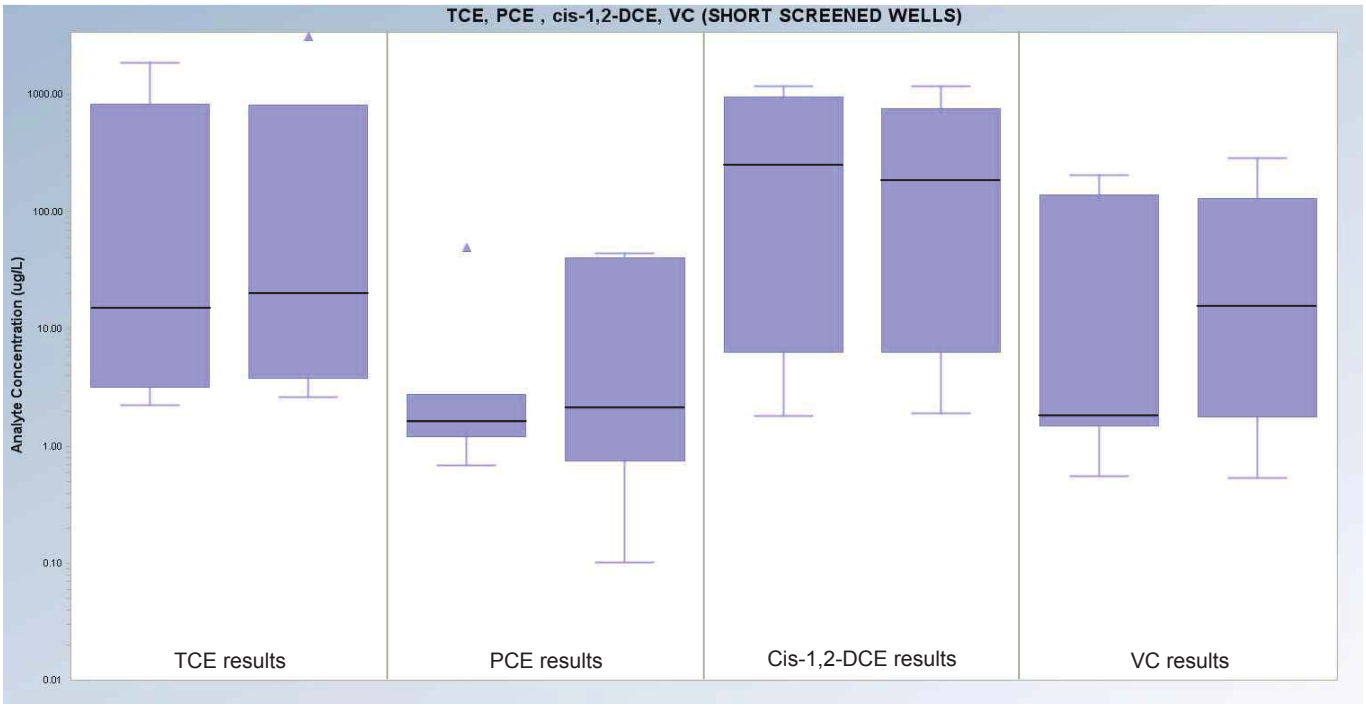
Outlier
Highest value not an outlier
Q3 - 75th percentile
Q2 - Median
Q1 - 25th percentile
Lowest value not an outlier

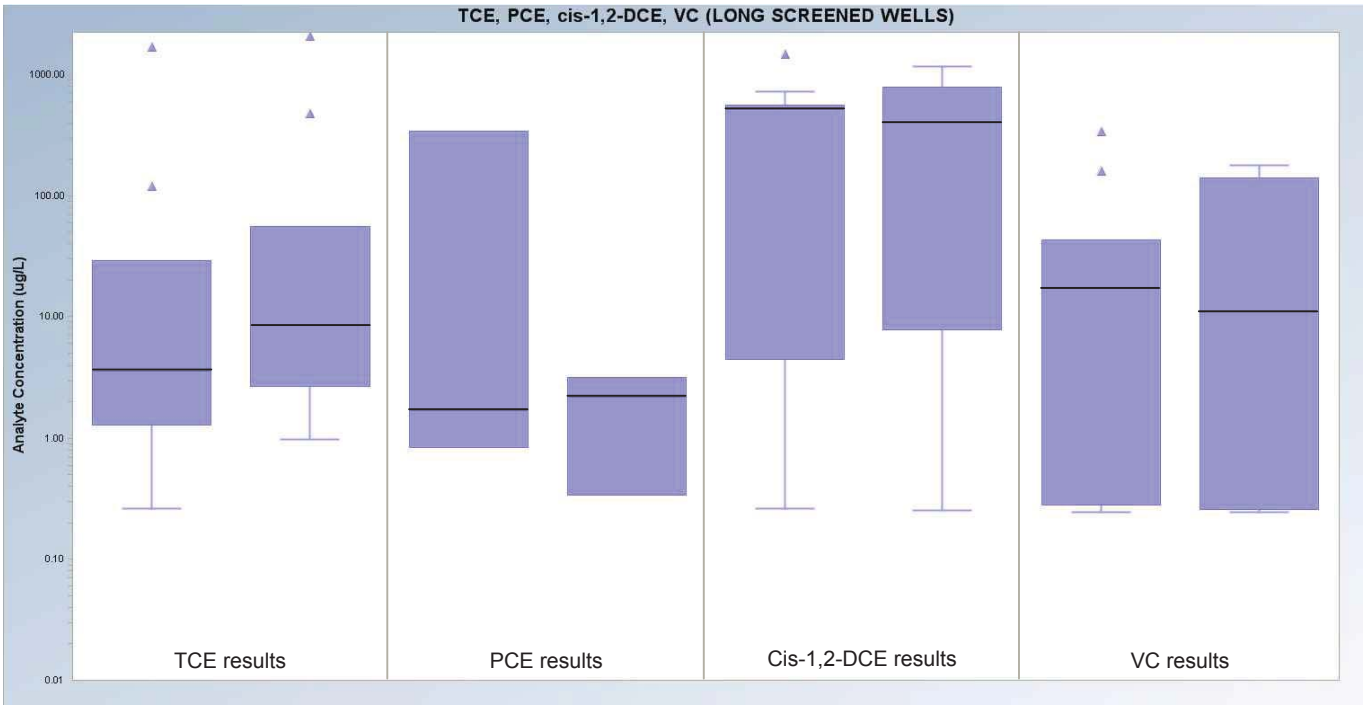
Note: An outlier is defined by the following two equations, where IQR = Q3 - Q1

1) Outlier > Q3 + 1.5 x IQR or 2) Outlier < Q1 - 1.5 x IQR

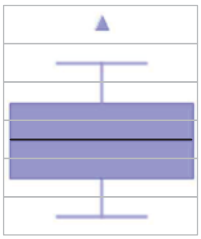
Brown AND Caldwell

Figure 4-3
PDB AND LOW-FLOW RESULTS
FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA





EXPLANATION



Outlier
Highest value not an outlier
Q3 - 75th percentile
Q2 - Median
Q1 - 25th percentile
Lowest value not an outlier

Note: An outlier is defined by the following two equations, where IQR = Q3 - Q1
1) Outlier > Q3 + 1.5 x IQR or
2) Outlier < Q1 - 1.5 x IQR

Brown AND Caldwell

Figure 4-4
BOX PLOTS
SHORT SCREENED
VERSUS LONG
SCREENED
FORMER NAS MOFFETT FIELD
MOFFETT FIELD, CALIFORNIA

ESTILES | Apr 11, 2012 - 12:37PM | Dwg: Box Plots | Layout: BOX PLOTS 2 | Path: P:\Projects\Navy\139264 - Moffett Field IR Sites 26 and 28 GW\CAD-ES\Figures\GW 2011 Annual Rpt

APPENDIX A

PROGRESS TOWARD COMPLETING FIVE-YEAR REVIEW RECOMMENDATIONS