Headquarters U.S. Air Force

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Mather Groundwater Cleanup

Presentation to the Sacramento Central Groundwater Authority Board of Directors
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Overview

- Four groundwater solvent plumes are associated with sources at Mather; contamination from the Inactive Rancho Cordova Test Site also underlies parts of Mather (Nov 2010 briefing by CVRWQCB)
- The Air Force began remedial investigations in 1982, and has been pumping and treating groundwater at Mather since 1994
- As of the end of 2010, about 10 billion gallons treated, and over 4000 pounds of contaminants removed. Combined pumping rate about 1600 gallons per minute; All but 100 gpm reinjected into aquifer

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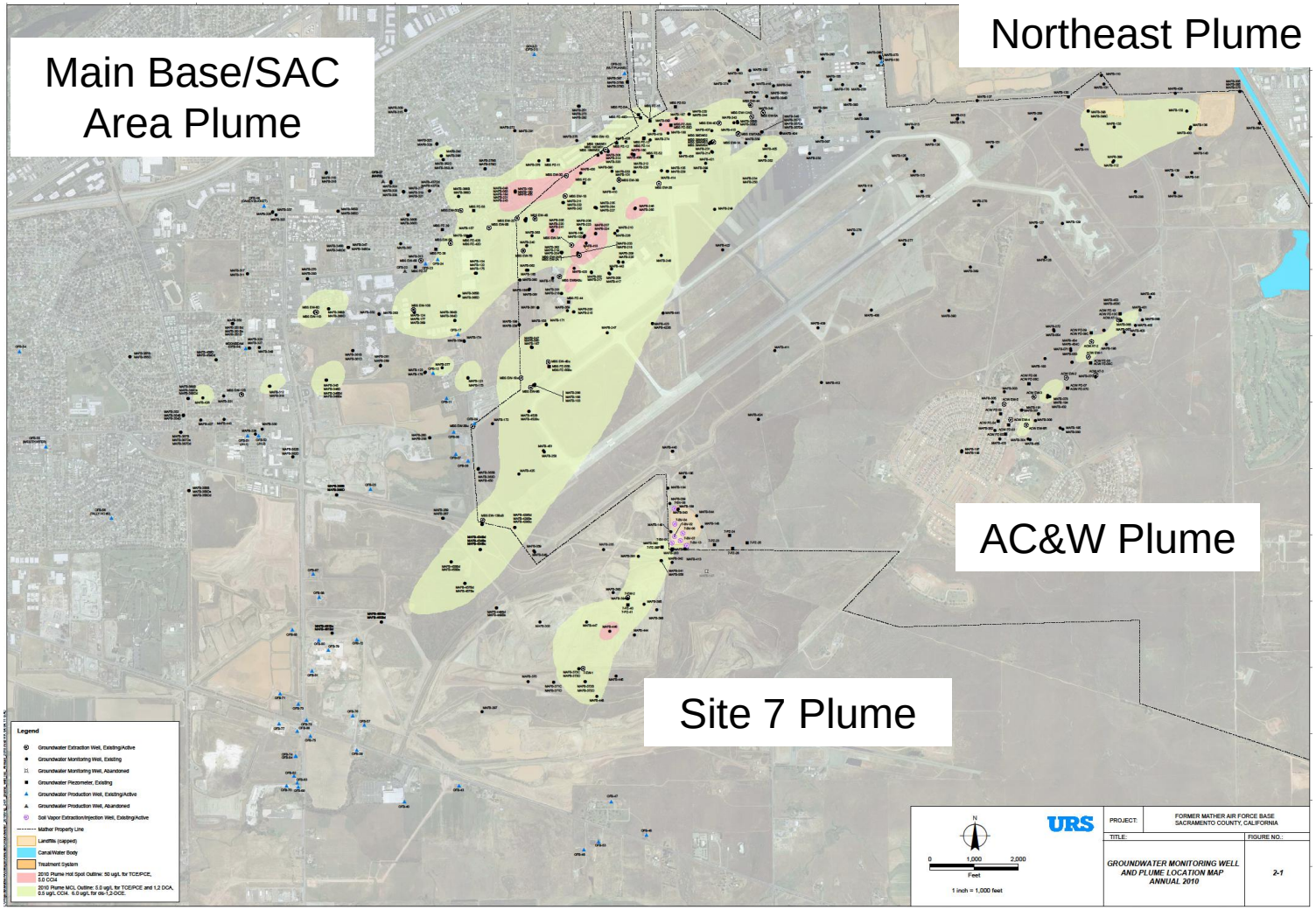
Mather Plume Map



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Main Base/SAC Area Plume

- Extends from multiple sources in the Main Base and Strategic Air Command Areas of Mather westward off base past Bradshaw to about Mayhew, and southwestward off base beneath gravel pits
- Reaches depths of almost 200 feet below sea level at concentrations exceeding aquifer cleanup levels
- Predominant contaminants of concern are PCE, TCE, and carbon tetrachloride, with cleanup levels of 5, 5, and 0.5 ug/L
- 24 extraction wells operating in 2011, with combined rate of up to 1575 gallons per minute; total concentration of volatile organic contaminants is about 15 ug/L
- Treated water is reinjected to deeper aquifer zone; seasonally some is used for street-side irrigation. Surface-water discharge structure has been built as alternative but not used to date.

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MBSA Area Plume (continued)

- MBSA plume has impacted several water supply wells:
- 1980's - Air Force provided alternate water for residents just west of Mather (Happy Lane, Mather Camellia Mobile Home Park, Old Placerville Road)
- 1997 – Air Force installed well-head treatment at the Citizens Utilities (now California American) well at Moonbeam Drive and at Sacramento County's Juvenile Hall water system
- Low concentrations (< 1 ug/L PCE and/or TCE) have also been observed at three other CUCC/Cal Am wells
- The Air Force samples public supply wells quarterly, private wells monthly

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Site 7 Plume

- Extends from a disposal site on the south side of Mather off base about 4000 feet toward Jackson Highway, and to depths of about 60 feet below sea level
- Predominant contaminants of concern are PCE and TCE, both with cleanup levels of 5 ug/L
- Two extraction wells operate in 2011 with combined a combined rate of about 55 gpm. Total volatile organic contaminant influent concentration is about 20 to 22 ug/L; maximum concentration in plume is about 80 ug/L total VOCs (near-souce)
- All treated water is reinjected to adjacent aquifer

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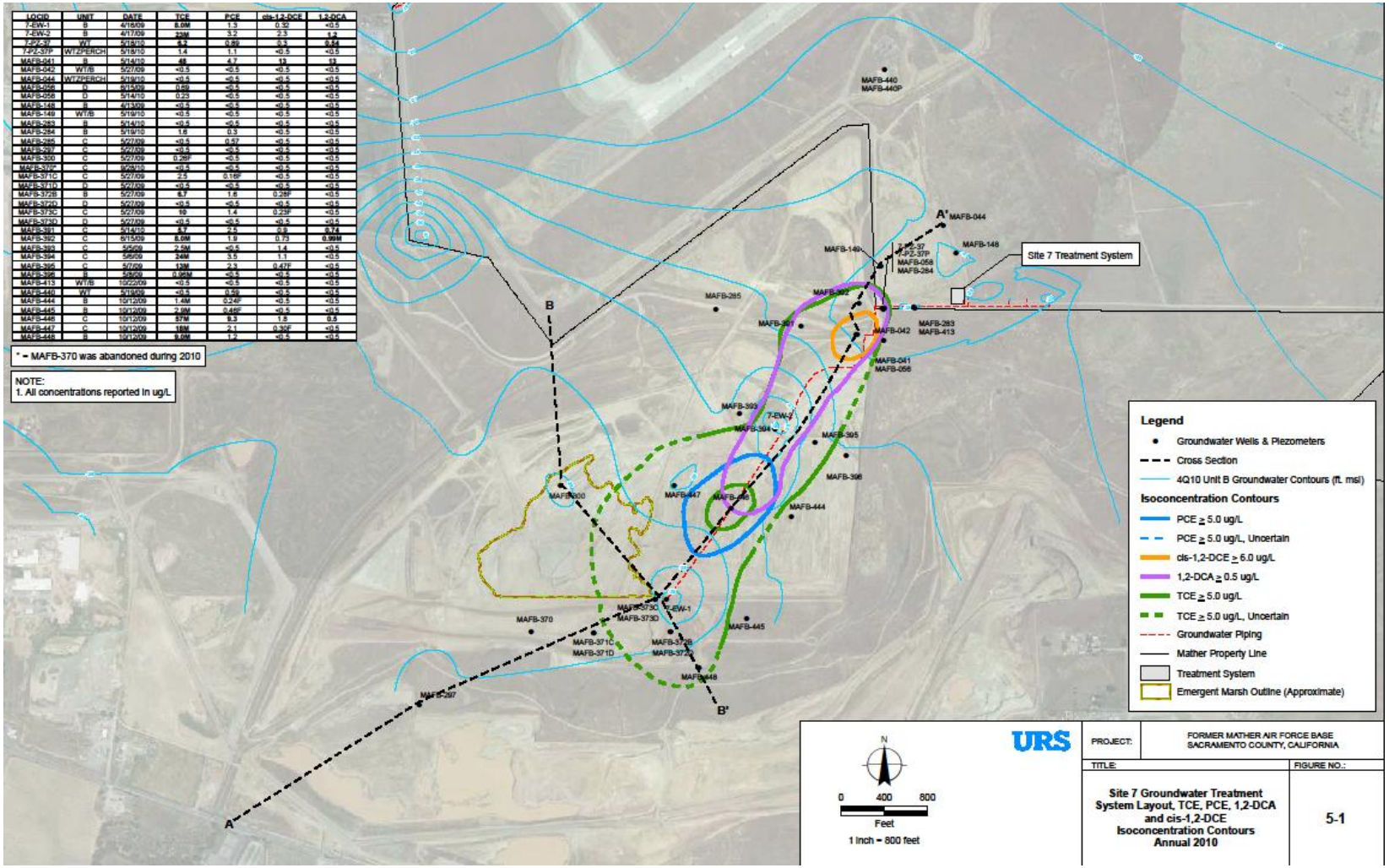
Site 7 Plume Map



LOCID	UNIT	DATE	TCE	PCE	cis-1,2-DCE	1,2-DCA
7-EW-1	B	4/16/09	8.6M	1.3	0.32	<0.5
7-EW-2	B	4/17/09	23M	3.2	2.3	1.2
7-PZ-37	WT	5/18/10	8.2	0.89	0.5	0.54
7-PZ-37P	WT/ZPERCH	5/18/10	1.4	1.1	<0.5	<0.5
MAFB-041	B	5/14/10	46	4.7	13	13
MAFB-042	WT/B	5/27/09	<0.5	<0.5	<0.5	<0.5
MAFB-044	WT/ZPERCH	5/19/10	<0.5	<0.5	<0.5	<0.5
MAFB-056	B	5/14/10	0.56	<0.5	<0.5	<0.5
MAFB-058	D	5/14/10	0.23	<0.5	<0.5	<0.5
MAFB-148	B	4/13/09	<0.5	<0.5	<0.5	<0.5
MAFB-149	WT/B	5/19/10	<0.5	<0.5	<0.5	<0.5
MAFB-283	B	5/14/10	<0.5	<0.5	<0.5	<0.5
MAFB-284	B	5/19/10	1.6	0.3	<0.5	<0.5
MAFB-285	C	5/27/09	<0.5	0.57	<0.5	<0.5
MAFB-297	C	5/27/09	<0.5	<0.5	<0.5	<0.5
MAFB-300	C	5/27/09	0.26F	<0.5	<0.5	<0.5
MAFB-370*	C	9/29/10	<0.5	<0.5	<0.5	<0.5
MAFB-371C	C	5/27/09	2.5	0.16F	<0.5	<0.5
MAFB-371D	D	5/27/09	<0.5	<0.5	<0.5	<0.5
MAFB-372B	B	5/27/09	6.7	1.6	0.28F	<0.5
MAFB-372D	D	5/27/09	<0.5	<0.5	<0.5	<0.5
MAFB-373C	C	5/27/09	99	1.4	0.23F	<0.5
MAFB-373D	D	5/27/09	<0.5	<0.5	<0.5	<0.5
MAFB-391	C	5/14/10	8.7	2.5	0.8	0.74
MAFB-392	C	5/15/09	8.6M	1.9	0.75	0.99M
MAFB-393	C	5/5/09	2.5M	<0.5	1.4	<0.5
MAFB-394	C	5/6/09	24M	3.5	1.1	<0.5
MAFB-395	C	5/7/09	12M	2.3	0.47F	<0.5
MAFB-396	B	5/8/09	0.95M	<0.5	<0.5	<0.5
MAFB-413	WT/B	10/22/09	<0.5	<0.5	<0.5	<0.5
MAFB-440	WT	5/19/09	<0.5	0.59	<0.5	<0.5
MAFB-444	B	10/12/09	1.4M	0.24F	<0.5	<0.5
MAFB-445	B	10/12/09	2.9M	0.46F	<0.5	<0.5
MAFB-446	C	10/12/09	57M	9.3	1.8	0.8
MAFB-447	C	10/12/09	18M	2.1	0.30F	<0.5
MAFB-448	B	10/12/09	9.0M	1.2	<0.5	<0.5

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Aircraft Control & Warning (AC&W) Plume

- Extends from the source area near the AC&W radar 'golf ball' about 4000 feet southwesterly and beneath the margin of the former Mather Family Housing area, now Independence at Mather
- The only contaminant of concern is TCE with a cleanup level of 5 ug/L
- Six extraction wells operate in 2011 with a combined rate of about 106 gpm. TCE influent concentration is 5 to 6 ug/L; maximum concentration in plume about 18 ug/L
- Treated water is discharged to Mather Lake, although up to 50 gpm may be diverted for irrigation (has not been used for many years)

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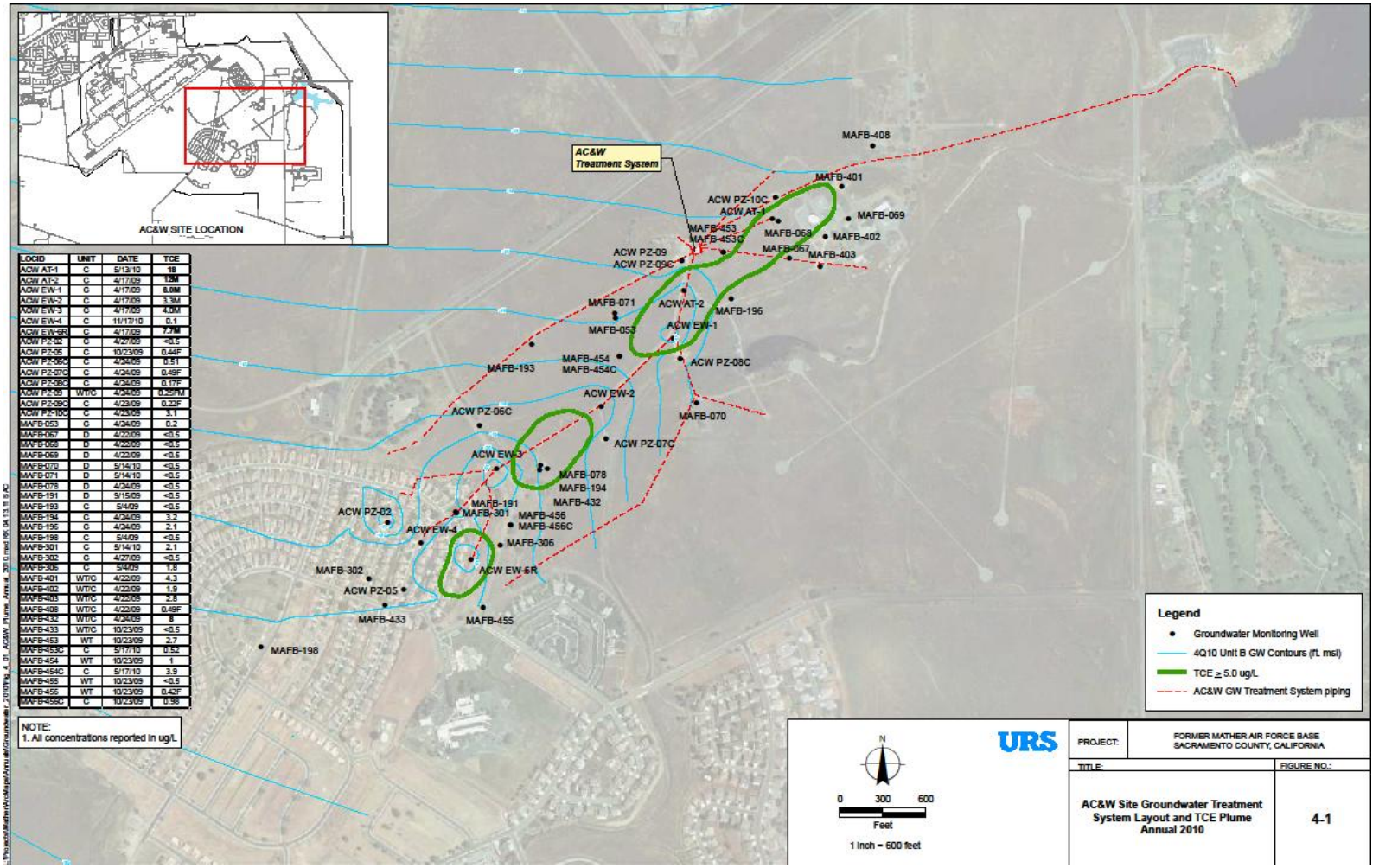
AC&W Plume Map



LOCID	UNIT	DATE	TCE
ACW AT-1	C	5/13/10	18
ACW AT-2	C	4/17/09	12M
ACW EW-1	C	4/17/09	6.0M
ACW EW-2	C	4/17/09	3.3M
ACW EW-3	C	4/17/09	4.0M
ACW EW-4	C	11/17/10	0.1
ACW EW-6R	C	4/17/09	7.7M
ACW PZ-02	C	4/27/09	<0.5
ACW PZ-05	C	10/23/09	0.44F
ACW PZ-06C	C	4/24/09	0.51
ACW PZ-07C	C	4/24/09	0.49F
ACW PZ-08C	C	4/24/09	0.17F
ACW PZ-09	WTC	4/24/09	0.25FM
ACW PZ-09C	C	4/23/09	0.22F
ACW PZ-10C	C	4/23/09	3.1
MAFB-053	C	4/24/09	0.2
MAFB-067	D	4/22/09	<0.5
MAFB-068	D	4/22/09	<0.5
MAFB-069	D	4/22/09	<0.5
MAFB-070	D	5/14/10	<0.5
MAFB-071	D	5/14/10	<0.5
MAFB-078	D	4/24/09	<0.5
MAFB-191	D	9/15/09	<0.5
MAFB-193	C	5/4/09	<0.5
MAFB-194	C	4/24/09	3.2
MAFB-196	C	4/24/09	2.1
MAFB-198	C	5/4/09	<0.5
MAFB-301	C	5/14/10	2.1
MAFB-302	C	4/27/09	<0.5
MAFB-306	C	5/4/09	1.8
MAFB-401	WTC	4/22/09	4.3
MAFB-402	WTC	4/22/09	1.9
MAFB-403	WTC	4/22/09	2.8
MAFB-408	WTC	4/22/09	0.49F
MAFB-432	WTC	4/24/09	8
MAFB-433	WTC	10/23/09	<0.5
MAFB-453	WT	10/23/09	2.7
MAFB-453C	C	5/17/10	0.52
MAFB-454	WT	10/23/09	1
MAFB-454C	C	5/17/10	3.9
MAFB-455	WT	10/23/09	<0.5
MAFB-456	WT	10/23/09	0.42F
MAFB-456C	C	10/23/09	0.38

NOTE:
1. All concentrations reported in ug/L

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Northeast Plume

- Sources at landfills; historically extended to southwest in gravel aquifer horizon. Now extent is limited as water table has dropped into underlying silty aquifer material
- Contaminants of concern are PCE and cis-1,2-DCE with aquifer cleanup levels of 5 and 6 ug/L respectively. Maximum concentrations at about 30 ug/L for each
- Remedy is long-term monitoring and institutional controls, in concert with 1996 capping or excavation of source landfills to eliminate rainwater percolating through the landfill waste

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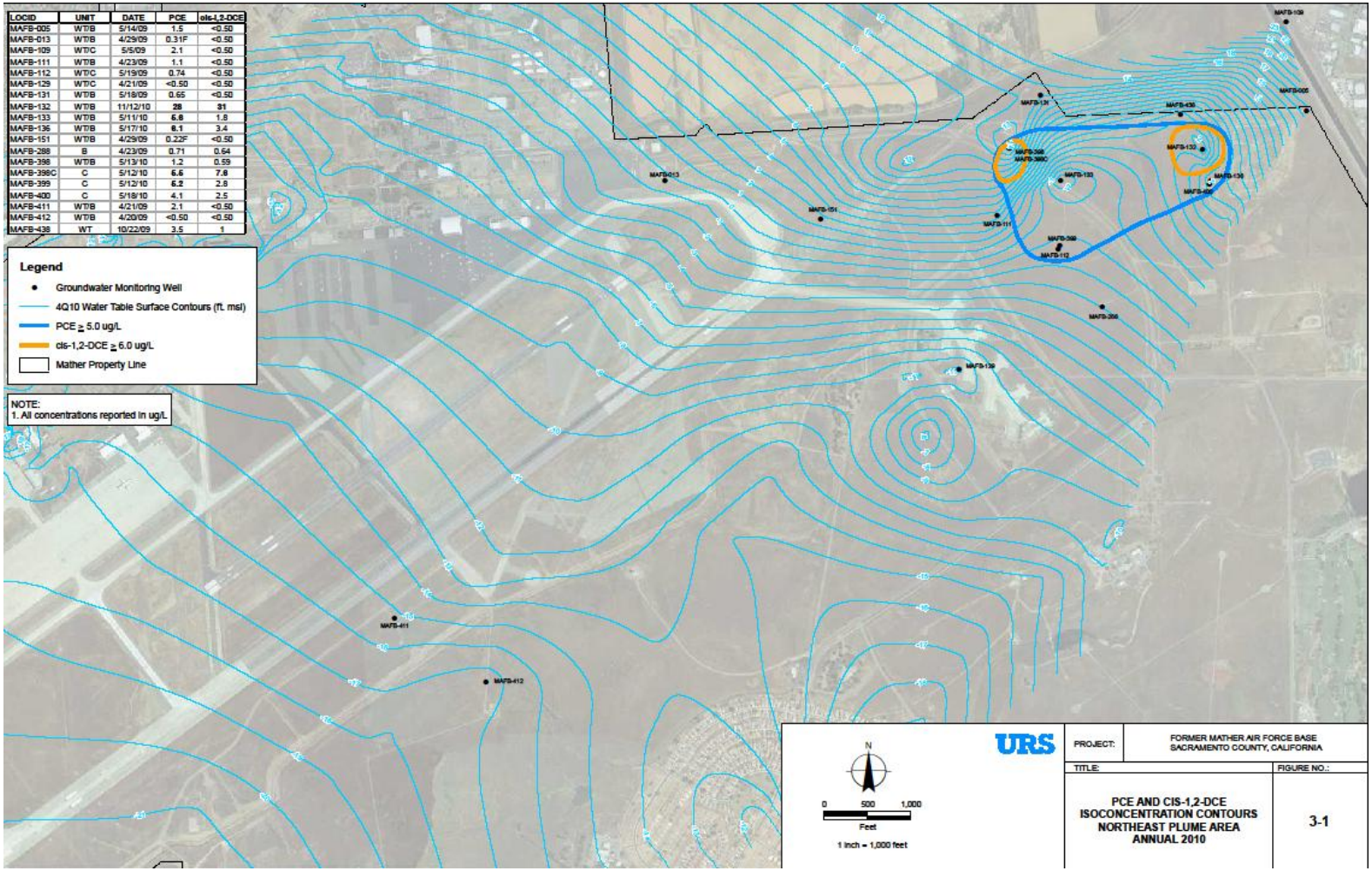
Northeast Plume Map



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Background

- Mather AFB operated from 1917 through 1993, primarily as a training base but also hosting a wing of the Strategic Air Command
- Groundwater contamination discovered in 1979 in some Mather supply wells; CVRWQCB also discovered contamination in some off-base private wells
- Air Force Installation Restoration Program began with Records Search at Mather in 1982
- Mather AC&W Plume listed on National Priorities List in 1987
- Mather announced for closure and remainder of base placed on NPL IN 1989

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Remedial Action Timeframes

- **Aircraft Control and Warning (AC&W) Plume: 1995 to approx 2020**
- **Main Base/SAC Area Plume: 1998 to approx 2050**
- **Site 7 Plume: 1998 to approx 2040**
- **Northeast Plume (passive): 1996 to approx**

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Decision Documents

- Records of Decision
  - Aircraft Control and Warning (AC&W) Operable Unit (OU-1)
    - ROD Signed Dec. 28, 1993
  - Groundwater OU (OU-2)
    - ROD Signed June, 1996
- Explanation of Significant Differences
  - AC&W
    - 1997 - changed from injection to surface-water discharge
    - 2008 - added institutional controls
  - Groundwater OU
    - 2010 - clarified and added institutional controls

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Mather Groundwater Reports

- Monthly letter reports are provided for supply well sampling
- Quarterly data is reported in a ‘fact sheet’ format with minimal interpretation
- Annual reports provide plume maps, potentiometric maps, evaluation of performance, and recommendations

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Where to find documents

- **Scanned images of documents are maintained at:**

https://afrpaar.lackland.af.mil/ar/docsearch.aspx

(select Mather from facility list; useful search categories are dates and key words)

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Questions?

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