June 16, 2009
Project: Cedar Chemical Company Project Number 013636

Mr. Ryan Benefield, P.E.
Arkansas Department of Environmental Quality (ADEQ)
5301 Northshore Drive
North Little Rock, Arkansas 72218

Subject: Final Response to Comments on the Facility Investigation (FI) Report for Former Cedar Chemical Company Facility (February, 2009) and the ADEQ Approval of the Response to Comments dated June 4, 2009
EPA ID Number ARD990660649, AFIN 54-00068

Dear Ryan:

On behalf of Exxon Mobil Chemical Company and Helena Chemical Company, AMEC Geomatrix, Inc., (AMEC) is pleased to provide the Arkansas Department of Environmental Quality (ADEQ) with the final change pages for insertion into the FI Report for the above-referenced facility. The FI Report was submitted to ADEQ in February 2009. ADEQ issued comments requesting additional clarification on certain items in a letter dated April 22, 2009. Our comments to that letter were provided to the ADEQ on May 29th 2009 and the ADEQ approved the comments on June 4, 2009. Based on the approval, the following change pages are provided. Please substitute the following pages in your copies of the FI Report:

Table of Contents Page ii should be replaced with attached Table of Contents Page ii,
Page 20 should be substituted with the attached Page 20,
Page 25 should be substituted with the attached Page 25,
Table 11 should be replace with the attached Table 11,
Table 11A should be inserted behind Table 11,
Trend Plots should be inserted behind Table 11A,
Figure 2 should be replaced with the attached Figure 2, and
Figure 5 should be replaced with the attached Figure 5.

Sincerely yours,
AMEC Geomatrix, Inc.

Kelly Beck, P.G.
Sr. Project Manager

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AMEC Geomatrix

Enclosure: Final Revised FI Information

cc: Dave Roberson (DeMaximis, Inc. 2203 TImberloch Place, Suite 2132, The Woodlands, TX 77380
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Dave Backus (EnSafe., 5724 Summer Trees Drive, Memphis TN 38134)
Allan Gates (Mitchell Williams Selig Gates & Woodyard, PLLC, 425 West Capitol Ave, Suite 1800, Little Rock, Arkansas.72201-3525)
Kevin Vaughan (ExxonMobil Corporation, 3225 Gallows Road, Fairfax, VA 22037)

Text Changes

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Page 20 should be substituted with the attached Page 20
Page 25 should be substituted with the attached Page 25

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Volatile and Semi-Volatile Organic Constituents

The VOCs and SVOCs observed in soils include scattered low detections of acetone and methylene chloride. These compounds have historically been observed in trip and field blanks. This observation, and experience at other sites would suggest that at least some of the detections of these compounds in soil are likely artifacts of sampling and/or analytical procedures. Despite this, concentrations in certain soil samples and in Perched Zone groundwater are too high to be explained as laboratory or sampling artifacts, and both these compounds were believed to have been utilized at the Facility. Acetone and methylene chloride are therefore included as COCs for the Facility.

Organochlorine Pesticides in Soils

Organochlorine pesticides, (aldrin, alpha-BHC, beta-BHC, chlordane, dieldrin, endrin, gamma-BHC [lindane], methoxychlor) were detected in surface and subsurface soils throughout the facility at locations in the Process Areas, in backfill from samples collected within the Drum Vault, and in a few background samples above a regulatory standard.

Backfill samples collected from two locations within the Drum Vault contained only one pesticide, 4-chloroaniline. The concentration of this COC ranged from 5.0 to 11 mg/kg. The water sample collected from Test Hole #1 in the Drum Vault contained several pesticides and herbicides. These included 4-chloroaniline (47000 ug/l), dinoseb (350 ug/l), and propanil (2800 ug/l). Soil and water analytical results from the Drum Vault are presented in Tables 6 and 7.

Metals in Soils

Soils were analyzed for a range of metals at most of the DPT locations. These were compared to values observed in background sampling locations. In general, metal concentrations observed in on-site soils were consistent with the ranges observed in off-site soils that are not believed to be affected by historical Facility operations.

One exception would be the detections of arsenic observed in soils from DPT-3, DPT-10 (near former Process Unit 3) and DPT-30, near the Facility Maintenance Building. The observed arsenic concentrations (ranging from 32.3 to 128 mg/kg) although relatively low, are well above observed background concentrations. This suggests there may have been minor localized releases of an arsenic source material in these areas. It is also possible, however, that these may be a relict of routine pesticide application around building exteriors at the Facility.

As shown in Table 11 and 11A, maximum concentrations of most constituents in the Perched Zone and Alluvial Aquifer groundwater have declined from historical highs. In the Perched Zone, examples include acetone, benzene, chloroform, propanil, 1,2-DCA, 1,2-DCB and dinoseb. Trend plots for these Perched Zone constituents are provided with Table 11A. In the Alluvial Aquifer, examples include 1,2-DCA (FI maximum of 19,000 ug/l vs historical maximum of 92,000 ug/l), 4-chloroaniline (FI maximum of 2,100 ug/l vs historical maximum of 8,700 ug/l), and dinoseb (FI maximum of 27 ug/l vs historical maximum of 980 ug/l). Most of the exceptions to this trend represent compounds that were detected at low levels during the FI, but that were not detected during the historical site investigations. Given that historical investigations of the Facility continued nearly to the end of Facility operations, these newly-observed low detections most likely represent either on-going improvements in analytical procedures or sampling in previously uninvestigated areas, rather than any new release from the Facility.

A large number of compounds that have historically been detected in Alluvial Aquifer groundwater were not detected in any FI samples. These include dieldrin, acetone, and trichloroethene (TCE). In addition, certain compounds that were formerly detected in off-site Alluvial Aquifer wells, such as 1,2-DCB, now appear to be largely constrained to groundwater in on-site areas.

In general, these trends indicate that contaminant levels and contaminant mass in the Alluvial Aquifer have declined significantly since operations concluded at the Facility. Although a conclusive evaluation of the data with respect to possible natural attenuation trends would require additional evaluation, the FI data does strongly suggest that such attenuation is occurring in the Alluvial Aquifer.

Table Changes

Table 11 should be replaced with the attached Table 11
Table 11A should be inserted behind Table 11

Table 11
Historical Comparison of Detections in Groundwater
Alluvial Aquifer
Cedar Chemical Corporation
Helena-West Helena, Arkansas

CCR[1]		FI[2] (Sept. 08 Data)	
Analyte	**Maximum observed concentration (ug/l)**	**Analyte**	**Maximum observed concentration (ug/l)**
Pesticides/Polychlorinated Biphenyls		**Pesticides/Polychlorinated Biphenyls**	
4,4'-DDT	0.074	~~4,4' DDT~~	
4,4'-DDD		4,4'-DDD	0.041 J
Aldrin		Aldrin	0.053 J
Alpha-BHC	0.07	alpha-BHC	0.01
alpha-Chlordane		alpha-Chlordane	0.0098
Aroclor-1016	0.07	~~Aroclor-1016~~	
beta-BHC		beta-BHC	0.046 J
Dieldrin	0.03	~~Dieldrin~~	
Dinoseb	980	Dinoseb	27
Endrin		Endrin	0.0081
gamma-BHC (Lindane)	0.2	gamma-BHC (Lindane)	0.059 J
Heptachlor	0.2	Heptachlor	0.076 J
Heptachlor epoxide		Heptachlor epoxide	0.098 J
Methoxychlor	0.13	Methoxychlor	0.018
Semivolatile Organic Compounds		**Semivolatile Organic Compounds**	
1,2-Dichlorobenzene	6800	1,2-Dichlorobenzene	1100
1,2-Dichloropropane	0.018	1,2-Dichloropropane	2.1
1,3-Dichlorobenzene	310	1,3-Dichlorobenzene	90
1,4-Dichlorobenzene	11	1,4-Dichlorobenzene	0.96 J
2,4-Dichlorophenol	57	2,4-Dichlorophenol	39
2,6-Dinitrotoluene	13	~~2,6-Dinitrotoluene~~	
2-Chloronaphthalene	13	2-Chloronaphthalene	13
2-Chlorophenol	110	2-Chlorophenol	3.6 J
2-Butanone (MEK)		2-Butanone (MEK)	3.7 J
2-Methylphenol (o-Cresol)	1200	2-Methylphenol (o-Cresol)	41
2-Hexanone		2-Hexanone	13
4-Chloroaniline	8700	4-Chloroaniline	2100 J
4-Methylphenol (p-Cresol)	660	3-Methylphenol & 4-Methylphenol	3.5 J
4-Methyl-2-Pentanone (MIBK)	2500	4-Methyl-2-pentanone (MIBK)	1.2
4-Nitrophenol	250	~~4-Nitrophenol~~	
Benzoic acid	1400	~~Benzoic acid~~	
Benzyl alcohol	110	~~Benzyl alcohol~~	
bis(2-Chloroethyl)ether	180	bis(2-Chloroethyl) ether	41
bis(2-Ethylhexyl)phthalate (BEHP)	31	bis(2-Ethylhexyl)phthalate (BEHP)	300
Carbon disulfide		Carbon disulfide	1.1
Diethylphthalate	1	~~Diethylphthalate~~	
Dimethylphthalate	6.3	~~Dimethylphthalate~~	
Di-n-butylphthalate	6.3	Di-n-butyl phthalate	1.8 J
Fluoranthene	980	~~Fluoranthene~~	
Isophorone	350	Isophorone	1.3 J
Naphthalene	6	~~Naphthalene~~	
Nitrobenzene	4	~~Nitrobenzene~~	
N-Nitroso-di-n-propylamine	740	~~N-Nitroso-di-n-propylamine~~	
Phenol	3200	Phenol	5.4 J
Propanil	700	Propanil	49
Volatile Organic Compounds		**Volatile Organic Compounds**	
1,1,2-Trichloroethene		1,1,2-Trichloroethene	0.53 J
1,1,2-Trichloroethane	27	~~1,1,2-Trichloroethane~~	
1,2,4-Trichlorobenzene		1,2,4-Trichlorobenzene	5.7 J
1,1-Dichloroethane	1.4	1,1-Dichloroethene	1.3
1,2-Dichloroethane	92000	1,2-Dichloroethane	19000
1,2-Dichloropropane	43	~~1,2-Dichloropropane~~	
3,4-Dichloroaniline		3,4-Dichloroaniline	17000
Acetone	2000	~~Acetone~~	
Aniline		Aniline	18
Benzene	810	Benzene	21
Bromodichloromethane	6.1	~~Bromodichloromethane~~	
Bromoform	11	~~Bromoform~~	
Chlorobenzene	470	Chlorobenzene	310
Chloroethane	170	Chloroethane	11
Chloroform	340	Chloroform	0.43
Chloromethane	55	Chloromethane	1.7 J
Ethylbenzene	2000	Ethylbenzene	2.4
Methylene chloride	2000	Methylene chloride	0.8 J
o-Xylene	2000	o-Xylene	0.49
Toluene	760000	Toluene	0.71 J
trans-1,2-Dichloroethene	32	~~trans-1,2-Dichloroethene~~	
Trichloroethene	10	~~Trichloroethene~~	
Vinyl acetate	10	~~Vinyl acetate~~	
Vinyl chloride	40	Vinyl chloride	10

~~analyte:~~ Detected in CCR but not in FI
analyte: Detected in FI but not in CCR
Compound Decreased in Concentration Since CCR.
[1]CCR Data is from the Current Conditions Report, dated November 2007.
[2]FI Data is from the Facility Investigation Report, dated February 2009.

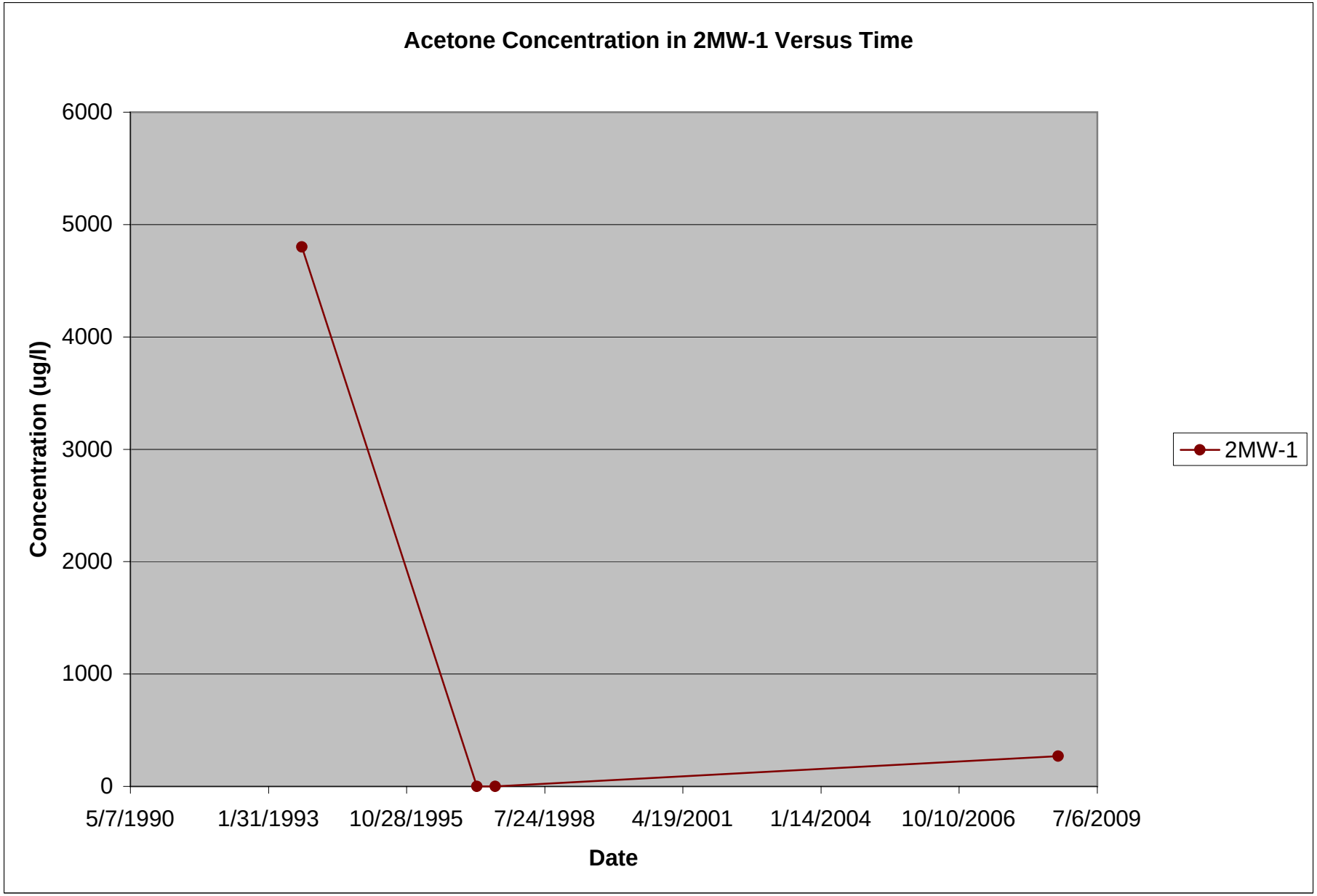
Table 11A
Historical Comparison of Detections in Groundwater
Perched Zone
Cedar Chemical Corporation
Helena-West Helena, Arkansas

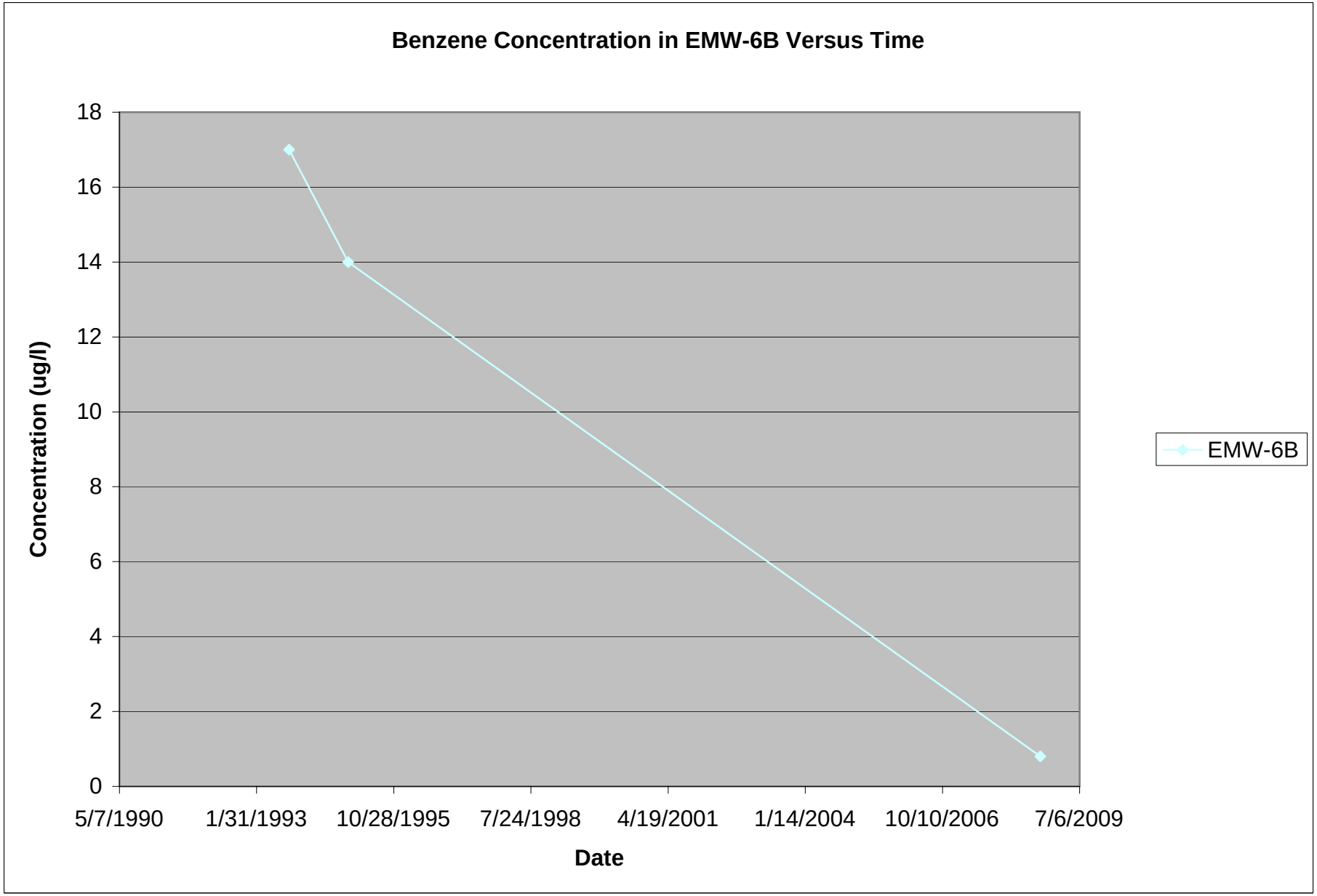
CCR		FI (Sept. 08 Data)	
Analyte	**Maximum observed concentration (ug/l)**	**Analyte**	**Maximum observed concentration (ug/l)**
Pesticides/Polychlorinated Biphenyls		**Pesticides/Polychlorinated Biphenyls**	
4,4'-DDD	Not Detected	4,4'-DDD	0.024 J
4,4'-DDE	Not Detected	4,4'-DDE	0.012 J
4,4'-DDT	0.56	4,4'-DDT	0.015
Aldrin	Not Detected	Aldrin	0.095 J
Alpha-BHC	0.05	alpha-BHC	0.24
alpha-Chlordane	NA	alpha-Chlordane	0.11 J
beta-BHC	Not Detected	beta-BHC	0.39 J
delta-BHC	NA	delta-BHC	0.18
Dieldrin	Not Detected	Dieldrin	0.45 J
Dinoseb	86	Dinoseb	1400
Endosulfan II	NA	Endosulfan II	0.18 J
Endosulfan sulfate	NA	Endosulfan sulfate	0.042 J
Endrin aldehyde	NA	Endrin aldehyde	0.95 J
Endrin ketone	NA	Endrin ketone	0.15 J
gamma-BHC (Lindane)	Not Detected	gamma-BHC (Lindane)	110 J
gamma-Chlordane	NA	gamma-Chlordane	0.28 J
Heptachlor	Not Detected	Heptachlor	0.02 J
Methoxychlor	Not Detected	Methoxychlor	8
Semivolatile Organic Compounds		**Semivolatile Organic Compounds**	
1,2-Dichlorobenzene	130	1,2-Dichlorobenzene	1800
1,4-Dichlorobenzene	0.5	1,4-Dichlorobenzene	11
2,4-Dichlorophenol	Not Detected	2,4-Dichlorophenol	3.6 J
2,4-Dinitrophenol	Not Detected	2,4-Dinitrophenol	8900 J
2-Chlorophenol	Not Detected	2-Chlorophenol	12
2-Butanone (MEK)	NA	2-Butanone (MEK)	15000
2-Nitrophenol	NA	2-Nitrophenol	110
4-Chloroaniline	6900	4-Chloroaniline	10000 J
4-Methyl-2-Pentanone (MIBK)	Not Detected	4-Methyl-2-pentanone (MIBK)	32 J
4-Nitrophenol	Not Detected	4-Nitrophenol	1400
Benzoic acid	8	Benzoic acid	180 J
Benzyl alcohol	Not Detected	Benzyl alcohol	86
bis(2-Chloroethyl)ether	5	~~bis(2-Chloroethyl) ether~~	
Diethylphthalate	Not Detected	Diethylphthalate	7.8 J
Dimethylphthalate	10	~~Dimethylphthalate~~	
Naphthalene	15	Naphthalene	1.5 J
Nitrobenzene	Not Detected	Nitrobenzene	7.9 J
Phenol	1	Phenol	58
Propanil	18	Propanil	390
Volatile Organic Compounds		**Volatile Organic Compounds**	
1,2,4-Trichlorobenzene	Not Detected	1,2,4-Trichlorobenzene	2.9 J
1,2-Dichloroethane	1900	1,2-Dichloroethane	120000
3,4-Dichloroaniline	NA	3,4-Dichloroaniline	59000
Acetone	230	Acetone	5300
Benzene	17	Benzene	2.4
cis-1,2-Dichloroethene	0.6	~~cis-1,2-Dichloroethene~~	
Chlorobenzene	79	Chlorobenzene	96
Chloroform	1	~~Chloroform~~	
Ethylbenzene	Not Detected	Ethylbenzene	3.7
Methylene chloride	Not Detected	Methylene chloride	9200
o-Xylene	Not Detected	o-Xylene	94 J
Toluene	Not Detected	Toluene	7000
Total Xylenes	Not Detected	Total Xylenes	160 J
trans-1,2-Dichloroethene	0.4	~~trans-1,2-Dichloroethene~~	

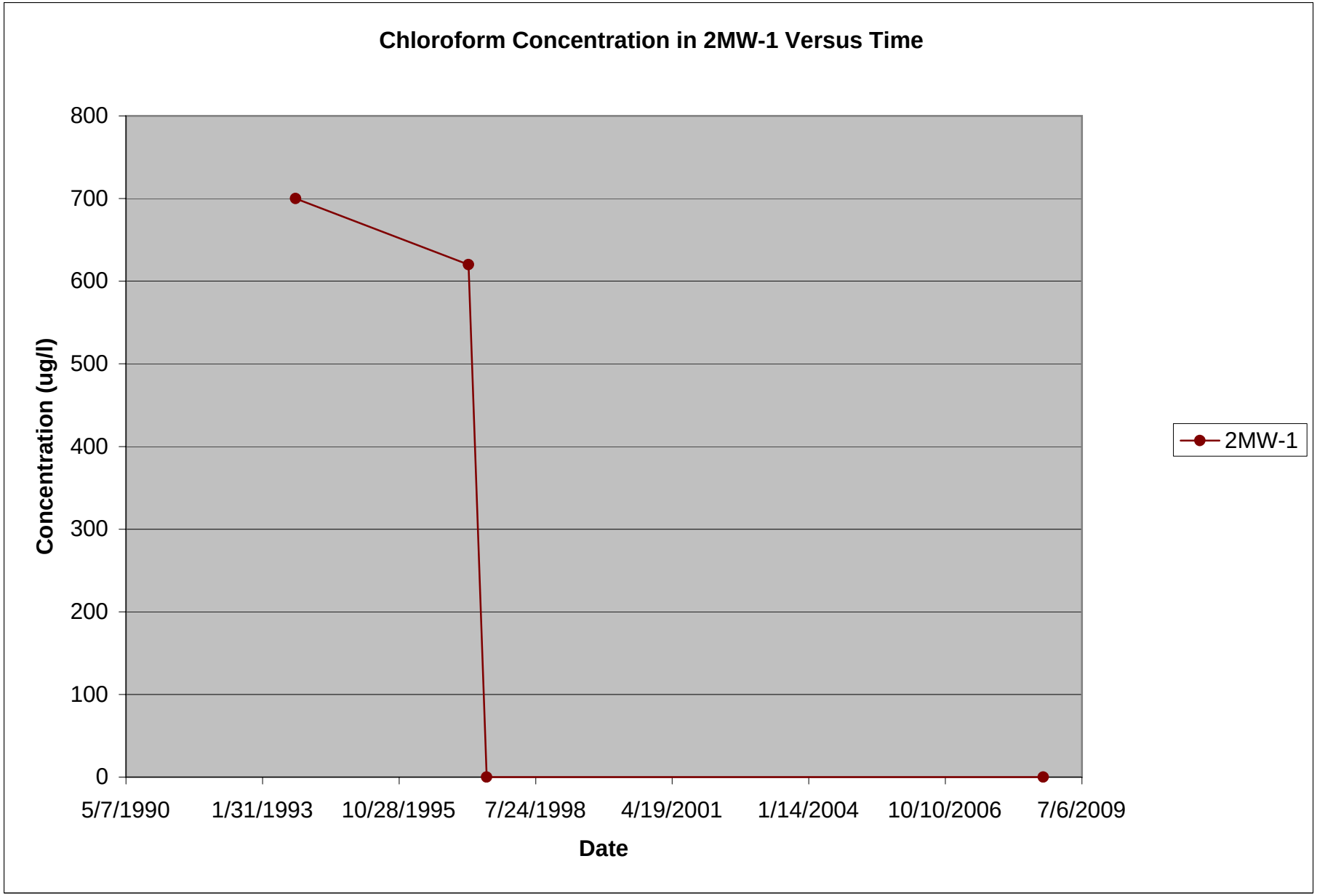
~~analyte:~~ Detected in CCR but not in FI
analyte: Detected in FI but not in CCR
Compound Decreased in Concentration Since CCR.
CCR Data is from the Current Condions Report, dated November 2007.
FI Data is from the Facility Investigation Report, dated February 2009.

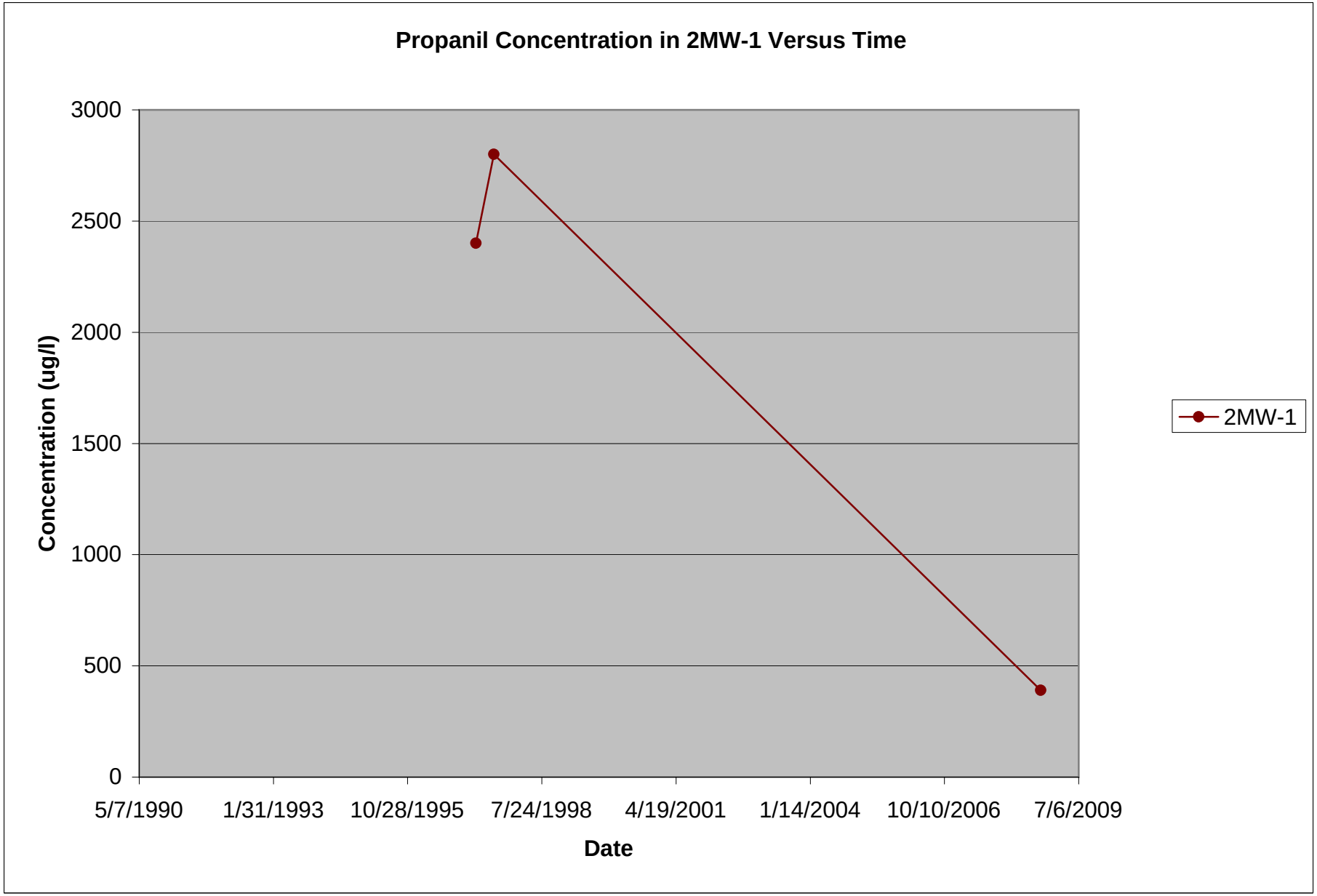
Trend Plots

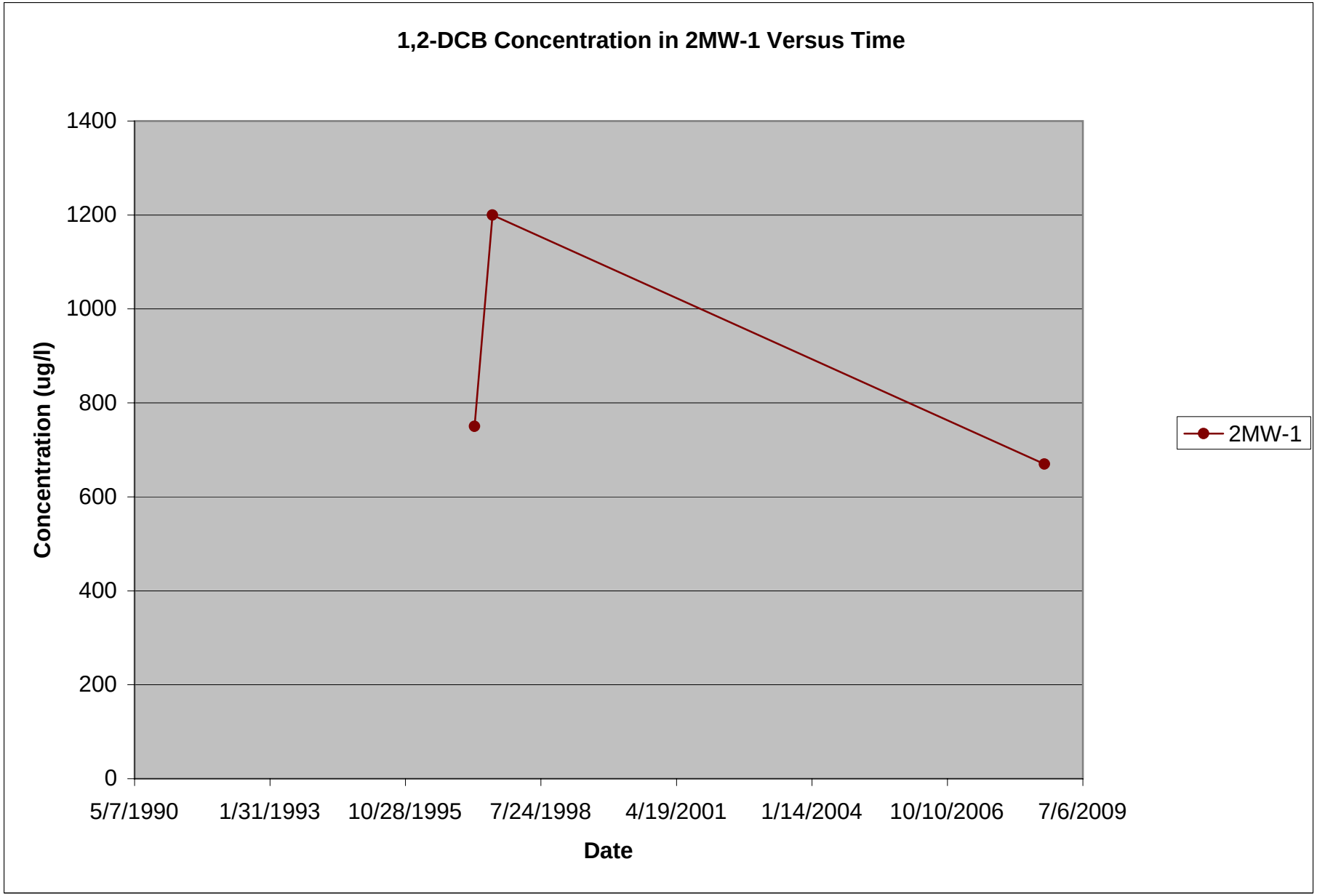
Trend Plots should be inserted behind Table 11A

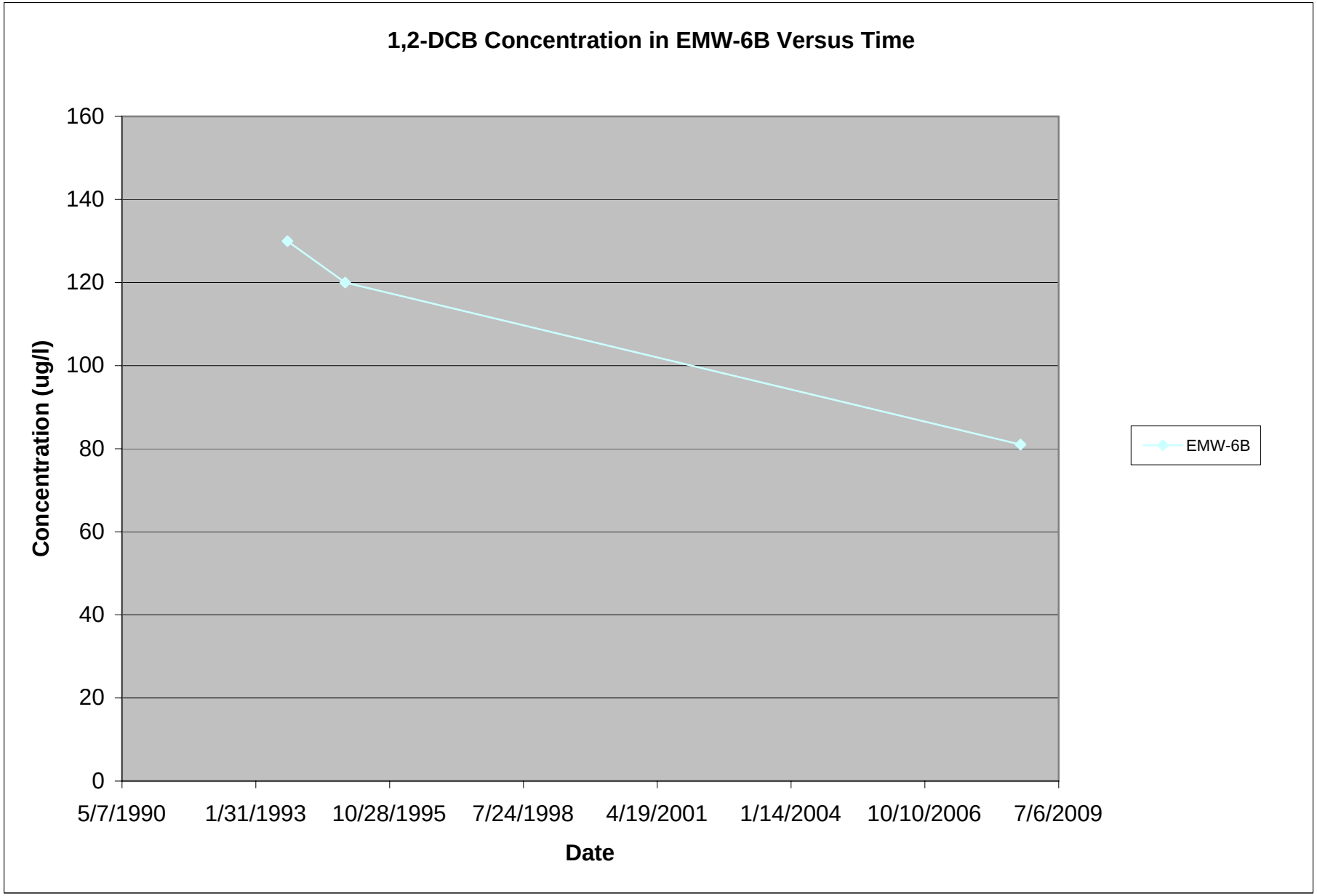

Acetone Concentration in 2MW-1 Versus Time
6000
5000
4000
3000
2000
1000
0
Concentration (ug/l)
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
2MW-1

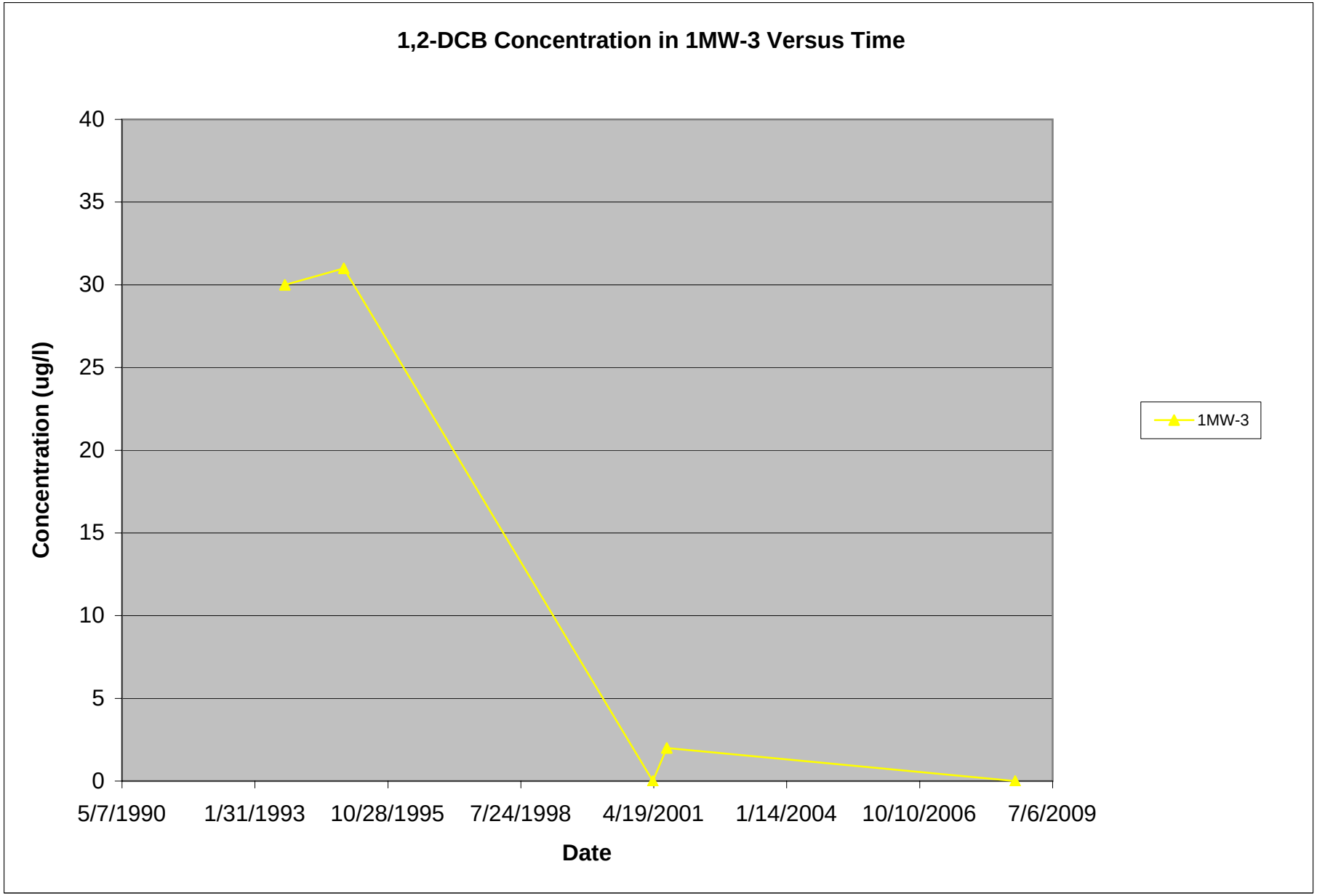

Benzene Concentration in EMW-6B Versus Time
Concentration (ug/l)
18
16
14
12
10
8
6
4
2
0
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
EMW-6B

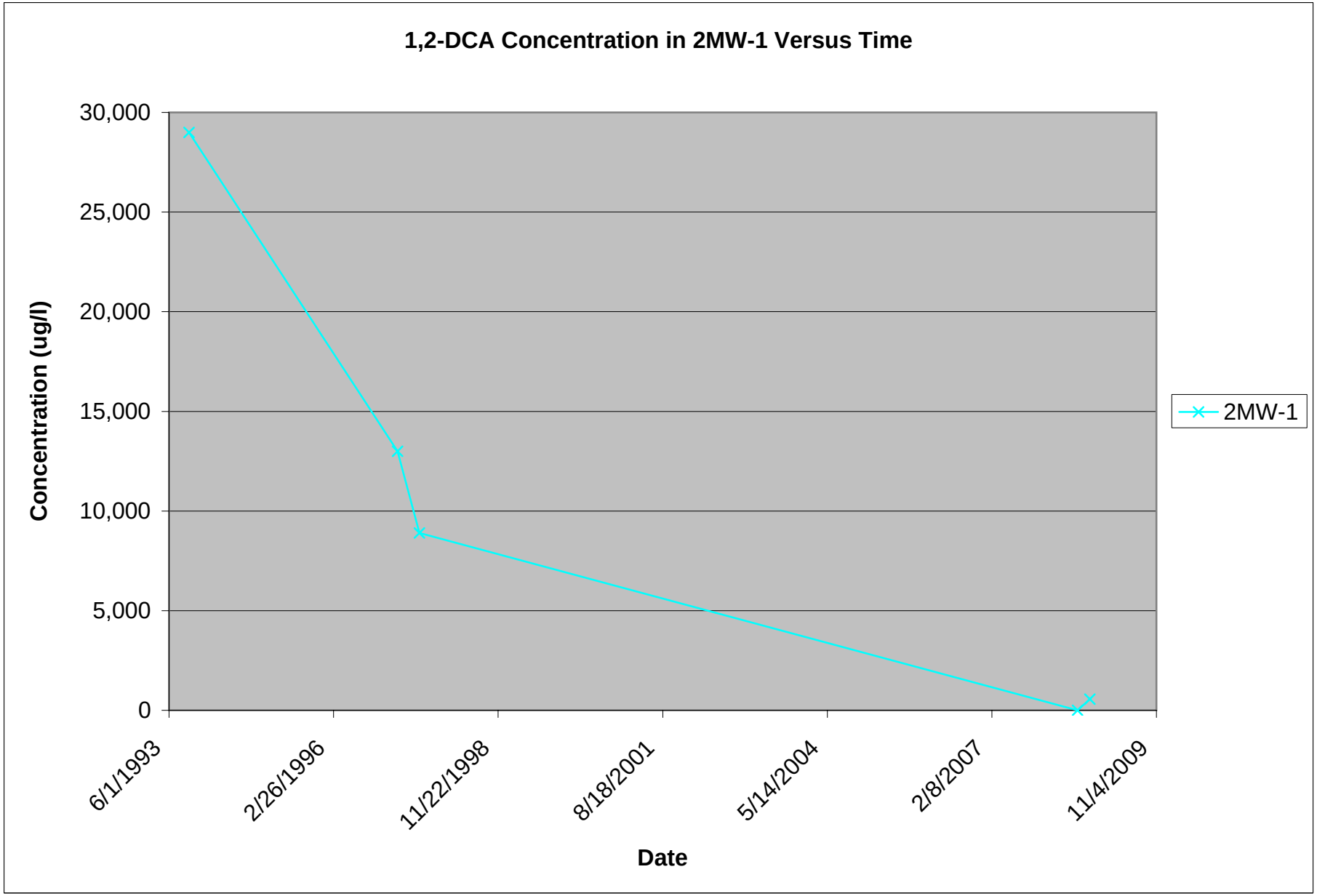

Chloroform Concentration in 2MW-1 Versus Time
800
700
600
500
400
300
200
100
0
Concentration (ug/l)
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
2MW-1

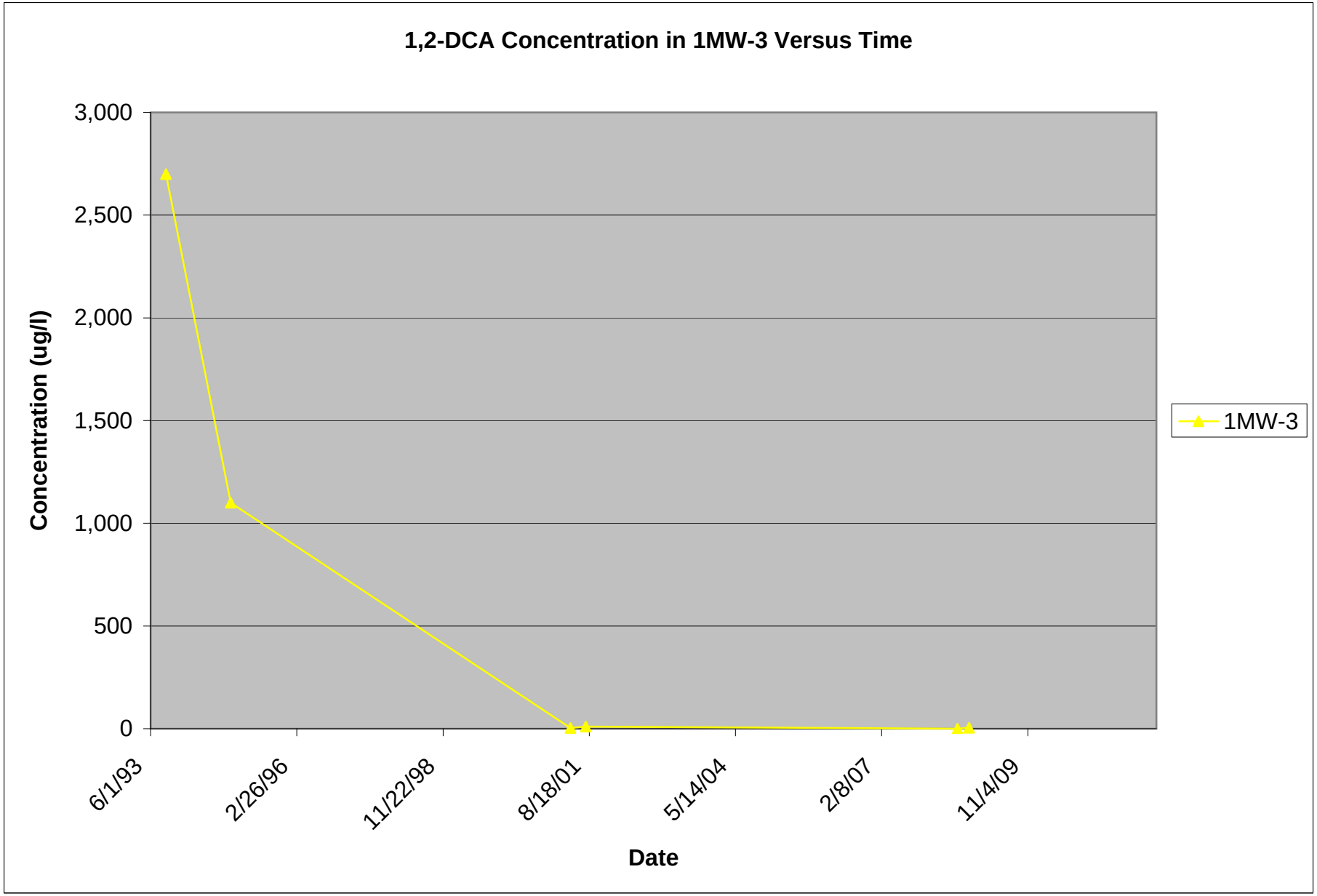

Propanil Concentration in 2MW-1 Versus Time
Concentration (ug/l)
3000
2500
2000
1500
1000
500
0
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
2MW-1

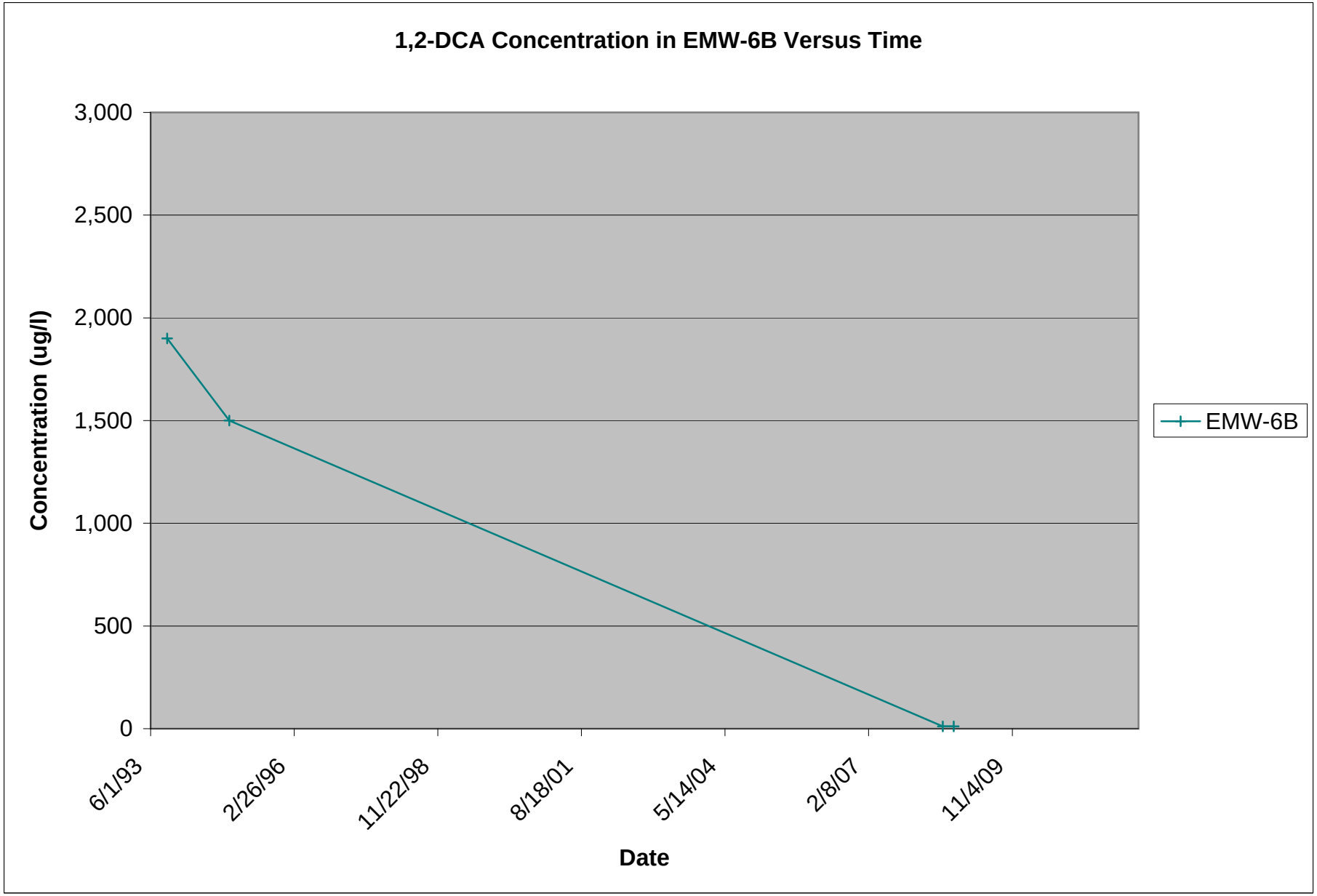

1,2-DCB Concentration in 2MW-1 Versus Time
Concentration (ug/l)
1400
1200
1000
800
600
400
200
0
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
2MW-1


1,2-DCB Concentration in EMW-6B Versus Time
160
140
120
100
80
60
40
20
0
Concentration (ug/l)
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
EMW-6B


1,2-DCB Concentration in 1MW-3 Versus Time
Concentration (ug/l)
40
35
30
25
20
15
10
5
0
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
Date
1MW-3


1,2-DCA Concentration in 2MW-1 Versus Time
Concentration (ug/l)
30,000
25,000
20,000
15,000
10,000
5,000
0
6/1/1993
2/26/1996
11/22/1998
8/18/2001
5/14/2004
2/8/2007
11/4/2009
Date
2MW-1


1,2-DCA Concentration in 1MW-3 Versus Time
Concentration (ug/l)
3,000
2,500
2,000
1,500
1,000
500
0
6/1/93
2/26/96
11/22/98
8/18/01
5/14/04
2/8/07
11/4/09
Date
1MW-3


1,2-DCA Concentration in EMW-6B Versus Time
Concentration (ug/l)
3,000
2,500
2,000
1,500
1,000
500
0
6/1/93
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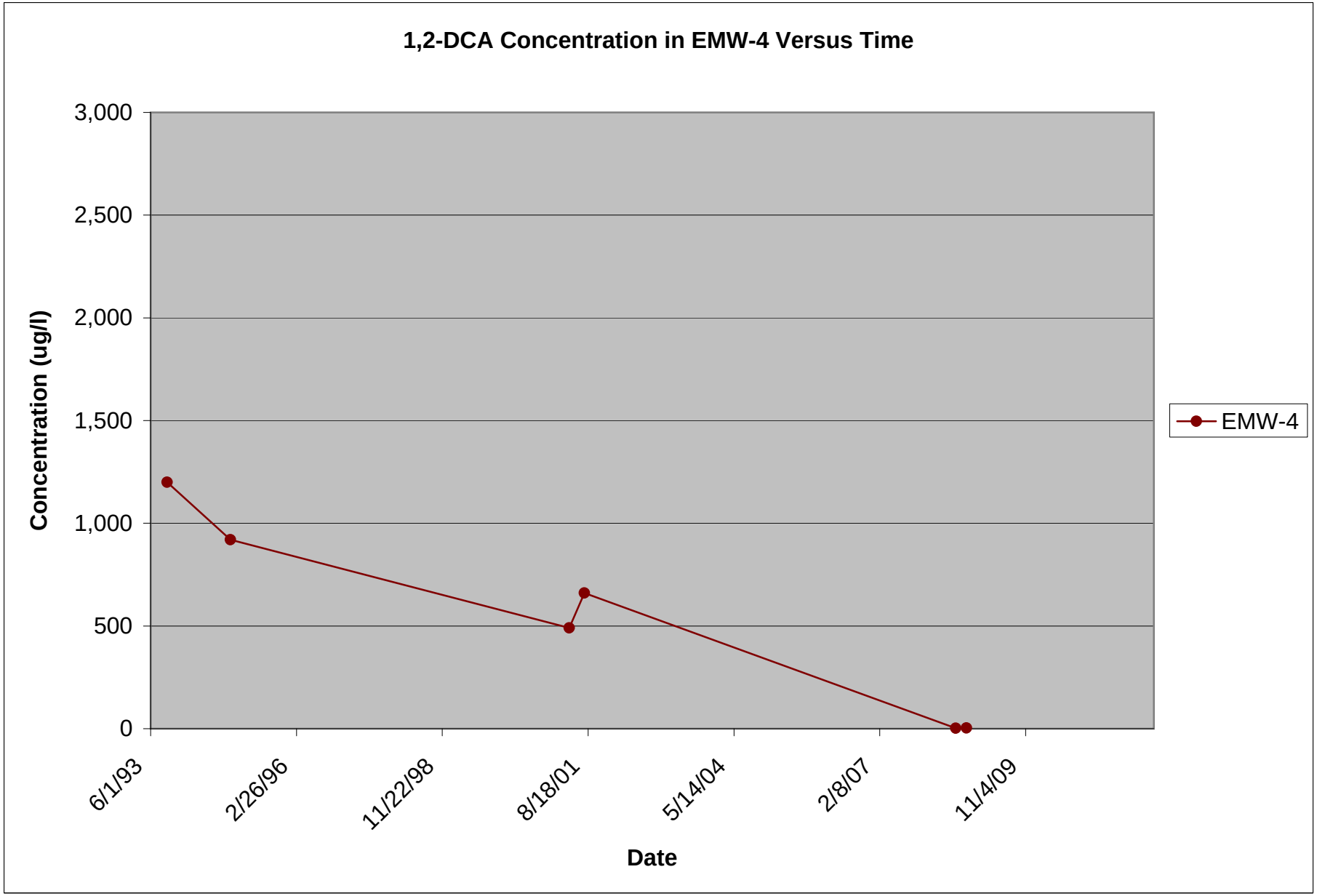
11/22/98
8/18/01
5/14/04
2/8/07
11/4/09
Date
EMW-6B


1,2-DCA Concentration in EMW-4 Versus Time
Concentration (ug/l)
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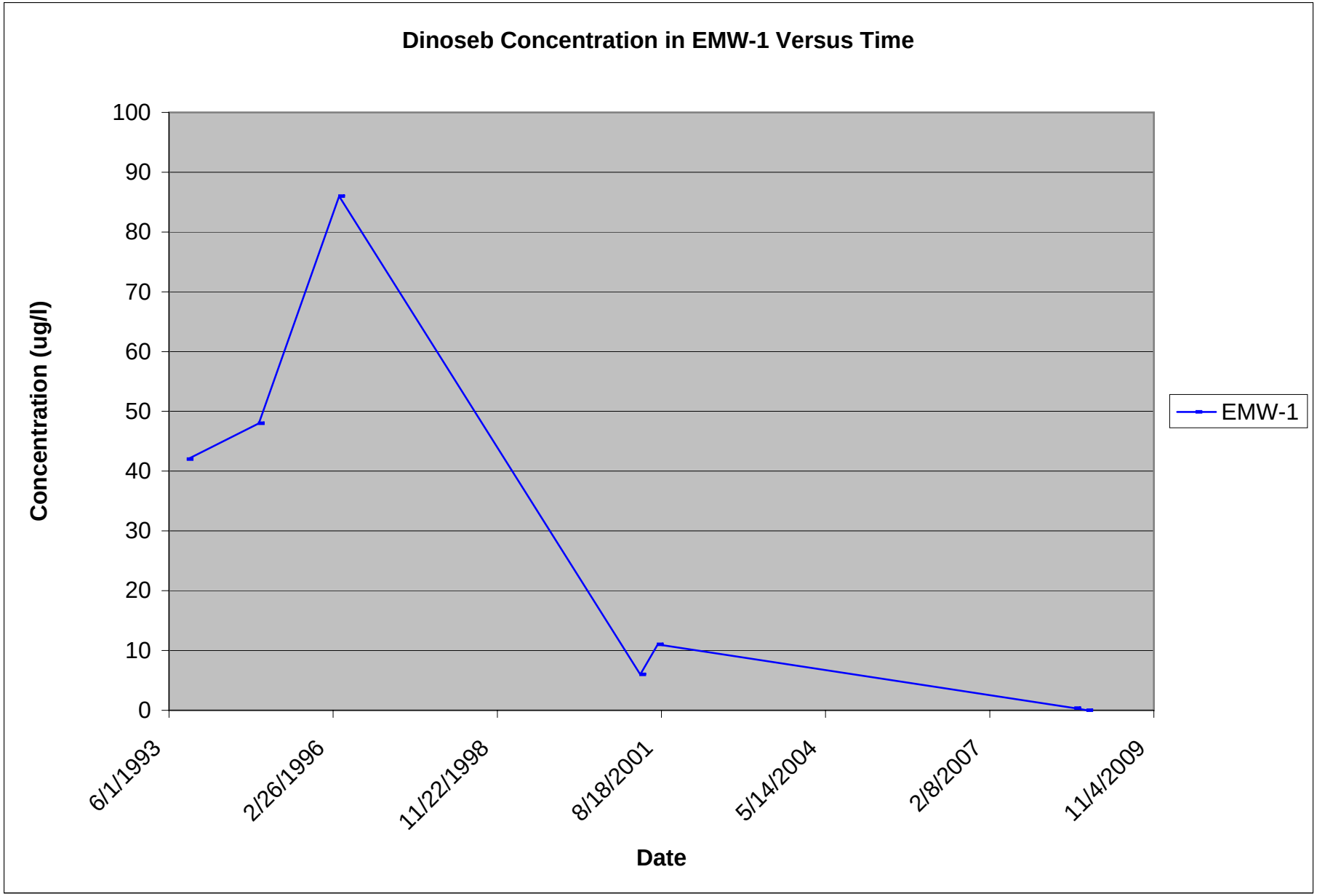
2,500
2,000
1,500
1,000
500
0
6/1/93
2/26/96
11/22/98
8/18/01
5/14/04
2/8/07
11/4/09
Date
EMW-4


Dinoseb Concentration in EMW-1 Versus Time
Concentration (ug/l)
100
90
80
70
60
50
40
30
20
10
0
6/1/1993
2/26/1996
11/22/1998
8/18/2001
5/14/2004
2/8/2007
11/4/2009
Date
EMW-1

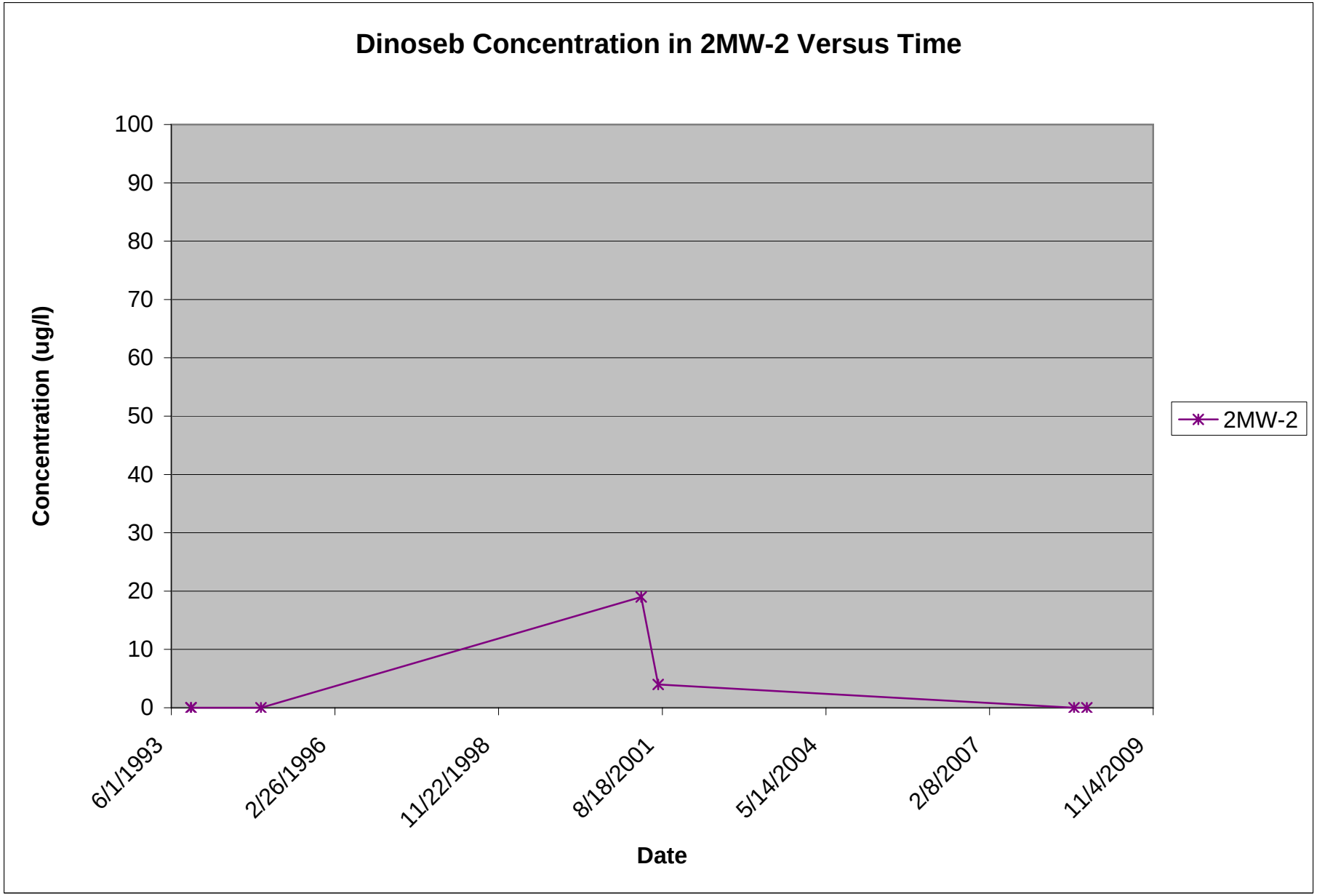

Dinoseb Concentration in 2MW-2 Versus Time
Concentration (ug/l)
100
90
80
70
60
50
40
30
20
10
0
6/1/1993
2/26/1996
11/22/1998
8/18/2001
5/14/2004
2/8/2007
11/4/2009
Date
2MW-2

Figure Changes

Figure 2 should be replaced with the attached Figure 2
Figure 5 should be replaced with the attached Figure 5

EXPLANATION

Suspected Sources Area

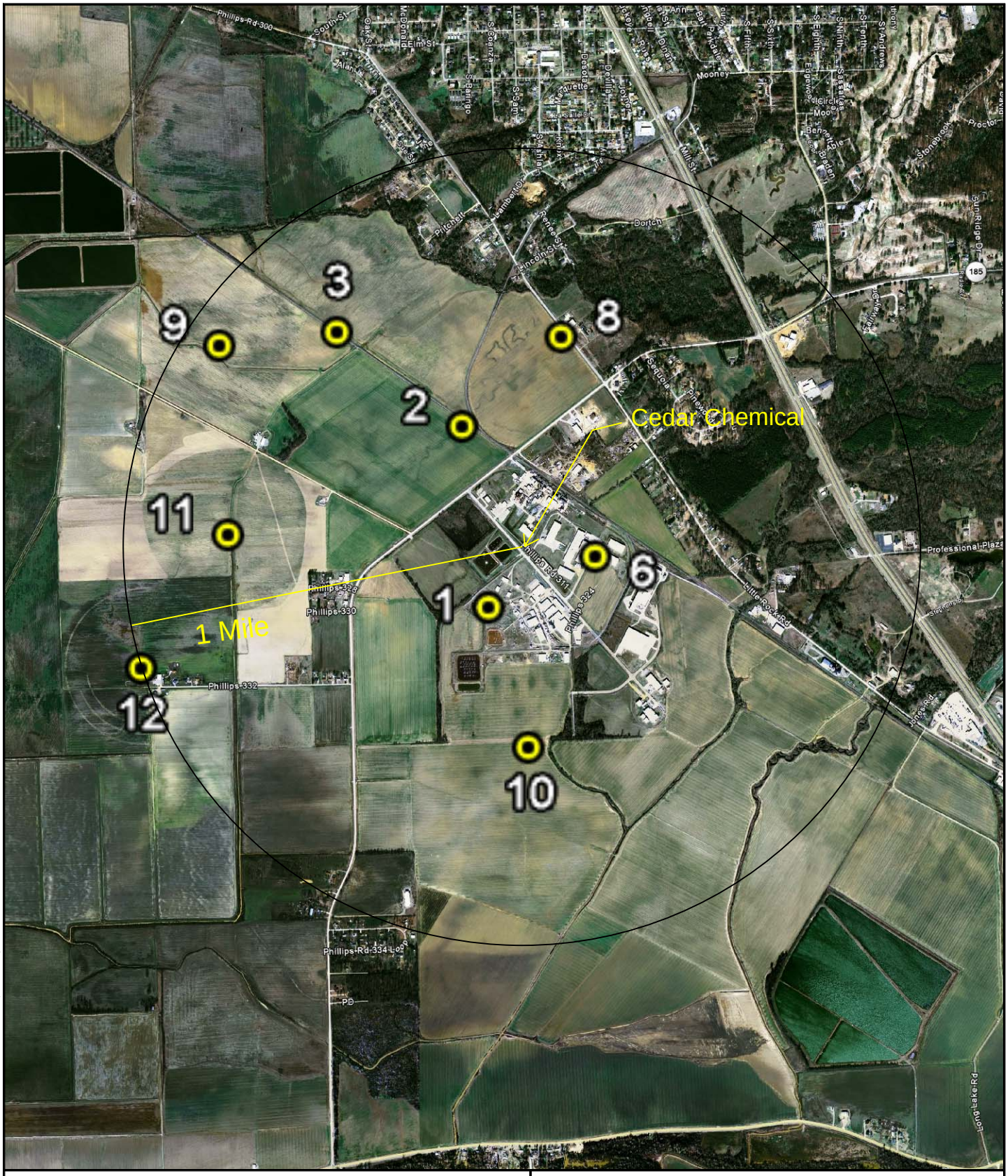
0 75 150
Approximate Scale in Feet

Suspected Source Areas

Cedar Chemical
Helena - West Helena, Arkansas

By: MLS	Date: 1/5/09	Project No. 13636
AMEC Geomatrix		Figure 2

Plot Date: 05/26/09 - 9:26am, Plotted by: mike.schofield
Drawing Path: I:\13636 - Arkansas Helena-West Helena\FIGURES\, Drawing Name: Source Locations.dwg



SOURCES: Ground verification performed by EnSafe on 5/6/09 and 5/8/09, Google Earth Pro

0 1800

APPROXIMATE SCALE IN FEET

Domestic Well Locations
Within a One-Mile Radius

Cedar Chemical
Helena-West Helena, Arkansas

AMEC Geomatrix | Project 13636 | Figure 5

I:\13636 - Arkansas Helena-West Helena\2007 CCR\FINAL FIGURES\ FIG 1 Site Location Map\FIG 1.dwg