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Johnston County Landfill
C&D

Ground Water Monitoring Report

May 2007 Semi-annual Monitoring Event

Johnston County Landfill
Smithfield, North Carolina
NC Solid Waste Permit # 51-03

Received
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Solid Waste Section

Prepared for:
Johnston County Department of Public Utilities
309 East Market Street
Smithfield, North Carolina 27577

September 2007

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Raleigh, North Carolina 27603

Spring 2007 Ground Water Monitoring Report

Johnston County C&D Landfill
Smithfield, North Carolina
NC Solid Waste Permit # 51-03

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RSG Project No. **Johnston - 4**

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Johnston County – C&D Landfill
Semi-annual Ground Water Monitoring Report
May 2007 Sampling Event

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1.0 Introduction

The Johnston County Landfill, currently operating under Solid Waste Permit # 51-03 (C&D) is required to submit semiannual ground water monitoring reports for C&D. This report presents the results of the first semi-annual monitoring event for 2007. This event was performed to comply with the semi-annual monitoring schedule required by NC Solid Waste Regulations.

The ground water monitoring for the C&D landfill included 11 ground water monitoring wells and four leachate lagoon monitoring wells. This report includes summaries of the field procedures, laboratory analyses, statistical analyses, and ground water characterization for the entire site. Also included are summary tables of the results, summary of the statistical analysis, graphs of the data, and laboratory analytical reports.

2.0 Sampling Procedures

The sampling event, performed by trained personnel from Johnston County Landfill, on 5/24/2007 to 31consisted of collecting samples from 12 ground water wells (CDMW-1, CDMW-2, CDMW-3, CDMW-4, CDMW-5, CDMW-5D, CDMW-6, CDMW-7, CDMW-8, CDMW-8D, CDMW-9 and CDMW-9D), shown in **Figure 1**. This sampling was conducted in accordance with the approved site Sampling and Analysis Plan. Also included in the analysis was a trip blank for quality control.

Sampling methods followed the protocol outlined in the North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities (NCDENR, DWM). The depth to water in each well was gauged prior to purging and sampling. Field measurements of pH, specific conductivity, and temperature were obtained from each well. Water table elevations and field parameter results are included in **Tables 1 and 2,** respectively.

All samples were collected by Johnston County personnel in laboratory prepared containers for the specified analytical procedures. Samples were using new teflon bailers. Ground water samples were properly preserved, placed on ice, and transported to the laboratory facility, Environment 1, Inc., within the specified holding times for each analysis.

3.0 Field and Laboratory Results

3.1 Laboratory Analysis

Ground water samples were collected from the monitoring network associated with C&D using new, factory sealed, Teflon bailers for each well. These samples were analyzed for Appendix I constituents.

3.2 Field and Laboratory Results

All samples were transported to the laboratory facility under proper chain of custody analyzed at the specified DWM Practical Quantitation Limits for Appendix I constituents. The laboratory report is attached for your review as **Appendix A**.

Ground water level and field measurements are included in **Table 2**. The laboratory analysis detected eleven (11) organic constituents: 1,1-Dichloroethane, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,4-Dichloroenzene, Benzene, Chlrobenzene, Cis-1,2 Dichloroethene, Methylene Chloride, Tetrachloroethene, trichloroethene and vinyl Chloride and thirteen (13) inorganic constituents: Arsenic, Barium, Beryllium, Cadmium, Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Total Chromium, Vanadium and Zinc. **Table 3** summarizes the list of constituents detected.

Concentration above 2L standard were found for 1,2-Dichloroethane, 1,2-Dichloropropane, Barium, Beryllium, Cadmium, Cobalt, Lead, Manganese, Mercury, Tetrachloroethene, Total Chromium, vinyl Chloride and Vanadium. These are highlighted in **Table 3**.

4.0 Site Assessment/Remedial Action

The Johnston County lined C&D landfill has been constructed as a "piggy-back" landfill which partially covers a sideslope of the existing unlined Phase 3 MWS landfill. This "piggy-back" design of the lined C&D landfill is the latest phase of an ongoing remedial action for the unlined landfill (Phases 3 and 4). This remedial action includes the construction of several lined "piggy-back" cells and a partial geomembrane cover to limit the infiltration of rainwater into the unlined waste mass. When all the phases of this remedial action are completed, approximately 70 to 75% of the Phase 3 and 4 landfills will be covered to reduce infiltration and the production of uncontrolled leachate.

Prior to construction of the C&D landfill, a ground water assessment was completed in the C&D area[1] to evaluate the effect of the unlined landfills on ground water within and around the then proposed C&D landfill. The conclusions of this assessment indicated that some organic constituents were detected in CDMW-9 and CDMW-9d, and that several inorganic constituents were detected across the C&D area. Collection of filtered samples indicated the inorganic detections were due to suspended solids in the samples collected. This is in keeping with the data collected during the baseline sampling.

However, it should be noted that wells CDMW-1 and CDMW-2 located next to the unlined Phases 1 and 2 had not been installed at the time of the assessment. Given their location related to the unlined Phases 1 and 2 and the sampling of these wells before waste placement in the C&D landfill, the impact detected in these wells appears to be from the unlined MSW landfill.

5.0 Statistical Analysis & Results

5.1 Statistical Analysis

The laboratory analytical results were entered into our statistical database for the site. Data entry and analysis was performed using the Chempoint/Chemstat™ statistical software

[1] G. N. Richardson and Associates, Inc., Johnston County Landfill Proposed Future C&D Landfill Area Ground Water Assessment Report, Revised February 2005.

package developed specifically for RCRA Subtitle D sites (Starpoint Software, Cincinnati, OH). Chemstat follows EPA and DSWM protocols for approved statistical analysis methods for groundwater data.

The following constituents were found to be statistically significant (See **Table 4**): 1,4- Dichlorobenzene (CDMW-9), Beryllium (CDMW-1), Chlorobenzene (CDMW-9), Cobalt (CDMW-3), Lead (CDMW-1 & CDMW-3), Manganese (CDMW-1,CDMW-2, CDMW-3, CDMW-4, CDMW-7, CDMW-8 & CDMW-9D), Chromium (CDMW-1), Vanadium (CDMW-1) and Zinc (CDMW-1 & CDMW-3).

5.2 2L/MCL Statistical Analysis

For wells that showed statistically significant differences from background concentrations, additional analysis was performed. This analysis has recently been required as part of ongoing Assessment monitoring for landfills in North Carolina. To perform the analysis, the respective 2L standard or MCL was determined for each parameter with statistically significant results. Each compliance well with statistical significance was re-analyzed against the lower of the 2L or MCL standard as a Ground Water Protection Standard (GWPS).

This analysis was performed using tolerance interval analysis. Since a smaller subset of wells was analyzed during this step, the compliance well data were retested for normal distribution. If the data were normally distributed, parametric tolerance intervals were constructed for each well and compared to the GWPS for each parameter. For those wells not exhibiting normal distribution, Poisson tolerance intervals were constructed. If the distribution of the data was marginally normal, both tests were run to cross-check the results. All of these cross-checks yielded the same results from both test methods.

The statistical results for this additional analysis are presented in **Table 4**. An upper tolerance limit higher than the GWPS standard was considered to be a statistically significant result. This analysis indicated statistically significant results of Beryllium (CDMW-1), Cobalt (CDMW-3), Lead (CDMW-1, CDMW-3), Manganese (CDMW-1,CDMW-2, CDMW-3, CDMW-4, CDMW-7, CDMW-8 & CDMW-9D), Chromium (CDMW-1), Vanadium (CDMW-1) and Zinc (CDMW-1 & CDMW-3).

6.0 Ground Water Characterization

A potentiometric surface map was prepared from ground water elevation data collected during this sampling event. Ground water velocity was calculated for each monitoring well on-site using the equation $V = (KI)/n$ where:

K = hydraulic conductivity
I = ground water gradient
n = porosity

Slug test was not performed for any of the C&D wells except CDMW-9 which was previously named as PZ-9 during site permitting activities. PZ-1 to PZ-10 installed in 2003

were previously located within the C&D footprints. Therefore, we used the average hydraulic conductivity and porosity for PZ-1 to PZ-10 for the evaluation of ground water flow in CDMW-1 through CDMW-8.

Ground water velocities ranged from 0.049 feet/day (CDMW-4) to 0.016 feet/day (CDMW-6). These calculations are included in **Table 5**. The data indicates that ground water is flowing generally to the north towards the tributaries of Middle Creek. This is consistent with ground water flow patterns previously seen at this site. The potentiometric surface map (**Figure 1**) is also attached for your review.

7.0 Conclusions

The results of this monitoring event indicate detectable levels of 13 inorganic constituents and 11 organic constituents. The inorganic constituents are likely due to suspended solids in the samples (as evidenced by elevated turbidity readings from the wells). Of the organic constituents, six (6) were detected at levels above the ground water standards. Most of these were previously detected; however, some are detected for the first time due to lower laboratory practical quantitation limits set by NCDENR. Given the history of the site and the location of unlined landfills adjacent to the C&D landfill, these detections are likely due to impact from the unlined landfills. As the C&D landfill is part of the overall site remediation, it is likely that over time the detected levels will decrease.

Figures

Tables

Table 1
Johnston County C&D Landfill
Ground Water Elevations & Velocities
5/24/2007

Well	TOC Elevation (feet)	Water Level (feet)	GW Elev. (feet)	Hyd. Cond. (ft/day)	Porosity (%)	Gradient (ft/ft)	Velocity (ft/day)
CDMW-1	189.46	7.71	181.75	0.232	0.25	0.036	0.033
CDMW-2	186.13	8.59	177.54	0.232	0.25	0.019	0.018
CDMW-3	170.65	29.9	140.75	0.232	0.25	0.032	0.030
CDMW-4	172.84	29.8	143.04	0.232	0.25	0.053	0.049
CDMW-5	167.39	30.2	137.19	0.232	0.25	0.038	0.035
CDMW-5D	167.43	29.37	138.06	NA	NA	NA	NA
CDMW-6	162.12	12.3	149.82	0.232	0.25	0.018	0.016
CDMW-7	175.27	13.12	162.15	0.232	0.25	0.030	0.028
CDMW-8	127.41	6.55	120.86	0.232	0.25	0.039	0.036
CDMW-8D	127.63	16.45	111.18	NA	NA	NA	NA
CDMW-9	160.5	15.15	145.35	0.259	0.25	0.031	0.032
CDMW-9D	160.71	14.97	145.74	NA	NA	NA	NA

Notes

Velocity Calculated from V=K*I/n
V = velocity
K = Hydraulic Conductivity
I = Gradient
n = Porosity
Hydraulic Conductivity data from slug testing
Porosity values assumed from Groundwater & Wells (Driscoll)
na = not available

Table 2
Johnston County C&D Landfill
Field Parameters
5/24/2007

Well Identification	Static Water Level (ft) (DTW)	Temperature (Celsius)	Turbidity (NTU)	pH	Specific Conductivity (uS/cm)
CDMW-1	7.71	18.56	ES	5.87	360
CDMW-2	8.59	17.65	ES	6.51	1425
CDMW-3	29.9	15.97	198	5.28	31
CDMW-4	29.8	17.11	21.2	5.79	41
CDMW-5	30.2	17.54	ES	5.56	65
CDMW-5D	29.37	17.44	9.68	5.28	57
CDMW-6	12.3	17.01	ES	5.72	50
CDMW-7	13.12	16.55	ES	4.75	151
CDMW-8	6.55	16.44	74.7	4.69	121
CDMW-8D	16.45	nm	ES	nm	nm
CDMW-9	15.15	15.51	ES	5.39	160
CDMW-9D	14.97	16.94	7.38	5.5	166

nm = Not Measured
ES = Exceeds scale

Table 3
Johnston County C&D Landfill
Detected Inorganic and Organic Constituents
5/24/2007

Inorganic Constituents														
Arsenic	10	50	**49**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12**
Barium	100	2000	**451**	**682**	**116**	ND	ND	ND	ND	ND	ND	ND	**190**	ND
Beryllium	1	--	[illegible]	[illegible]	[illegible]	ND	[illegible]	ND	[illegible]	[illegible]	[illegible]	ND	[illegible]	ND
Cadmium	1	5	**1**	**2**	ND	ND	ND	ND	ND	**4**	ND	ND	[illegible]	ND
Cobalt	10	--	ND	[illegible]	[illegible]	ND	[illegible]	ND	[illegible]	[illegible]	ND	ND	[illegible]	[illegible]
Copper	10	1000	**18**	**17**	**45**	ND	**39**	ND	**21**	**113**	ND	ND	**63**	ND
Lead	10	15	[illegible]	[illegible]	[illegible]	ND	[illegible]	ND	[illegible]	[illegible]	ND	ND	[illegible]	ND
Manganese	50	--	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	[illegible]	[illegible]	[illegible]	ND	[illegible]	[illegible]
Mercury	0.2	1.1	ND	ND	ND	ND	ND	[illegible]	ND	ND	ND	ND	[illegible]	ND
Nickel	50	100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**77**	ND
Vanadium	25	--	[illegible]	[illegible]	ND	ND	ND	ND	ND	[illegible]	ND	ND	[illegible]	ND
Zinc	10	2100	**59**	**35**	**89**	**18**	**181**	ND	**145**	**69**	**35**	ND	**556**	ND
Organic Constituents														
1,1-Dichloroethane	5	700	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.9**	**11.4**
1,2-Dichloroethane	1	0.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	[illegible]	ND
1,2-Dichloropropane	1	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	[illegible]	[illegible]
1,4-Dichlorobenzene	1	75	**2.7**	**4.2**	ND	ND	ND	ND	ND	ND	ND	ND	**5.8**	**4.1**
Benzene	1	1	[illegible]	[illegible]	ND	ND	ND	ND	ND	ND	ND	ND	[illegible]	[illegible]
Chlorobenzene	3	50	**4.4**	**7.5**	ND	ND	ND	ND	ND	ND	ND	ND	**6.3**	**4.5**
Cis-1,2-Dichloroethene	5	70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**29**	**20.1**
Methylene Chloride	1	5	ND	ND	ND	ND	ND	**1.6**	ND	ND	ND	ND	ND	ND
Tetrachloroethene	1	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	[illegible]	[illegible]
Total Chromium	10	50	**23**	**13**	ND	ND	**26**	ND	**25**	**29**	ND	ND	[illegible]	ND
Trichloroethene	1	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.8**	**1.5**
Vinyl Chloride	1	0.015	[illegible]	[illegible]	ND	ND	ND	ND	ND	ND	ND	ND	[illegible]	[illegible]

Notes

ND = Not detected
Bold indicates level above PQL
Shading indicates level above 2L standard, or no standard is established.

All results are in ug/l.

Table 4
Johnston County C&D Landfill
Statistical Analysis Summary
5/24/2007

LOCATION	PARAMETER	RESULT	DETECTION LIMIT	TEST UNITS	%ND	Test	Statistically Significant?	2nd statistical Analysis	Test
CDMW-9	1,1-Dichloroethane	12.9	<5	ug/l	10	PPL (USEPA Formula 99%)	N	—	—
CDMW-9D	1,1-Dichloroethane	11.4	<5	ug/l	10	PPL (USEPA Formula 99%)	N	—	---
CDMW-9	1,2-Dichloroethane	1	<1	ug/l	80	NPPL	N	—	---
CDMW-9	1,2-Dichloropropane	2.6	<1	ug/l	80	NPPL	N	---	—
CDMW-9D	1,2-Dichloropropane	2.1	<1	ug/l	80	NPPL	N	—	—
CDMW-1	1,4-Dichlorobenzene	2.7	<1	ug/l	65	NPPL	N	—	—
CDMW-2	1,4-Dichlorobenzene	4.2	<1	ug/l	65	NPPL	N	---	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	MCL-PTI (1992)
CDMW-9D	1,4-Dichlorobenzene	4.1	<1	ug/l	65	NPPL	N	---	---
CDMW-1	Arsenic	0.049	<0.010	mg/l	10	NPPL	N	---	—
CDMW-9D	Arsenic	0.012	<0.010	mg/l	10	NPPL	N	—	—
CDMW-1	Barium	0.451	<0.1	mg/l	35	NPPL	N	—	—
CDMW-2	Barium	0.682	<0.1	mg/l	35	NPPL	N	---	—
CDMW-3	Barium	0.116	<0.1	mg/l	35	NPPL	N	—	---
CDMW-9	Barium	0.19	<0.1	mg/l	35	NPPL	N	---	—
CDMW-1	Benzene	2.3	<1	ug/l	60	NPPL	N	---	—
CDMW-2	Benzene	3.4	<1	ug/l	60	NPPL	N	—	---
CDMW-9	Benzene	2	<1	ug/l	60	NPPL	N	---	—
CDMW-9D	Benzene	1.3	<1	ug/l	60	NPPL	N	—	---
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NPPL	[illegible]	[illegible]	[illegible]
CDMW-2	Beryllium	0.002	<0.001	mg/l	47.5	NPPL	N	—	—
CDMW-3	Beryllium	0.002	<0.001	mg/l	47.5	NPPL	N	---	---
CDMW-5	Beryllium	0.001	<0.001	mg/l	47.5	NPPL	N	—	—
CDMW-6	Beryllium	0.002	<0.001	mg/l	47.5	NPPL	N	—	---
CDMW-7	Beryllium	0.004	<0.001	mg/l	47.5	NPPL	N	—	—
CDMW-8	Beryllium	0.001	<0.001	mg/l	47.5	NPPL	N	—	—
CDMW-9	Beryllium	0.001	<0.001	mg/l	47.5	NPPL	N	---	---
CDMW-1	Cadmium	0.001	<0.001	mg/l	50	NPPL	N	---	---
CDMW-2	Cadmium	0.002	<0.001	mg/l	50	NPPL	N	—	—
CDMW-7	Cadmium	0.004	<0.001	mg/l	50	NPPL	N	---	---
CDMW-9	Cadmium	0.005	<0.001	mg/l	50	NPPL	N	—	—
CDMW-1	Chlorobenzene	4.4	<3	ug/l	50	PPL (USEPA Formula 99%)	N	—	—
CDMW-2	Chlorobenzene	7.5	<3	ug/l	50	PPL (USEPA Formula 99%)	Y	N	MCL-PTI (1992)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-9D	Chlorobenzene	4.5	<3	ug/l	50	PPL (USEPA Formula 99%)	N	---	---

Table 4
Johnston County C&D Landfill
Statistical Analysis Summary
5/24/2007

LOCATION	PARAMETER	RESULT	DETECTION LIMIT	TEST UNITS	%ND	Test	Statistically Significant?	2nd statistical Analysis	Test
CDMW-9	Cis-1,2-Dichloroethene	29	<5	ug/l	0	PPL (USEPA Formula 99%)	N	—	—
CDMW-9D	Cis-1,2-Dichloroethene	20.1	<5	ug/l	0	PPL (USEPA Formula 99%)	N	—	—
CDMW-2	Cobalt	0.031	<0.010	mg/l	25.71	NPPL	N	—	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-5	Cobalt	0.014	<0.010	mg/l	25.71	NPPL	N	—	—
CDMW-6	Cobalt	0.013	<0.010	mg/l	25.71	NPPL	N	—	—
CDMW-7	Cobalt	0.012	<0.010	mg/l	25.71	NPPL	N	—	—
CDMW-9	Cobalt	0.311	<0.010	mg/l	25.71	NPPL	N	—	—
CDMW-9D	Cobalt	0.0258	<0.010	mg/l	25.71	NPPL	N	—	—
CDMW-1	Copper	0.018	<0.010	mg/l	51.42	NPPL	N	—	—
CDMW-2	Copper	0.017	<0.010	mg/l	51.42	NPPL	N	—	—
CDMW-3	Copper	0.045	<0.010	mg/l	51.42	NPPL	N	—	—
CDMW-5	Copper	0.039	<0.010	mg/l	51.42	NPPL	N	—	—
CDMW-6	Copper	0.021	<0.010	mg/l	51.42	NPPL	N	—	—
CDMW-7	Copper	0.113	<0.010	mg/l	51.42	NPPL	N	—	—
CDMW-9	Copper	0.063	<0.010	mg/l	51.42	NPPL	N	—	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-2	Lead	0.067	<0.010	mg/l	31.42	NPPL	N	—	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-5	Lead	0.023	<0.010	mg/l	31.42	NPPL	N	—	—
CDMW-6	Lead	0.02	<0.010	mg/l	31.42	NPPL	N	—	—
CDMW-7	Lead	0.024	<0.010	mg/l	31.42	NPPL	N	—	—
CDMW-9	Lead	0.061	<0.010	mg/l	31.42	NPPL	N	—	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-5	Manganese	1.004	<0.050	mg/l	0	NPPL	N	—	—
CDMW-6	Manganese	0.497	<0.050	mg/l	0	NPPL	N	—	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-9	Manganese	5.565	<0.050	mg/l	0	NPPL	N	—	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-5D	Mercury	0.00024	<0.0002	mg/l	0	NPPL	N	—	—
CDMW-9	Mercury	0.00038	<0.0002	mg/l	0	NPPL	N	—	—
CDMW-5D	Methylene Chloride	1.6	<1	ug/l	80	PPL (USEPA Formula 99%)	N	—	—
CDMW-9	Nickel	0.077	<0.050	mg/l	20	PPL (USEPA Formula 99%)	N	—	—

Table 4
Johnston County C&D Landfill
Statistical Analysis Summary
5/24/2007

LOCATION	PARAMETER	RESULT	DETECTION LIMIT	TEST UNITS	%ND	Test	Statistically Significant?	2nd statistical Analysis	Test
CDMW-9	Tetrachloroethene	1.6	<1	ug/l	80	NPPL	N	---	—
CDMW-9D	Tetrachloroethene	1.8	<1	ug/l	80	NPPL	N	—	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-2	Total Chromium	0.013	<0.010	mg/l	30	NPPL	N	---	---
CDMW-5	Total Chromium	0.026	<0.010	mg/l	30	NPPL	N	—	—
CDMW-6	Total Chromium	0.025	<0.010	mg/l	30	NPPL	N	—	---
CDMW-7	Total Chromium	0.029	<0.010	mg/l	30	NPPL	N	---	—
CDMW-9	Total Chromium	0.057	<0.010	mg/l	30	NPPL	N	—	---
CDMW-9	Trichloroethene	1.8	<1	ug/l	80	NPPL	N	—	---
CDMW-9D	Trichloroethene	1.5	<1	ug/l	80	NPPL	N	---	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-2	Vanadium	0.049	<0.025	mg/l	45	NPPL	N	—	---
CDMW-7	Vanadium	0.044	<0.025	mg/l	45	NPPL	N	—	—
CDMW-9	Vanadium	0.035	<0.025	mg/l	45	NPPL	N	---	---
CDMW-1	Vinyl Chloride	1.6	<1	ug/l	60	NPPL	N	---	---
CDMW-2	Vinyl Chloride	1.8	<1	ug/l	60	NPPL	N	—	—
CDMW-9	Vinyl Chloride	1.9	<1	ug/l	60	NPPL	N	---	---
CDMW-9D	Vinyl Chloride	1.3	<1	ug/l	60	NPPL	N	—	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-2	Zinc	0.035	<0.010	mg/l	26.66	NPPL	N	---	---
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CDMW-4	Zinc	0.018	<0.010	mg/l	26.66	NPPL	N	---	—
CDMW-5	Zinc	0.181	<0.010	mg/l	26.66	NPPL	N	—	---
CDMW-6	Zinc	0.145	<0.010	mg/l	26.66	NPPL	N	---	—
CDMW-7	Zinc	0.069	<0.010	mg/l	26.66	NPPL	N	—	—
CDMW-8	Zinc	0.035	<0.010	mg/l	26.66	NPPL	N	---	---
CDMW-9	Zinc	0.556	<0.010	mg/l	26.66	NPPL	N	—	—

Legend:

%ND	Method chosen due to percent non-detects
PPL	Poisson Prediction Limit
NPPL	Non-parametric Prediction Interval

Shading indicates statistical significance.

Appendix A

Laboratory Analytical Reports

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633
Drinking Water ID: 27715
Wastewater ID: 10

ID#: 6058

JOHNSTON CO. (NEW) C&D LANDFILL
MR. KEVIN SHIELDS
P.O. BOX 2263
SMITHFIELD ,NC 27577

DATE COLLECTED: 05/30/07
DATE REPORTED : 06/22/07

REVIEWED BY:

PARAMETERS	MDL	SWSL	CDMW-1	CDMW-2	CDMW-4	CDMW-6	CDMW-7	Analysis Date	Analyst	Method Code
Total Alkalinity, mg/l	1.0	1.0	199	496	24	16	5	06/01/07	TRB	SM2320B
Chloride, mg/l	5.0	5.0	72	122	12	--- U	25	06/04/07	MDM	SM4500-CLB
Total Dissolved Residue, mg/l	1.0	1.0	230	562	48	56	91	06/01/07	SMA	SM2540C
Sulfate, mg/l	5.0	250.0	9.2 J	11.6 J	8.2 J	8.1 J	11.1 J	06/06/07	TRB	SM4500-SO4
Antimony, ug/l	0.05	6.0	--- U	--- U	--- U	--- U	0.1 J	06/05/07	CMF	EPA200.8
Arsenic, ug/l	0.47	10.0	49	7.7 J	0.6 J	4.2 J	5.0 J	06/05/07	CMF	EPA200.8
Barium, ug/l	0.04	100.0	451	682	5.0 J	30.8 J	60.2 J	06/05/07	CMF	EPA200.8
Beryllium, ug/l	0.08	1.0	4	2	0.1 J	2	4	06/05/07	CMF	EPA200.8
Cadmium, ug/l	0.06	1.0	1	2	0.1 J	0.3 J	4	06/05/07	CMF	EPA200.8
Cobalt, ug/l	0.41	10.0	4.8 J	31	2.4 J	13	12	06/05/07	CMF	EPA200.8
Copper, ug/l	0.20	10.0	18	17	9.6 J	21	113	06/05/07	CMF	EPA200.8
Total Chromium, ug/l	0.24	10.0	23	13	2.1 J	25	29	06/05/07	CMF	EPA200.8
Iron, ug/l	4.05	300.0	326800	27930	6485	55980	73400	06/14/07	ADD	SM3111B
Manganese, ug/l	0.51	50.0	2660	4795	100	497	95	06/14/07	LFJ	EPA200.8
Lead, ug/l	0.07	10.0	114	67	1.9 J	20	24	06/05/07	CMF	EPA200.8
Mercury, ug/l	0.04	0.20	0.16 J	0.15 J	--- U	--- U	--- U	06/05/07	CMF	EPA200.8
Nickel, ug/l	0.66	50.0	2.2 J	5.1 J	5.5 J	34.1 J	17.8 J	06/05/07	CMF	EPA200.8
Selenium, ug/l	0.35	10.0	6.0 J	9.9 J	--- U	--- U	9.8 J	06/05/07	CMF	EPA200.8
Silver, ug/l	0.52	10.0	--- U	--- U	--- U	--- U	--- U	06/05/07	CMF	EPA200.8
Thallium, ug/l	0.07	5.0	2.4 J	0.9 J	--- U	--- U	--- U	06/05/07	CMF	EPA200.8
Vanadium, ug/l	0.42	25.0	101	49	1.7 J	14.4 J	44	06/05/07	CMF	EPA200.8
Zinc, ug/l	0.20	10.0	59	35	18	145	69	06/05/07	CMF	EPA200.8

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

Drinking Water ID: 24015
Wastewater ID: 10

ID#: 6058

JOHNSTON CO. (NEW) C&D LANDFILL
MR. KEVIN SHIELDS
P.O. BOX 2263
SMITHFIELD ,NC 27577

DATE COLLECTED: 05/30/07
DATE REPORTED : 06/22/07

REVIEWED BY:

PARAMETERS	MDL	SWSL	CDMW-9	Trip Blank	Analysis Date	Analyst	Method Code
Total Alkalinity, mg/l	1.0	1.0	73		06/01/07	TRB	SM2320B
Chloride, mg/l	5.0	5.0	7		06/04/07	MDM	SM4500-CLB
Total Dissolved Residue, mg/l	1.0	1.0	96		06/01/07	SMA	SM2540C
Sulfate, mg/l	5.0	250.0	21.1 J		06/06/07	TRB	SM4500-SO4E
Antimony, ug/l	0.05	6.0	0.1 J		06/05/07	CMF	EPA200.8
Arsenic, ug/l	0.47	10.0	8.4 J		06/05/07	CMF	EPA200.8
Barium, ug/l	0.04	100.0	190		06/05/07	CMF	EPA200.8
Beryllium, ug/l	0.08	1.0	1		06/05/07	CMF	EPA200.8
Cadmium, ug/l	0.06	1.0	5		06/05/07	CMF	EPA200.8
Cobalt, ug/l	0.41	10.0	311		06/05/07	CMF	EPA200.8
Copper, ug/l	0.20	10.0	63		06/05/07	CMF	EPA200.8
Total Chromium, ug/l	0.24	10.0	57		06/05/07	CMF	EPA200.8
Iron, ug/l	4.05	300.0	186700		06/14/07	ADD	SM3111B
Manganese, ug/l	0.51	50.0	5565		06/14/07	LFJ	EPA200.8
Lead, ug/l	0.07	10.0	61		06/05/07	CMF	EPA200.8
Mercury, ug/l	0.04	0.20	0.38		06/05/07	CMF	EPA200.8
Nickel, ug/l	0.66	50.0	77		06/05/07	CMF	EPA200.8
Selenium, ug/l	0.35	10.0	2.1 J		06/05/07	CMF	EPA200.8
Silver, ug/l	0.52	10.0	--- U		06/05/07	CMF	EPA200.8
Thallium, ug/l	0.07	5.0	0.1 J		06/05/07	CMF	EPA200.8
Vanadium, ug/l	0.42	25.0	35		06/05/07	CMF	EPA200.8
Zinc, ug/l	0.20	10.0	556		06/05/07	CMF	EPA200.8

J = Between MDL and SWSL, U = Below ALL Quanititation Limits.

Environment 1, Incorporated

Laboratory ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: JOHNSTON CO. (NEW) C&D LANDFILL
MR. KEVIN SHIELDS
P.O. BOX 2263
SMITHFIELD, NC 27577

CLIENT ID: 6058

ANALYST: MAO
DATE COLLECTED: 05/30/07
DATE REPORTED: 06/22/07

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	06/11/07 CDMW-1	06/11/07 CDMW-2	06/12/07 CDMW-4	06/12/07 CDMW-6	06/12/07 CDMW-7
Date Analyzed:			06/11/07	06/11/07	06/12/07	06/12/07	06/12/07
1. Chloromethane	0.18	1.0	--- U	--- U	--- U	0.20 J	--- U
2. Vinyl Chloride	0.34	1.0	1.60	1.80	--- U	--- U	--- U
3. Bromomethane	0.26	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.29	10.0	0.70 J	0.60 J	--- U	--- U	--- U
5. Trichlorofluoromethane	0.13	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.14	5.0	--- U	--- U	--- U	--- U	--- U
7. Acetone	1.21	100.0	6.50 J	7.00 J	4.00 J	5.20 J	6.10 J
8. Iodomethane	0.12	10.0	--- U	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.14	100.0	--- U	0.20 J	--- U	--- U	--- U
10. Methylene Chloride	0.14	1.0	--- U	--- U	--- U	--- U	0.40 J
11. trans-1,2-Dichloroethene	0.13	5.0	--- U	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.16	5.0	--- U	--- U	0.60 J	--- U	3.60 J
13. Vinyl Acetate	0.20	5.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.14	5.0	0.40 J	0.60 J	--- U	--- U	1.50 J
15. 2-Butanone	0.85	100.0	1.20 J	1.60 J	1.70 J	1.60 J	2.30 J
16. Bromochloromethane	0.11	3.0	--- U	--- U	--- U	--- U	--- U
17. Chloroform	0.13	5.0	--- U	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.11	1.0	--- U	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.13	1.0	--- U	--- U	--- U	--- U	--- U
20. Benzene	0.16	1.0	2.30	3.40	--- U	--- U	--- U
21. 1,2-Dichloroethane	0.12	1.0	--- U	--- U	--- U	--- U	--- U
22. Trichloroethene	0.13	1.0	--- U	--- U	--- U	--- U	0.60 J
23. 1,2-Dichloropropane	0.17	1.0	--- U	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.13	1.0	--- U	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.17	1.0	--- U	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	0.68	100.0	--- U	--- U	--- U	--- U	--- U
27. Toluene	0.13	1.0	0.70 J	0.60 J	0.40 J	0.40 J	0.60 J
28. trans-1,3-Dichloropropene	0.14	1.0	--- U	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.20	5.0	--- U	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.16	1.0	--- U	--- U	--- U	--- U	0.60 J
31. 2-Hexanone	1.00	50.0	--- U	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.14	1.0	--- U	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.13	1.0	--- U	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.13	3.0	4.40	7.50	--- U	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.14	5.0	--- U	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.16	1.0	--- U	--- U	--- U	--- U	--- U
37. Xylenes	0.48	4.0	--- U	--- U	--- U	--- U	--- U
38. Dibromomethane	0.17	10.0	--- U	--- U	--- U	--- U	--- U
39. Styrene	0.16	1.0	--- U	--- U	--- U	--- U	--- U
40. Bromoform	0.11	3.0	--- U	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.16	1.0	--- U	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.06	1.0	--- U	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.21	1.0	2.70	4.20	--- U	0.30 J	0.40 J
44. 1,2-Dichlorobenzene	0.13	5.0	0.60 J	0.80 J	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.26	1.0	--- U	--- U	--- U	--- U	--- U
46. Acrylonitrile	1.49	200.0	--- U	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.14	100.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quanititation Limits.

Environment 1, Incorporated

Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: JOHNSTON CO. (NEW) C&D LANDFILL
MR. KEVIN SHIELDS
P.O. BOX 2263
SMITHFIELD, NC 27577

CLIENT ID: 6058

ANALYST: MAO
DATE COLLECTED: 05/30/07
DATE REPORTED: 06/22/07

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Date Analyzed: 06/12/07 CDMW-9	06/12/07 Trip Blank
1. Chloromethane	0.18	1.0	--- U	--- U
2. Vinyl Chloride	0.34	1.0	1.90	--- U
3. Bromomethane	0.26	10.0	--- U	--- U
4. Chloroethane	0.29	10.0	0.80 J	--- U
5. Trichlorofluoromethane	0.13	1.0	--- U	--- U
6. 1,1-Dichloroethene	0.14	5.0	0.20 J	--- U
7. Acetone	1.21	100.0	4.50 J	2.90 J
8. Iodomethane	0.12	10.0	--- U	--- U
9. Carbon Disulfide	0.14	100.0	--- U	--- U
10. Methylene Chloride	0.14	1.0	--- U	--- U
11. trans-1,2-Dichloroethene	0.13	5.0	0.40 J	--- U
12. 1,1-Dichloroethane	0.16	5.0	12.90	--- U
13. Vinyl Acetate	0.20	5.0	--- U	--- U
14. Cis-1,2-Dichloroethene	0.14	5.0	29.00	--- U
15. 2-Butanone	0.85	100.0	1.60 J	--- U
16. Bromochloromethane	0.11	3.0	--- U	--- U
17. Chloroform	0.13	5.0	--- U	--- U
18. 1,1,1-Trichloroethane	0.11	1.0	--- U	--- U
19. Carbon Tetrachloride	0.13	1.0	--- U	--- U
20. Benzene	0.16	1.0	2.00	--- U
21. 1,2-Dichloroethane	0.12	1.0	1.00	--- U
22. Trichloroethene	0.13	1.0	1.80	--- U
23. 1,2-Dichloropropane	0.17	1.0	2.60	--- U
24. Bromodichloromethane	0.13	1.0	--- U	--- U
25. Cis-1,3-Dichloropropene	0.17	1.0	--- U	--- U
26. 4-Methyl-2-Pentanone	0.68	100.0	--- U	--- U
27. Toluene	0.13	1.0	0.40 J	1.10
28. trans-1,3-Dichloropropene	0.14	1.0	--- U	--- U
29. 1,1,2-Trichloroethane	0.20	5.0	--- U	--- U
30. Tetrachloroethene	0.16	1.0	1.60	--- U
31. 2-Hexanone	1.00	50.0	--- U	--- U
32. Dibromochloromethane	0.14	1.0	--- U	--- U
33. 1,2-Dibromoethane	0.13	1.0	--- U	--- U
34. Chlorobenzene	0.13	3.0	6.30	--- U
35. 1,1,1,2-Tetrachloroethane	0.14	5.0	--- U	--- U
36. Ethylbenzene	0.16	1.0	--- U	--- U
37. Xylenes	0.48	4.0	--- U	--- U
38. Dibromomethane	0.17	10.0	--- U	--- U
39. Styrene	0.16	1.0	--- U	--- U
40. Bromoform	0.11	3.0	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.16	1.0	--- U	--- U
42. 1,2,3-Trichloropropane	0.06	1.0	--- U	--- U
43. 1,4-Dichlorobenzene	0.21	1.0	5.80	--- U
44. 1,2-Dichlorobenzene	0.13	5.0	0.40 J	--- U
45. 1,2-Dibromo-3-Chloropropane	0.26	1.0	--- U	--- U
46. Acrylonitrile	1.49	200.0	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.14	100.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quanititation Limits.

? Cooler only

...ment ..., Inc.
P.O. Box ...085, 114 Oakmont Dr.
Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

Page 1 of 1

CLIENT: 6058 WEEK: 21

Johnston Co. (New) C&D Landfill
Kevin J. Shields
P.O. Box 2263
Smithfield, NC 27577
(919) 938-4747

DISINFECTION
- ☐ CHLORINE
- ☐ UV
- ☐ NONE
- ☐ _____

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	ALKALINITY	CHLORIDE	TDS	SULFATE	METALS	EPA 8260B	8260 Dup. 1	8260 Dup. 2
							7/2			L2	L2	L2	L2
						P	P	P	P	P	G	G	G
						A	A	A	A	B	E	E	E
CDMW-1	5/30/07	11:01	N/A	19	7	x	x	x	x	x	x	x	
CDMW-2		11:49	N/A	18	8	x	x	x	x	x	x	x	x
CDMW-4		16:24	N/A	17	7	x	x	x	x	x	x	x	
CDMW-6		12:58	N/A	17	7	x	x	x	x	x	x	x	
CDMW-7		14:16	N/A	17	7	x	x	x	x	x	x	x	
CDMW-9		17:35	N/A	16	7	x	x	x	x	x	x	x	
Trip Blank		N/A	N/A	N/A	1						X		

PARAMETERS

CHLORINE NEUTRALIZED AT COLLECTION

pH CHECK (LAB)

CONTAINER TYPE, P/G

CHEMICAL PRESERVATION

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE
G - NA THIOSULFATE

CLASSIFICATION:
- ☐ WASTEWATER (NPDES)
- ☐ DRINKING WATER
- ☐ DWQ/GW
- ☒ SOLID WASTE SECTION

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY
Y N

SAMPLES COLLECTED BY: (Please Print)
~~[illegible]~~ Kevin J. Shields

SAMPLES RECEIVED IN LAB AT 2.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
[signature]	5/31/07 09:30	[signature]	5/31/07 3:23
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

Instructions for completing this form are on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

№ 150311

FORM #5

Environment 1, Incorporated

Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6058

JOHNSTON CO. (NEW) C&D LANDFILL
MR. KEVIN SHIELDS
P.O. BOX 2263
SMITHFIELD ,NC 27577

DATE COLLECTED: 05/31/07
DATE REPORTED : 06/28/07

REVIEWED BY:

PARAMETERS	MDL	SWSL	CDMW-3	CDMW-5	CDMW-5D	CDMW-8	CDMW-9D	Analysis Date	Analyst	Method Code
Total Alkalinity, mg/l	1.0	1.0	38	12	14	2	76	06/01/07	TRB	SM2320B
Chloride, mg/l	5.0	5.0	--- U	5	5	23	7	06/04/07	MDM	SM4500-CLB
Total Dissolved Residue, mg/l	1.0	1.0	42	72	56	90	116	06/06/07	SMA	SM2540C
Sulfate, mg/l	5.0	250.0	8.3 J	14.8 J	17.9 J	6.7 J	--- U	06/06/07	TRB	SM4500-SO4
Antimony, ug/l	0.05	6.0	0.3 J	0.1 J	--- U	0.1 J	--- U	06/18/07	ADD	EPA200.8
Arsenic, ug/l	0.47	10.0	2.3 J	2.8 J	--- U	0.9 J	12	06/18/07	ADD	EPA200.8
Barium, ug/l	0.04	100.0	116	61.4 J	6.9 J	46.1 J	8.7 J	06/18/07	ADD	EPA200.8
Beryllium, ug/l	0.08	1.0	2	1	--- U	1	--- U	06/18/07	ADD	EPA200.8
Cadmium, ug/l	0.06	1.0	0.7 J	0.5 J	--- U	0.1 J	0.1 J	06/18/07	ADD	EPA200.8
Cobalt, ug/l	0.41	10.0	19	14	3.5 J	6.4 J	25.8	06/18/07	ADD	EPA200.8
Copper, ug/l	0.20	10.0	45	39	2.0 J	5.3 J	1.4 J	06/18/07	ADD	EPA200.8
Total Chromium, ug/l	0.24	10.0	9.7 J	26	0.7 J	6.2 J	0.5 J	06/18/07	ADD	EPA200.8
Iron, ug/l	4.05	300.0	29880	48760	1114	6560	4698	06/14/07	ADD	SM3111B
Manganese, ug/l	0.51	50.0	603	1004	39.7 J	72	1826	06/18/07	ADD	EPA200.8
Lead, ug/l	0.07	10.0	16	23	0.4 J	3.5 J	0.9 J	06/18/07	ADD	EPA200.8
Mercury, ug/l	0.04	0.20	0.07 J	0.09 J	0.24	0.06 J	0.09 J	06/18/07	ADD	EPA200.8
Nickel, ug/l	0.66	50.0	24.9 J	43.9 J	3.2 J	9.9 J	10.3 J	06/18/07	ADD	EPA200.8
Selenium, ug/l	0.35	10.0	0.8 J	1.1 J	--- U	1.9 J	1.4 J	06/18/07	ADD	EPA200.8
Silver, ug/l	0.52	10.0	--- U	--- U	--- U	--- U	--- U	06/18/07	ADD	EPA200.8
Thallium, ug/l	0.07	5.0	0.3 J	0.1 J	0.1 J	0.1 J	--- U	06/18/07	ADD	EPA200.8
Vanadium, ug/l	0.42	25.0	8.6 J	17.9 J	0.7 J	12.2 J	--- U	06/18/07	ADD	EPA200.8
Zinc, ug/l	0.20	10.0	89	181	7.9 J	35	5.2 J	06/25/07	CMF	EPA200.8

J = Between MDL and SWSL, U = Below ALL Quanititation Limits.

Environment 1, Incorporated

Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: JOHNSTON CO. (NEW) C&D LANDFILL
MR. KEVIN SHIELDS
P.O. BOX 2263
SMITHFIELD, NC 27577

CLIENT ID: 6058

ANALYST: MAO
DATE COLLECTED: 05/31/07
DATE ANALYZED: 06/12/07
DATE REPORTED: 06/28/07

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	CDMW-3	CDMW-5	CDMW-5D	CDMW-8	CDMW-9D
1. Chloromethane	0.18	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.34	1.0	--- U	--- U	--- U	--- U	1.30
3. Bromomethane	0.26	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.29	10.0	--- U	--- U	--- U	--- U	--- U
5. Trichlorofluoromethane	0.13	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.14	5.0	--- U	--- U	--- U	--- U	0.30 J
7. Acetone	1.21	100.0	5.00 J	5.40 J	6.50 J	6.10 J	7.00 J
8. Iodomethane	0.12	10.0	--- U	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.14	100.0	--- U	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.14	1.0	--- U	0.30 J	1.60	0.20 J	0.70 J
11. trans-1,2-Dichloroethene	0.13	5.0	--- U	--- U	--- U	--- U	0.30 J
12. 1,1-Dichloroethane	0.16	5.0	0.20 J	1.70 J	4.40 J	--- U	11.40
13. Vinyl Acetate	0.20	5.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.14	5.0	--- U	0.90 J	2.60 J	--- U	20.10
15. 2-Butanone	0.85	100.0	2.20 J	2.20 J	2.20 J	2.10 J	3.10 J
16. Bromochloromethane	0.11	3.0	--- U	--- U	--- U	--- U	--- U
17. Chloroform	0.13	5.0	--- U	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.11	1.0	--- U	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.13	1.0	--- U	--- U	--- U	--- U	--- U
20. Benzene	0.16	1.0	--- U	--- U	0.20 J	--- U	1.30
21. 1,2-Dichloroethane	0.12	1.0	--- U	0.20 J	--- U	--- U	0.80 J
22. Trichloroethene	0.13	1.0	--- U	0.30 J	0.60 J	--- U	1.50
23. 1,2-Dichloropropane	0.17	1.0	--- U	--- U	0.60 J	--- U	2.10
24. Bromodichloromethane	0.13	1.0	--- U	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.17	1.0	--- U	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	0.68	100.0	--- U	--- U	--- U	--- U	--- U
27. Toluene	0.13	1.0	0.30 J	0.20 J	0.40 J	0.30 J	0.50 J
28. trans-1,3-Dichloropropene	0.14	1.0	--- U	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.20	5.0	--- U	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.16	1.0	--- U	0.30 J	0.60 J	--- U	1.80
31. 2-Hexanone	1.00	50.0	--- U	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.14	1.0	--- U	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.13	1.0	--- U	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.13	3.0	--- U	--- U	0.20 J	--- U	4.50
35. 1,1,1,2-Tetrachloroethane	0.14	5.0	--- U	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.16	1.0	--- U	--- U	--- U	--- U	--- U
37. Xylenes	0.48	4.0	--- U	--- U	--- U	--- U	--- U
38. Dibromomethane	0.17	10.0	--- U	--- U	--- U	--- U	--- U
39. Styrene	0.16	1.0	--- U	--- U	--- U	--- U	--- U
40. Bromoform	0.11	3.0	--- U	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.16	1.0	--- U	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.06	1.0	--- U	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.21	1.0	--- U	--- U	0.50 J	--- U	4.10
44. 1,2-Dichlorobenzene	0.13	5.0	--- U	--- U	--- U	--- U	0.30 J
45. 1,2-Dibromo-3-Chloropropane	0.26	1.0	--- U	--- U	--- U	--- U	--- U
46. Acrylonitrile	1.49	200.0	--- U	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.14	100.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quanititation Limits.

Environment 1, Incorporated

Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: JOHNSTON CO. (NEW) C&D LANDFILL
MR. KEVIN SHIELDS
P.O. BOX 2263
SMITHFIELD, NC 27577

CLIENT ID: 6058

ANALYST: MAO
DATE COLLECTED: 05/31/07
DATE ANALYZED: 06/12/07
DATE REPORTED: 06/28/07

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Equipment Blank	Trip Blank
1. Chloromethane	0.18	1.0	--- U	--- U
2. Vinyl Chloride	0.34	1.0	--- U	--- U
3. Bromomethane	0.26	10.0	--- U	--- U
4. Chloroethane	0.29	10.0	--- U	--- U
5. Trichlorofluoromethane	0.13	1.0	--- U	--- U
6. 1,1-Dichloroethene	0.14	5.0	--- U	--- U
7. Acetone	1.21	100.0	13.30 J	2.00 J
8. Iodomethane	0.12	10.0	--- U	--- U
9. Carbon Disulfide	0.14	100.0	--- U	--- U
10. Methylene Chloride	0.14	1.0	1.10	--- U
11. trans-1,2-Dichloroethene	0.13	5.0	--- U	--- U
12. 1,1-Dichloroethane	0.16	5.0	--- U	--- U
13. Vinyl Acetate	0.20	5.0	--- U	--- U
14. Cis-1,2-Dichloroethene	0.14	5.0	--- U	--- U
15. 2-Butanone	0.85	100.0	5.50 J	--- U
16. Bromochloromethane	0.11	3.0	--- U	--- U
17. Chloroform	0.13	5.0	0.40 J	--- U
18. 1,1,1-Trichloroethane	0.11	1.0	--- U	--- U
19. Carbon Tetrachloride	0.13	1.0	--- U	--- U
20. Benzene	0.16	1.0	--- U	--- U
21. 1,2-Dichloroethane	0.12	1.0	--- U	--- U
22. Trichloroethene	0.13	1.0	--- U	--- U
23. 1,2-Dichloropropane	0.17	1.0	--- U	--- U
24. Bromodichloromethane	0.13	1.0	--- U	--- U
25. Cis-1,3-Dichloropropene	0.17	1.0	--- U	--- U
26. 4-Methyl-2-Pentanone	0.68	100.0	--- U	--- U
27. Toluene	0.13	1.0	0.60 J	1.00
28. trans-1,3-Dichloropropene	0.14	1.0	--- U	--- U
29. 1,1,2-Trichloroethane	0.20	5.0	--- U	--- U
30. Tetrachloroethene	0.16	1.0	--- U	--- U
31. 2-Hexanone	1.00	50.0	1.40 J	--- U
32. Dibromochloromethane	0.14	1.0	--- U	--- U
33. 1,2-Dibromoethane	0.13	1.0	--- U	--- U
34. Chlorobenzene	0.13	3.0	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.14	5.0	--- U	--- U
36. Ethylbenzene	0.16	1.0	--- U	--- U
37. Xylenes	0.48	4.0	--- U	--- U
38. Dibromomethane	0.17	10.0	--- U	--- U
39. Styrene	0.16	1.0	--- U	--- U
40. Bromoform	0.11	3.0	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.16	1.0	--- U	--- U
42. 1,2,3-Trichloropropane	0.06	1.0	--- U	--- U
43. 1,4-Dichlorobenzene	0.21	1.0	0.40 J	--- U
44. 1,2-Dichlorobenzene	0.13	5.0	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.26	1.0	--- U	--- U
46. Acrylonitrile	1.49	200.0	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.14	100.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quanititation Limits.

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 0058 WEEK: 21
JOHNSTON CO. (WEW) C&D LANDFILL
KEVIN J. SHIELDS
P.O. BOX 2263
SMITHFIELD, NC 27577
(919) 938-4747

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	ALKALINITY	CHLORIDE	TDS	SULFATE	METALS	EPA 8260B	8260 Dep. 1	8260 Dep. 2
CHLORINE NEUTRALIZED AT COLLECTION													
pH CHECK (LAB)										12	12	12	
CONTAINER TYPE, P/G						P	P	P	P	P	G	G	G
CHEMICAL PRESERVATION						A	A	A	A	B	E	E	E
CAMW-5D	5/31/07	11:17	N/A	17	7	X	X	X	X	X	X	X	
CAMW-5		11:54	N/A	17	7	X	X	X	X	X	X	X	
~~CAMW-8D~~		INSUFFICIENT WATER VOLUME TO SAMPLE											
CAMW-8		12:54	N/A	16	7	X	X	X	X	X	X	X	
CAMW-3		13:46	N/A	16	7	X	X	X	X	X	X	X	
CAMW-9D		15:39	N/A	17	7	X	X	X	X	X	X	X	
TRIP BLANK					1						X		
EQUIPMENT BLANK		16:05	N/A	N/A	1						X		

PARAMETERS

A - NONE
B - HNO_3
C - H_2SO_4
D - NAOH
E - HCL
F - ZINC ACETATE
G - NA THIOSULFATE

CLASSIFICATION:
☐ WASTEWATER (NPDES)
☐ DRINKING WATER
☐ DWQ/GW
☒ SOLID WASTE SECTION

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY: N

SAMPLES COLLECTED BY: (Please Print) KEVIN J. SHIELDS

SAMPLES RECEIVED IN LAB AT 3.4 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
[signature]	05:30 6/1/07	[signature]	6/1/07 8:31
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS: #8D - INSUFFICIENT WATER VOLUME TO RETRIEVE SAMPLES.

Instructions for completing this form are on the reverse side.

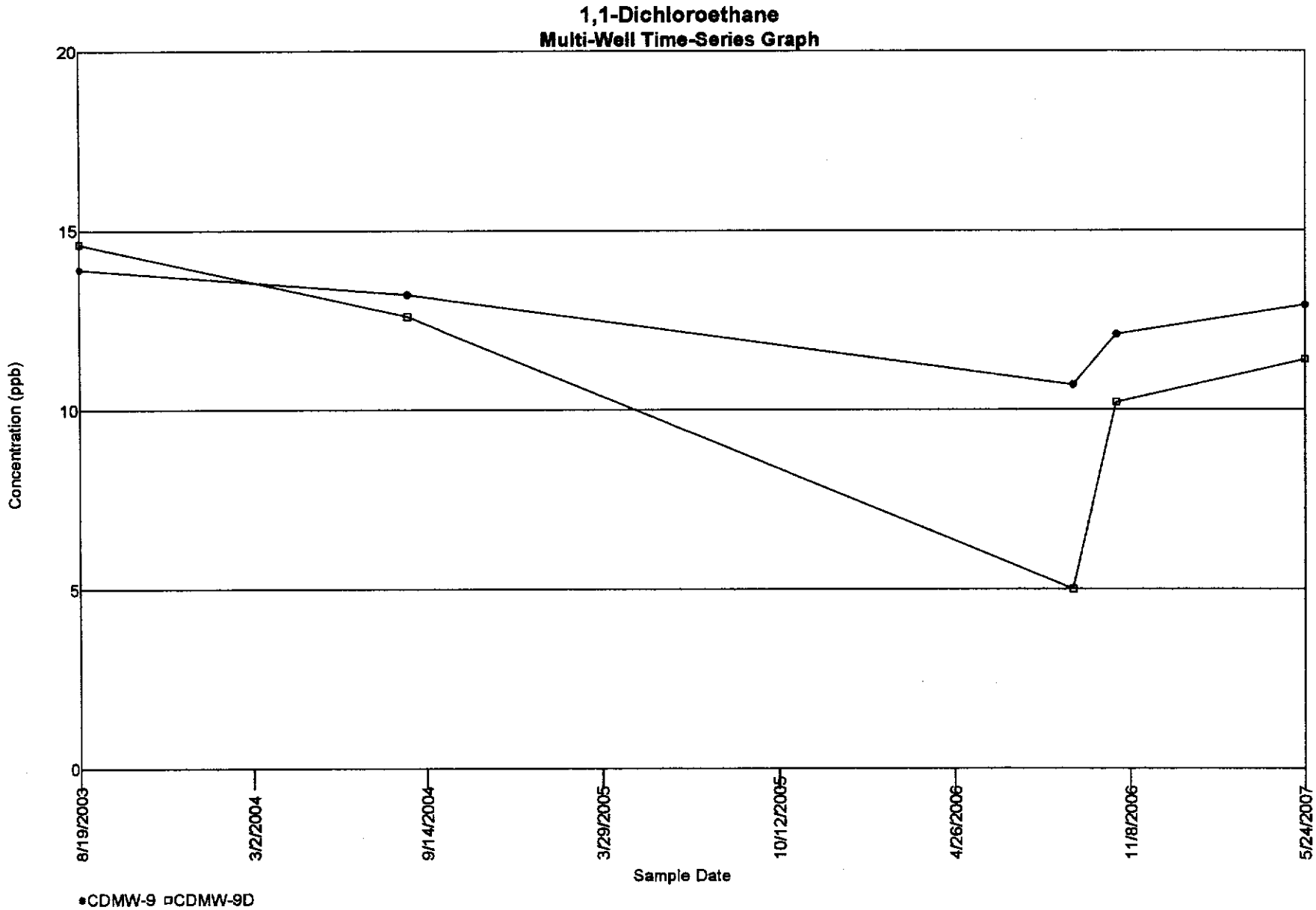
Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

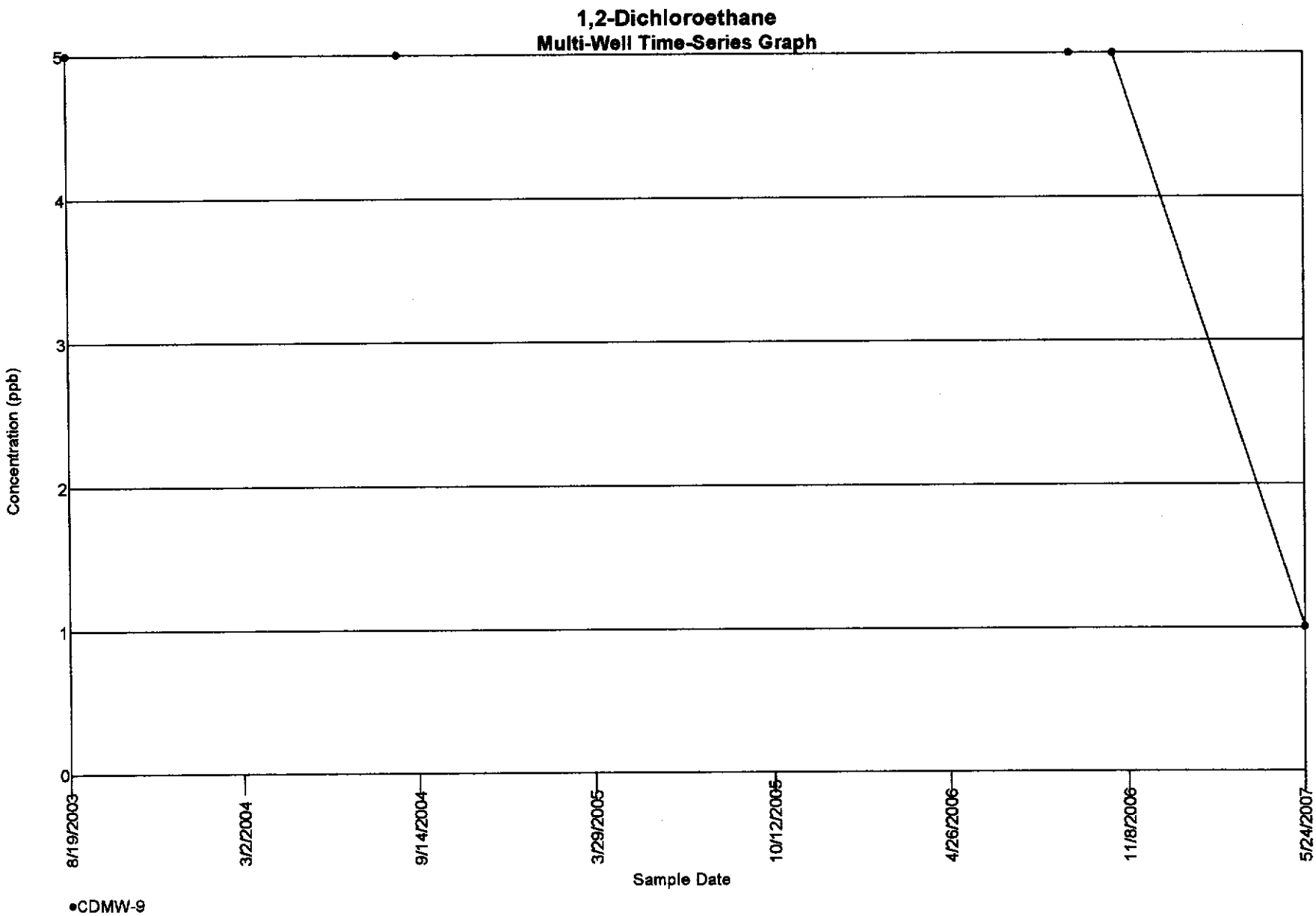
№ 150313

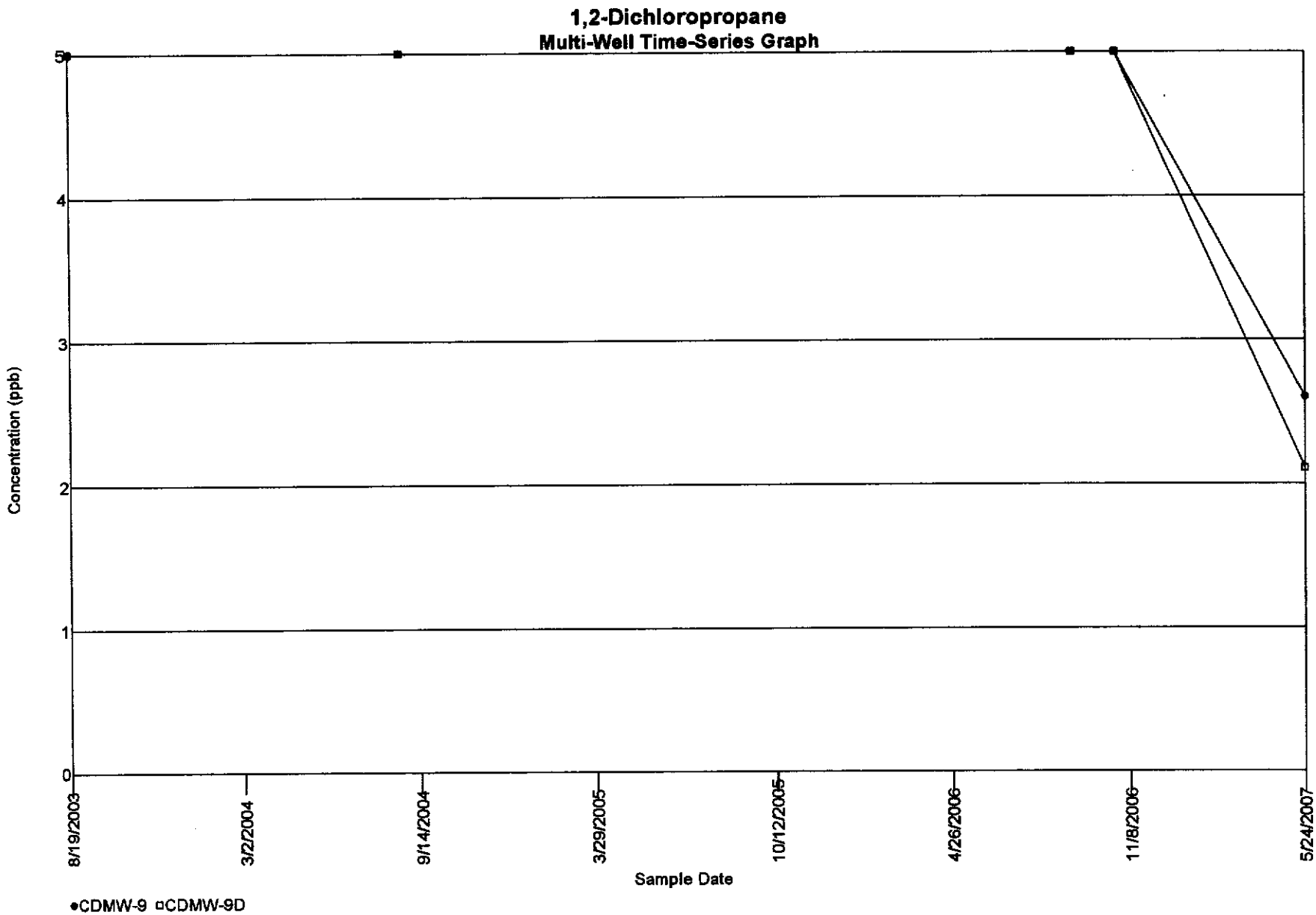
FORM #5

Appendix B

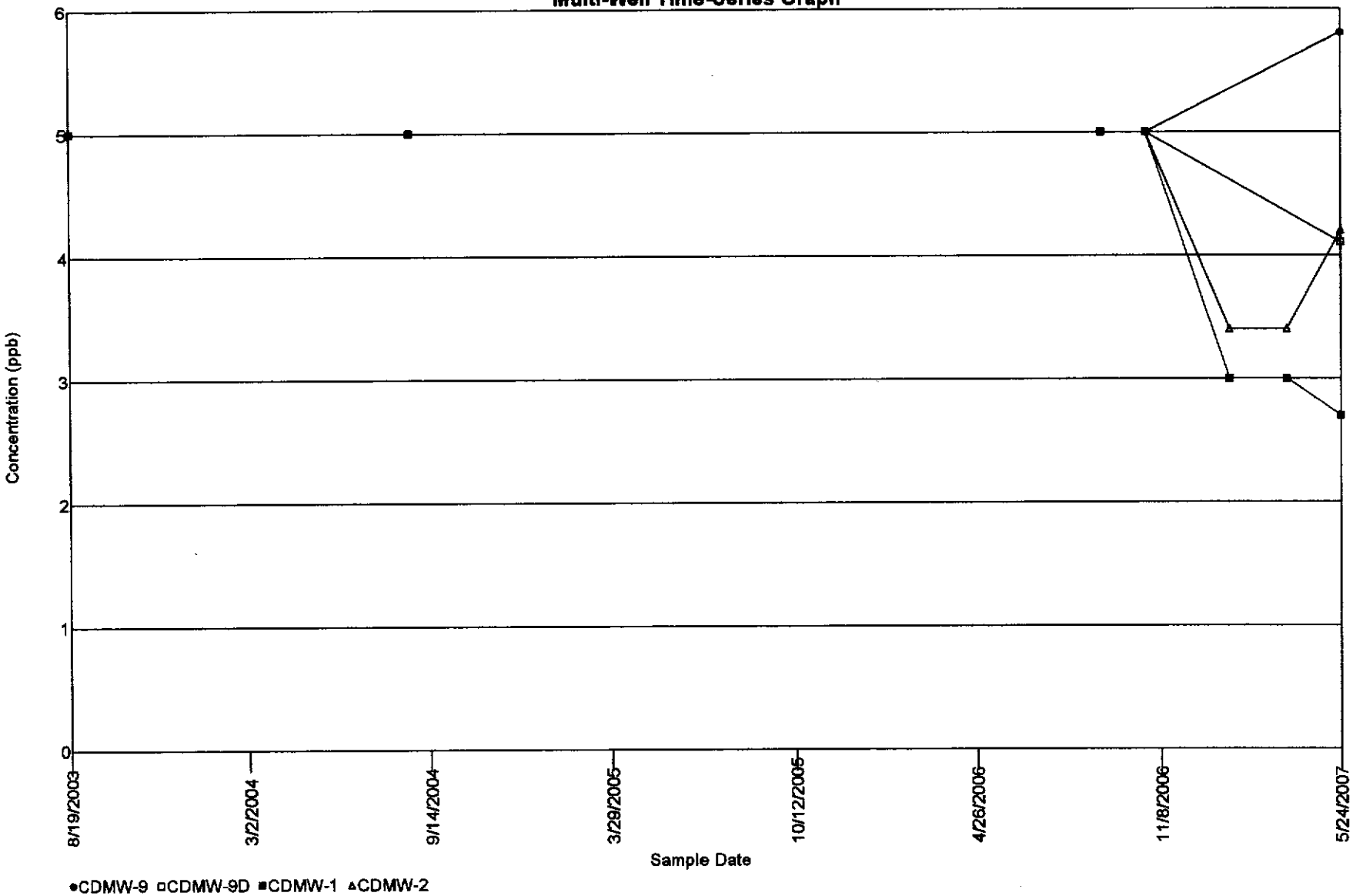
Time vs. Concentration Graphs

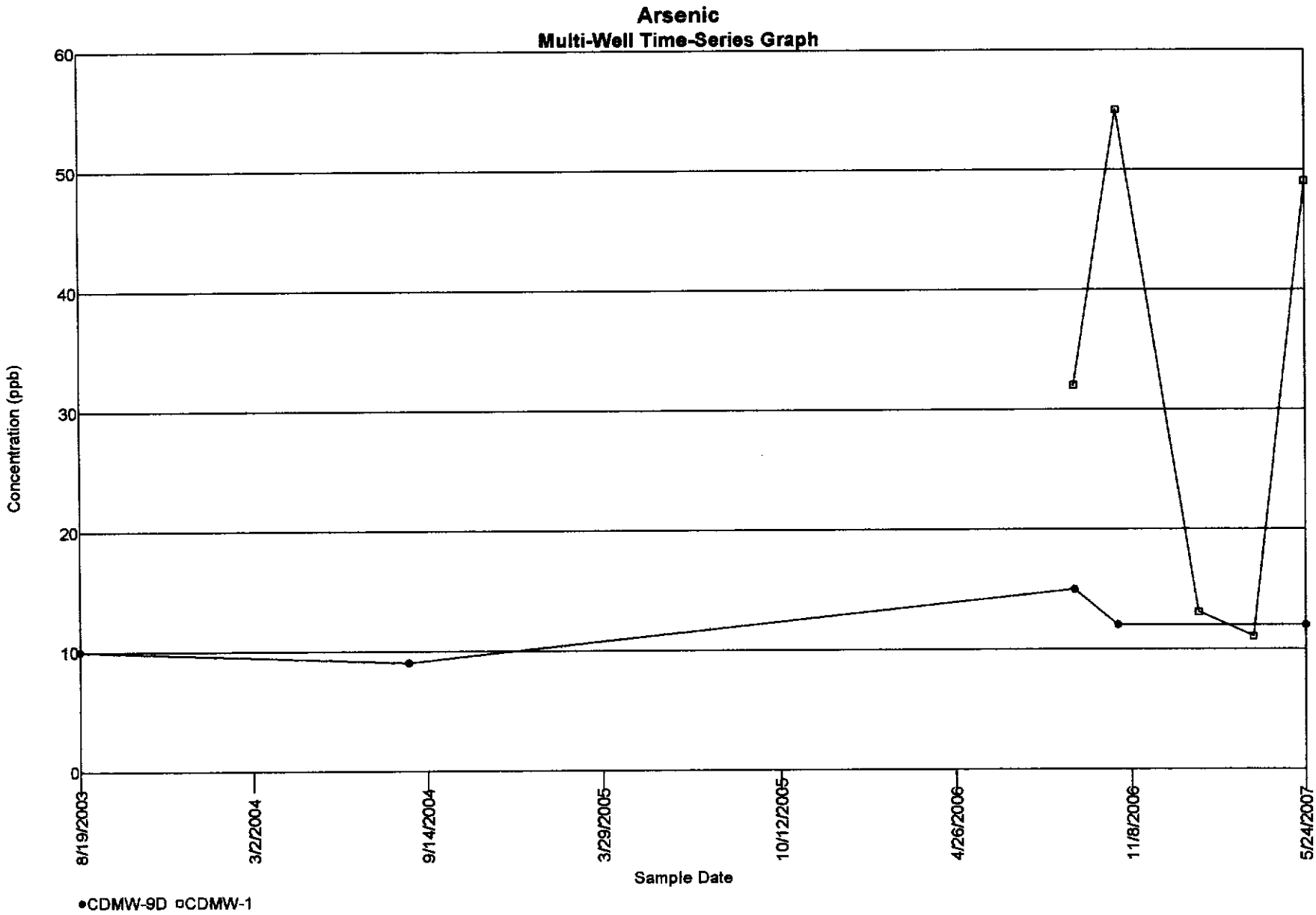

1,1-Dichloroethane
Multi-Well Time-Series Graph
Concentration (ppb)
20
15
10
5
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
•CDMW-9 ▫CDMW-9D

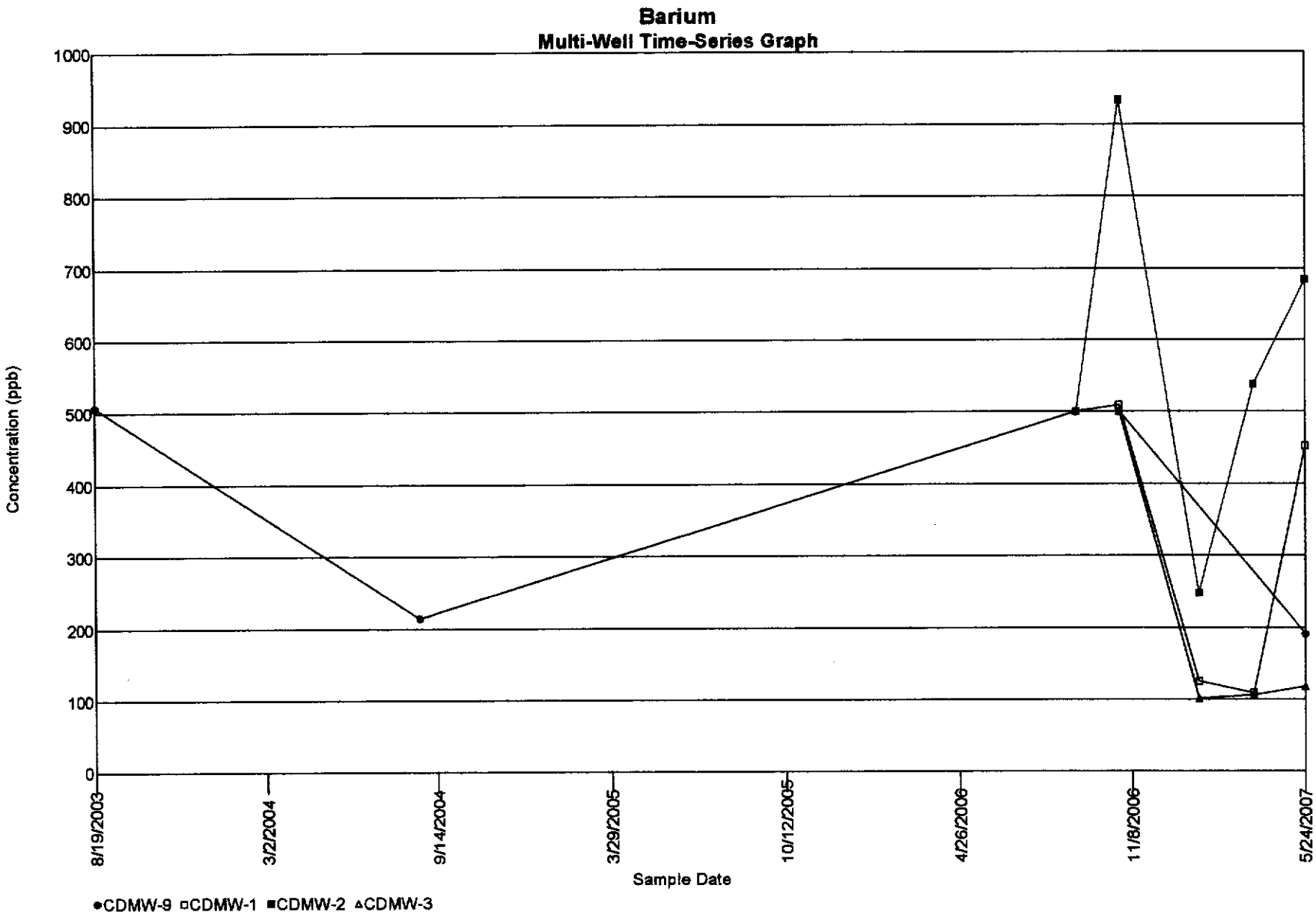

1,2-Dichloroethane
Multi-Well Time-Series Graph
Concentration (ppb)
5
4
3
2
1
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
•CDMW-9

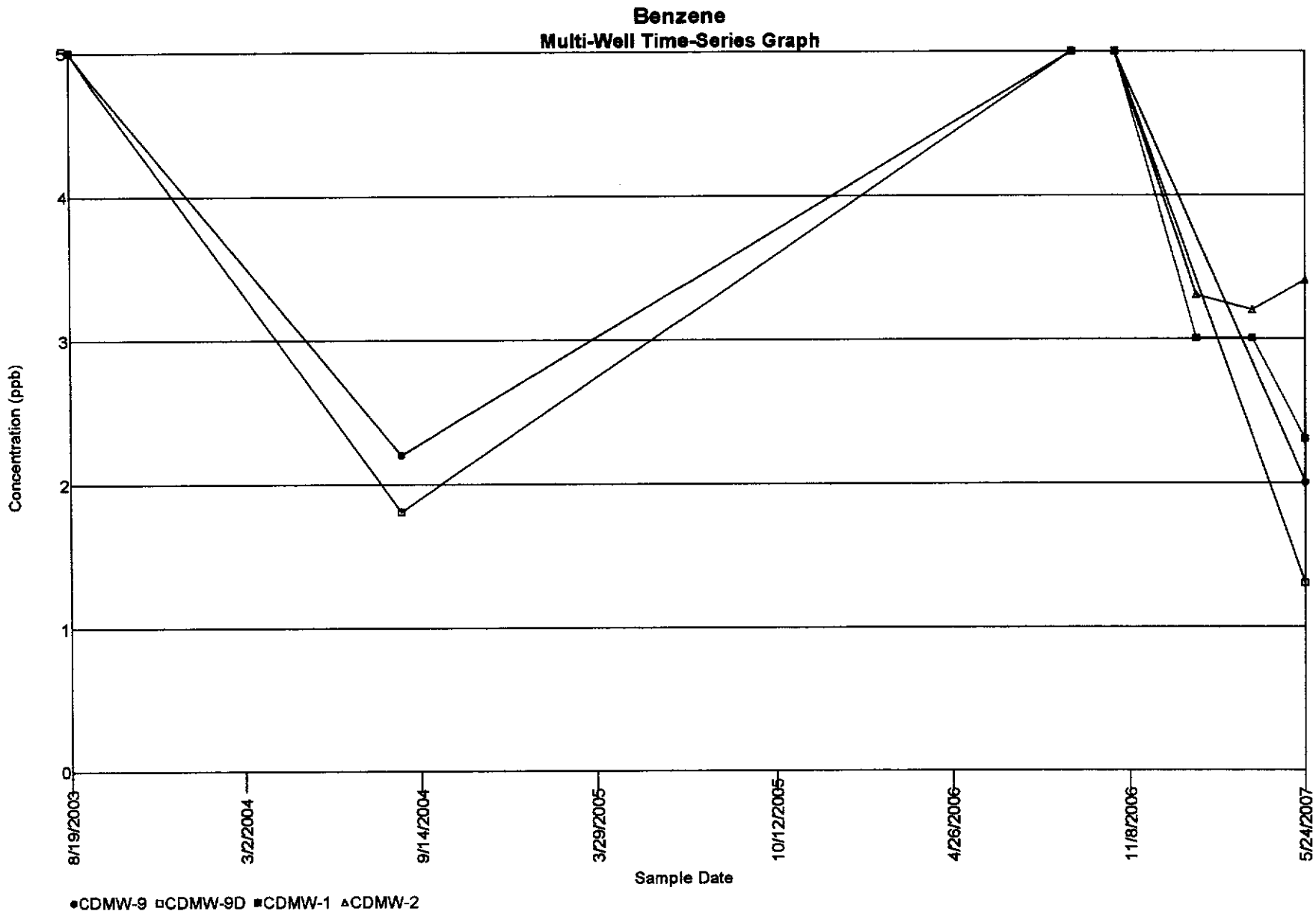

1,2-Dichloropropane
Multi-Well Time-Series Graph
Concentration (ppb)
5
4
3
2
1
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
•CDMW-9 ▫CDMW-9D

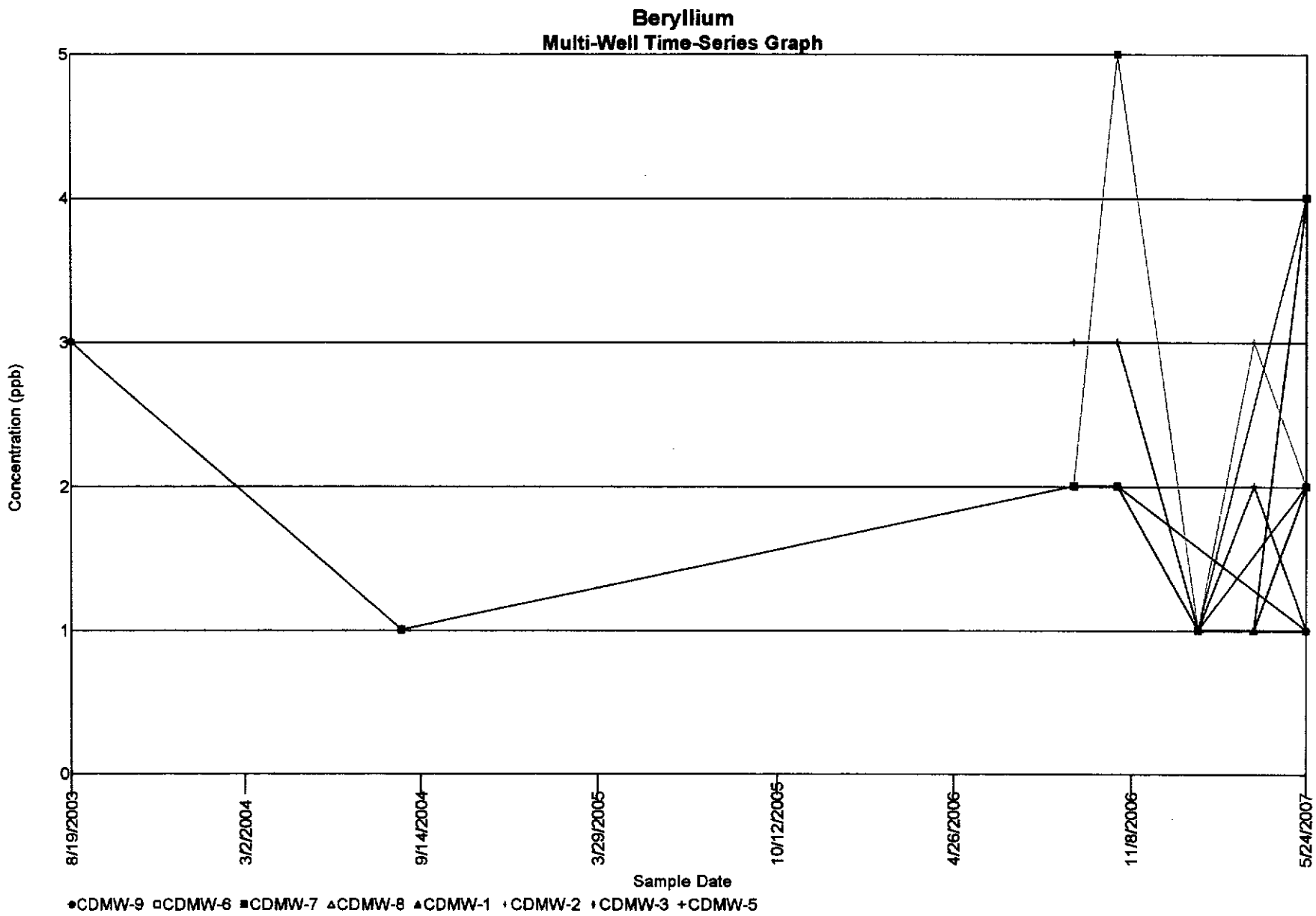
1,4-Dichlorobenzene
Multi-Well Time-Series Graph

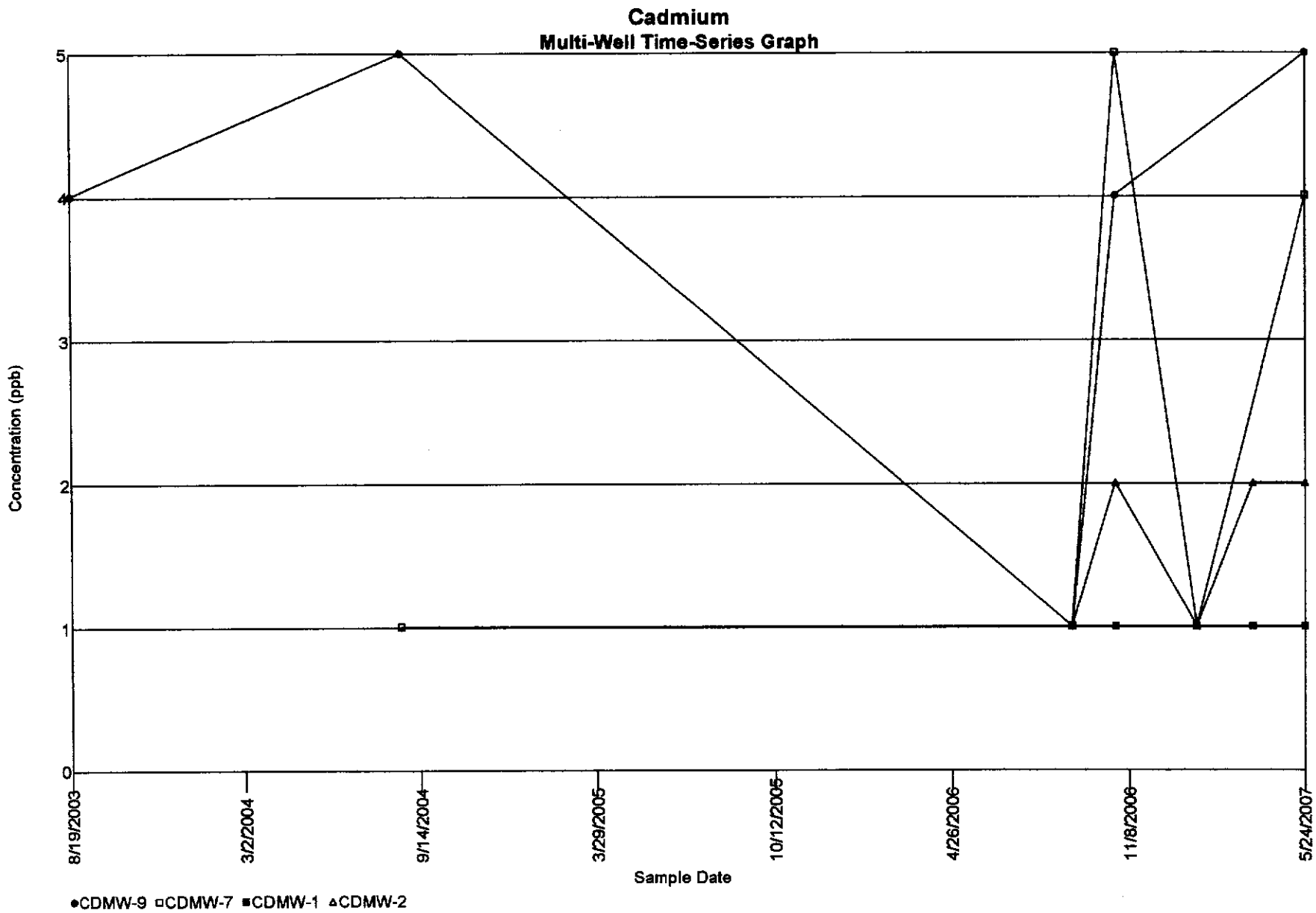


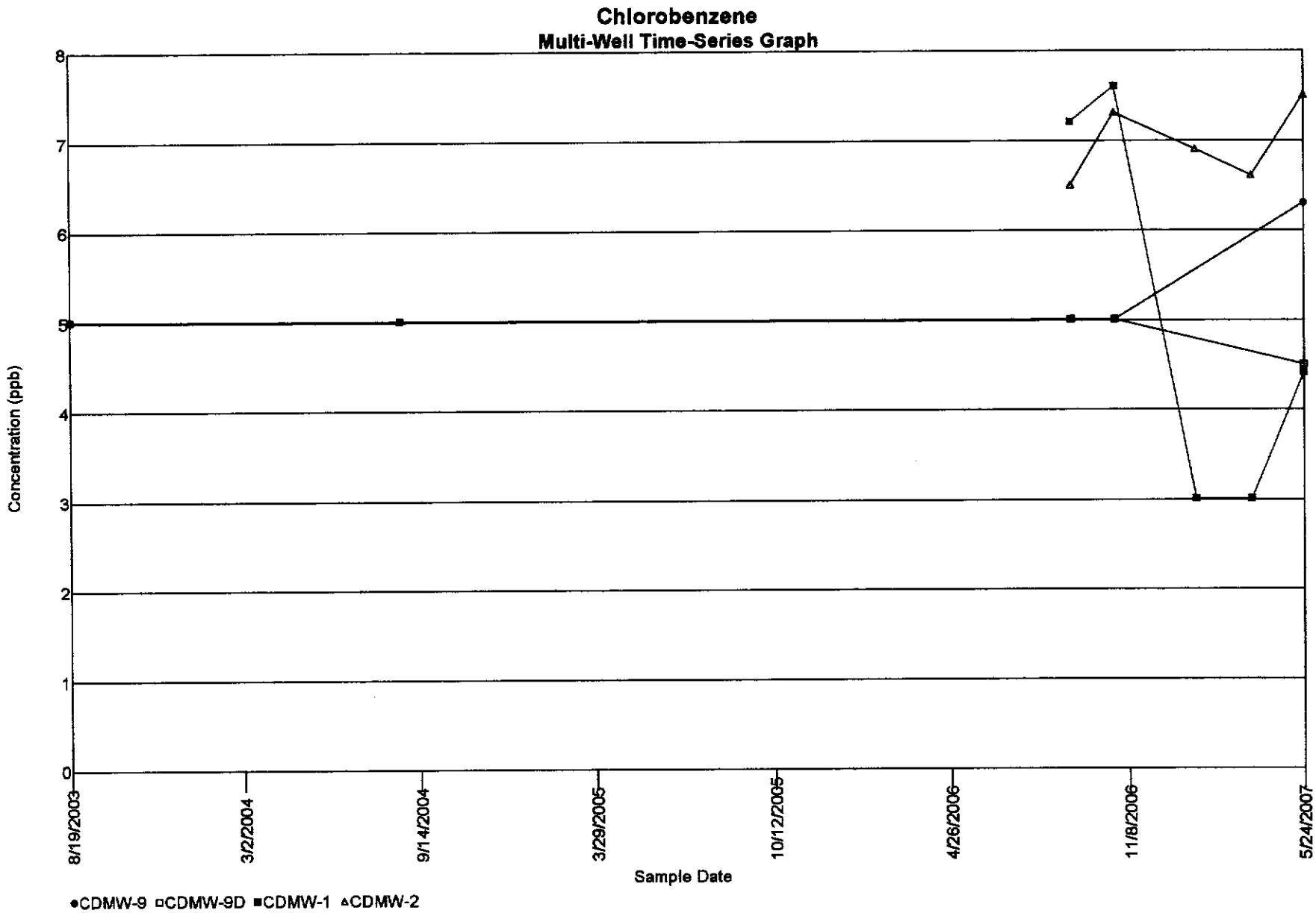

Arsenic
Multi-Well Time-Series Graph
Concentration (ppb)
60
50
40
30
20
10
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
•CDMW-9D ▫CDMW-1

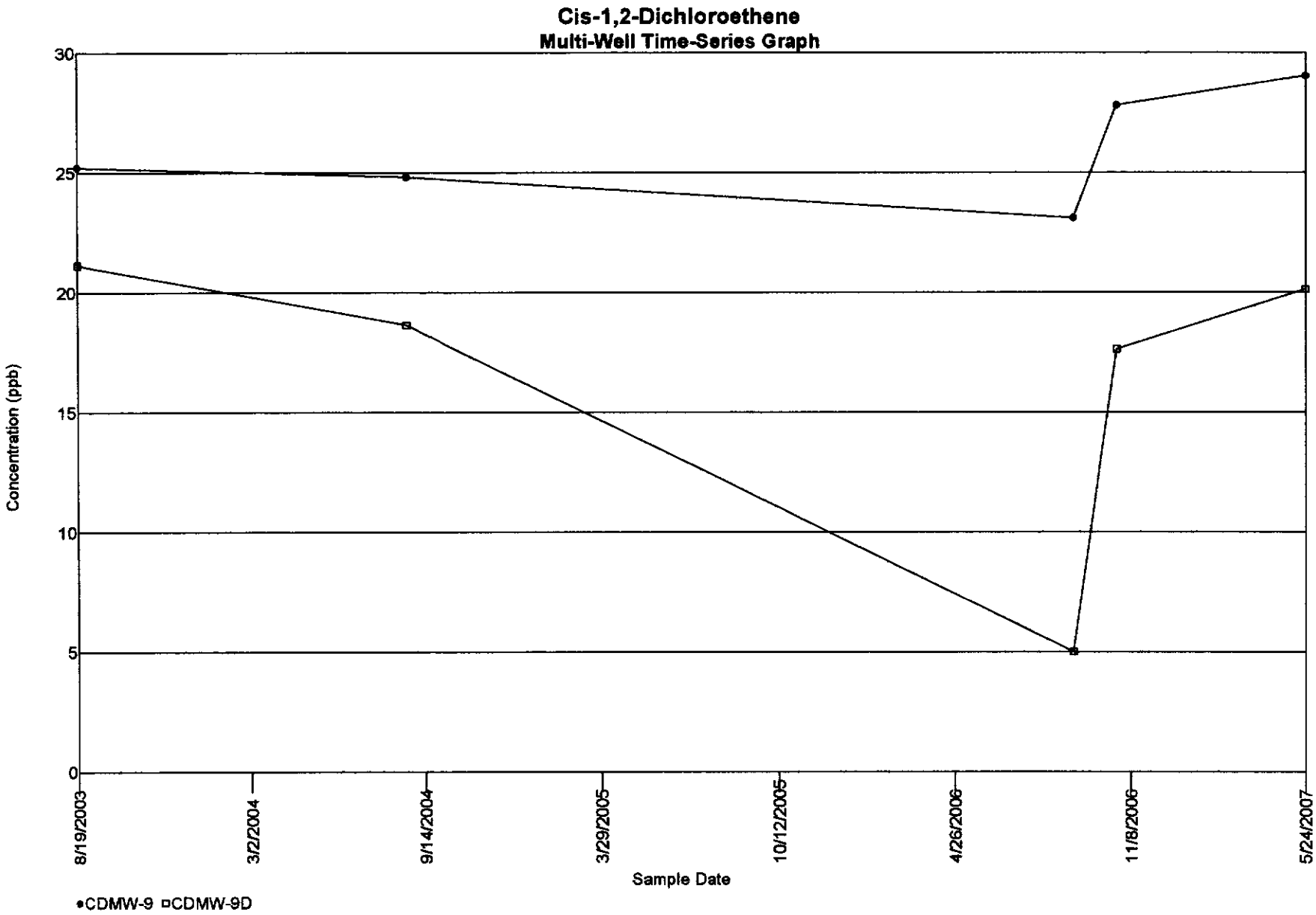

Barium
Multi-Well Time-Series Graph
Concentration (ppb)
1000
900
800
700
600
500
400
300
200
100
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
●CDMW-9 □CDMW-1 ■CDMW-2 ▲CDMW-3

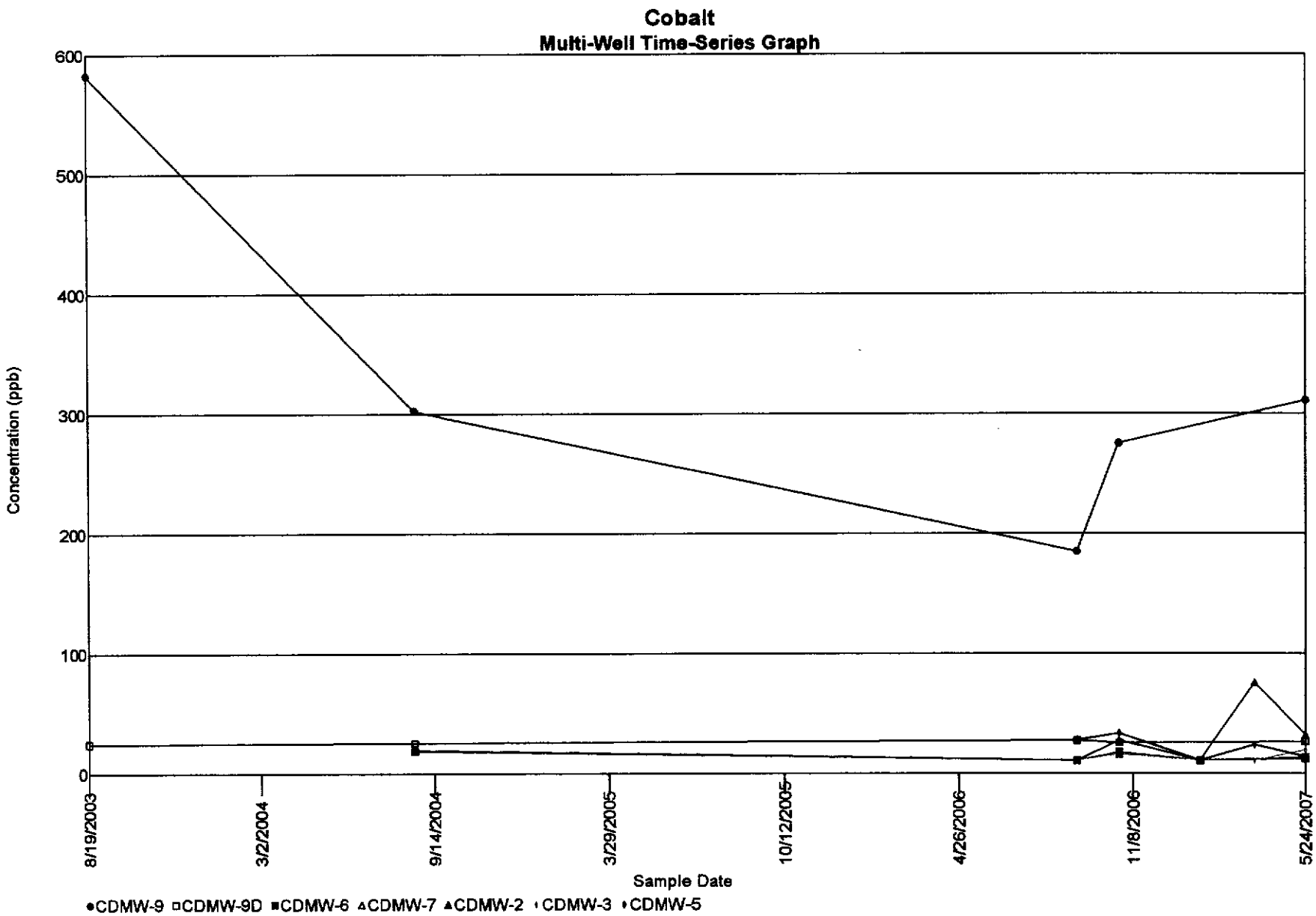

Benzene
Multi-Well Time-Series Graph
Concentration (ppb)
0
1
2
3
4
5
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
●CDMW-9 □CDMW-9D ■CDMW-1 △CDMW-2

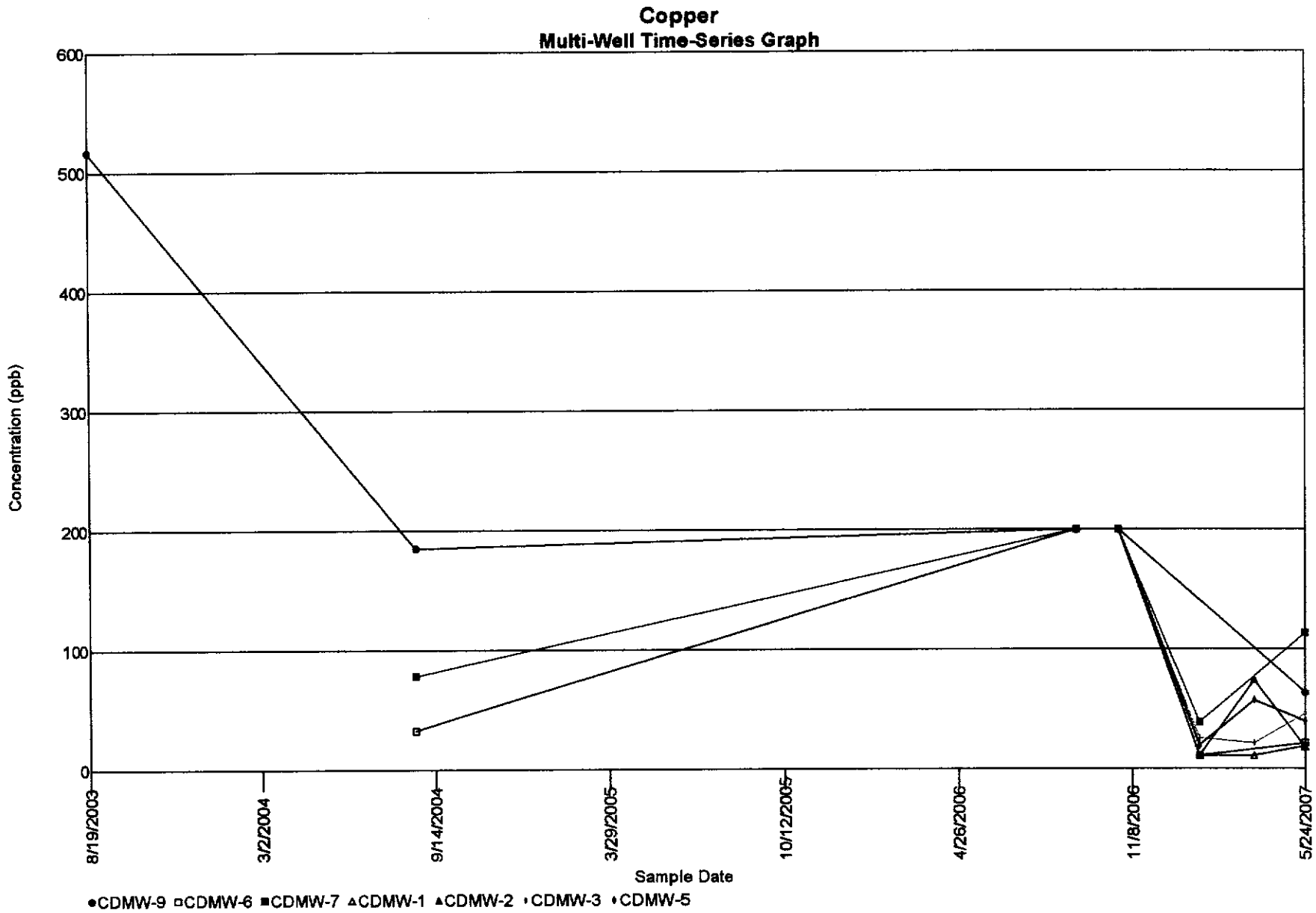

Beryllium
Multi-Well Time-Series Graph
Concentration (ppb)
5
4
3
2
1
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
CDMW-9 CDMW-6 CDMW-7 CDMW-8 CDMW-1 CDMW-2 CDMW-3 CDMW-5

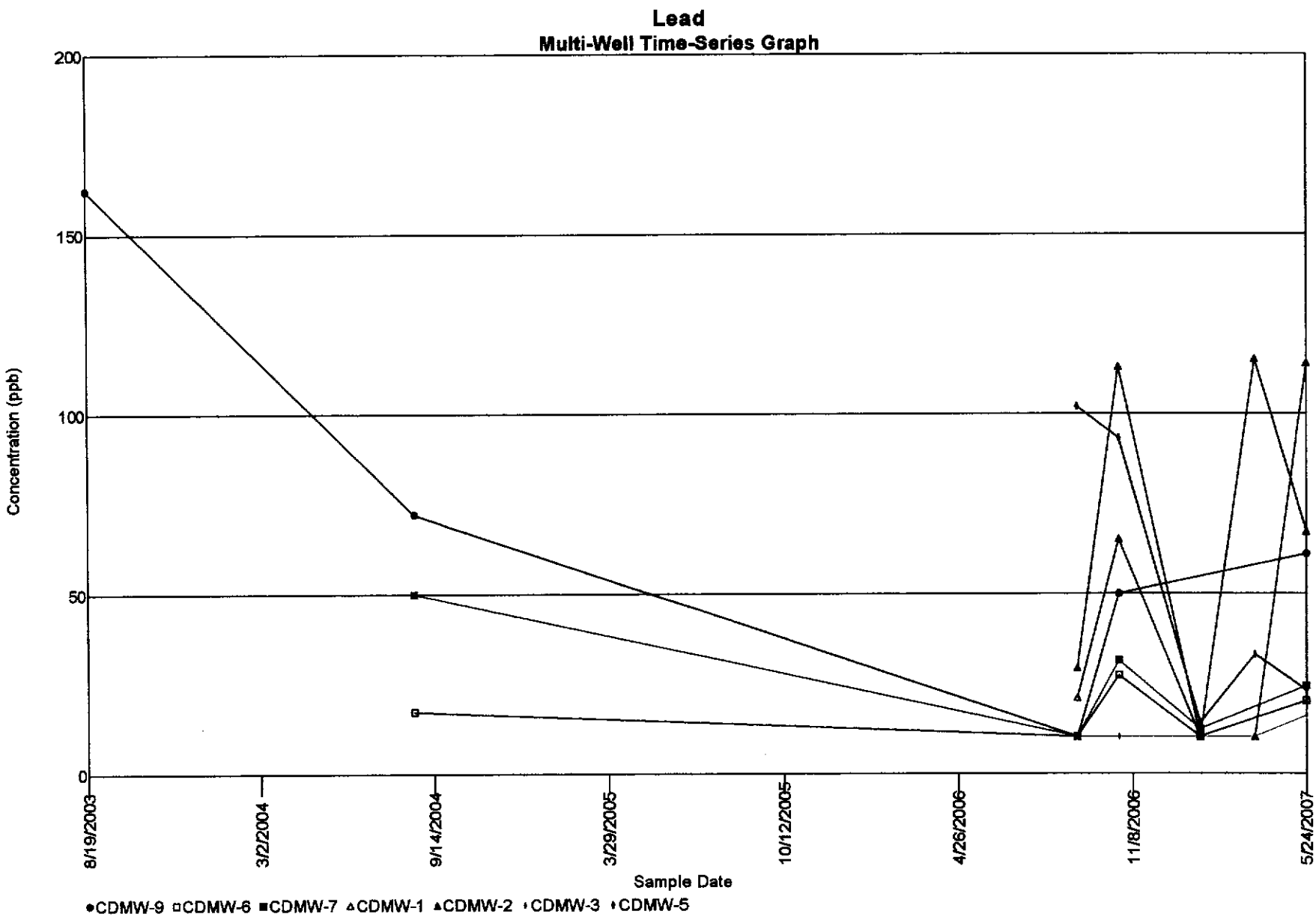

Cadmium
Multi-Well Time-Series Graph
Concentration (ppb)
0
1
2
3
4
5
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
●CDMW-9 □CDMW-7 ■CDMW-1 △CDMW-2

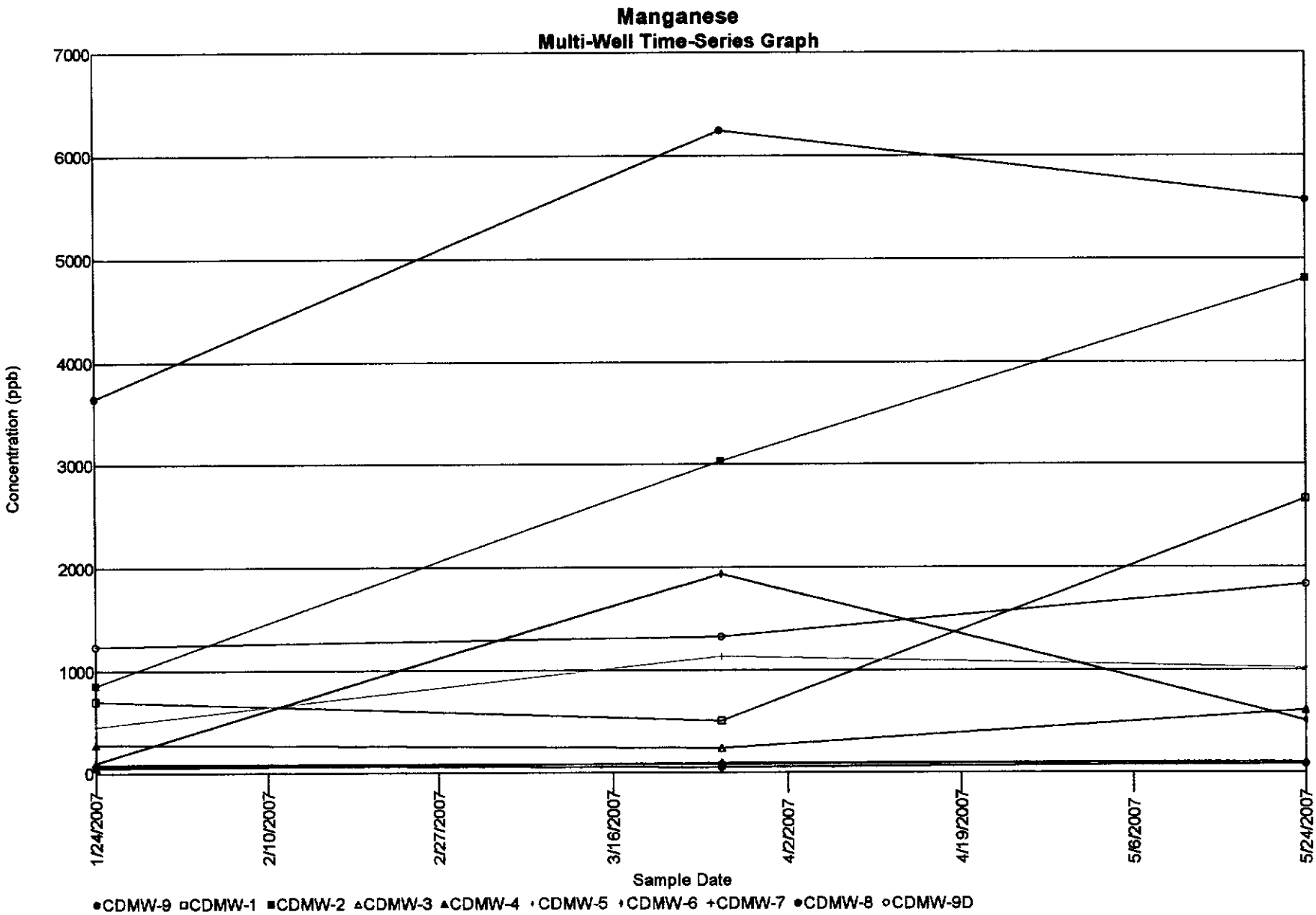

Chlorobenzene
Multi-Well Time-Series Graph
Concentration (ppb)
0
1
2
3
4
5
6
7
8
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
●CDMW-9 □CDMW-9D ■CDMW-1 ▲CDMW-2

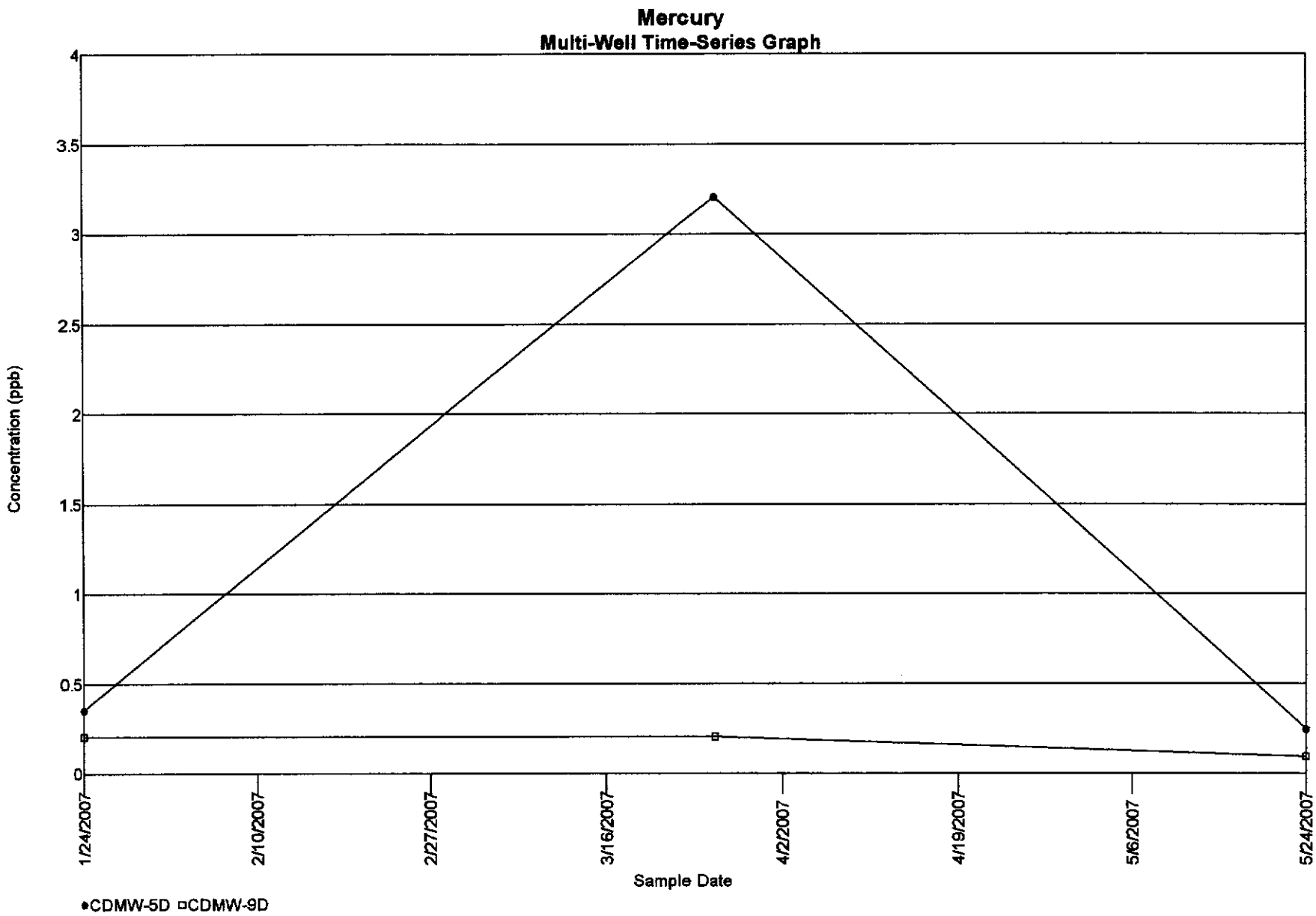

Cis-1,2-Dichloroethene
Multi-Well Time-Series Graph
Concentration (ppb)
30
25
20
15
10
5
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
•CDMW-9 ▫CDMW-9D

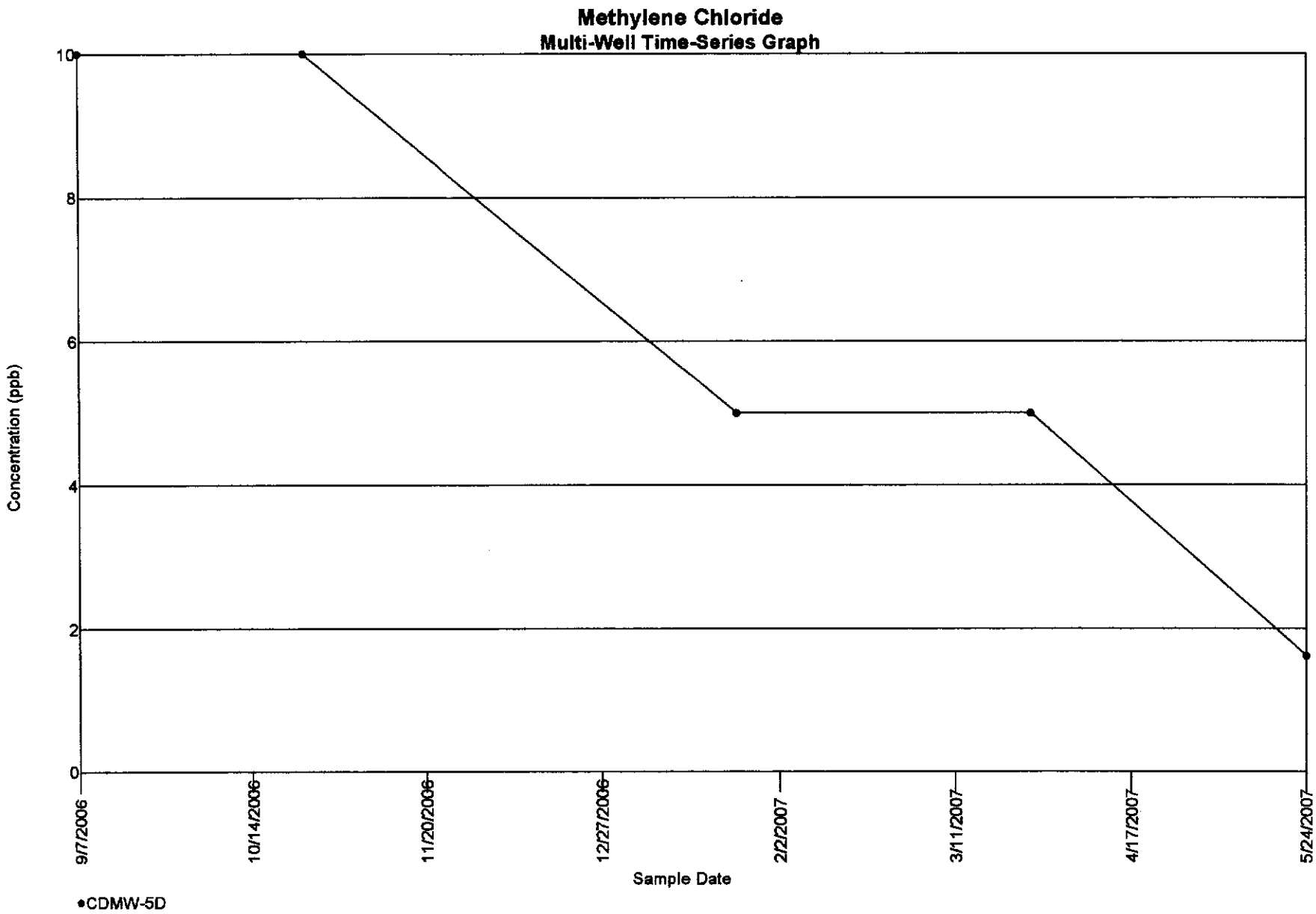

Cobalt
Multi-Well Time-Series Graph
Concentration (ppb)
600
500
400
300
200
100
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
CDMW-9
CDMW-9D
CDMW-6
CDMW-7
CDMW-2
CDMW-3
CDMW-5

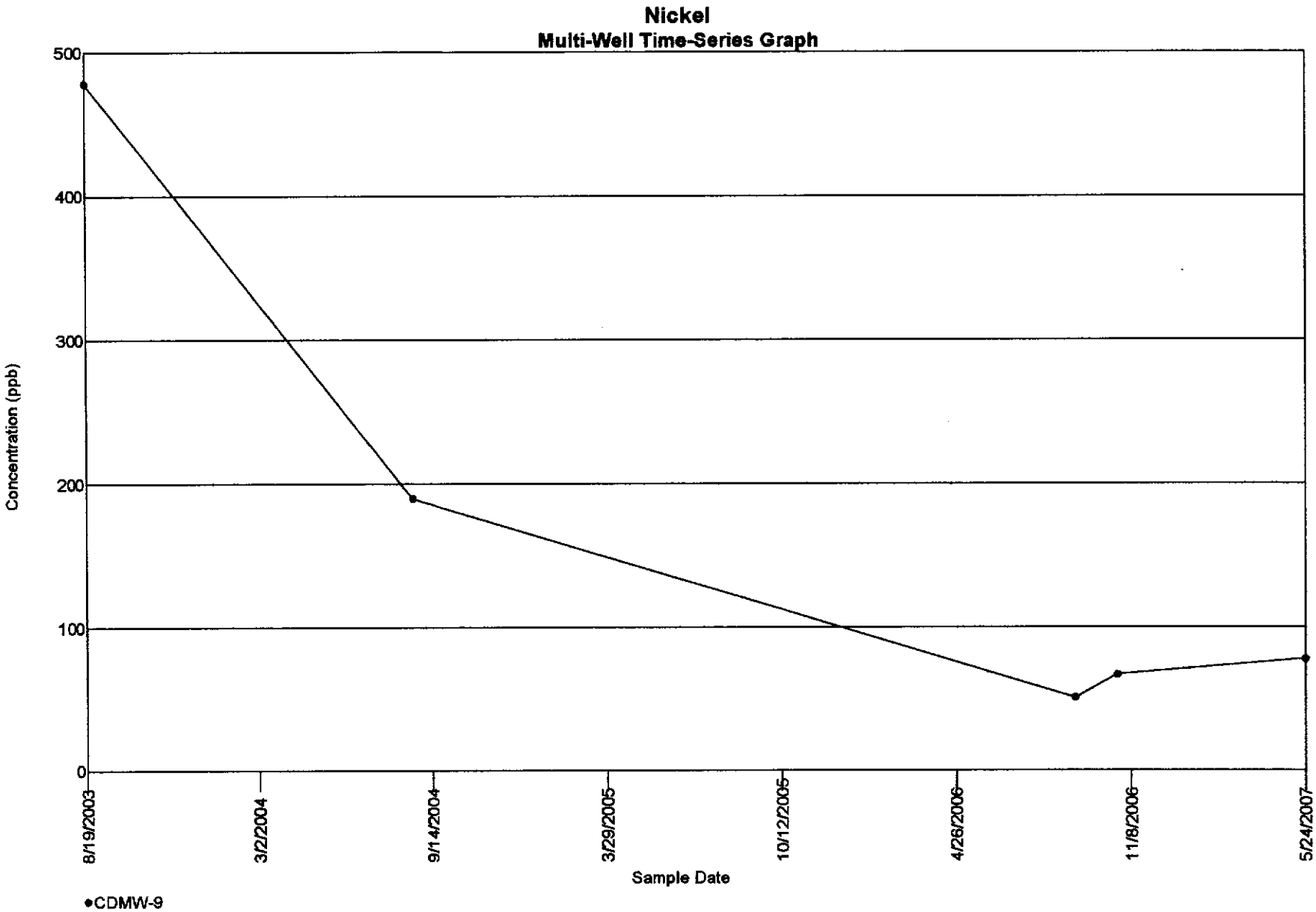

Copper
Multi-Well Time-Series Graph
Concentration (ppb)
600
500
400
300
200
100
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
CDMW-9 CDMW-6 CDMW-7 CDMW-1 CDMW-2 CDMW-3 CDMW-5

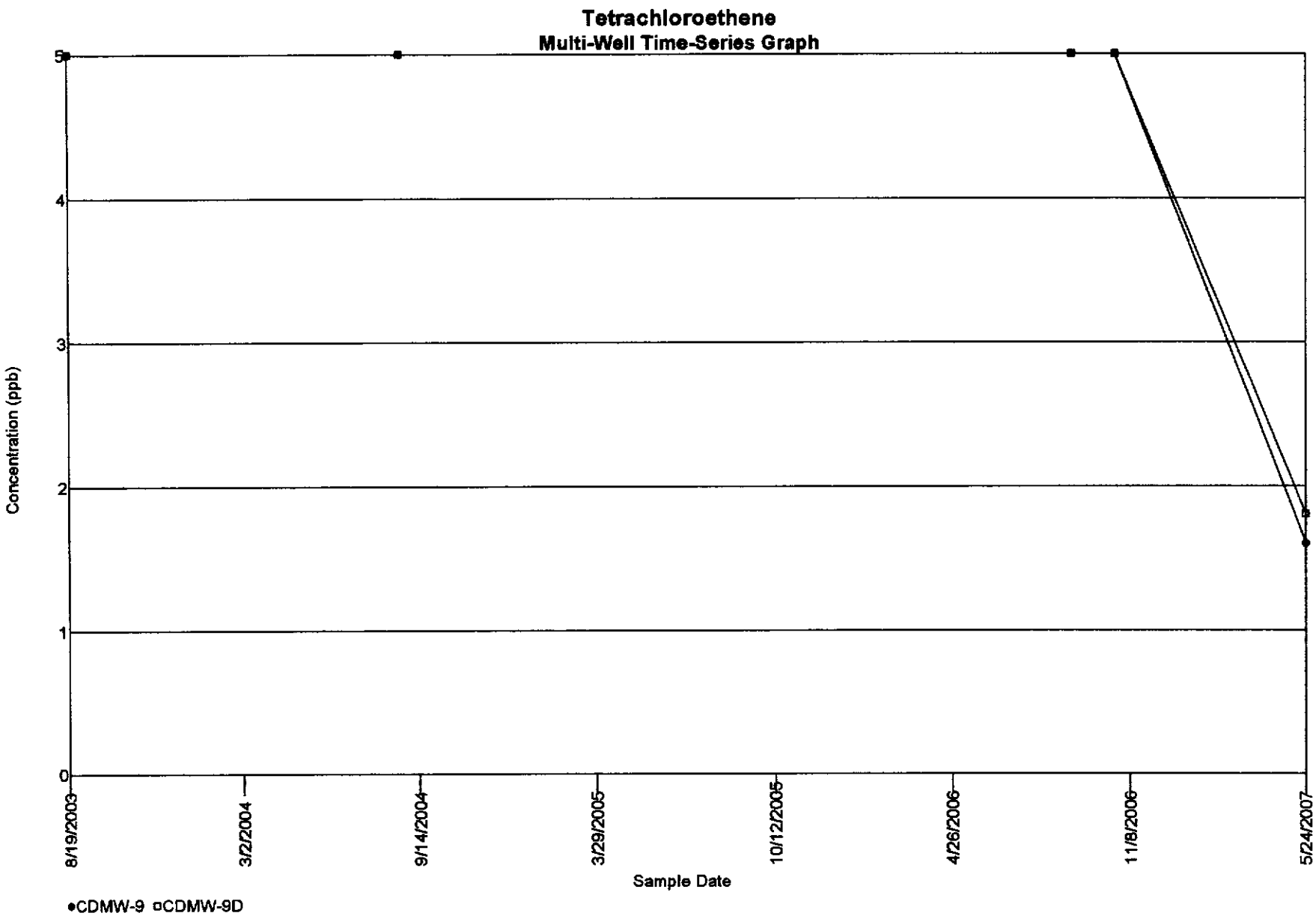

Lead
Multi-Well Time-Series Graph
Concentration (ppb)
200
150
100
50
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
CDMW-9 CDMW-6 CDMW-7 CDMW-1 CDMW-2 CDMW-3 CDMW-5

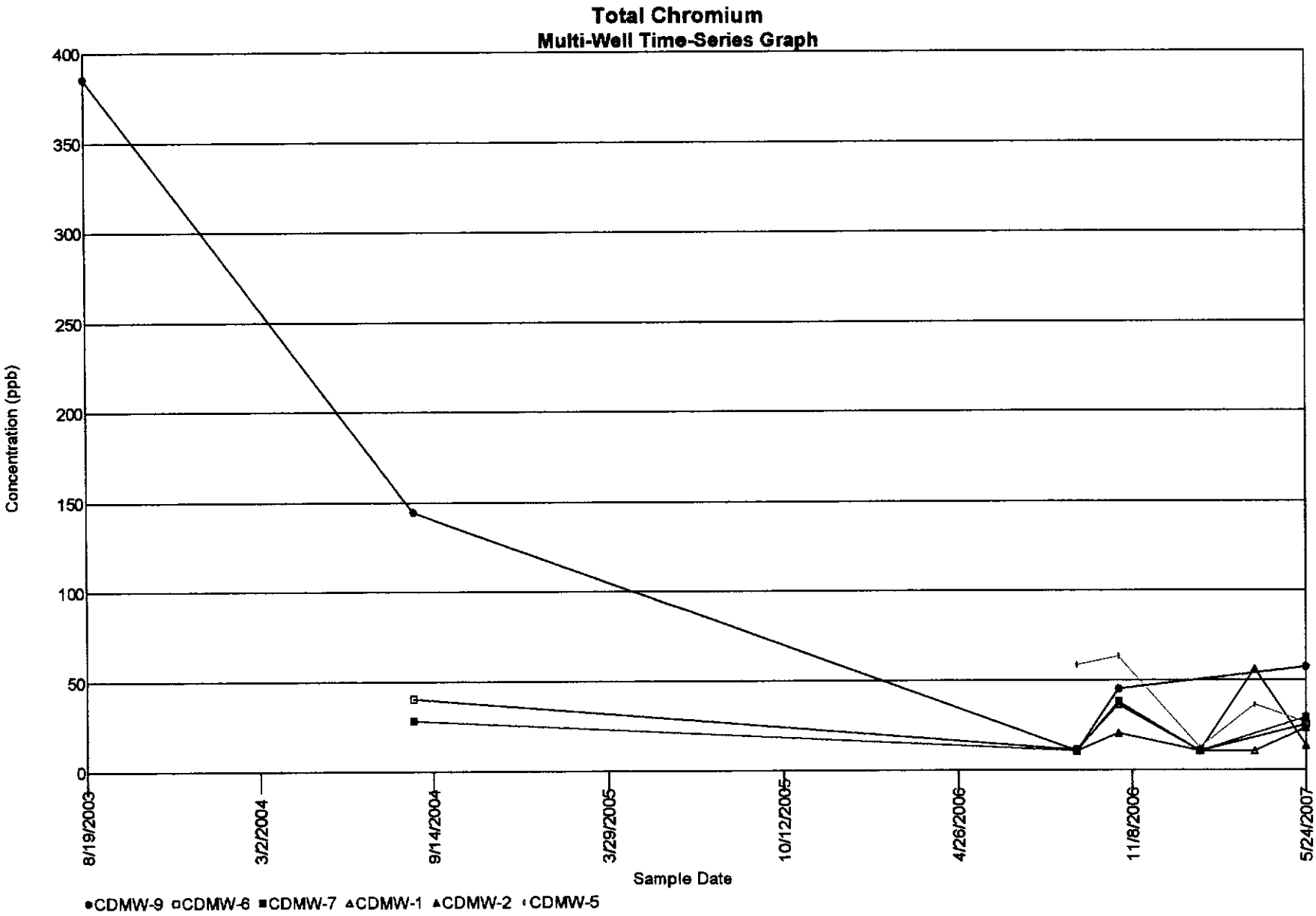

Manganese
Multi-Well Time-Series Graph
Concentration (ppb)
7000
6000
5000
4000
3000
2000
1000
0
1/24/2007
2/10/2007
2/27/2007
3/16/2007
4/2/2007
4/19/2007
5/6/2007
5/24/2007
Sample Date
CDMW-9 CDMW-1 CDMW-2 CDMW-3 CDMW-4 CDMW-5 CDMW-6 CDMW-7 CDMW-8 CDMW-9D

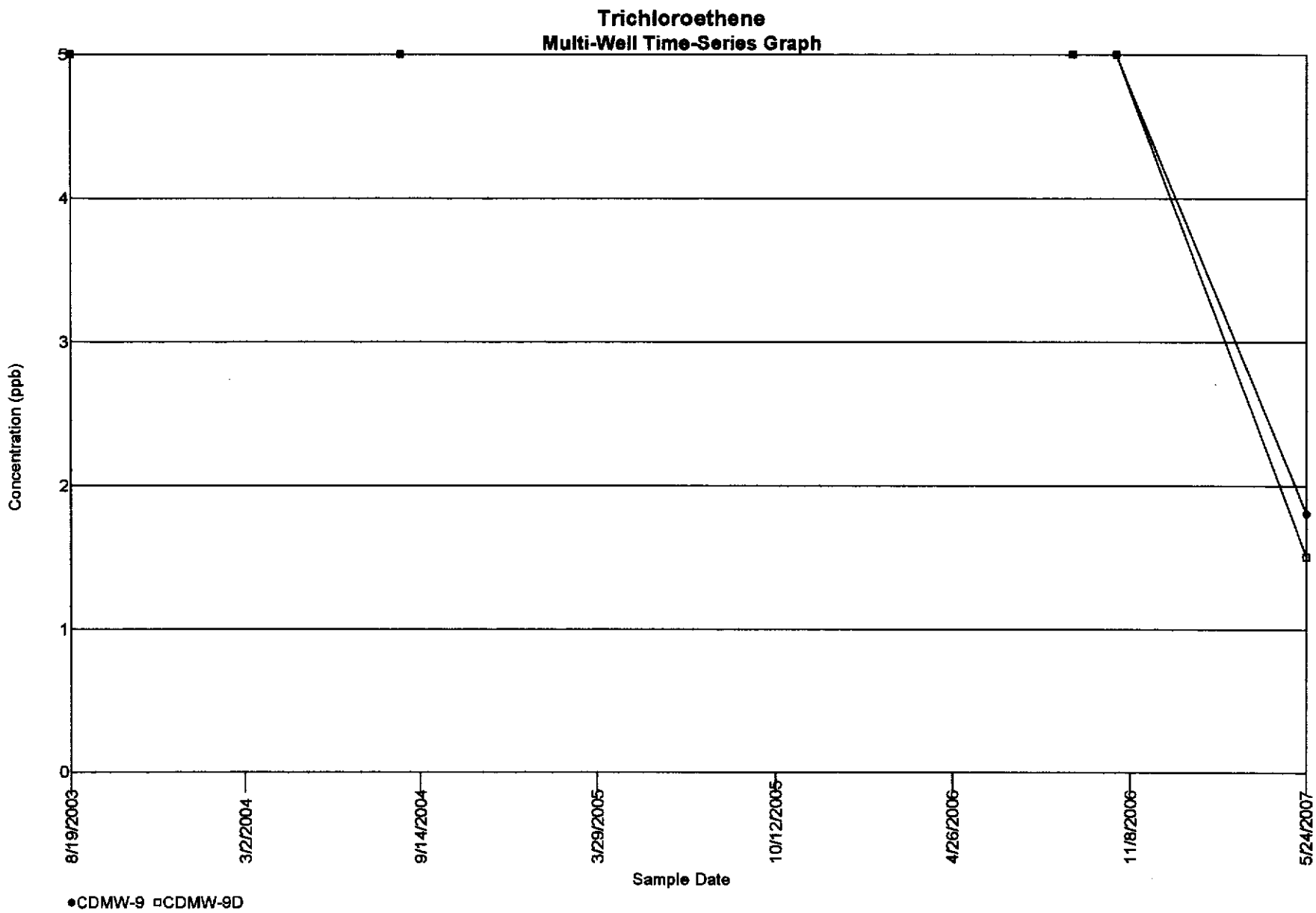

Mercury
Multi-Well Time-Series Graph
Concentration (ppb)
4
3.5
3
2.5
2
1.5
1
0.5
0
1/24/2007
2/10/2007
2/27/2007
3/16/2007
4/2/2007
4/19/2007
5/6/2007
5/24/2007
Sample Date
CDMW-5D
CDMW-9D

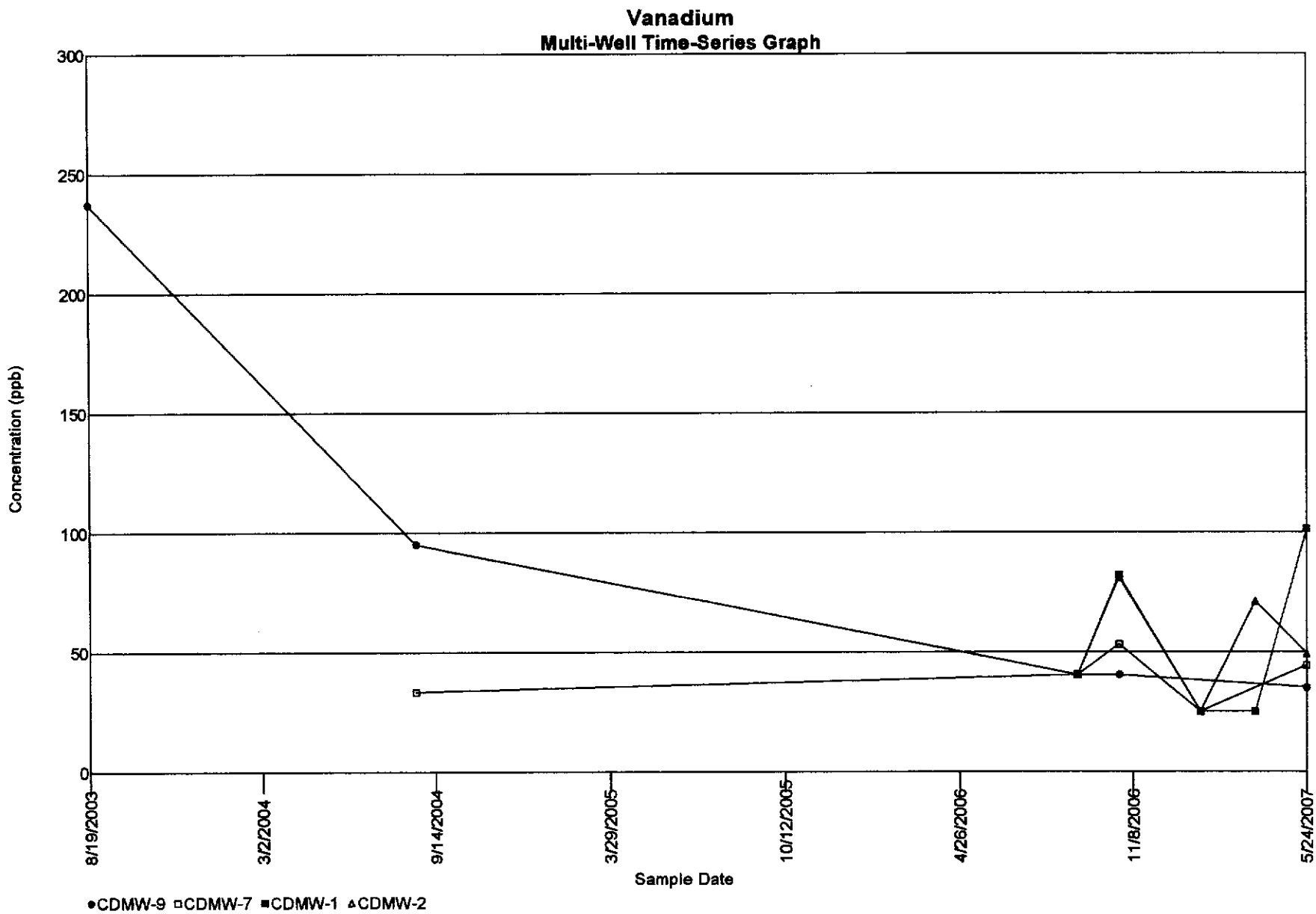

Methylene Chloride
Multi-Well Time-Series Graph
Concentration (ppb)
10
8
6
4
2
0
9/7/2006
10/14/2006
11/20/2006
12/27/2006
2/2/2007
3/11/2007
4/17/2007
5/24/2007
Sample Date
CDMW-5D

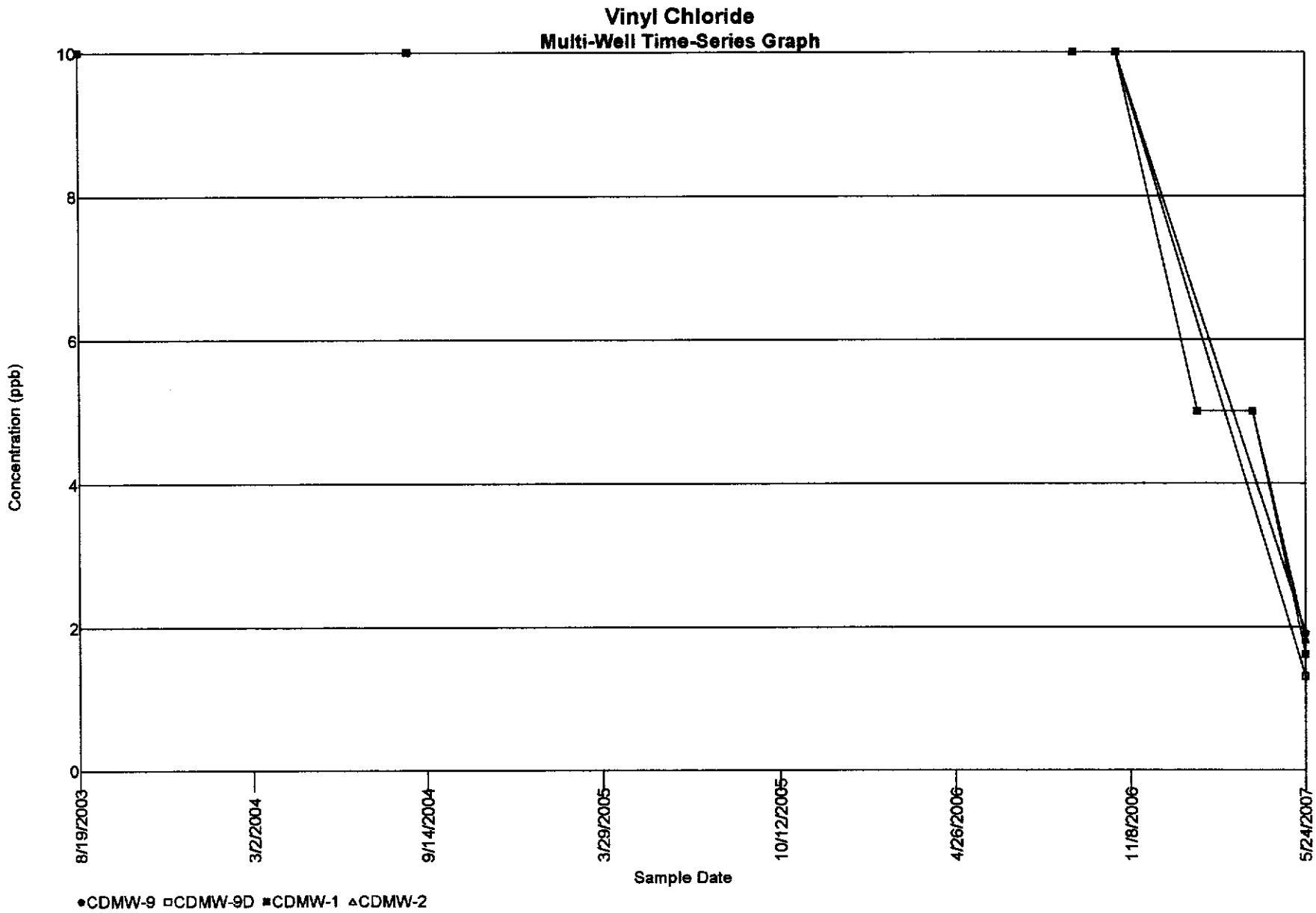

Nickel
Multi-Well Time-Series Graph
500
400
300
200
100
0
Concentration (ppb)
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
CDMW-9

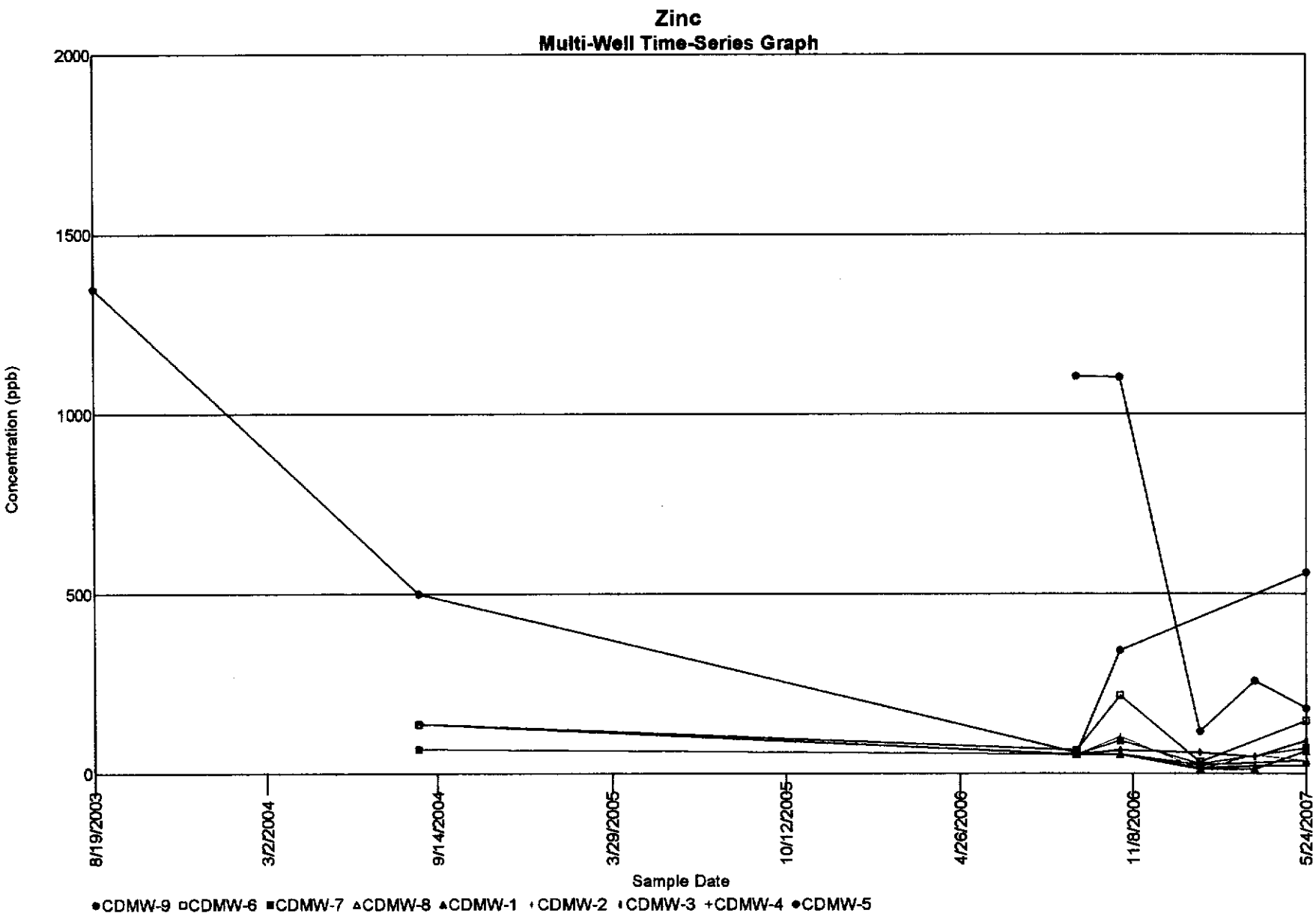

Tetrachloroethene
Multi-Well Time-Series Graph
Concentration (ppb)
0
1
2
3
4
5
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
•CDMW-9 ▫CDMW-9D


Total Chromium
Multi-Well Time-Series Graph
Concentration (ppb)
400
350
300
250
200
150
100
50
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
●CDMW-9 □CDMW-6 ■CDMW-7 ▲CDMW-1 ▲CDMW-2 ◊CDMW-5


Trichloroethene
Multi-Well Time-Series Graph
Concentration (ppb)
0
1
2
3
4
5
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
●CDMW-9 ▫CDMW-9D


Vanadium
Multi-Well Time-Series Graph
Concentration (ppb)
300
250
200
150
100
50
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
●CDMW-9 □CDMW-7 ■CDMW-1 ▲CDMW-2


Vinyl Chloride
Multi-Well Time-Series Graph
Concentration (ppb)
10
8
6
4
2
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
CDMW-9
CDMW-9D
CDMW-1
CDMW-2


Zinc
Multi-Well Time-Series Graph
Concentration (ppb)
2000
1500
1000
500
0
8/19/2003
3/2/2004
9/14/2004
3/29/2005
10/12/2005
4/26/2006
11/8/2006
5/24/2007
Sample Date
CDMW-9 CDMW-6 CDMW-7 CDMW-8 CDMW-1 CDMW-2 CDMW-3 CDMW-4 CDMW-5