TRONOX

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December 2, 2009

Tony Russell, Chief
Mississippi Department of Environmental Quality
Assessment Remediation Branch
Office of Pollution Control
P.O. Box 10385
Jackson, MS 39289-0385

Re: Gulf States Creosote Site
Hattiesburg, Mississippi
Report Submittal: Monitored Natural Attenuation Results and Recommendations

Dear Mr. Russell:

Please find enclosed two copies of a report entitled, *Monitored Natural Attenuation Results and Recommendations, Former Gulf States Creosoting Site, Hattiesburg, Mississippi*. This report documents the natural attenuation activity in the site groundwater system documented over the last nine years, and includes recommendations for ongoing monitoring of the remaining groundwater impact. If you have any questions or comments, please call me at (405) 775-5475.

Sincerely,

A. Keith Watson
Project Manager

Copy: D. Upthegrove – Pisani
T. Reed - Tronox

MONITORED NATURAL ATTENTUATION RESULTS AND RECOMMENDATIONS

FORMER GULF STATES CREOSOTING SITE HATTIESBURG, MISSISSIPPI

Project No. 21-04

Prepared By:

Thomas W. Reed, CPG
Safety and Environmental Affairs
Tronox LLC

December 2, 2009

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MONITORED NATURAL ATTENUATION RESULTS AND RECOMMENDATIONS

FORMER GULF STATES CREOSOTING SITE HATTIESBURG, MISSISSIPPI

EXECUTIVE SUMMARY

A Remedial Investigation (RI) was conducted and completed at the former Gulf States Creosoting site in Hattiesburg, Mississippi during the time frame of 1996 to 2001. During that time, site groundwater quality conditions were characterized through multiple phases of investigation, monitor well installation, and sampling. Sources of groundwater impact were controlled and remediated. The lateral extent of affected groundwater was delineated and was also confirmed through quarterly sampling beginning in 2001. In 2004, the Mississippi Department of Environmental Quality (MDEQ) approved annual groundwater sampling frequency for the site.

Beginning in 2001, both laboratory and field analytical parameters were collected to determine if natural attenuation from in situ biodegradation of the impacted groundwater was occurring. Time versus concentration graphs were prepared for selected biodegradation constituents, along with time versus concentration graphs for naphthalene. The results from the biodegradation and naphthalene trend data indicate that the creosote – impacted groundwater is stable, chemical concentrations are declining, and natural, in situ biodegradation of the plume is occurring.

Based on these favorable results, Tronox LLC recommends that further groundwater sampling and analysis to determine if natural attenuation processes are occurring is not necessary, and further sampling for creosote constituents in select wells outside the groundwater plume is no longer warranted.

INTRODUCTION

Tronox LLC and its predecessor, Kerr-McGee Chemical, LLC (KMCLLC) have conducted investigation and remediation activities at the former Gulf States Creosoting site in Hattiesburg, Mississippi since 1996. During that time, site groundwater quality has been characterized through multiple phases of investigation, including the installation and sampling of numerous monitor wells and temporary well points. The lateral extent of groundwater impact was delineated through eight initial quarterly groundwater monitoring events from late 2001 through 2003. MDEQ approved a request to decrease groundwater monitoring to an annual frequency for the Hattiesburg site.

Two separate and distinct areas of groundwater impact have been identified: the former Process Area / northeast drainage ditch area, and the Fill Area. The subsurface lithology and water bearing units are significantly different between the areas and are not connected hydraulically. Figure 1 is a potentiometric map from February 2009 which shows the hydraulic setting and direction of groundwater flow at the two impacted areas.

In 2003, Tronox LLC implemented remedial measures that included the removal and offsite disposal of creosote source material potentially contributing to the groundwater impact. In addition, remedial measures included containment and control elements designed to either reduce the potential migration of constituents in the groundwater or preclude the potential for infiltration / percolation of water through affected soils left in place.

MONITORED NATURAL ATTENUATION REQUIREMENTS

Monitored natural attenuation is one method of applying in situ bioremediation. It is essentially the advantageous use of indigenous microorganisms to degrade contaminants of concern, coupled with the observation of changes in the groundwater chemistry associated with this activity. Two common lines of evidence normally required to document natural attenuation are as follows:

- Historical trends indicating a decrease in contaminant concentrations over time and a plume that is stable or retreating,

- Chemical indicators of contaminant biodegradation such as, 1) biological consumption of natural levels of oxygen and oxygen consumption from nitrate and sulfate, and 2) the creation of soluble byproducts such as iron, manganese, and methane.

NATURAL ATTENUATION MONITORING RESULTS

PAH compounds at the Hattiesburg site are highest in wells within areas where creosote and creosote residuals were handled (i.e., the former Process Area / northeast drainage ditch and the Fill Area). The approximate extent of impacted groundwater is shown on Figure 2.

Historical Naphthalene Trends

Naphthalene is the most prevalent and the most soluble PAH compound detected in site groundwater and is the only constituent reported at levels exceeding the MDEQ Tier 1 Target Remediation Goals (TRGs) in wells located outside the historic source areas. Using naphthalene as a representative indicator of PAH presence in groundwater, the results of the initial eight quarterly groundwater monitoring periods beginning in December 2001, along with the subsequent annual monitoring through February 2009 indicate that naphthalene constituent concentrations in both affected areas (monitor wells MW-1R, -2R, -4, -06, -09R, -12, -17, and -19) have declined and continue to decline or stabilize over time. In addition, the naphthalene in monitor well MW-22, downgradient along the northeast drainage ditch, has remained stable and not increased, indicating that the plume is stable or retreating in size. It should be noted that the significant decline in naphthalene in wells located along the edge of the impacted areas, specifically MW-1R, MW-4, MW-12 and MW-18 demonstrates not only the reduction in the concentration of the constituent plume, but also the lateral reduction in size of the plume. The table containing naphthalene analytical results along with naphthalene concentration versus time graphs for these wells are contained in Appendix A. For convenience, the graphs are grouped in three groups: select wells outside the main plumes with non-detect concentrations, wells on the edge of the plume with rapidly declining

concentrations, and wells within the main part of the plume with high concentrations.

Chemical Indicators of Biodegradation

Several different chemical parameters are analyzed at the Hattiesburg site to determine if constituent biodegradation is occurring. These parameters include chloride, total iron, dissolved iron, methane, nitrate nitrogen, sulfate, and field parameters including dissolved oxygen, ferrous iron, and redox potential.

Chemical variations in groundwater that commonly indicate natural attenuation activity include the following:

- Dissolved oxygen concentrations below background,
- Nitrate concentrations below background,
- Iron concentrations above background,
- Sulfate concentrations below background,
- Methane concentrations above background.

For a determination of natural attenuation activity at the Hattiesburg site, total iron, sulfate and methane constituent concentrations were selected for time versus concentration graph comparisons. Of all the parameters collected at the Hattiesburg site for analysis, these constituents characteristically yield the most reliable analytical results. The graphs are grouped in three categories for discussion: 1) select wells outside the plume with non-detect concentrations of PAHs (MW-16, -22), 2) wells on the edge of the plume with rapidly declining concentrations of PAHs (MW-1R, -4, -12, and -18), and 3) wells within the main part of the plume with high concentrations of PAHs (MW-2R, -06, -09R, -17, and -19). The graphs along with analytical tables for total iron, methane, and sulfate are included in Appendix B.

Select Wells Outside the Plume – Well MW-16 is a good example of groundwater constituents relatively unaffected by in situ biodegradation. With the absence of creosote constituents, no biodegradation is taking place and therefore no oxygen demand is placed on the system. As such, iron is not

reduced and remains relatively insoluble, methane is not produced as a by-product, and sulfate is not reduced and remains in the groundwater system.

Wells on the Edge of the Plume - These once were or are currently on the edge of the contaminant plume. They initially contained significant concentrations of naphthalene but over time have shown significant declines in naphthalene impact (see Appendix A). Wells MW-1R, MW-4, and MW-18 are associated with the Process Area / Northeast Drainage Ditch plume, while well MW-12 is an edge well at the Fill Area plume (see figure 1). A review of the iron and methane graphs for these wells (Appendix B) shows a rough parallel between the decrease in naphthalene over time and an associated decline in total iron and methane. As the naphthalene is biodegraded, less and less "food" is available for the indigenous microorganisms, hence less oxygen is required so iron is not reduced and methane is not produced as a by-product.

Increase in sulfate concentration also occur with the decline in available naphthalene but not as apparent as the decrease that is seen in iron. Again, the sulfate graphs for the wells on the edge of the plume are located in Appendix B.

Wells Within the Main Part of the Plume - These wells are all associated with the Process Area / Northeast Drainage Ditch plume and contain significant but declining concentrations of naphthalene. This is the area of current, active bioremediation of the creosote constituent impact at the Hattiesburg site. Associated with these declining concentrations of naphthalene are high concentrations of soluble iron and high concentrations of methane. In general, the sulfate concentrations tend to be low in concentration as the indigenous microorganisms also reduce the sulfate in solution.

One well that doesn't fit this pattern is MW-2R. MW-2R has the highest concentration of naphthalene of the wells within the main plume. Based on the total iron, methane, and sulfate graphs, no significant in situ biodegradation is occurring at this well. Even though the naphthalene concentration is declining over time, the concentration has apparently not reached a low enough concentration for the microorganisms to efficiently feed and multiply in this area. A review of the biodegradation components at well MW-06 indicated that more prominent activity (soluble iron and methane production) began to occur as

naphthalene concentrations dropped below around 4,000 ug/L. The current decline rate in naphthalene concentrations in well MW-2R should reach the 4,000 ug/L range or below within the next year.

One other well of interest located outside the main naphthalene plume is MW-22. MW-22 is the farthest well downgradient along the Northeast Drainage Ditch area. It has historically shown minimal to non-detect concentrations of naphthalene (Appendix A). However, based on the natural attenuation constituent graphs in Appendix B, MW-22 has increased in iron over the last four years, has some measureable methane concentrations, and has low sulfate compared to other wells outside the plume (MW-16). The high iron, measureable methane, and low sulfate would be more representative of a well with higher naphthalene concentrations. This apparent anomaly may be due to biodegradation products in the groundwater flowing downgradient to MW-22 from the main portion of the plume. The naphthalene is either retarded in its movement or is being biodegraded as it moves slowly downgradient, or more likely a combination of both.

CONCLUSIONS AND RECOMMENDATIONS

Groundwater information for naphthalene collected over the last 9 years at the Hattiesburg site indicates that the creosote contaminant concentrations are declining and that the contaminant plumes associated with both the Fill Area and the Process Area / Northeast Drainage Ditch are stable in movement and retreating is size.

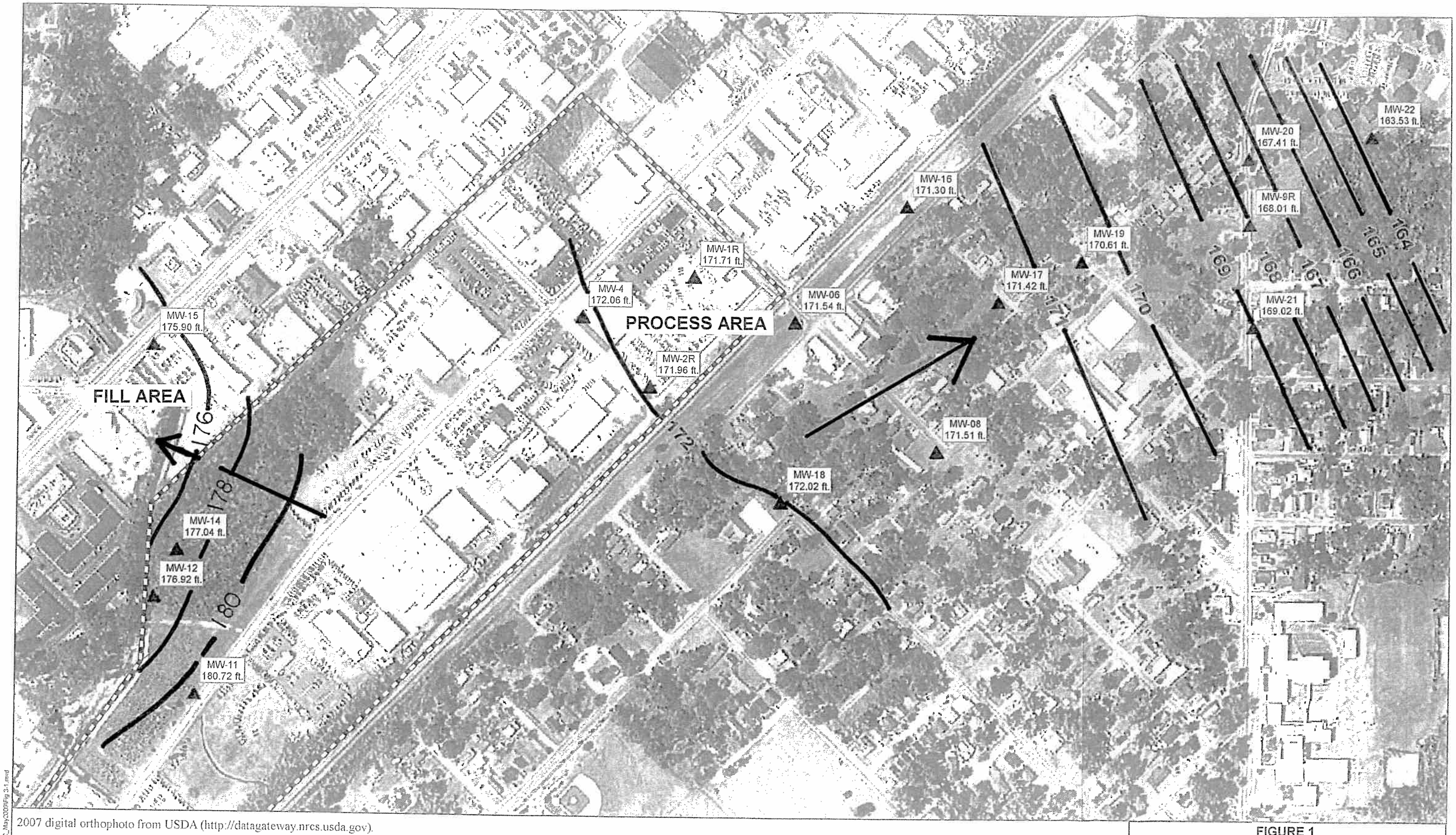
In addition, analytical information for chemical indicators of biodegradation collected over this same time period shows that in situ biodegradation, i.e. natural attenuation, of the creosote impact is actively occurring in the interior and edges of the main plume and should continue until constituent concentrations are depleted.

Tronox LLC recommends that groundwater analytical sampling for creosote constituents be continued on an annual basis at the site to monitor the retreating size of the creosote constituent plume. Monitor wells recommended for annual

sampling include only MW-1R, -2R, -4, -06, -9R, -17, -18, -19, and -22 in the Process Area plume and only MW-12 in the Fill Area plume.

In addition, Tronox LLC recommends that future sampling for field and laboratory analysis of monitored natural attenuation chemical indicators be discontinued. Data over the past 9 years has confirmed that biodegradation is occurring and that the creosote constituent plume is being bioremediated.

FIGURES



2007 digital orthophoto from USDA (http://datagateway.nrcs.usda.gov).

Legend

- Approximate Site Boundary
- Wells
- Potentiometric Surface Contours in feet abpve mean sea level (Feb 2, 2009)
- General direction of ground water flow

0 150 300 600 Feet

N

FIGURE 1
February 2, 2009 Potentiometric Surface Map
(Process Area & Offsite)
Former Gulf States Creosoting Site
Hattiesburg, Mississippi

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Management & Engineering Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: JRB	Drawn: JRB	Checked: DCU	Date:5/27/2009	Project: 21-04

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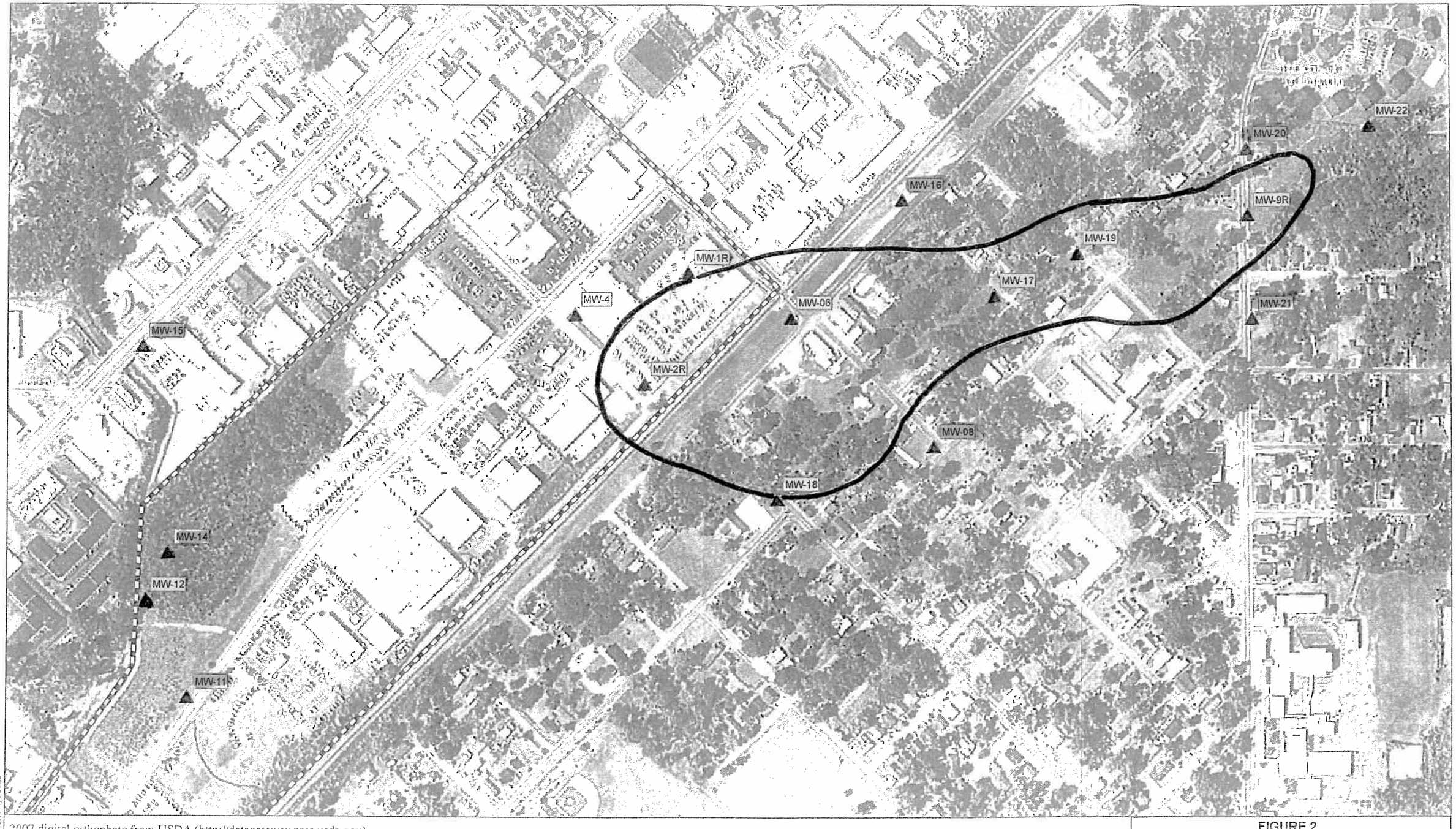

2007 digital orthophoto from USDA (http://datagateway.nrcs.usda.gov).

Legend

Approximate Site Boundary ▲ Wells Extent of Affected Ground Water

0 150 300 600 Feet

N

FIGURE 2
Approximate Extent of Affected Ground Water
(February 2009)
Former Gulf States Creosoting Site
Hattiesburg, Mississippi

MICHAEL PISANI & ASSOCIATES, INC.
Environmental Management & Engineering Services
Houston, Texas New Orleans, Louisiana Baton Rouge, Louisiana

Designed: JRB	Drawn: JRB	Checked: DCU	Date:5/27/2009	Project: 21-04

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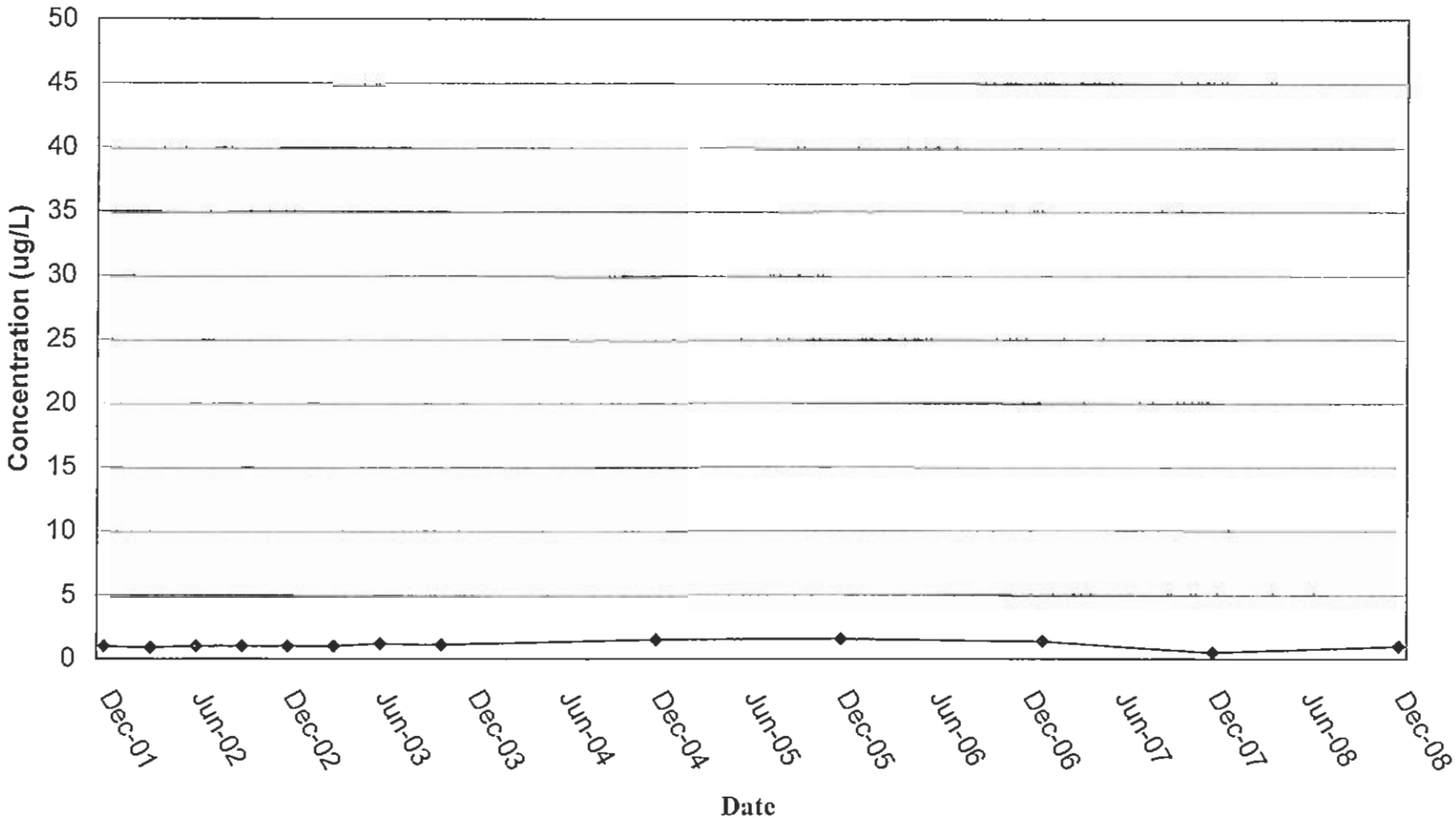
Naphthalene Concentrations in Monitoring Wells (in ug/L)

Gulf States Creosoting Site
Hattiesburg, Mississippi

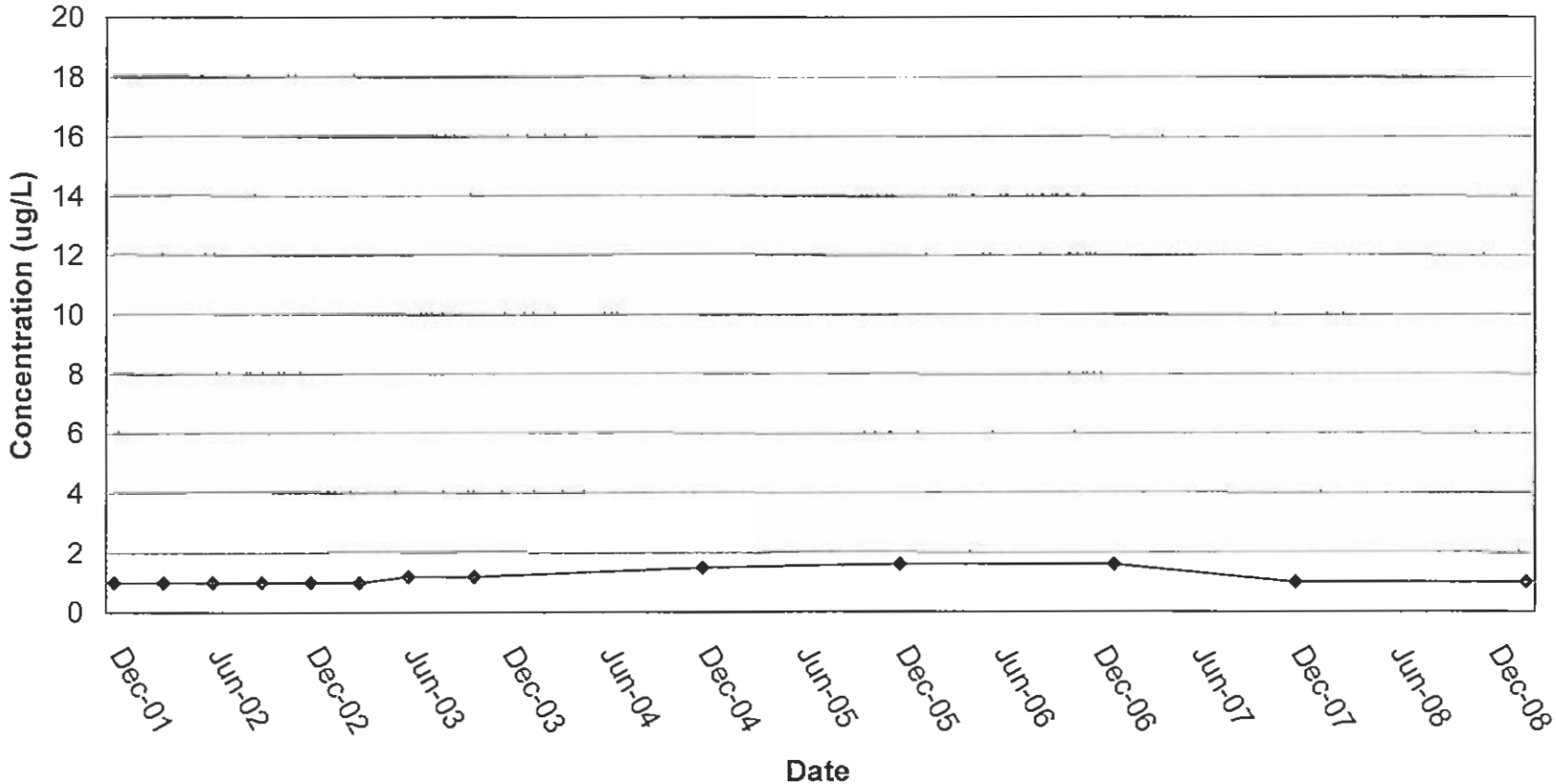
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-1R	4700	250	110	36	22	2.2	65	46	21	12	14	0.59	2
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-2R	12000	8700	9000	9300	8900	11000	9700	8100	7300	6000	5800	7500	6900
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-4	110	8	8	59	4.5	12	12	35	34	12	38	13	2
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-06	9100	7300	6800	8200	8600	7600	8500	6400	7100	4100	6500	5200	2200
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-09R	2600	1000	1600	2400	1000	1100	1700	1400	1300			760	1300
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-12	5600	2900	2600	4800	360	210	2.2	12	11	7.8	3.7	79	160
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-16	1.0	0.9	1.0	1.0	1.0	1.0	1.2	1.1	1.5	1.6	1.4	0.5	1.0
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-17	720	750	560	590	480	140	12	13	330	94	9.6	14	110
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-18	470	830	170	27	310	22	12	10	500	180	290	25	1.9
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-19	290	980	890	500	1100	1000	970	1000	830	640	270	37	38
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-22	1	1	1	1	1	1	1.2	1.2	1.5	1.6	1.6	1	1

Select Wells Outside the Plume

Naphthalene Concentrations in MW-16
Hattiesburg, MS

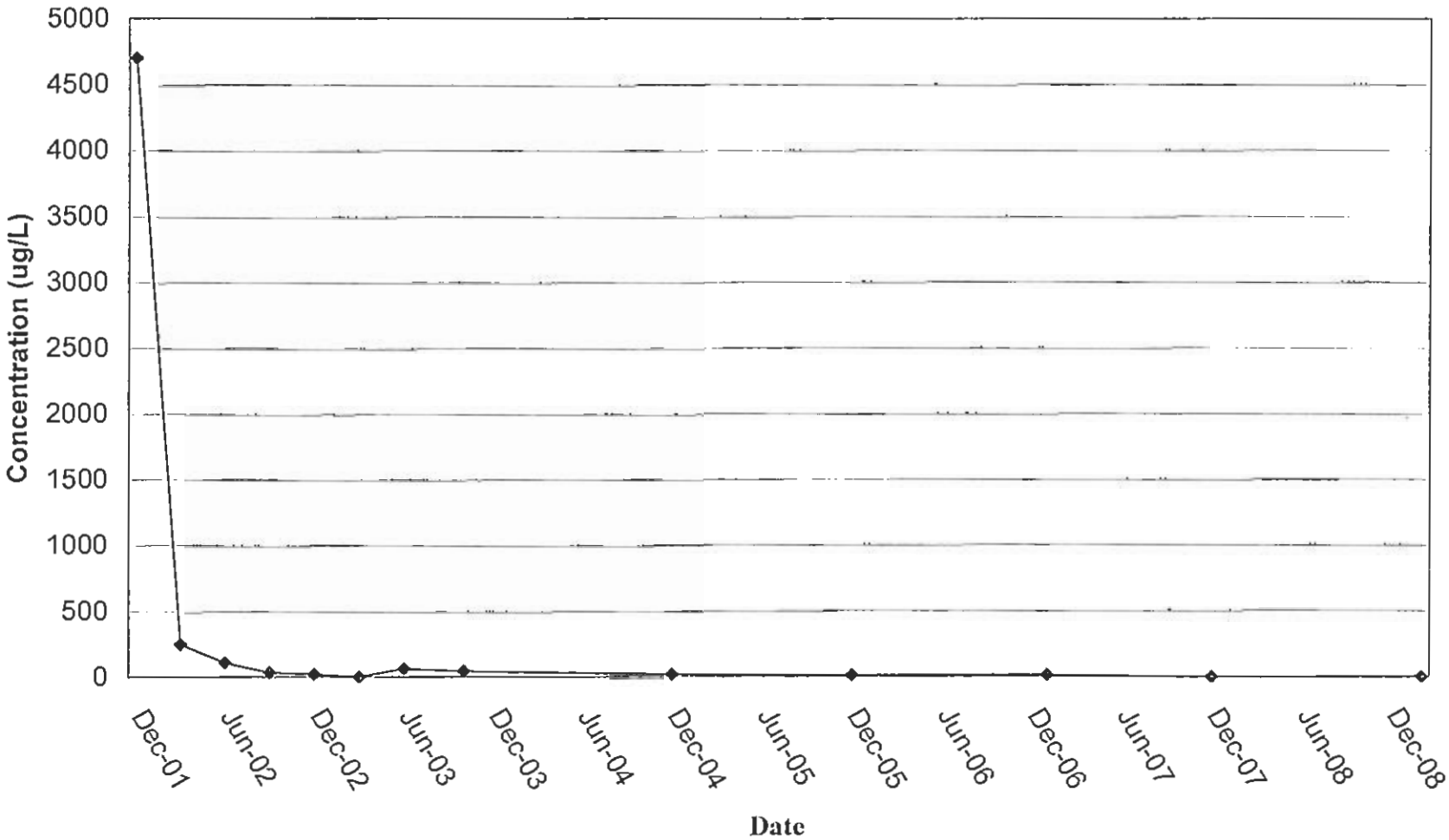


Naphthalene Concentrations in MW-22
Hattiesburg, MS

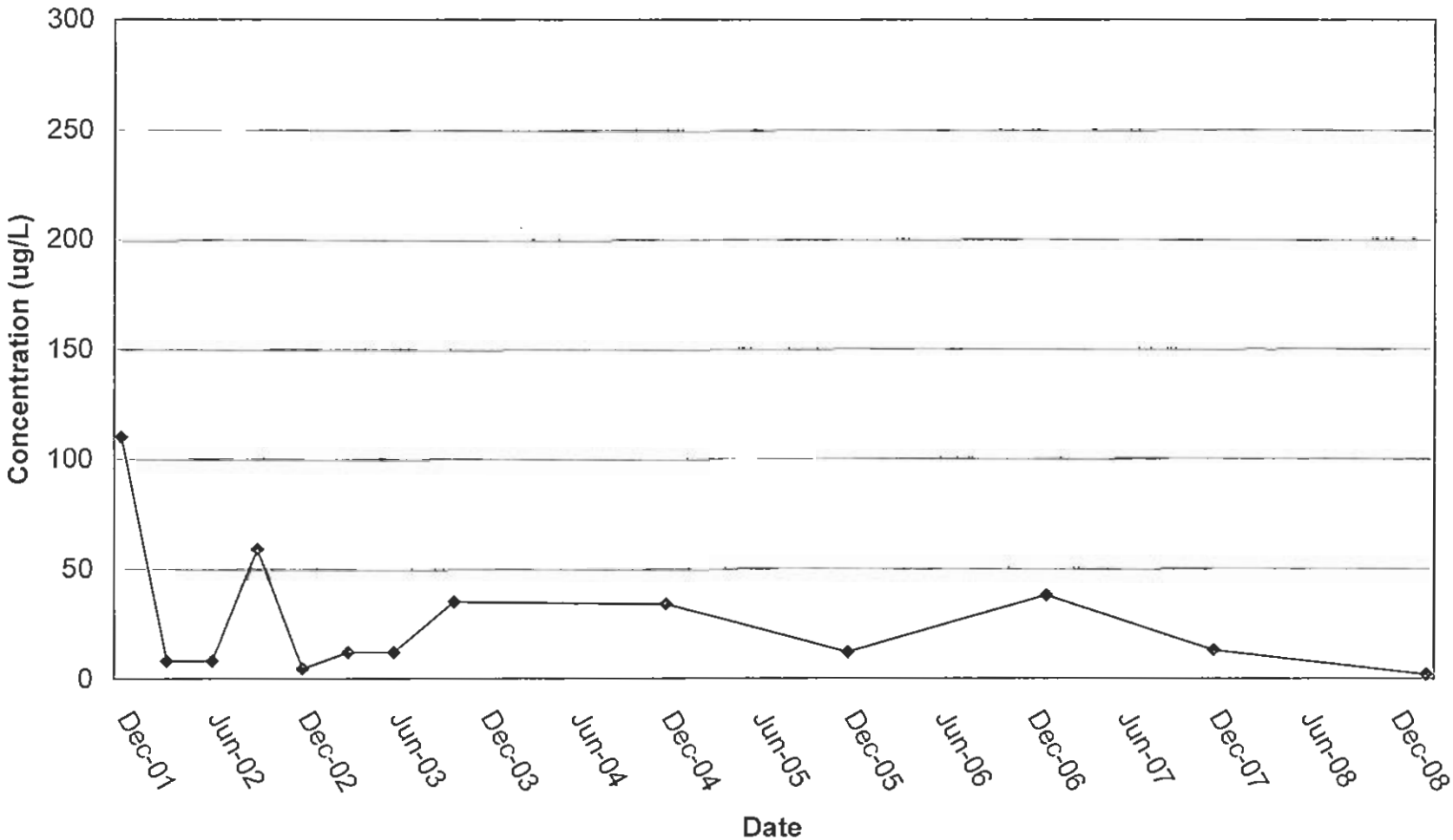


Wells on the Edge of the Plume

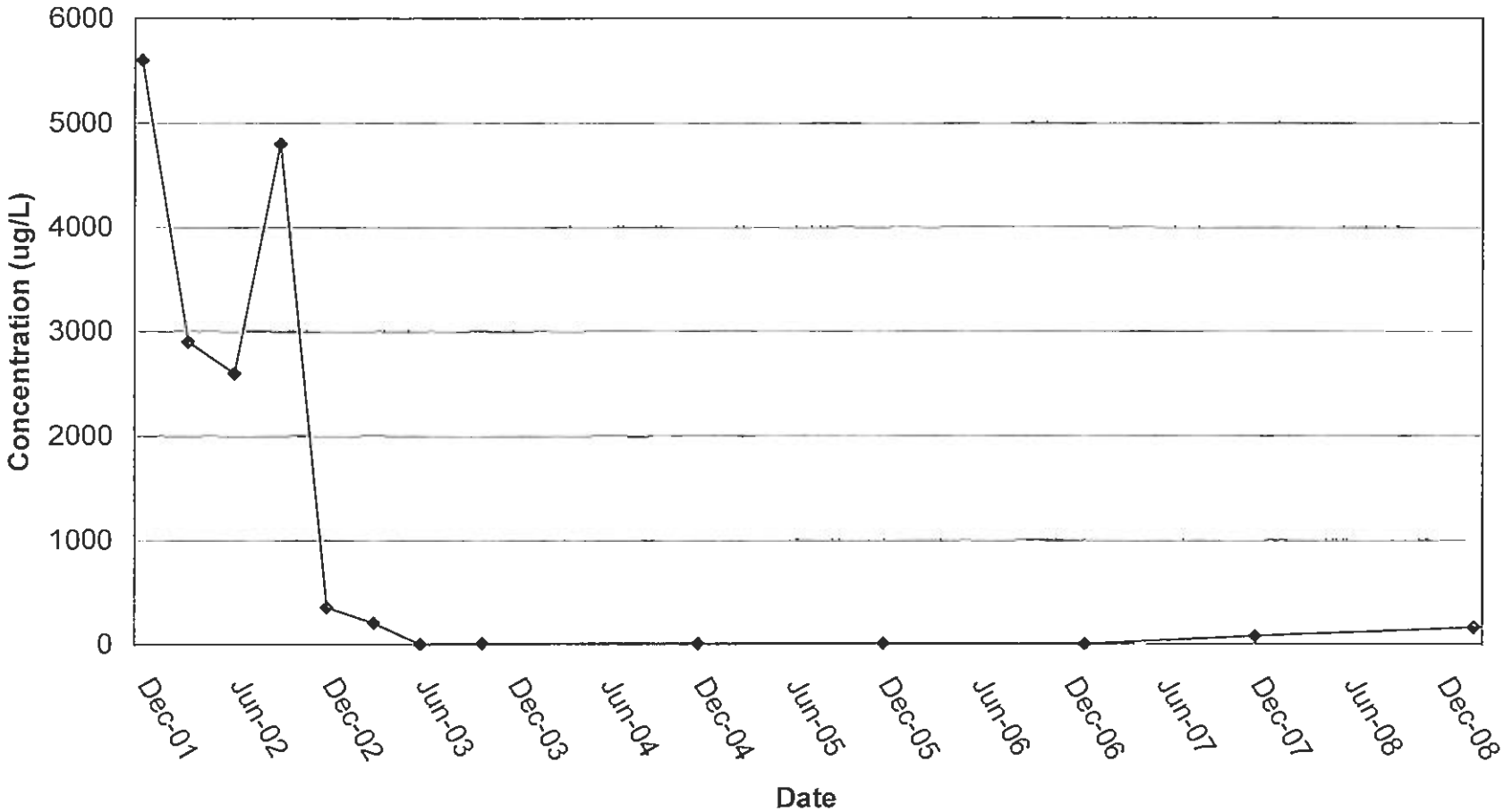
Naphthalene Concentrations in MW-1R
Hattiesburg, MS



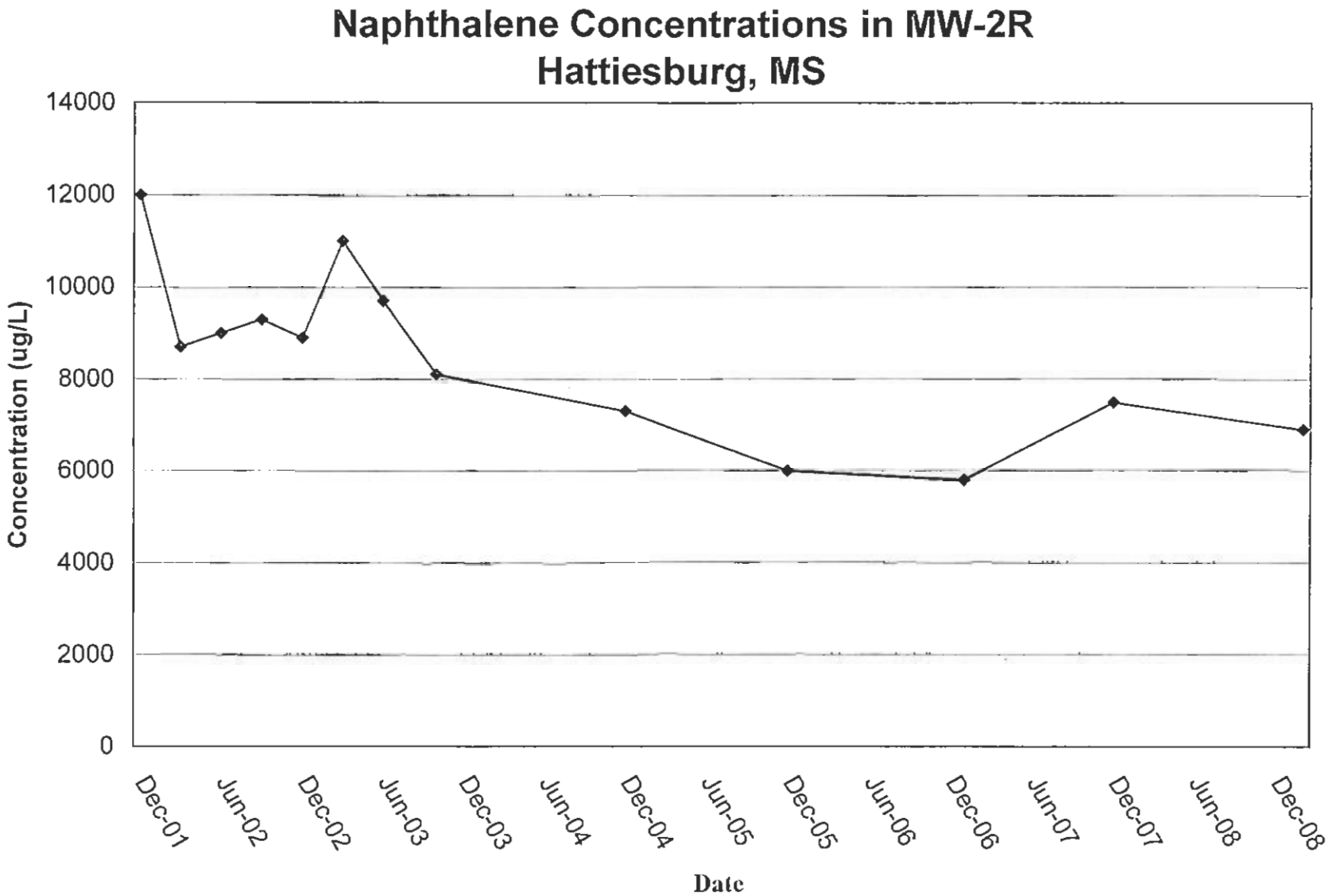
Naphthalene Concentrations in MW-4
Hattiesburg, MS



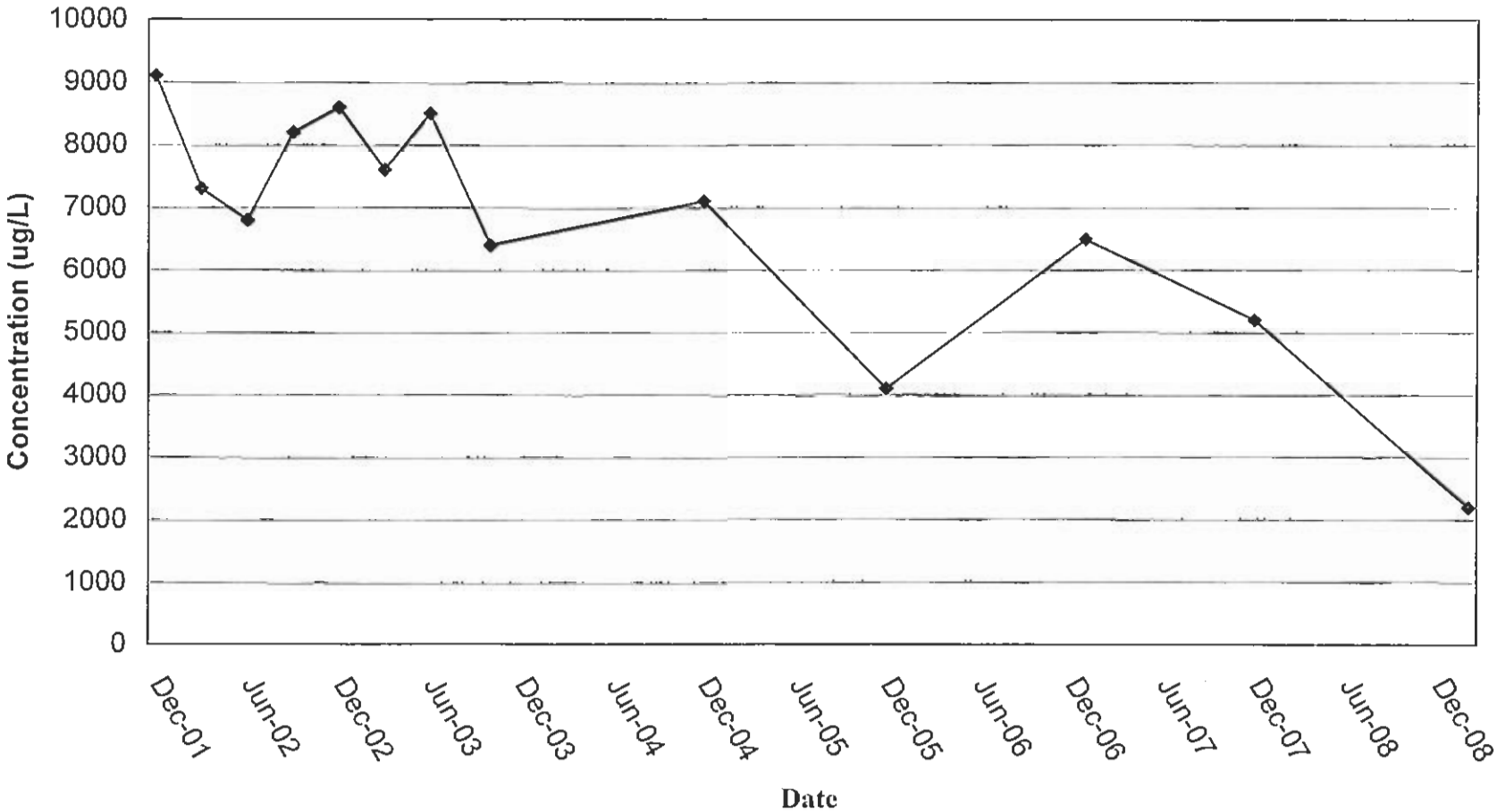
Naphthalene Concentrations in MW-12
Hattiesburg, MS.



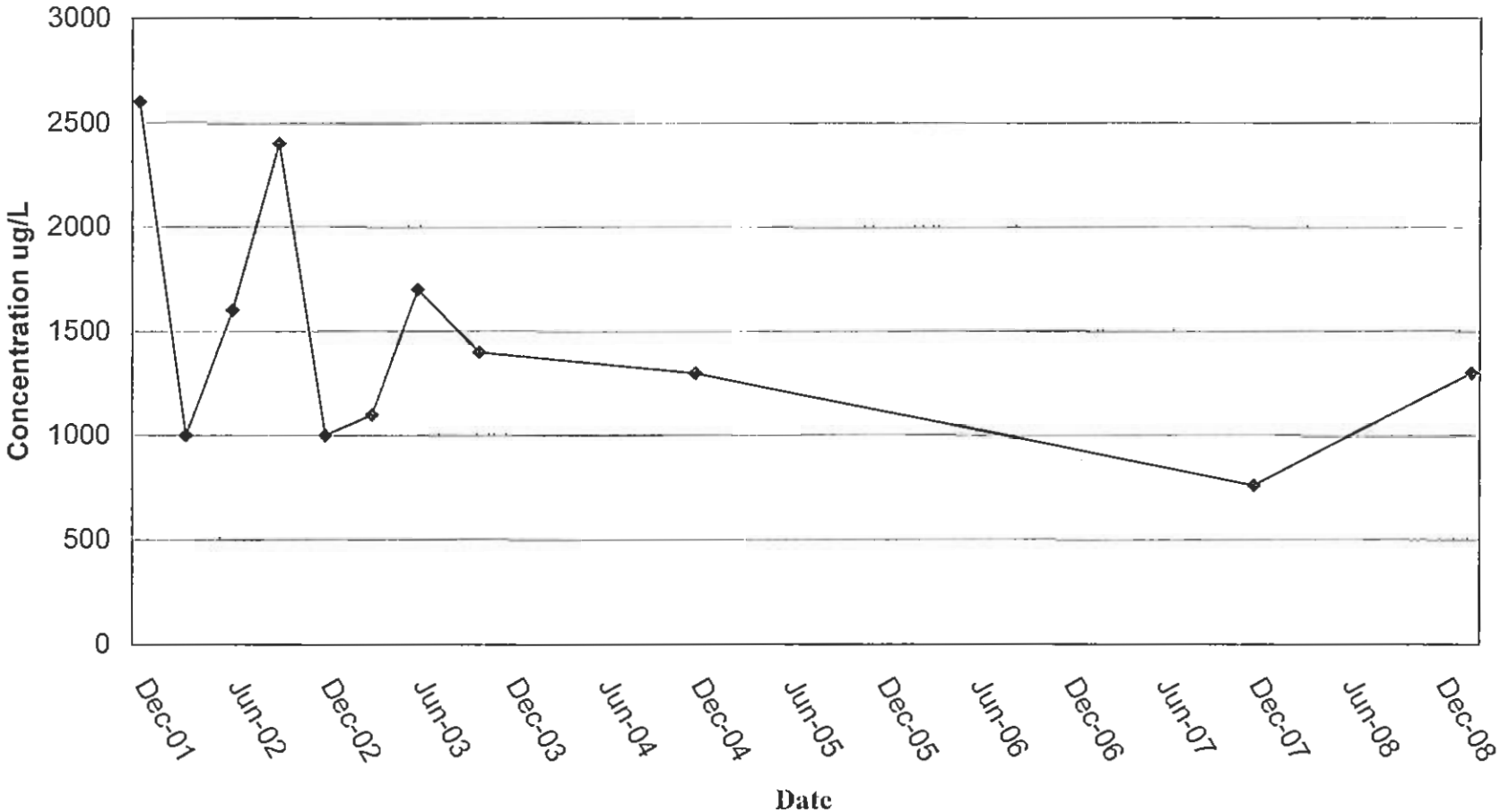
Wells Within the Main Part of the Plume


Naphthalene Concentrations in MW-2R
Hattiesburg, MS
Concentration (ug/L)
14000
12000
10000
8000
6000
4000
2000
0
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Date

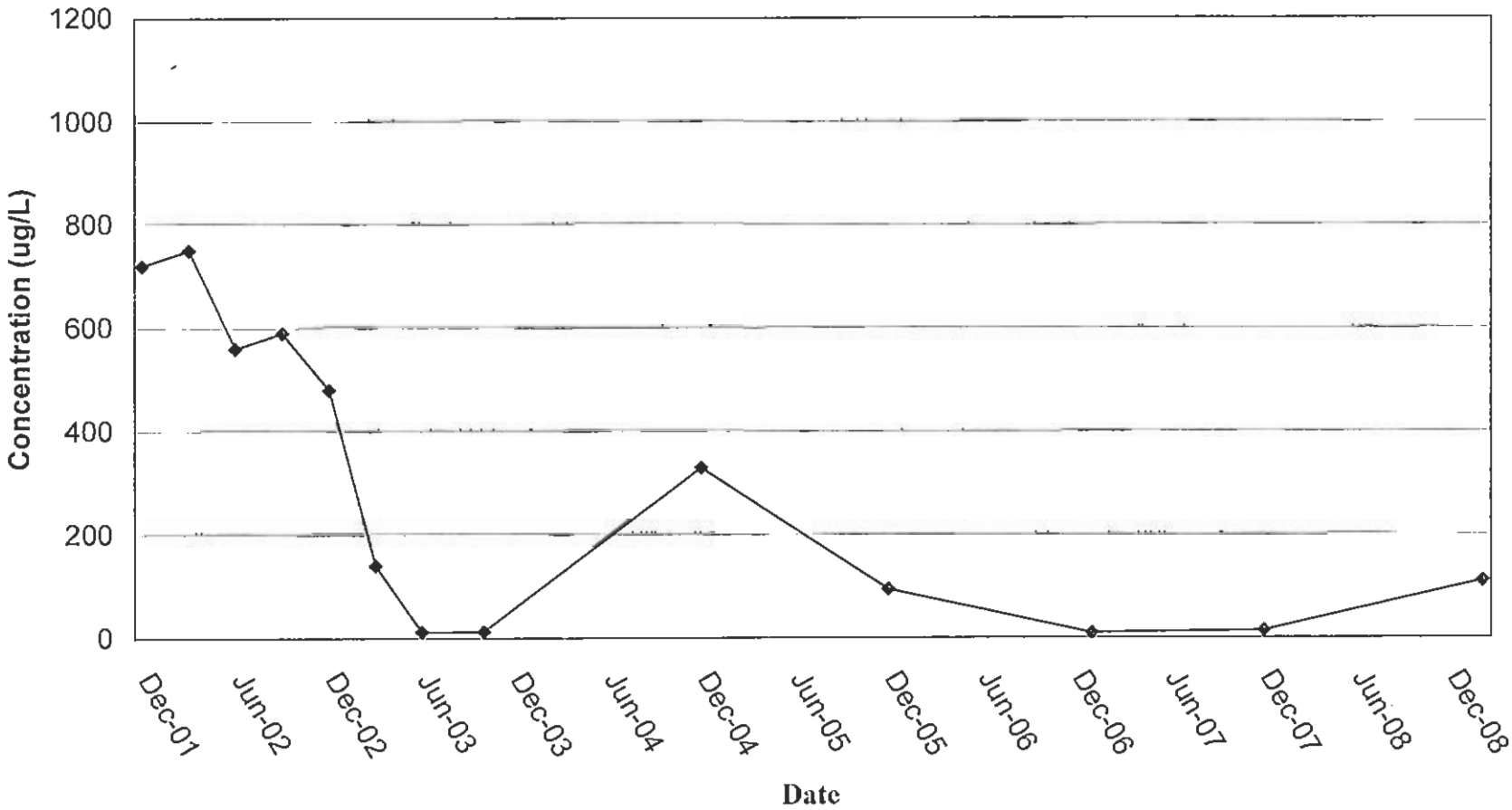
Naphthalene Concentrations in MW-06
Hattiesburg, MS



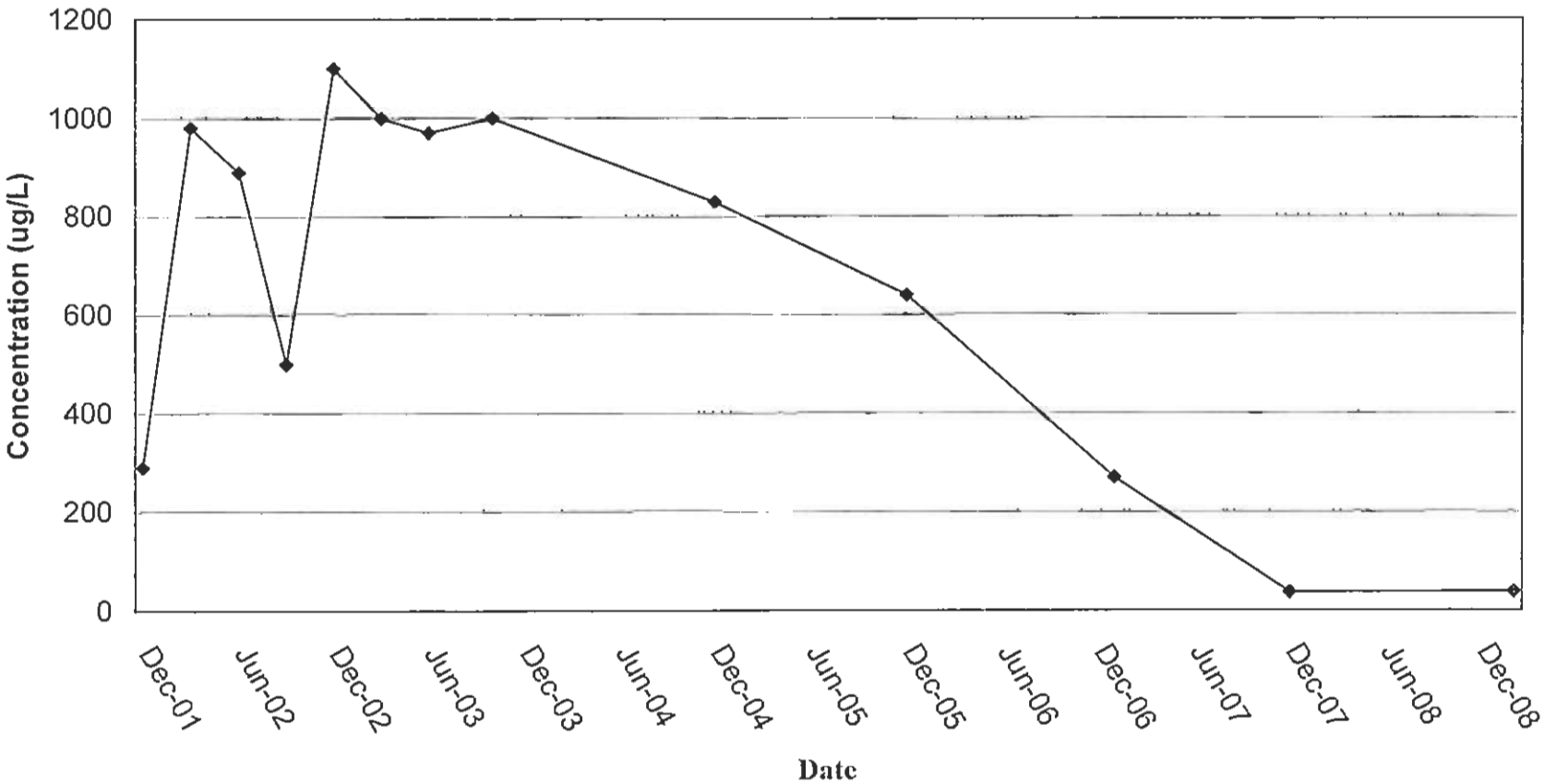
Naphthalene Concentrations in MW-09R
Hattiesburg, MS



Naphthalene Concentrations in MW-17
Hattiesburg, MS



Naphthalene Concentrations in MW-19
Hattiesburg, MS



APPENDIX B

CHEMICAL CONSTITUENT TABLES AND GRAPHS

MNA Concentrations in Monitoring Wells

Gulf States Creosoting Site
Hattiesburg, Mississippi

Total Iron (mg/L)

	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-1R	18.1	8.9	4.1	2	1.4	0.1	1.4	0.2	0.1	0.2	0.1	0.1	0.1
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-2R	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-4	0.1	0.1	0.3	0.5	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-06	20.6	23	21.7	19.8	21.4	15.3	16.8	18.8	22	26.9	26.1	26.3	23.5
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-09R	15.8	15.3	15.2	16	14.8	17.3	15.8	18	26.8			24.9	27.6
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-12	1.8	1.9	1.7	1.8	1.6	1.7	1.4	1.3	1.1	1.3	0.9	0.9	0.8
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-16	1.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-17	4.1	4.5	4.7	8.4	5.1	2.3	1.4	4.6	7.9	8.5	3.5	3.3	2.4
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-18	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-19	4.7	5.7	5.8	5.5	6.8	5.6	6	5.6	6.1	7.3	8	6.6	7.8
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-22	2.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.9	1.2	14.2	6.6	12.8

MNA Concentrations in Monitoring Wells

Gulf States Creosoting Site
Hattiesburg, Mississippi

Methane (ug/L)

	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-1R	2400	350	71	43	48	2	35	3.7	2.2	2	10	2	2
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-2R	2.8	2.2	2	2	2	2	2	2	2.1	2	2.3	2	5
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-4	3.1	2	2	2	2	2	2	2	2	2	2	2	5
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-06	1200	1400	1400	1900	1900	1200	1900	1400	2500	1400	2300	1400	780
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-09R	590	380	480	340	230	750	580	450	1500			2000	1500
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-12	400	360	370	400	240	210	170	140	64	50	50	140	230
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-16	17.0	2.0	3.3	3.3	2.0	2.0	2.0	2.0	2.1	2.0	2.0	2.0	5.0
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-17	850	1400	910	930	640	470	300	390	550	300	140	230	310
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-18	4.4	4.6	2	2	2	2	2	2	3.9	2	2	2	5
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-19	590	1400	1200	1000	1400	1400	1200	1300	1300	780	700	450	580
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-22	100.0	71.0	41.0	19.0	33.0	46.0	55.0	38.0	16.0	11.0	9.7	19.0	16.0

MNA Concentrations in Monitoring Wells

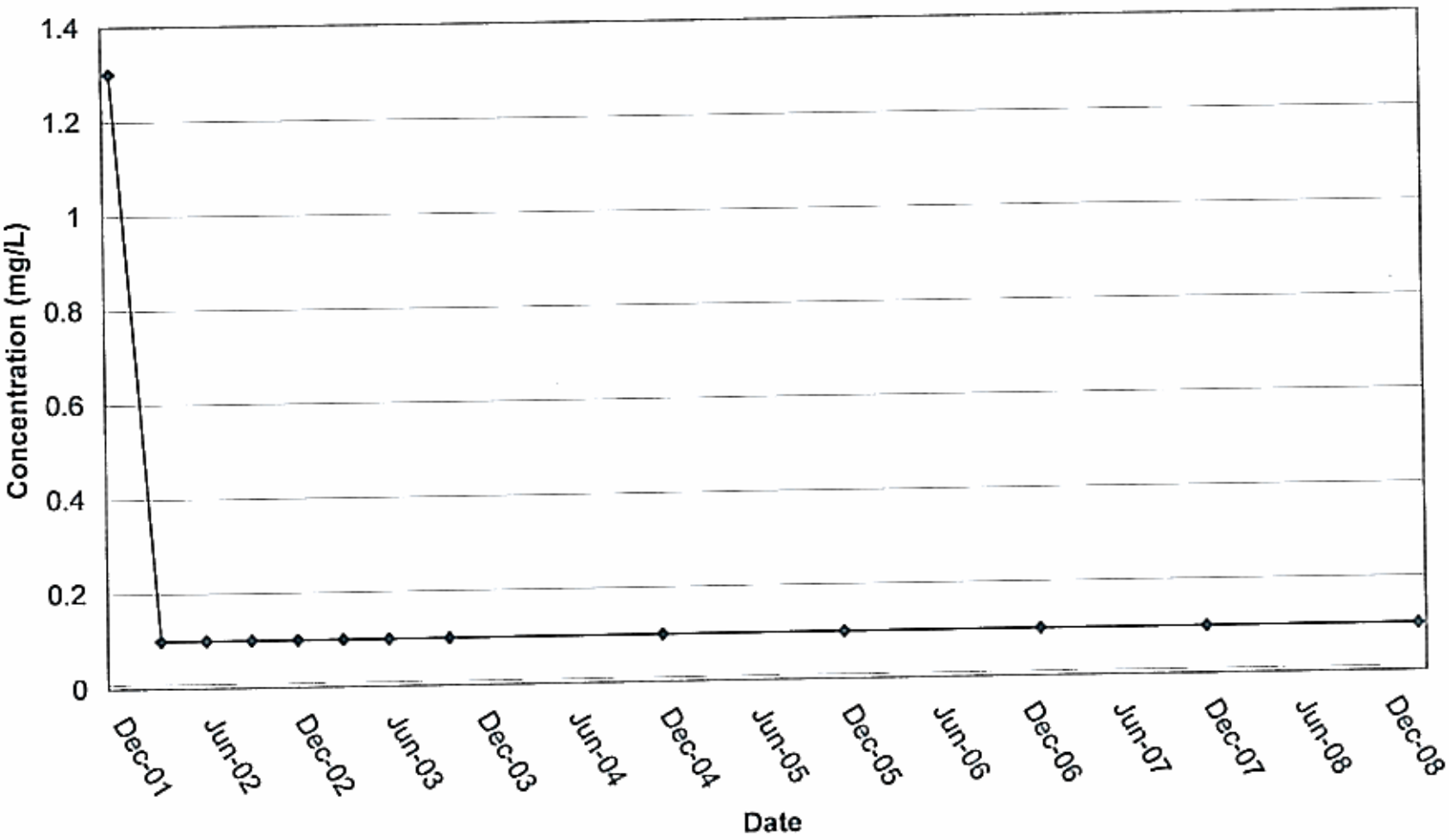
Gulf States Creosoting Site
Hattiesburg, Mississippi

Sulfate (mg/L)

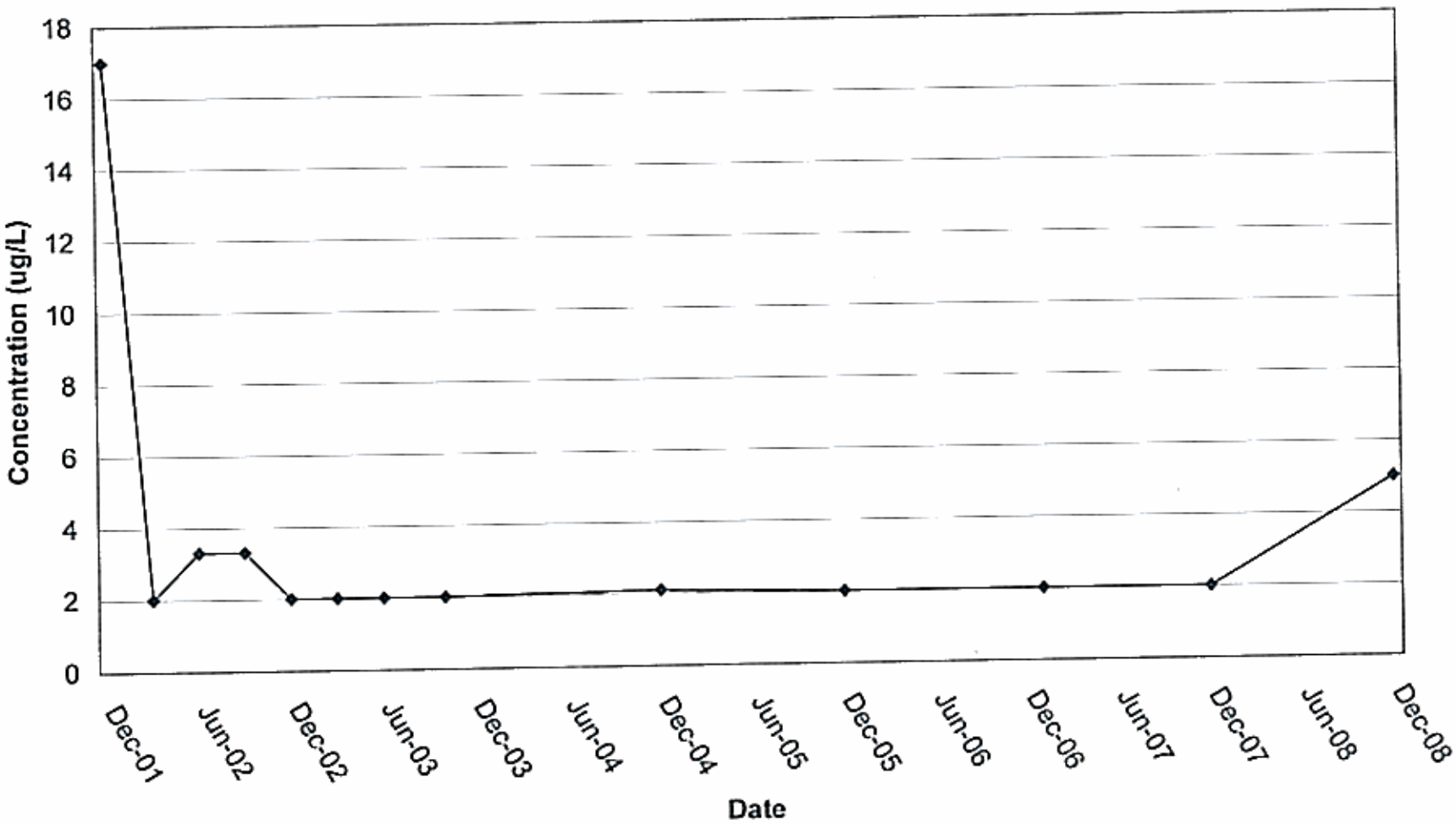
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-1R	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.9	4.7	4.8
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-2R	19.9	18.8	20.9	21.2	19.3	20.9	21.8	19.9	17.9	18.8	19	16.8	14.7
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.9	1.5	1.5	1.5	1.5	1.5
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-06	3	4.9	3.7	4.1	6	4.8	2.7	5.2	3.4	3.6	1.9	2.8	4.9
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-09R	3.4	6.6	4	1.5	5.3	9.8	6.4	13.8	1.5			1.5	1.5
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-12	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2.1	1.5	2.2
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-16	3.1	2.7	3.1	15.3	5.9	8.1	12.6	26.6	9.1	18.8	6.2	6.5	13.4
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-17	5.6	6.3	9.8	6.7	11.1	17.5	10.3	9.2	9.1	7.9	9.8	8	5.6
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-18	6.9	9.7	9.8	9.7	5.5	7.1	6.7	4.3	4.3	1.5	3.3	4.1	4.7
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-19	6.7	4.3	4.3	1.5	1.5	1.5	1.5	2.8	2.1	2.3	2.1	2.9	2.8
	Dec-01	Mar-02	Jun-02	Sep-02	Dec-02	Mar-03	Jun-03	Oct-03	Dec-04	Dec-05	Jan-07	Dec-07	Feb-09
MW-22	6.3	5.0	4.9	4.3	5.4	5.0	4.8	4.1	4.6	5.2	5.2	4.8	4.1

Select Wells Outside the Plume

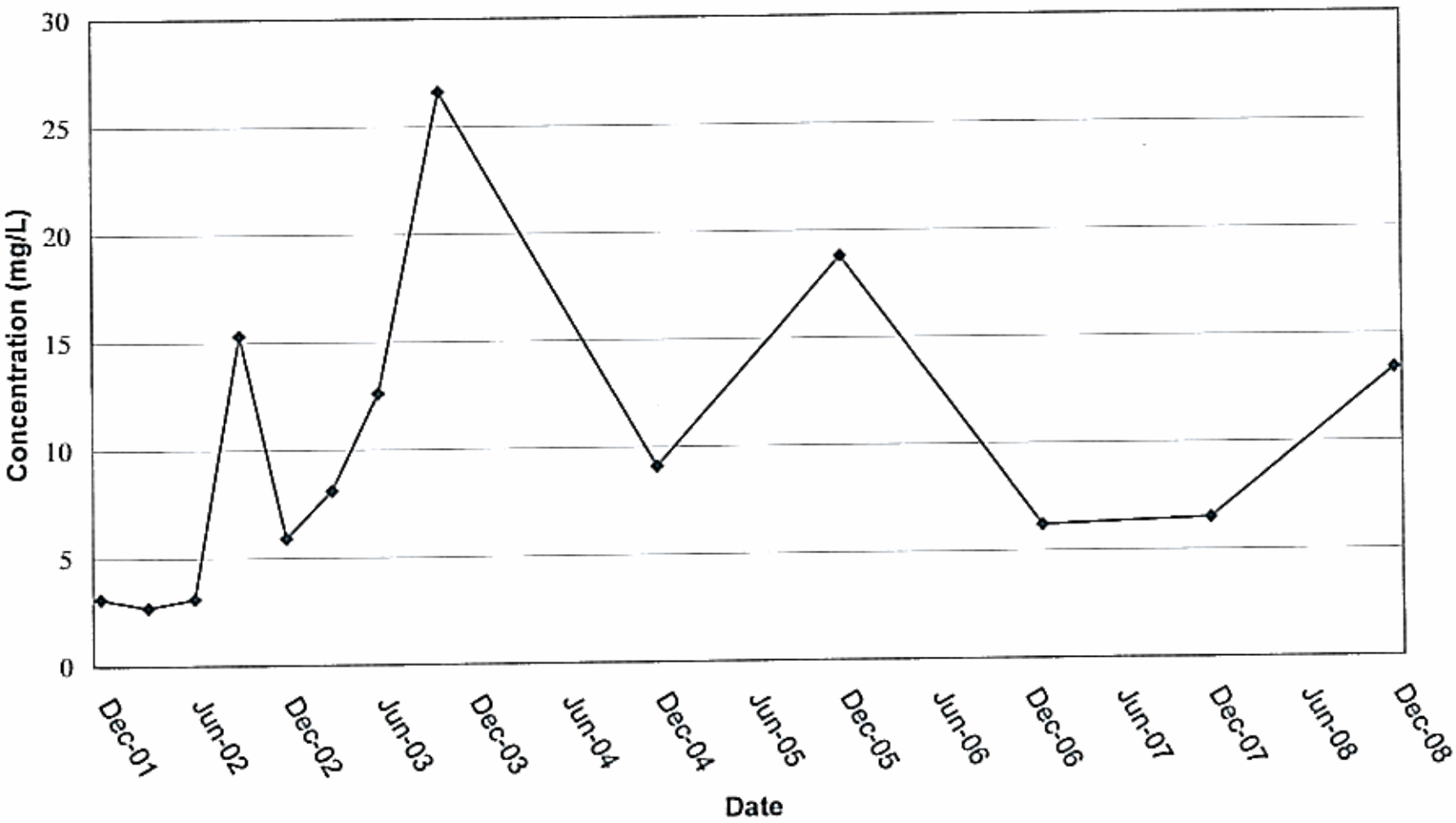
Total Iron Concentrations in MW-16
Hattiesburg, MS

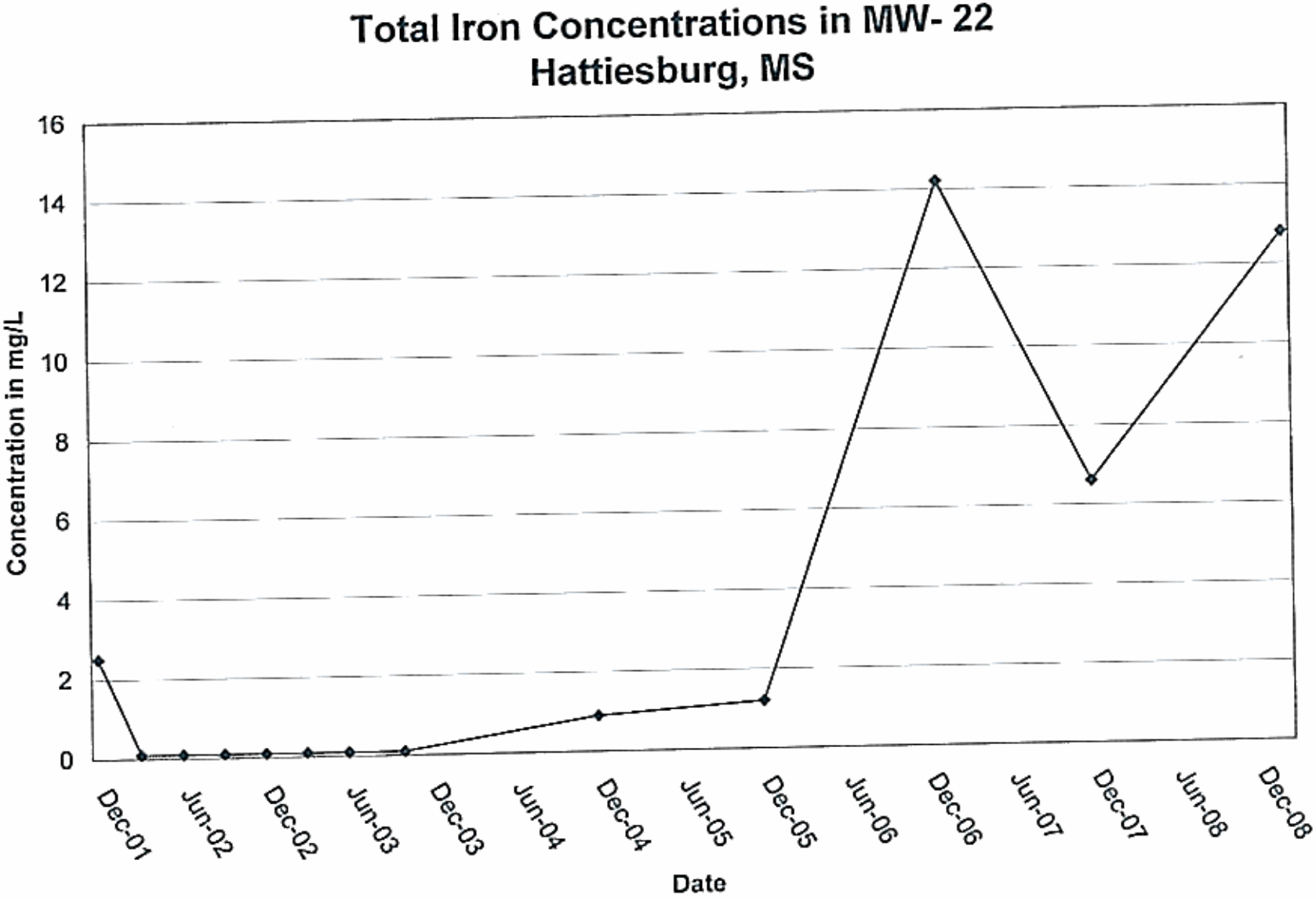


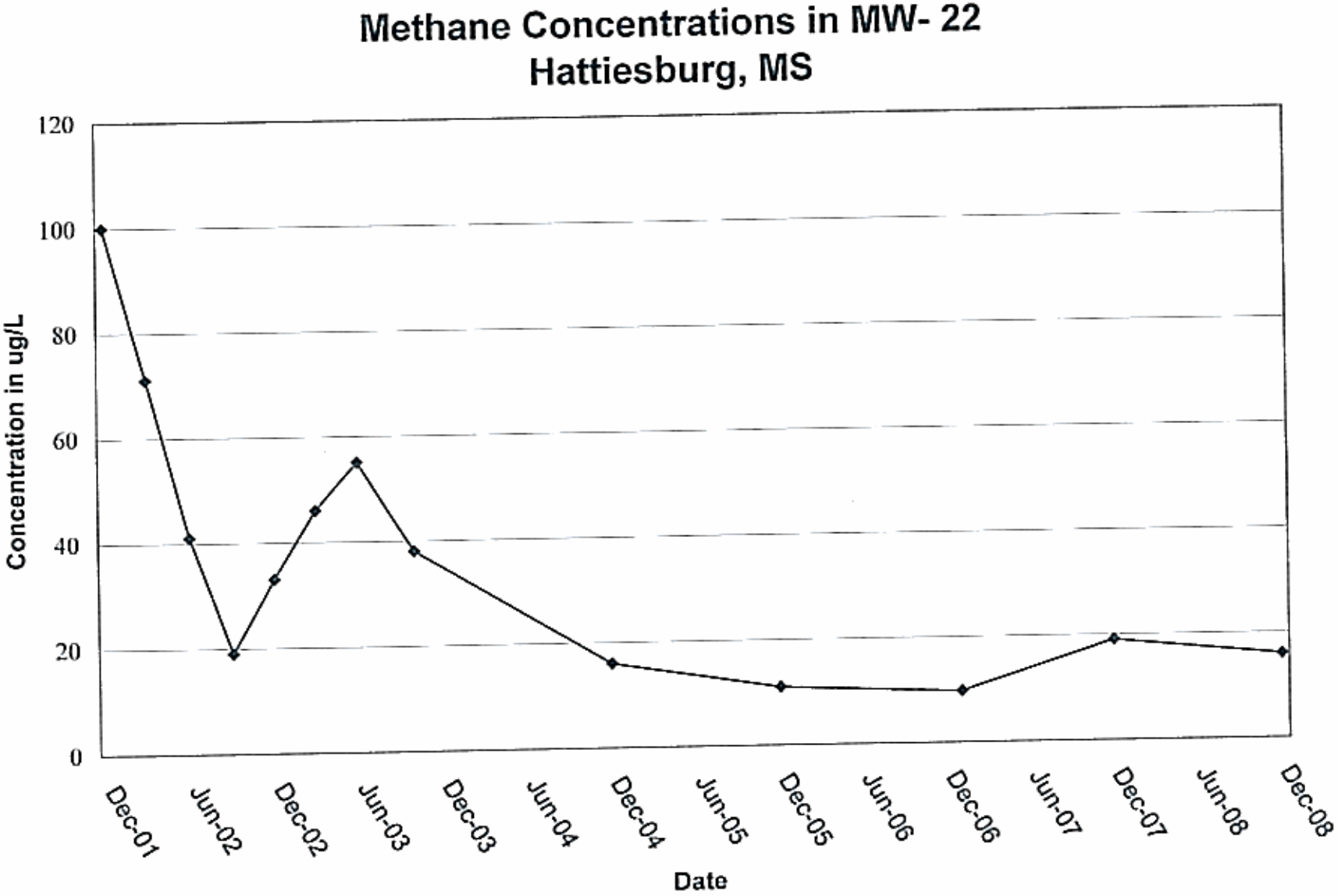
Methane Concentrations in MW-16
Hattiesburg, MS

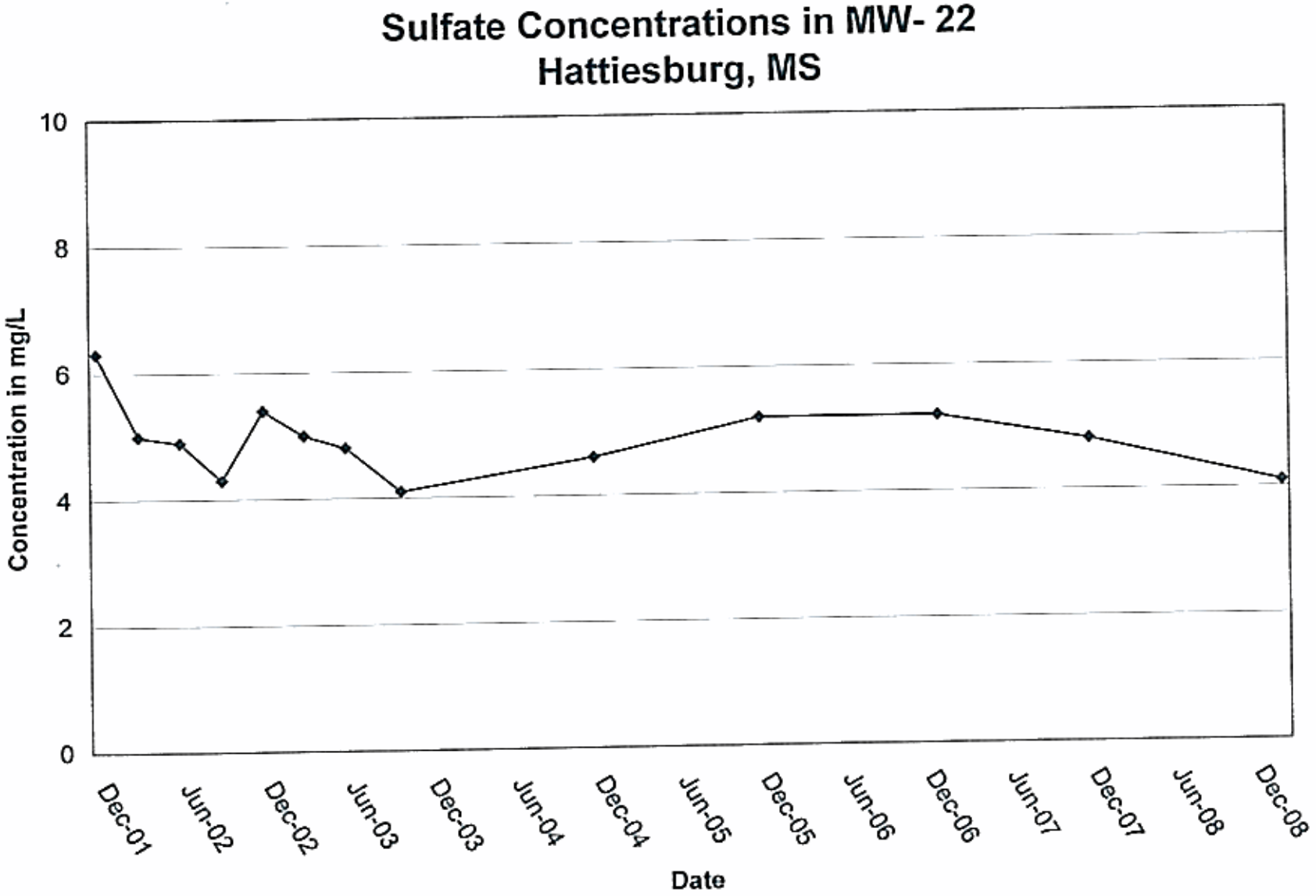


Sulfate Concentrations in MW-16
Hattiesburg, MS

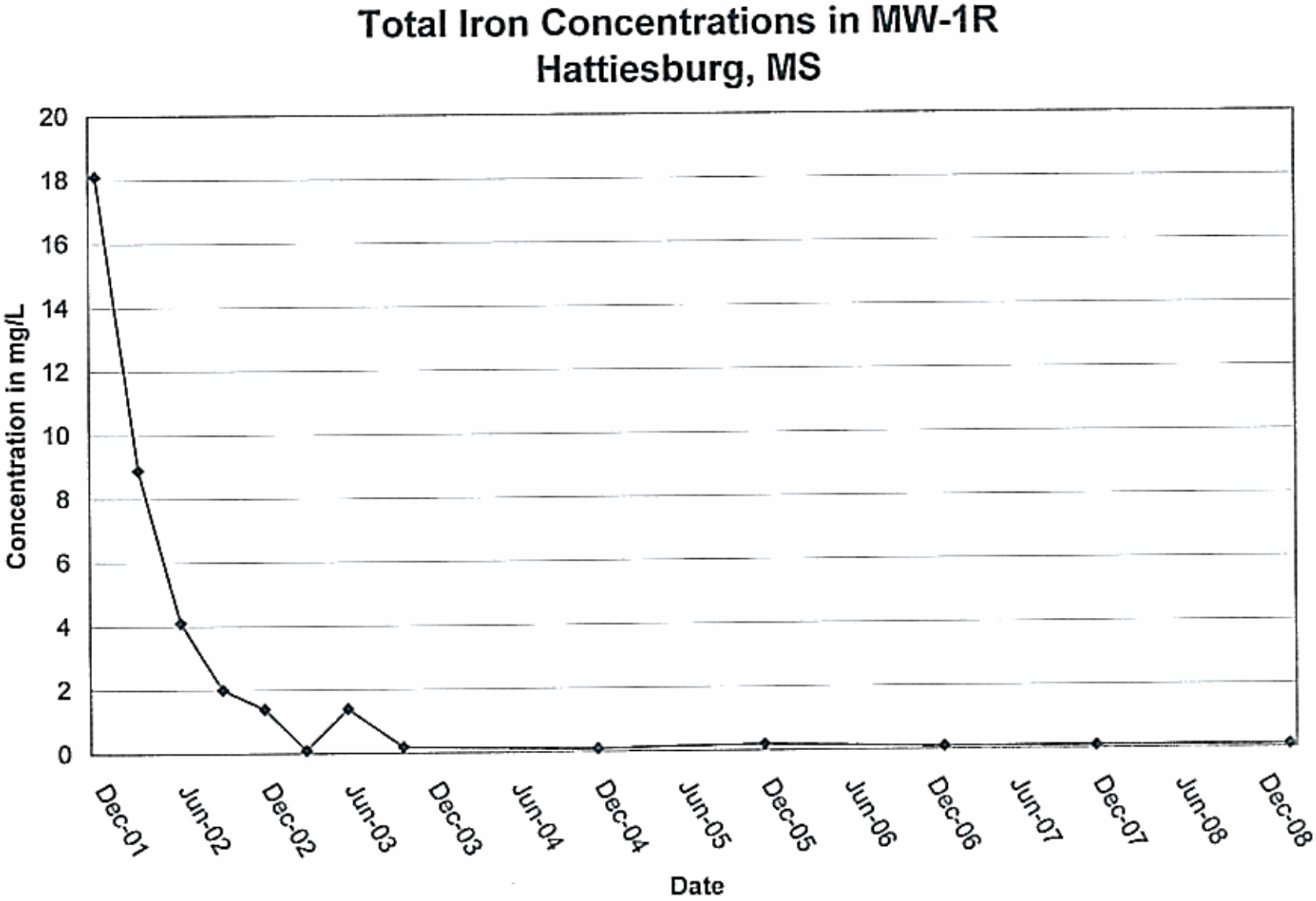


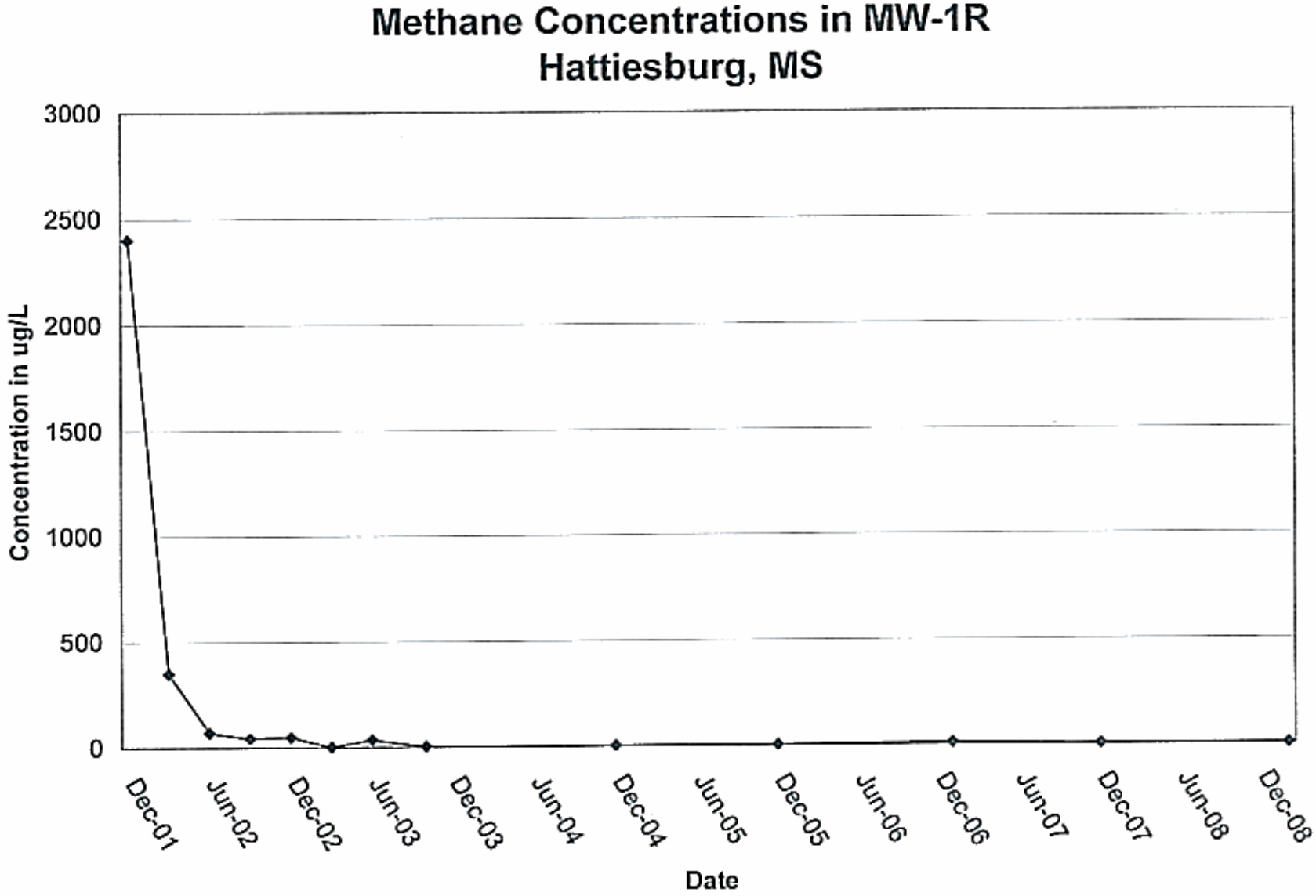

Total Iron Concentrations in MW- 22
Hattiesburg, MS
Concentration in mg/L
16
14
12
10
8
6
4
2
0
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Date

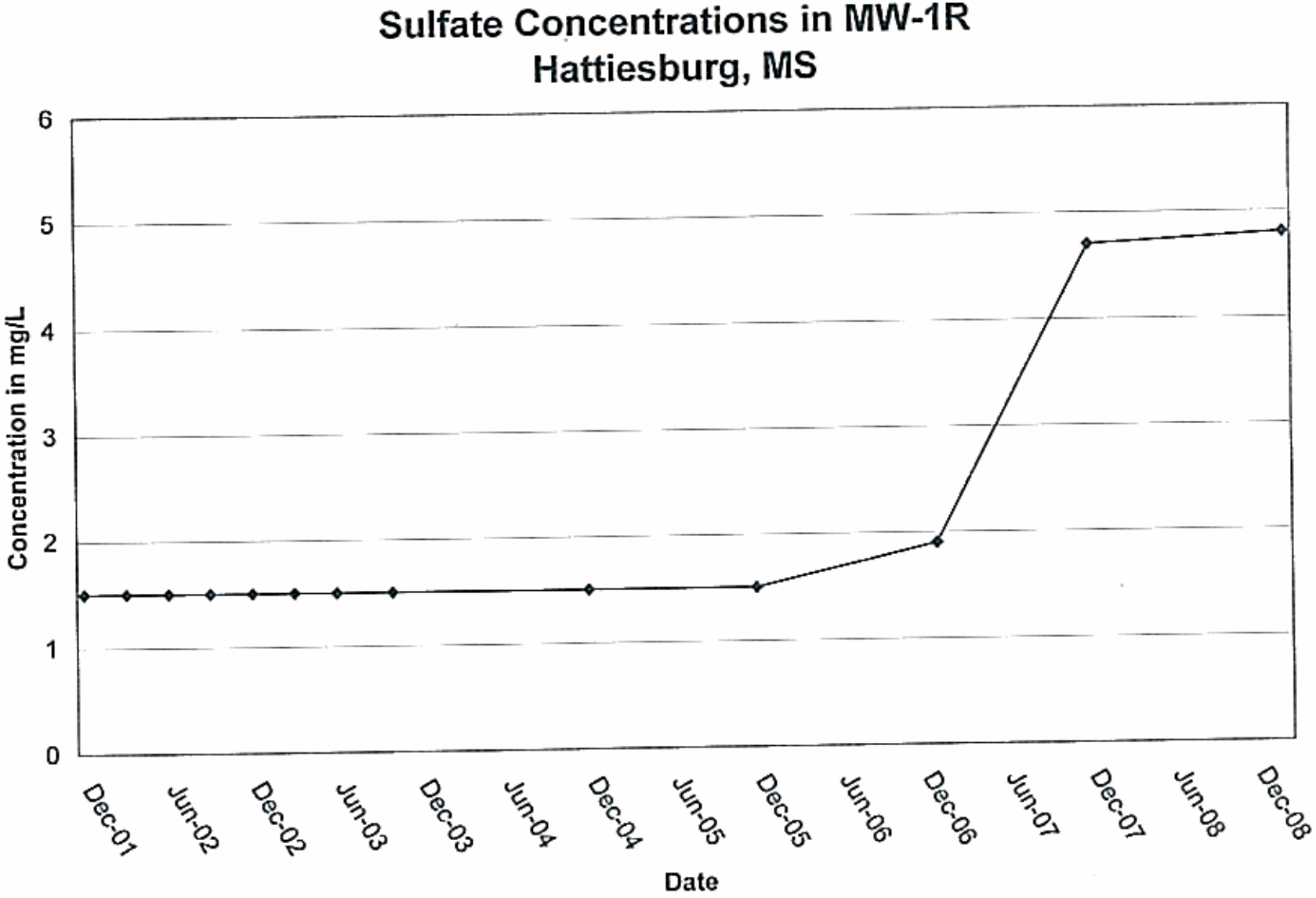

Methane Concentrations in MW- 22
Hattiesburg, MS
Concentration in ug/L
120
100
80
60
40
20
0
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Date


Sulfate Concentrations in MW- 22
Hattiesburg, MS
Concentration in mg/L
10
8
6
4
2
0
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Date

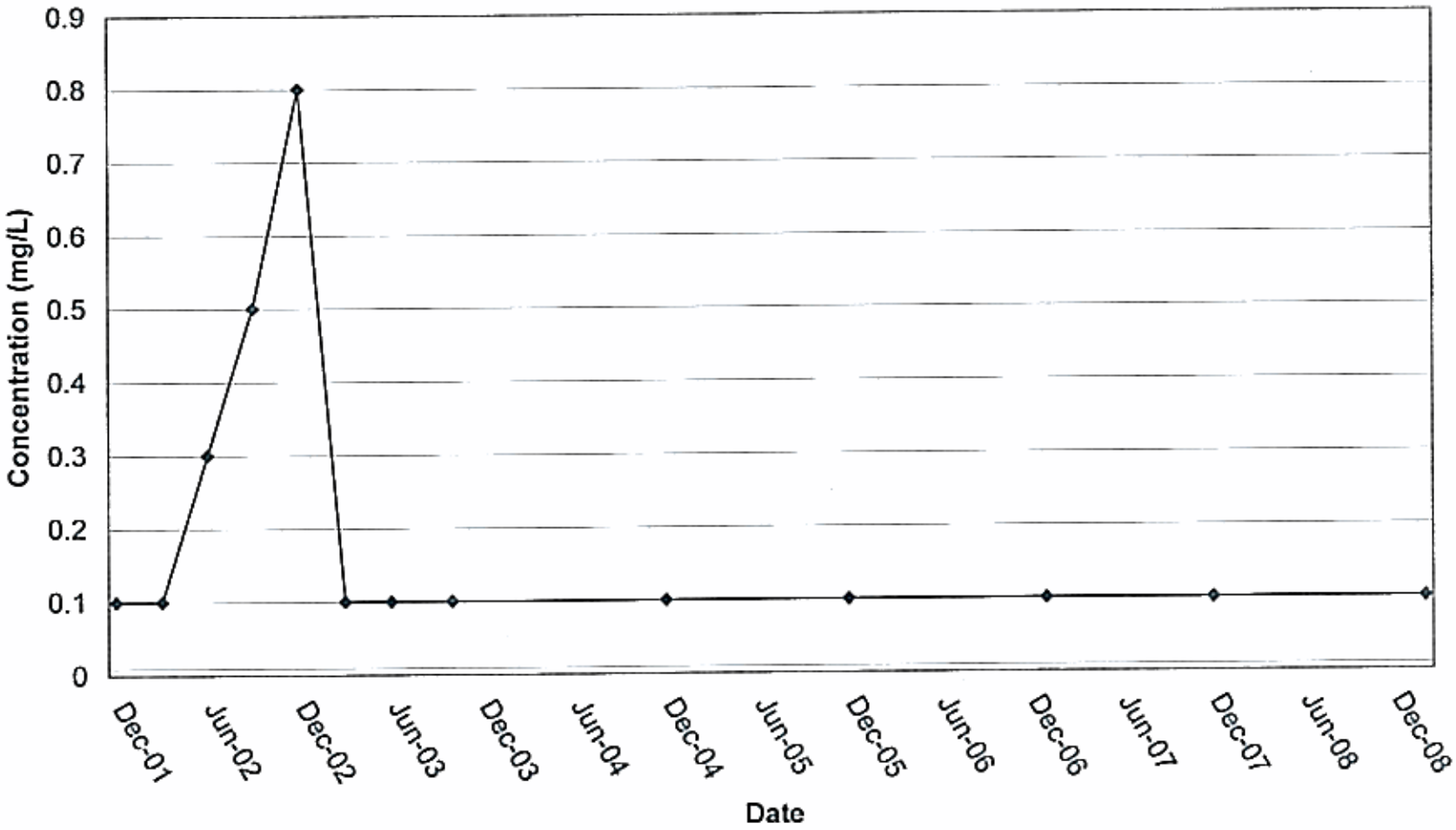
Wells on the Edge of the Plume


Total Iron Concentrations in MW-1R
Hattiesburg, MS
Concentration in mg/L
20
18
16
14
12
10
8
6
4
2
0
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Date

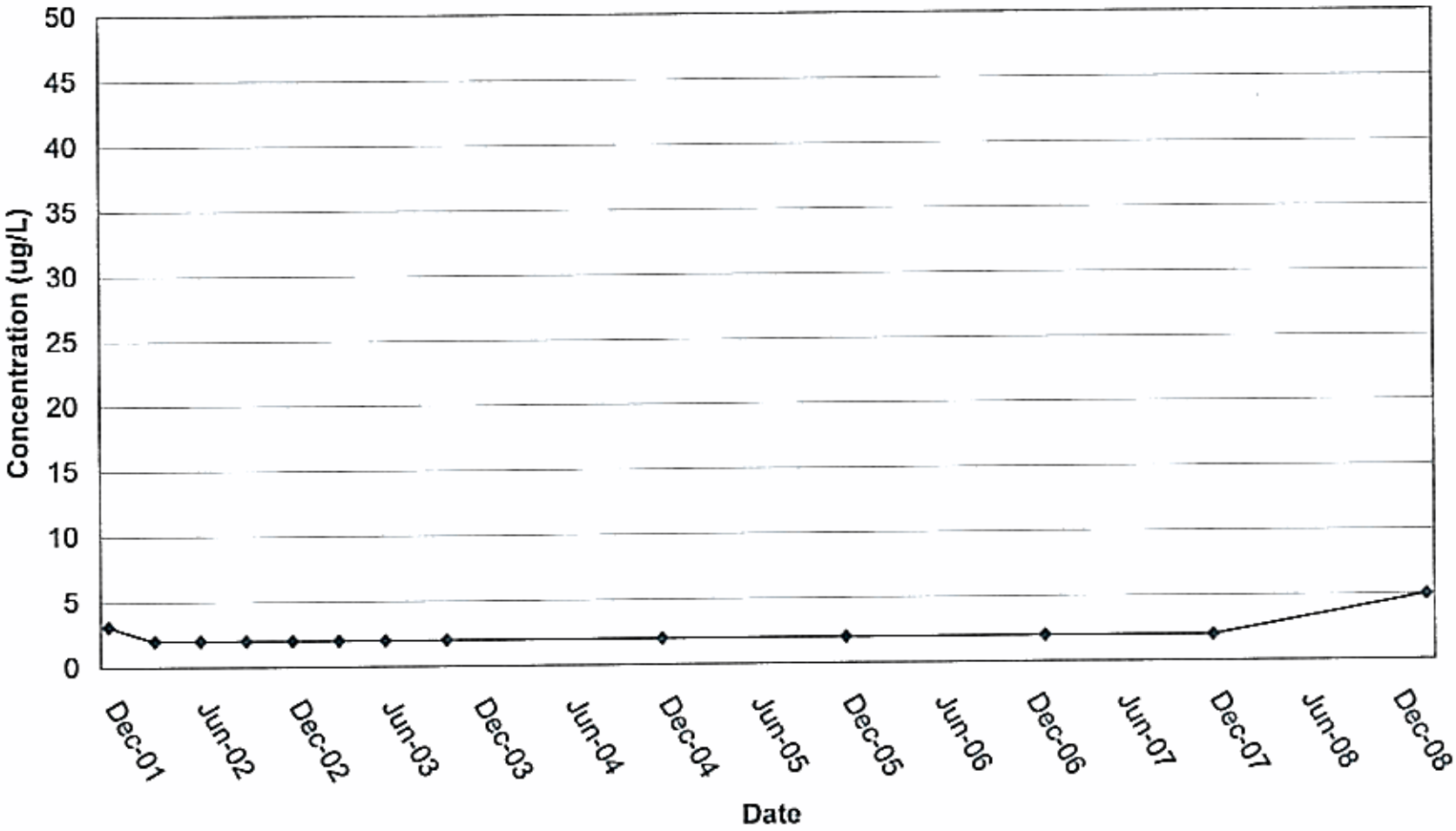

Methane Concentrations in MW-1R
Hattiesburg, MS
Concentration in ug/L
3000
2500
2000
1500
1000
500
0
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Date


Sulfate Concentrations in MW-1R
Hattiesburg, MS
Concentration in mg/L
0
1
2
3
4
5
6
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Date

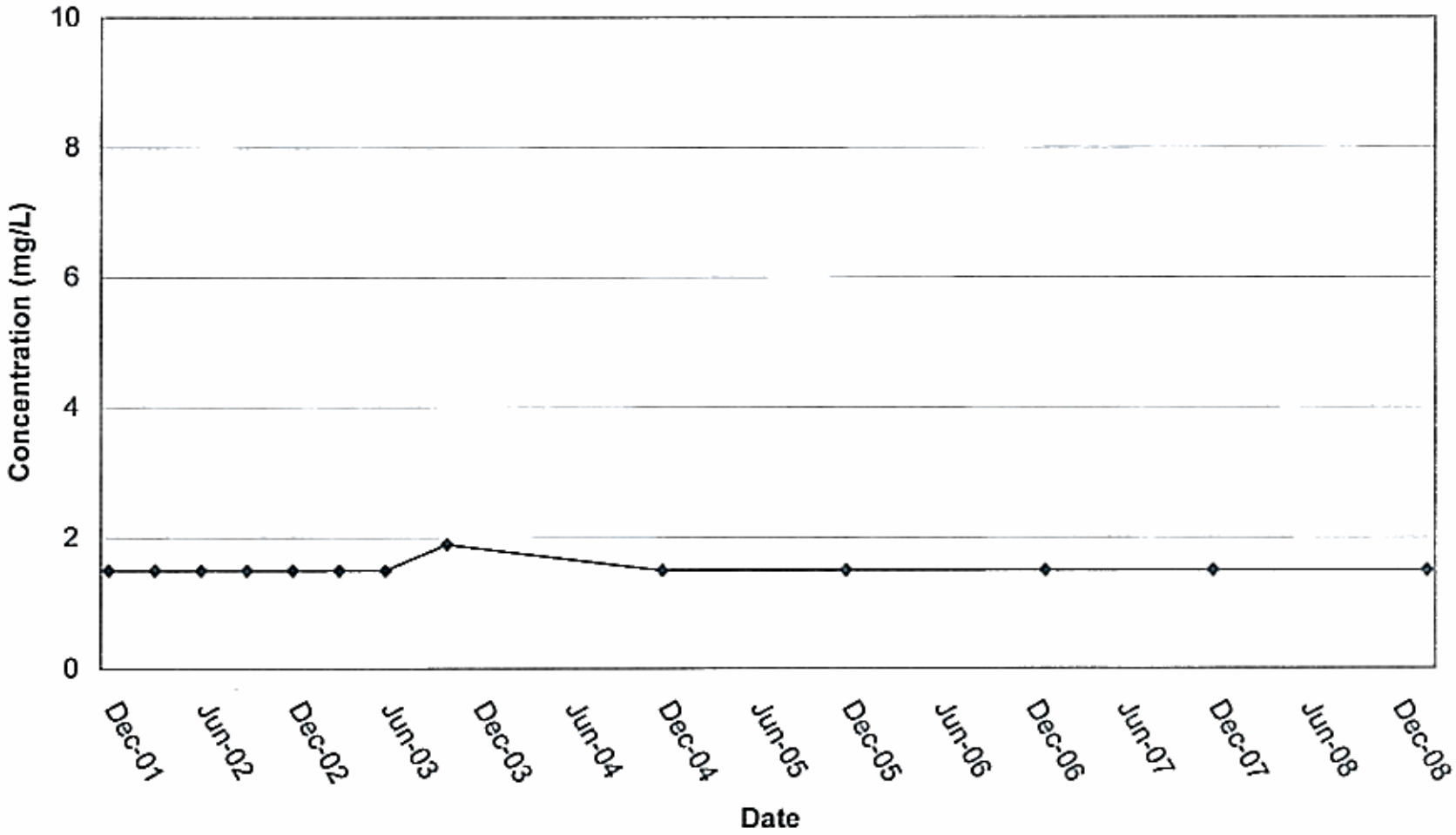
Total Iron Concentrations in MW-4
Hattiesburg, MS



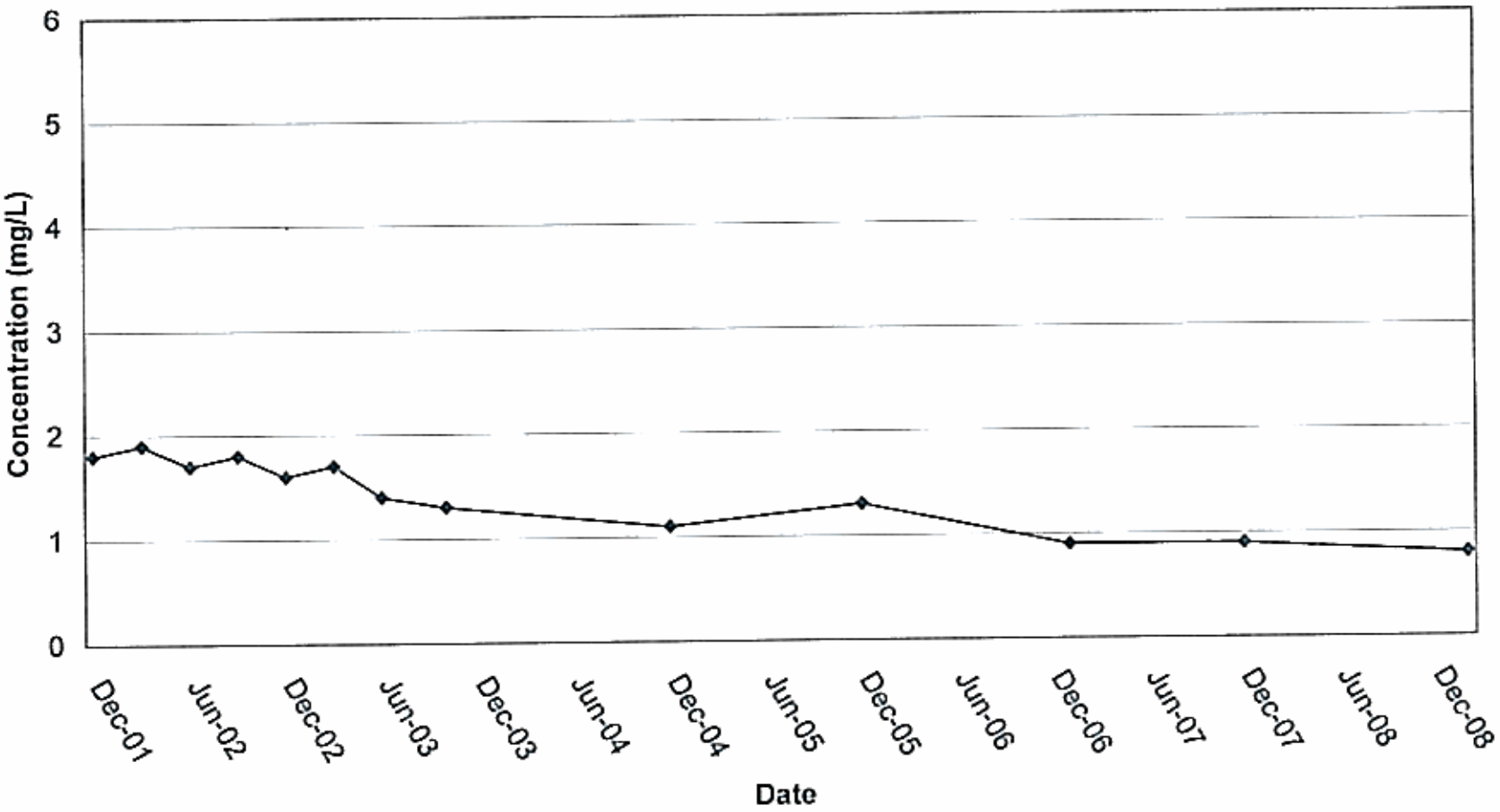
Methane Concentrations in MW-4
Hattiesburg, MS



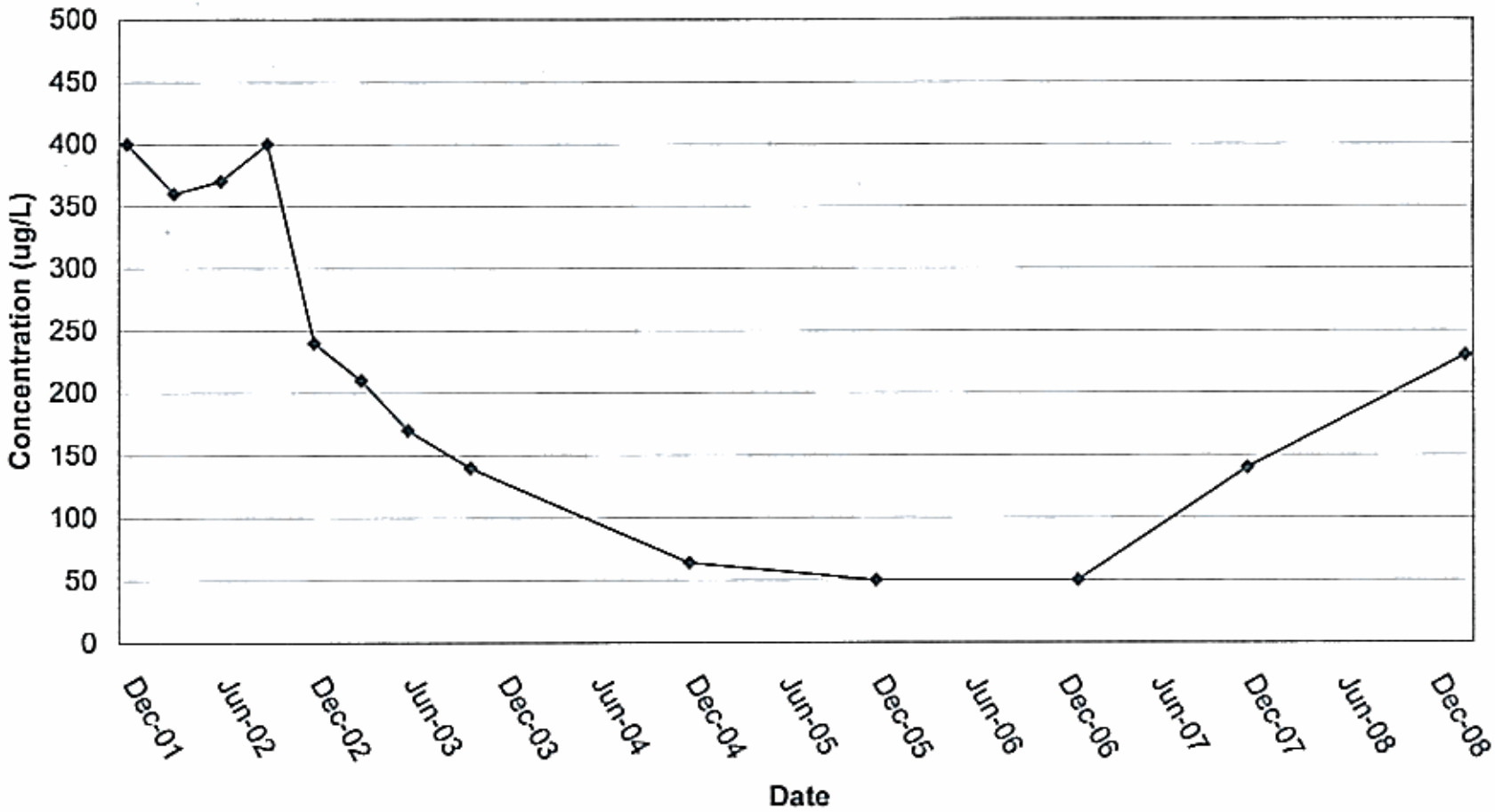
Sulfate Concentrations in MW-4
Hattiesburg, MS



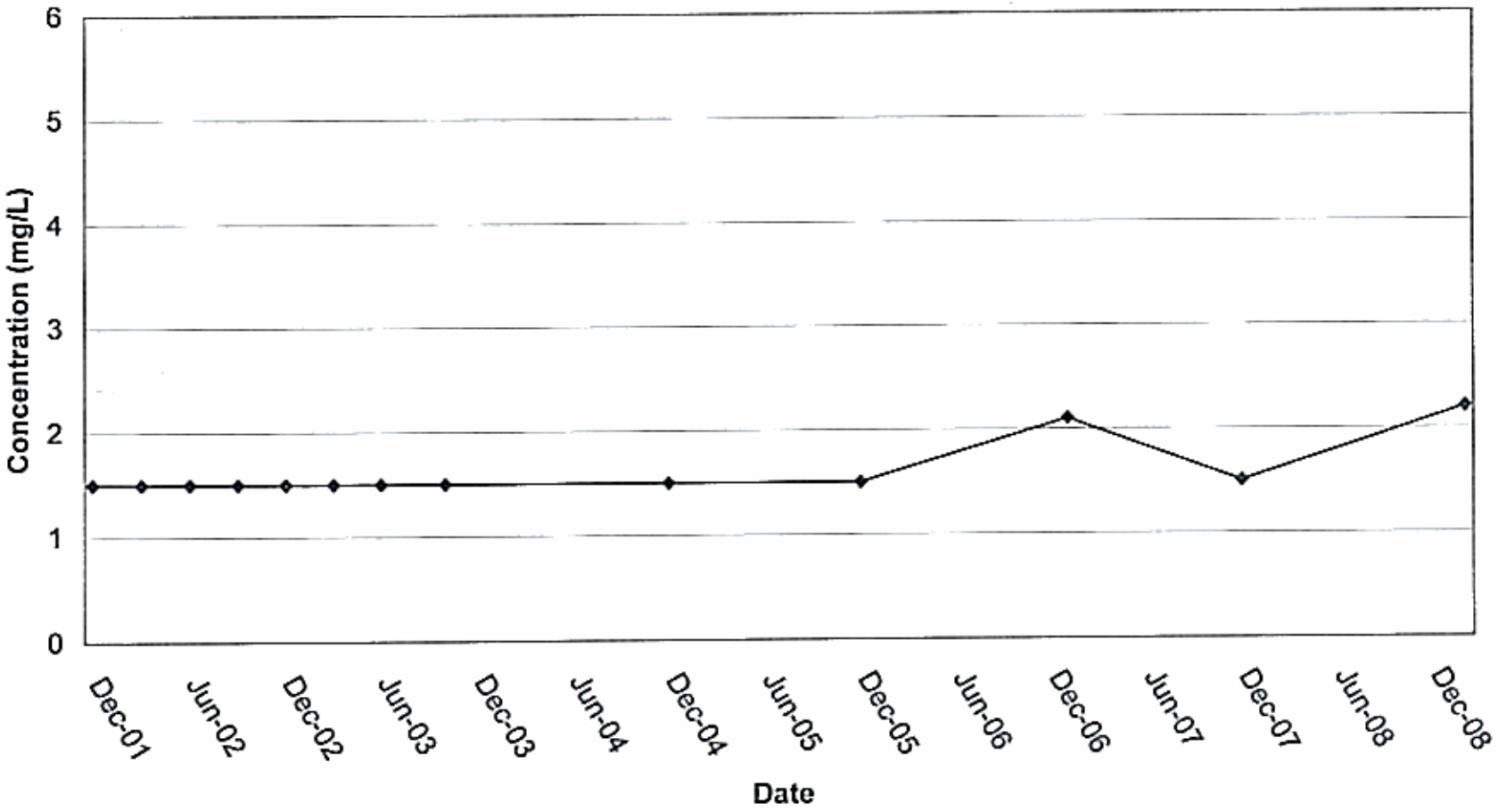
Total Iron Concentrations in MW-12
Hattiesburg, MS



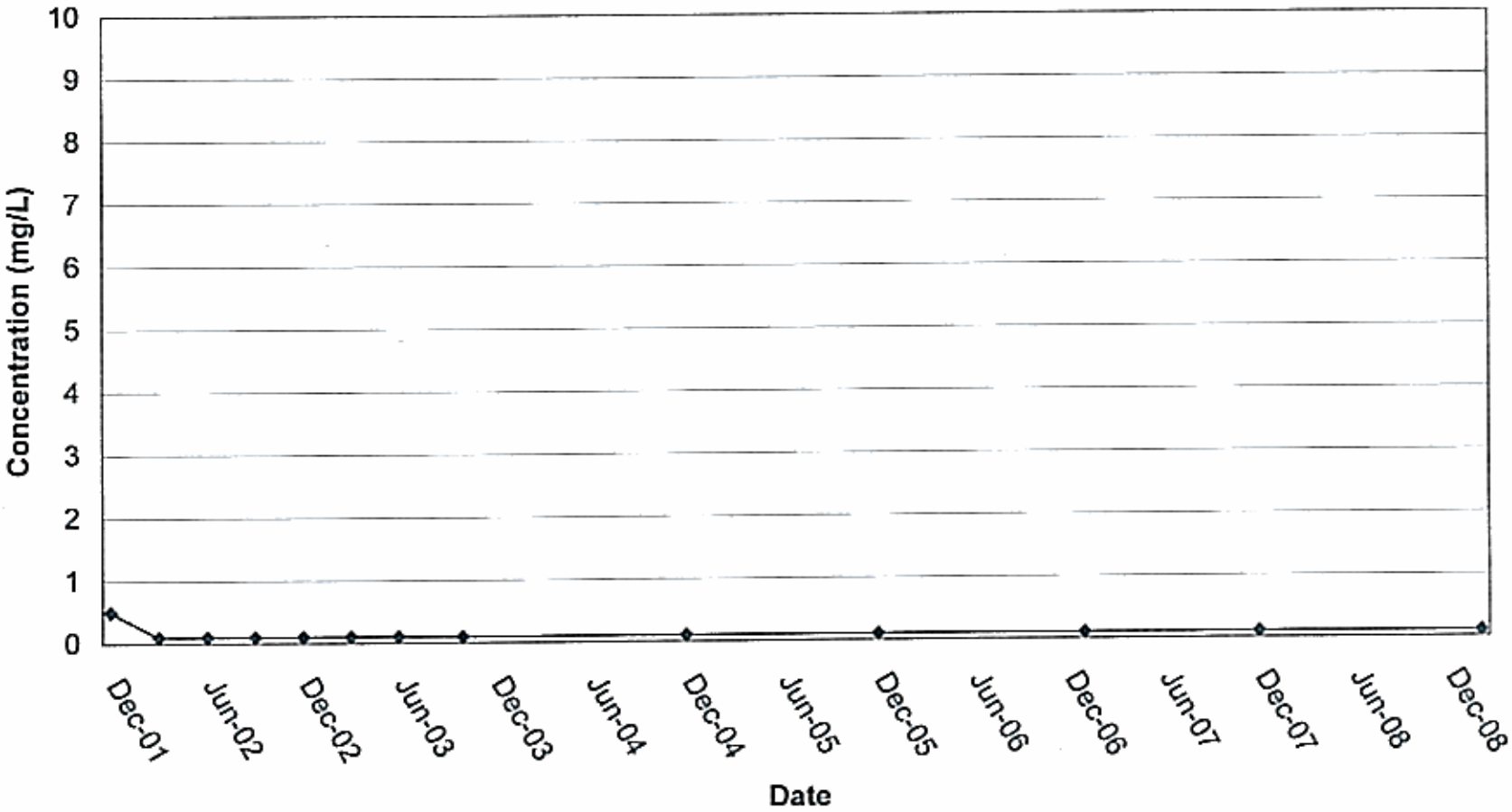
Methane Concentrations in MW-12
Hattiesburg, MS



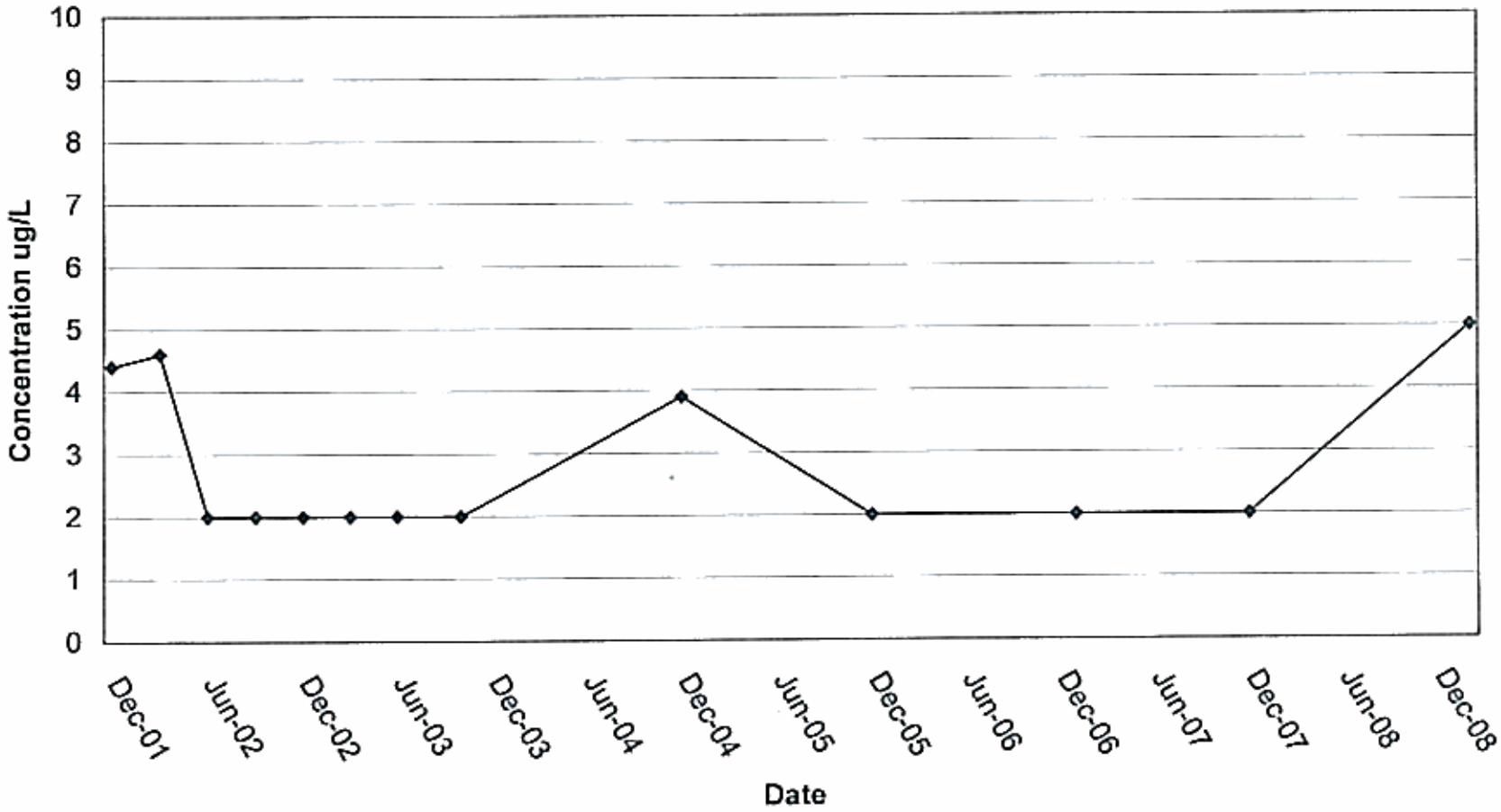
Sulfate Concentrations in MW-12
Hattiesburg, MS



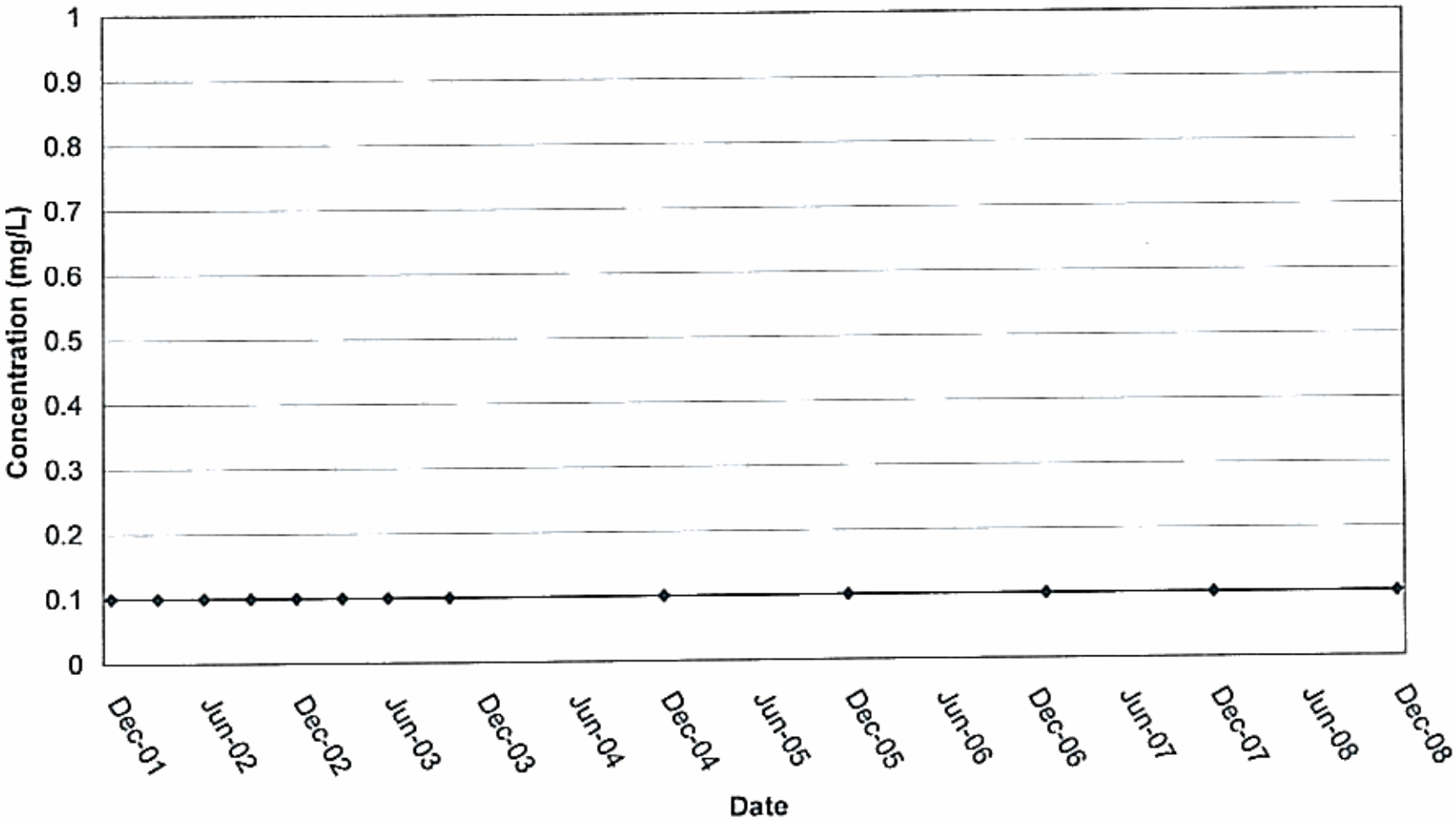
Total Iron Concentrations in MW-18
Hattiesburg, MS



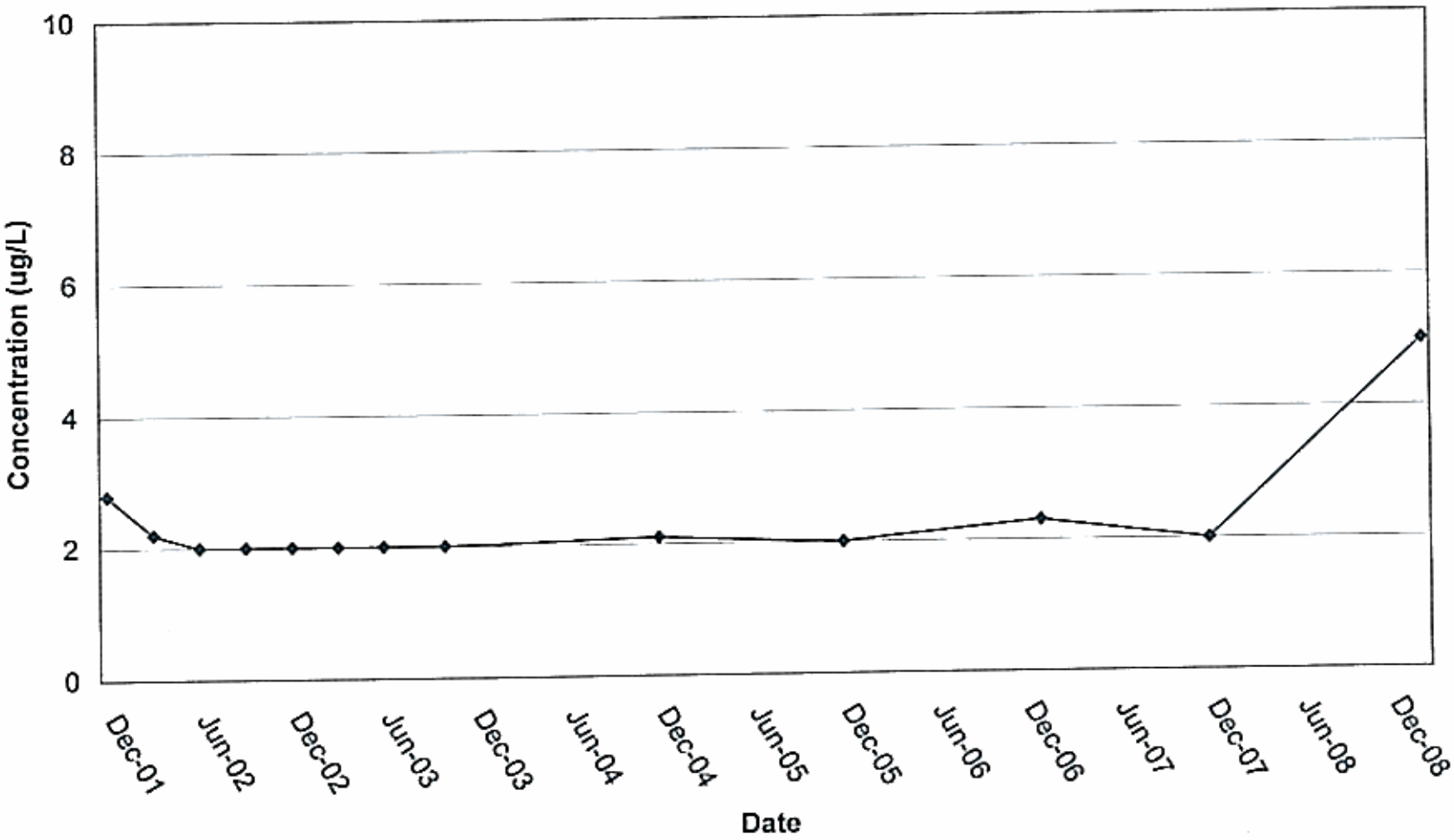
Methane Concentrations in MW-18
Hattiesburg, MS



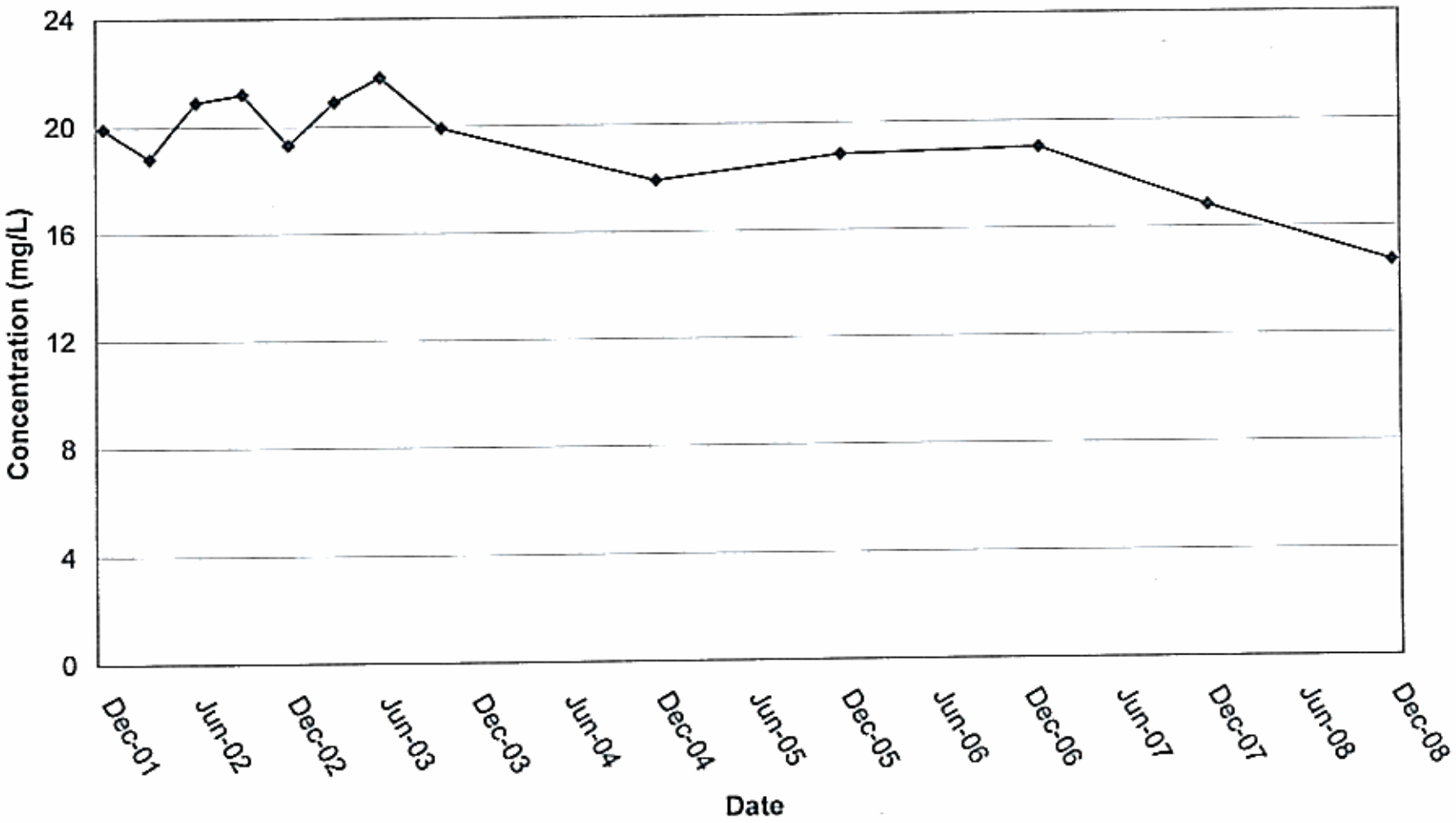
Total Iron Concentrations in MW-2R
Hattiesburg, MS



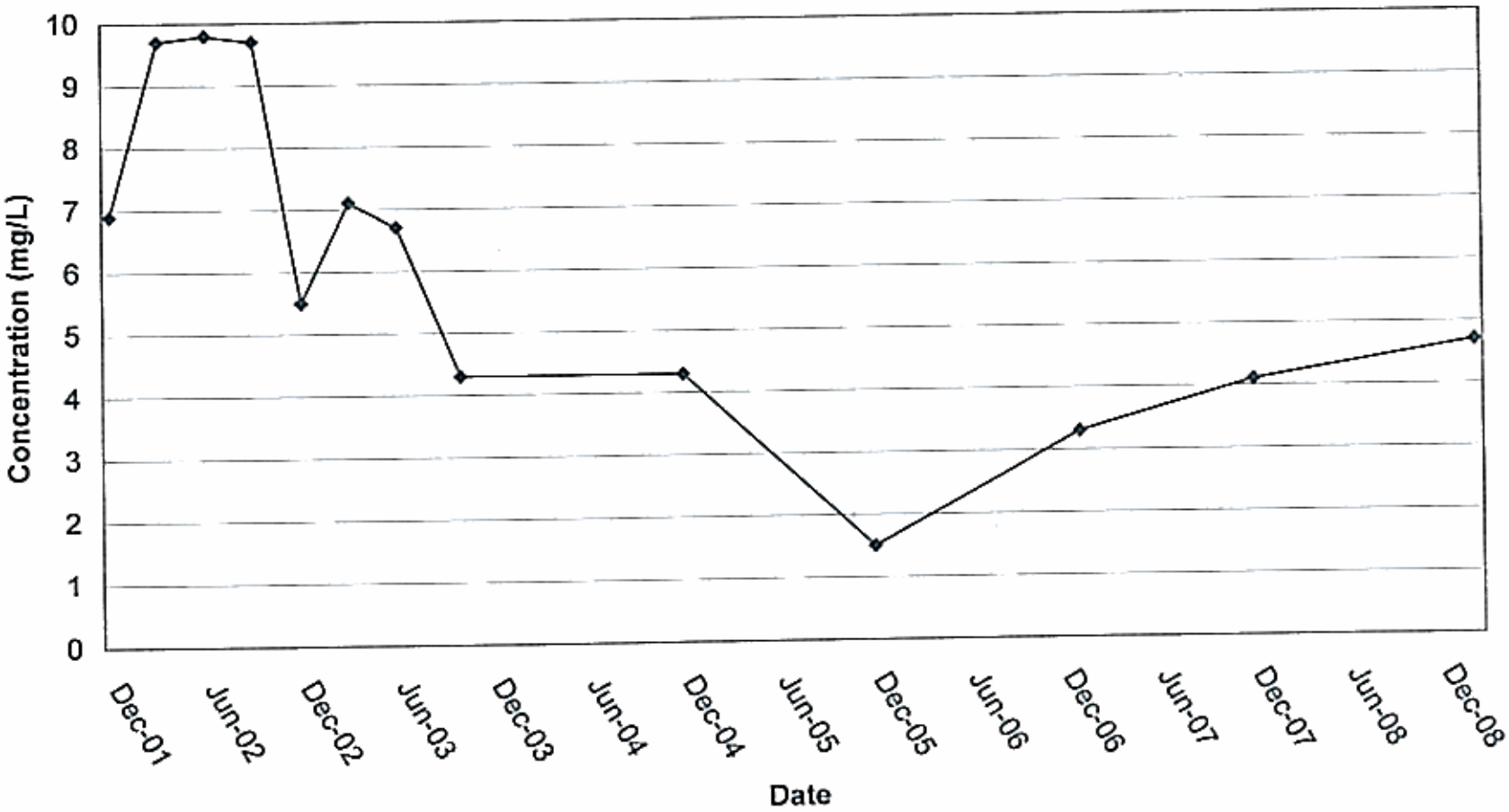
Methane Concentrations in MW-2R
Hattiesburg, MS



Sulfate Concentrations in MW-2R
Hattiesburg, MS

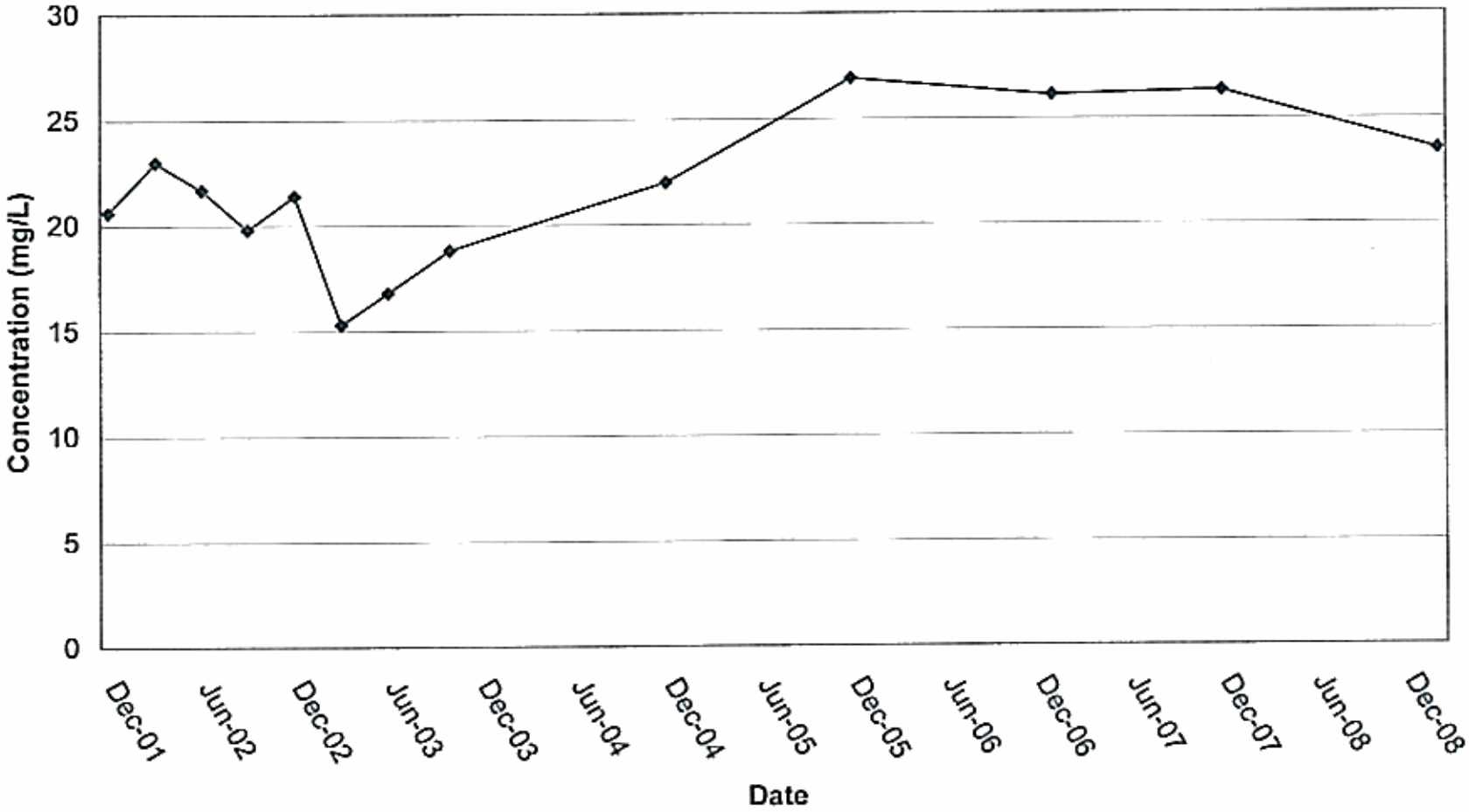


Sulfate Concentrations in MW-18
Hattiesburg, MS

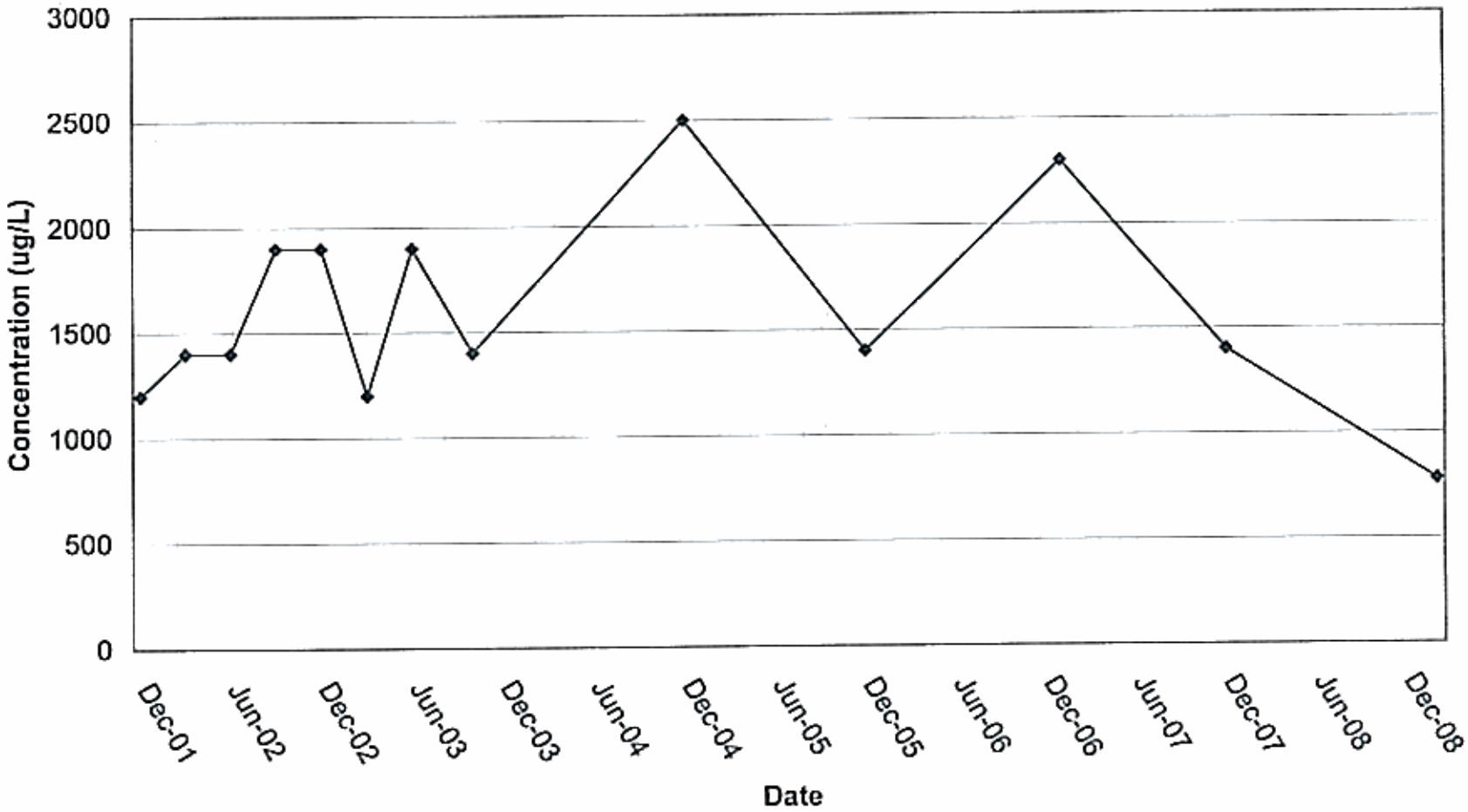


Wells Within the Main Part of the Plume

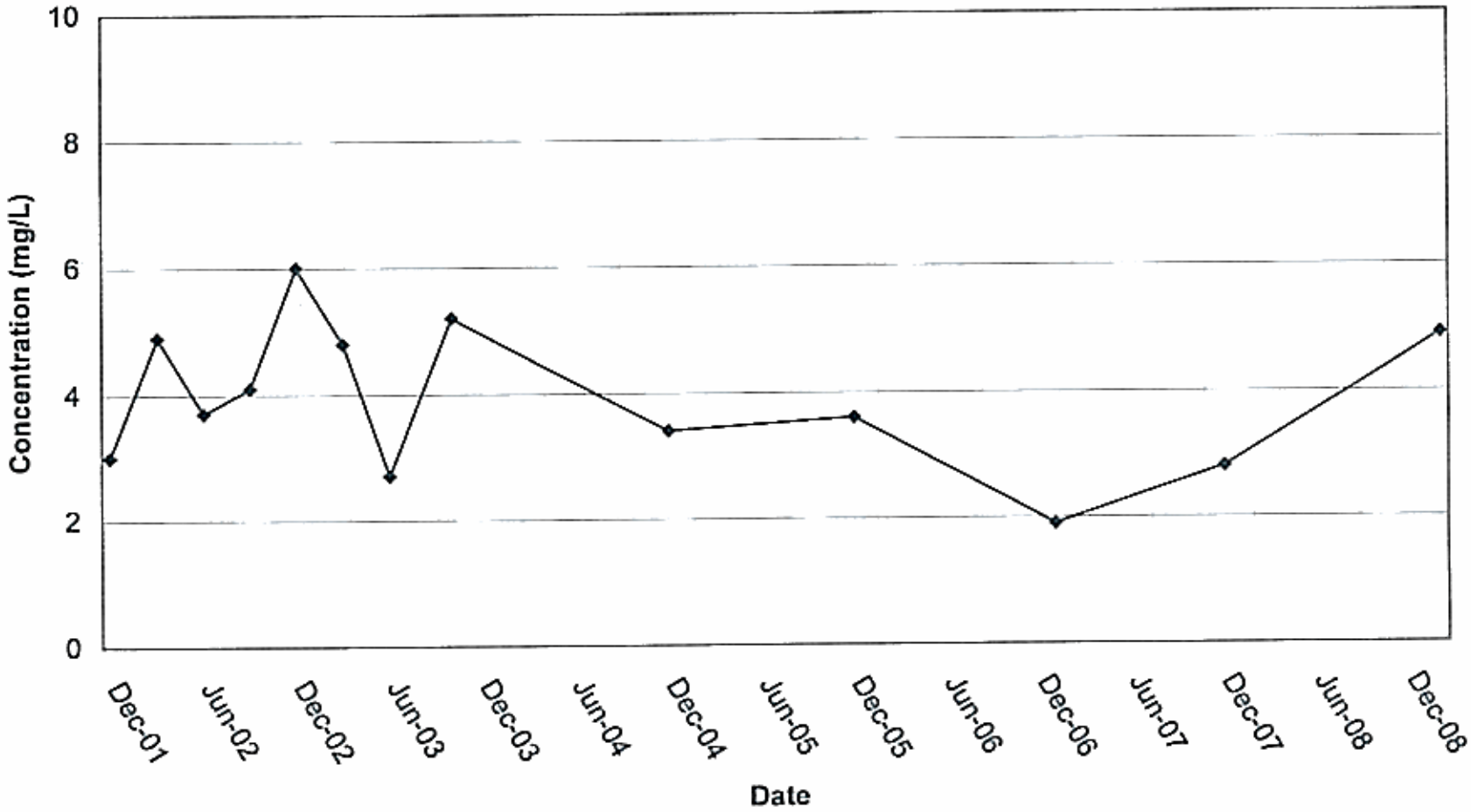
Total Iron Concentrations in MW-06
Hattiesburg, MS



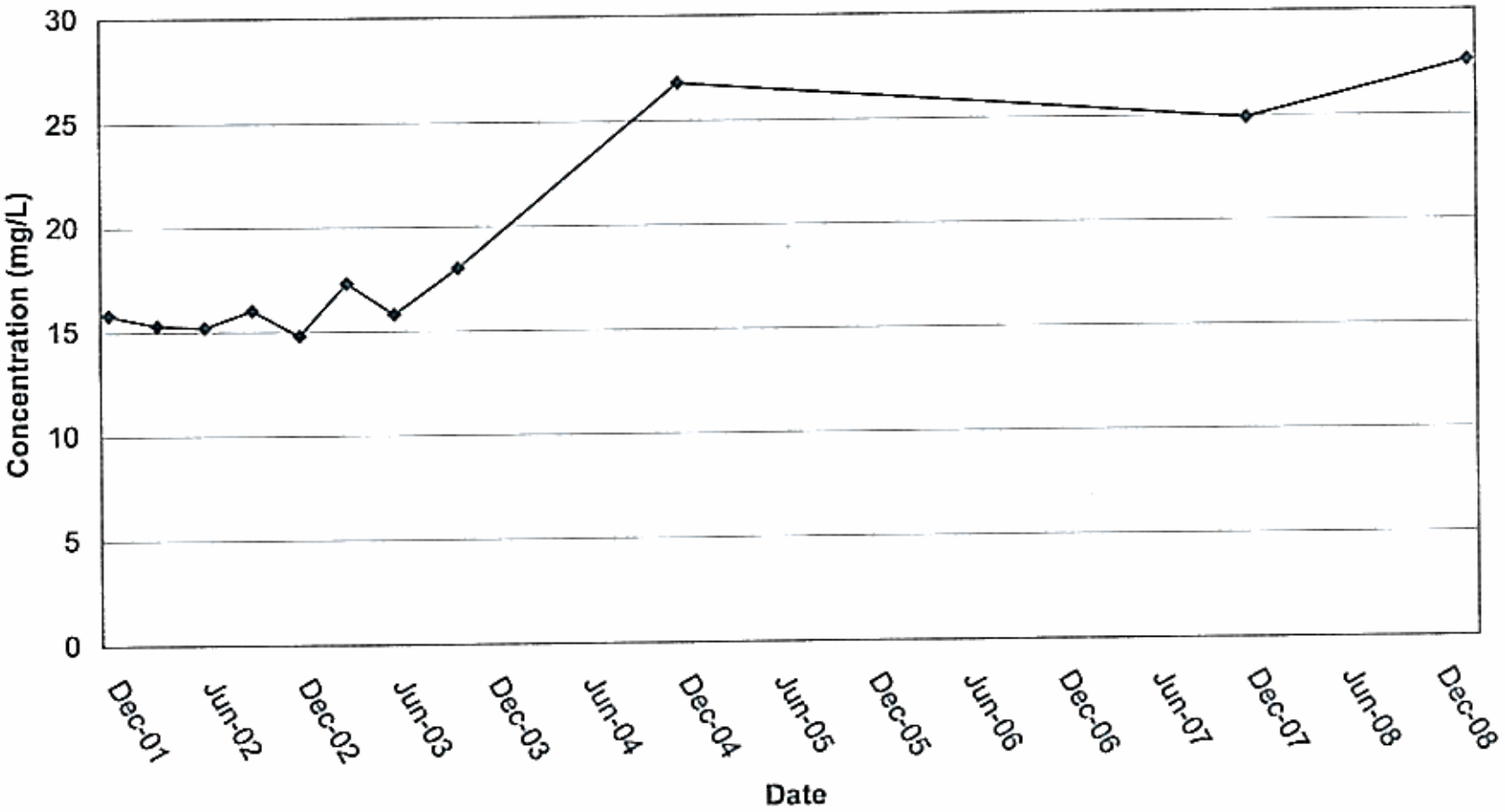
Methane Concentrations in MW-06
Hattiesburg, MS



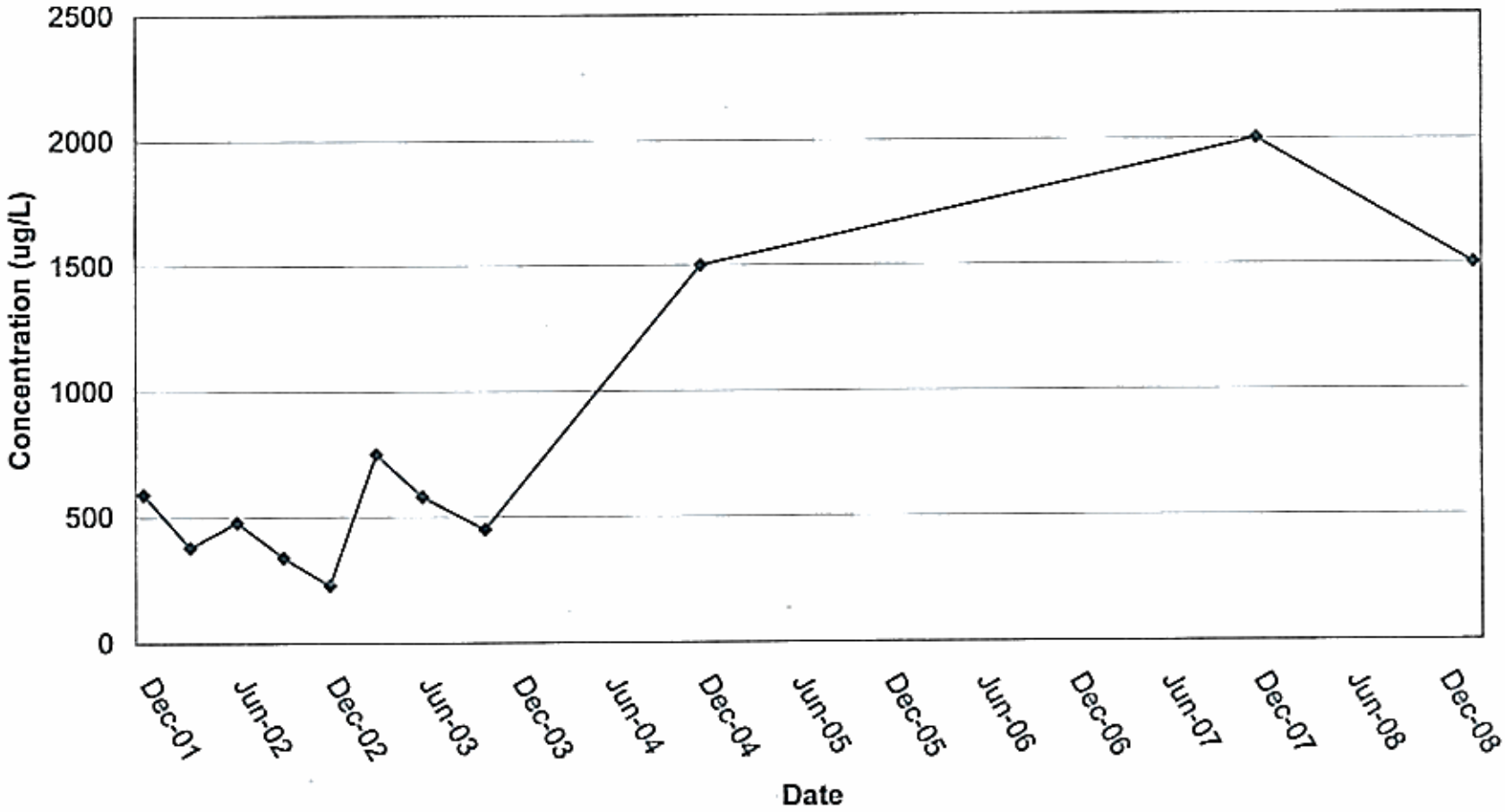
Sulfate Concentrations in MW-06
Hattiesburg, MS



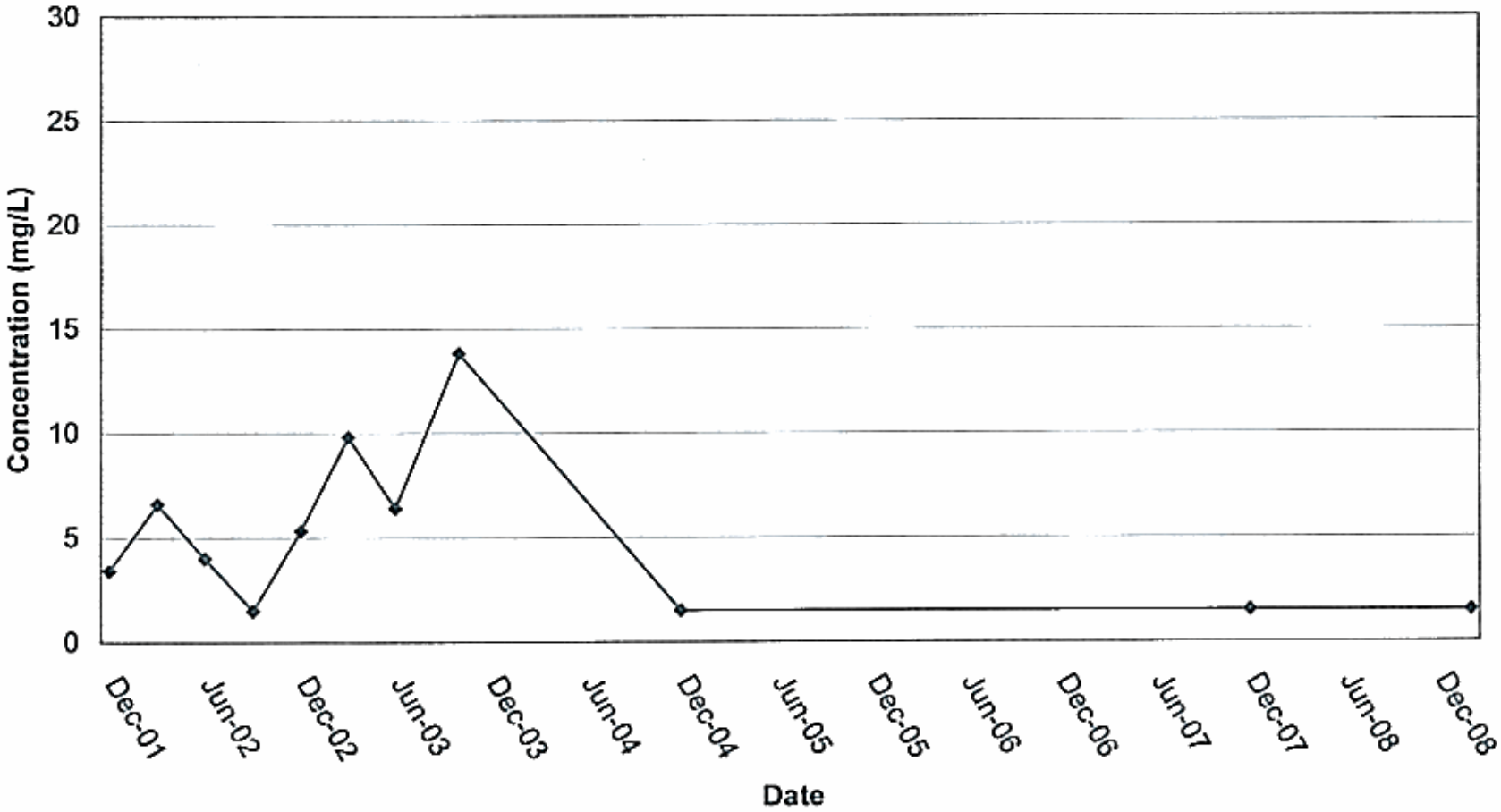
Total Iron Concentrations in MW-09R
Hattiesburg, MS



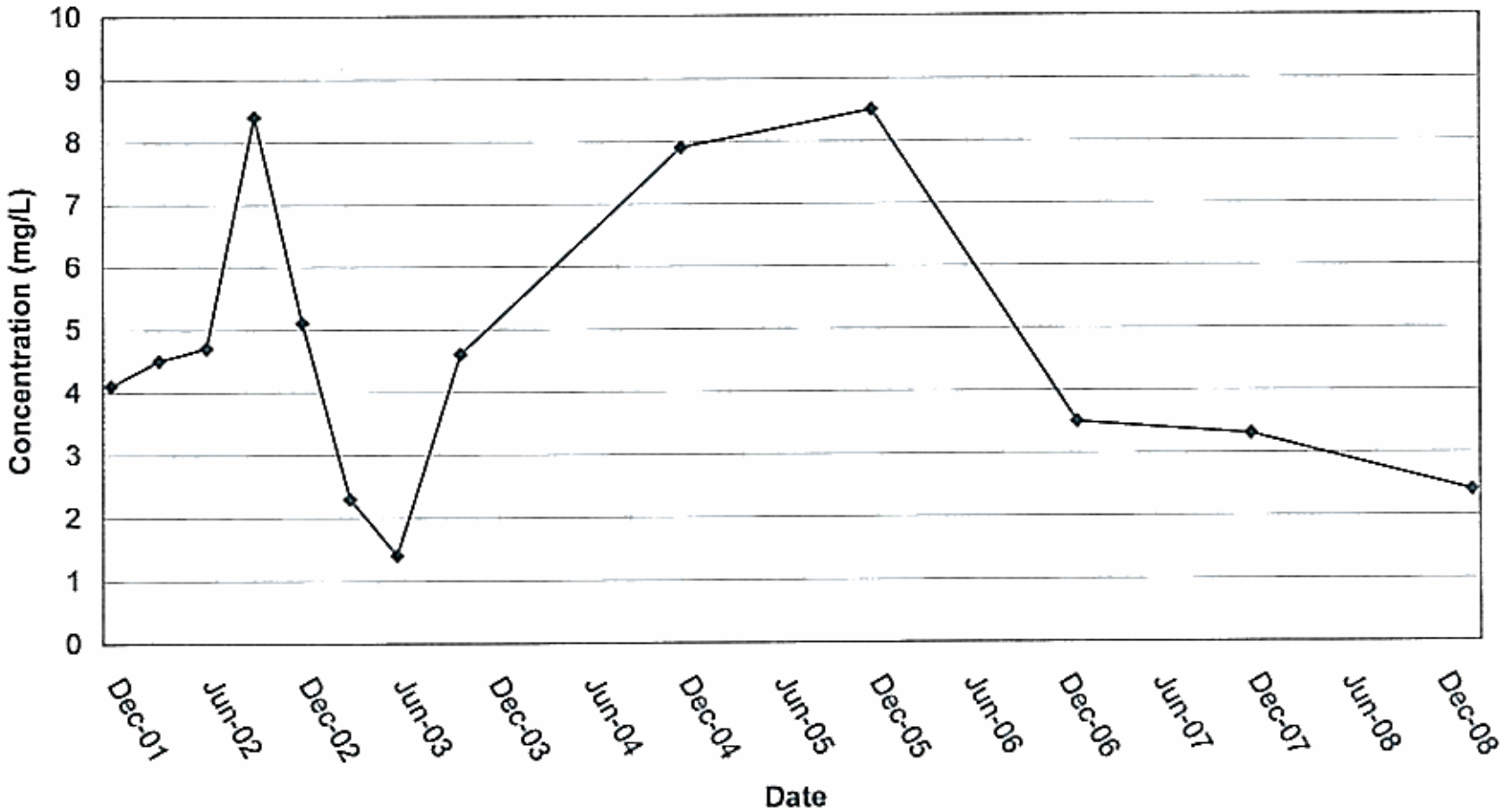
Methane Concentrations in MW-09R
Hattiesburg, MS



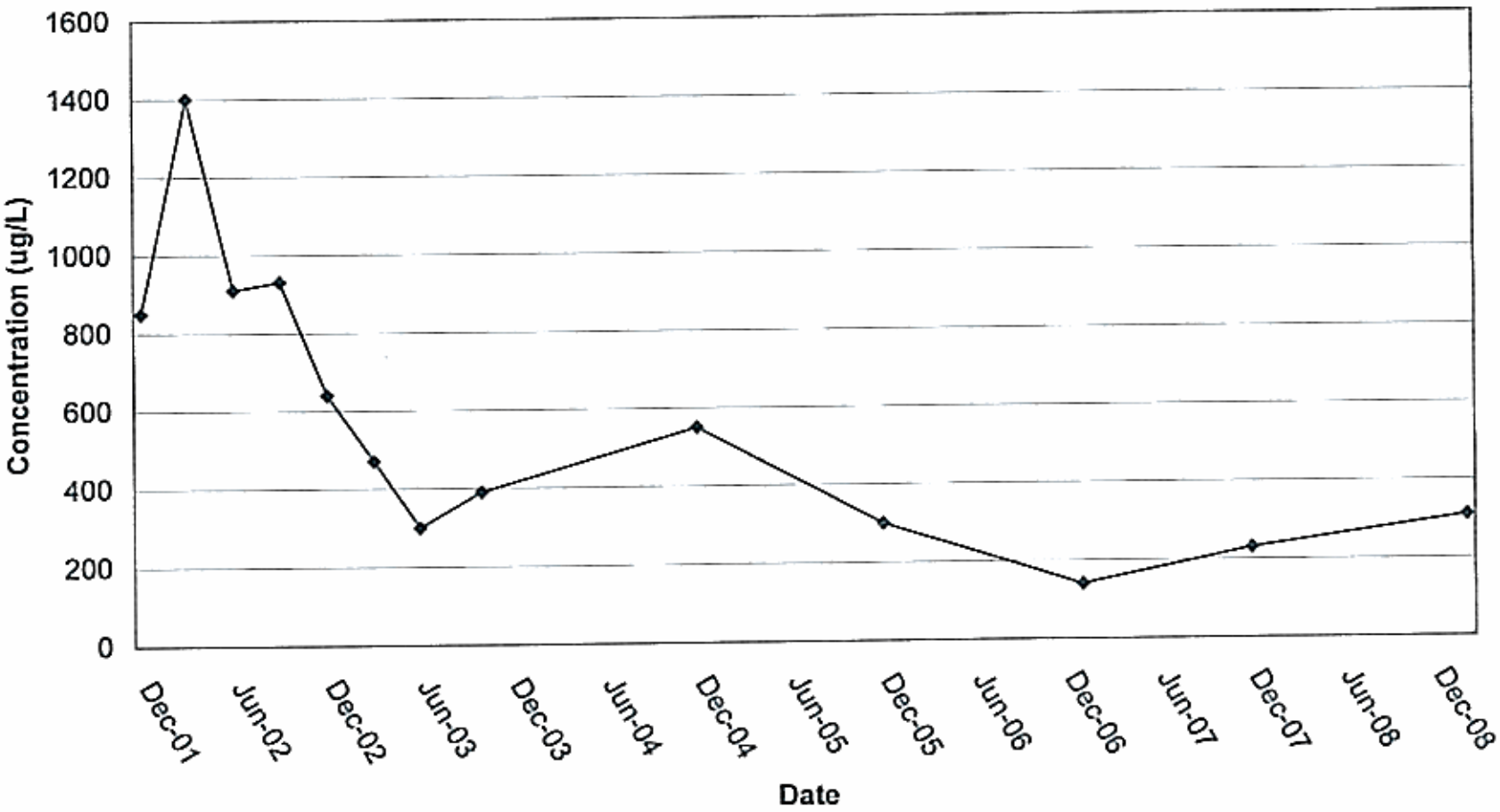
Sulfate Concentrations in MW-09R
Hattiesburg, MS



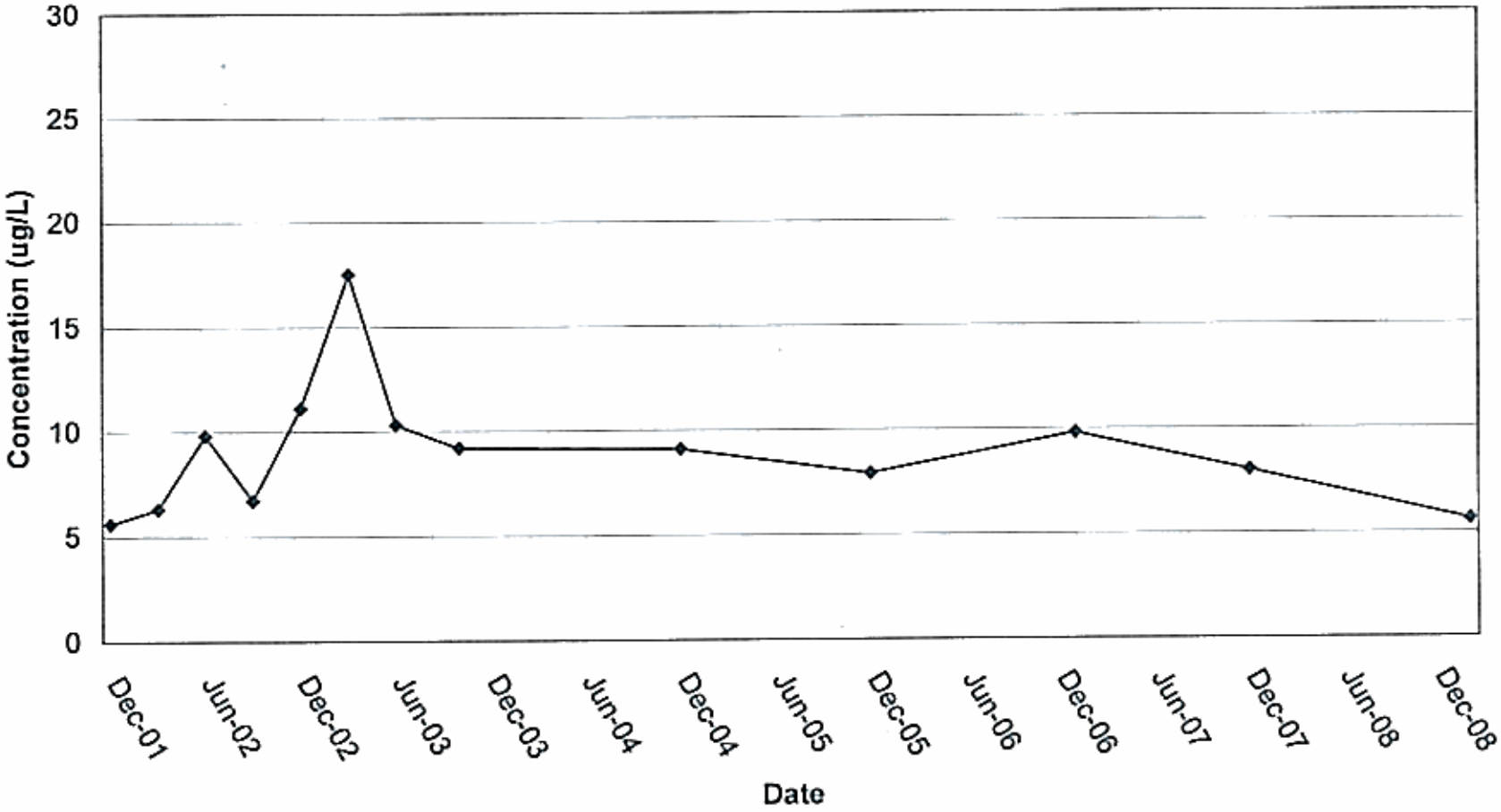
Total Iron Concentrations in MW-17
Hattiesburg, MS



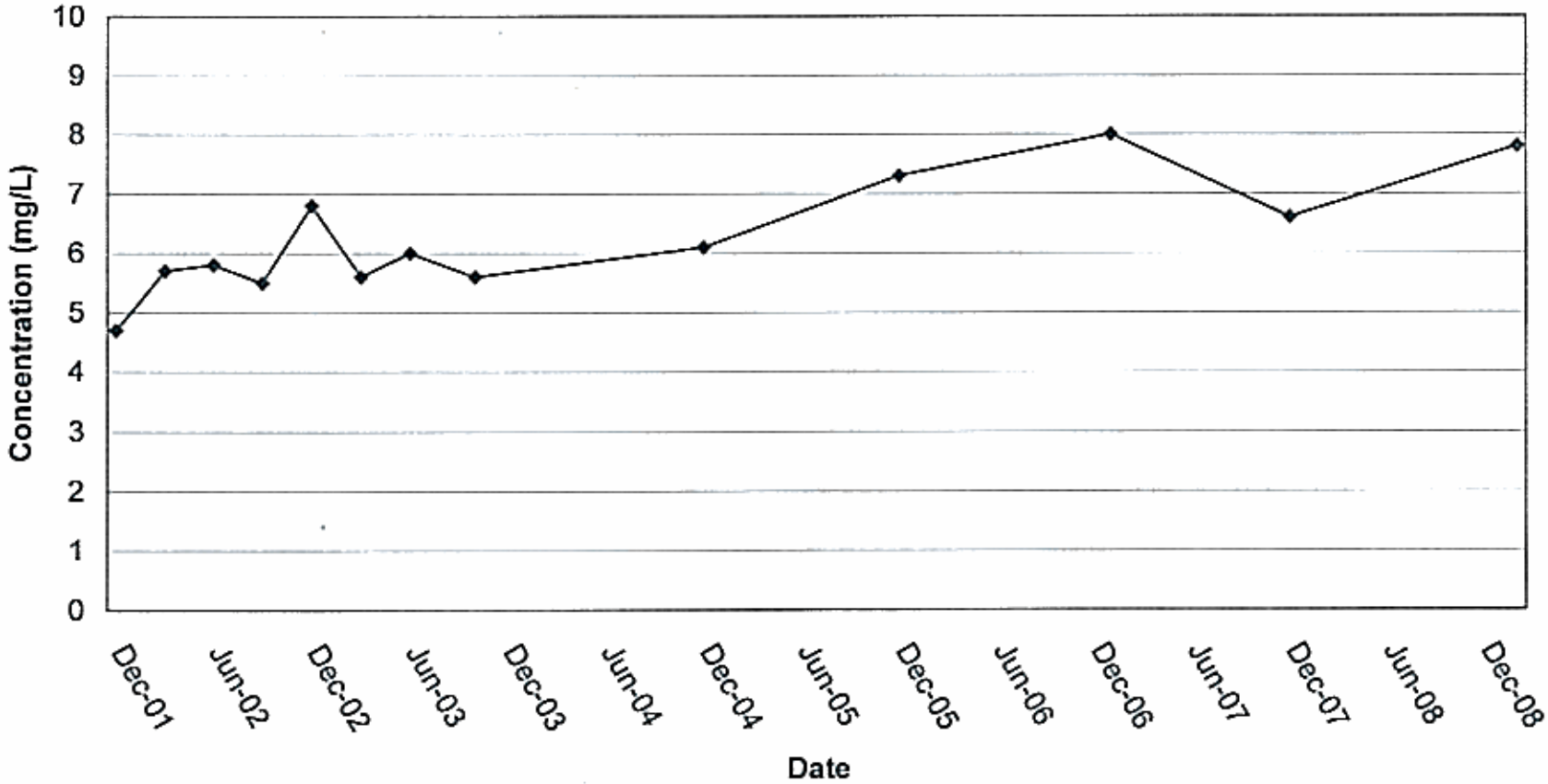
Methane Concentrations in MW-17
Hattiesburg, MS



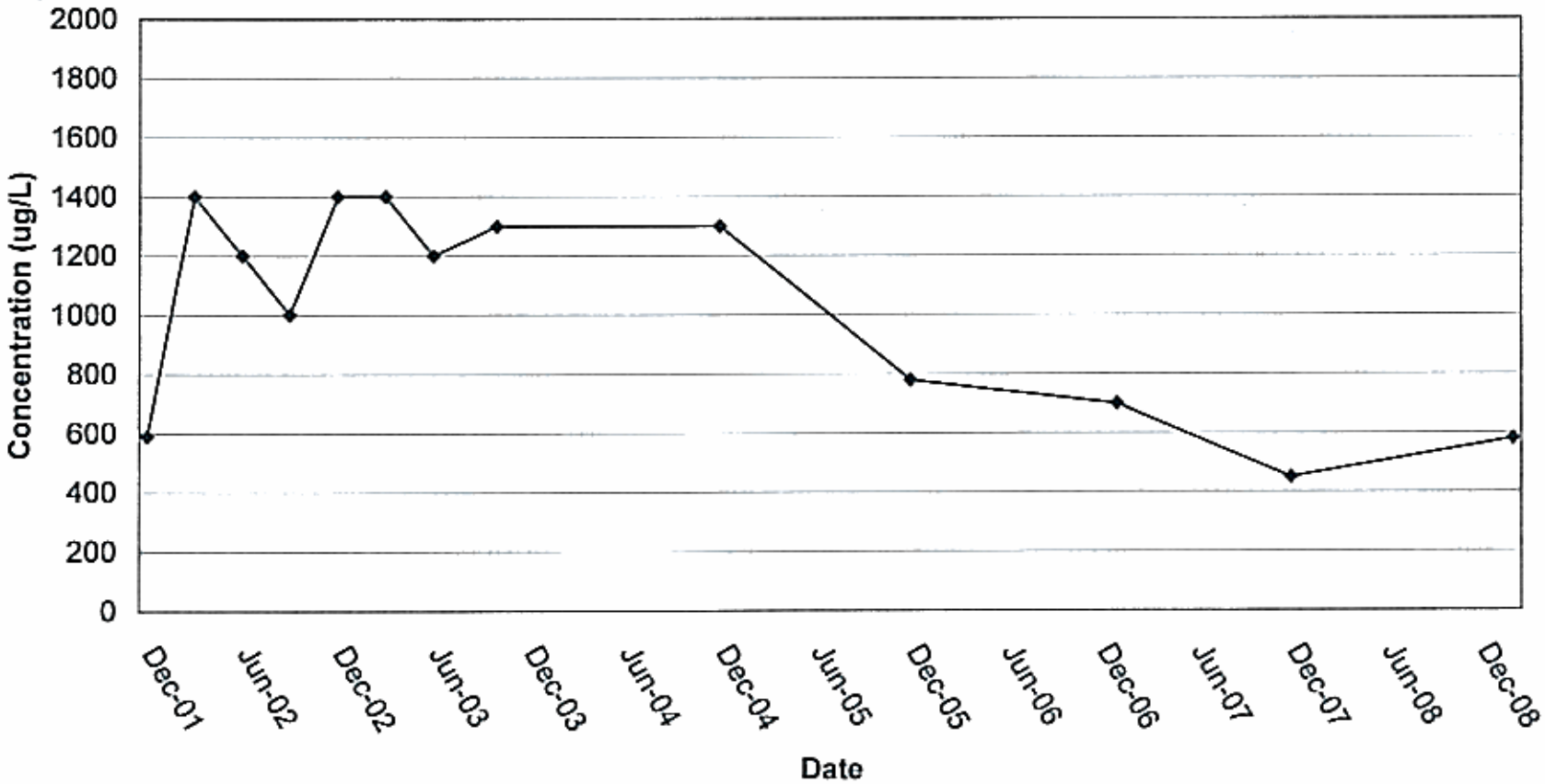
Sulfate Concentrations in MW-17
Hattiesburg, MS



Total Iron Concentrations in MW-19
Hattiesburg, MS



Methane Concentrations in MW-19
Hattiesburg, MS



Sulfate Concentrations in MW-19
Hattiesburg, MS