

**Environmental
Resources
Management**

CityCentre Four
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September 9, 2014

Mr. Rodney Bryant
Project Manager
Voluntary Cleanup Section
Texas Commission on Environmental Quality
Mail Code 221
12118 North IH 35, Building D
Austin, Texas 78753

Project No. 0260324



Subject: First Quarter 2014 Monitoring Data Transmittal
Former Cameron Iron Works Facility, Houston, Texas
VCP No. 221; RN101474880; CN600374821

Dear Mr. Bryant:

On behalf of Cameron International Corporation (Cameron), Environmental Resources Management (ERM) is providing the First Quarter 2014 ground water monitoring results for the Former Cameron Iron Works Facility (the facility) for your review and consideration. This quarterly ground water sampling event was completed in January 2014 in accordance with the Texas Commission on Environmental Quality's (TCEQ) letter dated October 14, 2013.

All ground water analytical results collected during this sampling event were compared with the response action objectives outlined in the Response Action Plan (RAP), dated August 28, 2003. Table 1 lists the wells which require a response action and the proposed action for each well. The ground water analytical results are summarized in Table 2. Figure 1 posts the analytical data on the site map. A concentration versus time graph for each monitor well is also included in Attachment 2.

The laboratory reports and data usability summaries will be provided in the 2014 Annual Ground Water Monitoring Report and Field Activities Summary.

Evaluation of Plume Movement

An evaluation of the data and information collected on the Texas Department of Transportation's (TxDOT) I-610/I-10 Interchange dewatering system continues to confirm that this discharge is the cause of the on-site and off-site plume movement toward the east as observed to date. This information was presented to the TCEQ in a February 2013 meeting in Austin and in Cameron's April 16, 2013 submittal entitled *Former Cameron Iron Works – TxDOT Dewatering System Evaluation and Response*. The discussions and information presented in that report focused on the changes in ground water flow conditions induced by the I-610/I-10 Inter-change dewatering system. In accordance with the TCEQ's June 25, 2013 letter, Cameron submitted an addendum to the 2003 RAP on March 12, 2014 to address the plume movement induced by TxDOT's dewatering system.

The following discussion provides details on the recent ground water monitoring results and the remedy component/components addressing the ground water in the vicinity.

Concentration Trends and Response Action Plan Activities

Ground water samples from the 10 trigger wells listed in the TCEQ's October 14, 2013 letter were collected on January 29 and 30, 2014. The results of the First Quarter 2014 sampling event have been grouped into one of three categories:

- No elevated concentrations of Constituents of Concern (COCs);
- Concentrations of COCs that are decreasing or stable but above PCLs; and
- Monitor wells in which the concentrations of COCs are exhibiting increasing concentration trends above their PCLs.

No elevated concentrations of COCs.

No elevated concentrations of COCs were reported at MW-134 and MW-145.

Concentrations of COCs decreasing or stable but above PCLs

Eight monitor wells exhibit elevated, but decreasing or stable concentrations:

- MW-74, MW-146 and MW-147 - The COC concentrations are trending downward or have remained stable above the PCLs at MW-74 since March 2012. The concentrations of 1,1-DCE at MW-146 and MW-147 have remained generally stable at the same magnitude above the PCL.
- MW-84 and MW-174 - The concentration of 1,1-DCE was reported at 0.015 mg/L and 0.013 mg/L, respectively - slightly above the 1,1-DCE PCL of 0.007 mg/L. The concentrations of COCs have decreased over 90% from the reported maximums following oxidant treatments in July 2011 and March 2012.

- MW-169 - The reported concentrations of 1,1-DCE have displayed generally stable trends above its PCL since February 2013. The monitor well lies within the capture zone of the treatment system on the Paraffine Partners Ltd. property which continues to address affected ground water in the area.

The monitor wells listed above are located along the eastern boundary of the ground water plume that is being influenced by the dewatering system.

Attenuation of COCs through natural processes continues to address the PCL exceedences in the western plume. Monitoring wells in this area include:

- MW-122 - The concentration of TCE has fluctuated above and below the PCL since 2011 and was slightly above the PCL in January 2014. Concentrations of 1,1-DCA, 1,1-DCE and cis-1,2-DCE were reported above the SQL but below the PCLs.
- MW-125 - The concentrations of PCE have remained generally stable and slightly above the PCL since 2009.

Concentrations of COCs exhibiting increasing concentration trends above the PCLs

No monitor wells exhibited increasing COC concentration trends above the PCLs. Such trends were previously present in MW-146, MW-147 and MW-169; however, the concentrations of COCs above the PCLs at these locations have stabilized over recent sampling events.

Table 1 lists the monitor wells scheduled for the August 2014 quarterly sampling event.

Conclusions

Ground water concentrations were monitored at select wells in the first quarter of 2014 in accordance with the TCEQ's October 14, 2013 letter to document the potential for plume movement and assess the effectiveness of the remedy. The dewatering system at the I-610/I-10 Interchange is continuing to influence concentration trends in both on- and off-site areas. In accordance with the TCEQ's June 25, 2013 letter, Cameron submitted an addendum to the 2003 RAP on March 12, 2014 to address the plume movement induced by TxDOT's dewatering system. The TCEQ has responded to the addendum in their July 22, 2014 letter and the comments are currently under consideration.

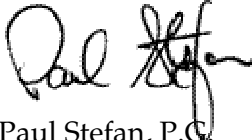
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**Environmental
Resources
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Please contact Mr. Ted Fasting of Cameron International Corporation at (713) 513-3325 or me at (281) 600-1000 with any questions or comments.

Sincerely,

Environmental Resources Management

A handwritten signature in black ink that reads "Paul Stefan". The signature is written in a cursive, flowing style.

Paul Stefan, P.C.
Principal Partner

PAS/hmh
Attachments

cc: Jason Ybarra, Texas Commission on Environmental Quality, Region XII, Houston
Ted Fasting, Cameron International Corporation
Bruce Himmelreich, Cameron International Corporation (without attachments)
President, Stablewood Property Owners Association
Robin Morse, Crain, Caton, and James, P.C.
Larry Nettles, Vinson & Elkins

Tables
Attachment 1

September 9, 2014
Project No. 0260324

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000

TABLE 1

Summary of Response Action Plan Implementation
First Quarter 2014 Monitoring Data Transmittal

Former Cameron Iron Works Facility
Houston, Texas

Well ⁽¹⁾	COCs elevated above MQL	COCs elevated above PCL	Need for Additional Notification (Yes or No)	In-situ Treatment (Yes or No)	Sampling Frequency
MW-74	1,1-dichloroethane		no (a)	no	Quarterly
MW-74	1,1-dichloroethene	1,1-dichloroethene	no (a)	no	Quarterly
MW-74	cis-1,2-dichloroethene		no (a)	no	Quarterly
MW-74	vinyl chloride	vinyl chloride	no (a)	no	Quarterly
MW-84	1,1-dichloroethane		no (a)	yes (c)	Quarterly
MW-84	1,1-dichloroethene	1,1-dichloroethene	no (a)	yes (c)	Quarterly
MW-122	1,1-dichloroethane		no (a)	no	Quarterly
MW-122	1,1-dichloroethene		no (a)	no	Quarterly
MW-122	cis-1,2-dichloroethene		no (a)	no	Quarterly
MW-122	Trichloroethene	Trichloroethene	no (a)	no	Quarterly
MW-125	Tetrachloroethene	Tetrachloroethene	no (a)	yes (c)	Quarterly
MW-134			no (a)	no	Quarterly
MW-145	1,1-dichloroethane		no (a)	yes (c)	Quarterly
MW-145	1,1-dichloroethene		no (a)	yes (c)	Quarterly
MW-145	cis-1,2-dichloroethene		no (a)	yes (c)	Quarterly
MW-145	vinyl chloride		no (a)	yes (c)	Quarterly
MW-146	1,1-dichloroethane		no (a)	yes (c)	Quarterly
MW-146	1,1-dichloroethene	1,1-dichloroethene	no (a)	yes (c)	Quarterly
MW-146	cis-1,2-dichloroethene		no (a)	yes (c)	Quarterly
MW-146	vinyl chloride		no (a)	yes (c)	Quarterly
MW-147	1,1-dichloroethane		no (a)	yes (c)	Quarterly
MW-147	1,1-dichloroethene	1,1-dichloroethene	no (a)	yes (c)	Quarterly
MW-169	1,1-dichloroethane		no (b)	no	Quarterly
MW-169	1,1-dichloroethene	1,1-dichloroethene	no (b)	no	Quarterly
MW-174	1,1-dichloroethane		no (a)	yes (c)	Quarterly
MW-174	1,1-dichloroethene	1,1-dichloroethene	no (a)	yes (c)	Quarterly

NOTES:

COCs = Chemicals of Concern

MQL = Method Quantitation Limit

PCL = Protective Concentration Level

⁽¹⁾ - Quarterly trigger well list as provided in TCEQ letter dated October 14, 2013.

(a) Properties in the vicinity of the affected ground water have been previously notified.

(b) MW-169 lies within the capture zone EW-1 of the Paraffine Partners Ltd. Remediation System.

(c) Injection wells located in this area were injected with sodium permanganate in March 2012. This area is being gauged periodically for the presence of permanganate. Additional permanganate will be injected as needed to reduce concentration levels to the PCL.

(d) Not Sampled due to the presence of permanganate in ground water during low flow purging.

TABLE 2

Summary of Ground Water Data for Trigger Wells
First Quarter 2014 Monitoring Data Transmittal

Former Cameron Iron Works Facility
Houston, Texas

Constituent	MQL	Critical PCLs (a)	Location:	MW-74	MW-84	MW-122	MW-125	MW-134
			Depth: (b)	29'	33'	29'	BAILED	26'
			Date:	1/30/2014	1/30/2014	1/29/2014	1/30/2014	1/30/2014
1,1-Dichloroethane	0.0050	4.9		0.079	0.0048 J	0.00067 J	ND (0.00040)	ND (0.00040)
1,1-Dichloroethene	0.0050	0.0070		0.014	0.015	0.0058	ND (0.00050)	ND (0.00050)
1,2-Dichloroethane	0.0050	0.0050		ND (0.00050)	ND (0.00050)	ND (0.00050)	ND (0.00050)	ND (0.00050)
cis-1,2-Dichloroethene	0.0050	0.070		0.0018 J	ND (0.00060)	0.0025 J	ND (0.00060)	ND (0.00060)
Tetrachloroethene	0.0050	0.0050		ND (0.00060)	ND (0.00060)	ND (0.00060)	0.0064	ND (0.00060)
Trichloroethene	0.0050	0.0050		ND (0.00050)	ND (0.00050)	0.0095	ND (0.00050)	ND (0.00050)
Vinyl Chloride	0.0020	0.0020		0.0049	ND (0.00040)	ND (0.00040)	ND (0.00040)	ND (0.00040)

Constituent	MQL	Critical PCLs (a)	Location:	MW-145	MW-146	MW-147	MW-169	MW-174
			Depth: (b)	25'	30'	30'	35'	34'
			Date:	1/29/2014	1/29/2014	1/29/2014	1/29/2014	1/29/2014
1,1-Dichloroethane	0.0050	4.9		0.0070	0.022	0.0017 J	0.0073	0.049
1,1-Dichloroethene	0.0050	0.0070		0.0053	0.035	0.035	0.051	0.013
1,2-Dichloroethane	0.0050	0.0050		ND (0.00050)	ND (0.00050)	ND (0.00050)	ND (0.00050)	ND (0.00050)
cis-1,2-Dichloroethene	0.0050	0.070		0.00080 J	0.0035 J	ND (0.00060)	ND (0.00060)	ND (0.00060)
Tetrachloroethene	0.0050	0.0050		ND (0.00060)	ND (0.00060)	ND (0.00060)	ND (0.00060)	ND (0.00060)
Trichloroethene	0.0050	0.0050		ND (0.00050)	ND (0.00050)	ND (0.00050)	ND (0.00050)	ND (0.00050)
Vinyl Chloride	0.0020	0.0020		0.00062 J	0.0012 J	ND (0.00040)	ND (0.00040)	ND (0.00040)

NOTES:

The reported concentrations are in mg/L.

0.023 = exceedance of TCEQ Texas Risk Reduction Program (TRRP) Tier 1 Residential Class 2 Ground Water critical PCLs.

Bold values exceed the MQL.

ND (0.00050) = *Not Detected* at the Sample Detection Limit (SDL) given in parentheses.

MQL = Method Quantitation Limit.

(a) TCEQ Texas Risk Reduction Program (TRRP) Tier 1 Residential Class 2 Ground Water PCLs, Table 3, table for TRRP Rule dated April 2008.

(b) The sample depths are reported in feet below top of casing elevations.

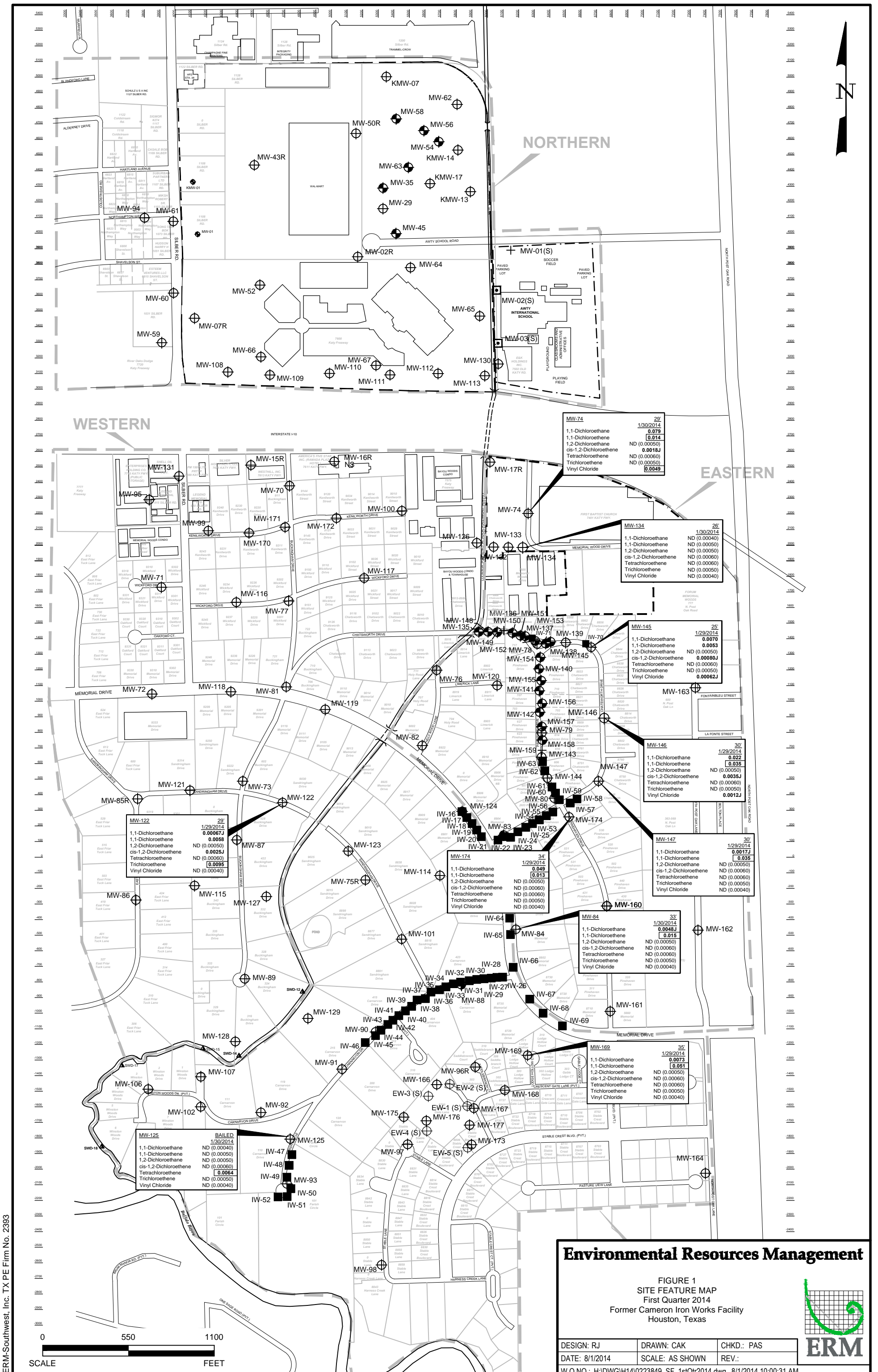
J = Estimated data, the reported sample concentration is approximated due to exceedance of QC requirements.

NS = Not Sampled due to the presence of permanganate during low flow purging.

Figures
Attachment 2

September 9, 2014
Project No. 0260324

Environmental Resources Management
CityCentre Four
840 West Sam Houston Parkway North, Suite 600
Houston, Texas 77024-3920
(281) 600-1000



ERM-Southwest, Inc. TX PE Firm No. 2393

Environmental Resources Management

FIGURE 1
SITE FEATURE MAP
 First Quarter 2014
 Former Cameron Iron Works Facility
 Houston, Texas

DESIGN: RJ	DRAWN: CAK	CHKD.: PAS
DATE: 8/1/2014	SCALE: AS SHOWN	REV.: .
W.O.NO.: H:\DWG\H140223849_SF_1stQtr2014.dwg, 8/1/2014 10:00:31 AM		

WESTERN

NORTHERN

EASTERN

MW-122
 29'
 1/29/2014
 0.00067J
 0.0058
 ND (0.00050)
 0.0025J
 ND (0.00060)
 ND (0.00050)
 ND (0.00040)

MW-74
 29'
 1/30/2014
 0.079
 0.014
 ND (0.00050)
 0.0018J
 ND (0.00060)
 ND (0.00050)
 ND (0.00040)

MW-134
 26'
 1/30/2014
 ND (0.00040)
 ND (0.00050)
 ND (0.00050)
 ND (0.00060)
 ND (0.00060)
 ND (0.00050)
 ND (0.00040)

MW-145
 25'
 1/29/2014
 0.0070
 0.0053
 ND (0.00050)
 0.00080J
 ND (0.00060)
 ND (0.00050)
 0.00062J

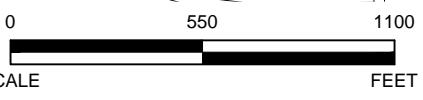
MW-146
 30'
 1/29/2014
 0.022
 0.035
 ND (0.00050)
 0.0035J
 ND (0.00060)
 ND (0.00050)
 ND (0.00040)

MW-174
 34'
 1/29/2014
 0.049
 0.073
 ND (0.00050)
 ND (0.00060)
 ND (0.00060)
 ND (0.00050)
 ND (0.00040)

MW-84
 33'
 1/30/2014
 0.0048J
 0.015
 ND (0.00050)
 ND (0.00060)
 ND (0.00060)
 ND (0.00050)
 ND (0.00040)

MW-125
 BAILED
 1/30/2014
 ND (0.00040)
 ND (0.00050)
 ND (0.00050)
 ND (0.00060)
 0.0064
 ND (0.00050)
 ND (0.00040)

MW-169
 35'
 1/29/2014
 0.0073
 0.051
 ND (0.00050)
 ND (0.00060)
 ND (0.00050)
 ND (0.00050)
 ND (0.00040)

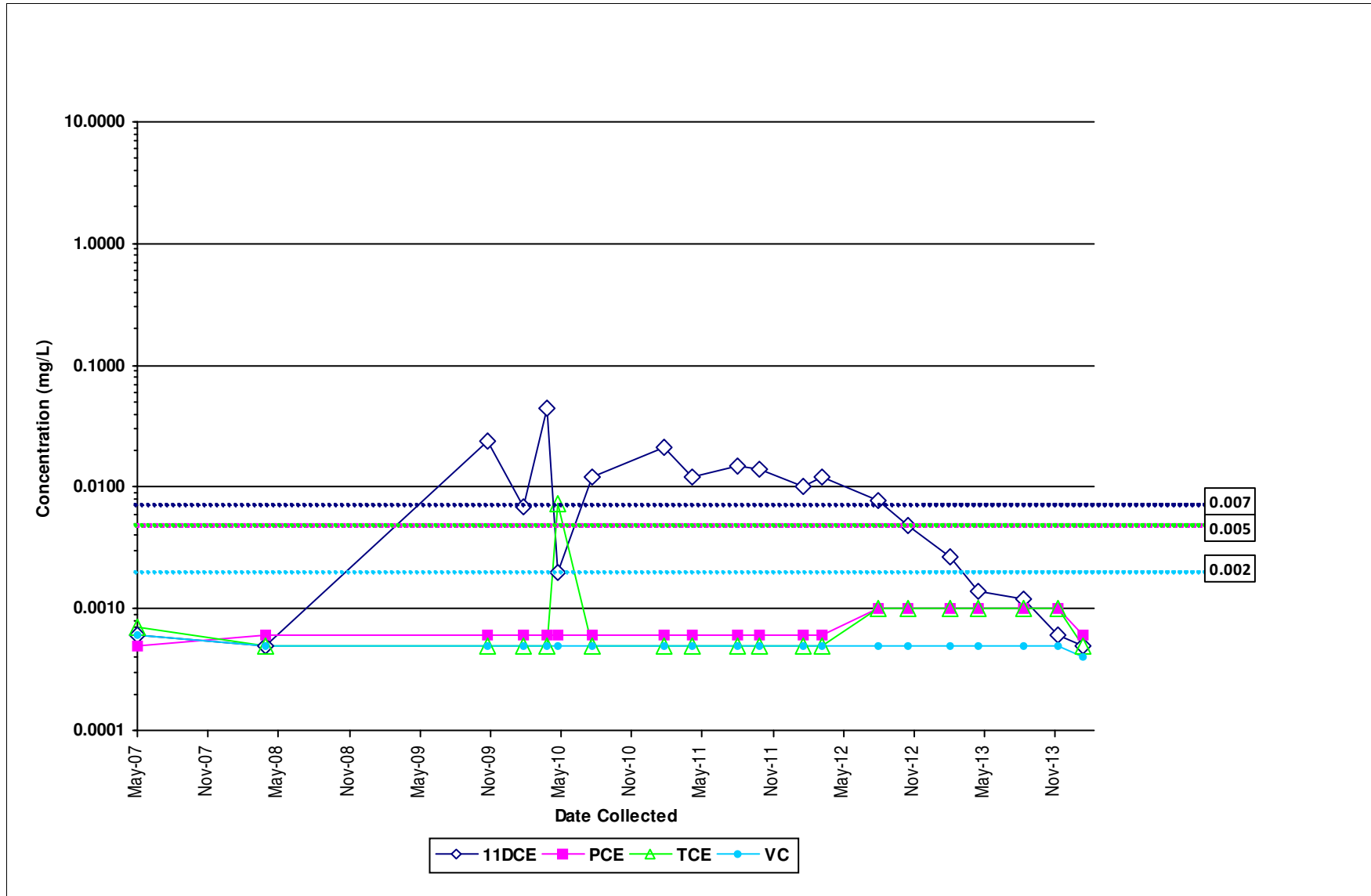


Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: EASTERN

Client Sample ID: MW-134

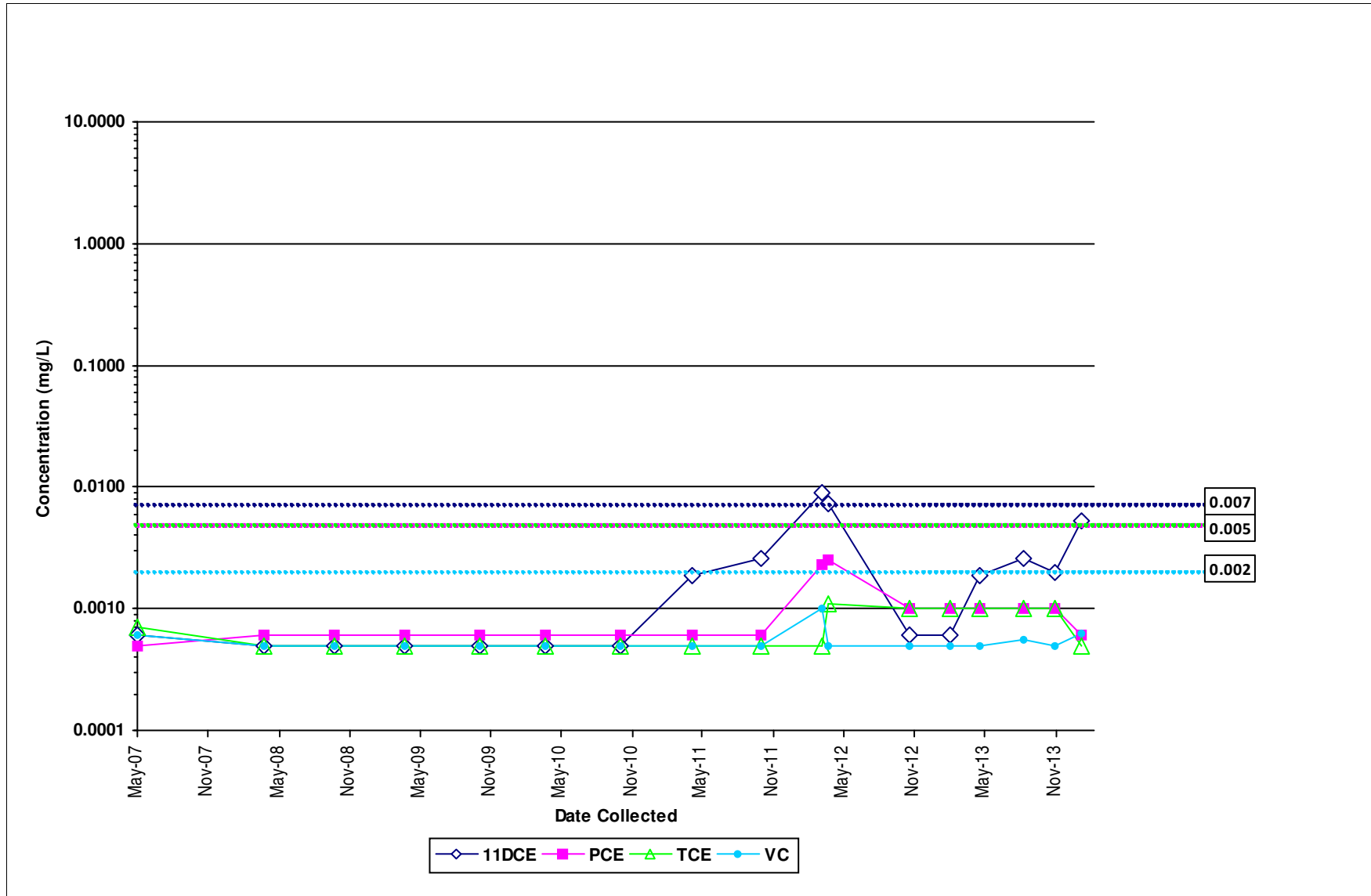


Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: EASTERN

Client Sample ID: MW-145

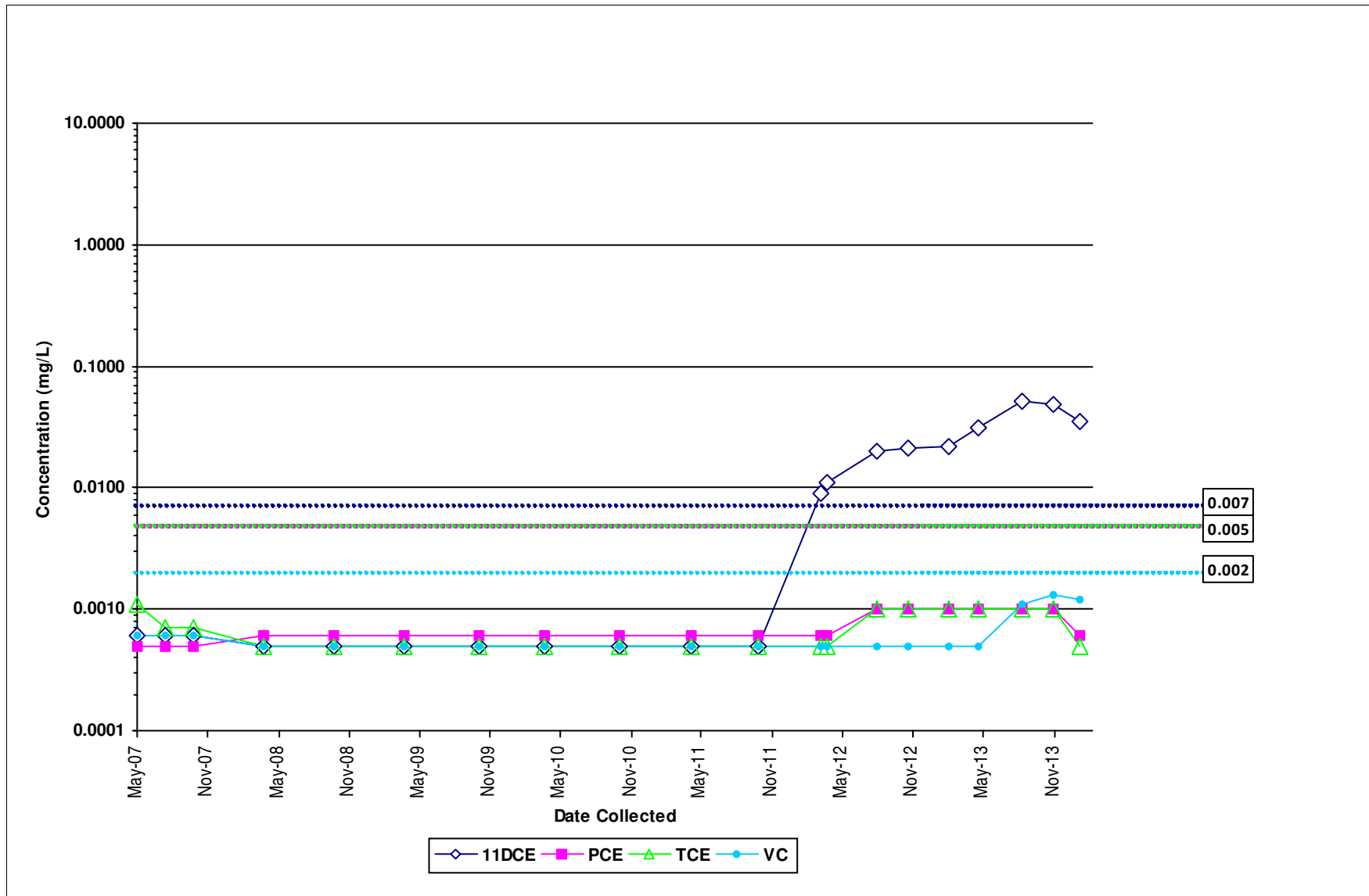


Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: EASTERN

Client Sample ID: MW-146

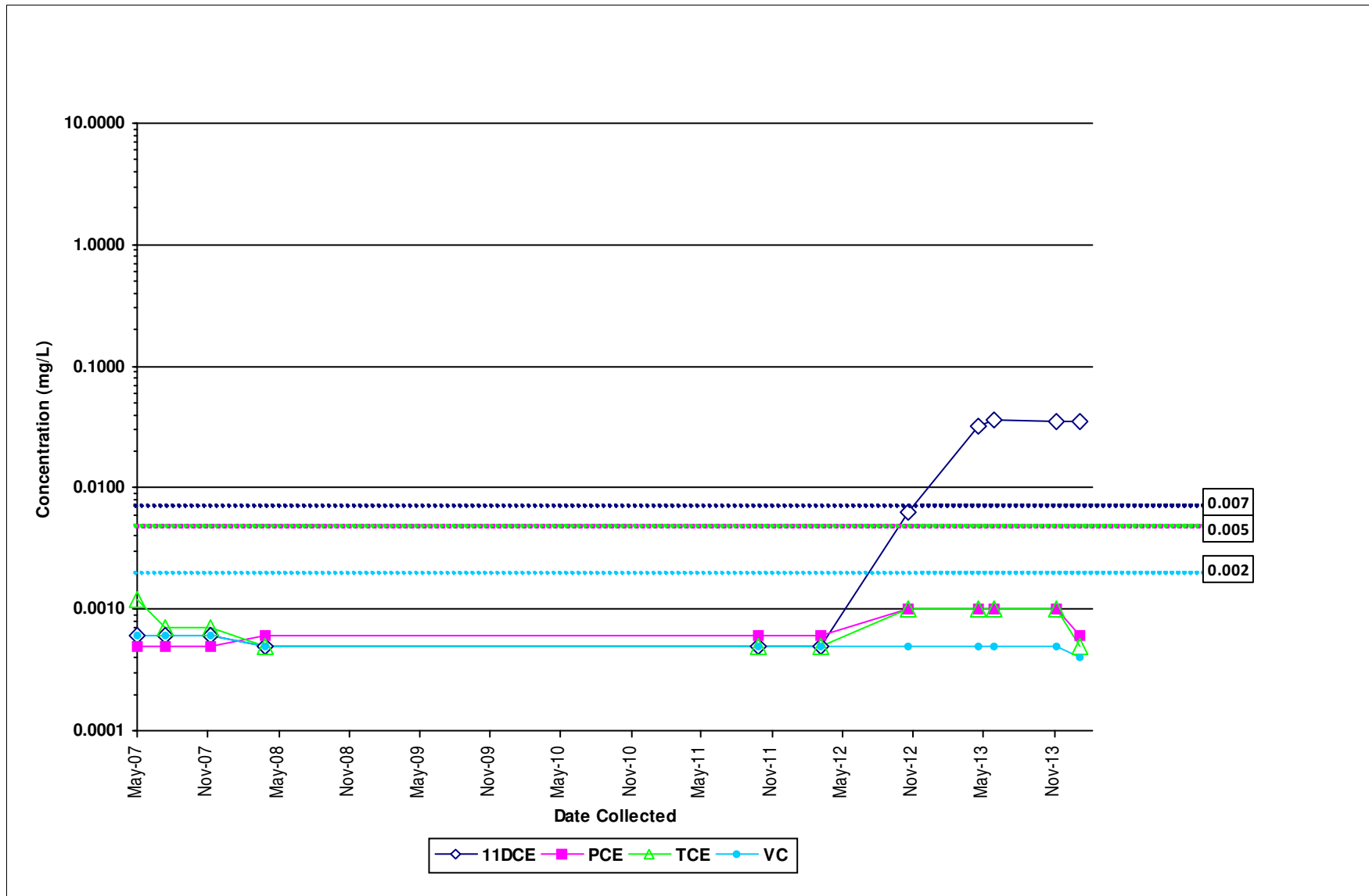


Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: EASTERN

Client Sample ID: MW-147

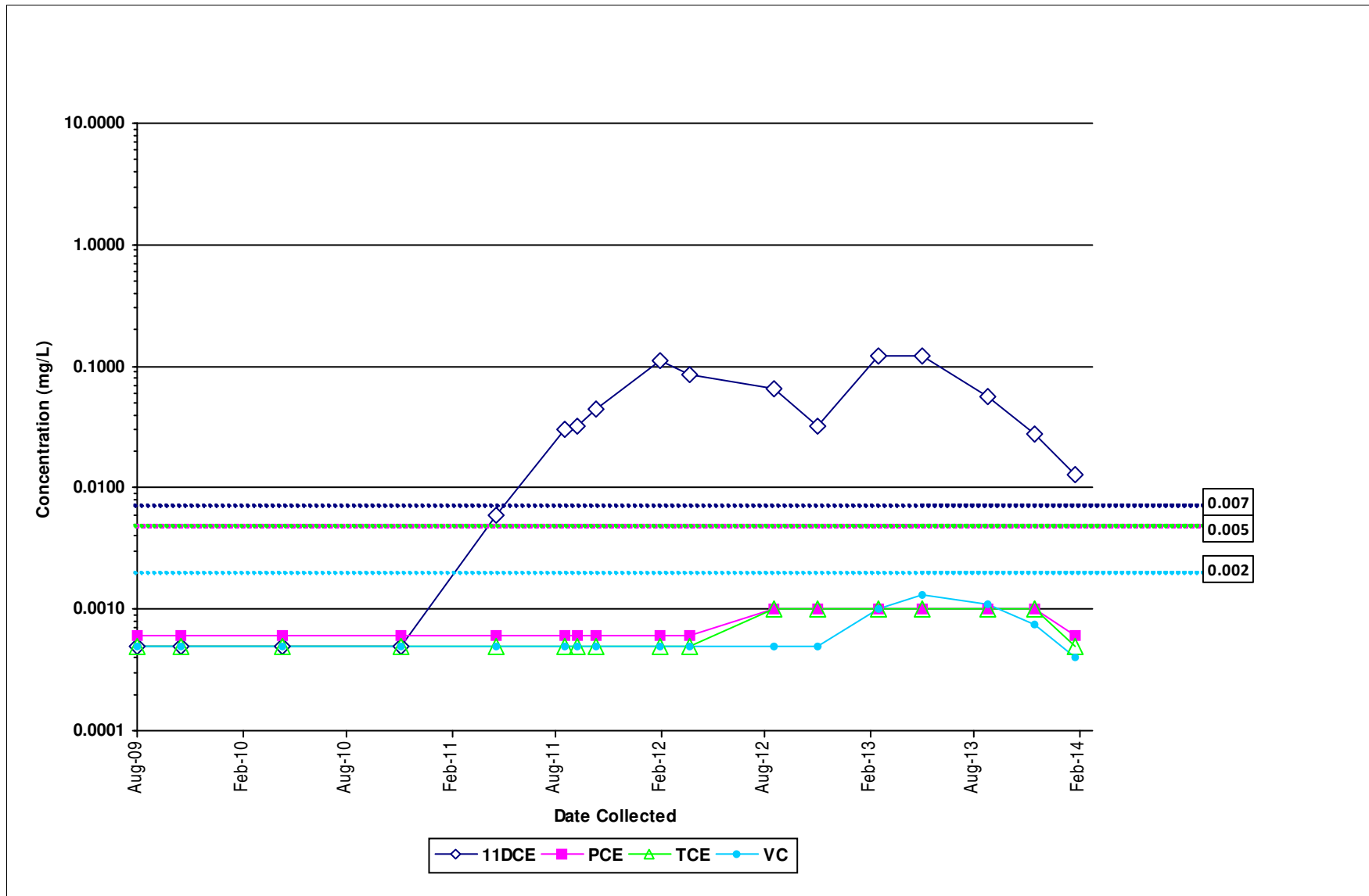


Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: EASTERN

Client Sample ID: MW-174

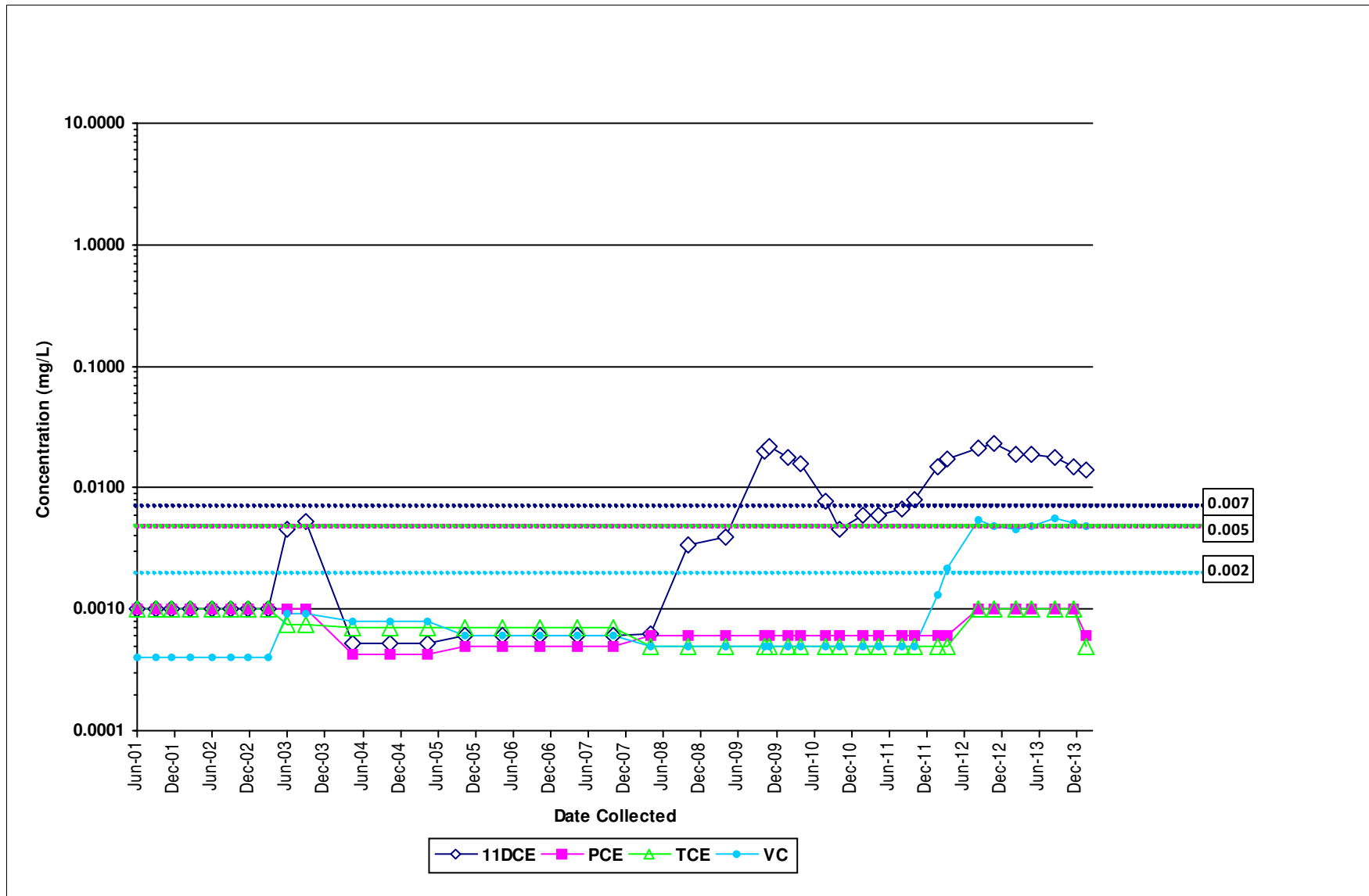


Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: EASTERN

Client Sample ID: MW-74

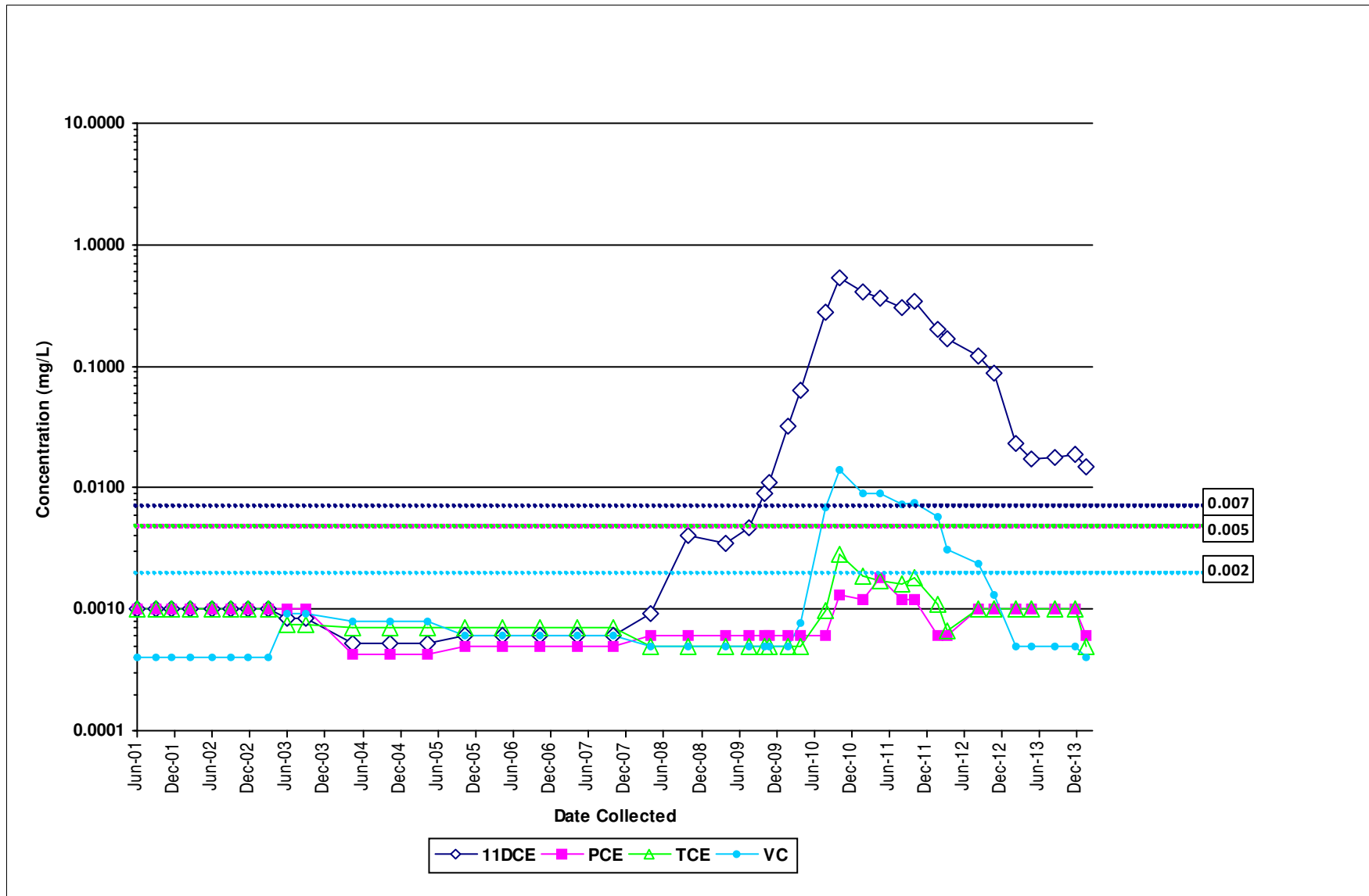


Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: EASTERN

Client Sample ID: MW-84

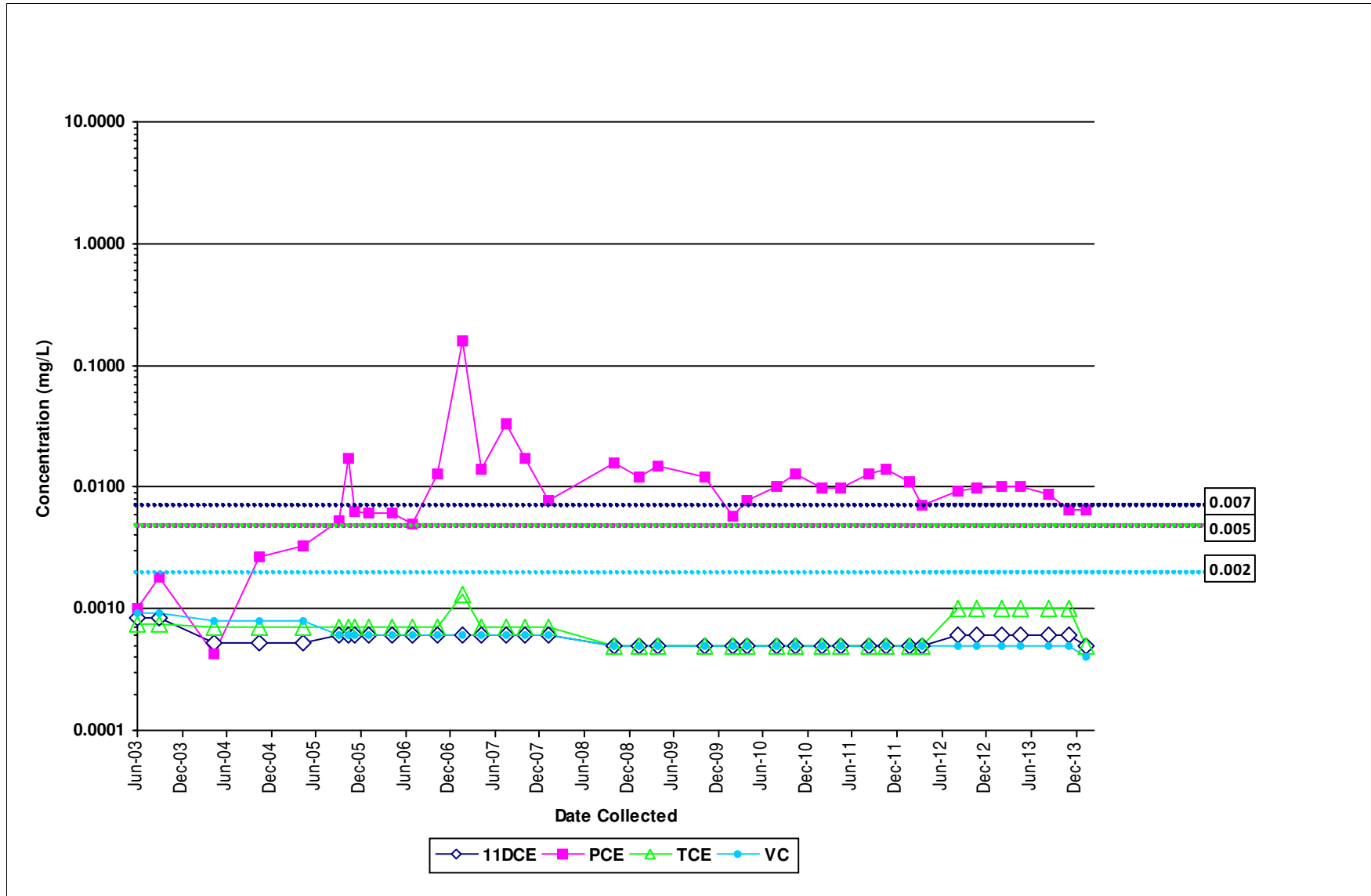


Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: SOUTHERN

Client Sample ID: MW-125

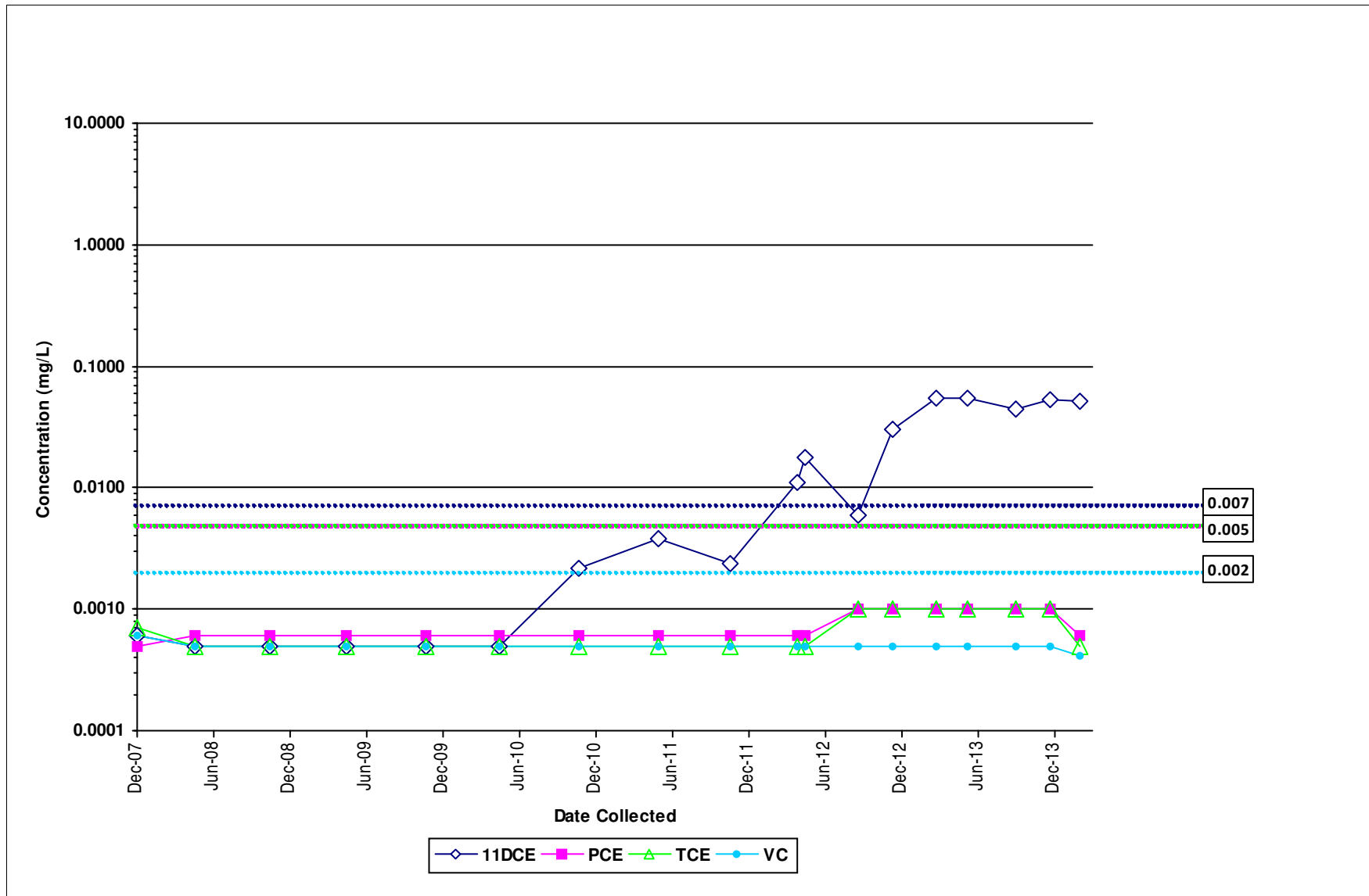


Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: SOUTHERN

Client Sample ID: MW-169



Ground Water Progress Graph

Former Cameron Iron Works Facility
Houston, Texas

Plume Area: WESTERN

Client Sample ID: MW-122

