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July 18, 2012

Mr. Andrew Fan
Project Manager
Technical Support Branch (3LC20)
Land and Chemicals Division
United States Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

RE: Transmittal of Semi-Annual Progress Report: January 2012 through June 2012
Former Chevron Facility 122208
5801 Riggs Road, Chillum, Maryland

Dear Mr. Fan:

Pursuant to Section VI, Paragraph E of the Administrative Order (U.S. Environmental Protection Agency [EPA] Docket Number RCRA-03-2008-0355TH), Chevron is submitting one copy of the referenced document for your review.

All data from the January 2012/June 2012 semi-annual sampling event are provided, including trend analysis figures, groundwater potentiometric surface maps, and groundwater concentration contour maps. In addition, a summary of the remedy construction is also provided.

If you have any questions, please feel free to contact me at 713-432-2142.

Sincerely,

Robert Speer, P.E.
Project Manager

cc: Ms. V. North, DDOE
Mr. C. Ralston, MDE
R. Scrafford, GF

SEMI-ANNUAL PROGRESS REPORT

FORMER CHEVRON FACILITY NO. 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND
JANUARY 2012 THROUGH JUNE 2012

1.0 INTRODUCTION

Pursuant to the U.S. Environmental Protection Agency (EPA) Administrative Order, Docket Number RCRA-03-2008-0355TH (AO), Chevron U.S.A. Inc. (Chevron) is conducting work at, and adjacent to, the former Chevron Service Station (Facility No. 122208) located at 5801 Riggs Road, Chillum, Maryland (the site). In accordance with Section VI, Paragraph E, subsection 3(c) of the AO, Chevron has prepared this Semi-Annual Progress Report (Report) to describe actions taken by Chevron pursuant to the AO. The reporting period for this report is January through June 2012.

The remainder of the Report is divided into the following seven sections and five appendices:

- Section 2.0 - Work Conducted During the Reporting Period
- Section 3.0 - Summary of Findings
- Section 4.0 - Permit Compliance
- Section 5.0 - Summary of Deviations from Approved Plans, Problems Encountered, and Corrective Actions Taken
- Section 6.0 - Summary of Meetings with Public and Government
- Section 7.0 - Changes in Key Personnel During the Reporting Period
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- Appendix A - Dual-Phase Extraction System-Groundwater Extraction Data
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- Appendix B - Dual-Phase Extraction System-Soil Vapor Extraction Data
  - Figure: Process and Instrumentation Diagram
  - Table B-1: Soil Vapor Extraction System Data
  - Table B-2: Soil Vapor Extraction System Influent Analytical Results
  - Table B-3: Soil Vapor Extraction System Effluent Analytical Results
- Appendix C - Groundwater Monitoring Data
  - Table C-1: Groundwater Elevation Data
  - Table C-2: Groundwater Analytical Results
- Appendix D - Soil Vapor Sampling Data
  - Table D-1: Soil Vapor Monitoring Report
- Appendix E - Vapor Mitigation System Data
  - Table E-1 VMS Monitoring Data

2.0 WORK CONDUCTED DURING THE REPORTING PERIOD

This section provides a summary of work conducted at the site during the reporting period.

2.1 Site Monitoring Work Conducted

The EPA-approved Interim Monitoring Sampling Plan calls for monthly gauging of ten monitoring wells, semi-annual gauging of all monitoring wells, semi-annual sampling of 72 monitoring wells, and semi-annual sampling of the four soil vapor wells (Table 1). Monthly groundwater gauging was conducted on January 26, February 20, March 19, May 29, and June 5, 2012. The semi-annual groundwater sampling event (with groundwater gauging) was conducted on April 24, 2012. Semi-annual soil vapor sampling was conducted on March 3, 2012.

2.2 Interim Measures Conducted

Interim measures activities were conducted during the reporting period. These activities are listed below followed by a general description:

- Continued operation and maintenance of the Area A Dual Phase Extraction (DPE) System; and

- Continued operation and maintenance of the vapor mitigation systems at three residences.

Overview of the Area A Dual Phase Extraction System

The DPE system consists of total fluids extraction and treatment and soil vapor extraction and treatment. The process and instrumentation diagram (P&ID) for the system (Appendix A) provides specific system information, such as equipment models and sizes, piping sizes, controls, and other technical information.

Total Fluids Recovery and Treatment

Pneumatic total fluids (i.e., groundwater and Liquid Phase Hydrocarbons [LPH], if present) pumps are installed in 11 DPE wells (RW-1, RW-2, RW-3, RW-4, RW-5, MW-7, MW-17, MW-22R, GP-27R, GP-39R and PTW-B). Total fluids are pumped from wells through buried piping to the total fluids manifold located in the treatment system compound, adjacent to the service station. The total fluids manifold leads to a coalescing-type oil/water separator. Level sensors in the oil/water separator control a centrifugal pump that intermittently transfers the water to an air stripper. LPH accumulate in the separator and are periodically skimmed off mechanically (if present). Effluent air from the air stripper is treated using two granular activated carbon (GAC) vessels in series and then discharged to the atmosphere in accordance with Maryland Department of the Environment (MDE) Air Quality General Permit to Construct for Groundwater Air Stripping Identification No. 033-9-1160. Treated water from the air stripper is pumped through two bag filters and then through two GAC vessels in series. The polished effluent flows through a buried pipe to a storm drain inlet located in Riggs Road near the intersection at Eastern Avenue, N.E. in accordance with MDE General Discharge Permit No. 2008 OGR-8514.

Soil Vapor Recovery and Treatment

Soil vapor extraction (SVE) is conducted at 12 wells (i.e., the 11 DPE wells plus MP-7). An individual piping leg runs from each well to a common 3-inch manifold in the remediation system compound. The manifold leads to a moisture knockout tank and then to the blower. The blower is a rotary lobe, positive displacement blower controlled by a variable frequency drive. Soil vapor is blown from the blower to a catalytic oxidizer for treatment. Treated air is discharged to the atmosphere in accordance with MDE Air Quality General Permit to Construct for Soil Vapor Extraction Equipment Identification No. 033-9-1164.

Area A DPE System Monitoring

The DPE System was visited every week during the reporting period. The following activities were conducted during each site visit:

- Recording groundwater and air flow rates;
- Measuring air influent and effluent concentrations using a flame ionization detector;
- Recording the manifold vacuum for the SVE system; and
- Conducting equipment maintenance tasks as needed, including checking the oil level of the SVE blower and air compressor, draining the air compressor, changing the bag filters, and skimming off LPH in the oil/water separator, if present.

The groundwater influent (SP-1) was sampled 6 times and the effluent (SP-3) was sampled 23 times for laboratory analysis during the reporting period (Appendix A). Effluent groundwater samples were analyzed by EPA Method 8260 for benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tert-butyl ether (MTBE), tetrachloroethene, trichloroethene, and 1,2-cis-dichloroethene. The permit limits are 100 µg/L for total BTEX and 5 µg/L for benzene. The discharge permit requires reporting of MTBE, tetrachloroethene, trichloroethene, and 1,2-cis-dichloroethene concentrations without establishing limits.

The air stripper effluent air was sampled five times during the reporting period (Appendix A). Air samples were collected before treatment (SP-50) and after treatment using the vapor carbon vessels (SP-52). The samples were analyzed for BTEX using EPA Method TO-15 and for total recoverable petroleum hydrocarbons (TRPH) in the C_4 to C_{10} range using Method TO-3. The air permit discharge limits are 20 pounds of volatile organic compounds per day and 0.02 pounds of benzene per hour.

The soil vapor extraction system operated continuously during the reporting period. The soil vapor extraction system influent (SP-100) and effluent (SP-200) both were sampled six times during the reporting period and submitted for laboratory analysis to document compliance with the air discharge permit (Appendix B). The treated effluent air sampling port (SP-200) is located in the catalytic oxidizer effluent stack before discharge to the atmosphere. Samples were analyzed for BTEX using EPA Method TO-15 and for TRPH in the C_4 to C_{10} range using Method TO-3. The air permit discharge limits are 20 pounds of volatile organic compounds per day and 0.02 pounds of benzene per hour.

Operations and Maintenance of Vapor Mitigation Systems (VMS)

The VMS at 5818 Eastern Avenue, 5824 Eastern Avenue, and 746 Oglethorpe Street were inspected once during the reporting period to ensure operation. All inspections were completed in conjunction with the annual VMS indoor air sampling event, which was conducted in April and May 2012. Each inspection included visual checking for damage to system components and measurement of static pressure, air flow, and differential pressures (i.e., inside home versus sub-slab versus outdoors). All systems were operating properly during the inspections.

A total of three annual VMS monitoring sampling events and related VMS inspections have been completed at 746 Oglethorpe Street and 5824 Eastern Avenue. There have been no exceedances of the EPA Indoor Air Standards with the system on or with the system off during three consecutive years of sampling at these residences. Therefore, Chevron has requested from EPA that operation and monitoring of the VMS at both 746 Oglethorpe Street and 5824 Eastern Avenue be discontinued. However, only two monitoring events were conducted at 5818 Eastern Avenue due to site access constraints, and Chevron is not requesting to discontinue operation at this residence at this time.

2.3 Corrective Measures Conducted

The following Corrective Measures activities were conducted during this period:

Area A (near the service station) Construction

- Replaced liquid level detector for angle well RW-5 vault sump;
- Started normal operation of angle well RW-5; and
- Cleaned and repaired broken tray in air stripper.

Area B (Oglethorpe Street Alley) Construction

- Completed trenching, excavation, piping installation, backfilling, and pavement restoration;
- Installed and wired electrical backboard for ISGR Wells ISGR-1 and ISGR-2;
- Completed installation of ISGR well internal components;
- Completed installation and development of monitoring wells MW-61B, MW-62A, and MW-62B;
- Developed ISGR wells ISGR-1 and ISGR-2, including their associated piezometer wells;
- Electrical wiring for ISGR wells ISGR-1 and ISGR-2 was completed and passed electrical inspection by the District of Columbia; and
- Both ISGR wells were run briefly for a troubleshooting session using generator power. Awaiting permanent tie in to D.C. power grid by Pepco.

Area C (Nicholson Street Alley) Construction

- Installed meter box on electrical backboard. Passed electrical inspection by the District of Columbia. Awaiting permanent tie in to D.C. power grid by Pepco;
- Installed and set oxygen diffusers for diffusion wells IW-1 through IW-5; and
- Installed sampling tubing for wells IW-1 through IW-5.

2.4 Submittal of Deliverables

Chevron submitted the following deliverables to EPA during the reporting period:

- Semi-Annual Progress Report for July 2011 through January 2012 on March 2, 2012; and

Annual Vapor Mitigation System Indoor Air Sampling Report – Year 3, 2012 on July 5, 2012.

3.0 SUMMARY OF FINDINGS

This section provides a summary of findings and results for **the** interim measures activities described in Section 2.2.

On-going Operation of the DPE System

The operating hours for both the total fluids and SVE portions of the DPE system were logged regularly during the reporting period by collecting measurements from the solenoid and hour meter, respectively. For the period of January 1, 2012 through June 30, 2012, the total fluids extraction portion of the system was operating 99.9 percent of the time (4,338.4hours on and 4.7 hours off). During the same time period, the SVE portion of the system was operating 78.9 percent of the time (3,427.6 hours on and 915.7 hours off).

Table A-1 in Appendix A contains groundwater extraction system performance data including date and time, on/off status, totalizer reading, cumulative gallons of hydrocarbons recovered, operating extraction points, maintenance information, reasons for system downtime, and types of maintenance performed during this reporting period and the previous period (July 1, 2011 through June 30, 2012). A detailed explanation of the tables is provided on the first page of Appendix A. A P&ID is also included in Appendix A.

The groundwater extraction portion of the DPE system pumped approximately 1,502,896 gallons of groundwater and recovered 18.9 equivalent gallons of dissolved hydrocarbons during the reporting period. The average system flow rate over the entire period was 5.9 gallons per minute (gpm). The total volume of groundwater pumped from this site since remediation began in 1989 is approximately 60,411,557 gallons.

The analytical results for groundwater samples collected at sample point SP-3 (treated groundwater that is discharged to the storm drain) (Table A-3 in Appendix A) indicated concentrations of benzene and BTEX in the treated groundwater were below the permit limits (5 µg/L benzene and 100 µg/L BTEX) during the reporting period.

The laboratory analytical results for monthly air stripper samples collected at sample points SP-50 (air stripper effluent) (Appendix A, Table A-4) and SP-52 (treated vapor that is discharged to the atmosphere) (Appendix A, Table A-5) indicated concentrations of benzene and TRPH in the treated vapor were well below the permit limits. The permit limits are 0.02 pounds per hour of benzene and 20 pounds per day of volatile organic compounds measured as TRPH.

Tables B-1, B-2, and B-3 in Appendix B contain the soil vapor extraction system performance data collected for the reporting period, including date and time, manifold air flow readings, manifold vacuum readings, influent and effluent screening concentrations measured using a flame ionization detector (FID), cumulative gallons of hydrocarbons recovered, and other information. A detailed explanation of the tables is provided on the first page of Appendix B. The P&ID is included in Appendix A.

The soil vapor extraction portion of the DPE system recovered 84.3 equivalent gallons of hydrocarbons in the vapor phase during the reporting period. The average air flow rate was 141 standard cubic feet per minute (scfm) when the system was on (excluding down time).

The laboratory analytical results for monthly SVE system samples collected at sample points SP-100 (soil vapor influent) (Appendix B, Table B-2) and SP-200 (treated soil vapor that is

discharged to the atmosphere) (Appendix B, Table B-3) indicated concentrations of benzene and TRPH in the treated soil vapor were well below the permit limits. The permit limits are 0.02 pounds per hour of benzene and 20 pounds per day of volatile organic compounds measured as TRPH.

Hydrocarbon Recovery Summary for Period and Cumulative Total for System

Period	Liquid-Phase Hydrocarbons (gallons)	Dissolved-Phase Hydrocarbons (eq. gallons)	Vapor-Phase Hydrocarbons (eq. gallons)	Cumulative Total Hydrocarbons (eq. gallons)
1/1/12 through 6/30/12	0.00	17.6	87.4	105.0
Cumulative Total for System	856.5	918.3	6,078.6	7,853.4

The volume of groundwater treated and the corresponding volume of hydrocarbons collected for the entire time the system has been operating on a quarter by quarter basis continued to be tracked (Figure 1).

Groundwater Monitoring

The fall 2011 semi-annual sampling event for the D.C. monitoring wells was completed in January 2012 due to delays in obtaining permit approval, and the spring 2012 semiannual groundwater sampling event was conducted in April/May 2012. The analytical results for groundwater sampling events for the past year provided in Appendix C, Tables C-1, and C-2, respectively. A detailed explanation of the table is provided on the first page of Appendix C.

Groundwater contour maps were created using data from the comprehensive gauging of all wells that was completed on April 19, 2012 (Figures 2 and 3). Groundwater concentration maps were created using analytical results from the January 2012 and April/May 2012 sampling events (Figures 4 through 7).

Passive Sampling Using the HydraSleeve™

The use of HydraSleeve passive samplers was approved by DDOE and EPA for use during the April/May 2012 semi-annual sampling event. Groundwater samples were collected from 11 wells (GP-24A, GP-30A, GP-35A, GP-41A, MW-6, MW-28A, MW-30R, MW-33A, MW-46, MW-49, and MW-60) using the HydraSleeve passive samplers.

Soil Vapor Monitoring

Soil vapor sampling was conducted twice during the reporting period: first in January 2012, and again in May 2012. Sampling was completed using Summa-type vacuum canisters and flow controllers provided by Air Toxics, Ltd. of Folsom, California. 1,1-Difluoroethane was used as a tracer compound during sampling as an indicator of sample train leakage. Additionally, a calibrated GEM-2000 landfill gas meter was used to measure concentrations of carbon dioxide, methane, and oxygen at each vapor well location immediately following soil vapor sample collection. The soil vapor analytical results for the current reporting period and the preceding year are provided in Table D-1 in Appendix D.

During the January 2012 sampling event, a soil vapor sample was collected from vapor well VW-01. In addition, an ambient air sample was collected in the vicinity of VW-04. No samples could be obtained from soil vapor wells VW-02, VW-03, and VW-04 due to the presence of water in the vapor sampling tubing. Hydrocarbons were not detected above laboratory reporting limits in the sample collected from VW-01. Additionally, measurements collected using the GEM-2000 landfill gas meter revealed the presence of depressed oxygen concentrations in soil vapor relative to ambient air (i.e., less than 21 per cent oxygen), which indicated that biodegradation was likely occurring in the vadose zone.

During the May 2012 sampling event, soil vapor samples were collected from vapor wells VW-01 and VW-02. The presence of water in the vapor sampling tubing of VW-03 and VW-04 prevented samples from being obtained at those locations. In addition, an ambient air sample was collected in the vicinity of VW-01. During the May 2012 event, toluene was detected in VW-01 and BTEX and MTBE were detected in VW-02. As in January, depressed oxygen concentrations were present in soil the vapor wells.

VMS Monitoring

The annual VMS indoor air sampling event was conducted at 5824 Eastern Avenue, 746 Oglethorpe Road, and 5818 Eastern Avenue during the reporting period. The VMS monitoring results for this reporting period and the preceding year are provided in Table E-1 in Appendix E. All cross-slab differential pressure readings were sufficiently negative at the residences, indicating that the systems were operating as designed.

4.0 PERMIT COMPLIANCE

Permits required for activities during this reporting period are described below.

Permits for Operation of the Area A DPE System

Permit numbers 033-9-1160 Air Quality General Permit for Groundwater Air Stripping effluent and 033-9-1164 Air Quality General Permit for Soil Vapor Extraction Equipment effluent were required.. Neither of these permits has an expiration date. Sampling and monitoring requirements include periodic effluent monitoring as described in Sections 2 and 3.

Permit number 2008-OGR-8514 General Discharge Permit was issued for discharge of treated groundwater at the site. This permit became effective on January 31, 2008, and expires on December 12, 2012. The permit requires weekly effluent sampling, system monitoring, and submission of a quarterly Discharge Monitoring Report.

Permits for Remedy Construction

Additional permits were required to conduct construction activities in Washington, D.C. The permits were issued by DDOT and the Department of Consumer and Regulatory Affairs (DCRA). The following permits were issued for the construction activities:

Area A:

All permits for Area A were allowed to expire after completion of installation and inspection by the District.

Areas B and C:

Public Space Construction Permit number PA-58744 was issued by DDOT on April 28, 2011 for the installation of bollards in the alley in Areas B and C and expired May 28, 2012. Bollard installation in both areas is complete.

Road Closure Permit number 10-2671 to close the alleyway of Area C during business hours for construction using the approved traffic control plan was issued by the DC Fire Marshal on September 24, 2010 and does not expire.

Public Space Construction Permit number PA-60975 was issued by DDOT on June 1, 2011 for the installation of wells and system in Area B; the renewal expires October 31, 2012.

Public Space Construction Permit number PA-63519 was issued by DDOT on July 14, 2011 for the installation of the MW-62 monitoring well cluster in Area B; the renewal expired June 27, 2012.

Public Space Construction Permit number PA-57370 was issued by DDOT on November 17, 2010 for the installation of all components in Area C; the current renewal expires on September 29, 2012.

Public Space Occupancy Permit number PA-10033716 was issued by DDOT on August 11, 2011 for the installation of wells in Area B; the renewal expired June 27, 2012.

Miscellaneous Soil Boring Permit number SB-1000102 for the installation of wells in Area C was issued by DCRA on November 17, 2010 and does not expire.

Miscellaneous Soil Boring Permit number SB-1100065 for the installation of wells in Area B was issued by DCRA on May 26, 2011; amended and issued by DCRA as SB-1100080 on June 28, 2011; and does not expire.

The various permits required for construction activity will not be renewed as construction work is substantially complete.

Permits for Groundwater Monitoring and Operation and Maintenance of Systems

Permit number PA10045396 for Public Space Occupancy was issued to cover traffic control requirements for sampling, gauging, and O&M of Areas B and C and expired on June 11, 2012. A permit renewal package was submitted to DCRA on May 22, 2012 and is currently under review.

5.0 SUMMARY OF DEVIATIONS FROM APPROVED PLANS, PROBLEMS ENCOUNTERED, AND CORRECTIVE ACTIONS TAKEN

- Applications for power service from the local utility, Pepco, were submitted in February 2011. Pepco completed a design, which included installing new poles to service the systems for Areas B and C. However, at a field meeting conducted at the site on February 13, 2012, Pepco engineers indicated that installing new poles would not be feasible. They decided to run new power supply lines on the existing poles owned by Verizon. Pepco revised their design and required the installation of the system equipment prior to providing the power drop. The electrical installation was completed in June 2012 and inspected by DCRA; copies of the inspection records were sent to Pepco. With the completion of DCRA's inspection, Pepco may now begin to schedule power drop installation.

- The project team determined that, due to drilling schedule delays, in order to complete pavement restoration work in Area B before the cold weather set in, installation of monitoring wells MW-61B, MW-62A, and MW-62B would be postponed until spring 2012. Permits for the installation of the above wells were obtained and the well installations and development were completed from June 11 to 13, 2012.

- There were no other major deviations from the approved design plans for Areas A, B, and C. Minor deviations from the approved plans will be detailed in the Construction Completion Reports for each area to be submitted to EPA following substantial construction completion.

6.0 SUMMARY OF MEETINGS WITH PUBLIC AND GOVERNMENT

No meetings were held during the reporting period.

7.0 CHANGES IN KEY PERSONNEL DURING THE REPORTING PERIOD

The following changes in key personnel occurred during the reporting period:

- The Gannett Fleming Project Manager changed from Robert Scrafford, P.E. to Brent Chapman, P.G. on May 15, 2012; and

- The DDOE Point of Contact changed from Victoria North to Raymond Montero on July 2, 2012.

8.0 PROJECTED WORK FOR THE NEXT REPORTING PERIOD

The following list identifies projected work to be conducted during the next reporting period, which is January through June 2012:

- Monthly monitoring of the Area A DPE system including influent and effluent sampling;
- Weekly sampling of the Area A DPE system effluent to comply with water discharge permits;
- Monthly gauging of select wells near the service station to check for the presence of LPH and to document drawdown caused by the total fluids extraction system;
- Semi-annual groundwater sampling and gauging event in the fall;
- Routine operations and maintenance activities for the Area A remediation system and the vapor mitigation system at 5818 Eastern Avenue. Discontinue operation and possible removal of the VMS at 5824 Eastern Avenue and 746 Oglethorpe Road pending approval by EPA;
- Start shake-down of the Areas B and C remediation systems; pending power service;
- Begin operation and maintenance (pending power service) of Area B and Area C; and
- Submit Construction Completion Reports for Areas A, B, and C.

9.0 REFERENCES

Gannett Fleming, 2008. Interim Measures Work Plan for Vapor Sampling and Mitigation at Residences, Former Chevron Facility 122208, 5801 Riggs Road, Chillum, Maryland. Dated July 2008.

TABLES

Gannett Fleming

Chevron

TABLE 1[(1)] SUMMARY OF GROUNDWATER AND SOIL VAPOR SAMPLING PLAN
FORMER CHEVRON FACILITY NO. 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

EXISTING WELLS TO BE SAMPLED

Well Identifier	Well Location Category	Petroleum Hydrocarbon Sampling Frequency	Current Sampling Method	Groundwater Gauging Frequency[(2)]	Comment
GP-30A	Dual-Phase Extraction System	Semi-annual	Hydrasleeve	Monthly	
GP-35A	Dual-Phase Extraction System	Semi-annual	Hydrasleeve	Monthly	
MP-7	Dual-Phase Extraction System	None	None	Monthly	Gauge only
MW-5	Dual-Phase Extraction System	Semi-annual	Hydrasleeve	Semi-annual	
MW-7	Dual-Phase Extraction System	Semi-annual	From pump	Monthly	Recovery Well
MW-15	Dual-Phase Extraction System	Semi-annual	Hydrasleeve	Semi-annual	
MW-16	Dual-Phase Extraction System	Semi-annual	Hydrasleeve	Monthly	
MW-17	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Recovery Well
MW-18	Dual-Phase Extraction System	Semi-annual	Bailer	Monthly	
MW-23	Dual-Phase Extraction System	Semi-annual	Hydrasleeve	Semi-annual	
PTW-B	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Recovery Well
RW-1	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Recovery Well
RW-2	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Recovery Well
RW-3	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Recovery Well
RW-4	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Recovery Well
RW-5	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Angled Recovery Well
GP-27R	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Recovery Well
MW-22R	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Recovery Well
GP-39R	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Recovery Well
GP-2E(45-50)	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
GP-2E(55-60)	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
GP-2F(45-50)	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
GP-2F(50-55)	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
GP-7A(30-35)	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
GP-7A(35-40)	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
GP-24A	Dissolved Hydrocarbons	Semi-annual	HydraSleeve	Semi-annual	
GP-41A	Dissolved Hydrocarbons	Semi-annual	HydraSleeve	Semi-annual	
GP-44A	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
MW-24A	Dissolved Hydrocarbons	Semi-annual	Bailer	Monthly	
MW-24B	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	

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Chevron

TABLE 1[(1)] SUMMARY OF GROUNDWATER AND SOIL VAPOR SAMPLING PLAN
FORMER CHEVRON FACILITY NO. 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Well Identifier	Well Location Category	Petroleum Hydrocarbon Sampling Frequency	Current Sampling Method	Groundwater Gauging Frequency[(2)]	Comment
MW-25A	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
MW-25B	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-26A	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-26B	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-27A	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-27B	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-33A	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	Added at the request of EPA
MW-33B	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-33C	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	Added at the request of EPA
MW-33S	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
MW-38	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-39R	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
MW-40	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-43B	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-44A	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
MW-44B	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-45	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-46	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-47	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
MW-49	Dissolved Hydrocarbons	Semi-annual	Hydrasleeve	Semi-annual	
MW-50	Dissolved Hydrocarbons	Semi-annual	Bailer	Semi-annual	
GP-7A(20-25)	Sentinel	Semi-annual	Bailer	Semi-annual	
GP-9A(20-25)	Sentinel	Semi-annual	Bailer	Semi-annual	
GP-11A(20-25)	Sentinel	Semi-annual	Bailer	Semi-annual	
MW-6	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-19	Sentinel	Semi-annual	Bailer	Semi-annual	
MW-20	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	Upgradient
MW-21	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-28A	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-28B	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	

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TABLE 1[(1)] SUMMARY OF GROUNDWATER AND SOIL VAPOR SAMPLING PLAN
FORMER CHEVRON FACILITY NO. 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Well Identifier	Well Location Category	Petroleum Hydrocarbon Sampling Frequency	Current Sampling Method	Groundwater Gauging Frequency[(2)]	Comment
MW-29A	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-29B	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-30R	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	Replacement for MW-30
MW-31B	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-41A	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-41B	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-42	Sentinel	Semi-annual	Bailer	Semi-annual	Upgradient
MW-43A	Sentinel	Semi-annual	Bailer	Semi-annual	
MW-48	Sentinel	Semi-annual	Bailer	Semi-annual	
MW-51	Sentinel	Semi-annual	Bailer	Semi-annual	
MW-53	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-54	Sentinel	Semi-annual	Bailer	Semi-annual	
MW-55	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	
MW-58	Oxygen Reactive Zone	Semi-annual	Hydrasleeve	Semi-annual	
MW-59	Oxygen Reactive Zone	Semi-annual	Hydrasleeve	Semi-annual	
MW-60	Oxygen Reactive Zone	Semi-annual	Hydrasleeve	Semi-annual	
MW-61A	ISGR System	Semi-annual	Hydrasleeve	Semi-annual	Well not developed
MW-61B	ISGR System	Semi-annual	Hydrasleeve	Semi-annual	Well not installed
MW-62A	ISGR System	Semi-annual	Hydrasleeve	Semi-annual	Well not installed
MW-62B	ISGR System	Semi-annual	Hydrasleeve	Semi-annual	Well not installed
VW-1	Soil Vapor	Semi-annual	NA	NA	
VW-2	Soil Vapor	Semi-annual	NA	NA	
VW-3	Soil Vapor	Semi-annual	NA	NA	
VW-4	Soil Vapor	Semi-annual	NA	NA	

Footnotes:
(1) This table is adapted from the Interim Measures Sampling Plan, dated April 2006.
(2) All wells will be gauged in the spring and the fall during the Semi-annual sampling events.
(3) Sampling will be conducted in the spring and fall (low and high groundwater conditions).

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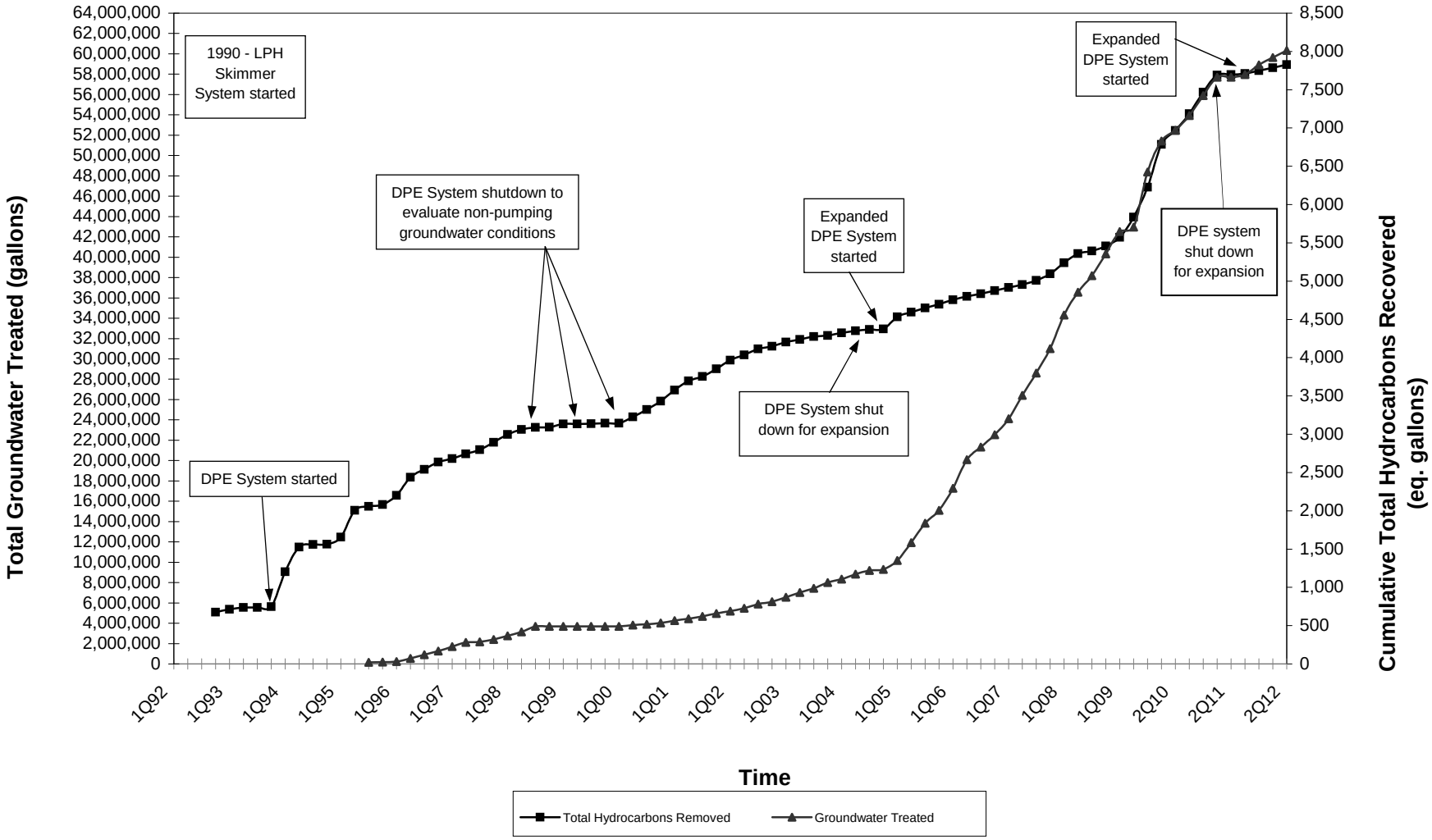
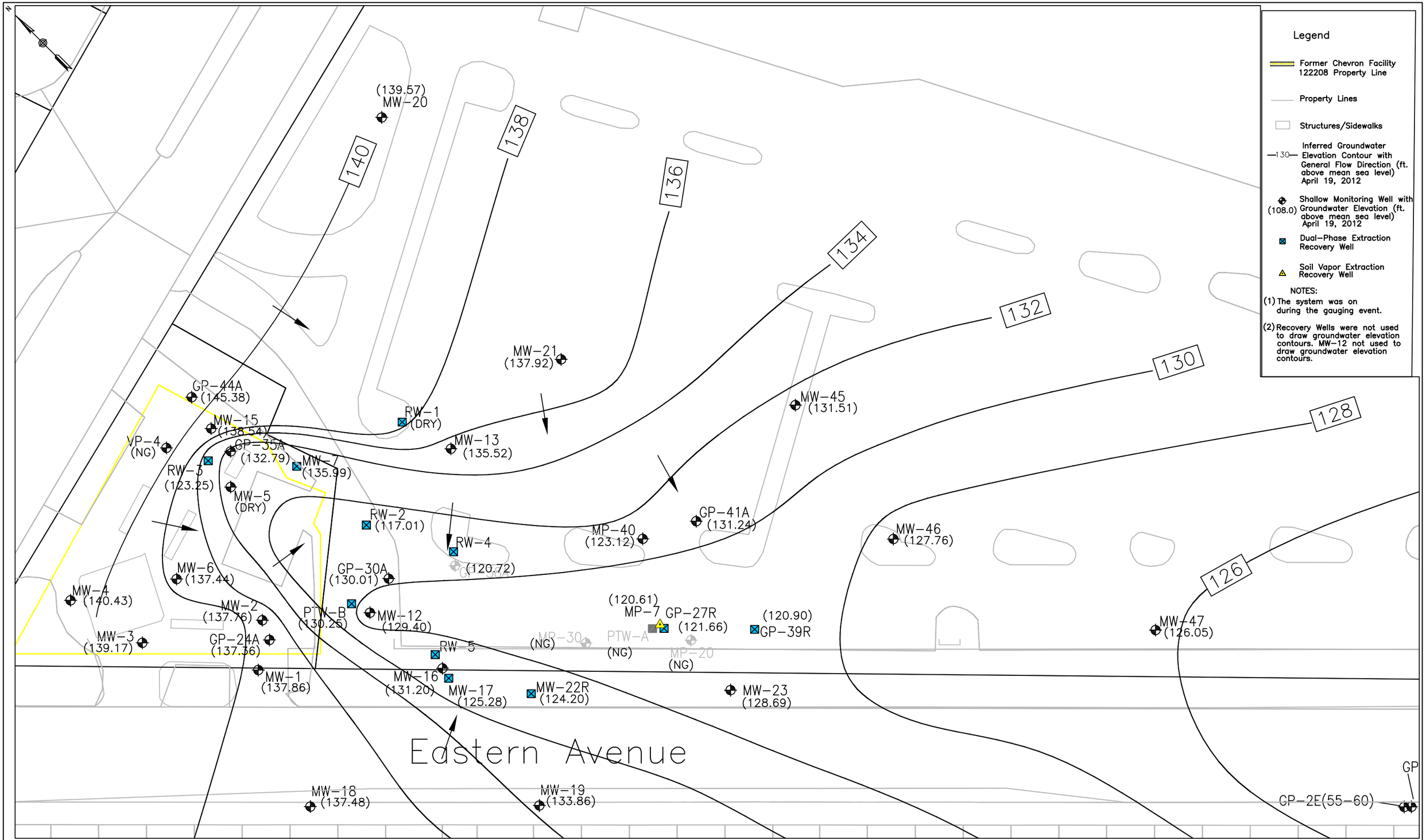
TABLE 2 SUMMARY OF GROUNDWATER AND SOIL VAPOR SAMPLING PLAN
JANUARY 2012 SAMPLING EVENT
FORMER CHEVRON FACILITY NO. 122208
5801 RIGGS ROAD, CHILLUM, MARYLAND

Well Identifier	Well Location Category	Petroleum Hydrocarbon Sampling Frequency	Sampling Method	Groundwater Gauging Frequency[2]	Comment
RW-5	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Pump not yet functioning
RW-4	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Already sampled
GP-27R	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Already sampled
MW-22R	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Already sampled
GP-39R	Dual-Phase Extraction System	Semi-annual	From pump	Semi-annual	Already sampled
MW-30R	Sentinel	Semi-annual	Hydrasleeve	Semi-annual	Well not developed
ISGR-1	ISGR System	Monthly	As per approved O&M Plan	None	Per approved design plan, ISGR wells are not included in long term monitoring plan. Wells will be monitored as part of O&M.
ISGR-2					
MW-61A	ISGR System	Semi-annual	Hydrasleeve	Semi-annual	Well not developed
MW-61B	ISGR System	Semi-annual	Hydrasleeve	Semi-annual	Well not installed
MW-62A	ISGR System	Semi-annual	Hydrasleeve	Semi-annual	Well not installed
MW-62B	ISGR System	Semi-annual	Hydrasleeve	Semi-annual	Well not installed
MW-58	Oxygen Reactive Zone	Semi-annual	Hydrasleeve	Semi-annual	To be sampled
MW-59	Oxygen Reactive Zone	Semi-annual	Hydrasleeve	Semi-annual	To be sampled
MW-60	Oxygen Reactive Zone	Semi-annual	Hydrasleeve	Semi-annual	To be sampled
IW-1	Oxygen Reactive Zone	Monthly	As per approved O&M Plan	None	Per approved design plan, oxygen injection wells are not included in long term monitoring plan. Wells will be monitored as part of O&M.
IW-2					
IW-3					
IW-4					
IW-5					

FIGURES

Figure 1
Cumulative Total Hydrocarbons Recovered and Groundwater Treated Since 1990
Semi-Annual Progress Report: January Through June 2012
Former Chevron Facility 122208, Chillum, Maryland





Legend

- Former Chevron Facility 122208 Property Line
- Property Lines
- Structures/Sidewalks
- —130— Inferred Groundwater Elevation Contour with General Flow Direction (ft. above mean sea level) April 19, 2012
- (108.0) Shallow Monitoring Well with Groundwater Elevation (ft. above mean sea level) April 19, 2012
- Dual-Phase Extraction Recovery Well
- Soil Vapor Extraction Recovery Well

NOTES:

(1) The system was on during the gauging event.

(2) Recovery Wells were not used to draw groundwater elevation contours. MW-12 not used to draw groundwater elevation contours.

0 40

SCALE IN FEET

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
DKB	DKB	1"=40'
CHECKED	APPROVED	APPROVED
JK	RWS	

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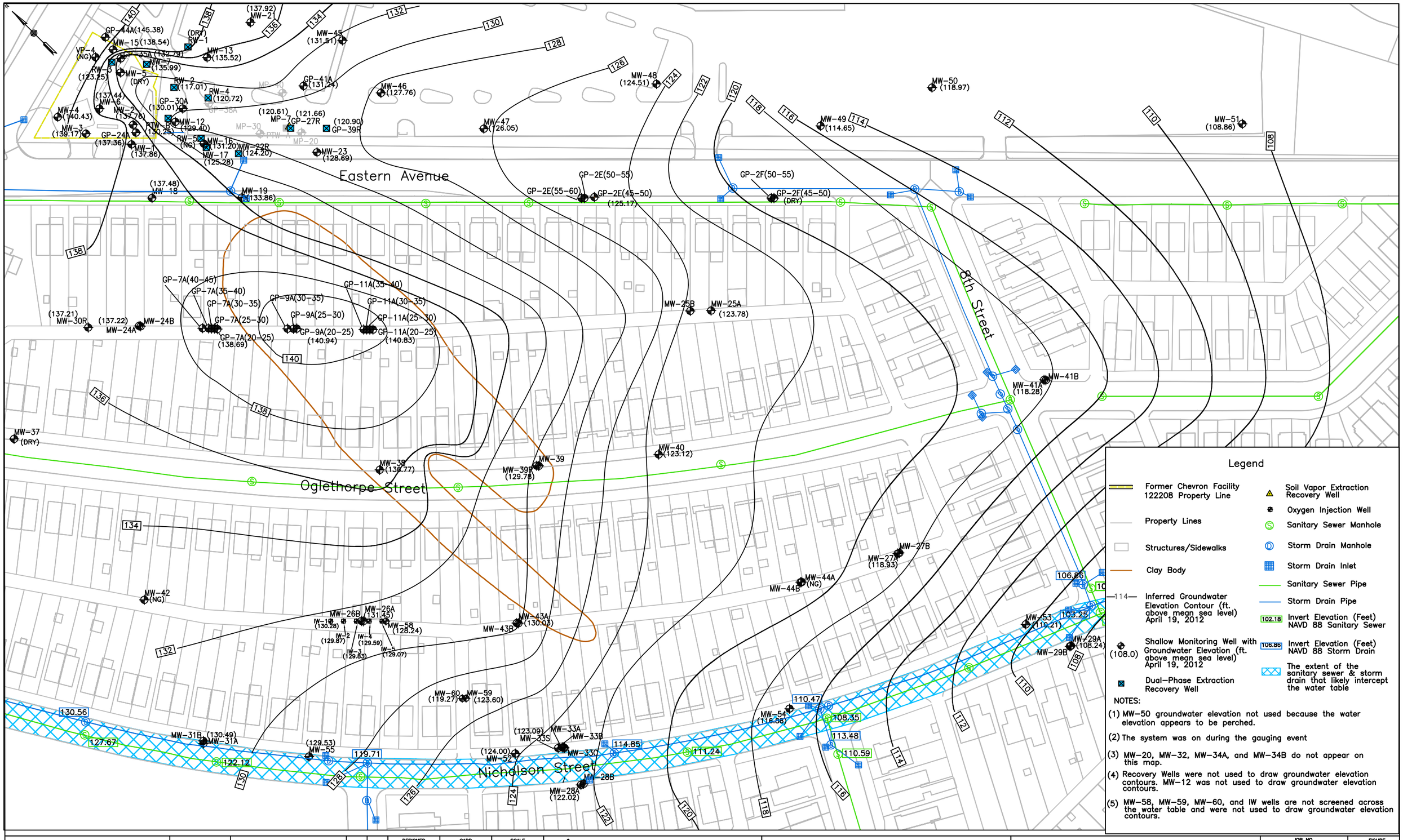
BALTIMORE, MARYLAND

2012 SEMI ANNUAL PROGRESS REPORT

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

Groundwater Potentiometric Surface Map
Remediation System Area
April 19, 2012

JOB NO.	FIGURE
55588	2
DATE: 07/03/12	
CAD FILE: GW CONTOURS 1Q 2012_blrup.dwg	



0 100
SCALE IN FEET

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
DKB	DKB	1" = 100'
CHECKED	APPROVED	APPROVED
JK	RWS	

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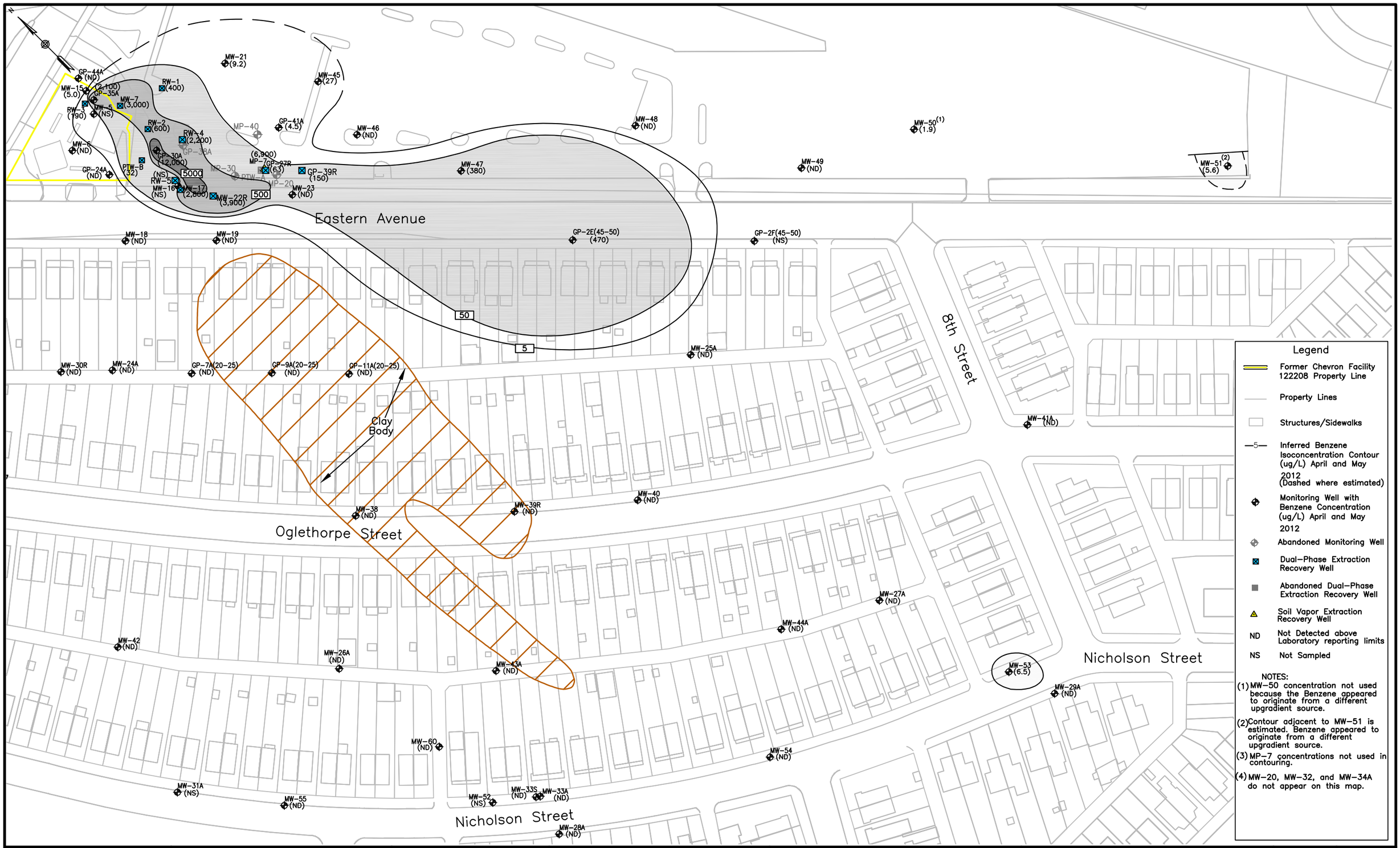
2012 SEMI-ANNUAL PROGRESS REPORT
FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

Groundwater Potentiometric Surface Map
April 19, 2012

JOB NO.	FIGURE
55588	3
DATE	
07/03/12	
CAD FILE	
GW CONTOURS 1Q 2012.dwg	



Legend

- Former Chevron Facility 122208 Property Line
- Property Lines
- Structures/Sidewalks
- —5— Inferred Benzene Isoconcentration Contour (ug/L) April and May 2012 (Dashed where estimated)
- Monitoring Well with Benzene Concentration (ug/L) April and May 2012
- Abandoned Monitoring Well
- Dual-Phase Extraction Recovery Well
- Abandoned Dual-Phase Extraction Recovery Well
- Soil Vapor Extraction Recovery Well
- ND Not Detected above Laboratory reporting limits
- NS Not Sampled

NOTES:

(1) MW-50 concentration not used because the Benzene appeared to originate from a different upgradient source.

(2) Contour adjacent to MW-51 is estimated. Benzene appeared to originate from a different upgradient source.

(3) MP-7 concentrations not used in contouring.

(4) MW-20, MW-32, and MW-34A do not appear on this map.

0 100

SCALE IN FEET

NO.	DESCRIPTION	DATE	BY
REVISIONS			

DESIGNED	CADD	SCALE
DKB	DKB	1"=100'
CHECKED	APPROVED	APPROVED
JK	RWS	

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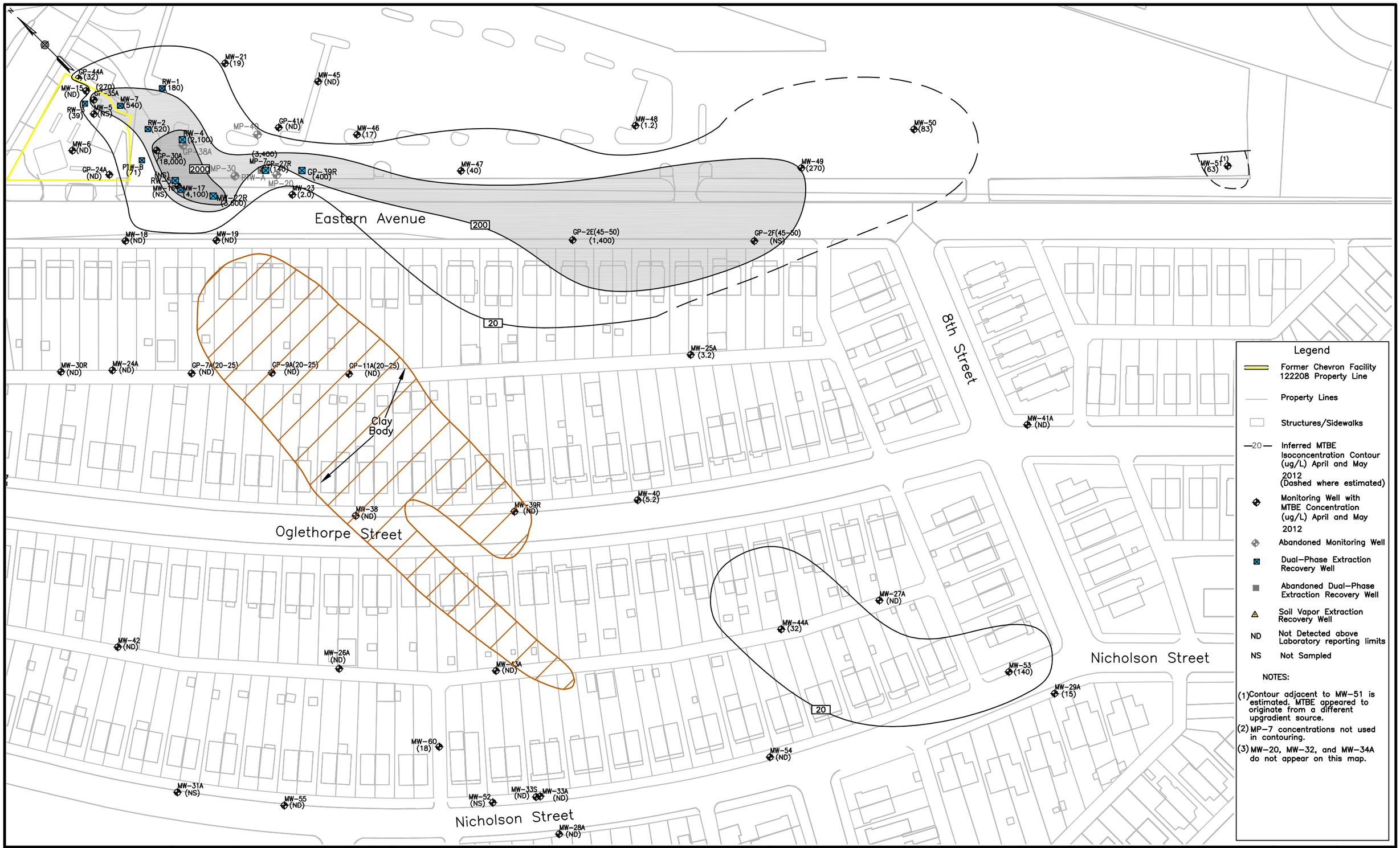
BALTIMORE, MARYLAND

CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
HOUSTON, TEXAS

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

Benzene Concentrations in Shallow Monitoring Wells April and May 2012

JOB NO.	SHEET NO.
55588	4
DATE	
07/06/12	
CAD FILE	
Shallow Benzene	



Legend

- Former Chevron Facility 122208 Property Line
- Property Lines
- Structures/Sidewalks
- —20— Inferred MTBE Isoconcentration Contour (ug/L) April and May 2012 (Dashed where estimated)
- Monitoring Well with MTBE Concentration (ug/L) April and May 2012
- Abandoned Monitoring Well
- Dual-Phase Extraction Recovery Well
- Abandoned Dual-Phase Extraction Recovery Well
- Soil Vapor Extraction Recovery Well
- ND Not Detected above Laboratory reporting limits
- NS Not Sampled

NOTES:

(1) Contour adjacent to MW-51 is estimated. MTBE appeared to originate from a different upgradient source.

(2) MP-7 concentrations not used in contouring.

(3) MW-20, MW-32, and MW-34A do not appear on this map.

0 100

SCALE IN FEET

NO.	DESCRIPTION	DATE	BY
REVISIONS			

DESIGNED	CADD	SCALE
DKB	DKB	1"=100'
CHECKED	APPROVED	APPROVED
JK	RWS	

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CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
HOUSTON, TEXAS

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

MTBE Concentrations in Shallow Monitoring Wells April and May 2012

JOB NO.	SHEET NO.
55588	5
DATE	
07/06/12	
CAD FILE	
Shallow MTBE	

DEEP WELL DATA NOT AVAILABLE UPGRADIENT OF THIS POINT

Eastern Avenue

8th Street

Nicholson Street

Nicholson Street

Oglethorpe Street

Clay Body

GP-2E(55-60) (200)

GP-2F(50-55) (44)

MW-25B (120)

MW-24B (ND)

GP-7A(30-35) (ND)

GP-7A(35-40) (4.2)

MW-41B (ND)

MW-27B (ND)

MW-44B (ND)

MW-43B (2.9)

MW-29B (ND)

MW-26B (850)

MW-58 (240)

IW-1

IW-2

IW-3

IW-4

IW-5

MW-59 (140)

MW-31B (ND)

MW-33B (380)

MW-33C (3.4)

MW-28B (ND)

50

5

500

Legend

- Former Chevron Facility 122208 Property Line
- Property Lines
- Structures/Sidewalks
- —5— Inferred Benzene Isoconcentration Contour (ug/L) April and May 2012 (Dashed where estimated)
- Monitoring Well with Benzene Concentration (ug/L) April and May 2012
- Dual-Phase Extraction Recovery Well
- Soil Vapor Extraction Recovery Well
- ND Not Detected above Laboratory reporting limits

NOTES:

(1) MW-33C & GP-7A(30-35) concentrations not used in contouring.

0 100

SCALE IN FEET

NO.	DESCRIPTION	DATE	BY

REVISIONS

DESIGNED	CADD	SCALE
DKB	DKB	1"=100'
CHECKED	APPROVED	APPROVED
JK	RWS	

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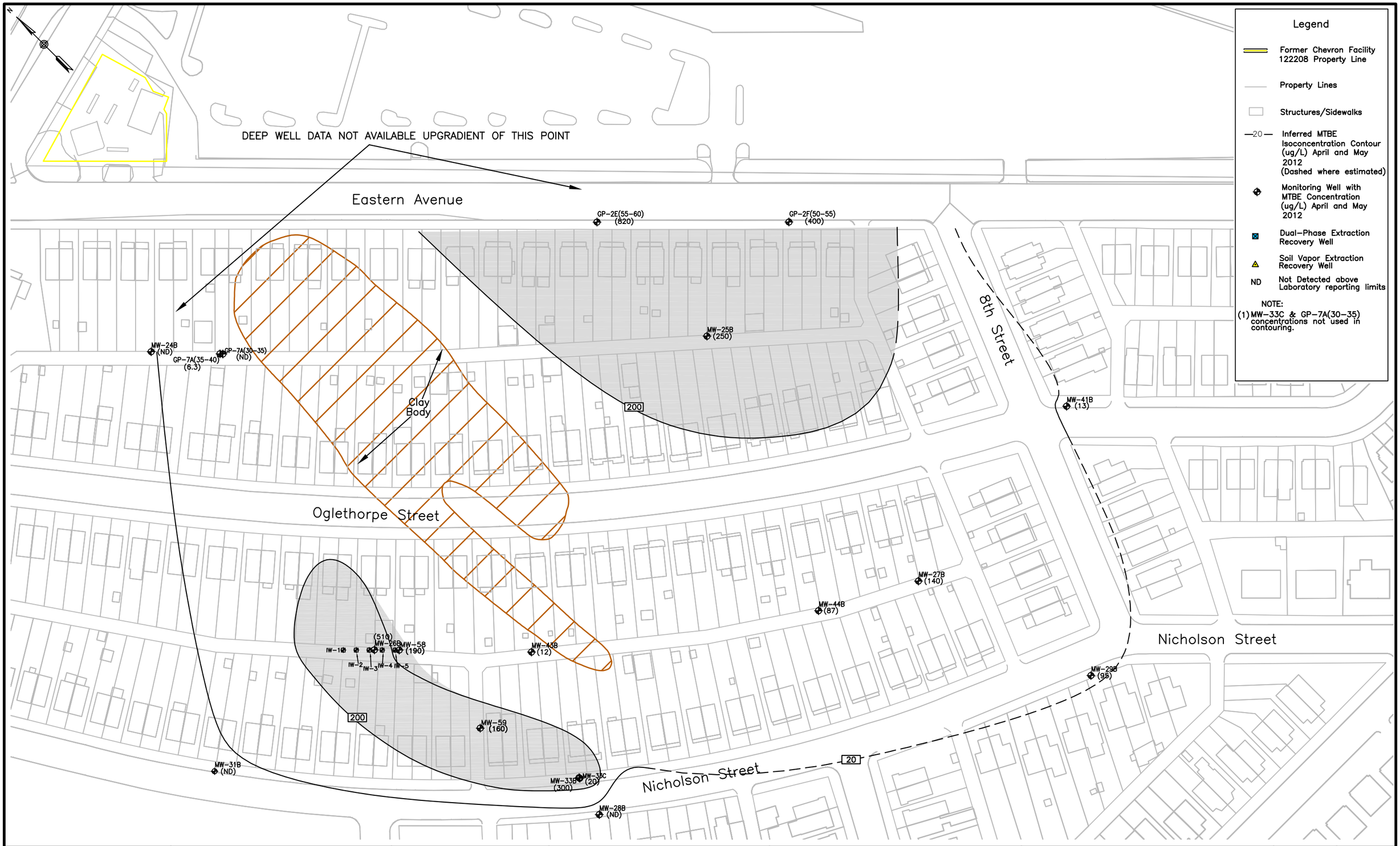
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
HOUSTON, TEXAS

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

Benzene Concentrations in Deep Monitoring Wells April and May 2012

JOB NO.	DATE	CAD FILE
55588	07/03/12	Deep Benzene

SHEET NO. 6



0 100
SCALE IN FEET

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
DKB	DKB	1"=100'
CHECKED	APPROVED	APPROVED
JK	RWS	

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HOUSTON, TEXAS

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

MTBE Concentrations in Deep Monitoring Wells April and May 2012

JOB NO.	DATE	CAD FILE	SHEET NO.
55588	07/03/12	Deep MTBE	7

Figure 8: MW-18 Benzene Trend Analysis

Former Chevron Facility 122208

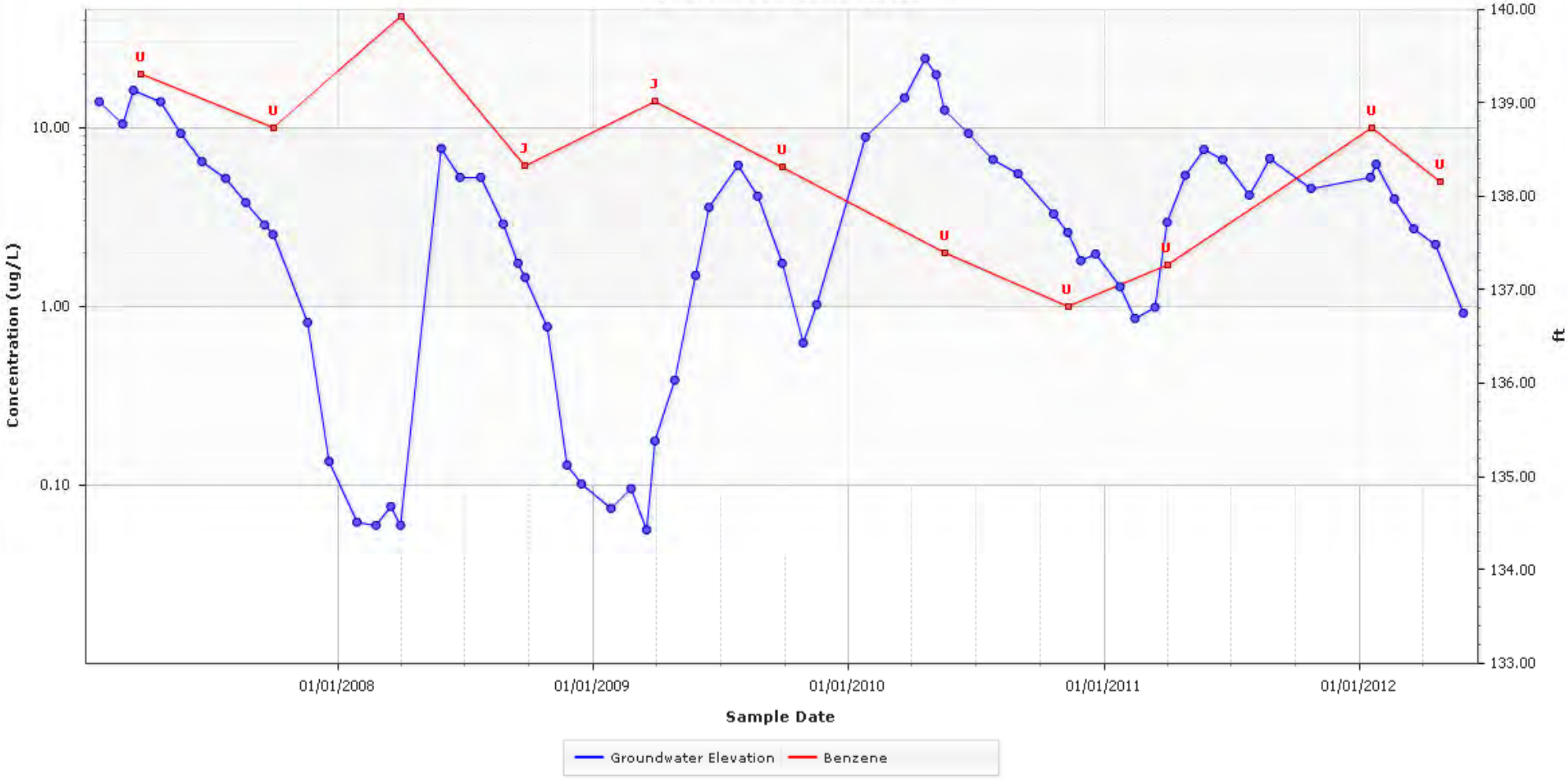


Figure 9: MW-18 MTBE Trend Analysis

Former Chevron Facility 122208

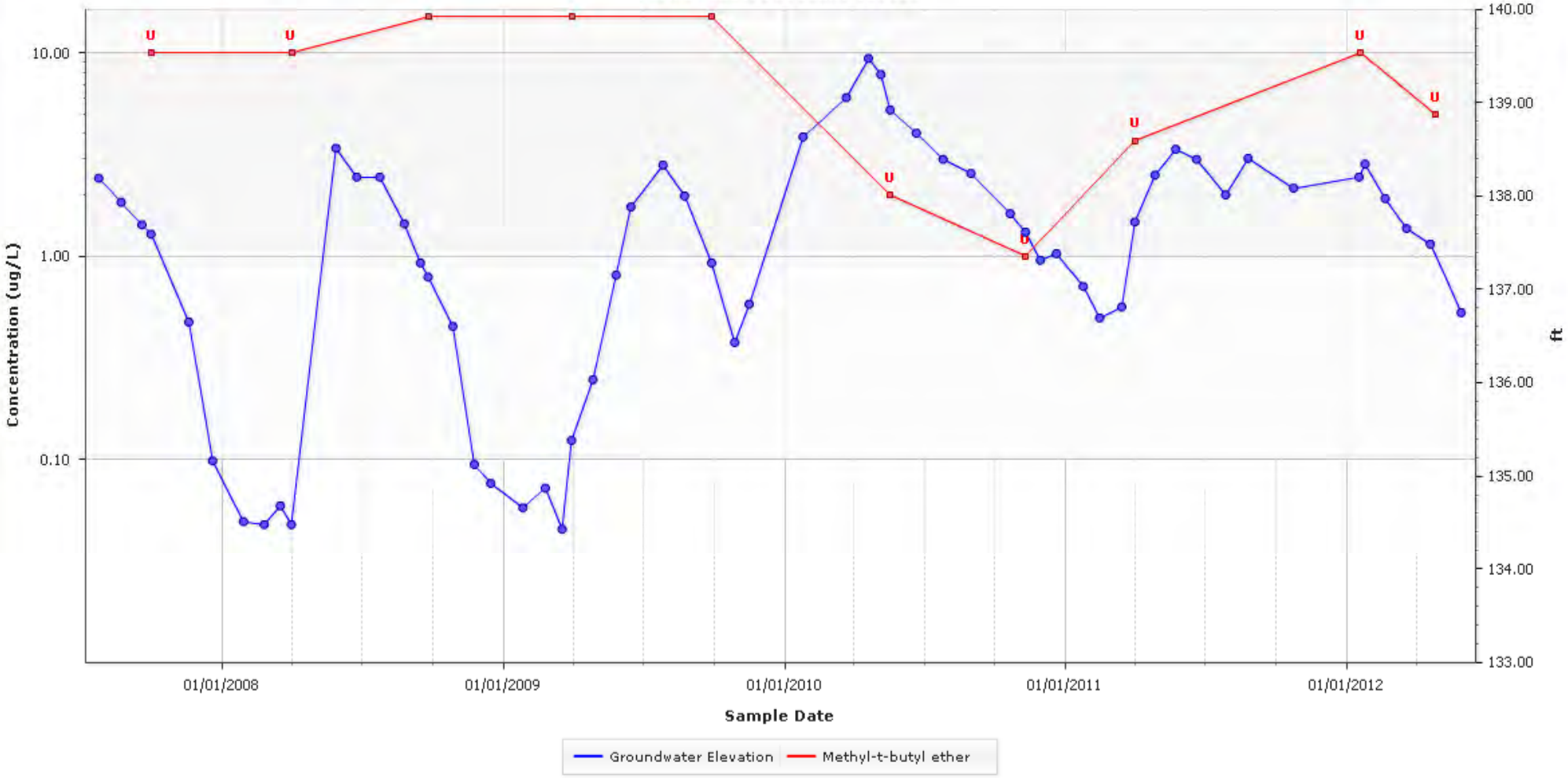


Figure 10: MW-24A Benzene Trend Analysis

Former Chevron Facility 122208

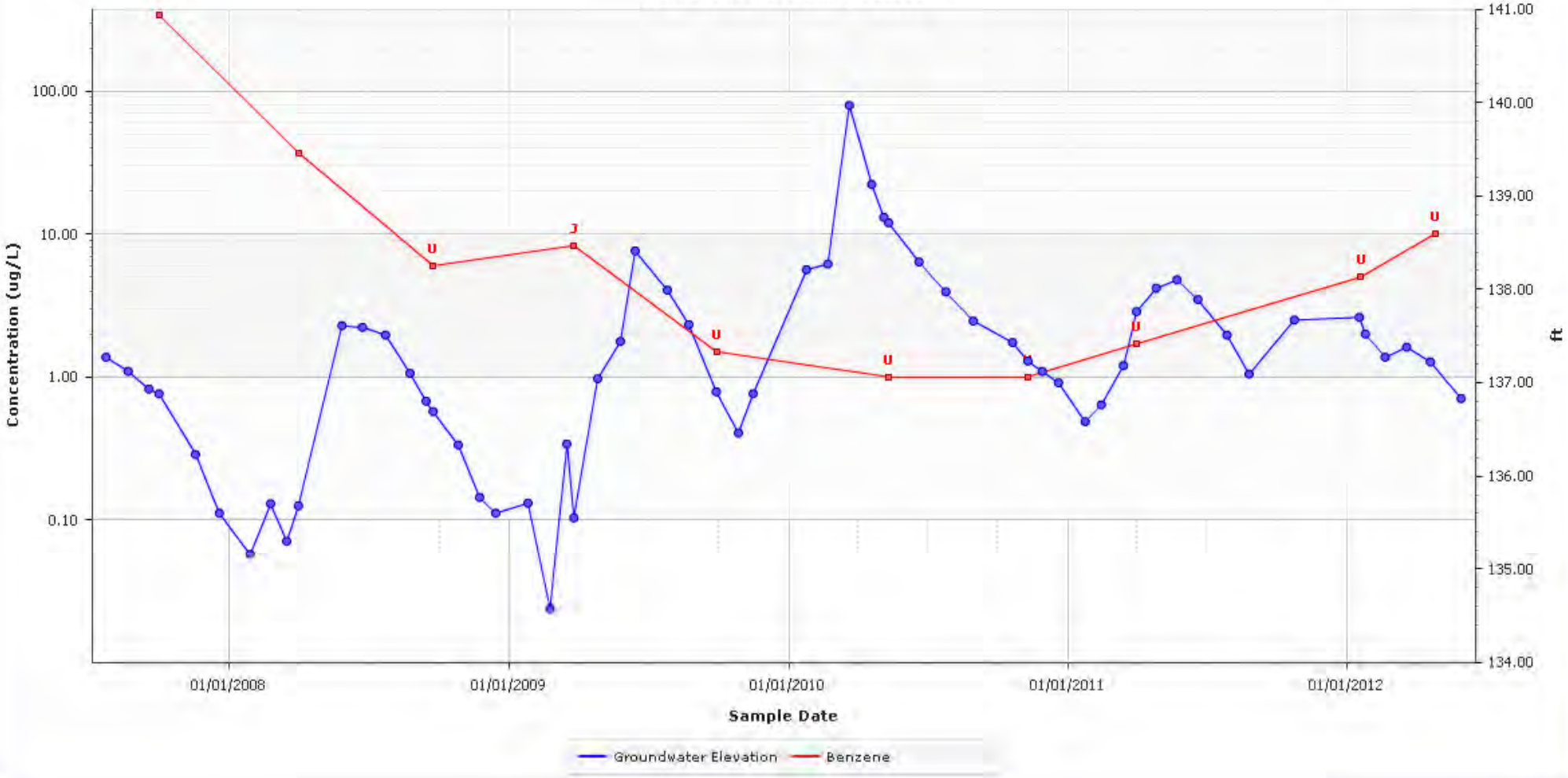


Figure 11: MW-24A MTBE Trend Analysis

Former Chevron Facility 122208

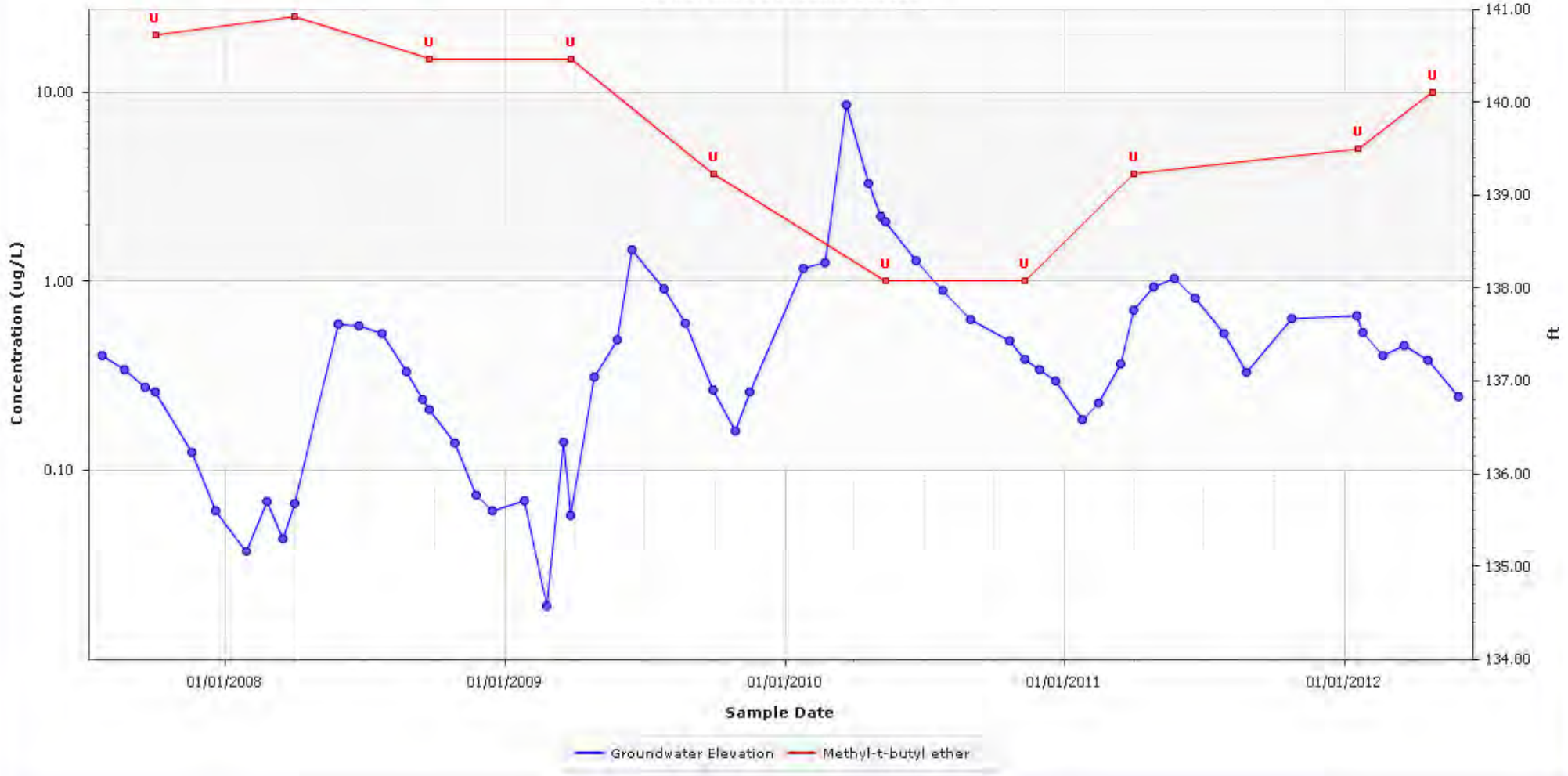


Figure 12: MW-24B Benzene Trend Analysis

Former Chevron Facility122208

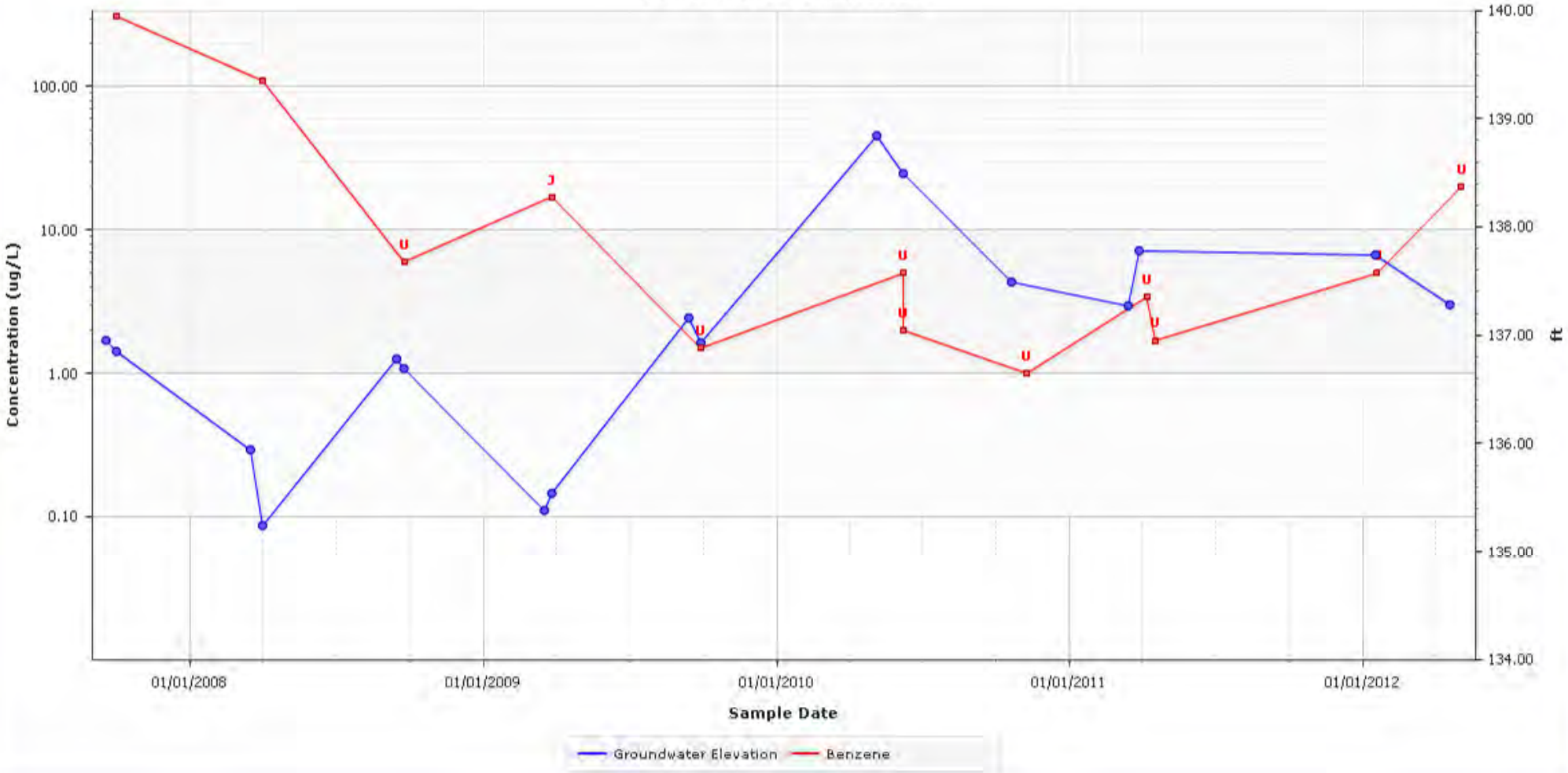


Figure 13: MW-24B MTBE Trend Analysis

Former Chevron Facility 122208

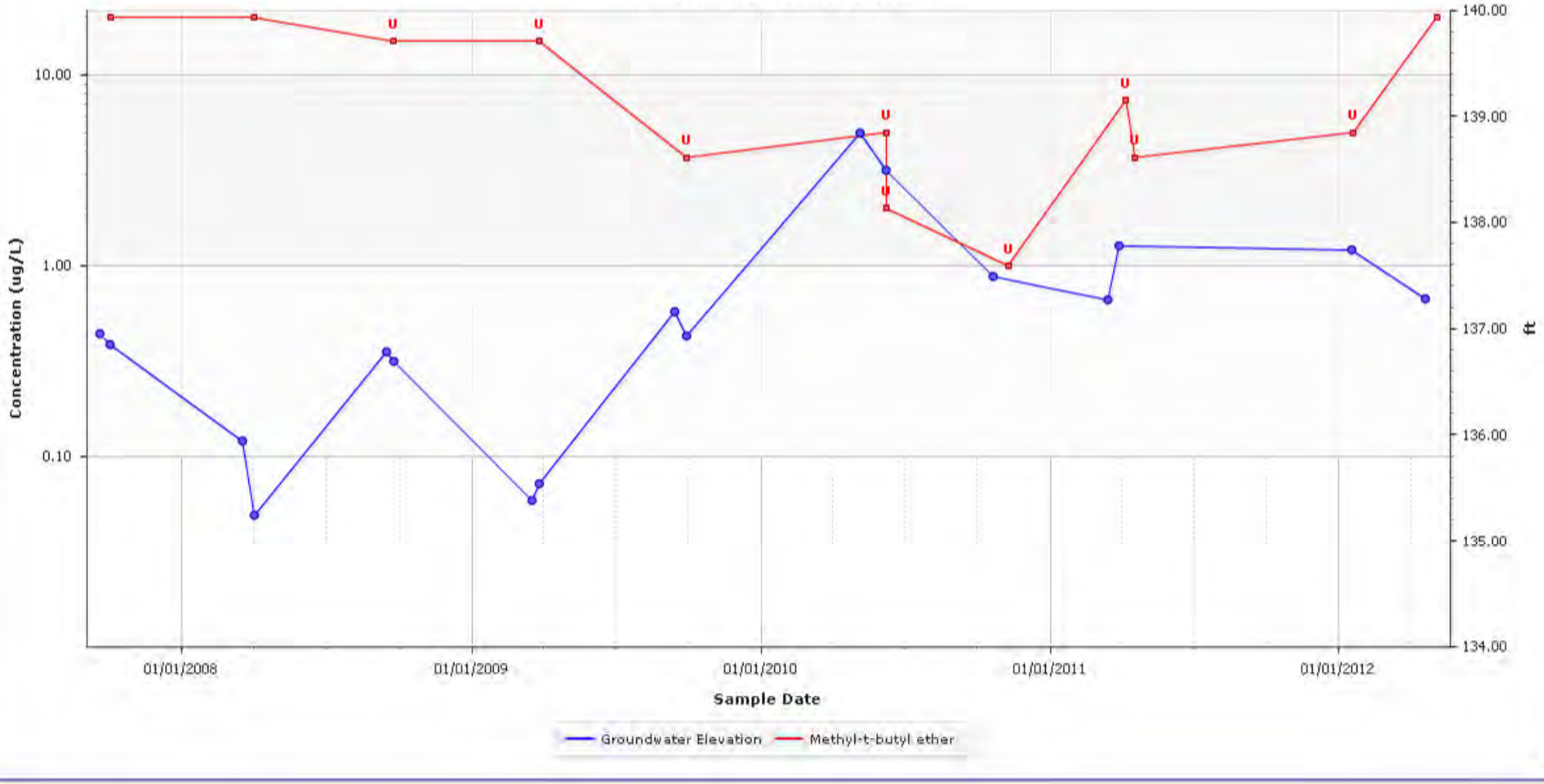


Figure 14: GP-2E{45-50} Benzene Trend Analysis

Former Chevron Facility 122208

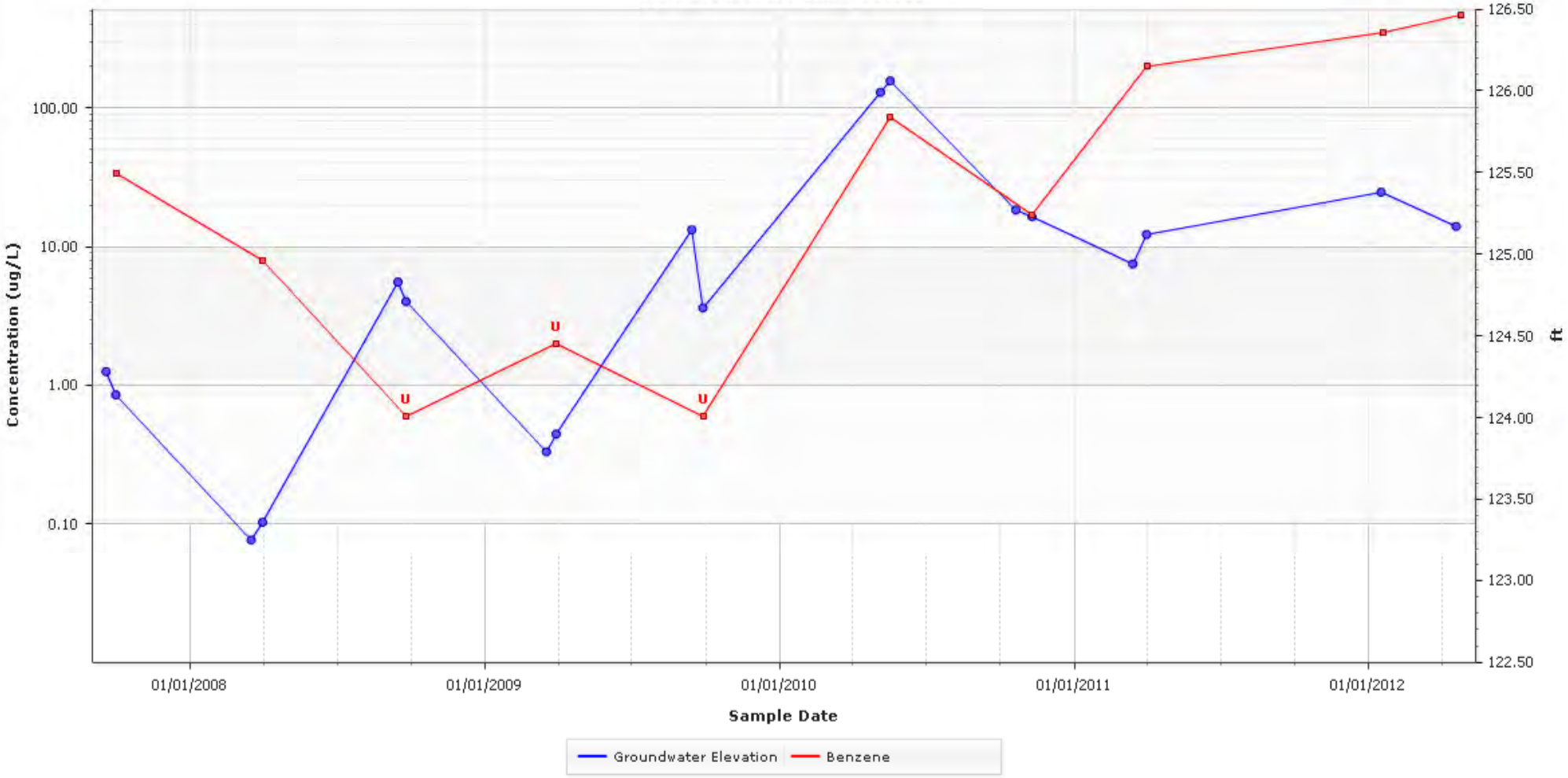


Figure 15: GP-2E{45-50} MTBE Trend Analysis

Former Chevron Facility 122208

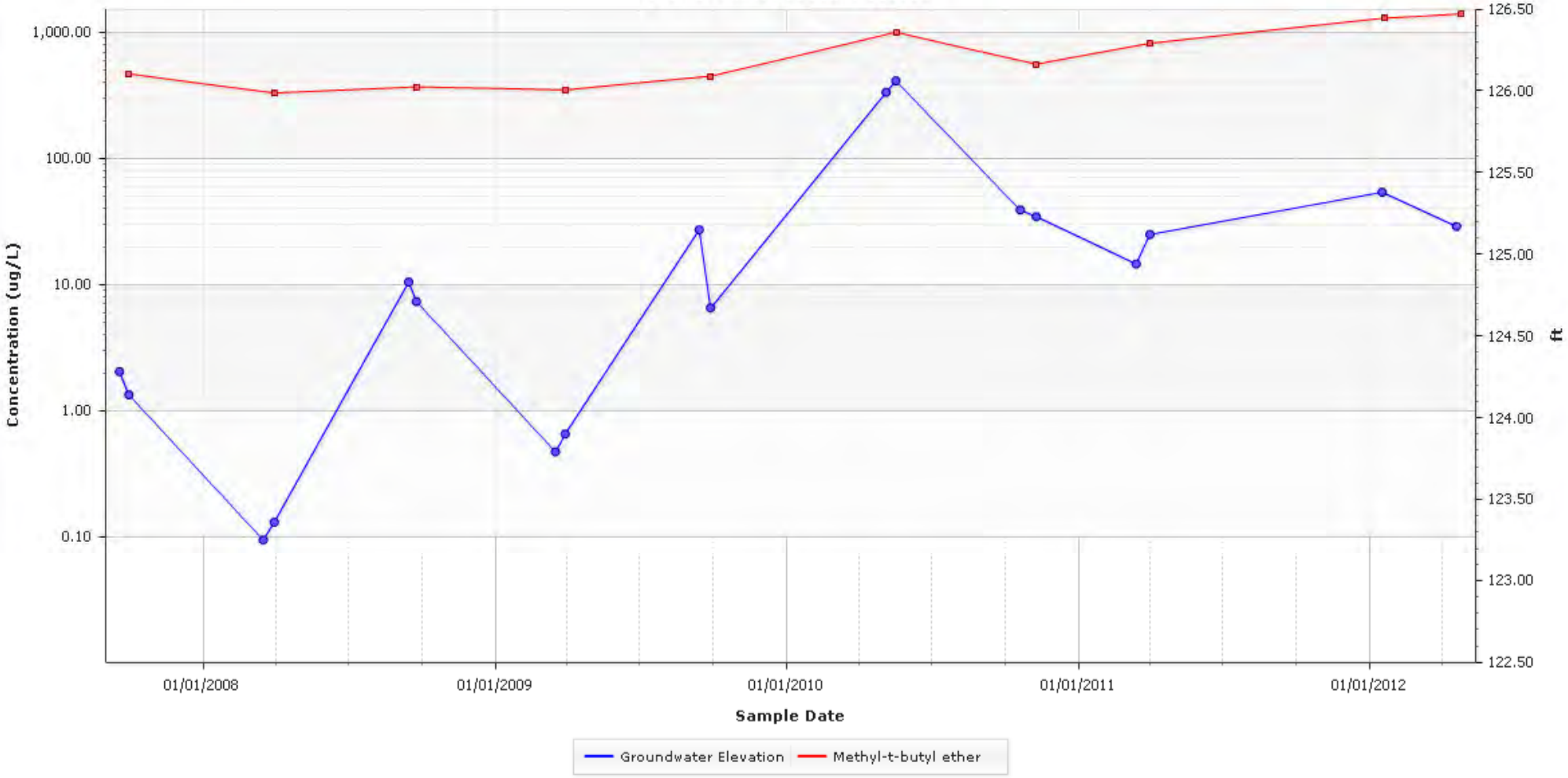


Figure 16: GP-2E{55-60} Benzene Trend Analysis

Former Chevron Facility 122208

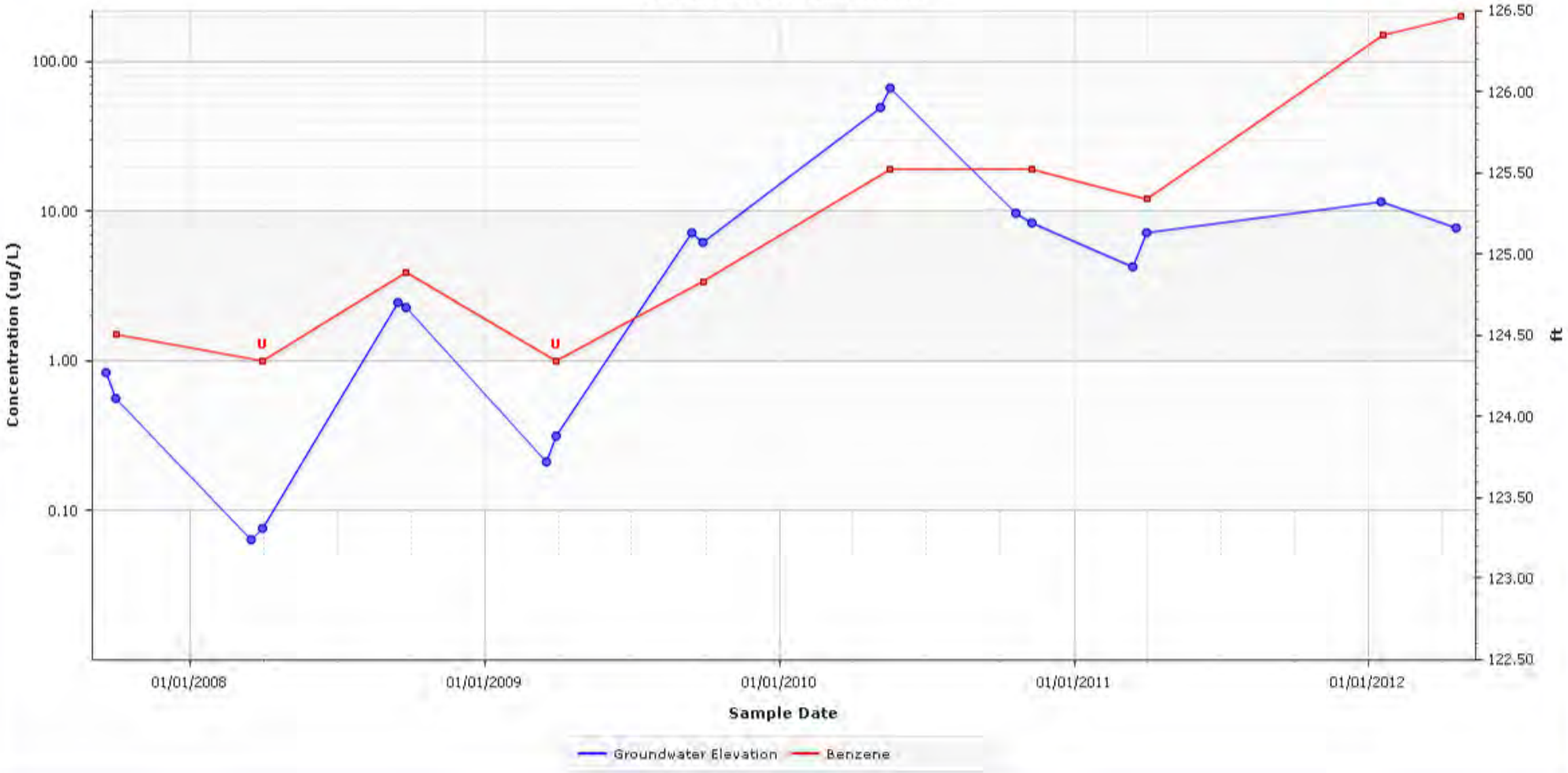


Figure 17: GP-2E{55-60} MTBE Trend Analysis

Former Chevron Facility 122208

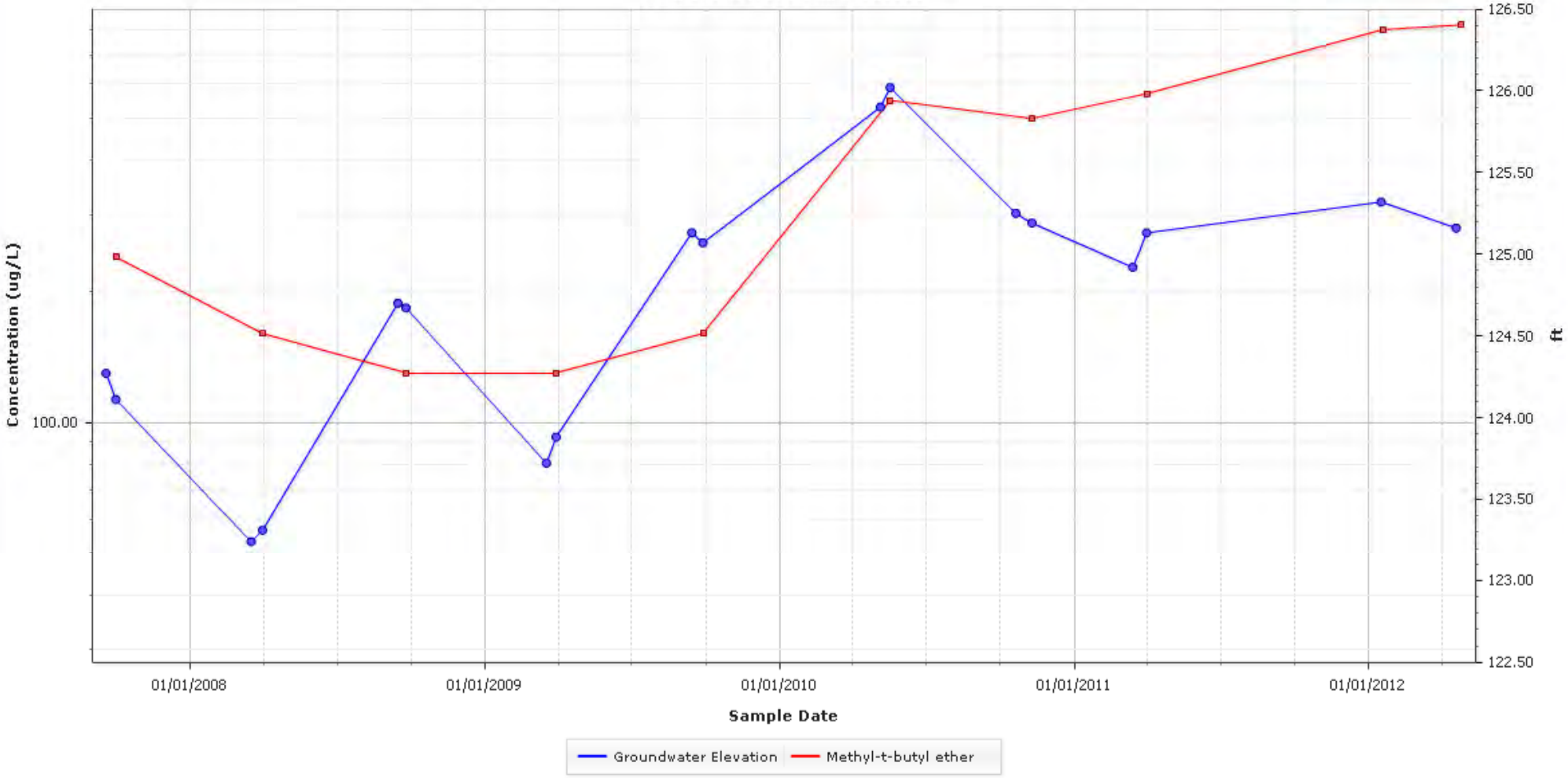


Figure 18: GP-2F{45-50} Benzene Trend Analysis

Former Chevron Facility122208

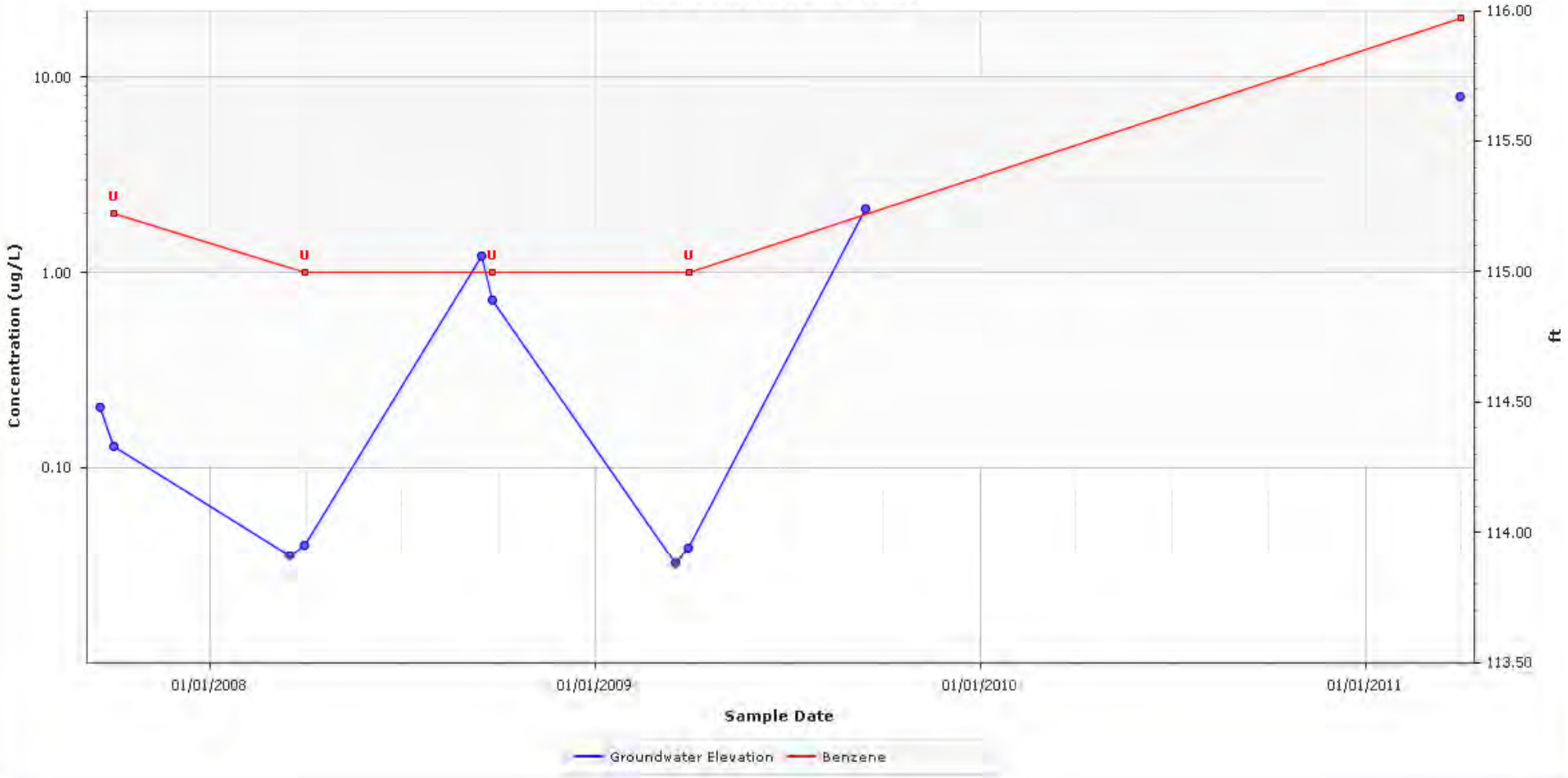


Figure 19: GP-2F{45-50} MTBE Trend Analysis

Former Chevron Facility 122208

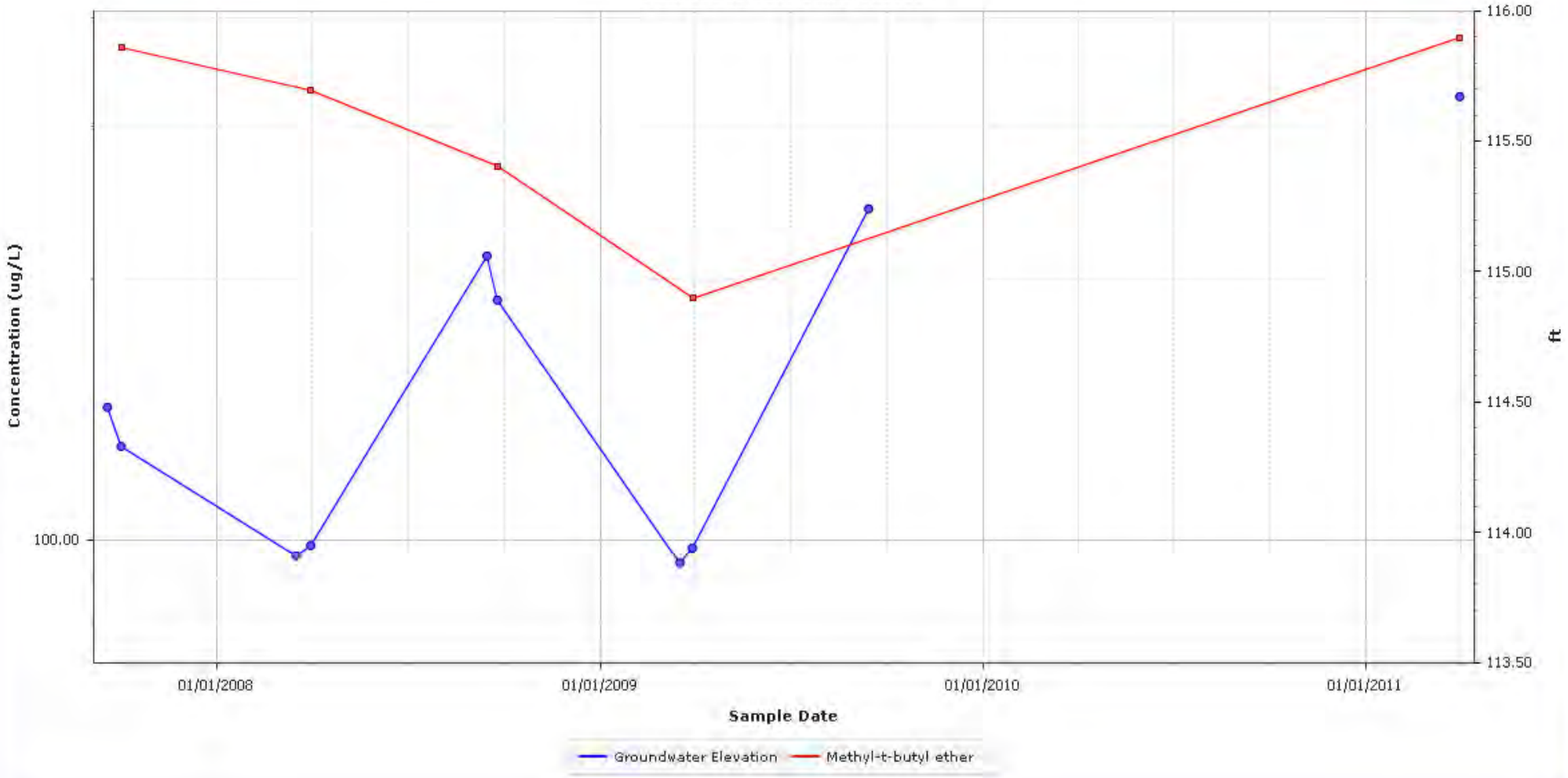


Figure 20: GP-2F{50-55} Benzene Trend Analysis

Former Chevron Facility 122208

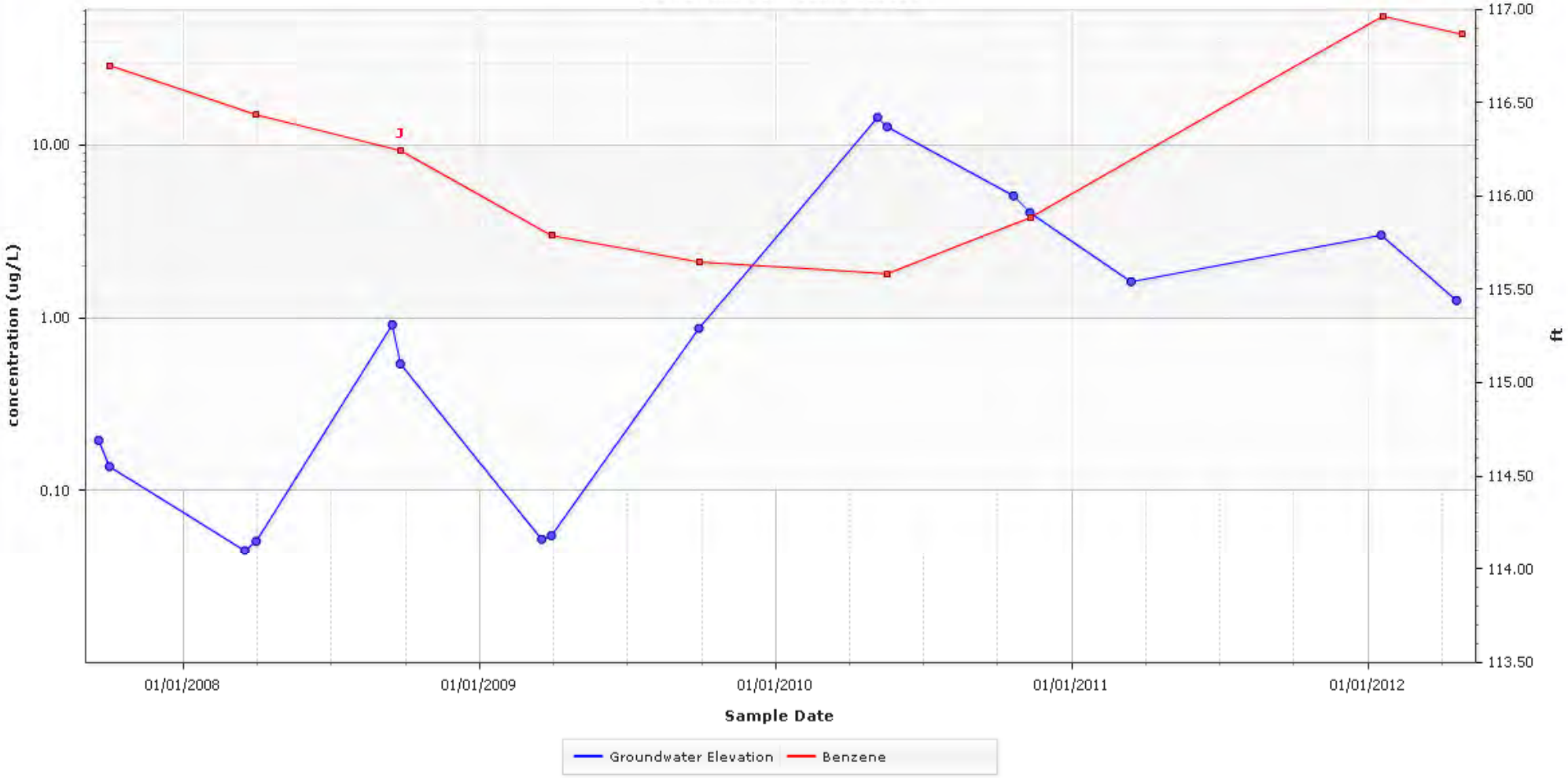


Figure 21: GP-2F{50-55} MTBE Trend Analysis

Former Chevron Facility 122208

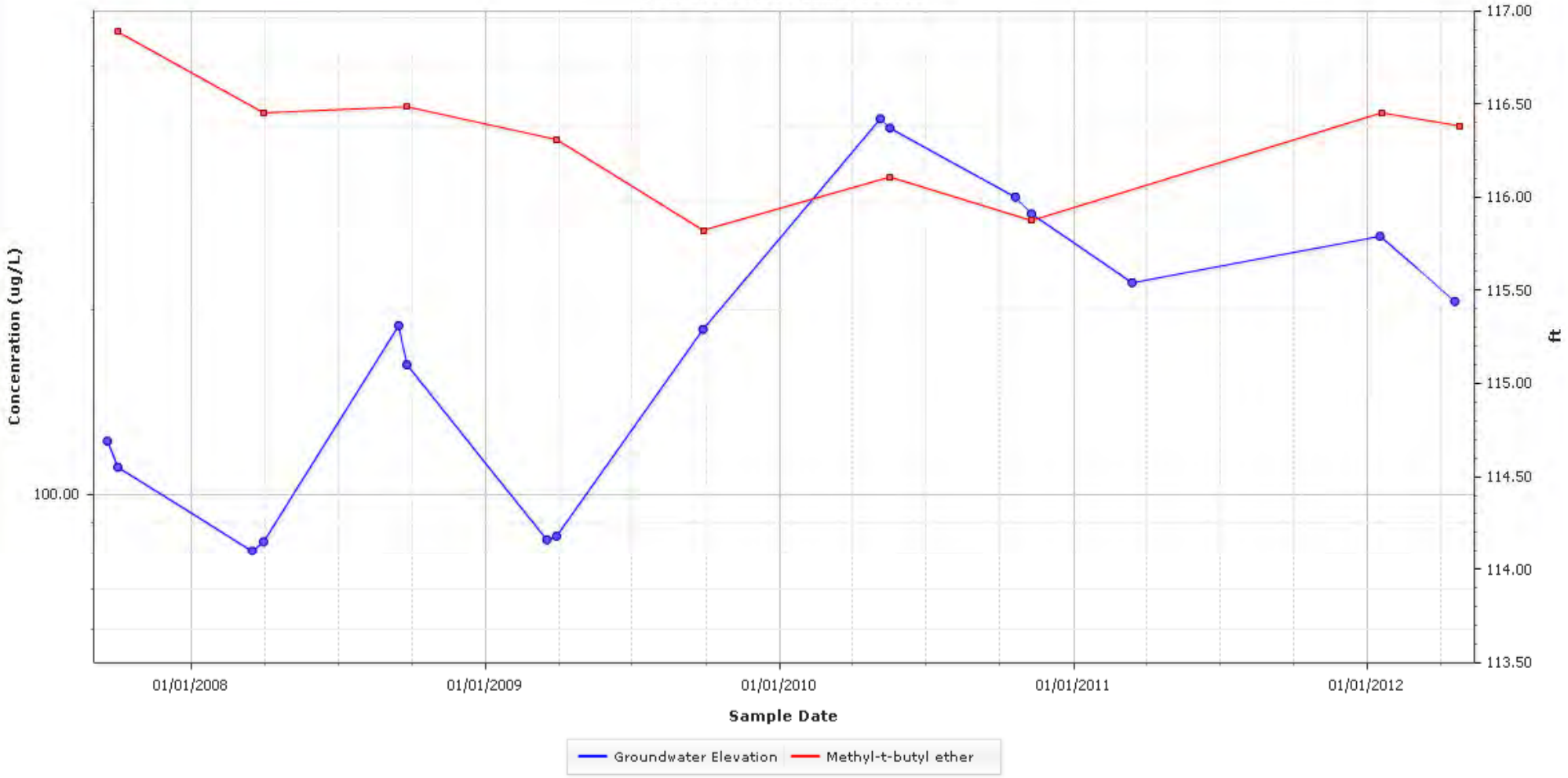


Figure 22: MW-33B Benzene Trend Analysis

Former Chevron Facility 122208

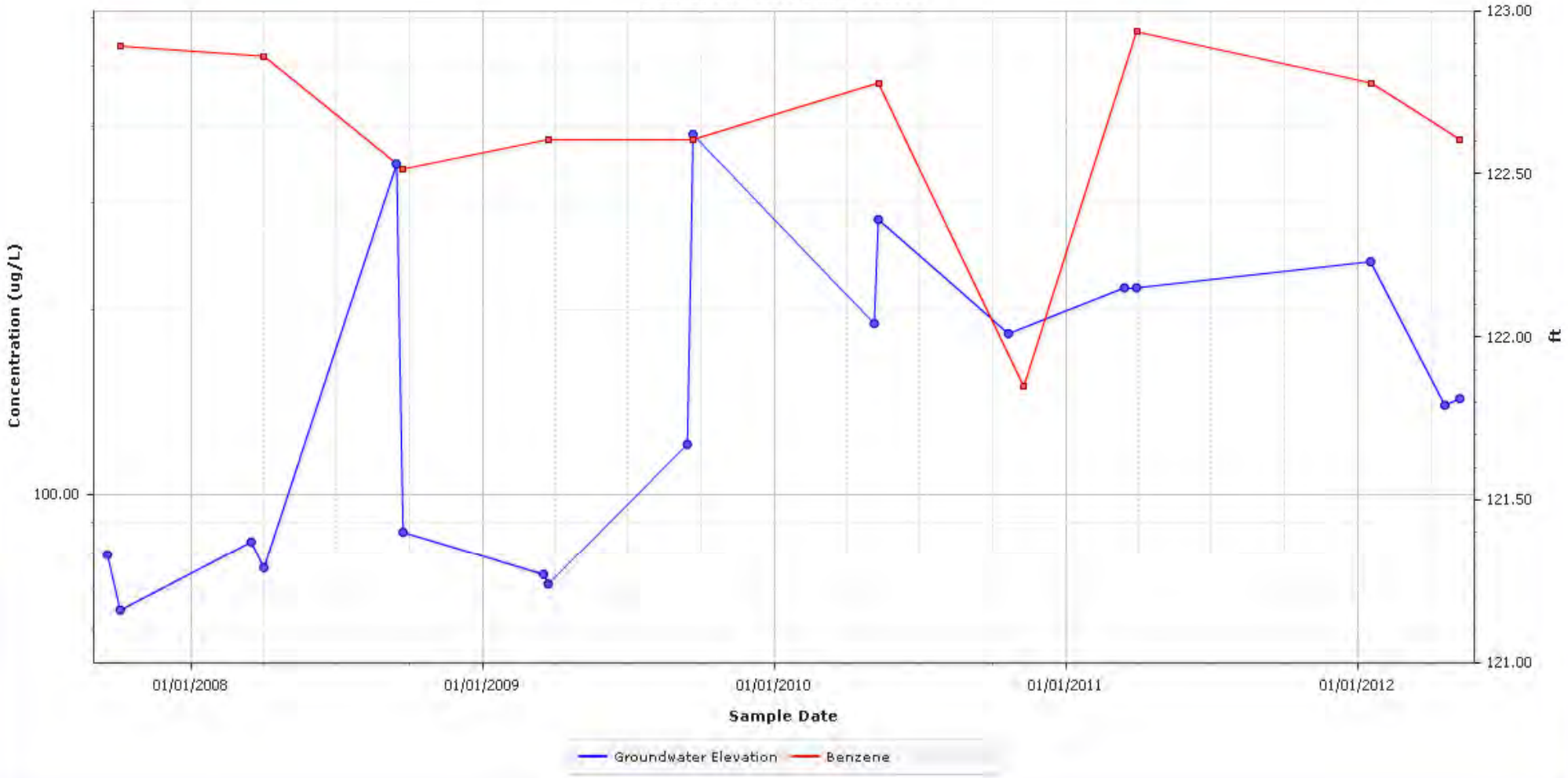


Figure 23: MW-33B MTBE Trend Analysis

Former Chevron Facility122208

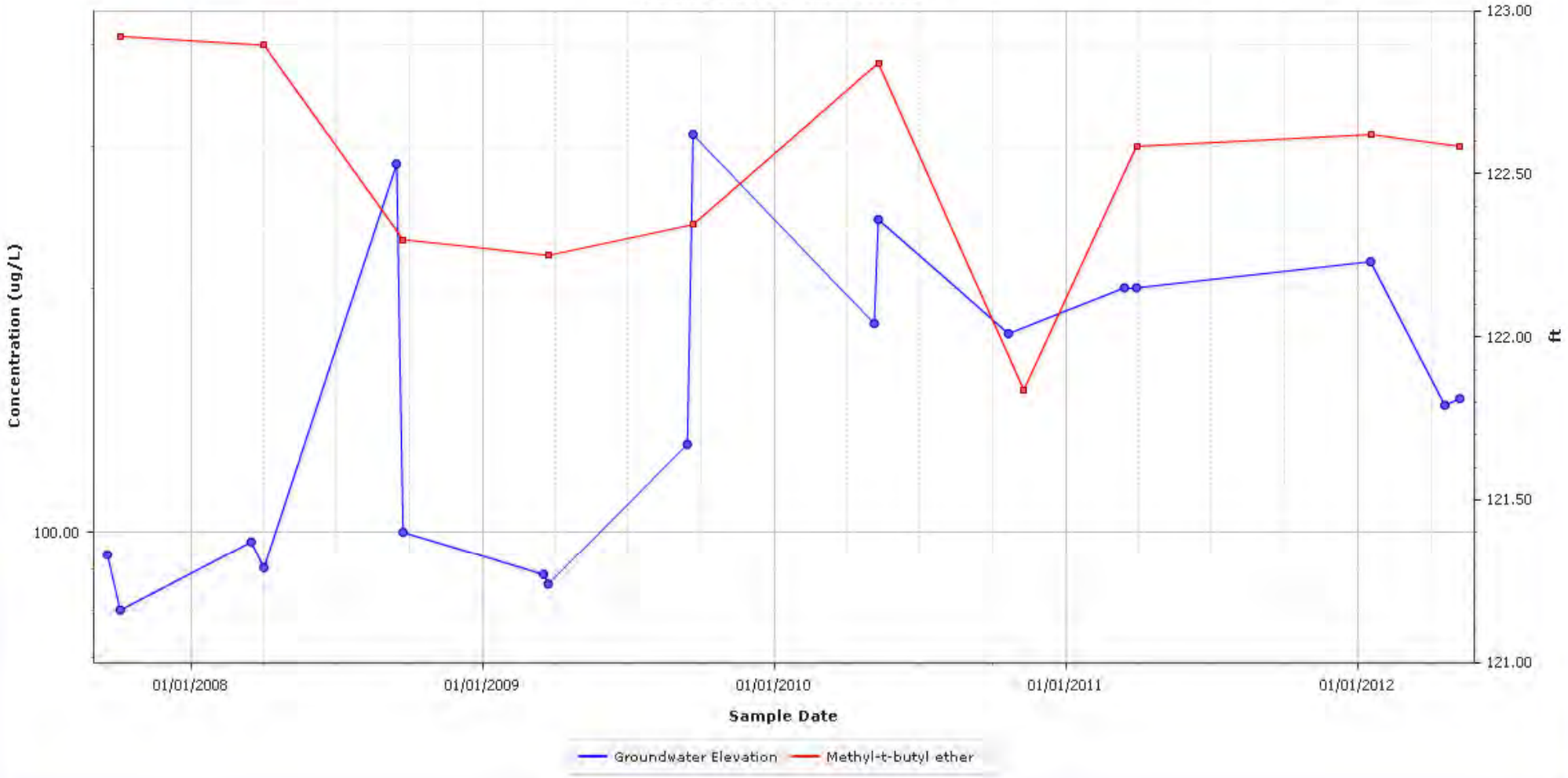


Figure 24: MW-33S Benzene Trend Analysis

Former Chevron Facility 122208

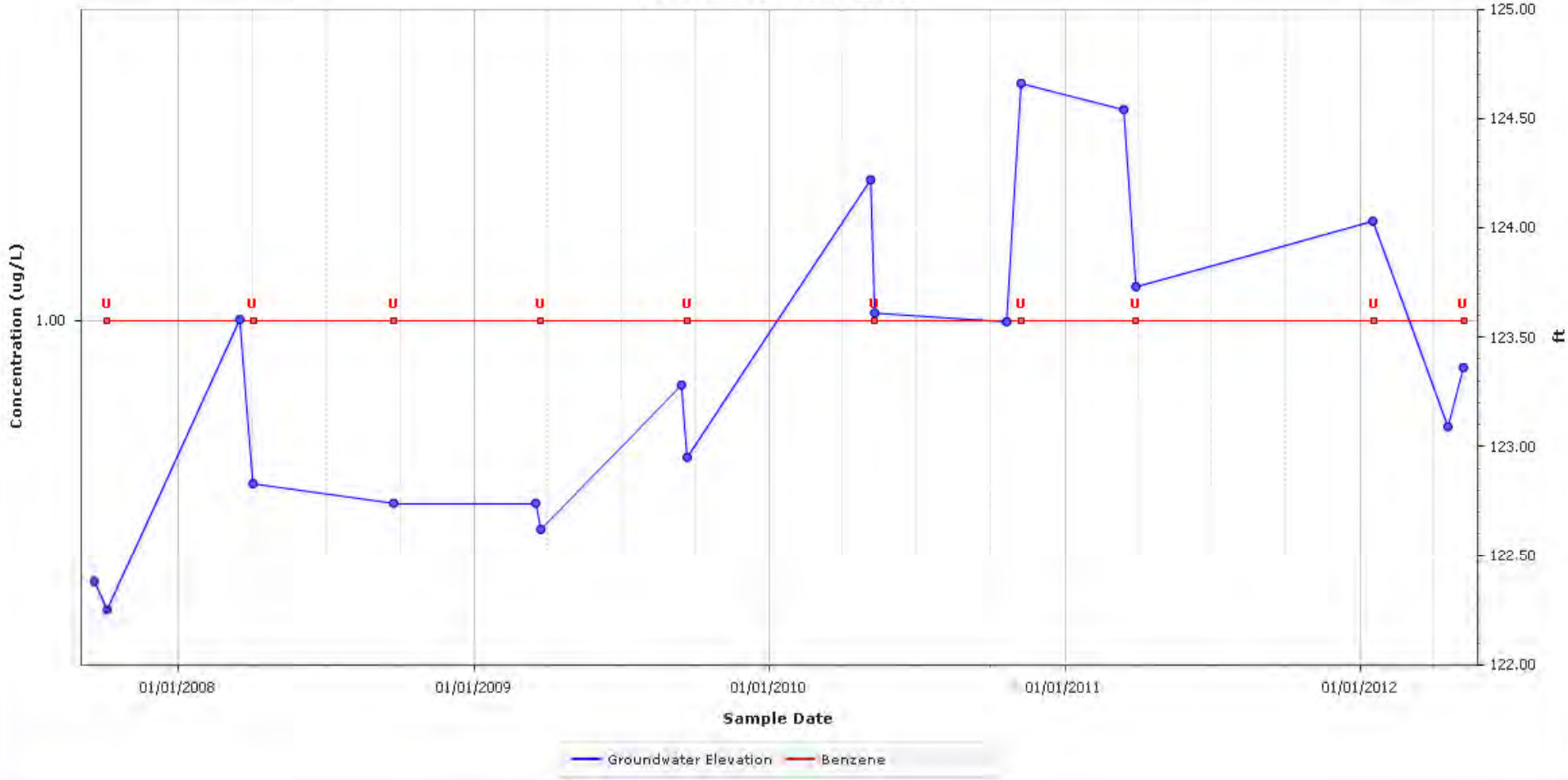
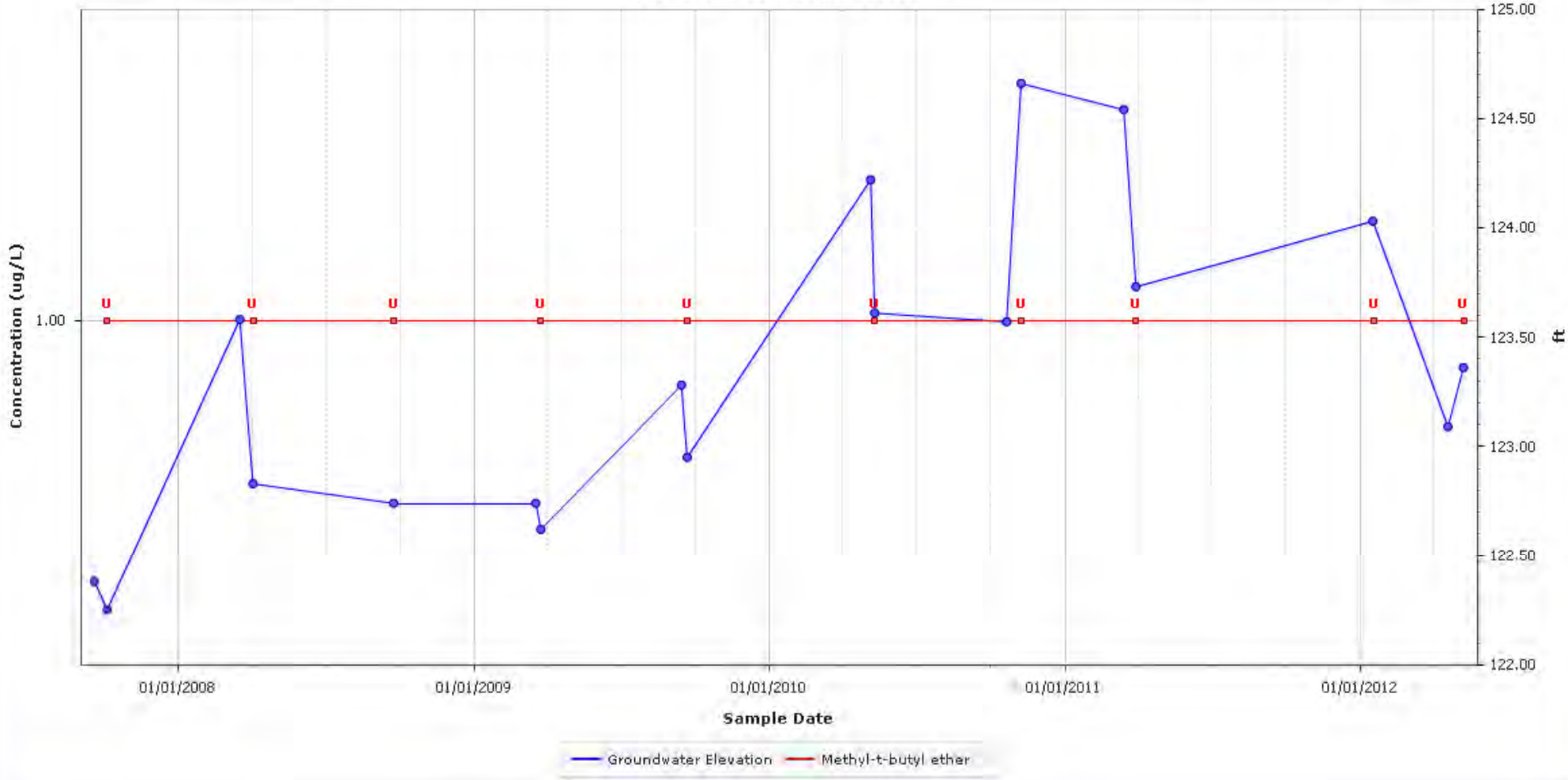


Figure 25: MW-33S MTBE Trend Analysis

Former Chevron Facility 122208



APPENDIX A

DUAL-PHASE EXTRACTION SYSTEM – TOTAL FLUIDS EXTRACTION DATA

APPENDIX A

DUAL-PHASE EXTRACTION SYSTEM – TOTAL FLUIDS EXTRACTION DATA

DESCRIPTION OF DATA TABLES

Chevron uses a central database to store remediation system data and laboratory analytical data. The tabulated data in Tables A-1, A-2, and A-3 is an exported summary of the total fluids extraction system data from the database. These data were recorded by the field technician during site visits. The analytical data for influent samples collected for laboratory analysis (Table A-2) are used to calculate the mass (and to estimate the volume) of hydrocarbons recovered in the dissolved phase. Effluent sample data are included in Table A-3 for comparison with permit limits.

The data table includes all system data collected since July 1, 2011. Data collected prior to this date are available in previous progress reports.

The following table lists the column headings in the table with a brief description of each. Please refer to the Process and Instrumentation Diagram (next page) for a schematic of equipment and sample ports.

Column Heading	Description
Date / Time	Date and time data were recorded.
System Status	System ON or OFF when technician recorded the data.
Influent BTEX (µg/L)	Sum of benzene, toluene, ethylbenzene, and total xylenes from influent sample port SP-1.
Effluent BTEX (µg/L)	Sum of benzene, toluene, ethylbenzene, and total xylenes from effluent sample port SP-3.
Treatment Efficiency (%)	Equation: (Influent-Effluent) / (Influent).
Totalizer Reading (gallons)	Reading on the totalizing flow meter.
Pumped Period (gallons)	Equation: (current totalizer reading) – (previous totalizer reading).
Pumped Total (gallons)	Cumulative total gallons of groundwater recovered.
Period Average (GPM)	Equation: (Gallons Pumped During Period) / (current Date-Time – previous Date-Time)
Hydrocarbons Recovered Period (gallons)[1]	Equation: [Avg. Influent BTEX (ug/L)] * e^6 * (1/0.2) * (3.785 L/gal) * (1 lb/453.6 g) * (gallons pumped) * (1 gal/6.26 lbs). NOTE: Formula assumes BTEX equals 20% of gasoline.
Hydrocarbons Recovered Cumulative (gallons)	Equation: (Hydrocarbons Recovered During Period) + (Previous Cumulative)
Operating Extraction Points	Wells in operation during the reporting period.

Notes

(1) Assumptions: BTEX is 20% of hydrocarbon product by volume; density of hydrocarbon product is 6.26 pounds/gallon. The Average (Avg.) Influent BTEX concentration is defined as the mean of the influent concentration for the current and previous sampling events.

GRS CONTROL PANEL
EOS CONTROLER

CAT OXIDIZER RUNNING (1)
CAT OXIDIZER INLET TEMP T-1 (2)
CAT OXIDIZER OUTLET TEMP T-2 (3)
SVE AIR FLOW (4)
KO TANK VACUUM (4)
RUN/STOP KO PUMP P-1 (HS, XA) (4)
KO TANK LEVEL HI/HI (5)
KO TANK LEVEL HI (6)
KO TANK LEVEL LO (7)
OIL/WATER SEPERATOR LEVEL HI/HI (8)
OIL/WATER SEPERATOR LEVEL HI (8)
OIL/WATER SEPERATOR LEVEL LO (8)
RUN/STOP OIL/WATER SEPERATOR PUMP P-2 (HS, XA) (8)
SVE BLOWER RPM (9)
SVE BLOWER SPEED SET POINT (10)
RUN/STOP SVE BLOWER B-1 (HS, XA) (11)
RUN/STOP AST BLOWER B-2 (HS, XA) (12)
AST BLOWER DISCHARGE FLOW SWITCH (13)
AST LEVEL HI/HI (14)
AST LEVEL HI (15)
AST LEVEL LO (16)
RUN/STOP AST PUMP P-3 (HS, XA) (17)
NOT USED (18)
3-WAY COMPRESSED AIR SOLENOID VALVE (XA) (19)
RUN/STOP COMPRESSER C-1 (HS, XA) (20)
AST EFFLUENT FLOW PULSE (21)
RUN/STOP ANGLE WELL PUMP (22)
ALARM ANGLE WELL PUMP (23)
ALARM LIQUID DETECTOR (27)
RUN/STOP METERING PUMP (24)
ALARM METERING PUMP (25)
ALARM HIGH PRESSURE SWITCH (26)
RTU-02
CONTROL PANEL

SEE SHEET NO. 4 FOR CONTINUATION

SHEET NOTES

1. SEE SHEET NO. 4 FOR MODIFICATION WORK.
2. REMOVE CONNECTIONS FROM WELL PTW-A.
3. METERING PUMP TO BE LOCATED IN THE CARBON SHED ON/ABOVE THE CHEMICAL DRUM.

NON-CLASSIFIED ATMOSPHERE
CLASSIFIED ATMOSPHERE (CLASS 1, DIV 2)

2" PVC
TUBING
DETAIL A

2" PVC 40 (TYP)
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
GP39-A AND GP27-A
MW-22
MW-7
MP-7
RW-3
RW-4
RW-1
RW-5
RW-2
MW-17
PTW-B
DETAIL A
ST
SEE SHEET NOTE 2

FROM ATMOSPHERE
DILUTION VALVE
PI
TO ATMOSPHERE
1 2 3
XA 006
TIT 006A
TIT 006B
M
TI
PSL
FLAME ARRESTER
CATALITIC OXIDIZER- FALCO 300 FALMOUTH PRODUCTS
SP-200
SP-100
3" CS 40

3/4" HOSE (TYP)
1" PVC BALL VALVE (TYP)
TUBING (TYP)
TO WELL RW-1
TO WELL RW-2
TO WELL RW-3
TO WELL MW-7
TO WELL MW-17
TO WELL PTW-B
TO WELL GP-27A
SEE SHEET NOTE 2
WELL PUMPS: QED MOD# AP4T

FT 003
FE 003
PI 003
PIT 003
SILENCER
3" PVC 40
KO TANK
LSHH 003
LSH 003
LSL 003
2" GLOBE VALVE
V1
VFD
STARTER
4
3" PVC 40
SVE B-1 BLOWER TUTHILL MOD# 4009-46L3 25 HP
1" HOSE
3/4" CS
SILENCER
P-1 KO PUMP MOYNO MOD #33201 2 HP
DRAIN
3" CS 40
1" PVC 80
2" PVC 80
LSHH 001
LSH 001
LSL 001
OIL/WATER SEPARATOR HYDRO QUIP MOD #AGM-2SS-60V 30 GPM
2" CS 40
P-2 OIL/WATER SEPARATOR PUMP AMT MOD #3694-97 1.5 HP
B-2 AST BLOWER NEW YORK BLOWER CO 5 HP
FSL 002
4" PVC 40
AS-1 AIR STRIPPER QED MOD #E-Z STACKER 4.4 P
LSHH 002
LSH 002
LSL 002
2" PVC 40
SP-1
P-3 AST PUMP GRUNDFOS CR8 5 HP (42 gpm @ 230 FT. TDH)
1 1/2" PVC 80
2" PVC 80
F-1B
F-1A
BAG FILTER
DRAIN (TYP.)
ROSEDALE PRODUCTS MODEL #L0618112P125CBPB (125 PSI)
FE 004
FQI 004

TO WELL RW-4
TO WELL MW-22
TO WELL GP-39A
TO WELL RW-5
LSH
TRAILER FLOOR SUMP

PSH 005
PSL 005
I
19
20
TSH
120 GAL RECEIVING TANK MAX 200 PSI
3/4" CS 40 AIR LINE
DRAIN
C-1 AIR COMPRESSOR SAYLOR BEALL MOD VT-PL-755-120 10 HP 34.4 CFM @ 175 PSI
CONTROL ROOM

CLASSIFIED ATMOSPHERE (CLASS 1, DIV 2)
NON-CLASSIFIED ATMOSPHERE
ANGLE WELL PUMP EPG MODEL TSP 2-3PT ½ HP
INSIDE ANGLE WELL VAULT RW-5
LIQUID DETECTOR
FUTURE GAC FILTER

VAPOR PHASE GAC FILTERS: TIGG MOD# N-500 400-800 CFM
4" PVC 40
VAPOR OFF GAS
ACTIVATED CARBON
GAC-5
GAC-4
GAC-3 (SPARE)
SP-50
SP-51a
SP-51b
TO ATMOSPHERE

SEE SHEET NOTE 1
SEE SHEET NOTE 3
METERING PUMP LMI ROYTRONICS MODEL A 141 718SI

LIQUID PHASE GAC FILTERS: SIEMENS MOD# LP-67 150 PSIG MAX
GAC FILTER
1" GS
1" HOSE
2" PVC 80
SP-2
SP-3
INSIDE CARBON SHED
SHED FLOOR SUMP
TO STORM DRAIN IN RICKS ROAD

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
EL	SJM	NONE
CHECKED	APPROVED	APPROVED
RWS	RWS	X

Gannett Fleming
BALTIMORE, MARYLAND

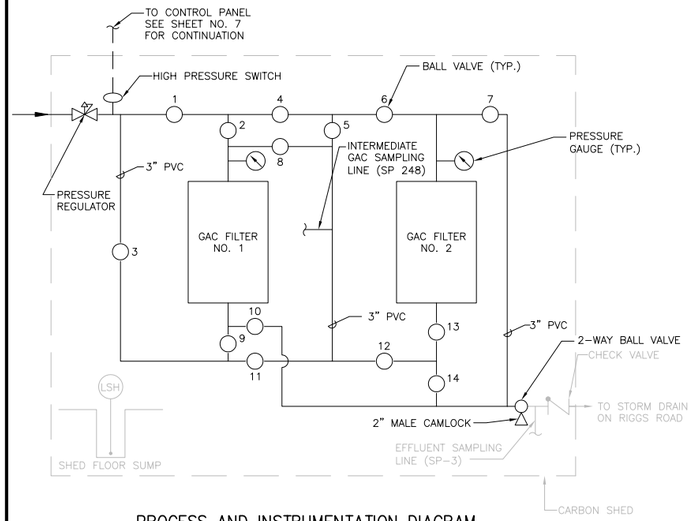
CHEVRON PRODUCTS COMPANY
ATLANTA, GEORGIA

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

AREA A
PROCESS AND INSTRUMENTATION DIAGRAM

JOB NO. 50641
DATE 12/03/09
CAD FILE 122208AA PID

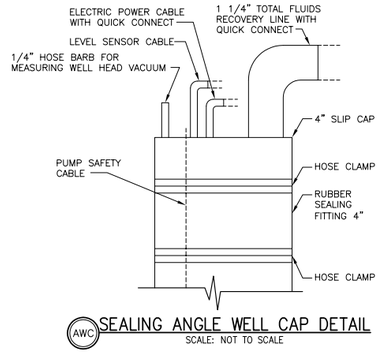
SHEET NO. 7
7 OF 10



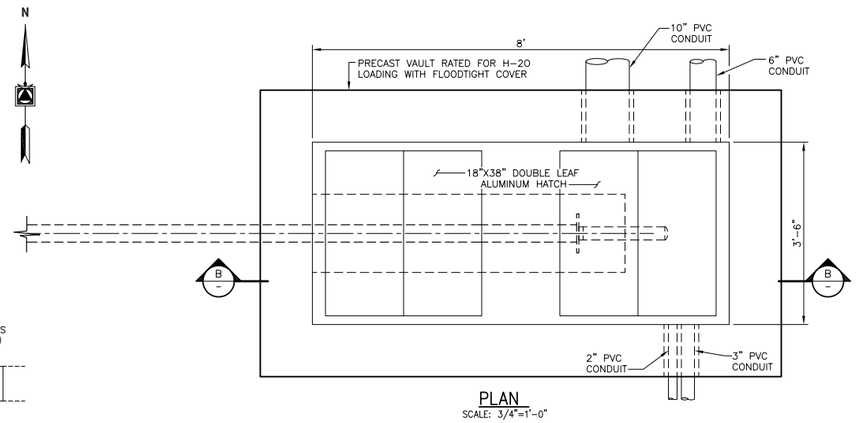
PROCESS AND INSTRUMENTATION DIAGRAM
SCALE: NOT TO SCALE

VALVE	SYSTEM OPERATING MODE						
	SERIES 1→2	SERIES 2→1	GAC 1	GAC 2	BW 1→2	BW 1	BW 2
1	O	O	O	O	C	C	C
2	O	C	O	C	C	C	–
3	C	C	C	C	O	O	O
4	C	O	C	O	–	–	–
5	O	C	–	C	C	C	C
6	O	O	–	O	C	–	C
7	C	C	C	C	O	C	O
8	C	O	C	–	O	O	C
9	O	C	C	–	O	O	C
10	C	O	O	C	C	C	–
11	O	C	–	–	C	C	O
12	C	O	–	C	O	O	O
13	O	O	–	O	O	C	O
14	O	C	C	O	C	O	C

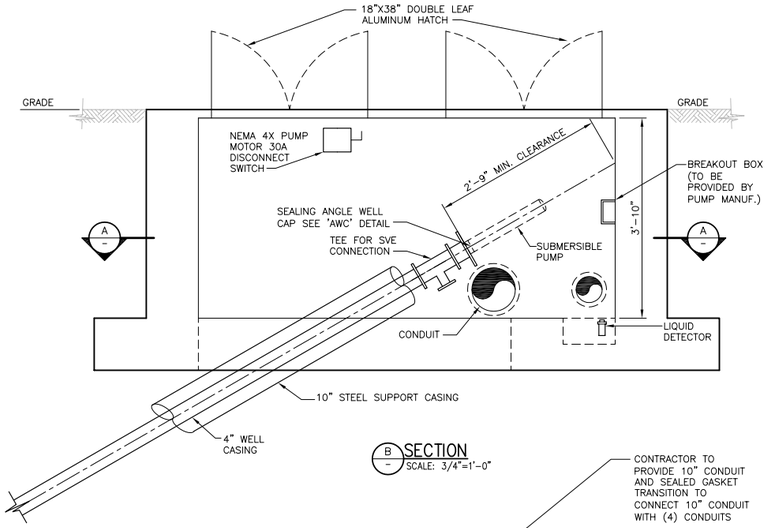
O = OPEN
C = CLOSED
– = IRRELEVANT
BW = BACKWASH



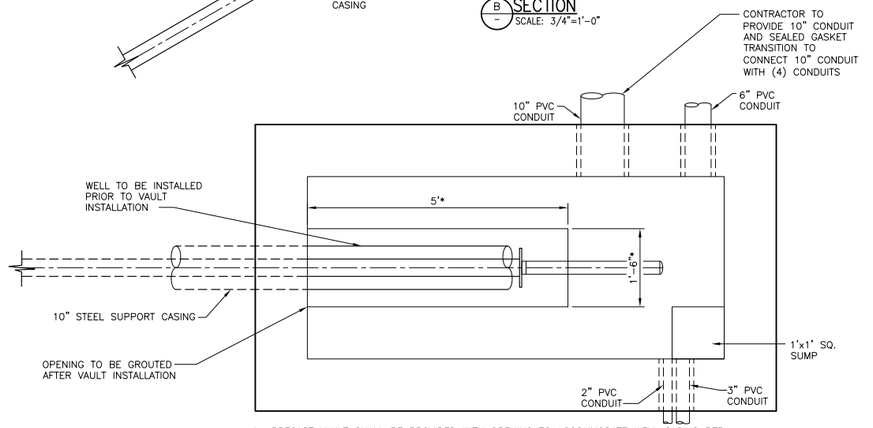
AWC SEALING ANGLE WELL CAP DETAIL
SCALE: NOT TO SCALE



PLAN
SCALE: 3/4"=1'-0"

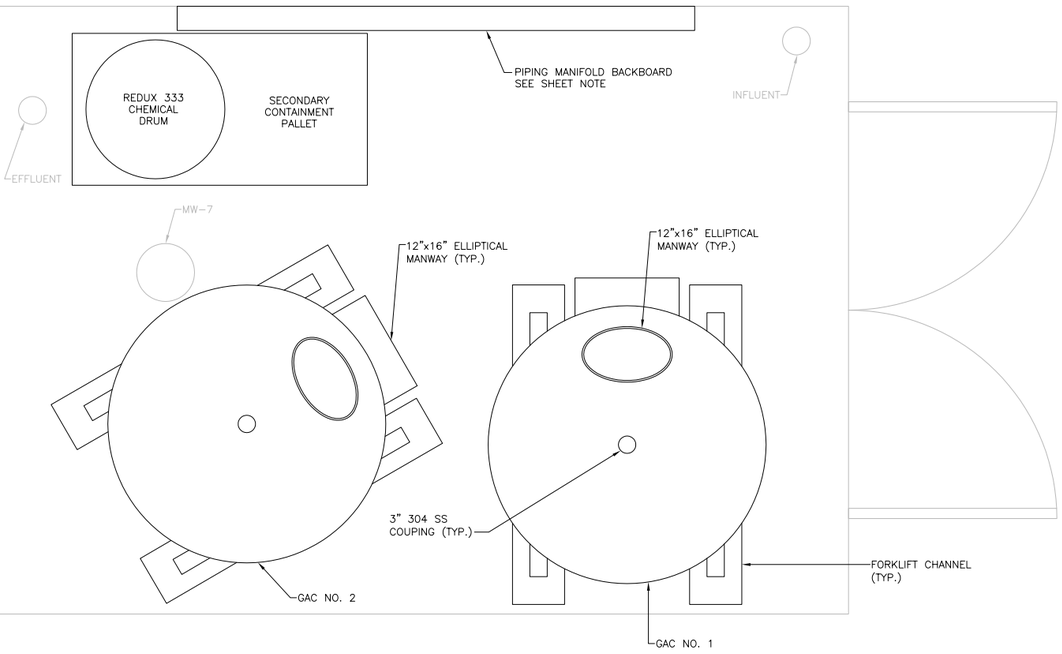


B SECTION
SCALE: 3/4"=1'-0"



* PRECAST VAULT SHALL BE PROVIDED WITH OPENING TO ACCOMMODATE WELL CASING PER THE FOLLOWING NOTES.
1. CONTRACTOR SHALL VERIFY OPENING DIMENSIONS AND LOCATIONS PRIOR TO CASTING THE VAULT.
2. CONTRACTOR SHALL DOWEL BARS, CAST CONCRETE IN PLACE AND CLOSE OPENING WATERTIGHT WITH NON-SHRINK GROUT TO LEVEL WITH BOTTOM OF THE PRECAST VAULT, PER THE PRECAST VAULT MANUFACTURER'S RECOMMENDATIONS.
3. CONTRACTOR SHALL PROTECT WELL CASING FROM CONCRETE IN ALL CONTACT AREAS PER THE PRECAST VAULT MANUFACTURER'S RECOMMENDATIONS.

A SECTION A-A
SCALE: 3/4"=1'-0"



GAC SHED PLAN VIEW
SCALE: 1" = 1'

SHEET NOTE:
PIPING SHALL NOT BLOCK ACCESS TO GAC MANWAYS OR RUN ACROSS THE FLOOR.

ANGLE WELL VAULT

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
EL	SJM	NONE
CHECKED	APPROVED	APPROVED
RWS	RWS	X

Gannett Fleming
BALTIMORE, MARYLAND

CHEVRON PRODUCTS COMPANY
ATLANTA, GEORGIA

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

AREA A
GAC SYSTEM AND ANGLE WELL VAULT

JOB NO.	SHEET NO.
50641	4
DATE	
12/03/09	
CAD FILE	4 OF 10
122208AA GAC	

Gannett Fleming

TABLE A-1: TOTAL FLUIDS EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	System Status	Influent BTEX (µg/L)	Effluent BTEX (µg/L)	Treatment Efficiency (%)	Totalizer Reading (gallons)	Period Pumped (gallons)	Total Pumped (gallons)	Period Average (GPM)	Hydrocarbons Recovered Period (gallons)	Hydrocarbons Recovered Cumul. (gallons)	Operating Extraction Points
8/3/11 11:38	ON	NS	NS	-	44,993,788	0	57,698,710	0.00	-	875.27	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
8/3/11 12:26	OFF	NS	NS	-	44,993,788	0	57,698,710	0.00	-	875.27	Off to repair leak (GW has not yet filled manifold so no water was released from effluent.)
8/4/11 9:50	ON	NS	NS	-	44,993,788	0	57,698,710	0.00	-	875.27	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
8/4/11 10:00	OFF	NS	NS	-	44,993,986	198	57,698,908	19.80	-	875.27	Off to repair leak
8/4/11 12:00	ON	NS	NS	-	44,993,986	0	57,698,908	0.00	-	875.27	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
8/4/11 12:15	OFF	NS	NS	-	44,994,300	314	57,699,222	20.93	-	875.27	Off to test Critical Devices
8/4/11 12:30	ON	NS	NS	-	44,994,300	0	57,699,222	0.00	-	875.27	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
8/10/11 5:47	OFF	NS	NS	-	45,002,856	8,556	57,707,778	1.04	-	875.27	Off on SUMP alarm due to OWS pump leak.
8/10/11 12:45	ON	NS	NS	-	45,002,856	0	57,707,778	0.00	-	875.27	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
8/19/11 9:26	OFF	NS	NS	-	45,108,786	105,930	57,813,708	8.30	-	875.27	Off to re-plumb Pressur High switch.
8/19/11 13:05	ON	2,620	0	100.0	45,108,786	0	57,813,708	0.00	12.85	888.13	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
8/22/11 18:35	OFF	NS	NS	-	45,128,910	20,124	57,833,832	4.33	-	888.13	Off due to blown PLC fuse
9/6/11 12:18	ON	NS	0	-	45,128,910	0	57,833,832	0.00	-	888.13	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
9/6/11 19:30	OFF	NS	NS	-	45,129,788	878	57,834,710	2.03	-	888.13	Off due to blown PLC fuse
9/19/11 9:45	ON	NS	0	-	45,129,788	0	57,834,710	0.00	-	888.13	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
9/26/11 9:10	ON	NS	NS	-	45,201,302	71,514	57,906,224	7.12	-	888.13	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
9/30/11 15:06	ON	NS	0	-	45,243,912	42,610	57,948,834	6.97	-	888.13	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
10/3/11 0:00	ON	1,692	0	100.0	45,270,955	27,043	57,975,877	7.92	2.33	890.46	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)

Gannett Fleming

TABLE A-1: TOTAL FLUIDS EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	System Status	Influent BTEX (µg/L)	Effluent BTEX (µg/L)	Treatment Efficiency (%)	Totalizer Reading (gallons)	Period Pumped (gallons)	Total Pumped (gallons)	Period Average (GPM)	Hydrocarbons Recovered Period (gallons)	Hydrocarbons Recovered Cumul. (gallons)	Operating Extraction Points
10/10/11 10:42	ON	NS	0	-	45,341,212	70,257	58,046,134	6.55	-	890.46	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
10/17/11 8:21	ON	NS	0	-	45,408,989	67,777	58,113,911	6.82	-	890.46	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
10/24/11 8:49	ON	NS	0	-	45,490,346	81,357	58,195,268	8.05	-	890.46	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
10/31/11 0:00	ON	NS	NS	-	45,571,396	81,050	58,276,318	8.49	-	890.46	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
11/7/11 8:11	ON	2,373	0	100.0	45,662,818	91,422	58,367,740	8.65	5.31	895.76	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
11/14/11 8:48	ON	NS	0	-	45,748,837	86,019	58,453,759	8.50	-	895.76	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
11/21/11 8:32	ON	NS	0	-	45,833,800	84,963	58,538,722	8.44	-	895.76	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
11/28/11 7:45	ON	NS	0	-	45,914,598	80,798	58,619,520	8.05	-	895.76	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
12/5/11 9:04	ON	2,107	0	100.0	45,993,192	78,594	58,698,114	7.74	4.93	900.70	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
12/12/11 8:12	OFF	NS	NS	-	46,053,376	60,184	58,758,298	6.00	-	900.70	Off due to compressor fault from bad motor starter
12/12/11 12:23	ON	NS	0	-	46,053,376	0	58,758,298	0.00	-	900.70	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
12/19/11 12:05	ON	NS	0	-	46,115,429	62,053	58,820,351	6.17	-	900.70	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
12/27/11 11:44	ON	NS	0	-	46,203,739	88,310	58,908,661	7.68	-	900.70	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
1/3/12 9:06	ON	1,396	0	100.0	46,271,793	68,054	58,976,715	6.86	3.25	903.95	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)

Gannett Fleming

TABLE A-1: TOTAL FLUIDS EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	System Status	Influent BTEX (µg/L)	Effluent BTEX (µg/L)	Treatment Efficiency (%)	Totalizer Reading (gallons)	Period Pumped (gallons)	Total Pumped (gallons)	Period Average (GPM)	Hydrocarbons Recovered Period (gallons)	Hydrocarbons Recovered Cumul. (gallons)	Operating Extraction Points
1/9/12 8:15	ON	NS	0	-	46,326,002	54,209	59,030,924	6.31	-	903.95	RW1 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 and RW-2 left off for pump repair)
1/16/12 8:19	ON	NS	0	-	46,391,552	65,550	59,096,474	6.50	-	903.95	RW1 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 and RW-2 left off for pump repair)
1/23/12 7:56	ON	0	0	-	46,450,765	59,213	59,155,687	5.89	0.00	903.95	RW1 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 and RW-2 left off for pump repair)
2/2/12 7:30	OFF	NS	NS	-	46,471,278	20,513	59,176,200	1.43	-	903.95	
2/2/12 9:42	ON	1,381	0	100.0	46,471,278	0	59,176,200	0.00	0.09	904.04	RW1 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 and RW-2 left off for pump repair)
2/13/12 9:00	ON	NS	0	-	46,569,575	98,297	59,274,497	6.22	-	904.04	RW1 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 and RW-2 left off for pump repair)
2/20/12 8:00	ON	NS	0	-	46,638,413	68,838	59,343,335	6.87	-	904.04	RW1 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 and RW-2 left off for pump repair)
2/27/12 7:44	ON	NS	0	-	46,709,309	70,896	59,414,231	7.04	-	904.04	RW1 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 and RW-2 left off for pump repair)
3/5/12 7:38	ON	2,790	0	100.0	46,717,810	8,501	59,422,732	0.84	3.43	907.47	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
3/12/12 7:51	ON	NS	0	-	46,790,009	72,199	59,494,931	7.15	-	907.47	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
3/19/12 9:10	ON	NS	0	-	46,862,035	72,026	59,566,957	7.09	-	907.47	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
3/26/12 7:49	ON	NS	0	-	46,932,540	70,505	59,637,462	7.05	-	907.47	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
4/2/12 8:08	OFF	NS	NS	-	46,951,834	19,294	59,656,756	1.91	4.54	912.01	
4/2/12 8:08	ON	3,030	0	100.0	46,951,834	0	59,656,756	0.00	-	912.01	RW1 RW2 RW3 RW-4 MW7 MW17 MW-22 PTWB GP-27R GP-39R (RW-5 left off for pump repair)
4/9/12 9:14	ON	NS	0	-	47,024,967	73,133	59,729,889	7.21	-	912.01	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R (RW-5, MW-7 left off for pump repair)

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TABLE A-1: TOTAL FLUIDS EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	System Status	Influent BTEX (µg/L)	Effluent BTEX (µg/L)	Treatment Efficiency (%)	Totalizer Reading (gallons)	Period Pumped (gallons)	Total Pumped (gallons)	Period Average (GPM)	Hydrocarbons Recovered Period (gallons)	Hydrocarbons Recovered Cumul. (gallons)	Operating Extraction Points
4/16/12 10:00	ON	NS	0	-	47,096,309	71,342	59,801,231	7.05	-	912.01	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R (RW-5, MW-7 left off for pump repair)
4/23/12 9:13	ON	NS	0	-	47,167,767	71,458	59,872,689	7.12	-	912.01	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R (RW-5, MW-7 left off for pump repair)
5/2/12 10:11	ON	1,369	0	100.0	47,253,473	85,706	59,958,395	6.58	4.42	916.43	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R (RW-5, MW-7 left off for pump repair)
5/7/12 9:45	ON	NS	0	-	47,299,407	45,934	60,004,329	6.40	-	916.43	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R (RW-5, MW-7 left off for pump repair)
5/14/12 9:42	ON	NS	0	-	47,380,230	80,823	60,085,152	8.02	-	916.43	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R MW 7 (RW-5 left off for pump repair)
5/23/12 8:25	ON	NS	0	-	47,476,568	96,338	60,181,490	7.48	-	916.43	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R MW-7 RW-5
5/29/12 8:52	ON	NS	NS	-	47,527,707	51,139	60,232,629	5.90	-	916.43	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R MW 7 (RW-5 left off due to bag filter clogging)
6/1/12 13:38	ON	NS	NS	-	47,554,631	26,924	60,259,553	5.85	-	916.43	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R MW 7
6/5/12 8:50	ON	341	0	100.0	47,587,103	32,472	60,292,025	5.93	1.90	918.33	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R MW-7 RW-5
6/11/12 8:33	ON	NS	0	-	47,638,948	51,845	60,343,870	6.01	-	918.33	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R MW-7 RW-5
6/25/12 8:21	OFF	NS	NS	-	47,706,635	67,687	60,411,557	3.36	-	918.33	Off due to ASTHH
6/25/12 10:50	ON	NS	NS	-	47,706,635	0	60,411,557	0.00	-	918.33	RW1 RW2 RW3 RW-4 MW17 MW-22 PTWB GP-27R GP-39R MW-7 RW-5

Notes:

(1) Hydrocarbons Recovered Period (gallons) = (avg. inf. conc.) x (e-6) x (1/0.2) x (3.785 L/gal) x (1 lb/453.6 g) x (gallons pumped) x (1 gal/6.26 lbs).

(2) Formula assumes BTEX equals 20% of gasoline.

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TABLE A-2: TOTAL FLUIDS EXTRACTION SYSTEM INFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Date/Time	Benzene (µg/L)	Toluene (µg/L)	E. Benzene (µg/L)	Xylenes (µg/L)	BTEX (µg/L)	MTBE (µg/L)
09/9/2009 0900	1,200	1,700	150	1,010	4,060	600
10/28/09 10:00	130	200	19	163	512	180
11/23/09 14:35	100	200	23	187	510	130
12/22/09 13:00	410	600	70	520	1,600	300
1/4/10 10:41	400	590	55	400	1,445	340
2/2/10 8:50	150	300	26	240	716	160
3/1/10 9:08	150	260	26	206	642	210
4/27/10 12:10	460	800	85	590	1,935	360
5/3/10 10:25	390	650	57	470	1,567	460
6/2/10 13:55	630	1,100	130	730	2,590	340
7/12/10 11:35	1,800	2,800	300	1,770	6,670	900
8/9/10 14:42	550	850	99	670	2,169	430
9/15/10 13:10	150	260	25	228	663	160
10/4/10 13:08	550	810	59	460	1,879	220
11/5/10 11:20	580	890	61	490	2,021	360
12/6/10 10:36	240	380	30	250	900	260
1/3/11 10:40	480	630	67	370	1,547	250
2/2/11 12:03	150	230	21	155	556	99
8/19/11 13:20	740	1,000	110	770	2,620	480
10/3/11 9:10	470	680	62	480	1,692	560
11/7/11 7:51	700	910	83	680	2,373	580
12/5/11 9:00	560	860	77	610	2,107	530
1/3/12 8:30	380	560	56	400	1,396	440
2/2/12 13:06	320	580	61	420	1,381	350
3/5/12 12:54	520	1,100	150	1,020	2,790	490
4/2/12 10:35	660	1,400	140	830	3,030	430
5/2/12 10:55	300	600	59	410	1,369	370
6/5/12 8:57	81	140	13	107	341	160

Notes:

(1) ND: Not Detected above reporting limit.

(2) <##: Parameter not detected above the reporting limit.

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TABLE A-3: TOTAL FLUIDS EXTRACTION SYSTEM EFFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	BTEX (µg/L)	MTBE (µg/L)
9/9/09 9:10	<1	<1	<1	<3	0	1.5
9/17/09 15:50	<1	<1	<1	<3	0	6.5
9/21/09 12:24	<1	<1	<1	<3	0	8.9
10/5/09 13:01	<1	<1	<1	<3	0	18
10/12/09 7:20	<1	<1	<1	<3	0	14
10/19/09 12:58	<1	<1	<1	<3	0	36
10/28/09 8:45	<1	<1	<1	<10	0	33
11/2/09 11:55	<1	<1	<1	<10	0	34
11/9/09 8:45	<1	<1	<1	<10	0	36
11/23/09 14:45	<1	<1	<1	<10	0	39
12/4/09 12:51	<1	<1	<1	<10	0	63
12/10/09 12:15	<1	<1	<1	<10	0	66
12/22/09 13:25	<1	<1	<1	<10	0	<1
12/28/09 13:00	<1	<1	<1	<10	0	<1
1/4/10 10:52	<1	<1	<1	<10	0	<1
1/12/10 12:57	<1	<1	<1	<10	0	<1
1/18/10 13:00	<1	<1	<1	<10	0	1.2
1/25/10 10:00	<1	<1	<1	<10	0	2.7
2/2/10 8:00	<1	<1	<1	<10	0	4.9
2/16/10 13:00	<1	<1	<1	<10	0	8.4
2/22/10 12:50	<1	<1	<1	<10	0	9.3
3/1/10 9:14	<1	<1	<1	<10	0	13
3/8/10 11:30	<1	<1	<1	<10	0	12
3/15/10 9:50	<1	<1	<1	<10	0	15
3/22/10 12:06	<1	<1	<1	<10	0	19
4/20/10 14:30	<1	<1	<1	<10	0	9
4/27/10 12:26	<1	<1	<1	<10	0	15
5/3/10 10:33	<1	<1	<1	<10	0	17
5/10/10 12:15	<1	<1	<1	<10	0	19
5/17/10 9:00	<1	<1	<1	<10	0	16
5/24/10 11:30	<1	<1	<1	<10	0	19
6/2/10 14:10	<1	<1	<1	<10	0	17
6/7/10 14:50	<1	<1	<1	<10	0	17
6/14/10 12:00	<1	<1	<1	<10	0	19
7/12/10 11:25	<1	<1	<1	<10	0	20
7/19/10 12:14	<1	<1	<1	<10	0	17
7/26/10 10:00	<1	<1	<1	<10	0	13
8/4/10 14:02	<1	<1	<1	<10	0	<1
8/9/10 14:49	<1	<1	<1	<10	0	<1
8/16/10 9:50	<1	<1	<1	<10	0	<1
8/23/10 8:53	<1	<1	<1	<10	0	<1
9/7/10 15:10	<1	<1	<1	<10	0	<1
9/15/10 13:17	<1	<1	<1	<10	0	<1
9/20/10 8:55	<1	<1	<1	<10	0	<1
9/27/10 15:05	<1	<1	<1	<10	0	<1
10/4/10 13:12	<1	<1	<1	<10	0	<1
10/11/10 13:50	<1	<1	<1	<10	0	<1
10/19/10 13:30	<1	<1	<1	<10	0	1.1

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TABLE A-3: TOTAL FLUIDS EXTRACTION SYSTEM EFFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	BTEX (µg/L)	MTBE (µg/L)
10/25/10 14:00	<1	<1	<1	<10	0	3.4
11/5/10 11:12	<1	<1	<1	<10	0	6.6
11/15/10 10:15	<1	<1	<1	<10	0	7.6
11/29/10 14:27	<1	<1	<1	<10	0	10
11/30/10 17:00	<1	<1	<1	<10	0	8.5
12/6/10 10:25	<1	<1	<1	<10	0	9.5
12/13/10 10:37	<1	<1	<1	<10	0	6.7
12/20/10 10:30	<1	<1	<1	<10	0	11
12/27/10 13:15	<1	<1	<1	<10	0	8
1/3/11 10:45	<1	<1	<1	<10	0	9.7
1/10/11 11:15	<1	<1	<1	<10	0	<1
1/19/11 10:15	<1	<1	<1	<10	0	3.9
1/25/11 12:32	<1	<1	<1	<10	0	9.5
2/2/11 12:12	<1	<1	<1	<10	0	9.7
2/7/11 10:45	<1	<1	<1	<10	0	8.8
2/21/11 9:55	<1	<1	<1	<5	0	12
2/28/11 9:00	<1	<1	<1	<5	0	12
3/21/11 12:15	<1	<1	<1	<5	0	16
8/19/11 13:42	<1	<1	<1	<10	0	<1
9/6/11 13:50	<1	<1	<1	<10	0	<1
9/19/11 9:11	<1	<1	<1	<10	0	<1
9/30/11 9:30	<1	<1	<1	<10	0	<1
10/3/11 9:03	<1	<1	<1	<10	0	<1
10/10/11 10:57	<1	<1	<1	<10	0	<1
10/17/11 10:45	<1	<1	<1	<10	0	<1
10/24/11 8:51	<1	<1	<1	<10	0	<1
11/7/11 8:03	<1	<1	<1	<10	0	<1
11/14/11 9:07	<1	<1	<1	<10	0	1.4
11/21/11 8:35	<1	<1	<1	<10	0	1.8
11/28/11 7:41	<1	<1	<1	<10	0	3.1
12/5/11 9:05	<1	<1	<1	<10	0	4.3
12/12/11 13:10	<1	<1	<1	<10	0	3.4
12/19/11 12:10	<1	<1	<1	<10	0	2.2
12/27/11 12:33	<1	<1	<1	<10	0	2.7
1/3/12 8:45	<1	<1	<1	<10	0	2.3
1/9/12 8:19	<1	<1	<1	<10	0	4.1
1/16/12 10:13	<1	<1	<1	<10	0	4.6
1/23/12 8:17	<1.0	<1.0	<1.0	<10	0	2.6
2/2/12 13:14	<1	<1	<1	<10	0	5
2/13/12 11:20	<1	<1	<1	<10	0	8.8
2/20/12 9:38	<1	<1	<1	<10	0	7.6
2/27/12 8:10	<1	<1	<1	<10	0	7.5
3/5/12 13:05	<1	<1	<1	<10	0	6.6
3/12/12 8:20	<1	<1	<1	<10	0	5.2
3/19/12 10:15	<1	<1	<1	<10	0	4.5
3/26/12 8:25	<1	<1	<1	<10	0	4.5
4/2/12 10:15	<1	<1	<1	<10	0	3.2
4/9/12 9:40	<1	<1	<1	<10	0	3.5

TABLE A-3: TOTAL FLUIDS EXTRACTION SYSTEM EFFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	BTEX (µg/L)	MTBE (µg/L)
4/16/12 9:00	<1	<1	<1	<10	0	3.7
4/23/12 9:15	<1	<1	<1	<10	0	2.1
5/2/12/ 1045	<1	<1	<1	<10	0	2.3
5/7/12 10:30	<1	<1	<1	<10	0	2.3
5/14/12 10:58	<1	<1	<1	<10	0	3.2
5/23/12 9:10	<1	<1	<1	<10	0	2.1
6/5/12 9:10	<1	<1	<1	<10	0	2

Notes:

(1) ND: Not Detected above reporting limit.

(2) <##: Parameter not detected above the reporting limit.

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TABLE A-4: SOIL VAPOR EXTRACTION SYSTEM INFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	TPH (µg/L)	Flow (SCFM)	Extraction Rate Benzene (lbs/hr)	Extraction Rate TPH (lbs/day)
11/21/11 0:00	4.10	5.60	0.35	2.60	20	165	0.0025	0.30
12/27/11 0:00	<0.0064	0.02	<.0087	<.0087	<2	186	<0.000004	<0.03
2/20/12 0:00	1.70	2.40	0.27	1.90	7	181	0.0012	0.12
3/12/12 0:00	0.05	0.14	<0.017	0.11	<4.1	194	0.0000	<0.07
4/9/12 0:00	2.20	2.90	0.20	1.30	18	184	0.0015	0.30
5/23/12 0:00	0.02	0.19	<.0087	0.09	<2	181	0.0000	<0.03
6/5/12 0:00	0.09	0.39	0.07	0.53	4	181	0.0001	0.07

Notes:

(1) Benzene (lbs/h) = (benzene conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (60 min/hr).

(2) TPH (lbs/day) = (TPH conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (1440 min/day).

(3) ug/L = (ppmv) x (MW g/mol) x (mol/24.45 L), where MW benzene = 78 and MW TPH = 92.

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TABLE A-5: SOIL VAPOR EXTRACTION SYSTEM EFFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	TPH (µg/L)	Flow (SCFM)	Discharge Rate Benzene (lbs/hr)	Discharge Rate TPH (lbs/day)
11/21/11 0:00	1.80	2.60	0.25	1.40	10	165	0.0011	0.14
12/27/11 0:00	1.10	1.60	0.11	0.71	7	186	0.0008	0.11
2/20/12 0:00	0.52	0.61	0.05	0.38	7	181	0.0004	0.11
3/12/12 0:00	0.90	1.50	0.16	1.00	7	194	0.0007	0.12
4/9/12 0:00	0.83	1.50	0.19	1.10	9	184	0.0006	0.14
5/23/12 0:00	0.86	0.89	0.07	0.40	5	181	0.0006	0.09
6/5/12 0:00	1.00	1.40	0.15	1.30	9	181	0.0007	0.15

Notes:

(1) Benzene (lbs/h) = (benzene conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (60 min/hr).

(2) TPH (lbs/day) = (TPH conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (1440 min/day).

(3) ug/L = (ppmv) x (MW g/mol) x (mol/24.45 L), where MW benzene = 78 and MW TPH = 92.

APPENDIX B

DUAL-PHASE EXTRACTION SYSTEM – SOIL VAPOR EXTRACTION DATA

APPENDIX B

DUAL-PHASE EXTRACTION SYSTEM – SOIL VAPOR EXTRACTION DATA

DESCRIPTION OF DATA TABLES

Overview

Chevron uses a central database to store remediation system data and laboratory analytical data. The tabulated data in Tables B-1, B-2 and B-3 is an exported summary of soil vapor extraction ("SVE") system data from the database. These data were recorded by the field technician during site visits. Analytical data for influent samples collected for laboratory analysis are included in Table B-2 to calculate the mass recovery rates of total petroleum hydrocarbons and benzene. Effluent sample data are included in Table B-3 for comparison with permit limits.

The data tables include all system data collected since July 1, 2011. Data collected prior to this date are available in previous progress reports.

The following table lists the column headings in the table with a brief description of each. Please refer to the Process and Instrumentation Diagram (Appendix A) for a schematic of equipment and sample ports.

Column Heading	Description
Date / Time	Date and time data were recorded.
System Status	System ON or OFF when technician recorded the data.
Hour Meter (hours)	Field measurement of the hour meter.
Manifold Vacuum (in Hg)	Field measurement of vacuum in manifold.
Influent (ppmv)	Field measurement of vapor concentration prior to treatment using a photoionization detector.
Influent (cfm)	Field measurement of total vapor flow in manifold.
Effluent (ppmv)	Field measurement of vapor concentration after treatment using a photoionization detector.
Treatment Efficiency (%)	Equation: (Influent-Effluent) / (Influent).
Hydrocarbons Recovered (lbs/day) [1]	Equation: [(Influent) / (10^{-6})] * [Manifold Extraction-Flow Rate] * CV1
Hydrocarbons Recovered Period (gal)	Equation: [(Avg. Influent) x (10^{-6})] * [Avg. Manifold Extraction-Flow Rate]
Hydrocarbons Recovered Cumulative (gal)	Equation: (Avg. Influent BTEX) * (1 L / 0.26 gal) * (lb/454x10^{6} µg) * (current Total Gallons Pumped – previous Total Gallons Pumped on last sampling date) * (gal hydrocarbons / 6.48 lbs hydrocarbons) * (0.2 gal BTEX / gal hydrocarbons).
Operating Extraction Points	Wells in operation during the reporting period.

Notes

(1) Assumptions: Hydrocarbon molecular weight is 92 grams/mole; vapor behaves like an ideal gas; Average (Avg.) Influent (ppmv) and flow rate (Manifold Extraction in the table) are averages between the current and last events. Unit conversion factors (CV) equations are:

CV1 = (92 grams/mole) * (1 mol/24.45 L) * (28.32 L/ft^3) * (1440 min/day) * (1 lb/454 grams) = 338 min*lbs/day.

CV2 = (92 grams/mole) * (1 mol/24.45 L) * (28.32 L/ft^3) * (Runtime in minutes) * (1 lb/454 grams) = 0.235 min*lbs.

GRS CONTROL PANEL
EOS CONTROLER

CAT OXIDIZER RUNNING (1)
CAT OXIDIZER INLET TEMP T-1 (2)
CAT OXIDIZER OUTLET TEMP T-2 (3)
SVE AIR FLOW (4)
KO TANK VACUUM (4)
RUN/STOP KO PUMP P-1 (HS, XA) (4)
KO TANK LEVEL HI/HI (5)
KO TANK LEVEL HI (6)
KO TANK LEVEL LO (7)
OIL/WATER SEPERATOR LEVEL HI/HI (8)
OIL/WATER SEPERATOR LEVEL HI (8)
OIL/WATER SEPERATOR LEVEL LO (8)
RUN/STOP OIL/WATER SEPERATOR PUMP P-2 (HS, XA) (8)
SVE BLOWER RPM (9)
SVE BLOWER SPEED SET POINT (10)
RUN/STOP SVE BLOWER B-1 (HS, XA) (11)
RUN/STOP AST BLOWER B-2 (HS, XA) (12)
AST BLOWER DISCHARGE FLOW SWITCH (13)
AST LEVEL HI/HI (14)
AST LEVEL HI (15)
AST LEVEL LO (16)
RUN/STOP AST PUMP P-3 (HS, XA) (17)
NOT USED (18)
3-WAY COMPRESSED AIR SOLENOID VALVE (XA) (19)
RUN/STOP COMPRESSER C-1 (HS, XA) (20)
AST EFFLUENT FLOW PULSE (21)
RUN/STOP ANGLE WELL PUMP (22)
ALARM ANGLE WELL PUMP (23)
ALARM LIQUID DETECTOR (27)
RUN/STOP METERING PUMP (24)
ALARM METERING PUMP (25)
ALARM HIGH PRESSURE SWITCH (26)
RTU-02
CONTROL PANEL

SEE SHEET NO. 4 FOR CONTINUATION

SHEET NOTES

1. SEE SHEET NO. 4 FOR MODIFICATION WORK.
2. REMOVE CONNECTIONS FROM WELL PTW-A.
3. METERING PUMP TO BE LOCATED IN THE CARBON SHED ON/ABOVE THE CHEMICAL DRUM.

NON-CLASSIFIED ATMOSPHERE
CLASSIFIED ATMOSPHERE (CLASS 1, DIV 2)

2" PVC
TUBING
DETAIL A

2" PVC 40 (TYP)
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
SVE PIPE FROM WELL
GP39-A AND GP27-A
MW-22
MW-7
MP-7
RW-3
RW-4
RW-1
RW-5
RW-2
MW-17
PTW-B
DETAIL A
ST
SEE SHEET NOTE 2

FROM ATMOSPHERE
DILUTION VALVE
PI
TO ATMOSPHERE
1 2 3
XA 006
TIT 006A
TIT 006B
M
TI
PSL
FLAME ARRESTER
CATALITIC OXIDIZER- FALCO 300 FALMOUTH PRODUCTS
SP-200
SP-100
3" CS 40

3/4" HOSE (TYP)
1" PVC BALL VALVE (TYP)
TUBING (TYP)
TO WELL RW-1
TO WELL RW-2
TO WELL RW-3
TO WELL MW-7
TO WELL MW-17
TO WELL PTW-B
TO WELL GP-27A
SEE SHEET NOTE 2
WELL PUMPS: QED MOD# AP4T

FT 003
FE 003
PI 003
PIT 003
SILENCER
3" PVC 40
KO TANK
LSHH 003
LSH 003
LSL 003
2" GLOBE VALVE
V1
VFD
STARTER
4
3" PVC 40
SVE B-1 BLOWER TUTHILL MOD# 4009-46L3 25 HP
1" HOSE
3/4" CS
SILENCER
P-1 KO PUMP MOYNO MOD #33201 2 HP
DRAIN
3" CS 40
1" PVC 80
2" PVC 80
LSHH 001
LSH 001
LSL 001
OIL/WATER SEPARATOR HYDRO QUIP MOD #AGM-2SS-60V 30 GPM
2" CS 40
P-2 OIL/WATER SEPARATOR PUMP AMT MOD #3694-97 1.5 HP
B-2 AST BLOWER NEW YORK BLOWER CO 5 HP
FSL 002
4" PVC 40
AS-1 AIR STRIPPER QED MOD #E-Z STACKER 4.4 P
LSHH 002
LSH 002
LSL 002
2" PVC 40
SP-1
P-3 AST PUMP GRUNDFOS CR8 5 HP (42 gpm @ 230 FT. TDH)
1 1/2" PVC 80
2" PVC 80
F-1B
F-1A
BAG FILTER
DRAIN (TYP.)
ROSEDALE PRODUCTS MODEL #L0618112P125CBPB (125 PSI)
FE 004
FQI 004

TO WELL RW-4
TO WELL MW-22
TO WELL GP-39A
TO WELL RW-5
LSH
TRAILER FLOOR SUMP

PSH 005
PSL 005
I
19
20
TSH
120 GAL RECEIVING TANK MAX 200 PSI
3/4" CS 40 AIR LINE
DRAIN
C-1 AIR COMPRESSOR SAYLOR BEALL MOD VT-PL-755-120 10 HP 34.4 CFM @ 175 PSI
CONTROL ROOM

CLASSIFIED ATMOSPHERE (CLASS 1, DIV 2)
NON-CLASSIFIED ATMOSPHERE
ANGLE WELL PUMP EPG MODEL TSP 2-3PT ½ HP
INSIDE ANGLE WELL VAULT RW-5
LIQUID DETECTOR
FUTURE GAC FILTER

VAPOR PHASE GAC FILTERS: TIGG MOD# N-500 400-800 CFM
4" PVC 40
VAPOR OFF GAS
ACTIVATED CARBON
GAC-5
GAC-4
GAC-3 (SPARE)
SP-50
SP-51a
SP-51b
TO ATMOSPHERE

SEE SHEET NOTE 1
SEE SHEET NOTE 3
METERING PUMP LMI ROYTRONICS MODEL A 141 718SI

LIQUID PHASE GAC FILTERS: SIEMENS MOD# LP-67 150 PSIG MAX
GAC FILTER
1" GS
1" HOSE
2" PVC 80
SP-2
SP-3
INSIDE CARBON SHED
SHED FLOOR SUMP
TO STORM DRAIN IN RICKS ROAD

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
EL	SJM	NONE
CHECKED	APPROVED	APPROVED
RWS	RWS	X

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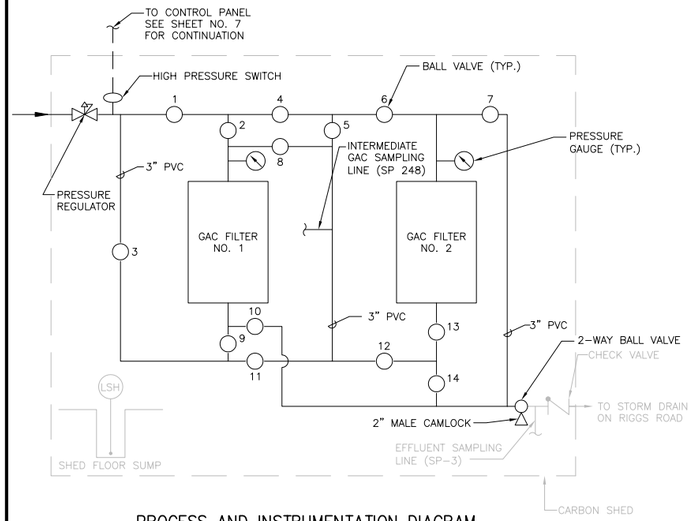
CHEVRON PRODUCTS COMPANY
ATLANTA, GEORGIA

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

AREA A
PROCESS AND INSTRUMENTATION DIAGRAM

JOB NO. 50641
DATE 12/03/09
CAD FILE 122208AA PID

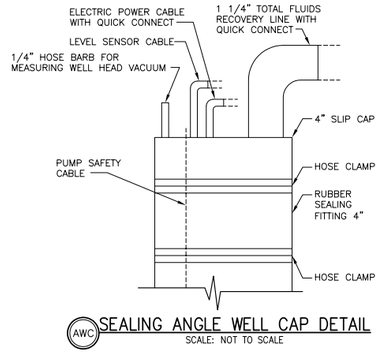
SHEET NO. 7
7 OF 10



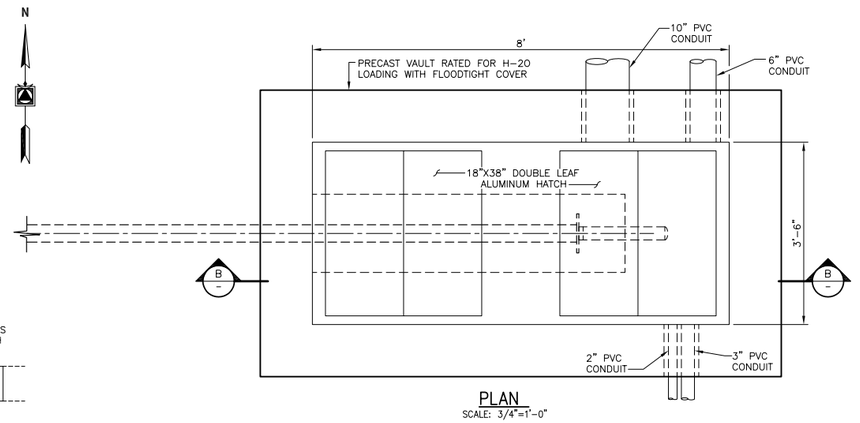
PROCESS AND INSTRUMENTATION DIAGRAM
SCALE: NOT TO SCALE

VALVE	SYSTEM OPERATING MODE						
	SERIES 1→2	SERIES 2→1	GAC 1	GAC 2	BW 1→2	BW 1	BW 2
1	O	O	O	O	C	C	C
2	O	C	O	C	C	C	–
3	C	C	C	C	O	O	O
4	C	O	C	O	–	–	–
5	O	C	–	C	C	C	C
6	O	O	–	O	C	–	C
7	C	C	C	C	O	C	O
8	C	O	C	–	O	O	C
9	O	C	C	–	O	O	C
10	C	O	O	C	C	C	–
11	O	C	–	–	C	C	O
12	C	O	–	C	O	O	O
13	O	O	–	O	O	C	O
14	O	C	C	O	C	O	C

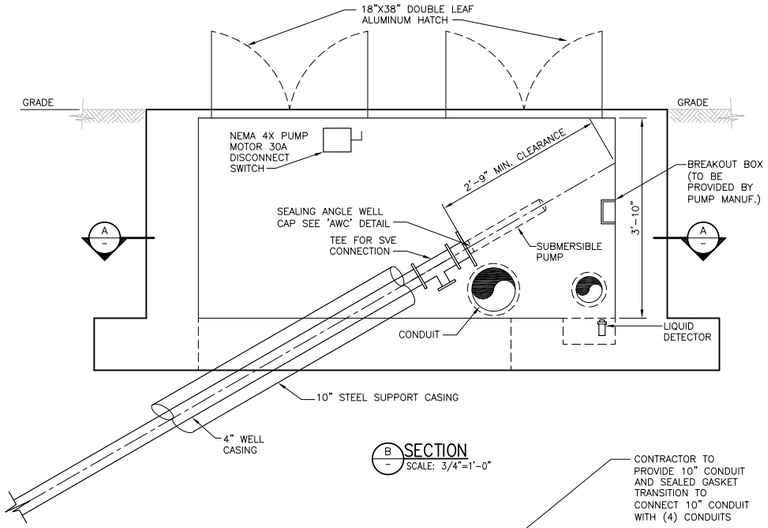
O = OPEN
C = CLOSED
– = IRRELEVANT
BW = BACKWASH



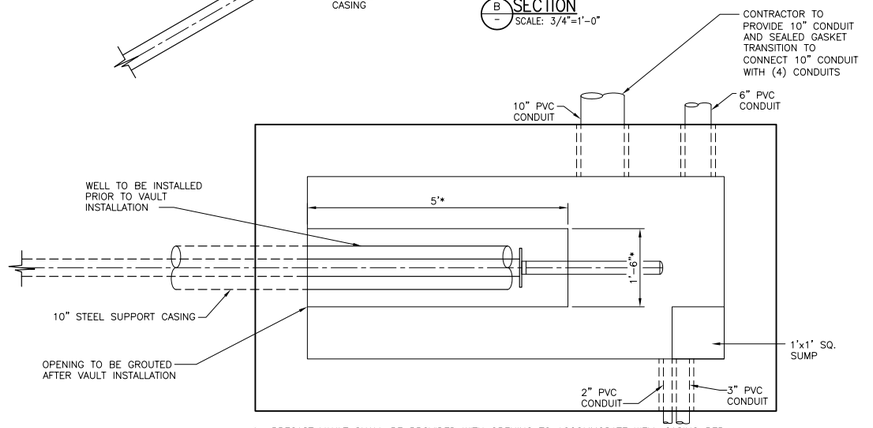
AWC SEALING ANGLE WELL CAP DETAIL
SCALE: NOT TO SCALE



PLAN
SCALE: 3/4"=1'-0"

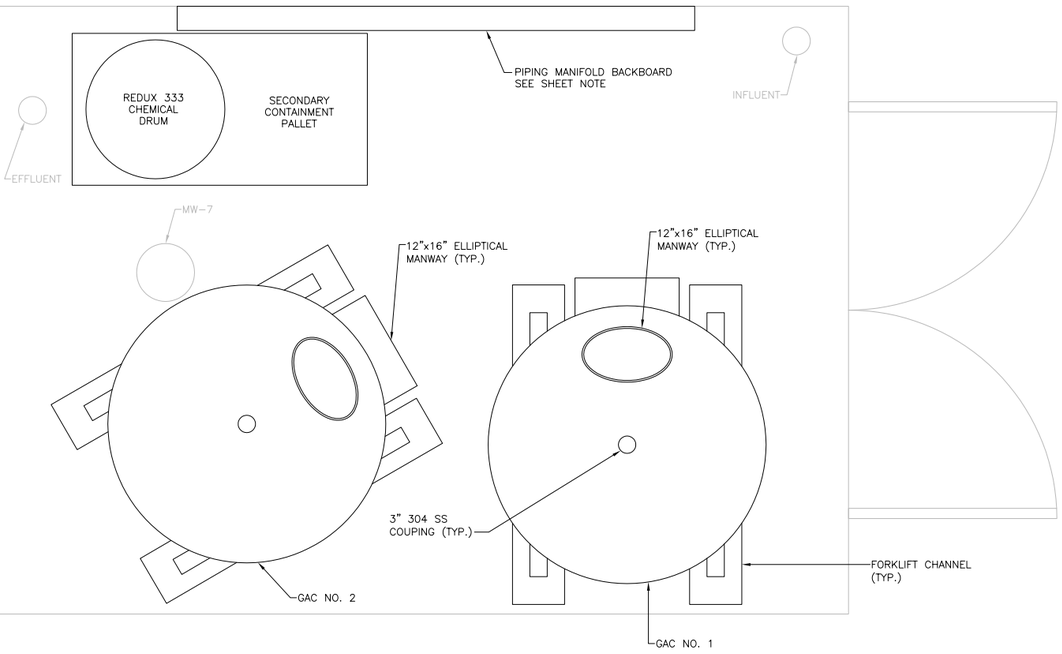


B SECTION
SCALE: 3/4"=1'-0"



* PRECAST VAULT SHALL BE PROVIDED WITH OPENING TO ACCOMMODATE WELL CASING PER THE FOLLOWING NOTES.
1. CONTRACTOR SHALL VERIFY OPENING DIMENSIONS AND LOCATIONS PRIOR TO CASTING THE VAULT.
2. CONTRACTOR SHALL DOWEL BARS, CAST CONCRETE IN PLACE AND CLOSE OPENING WATERTIGHT WITH NON-SHRINK GROUT TO LEVEL WITH BOTTOM OF THE PRECAST VAULT, PER THE PRECAST VAULT MANUFACTURER'S RECOMMENDATIONS.
3. CONTRACTOR SHALL PROTECT WELL CASING FROM CONCRETE IN ALL CONTACT AREAS PER THE PRECAST VAULT MANUFACTURER'S RECOMMENDATIONS.

A SECTION A-A
SCALE: 3/4"=1'-0"



GAC SHED PLAN VIEW
SCALE: 1" = 1'

SHEET NOTE:
PIPING SHALL NOT BLOCK ACCESS TO GAC MANWAYS OR RUN ACROSS THE FLOOR.

ANGLE WELL VAULT

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

DESIGNED	CADD	SCALE
EL	SJM	NONE
CHECKED	APPROVED	APPROVED
RWS	RWS	X

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ATLANTA, GEORGIA

FORMER CHEVRON FACILITY NO. 122208
CHILLUM, MARYLAND

AREA A
GAC SYSTEM AND ANGLE WELL VAULT

JOB NO.	SHEET NO.
50641	4
DATE	
12/03/09	
CAD FILE	4 OF 10
122208AA GAC	

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TABLE B-1: SOIL VAPOR EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	System Status	Hour Meter (hours)	Manifold Vacuum (in. H2O)	Influent (ppmv)	Influent (SCFM)	Effluent (ppmv)	Treatment Efficiency	Hydrocarbons Recovered (lbs/day)	Period (gallons)	Cumul. (gallons)	Operating Extraction Points
10/31/11 10:53	ON	35,599.2	13	66	194	33.5	49.0	4.3	-	5,967.8	RW1 RW3 MW7 MW17 PTW A PTWB MP7 *FID Readings
11/7/11 8:17	ON	35,715.6	13	55	194	20.2	63.5	3.6	4.3	5,972.0	RW1 RW3 MW7 MW17 PTW A PTWB MP7 *FID Readings
11/14/11 8:57	ON	35,884.3	10	27	167	14.6	44.9	1.5	2.7	5,974.8	RW1 RW3 MW7 MW17 PTW A PTWB MP7 *FID Readings
11/21/11 8:32	ON	36,052.1	12	48	168	23.1	52.2	2.7	2.3	5,977.1	RW1 RW3 MW7 MW17 PTW A PTWB MP7 *FID Readings
11/28/11 7:35	ON	36,218.3	13	53	194	21.6	59.4	3.5	3.4	5,980.5	RW1 RW3 MW7 MW17 PTW A PTWB MP7 *FID Readings
12/5/11 9:09	ON	36,387.8	11	52	180	21.0	59.8	3.2	3.7	5,984.2	RW1 RW3 MW7 MW17 PTW A PTWB MP7 *FID Readings
12/12/11 8:17	OFF	36,421.7	-	-	-	-	-	-	3.5	5,987.6	Off due to system over amping from clogged flame arrester
12/19/11 11:00	ON	36,421.7	13	25	194	11.0	56.0	1.6	-	5,987.6	RW1 RW3 MW7 MW17 PTW A PTWB MP7 *FID Readings
12/27/11 11:38	ON	36,614.4	12	68	168	29.4	56.5	3.8	3.6	5,991.2	RW1 RW3 MW7 MW17 PTW A PTWB MP7 *FID Readings
1/3/12 9:04	ON	36,779.7	12	33	168	14.3	56.1	1.9	3.1	5,994.3	RW1 RW3 MW7 MW17 PTW A PTWB MP7 *FID Readings
1/9/12 8:02	ON	36,922.7	11	56	180	23.1	58.8	3.4	2.4	5,996.7	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
1/16/12 9:07	ON	37,091.8	11	61	180	35.7	41.8	3.7	3.9	6,000.7	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
1/23/12 8:05	ON	37,258.1	12	31	168	8.8	71.3	1.7	3.0	6,003.6	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
2/2/12 9:08	OFF	37,308.0					0.0	-	2.8	6,006.4	Off due to surge protectors - need to be replaced
2/13/12 7:40	OFF	37,312.3	10	33	138	5.2	84.3	-	-	6,006.4	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
2/20/12 9:31	ON	37,434.9	10	26	140	9.8	61.6	1.2	-	6,006.4	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
2/27/12 7:50	ON	37,647.0	12	93	138	5.2	94.4	4.3	3.0	6,009.4	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
3/5/12 7:38	OFF	37,764.4	12	43	135	4.8	88.9	-	3.4	6,012.8	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
3/12/12 7:52	ON	37,930.0	12	85	137	33.5	60.4	3.9	-	6,012.8	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings

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TABLE B-1: SOIL VAPOR EXTRACTION SYSTEM DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	System Status	Hour Meter (hours)	Manifold Vacuum (in. H2O)	Influent (ppmv)	Influent (SCFM)	Effluent (ppmv)	Treatment Efficiency	Hydrocarbons Recovered (lbs/day)	Hydrocarbons Recovered Period (gallons)	Hydrocarbons Recovered Cumul. (gallons)	Operating Extraction Points
3/19/12 9:09	ON	38,099.3	11	96	138	23.1	75.8	4.5	4.6	6,017.4	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
3/26/12 7:47	ON	38,265.9	11	101	138	36.5	63.8	4.7	5.0	6,022.4	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
4/2/12 9:21	OFF	38,317.1	12	63	133	16.9	73.2	-	4.2	6,026.6	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
4/9/12 9:12	ON	38,484.9	11	104	137	35.5	65.7	4.8	-	6,026.6	RW3 MW7 MW17 MW22 GP39R GP27R PTWB MP7 *FID Readings
4/16/12 10:07	ON	38,653.9	11	66	139	20.2	69.5	3.1	4.4	6,030.9	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 *FID Readings
4/23/12 9:17	ON	38,821.0	12	47	117	22.3	52.7	1.9	2.7	6,033.6	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 *FID Readings
4/28/12 20:36	OFF	38,953.4					0.0	-	1.6	6,035.2	Off due to knockout tank HH
5/2/12 10:00	ON	38,953.4	14	47	117	7.3	84.5	1.9	-	6,035.2	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 *FID Readings
5/4/12 22:00	OFf	39,013.3					0.0	0.0	0.7	6,036.0	Off due to knockout tank HH
5/7/12 9:15	ON	39,013.3	13	60	120	36.8	38.8	2.4	-	6,036.0	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 *FID Readings
5/14/12 9:54	ON	39,181.8	13	68	126	26.5	60.7	2.9	2.9	6,038.9	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 RW-5 *FID Readings
5/23/12 8:25	ON	39,396.7	12	122	126	61.8	49.2	5.2	5.6	6,044.5	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 RW-5 *FID Readings
5/29/12 8:54	ON	39,540.8	13	119	126	51.9	56.4	5.1	4.8	6,049.4	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 *FID Readings
6/1/12 13:36	ON	39,548.4					0.0	0.0	2.5	6,051.9	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 RW-5 *FID Readings
6/5/12 8:47	ON	39,639.6	13	73	119	46.2	36.3	2.9	1.7	6,053.6	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 RW-5 *FID Readings
6/11/12 8:58	ON	39,783.8	12	195	135	104.1	46.6	8.9	5.4	6,059.1	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 RW-5 *FID Readings
6/25/12 8:21	OFF	39,980.1					0.0	-	19.5	6,078.6	Off due to AST HH
6/25/12 10:57	ON	39,980.1	12	140	132	58.3	58.3	6.3	-	6,078.6	GP-27R MP-7 MW-22 MW-17 PTW-B RW-3 MW-7 RW-5 *FID Readings

Notes:

(1) Hydrocarbons recovered are expressed as toluene (MW = 92 g/mol @ 77F).

(2) Hydrocarbons Recovered (lbs/day) = (inf. conc.) x (92 g/mol) x (mol/24.45 L) x (e-6) x (inf. flow) x (28.32 L/ft3) x (1440 min/day) x (1 lb/453.6 g).

(3) Hydrocarbons Recovered Period (gallons) = (avg. inf. conc.) x (92 g/mol) x (mol/24.45 L) x (e-6) x (avg. inf. flow) x (28.32 L/ft3) x (runtime in minutes) x (1 lb/453.6 g) x (gal/6.39 lb).

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TABLE B-2: SOIL VAPOR EXTRACTION SYSTEM INFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	TPH (µg/L)	Flow (SCFM)	Extraction Rate Benzene (lbs/hr)	Extraction Rate TPH (lbs/day)
11/14/11 9:31	0.86	3.20	1.20	0.13	230	39	0.0001	0.80
12/5/11 9:30	0.61	4.10	1.20	13.00	270	35	0.0001	0.84
1/3/12 9:30	1.40	6.00	1.60	15.00	300	168	0.0009	4.54
2/20/12 10:00	0.21	0.65	0.20	2.80	170	140	0.0001	2.14
3/12/12 8:30	0.13	0.39	0.07	1.40	200	137	0.0001	2.46
4/9/12 14:00	0.24	0.58	0.09	1.70	200	137	0.0001	2.47
5/14/12 11:05	0.70	2.10	0.34	4.80	270	126	0.0003	3.06

Notes:

(1) Benzene (lbs/h) = (benzene conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (60 min/hr).

(2) TPH (lbs/day) = (TPH conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (1440 min/day).

(3) ug/L = (ppmv) x (MW g/mol) x (mol/24.45 L), where MW benzene = 78 and MW TPH = 92.

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TABLE B-3: SOIL VAPOR EXTRACTION SYSTEM EFFLUENT ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Date/Time	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	TPH (µg/L)	Flow (SCFM)	Discharge Rate Benzene (lbs/hr)	Discharge Rate TPH (lbs/day)
11/14/11 9:33	0.72	2.1	0.6	4.3	170	38.91	0.0001	0.59
12/5/11 9:40	0.34	2.1	0.56	5.8	0.17	34.62	0.0000	0.00
1/3/12 9:45	0.67	2.70	0.65	6.00	160	168.49	0.0004	2.42
2/20/12 10:05	0.12	0.31	0.045	0.55	90	140.26	0.0001	1.13
3/12/12 8:33	0.072	0.19	<35	0.2	110	136.88	0.0000	1.35
4/9/12 14:10	0.13	0.26	0.034	0.53	120	138.16	0.0001	1.49
5/14/12 11:05	0.37	0.94	0.12	1.6	130	126.06	0.0002	1.47

Notes:

(1) Benzene (lbs/h) = (benzene conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (60 min/hr).

(2) TPH (lbs/day) = (TPH conc.) x (e-6) x (1 lb/453.6 g) x (flow) x (28.32 L/ft3) x (1440 min/day).

(3) ug/L = (ppmv) x (MW g/mol) x (mol/24.45 L), where MW benzene = 78 and MW TPH = 92.

APPENDIX C

GROUNDWATER MONITORING DATA

APPENDIX C

GROUNDWATER MONITORING DATA

DESCRIPTION OF DATA TABLE

Overview

Chevron uses a central database to store groundwater monitoring data including laboratory analytical data. The tabulated data in Appendix C (Tables C-1 and C-2) are exported summaries of groundwater elevation data and analytical data for the period beginning on July 1, 2011, and ending on June 30, 2012 (reporting period plus previous two quarters). Groundwater elevation data were measured using an interface probe in wells near the Service Station and a water level indicator at all other locations.

The following table lists the column headings in the table with a brief description of each.

Column Heading	Description
Date of Measurement	Date data were recorded.
Depth to Water (feet)	Depth to groundwater (ft)
TOC Elevation (feet)	Top of casing elevation (ft)
Water Table Elevation (feet)	Corrected water table elevation equation: (TOC) – (Depth to Water) + [(0.75)*(LPH Thickness)]
Depth to LPH (feet)	Depth to LPH (feet)
LPH Thickness (feet)	Equation: (Depth to Water-Depth to LPH)
LPH Elevation (feet)	Equation: (TOC-Depth to LPH)
Benzene (µg/L)	Laboratory reported concentration
Toluene (µg/L)	Laboratory reported concentration
Ethylbenzene (µg/L)	Laboratory reported concentration
m,p-Xylene (µg/L)	Laboratory reported concentration
o-Xylene (µg/L)	Laboratory reported concentration
Methyl-t-butyl ether (µg/L)	Laboratory reported concentration
TPH-GRO (µg/L)	Laboratory reported concentration

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Table C-1: GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
GP-2E(45-50)	01/17/2012	42.79	168.17	125.38				
	04/19/2012	43		125.17				
GP-2E(50-55)	01/17/2012	42.93	168.27	125.34				
	04/19/2012	43.1		125.17				
GP-2E(55-60)	01/17/2012	43.21	168.53	125.32				
	04/19/2012	43.37		125.16				
GP-2F(45-50)	01/17/2012	-	159.59	-				Dry at 43.11
	04/19/2012	-		-				Dry
GP-2F(50-55)	01/17/2012	43.8	159.59	115.79				
	04/19/2012	44.15		115.44				
GP-7A(20-25)	01/17/2012	18.75	158.11	139.36				
	04/19/2012	19.42		138.69				
GP-7A(25-30)	01/17/2012	18.64	158.08	139.44				
	04/19/2012	19.36		138.72				
GP-7A(30-35)	01/17/2012	20.55	158.09	137.54				
	04/19/2012	20.97		137.12				
GP-7A(35-40)	01/17/2012	20.81	158.09	137.28				
	04/19/2012	21.1		136.99				
GP-7A(40-45)	01/17/2012	-	158.11	-				Covered by steel plate
	04/19/2012	21.21		136.9				
GP-9A(20-25)	01/17/2012	17.03	158.86	141.83				
	04/19/2012	17.92		140.94				
GP-9A(25-30)	01/17/2012	19.28	158.81	139.53				
	04/19/2012	20.75		138.06				
GP-9A(30-35)	01/17/2012	20.92	158.76	137.84				
	04/19/2012	21.91		136.85				
GP-11A(20-25)	01/17/2012	17.02	158.28	141.26				
	04/19/2012	17.45		140.83				
GP-11A(25-30)	01/17/2012	18.7	158.43	139.73				
	04/19/2012	19.21		139.22				
GP-11A(30-35)	01/17/2012	20.38	158.38	138				
	04/19/2012	21.31		137.07				

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Table C-1: GROUNDWATER MONITORING DATA
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FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

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Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
GP-11A(35-40)	01/17/2012	27.26	158.38	131.12				
	04/19/2012	27.52		130.86				
GP-24A	01/17/2012	32.37	170.83	138.46				
	04/19/2012	33.47		137.36				
	05/03/2012	-		-				Hydrasleeve Installed
GP-27A	04/24/2012	-	172.06	-				Abondoned and overdrilled
GP-27R	07/28/2011	38.1	166.21	128.11				
	08/26/2011	38.5		127.71				Not Pumping
	10/24/2011	49.44		116.77				Pumping
	12/19/2011	43		123.21				
	01/17/2012	44		122.21				Covered by car
	01/25/2012	49.41		116.80				Pumping
	02/20/2012	-		-				Pumping
	03/19/2012	-		-				Pumping
	04/19/2012	44.55		121.66				Pumping
	04/26/2012	-		-				Pumping
	05/29/2012	49.45		116.76				"Top of pump, Pumping"
GP-30A	07/28/2011	36.92	171.78	134.86				
	08/26/2011	36.45		135.33				
	10/24/2011	42.2		129.58				
	12/19/2011	41.44		130.34				
	01/17/2012	-		-				
	01/25/2012	40.31		131.47				
	02/20/2012	-		-				Pumping
	03/19/2012	41.64		130.14				
	04/19/2012	41.77		130.01				Recovery Well
	05/03/2012	-		-				Hydrasleeve Installed
	05/29/2012	40.78		131				
GP-35A	07/28/2011	33.59	171.96	138.37				
	08/26/2011	33.23		138.73				
	10/24/2011	38.83		133.13				
	12/19/2011	35.87		136.09				

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Table C-1: GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

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Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
GP-35A	01/17/2012	33.48	171.96	138.48				
(Cont)	01/25/2012	34.15		137.81				
	02/20/2012	-		-				Pumping
	03/19/2012	38.35		133.61				
	04/19/2012	39.17		132.79				
	05/03/2012	-		-				Hydrasleeve Installed
	05/29/2012	44.22		127.74				
GP-38A	04/24/2012	-	171.22	-				Abondoned and overdrilled
GP-39A	04/24/2012	-	172.46	-				Abondoned and overdrilled
GP-41A	01/17/2012	42.2	172.28	130.08				
	04/19/2012	41.04		131.24				
	05/03/2012	-		-				Hydrasleeve Installed
GP-44A	01/17/2012	30.58	176.2	145.62				
	04/19/2012	30.82		145.38				
	04/24/2012	30.73		145.47				
IW-1	04/19/2012	4.55	134.83	130.28				
IW-2	04/19/2012	5.13	135.00	129.87				
IW-3	04/19/2012	5.1	134.93	129.83				
IW-4	04/19/2012	5.2	134.79	129.59				
IW-5	04/19/2012	5.59	134.66	129.07				
MP-7	07/28/2011	-	172.17	-				Well could not be opened
	08/26/2011	40.79		131.38				
	10/24/2011	42.68		129.49	42.61	0.34	129.56	Bailed product
	12/19/2011	38.23		133.94				
	01/17/2012	39.54		132.63				
	01/25/2012	42.42		129.75				
	02/20/2012	39.51		132.66				
	03/19/2012	39.68		132.49				
	04/19/2012	51.56		120.61				
	05/02/2012	37.39		134.78				
	05/29/2012	38.17		134				
MP-20	--	--	--	--	--	--	--	--

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Table C-1: GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
MP-30	--	--	--	--	--	--	--	--
MP-40	--	--	--	--	--	--	--	--
MW-1	01/17/2012	32.33	170.46	138.13				
	04/19/2012	32.6		137.86				
MW-2	01/17/2012	31.71	171.41	139.7				
	04/19/2012	33.65		137.76				
MW-3	01/17/2012	30.58	170.41	139.83				
	04/19/2012	31.24		139.17				
MW-4	01/17/2012	30.1	171.14	141.04				
	04/19/2012	30.71		140.43				
MW-5	01/17/2012	32.14	172.31	140.17				Dry
	04/19/2012	-		-				Dry at 35
	04/24/2012	-		-				Dry @35.31
MW-6	01/17/2012	32.8	171.12	138.32				
	04/19/2012	33.68		137.44				
	05/03/2012	-		-				Hydrasleeve Installed
MW-7	07/28/2011	40.17	177.11	136.94				
	08/26/2011	32.82		144.29				Not Pumping
	10/24/2011	50		127.11				Pumping
	12/19/2011	46.9		130.21				
	01/17/2012	40.8		136.31				Dry
	01/25/2012	42.39		134.72				Pumping
	02/20/2012	-		-				Pumping
	03/19/2012	-		-				Pumping
	04/19/2012	41.12		135.99				
	04/26/2012	41.6		135.51				
	05/29/2012	43.91		133.2				"Top of pump, Pumping"
MW-12	01/17/2012	41.58	171.5	129.92				
	04/19/2012	42.1		129.4				
MW-13	01/17/2012	36.5	172.47	135.97				
	04/19/2012	36.95		135.52				
MW-15	01/17/2012	30.46	172.34	141.88				Dry

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FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

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Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
MW-15	04/19/2012	33.8	172.34	138.54				Replace Lock
(Cont)	04/24/2012	30.63		141.71				
MW-16	07/28/2011	35.23	171.05	135.82				
	08/26/2011	36.65		134.4				
	10/24/2011	39.16		131.89				
	12/19/2011	-		-				DC permit not valid
	01/17/2012	39.46		131.59				
	01/25/2012	38.94		132.11				Pumping
	02/20/2012	-		-				Pumping
	03/19/2012	39.05		132				
	04/19/2012	39.85		131.2				
	05/29/2012	40.46		130.59				
MW-17	01/17/2012	44.35	170.67	126.32				
	04/19/2012	45.39		125.28				
MW-18	07/28/2011	30.44	168.45	138.01				
	08/26/2011	30.05		138.4				
	10/24/2011	30.37		138.08				
	12/19/2011	-		-				DC permit not valid
	01/17/2012	30.25		138.2				
	01/25/2012	30.11		138.34				
	02/20/2012	30.48		137.97				
	03/19/2012	30.8		137.65				
	04/19/2012	30.97		137.48				
	05/29/2012	31.7		136.75				
MW-19	01/17/2012	34.94	169.56	134.62				
	04/19/2012	35.7		133.86				
MW-20	01/17/2012	36.81	176.27	139.46				
	04/19/2012	36.7		139.57				
	04/24/2012	36.61		139.66				
MW-21	01/17/2012	35.38	173.37	137.99				
	04/19/2012	35.45		137.92				
	04/24/2012	36.42		136.95				

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Table C-1: GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

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Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
MW-22	01/17/2012	-	171.23	-				
	04/19/2012	-		-				
MW-22R	07/28/2011	36.97	165.08	128.11				
	08/26/2011	37.64		127.44				Not Pumping
	10/24/2011	45.05		120.03				Pumping
	12/19/2011	-		-				DC permit not valid
	01/25/2012	44.2		120.88				Pumping
	02/20/2012	-		-				Pumping
	03/19/2012	-		-				Pumping
	04/19/2012	40.88		124.2				
	05/29/2012	44.51		120.57				Pumping
MW-23	01/17/2012	42.42	171.31	128.89				
	04/19/2012	42.62		128.69				
MW-24A	07/28/2011	19.87	157.38	137.51				
	08/26/2011	20.29		137.09				
	10/24/2011	19.71		137.67				
	12/19/2011	-		-				DC permit not valid
	01/17/2012	19.68		137.7				
	01/25/2012	19.86		137.52				
	02/20/2012	20.11		137.27				
	03/19/2012	20		137.38				
	04/19/2012	20.16		137.22				
	05/29/2012	20.55		136.83				
MW-24B	01/17/2012	19.71	157.45	137.74				
	04/19/2012	20.17		137.28				
MW-25A	01/17/2012	26.09	149.99	123.9				
	04/19/2012	26.21		123.78				
MW-25B	01/17/2012	26.35	150.95	124.6				
	04/19/2012	26.5		124.45				
MW-26A	01/17/2012	2.69	135.62	132.93				
	04/19/2012	4.17		131.45				
MW-26B	01/17/2012	6.14	135.74	129.6				

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Table C-1: GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
MW-26B	04/19/2012	7.39	135.74	128.35				
(Cont)	04/30/2012	6.82		128.92				
MW-27A	01/17/2012	9.63	128.92	119.29				
	04/19/2012	9.99		118.93				
MW-27B	01/17/2012	12.22	128.92	116.7				
	04/19/2012	12.58		116.34				
MW-28A	01/17/2012	3.28	126.13	122.85				
	04/19/2012	4.11		122.02				
	05/08/2012	-		-				Hydrasleeve Installed
MW-28B	01/17/2012	3.74	125.49	121.75				
	04/19/2012	4.18		121.31				
	05/02/2012	4.52		120.97				
MW-29A	01/17/2012	7.42	115.7	108.28				
	04/19/2012	7.46		108.24				
	05/04/2012	7.52		108.18				
MW-29B	01/17/2012	6	115.54	109.54				
	04/19/2012	6.21		109.33				
	04/30/2012	6.09		109.45				
MW-30	01/17/2012	-	156.87	-				Not yet developed
MW-30R	04/19/2012	19.54	156.75	137.21				
	05/03/2012	-		-				Hydrasleeve Installed
MW-31A	01/17/2012	4.51	135.19	130.68				
	04/19/2012	4.7		130.49				
MW-31B	01/17/2012	4.5	135.81	131.31				
	04/19/2012	4.72		131.09				
	05/02/2012	4.75		131.06				
MW-32	01/17/2012	8.32	128.47	120.15				
	04/19/2012	8.8		119.67				
MW-33A	01/17/2012	2.72	126.35	123.63				
	04/19/2012	3.51		122.84				
	05/08/2012	-		-				Hydrasleeve Installed
MW-33B	01/17/2012	3.93	126.16	122.23				

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FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

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Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
MW-33B	04/19/2012	4.37	126.16	121.79				
(Cont)	05/08/2012	4.35		121.81				
MW-33C	01/17/2012	-	125.84	-				Unable to locate
	04/19/2012	4.33		121.51				
	05/08/2012	4.33		121.51				
MW-33S	01/17/2012	2.55	126.58	124.03				
	04/19/2012	3.49		123.09				
	05/08/2012	3.22		123.36				
MW-34A	01/17/2012	8.94	107.41	98.47				
	04/19/2012	8.98		98.43				
MW-34B	01/17/2012	8.71	107.4	98.69				
	04/19/2012	8.82		98.58				
MW-37	01/17/2012	-	152.61	-				Dry at 15.10
	04/19/2012	-		-				Dry at 15.1
MW-38	01/17/2012	9.59	146.91	137.32				
	04/19/2012	10.14		136.77				
MW-39	01/17/2012	13.82	146.02	132.2				
	04/19/2012	14.81		131.21				
MW-39R	01/17/2012	15.95	146.01	130.06				
	04/19/2012	-		-				
	04/19/2012	16.23		129.78				
MW-40	01/17/2012	21.85	145.18	123.33				
	04/19/2012	22.06		123.12				
MW-41A	01/17/2012	18.33	136.96	118.63				
	04/19/2012	18.68		118.28				
MW-41B	01/17/2012	19	136.82	117.82				
	04/19/2012	19.3		117.52				
MW-42	01/17/2012	6.9	140.03	133.13				
	04/19/2012	-		-				
	04/19/2012	7.35		132.68				
	04/30/2012	7.39		132.64				
MW-43A	01/17/2012	2.53	133.98	131.45				

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Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
MW-43A	04/19/2012	3.95	133.98	130.03				
MW-43B	01/17/2012	7.89	134.09	126.2				
	04/19/2012	8.39		125.7				
MW-44A	01/17/2012	8.78	130.22	121.44				
	04/19/2012	91.13		39.09				
MW-44B	01/17/2012	11.55	130.24	118.69				
	04/19/2012	12.26		117.98				
MW-45	01/17/2012	42.64	173.89	131.25				
	04/19/2012	42.38		131.51				
	04/24/2012	42.39		131.5				
MW-46	01/17/2012	46.34	174.12	127.78				
	04/19/2012	46.36		127.76				
	05/03/2012	-		-				Hydrasleeve Installed
MW-47	01/17/2012	45.37	171.5	126.13				
	04/19/2012	45.45		126.05				
	04/24/2012	-		-				
MW-48	01/17/2012	41.34	165.96	124.62				
	04/19/2012	41.45		124.51				
	04/24/2012	41.43		124.53				
MW-49	01/17/2012	44.16	159.15	114.99				
	04/19/2012	44.5		114.65				
	05/03/2012	-		-				Hydrasleeve Installed
MW-50	01/17/2012	36.77	156.12	119.35				
	04/19/2012	37.15		118.97				
	04/24/2012	37.11		119.01				
MW-51	01/17/2012	48.91	158.12	109.21				
	04/19/2012	49.26		108.86				
	04/24/2012	49.23		108.89				
MW-52	01/17/2012	2.8	127.59	124.79				
	04/19/2012	3.59		124				
MW-53	01/17/2012	6.03	116.18	110.15				
	04/19/2012	5.97		110.21				

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FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

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Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
MW-53	05/04/2012	5.96	116.18	110.22				
MW-54	01/17/2012	4.54	121.76	117.22				
	04/19/2012	4.88		116.88				
	04/30/2012	4.9		116.86				
MW-55	01/17/2012	-	131.49	-				Covered by car
	04/19/2012	1.96		129.53				
	05/04/2012	1.7		129.79				
MW-58	04/19/2012	6.73	134.97	128.24				
	05/04/2012	6.2		128.77				
MW-59	04/19/2012	7.5	131.10	123.6				
	05/04/2012	8.1		123.0				
MW-60	04/19/2012	11.81	131.08	119.27				
	05/04/2012	-		-				Hydrasleeve Installed
PTW-A	01/17/2012	-	172.26	-				Overdrilled
	04/19/2012	-		-				
	04/24/2012	-		-				Abandoned
PTW-B	01/17/2012	44.9	171.75	126.85				Pumping
	04/19/2012	41.5		130.25				Pumping
	04/26/2012	-		-				Pumping
RW-1	01/17/2012	53.29	173.36	120.07				Top of pump
	04/19/2012	-		-				Dry
	04/26/2012	-		-				Pumping
RW-2	01/17/2012	38.18	172.21	134.03				Top of pump
	04/19/2012	55.2		117.01				
	04/26/2012	-		-				Pumping
RW-3	01/17/2012	25.92	171.62	145.7				Pumping
	04/19/2012	48.37		123.25				Replace Lock
	04/26/2012	-		-				Pumping
RW-4	07/28/2011	37.28	171.62	134.34				
	08/26/2011	36.92		134.70				
	10/24/2011	50.11		121.51				Pumping
	12/19/2011	50.33		121.29				

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Table C-1: GROUNDWATER MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JULY 2011 THROUGH JUNE 2012

Chevron

Well No.	Date of Measurement	Depth to Water (feet below casing)	PVC Casing Elevation (feet MSL)	Water Table Elevation (feet MSL)	NAPL Measurement (feet)	NAPL Thickness (feet)	NAPL Elevation (feet MSL)	Comments
RW-4	01/17/2012	50.18	171.62	121.44				Pumping
(Cont)	01/25/2012	51.25		120.37				Pumping
	02/20/2012	-		-				Pumping
	03/19/2012	-		-				Pumping
	04/19/2012	50.9		120.72				
	04/26/2012	-		-				Pumping
	05/29/2012	50.1		121.52				"Top of pump, Pumping"
RW-5	04/26/2012	-	171.75	-				Off for repair
VP-4	--	--	--	--	--	--	--	--

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Table C-2: GROUNDWATER ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY 2012 THROUGHT JULY 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JANUARY 2012 THROUGH JULY 2012

Chevron

Location	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m+p-Xylene (µg/L)	o-Xylene (µg/L)	ether (µg/L)	TPH GRO (µg/L)
GP-2E(45-50)	01/19/2012	350	<10	<10	<50	52	1,300	990
	04/25/2012	470	<5.0	<5.0	<25	74	1,400	1,900
GP-2E(55-60)	01/19/2012	150	<5.0	<5.0	<25	<25	800	760
	04/25/2012	200	<5.0	<5.0	<25	36	820	1000
GP-2F(50-55)	01/19/2012	56	<5.0	<5.0	<25	<25	420	400
	04/25/2012	44	<2.0	<2.0	<10	<10	400	440
GP-7A(20-25)	01/19/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/25/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
GP-7A(30-35)	01/19/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/25/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
GP-7A(35-40)	01/19/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/25/2012	4.2	<1.0	<1.0	<5.0	<5.0	6.3	<100
GP-9A(20-25)	01/19/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/25/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
GP-11A(20-25)	01/19/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/25/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
GP-24A	05/03/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
GP-27R	04/26/2012	63	25	4.3	17	13	140	450
GP-30A	05/03/2012	12,000	14,000	750	3,400	2,200	18,000	63,000
GP-35A	05/03/2012	2,100	4,800	520	2,100	1,300	270	21,000
GP-41A	05/03/2012	4.5	<1.0	<1.0	<5.0	<5.0	<1.0	190
GP-44A	04/24/2012	<2.0	6.3	63	460	170	<2.0	6,500
MP-7	05/02/2012	6,900	13,000	1,500	6,200	2,900	3,400	67,000
MW-6	05/03/2012	<1.0	22	14	23	32	<1.0	620
MW-7	04/26/2012	3,000	4,500	600	1,100	750	540	20,000
MW-15	04/24/2012	5.0	33	12	29	19	<1.0	470
MW-17	04/26/2012	2,800	5,900	490	2,900	1,600	4,100	30,000
MW-18	01/19/2012	<10	<10	39	350	650	<10	50,000
	04/25/2012	<5.0	<5.0	11	100	200	<5.0	23,000
MW-19	01/19/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/25/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-20	04/24/2012	1.7	<1.0	<1.0	<5.0	<5.0	<1.0	460
MW-21	04/24/2012	9.2	<1.0	4.1	5.4	<5.0	19	370

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Table C-2: GROUNDWATER ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY 2012 THROUGHT JULY 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JANUARY 2012 THROUGH JULY 2012

Chevron

Location	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m+p-Xylene (µg/L)	o-Xylene (µg/L)	ether (µg/L)	TPH GRO (µg/L)
MW-22	04/26/2012	3,900	7,800	790	3,300	1,700	3,600	34,000
MW-23	01/19/2012	59	4.8	<1.0	<5.0	5.8	120	130
	05/03/2012	<1.0	<1.0	<1.0	<5.0	<5.0	2.0	<100
MW-24A	01/19/2012	<5.0	<5.0	110	270	57	<5.0	10,000
	04/25/2012	<10	<10	92	170	<50	<10	11,000
MW-24B	01/19/2012	<5.0	9.9	56	310	110	<5.0	11,000
	05/03/2012	<20	<20	59	310	<100	<20	11,000
MW-25A	01/19/2012	<1.0	<1.0	<1.0	<5.0	<5.0	3.5	<100
	04/25/2012	<1.0	<1.0	<1.0	<5.0	<5.0	3.2	<100
MW-25B	01/19/2012	200	<2.0	<2.0	<10	19	390	470
	04/25/2012	120	<1.0	<1.0	<5.0	26	250	570
MW-26A	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	05/04/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-26B	01/18/2012	520	<5.0	<5.0	<25	<25	290	880
	04/30/2012	850	<5.0	<5.0	26	37	510	1,700
MW-27A	05/04/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-27B	04/30/2012	<1.0	<1.0	<1.0	<5.0	<5.0	140	110
MW-28A	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	05/08/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-28B	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	05/02/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-29A	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	5.2	<100
	05/04/2012	<1.0	<1.0	<1.0	<5.0	<5.0	15	<100
MW-29B	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	100	<100
	04/30/2012	<1.0	<1.0	<1.0	<5.0	<5.0	95	<100
MW-30R	05/03/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-31B	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	1.1	<100
	05/02/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-33A	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	05/08/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-33B	01/18/2012	470	<2.0	<2.0	<10	<10	310	820
MW-33B	05/08/2012	380	<2.0	<2.0	<10	<10	300	1000

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Table C-2: GROUNDWATER ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY 2012 THROUGHT JULY 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JANUARY 2012 THROUGH JULY 2012

Location	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m+p-Xylene (µg/L)	o-Xylene (µg/L)	ether (µg/L)	TPH GRO (µg/L)
MW-33C	01/18/2012	17	<1.0	<1.0	<5.0	<5.0	34	<100
	05/08/2012	3.4	<1.0	<1.0	<5.0	<5.0	20	<100
MW-33S	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	05/08/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-38	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	05/03/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-39R	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/26/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-40	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	6.0	<100
	05/03/2012	<1.0	<1.0	<1.0	<5.0	<5.0	5.2	<100
MW-41A	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	05/03/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-41B	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	15	<100
	04/26/2012	<1.0	<1.0	<1.0	<5.0	<5.0	13	<100
MW-42	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/30/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-43A	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/30/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-43B	01/18/2012	4.3	<1.0	<1.0	<5.0	<5.0	16	<100
	04/30/2012	2.9	<1.0	<1.0	<5.0	<5.0	12	<100
MW-44A	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	33	<100
	04/30/2012	<1.0	<1.0	<1.0	<5.0	<5.0	32	<100
MW-44B	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	89	<100
	04/30/2012	<1.0	<1.0	<1.0	<5.0	<5.0	87	<100
MW-45	04/24/2012	27	<1.0	<1.0	<5.0	23	<1.0	380
MW-46	05/03/2012	<1.0	<1.0	<1.0	<5.0	<5.0	17	<100
MW-47	04/24/2012	380	42	<5.0	42	160	40	2,000
MW-48	04/24/2012	<1.0	<1.0	<1.0	<5.0	<5.0	1.2	<100
MW-49	05/03/2012	<1.0	<1.0	<1.0	<5.0	<5.0	270	320
MW-50	04/24/2012	1.9	<1.0	<1.0	<5.0	<5.0	83	<100
MW-51	04/24/2012	5.6	<1.0	<1.0	<5.0	<5.0	63	110

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Table C-2: GROUNDWATER ANALYTICAL RESULTS
SEMI-ANNUAL PROGRESS REPORT: JANUARY 2012 THROUGHT JULY 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JANUARY 2012 THROUGH JULY 2012

Location	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	m+p-Xylene (µg/L)	o-Xylene (µg/L)	ether (µg/L)	TPH GRO (µg/L)
MW-53	01/18/2012	5.1	<1.0	<1.0	<5.0	<5.0	180	130
	05/04/2012	6.5	<1.0	<1.0	<5.0	<5.0	140	120
MW-54	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	04/30/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-55	01/18/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
	05/04/2012	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<100
MW-58	01/19/2012	390	<2.0	5.9	<10	18	220	620
	05/04/2012	240	<1.0	<1.0	8.8	19	190	620
MW-59	01/19/2012	220	<2.0	<2.0	<10	<10	220	630
	05/04/2012	140	<1.0	<1.0	<5.0	<5.0	160	440
MW-60	01/19/2012	<1.0	<1.0	<1.0	<5.0	<5.0	16	<100
	05/04/2012	<1.0	<1.0	<1.0	<5.0	<5.0	18	<100
PTW-B	04/26/2012	32	31	4.2	29	20	71	480
RW-1	04/26/2012	400	250	37	120	110	180	1,900
RW-2	04/26/2012	600	600	72	280	230	520	3,900
RW-3	04/26/2012	190	1,400	150	870	590	39	5,000
RW-4	04/26/2012	2,200	2,500	270	1,200	690	2,100	23,000
RW-5	01/19/2012	460	1,800	300	1,300	460	82	7,600

Abbreviations:

J - Estimated value.

N.D. - Not detected at the minimum reported quantitation limit.

Notes:

All analytes reported in µg/L.

APPENDIX D

SOIL VAPOR SAMPLING DATA

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APPENDIX D-1: SOIL VAPOR MONITORING DATA
SEMI-ANNUAL PROGRESS REPORT: JANUARY 2012 THROUGH JUNE 2012
FORMER CHEVRON FACILITY 122208, 5801 RIGGS ROAD, CHILLUM, MARYLAND
PERIOD: JANUARY 2012 THROUGH JUNE 2012

Chevron

Location	Sample Date	Benzene ($\mu g/m^3$)	Toluene ($\mu g/m^3$)	Ethylbenzene ($\mu g/m^3$)	m+p-Xylene ($\mu g/m^3$)	o-Xylene ($\mu g/m^3$)	Methyl-t-butyl ether ($\mu g/m^3$)	1,1-Difluoroethane ($\mu g/m^3$)	Oxygen (%)	Carbon Dioxide (%)	Methane (%)
VW-01	1/23/2012	ND 3.3	ND 3.9	ND 4.4	ND 4.4	ND 4.4	ND 3.7	8.6	5.8	12.1	0
	5/10/2012	ND 3.9	13	ND 5.4	ND 5.4	ND 5.4	ND 4.4	840	7.8	10	0
VW-01 (AMB)	5/10/2012	ND 0.54	ND 0.64	ND 0.73	ND 0.73	ND 0.73	ND 0.61	--	--	--	--
VW-04 (AMB)	1/23/2012	ND 2.8	ND 3.3	ND 3.8	ND 3.8	ND 3.8	ND 3.2	--	--	--	--
VW-02	5/10/2012	25	5.1	7.9	7.6	ND 5.4	25	96	11.2	8.3	1.5

Notes:

1) E - Exceeds instrument calibration range
2) ND - Not detected at the minimum reported quantitation limit
3) Soil vapor wells VW-02, VW-03, and VW-04 were not sampled on 3/18/11 due to the presence of water.
4) Measurements of oxygen, carbon dioxide, and methane could not be collected from VW-02, VW-03, and VW-04 on 1/23/2012 due to the appearance of water in the vapor well tubing following sample collection

APPENDIX E

VAPOR MITIGATION SYSTEM DATA

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Chevron

TABLE E-1. VAPOR MITIGATION SYSTEM MEASUREMENTS
SEMI-ANNUAL PROGRESS REPORT: JULY THROUGH DECEMBER 2011
FORMER CHEVRON FACILITY NO. 122208, 5801 RIGGS ROAD, CHILLUM, MD
PERIOD: JULY 2010 - DECEMBER 2011

Address	Date	Average Flow Velocity Measured Using Anemometer (ft/min)	Air Flow Rate Measured Using Anemometer (standard ft^3/min)	Air Flow Rate Measured Using Omniguard/ Magnahelic Gauge (standard ft^3/min)	Cross-Slab Differential Pressure (in. H_2O)
5818 Eastern Avenue	05/09/12	NM[2]	NM[2]	139	0.002
5824 Eastern Avenue	04/02/12	NM[2]	NM[2]	158	-0.008
746 Oglethorpe Street	04/02/12	NM[2]	NM[2]	155	-0.044
				EPA Sub-Slab Depressurization Goal	-0.016
				ASTM Sub-Slab Depressurization Goal	-0.025

Notes:

1. Measurements of average flow velocity and air flow rate using an anemometer can vary greatly depending on the placement of the anemometer inside the piping where flow occurs. This variation in measurement is not encountered when using an Omniguard differential pressure recorder or magnahelic gauge; however, measuring average flow velocity is not possible. As such, measurements collected using both the anemometer and Omniguard / magnahelic gauge are presented in this table.
2. NM: Not measured due to equipment malfunction.