

Environmental Investigation
Exxon Service Station (former Chevron Service Station)
300 Mount Carmel Road, Hereford, Baltimore County, Maryland
Open Case No. 2005-0522-BA3

The Maryland Department of the Environment (MDE), Oil Control Program (OCP), continues to maintain an open case on the petroleum impacts at the Exxon Service station/convenience store located in northern Baltimore County. The Exxon station is served by a drinking water supply well located south of the service station building. The MDE became aware of concentrations of petroleum constituents in the on-site drinking water well during monthly sampling in 2002. The pre-filtration sample collected in January 2002 detected methyl tertiary-butyl ether (MTBE) at 52.9 parts per billion (ppb). Between March and December 2002, MTBE concentrations ranged from 367 to 2,550 ppb. The last round of sampling was in December 2007 and MTBE was detected at 238 ppb. A granular activated carbon (GAC) filtration system has been maintained on this supply well since late 1995. ExxonMobil is currently sampling the drinking water well on a quarterly basis.

MTBE is a fuel additive commonly used to reduce carbon monoxide and ozone levels caused by auto emissions. There is no national regulatory standard for MTBE in drinking water. In 1997, the U.S. Environmental Protection Agency (EPA) issued an advisory for MTBE of 20 to 40 ppb, based on taste and odor. Although the EPA has not established a regulated maximum contaminant level (MCL) for MTBE, the MDE has adopted an action level of 20 ppb.

This Exxon facility (formerly Chevron) has been an active gasoline retail station since the 1960s. The property was previously owned by Gulf Oil and transferred to the Chevron Corporation in January 1985. In September 2007, three 10,000-gallon gasoline and one 10,000-gallon diesel underground storage tanks (USTs) were excavated and removed from the property. Then in November 2007, two 12,000-gallon gasoline, one 8,000-gallon gasoline and one 8,000-gallon diesel USTs were installed on-site and registered by the ExxonMobil Corporation. The four USTs are fiberglass reinforced plastic with double-walled piping constructed of flexible plastic. Five monitoring wells, four tank field observation pipes, and a transient non-community drinking water supply well are also located on-site.

In 1988, the MDE-OCP was made aware of environmental problems at the former Chevron service station upon receiving groundwater sampling results from the on-site and adjacent drinking water supply wells (*Case No. 1991-0403-BA3*). Chevron installed a total of 13 monitoring wells on and off-site between 1988 and 1990. A GAC filtration system was installed on the service station's drinking water well in 1988. A pump-and-treat/soil vapor extraction system operated on-site from 1990 to 1992, removing approximately 1250 pounds of petroleum hydrocarbons. Based on the absence of liquid phase hydrocarbons (LPH) and decreasing levels of dissolved phase petroleum hydrocarbons in the monitoring wells, the MDE approved shut-down of the system in late 1992 and *Case No. 1991-0403-BA3* was closed.

As part of reconstruction activities at the service station, ExxonMobil removed a 1,000-gallon heating oil UST and a 1,000-gallon used oil UST from the property in 1995 (*Case No. 1995-2201-BA3*). A new GAC system was installed on the service station's drinking water well. ExxonMobil began sampling the on-site drinking water well on a monthly basis. Based on ExxonMobil's intent to maintain the GAC system on the on-site drinking water well and continuation of monthly sampling of this well, MDE issued a *Notice of Compliance* for the site and *Case No. 1995-2219-BA3* was subsequently closed.

Based on the elevated levels of petroleum contaminants in the station's monitoring well network, the MDE opened *Case No. 2005-0522-BA2* and is in the process of evaluating the extent of contamination and the potential for migration since this site is located in a high-risk groundwater use area. At this time, the MDE-OCP does not anticipate expanding the off-site residential sampling effort beyond sampling needed to ensure community safety.

Chronology

- January 1985. Gulf Oil transferred the property to Chevron Corporation (Chevron). UST registration amended to reflect the change in tank ownership.
- January 1988. Chevron installed GAC systems on the drinking water wells at the Exxon and Rittenhouse Fuel (316 Mount Carmel Rd).
- May 12, 1988. MDE received a copy of *Subsurface Hydrocarbon Investigation - May 12, 1988*.
 - Five monitoring wells installed on-site (MW1 - MW5);
 - Highest MTBE detected in MW4 at 10,000 ppb.
- September 23, 1988. *Phase II Summary Report*. A soil gas survey and pumping test conducted on MW5.
- December 28, 1989. MDE issued a *Notice of Violation (NV-90-114)* for the site requiring installation of a recovery system to remediate petroleum contaminated soils and groundwater.
- June 1990. MDE received Chevron's *Remedial Investigation and Corrective Action Plan (CAP)*, which proposed the installation of a groundwater pump-and-treat/soil vapor extraction (P&T/SVE) remediation system on-site.
- November 1990. Chevron installed three additional monitoring wells (MW11-MW13) on-site and started up a pump and treat/soil vapor extraction remediation system.
- April 14, 1991. MDE received *Quarterly Report – April 14, 1991*.
 - No product detected in the monitoring wells;
 - Approximately 80 gallons of LPH and dissolved phase hydrocarbons were recovered by the remediation system. A total of 334 pounds of vapor phase hydrocarbons was removed by the system.
- February-September 1992. Chevron sampled the on-site supply well and Rittenhouse Fuel's supply well (*See Table*).
- October 22, 1992. MDE received *Report of Remediation Activities – October 22, 1992*.
 - Recommended remediation system shutdown.
- November 11, 1992. MDE received *Remediation System Shutdown Report – November 11, 1992*.
 - The remediation system was shutdown on November 12, 1992.
 - A total of 71 pounds of dissolved phase hydrocarbons and 1,181 pounds of liquid and vapor phase hydrocarbons were removed from the site between November 1990 and November 1992.
- January 22, May 17 and September 17, 1993. MDE received *Quarterly Monitoring Reports.(See Table for Results)*.
 - Highest MTBE detected in MW4 at 310 ppb.
 - During some sampling events MTBE was not analyzed
 - On-site service station and Rittenhouse Fuel water supply wells sampled
- September 29, 1993. MDE issued a *Notice of Compliance* for the site and the case was closed.
 - Approved removal of the recovery system.
 - Required abandonment of all recovery/monitoring wells.
- Late 1993. Chevron Corporation sold the property to ExxonMobil Corporation. UST registration amended to reflect ExxonMobil as the registered owner of the UST system.
- February 24, 1995. The on-site drinking water well was sampled, no GAC system installed.
 - PW (on-site supply well): Benzene at 2 ppb; MTBE at 34 ppb
- April 19, 1995. The on-site drinking water well was sampled, no GAC system installed.
 - PW (on-site supply well) – ND

- March 15, 1995. MDE received an *Initial Report of Incident* for the site. A 2-3 gallon diesel fuel surface spill occurred at the site due to faulty dispenser nozzle.
- June 9, 1995. Baltimore County Department of Environmental Protection and Resource Management (DEPRM) sampled select off-site drinking water wells:
 - 308 Mount Carmel Road ND
 - 314 Mount Carmel Road ND
- September 20, 1995. A 1,000-gallon fuel oil UST and a 1,000-gallon used oil UST were removed from the site.
- October 1995. Chevron installed four USTs : three 10,000-gallon gasoline and one 10,000-gallon diesel.
- November 7, 1995. *Tank Excavation Assessment Report*. No evidence of petroleum impact observed from the removal of two 1,000-gallon USTs (heating oil and used oil) from the site.
- December 15, 1995. On-site supply well sampled. GAC system installed during reconstruction of the site in late 1995. (*See Table*).
- January 1, 1996. MDE required monthly sampling of on-site drinking water well for select petroleum constituents.
- February 8, 1999. MDE received a closure request from ExxonMobil stating their intent to maintain a GAC system on the on-site drinking water well until water meets State drinking water standards. In addition, the letter stated that the drinking water well would be sampled on a monthly basis.
- June 16, 1999. MDE issued a *Notice of Compliance* for *Case No. 1991-0403BA2*. Case Closed.
- October 18, 2001. MDE letter to ExxonMobil denying request to reduce sampling of on-site supply well from monthly to quarterly.
- November 20, 2002. MDE letter to Exxon Mobil requiring the following:
 - Seven (7) off-site private wells to be sampled 220, 306, 308, 310, 312, 314, and 315 Mount Carmel Road.
 - Tank field monitoring pipes must be sampled if previous monitoring wells were no longer present;
 - Sampling of existing monitoring well must continue.
- December 18, 2002. ExxonMobil sampled several off-site drinking water wells adjacent to the service station (*See Sampling Table for results*).
- January 22, 2003. ExxonMobil sampled select off-site drinking water wells (*See Sampling Table for results*).
 - 301 Mt. Carmel Road: Supply well not sampled. Facility was pumping water from a separate location.
 - 310 and 312 Mt. Carmel Road: Vacant residences - drinking water wells not sampled.
- July 2, 2003. MDE received *Quarterly Water Treatment System Sampling Reports* (*See Sampling Table for results*).
- January 12, July 2, and October 25, 2004. MDE received *Water Treatment System Sampling Reports*. (*See Sampling Table for results*).
- February 3, 2004. MDE received a letter from ExxonMobil that the on-site drinking water well would be out of service for the next three months due to a fire. Therefore, no sampling conducted for first quarter 2004.
- November 8, 2004. MDE letter to current property owner (ExxonMobil) and former property owner (Chevron) requiring the submittal of a joint *Work Plan* to delineate the extent of petroleum contamination.
- December 14, 2004. ExxonMobil submitted a request for an extension on submitting *Work Plan* for the site.

- January 31, 2005. MDE received *Proposed Work Plan - January 28, 2005* detailing the installation of five monitoring wells to assess groundwater contamination. Also received *Fourth Quarter 2004 Water Treatment System Sampling Report - January 28, 2005*.
- February 7, 2005. MDE approved ExxonMobil's *Proposed Work Plan - January 28, 2005*, with contingencies.
- March 28, 2005. MDE received UST testing results, including:
 - All sump containers - passed
 - Dry break bucket - failed
 - All other spill buckets - passed
 - All five dispenser pans - failed
 - Exxon Mobil stated intent to repair all failed components
- April 4-8, 2005. ExxonMobil installed five monitoring wells on-site (MW1 - MW5).
- April 28, 2005. ExxonMobil conducted slug tests on three of the newly installed monitoring wells (MW1, 3, 5). Slug tests could not be performed on MW2 and MW4 due to the wells being dry at the time of testing.
- May 2 and October 25, 2005. MDE received *Water Treatment System Sampling Reports*.
 - Highest MTBE detected in MW5 at 5,570 ppb. (*See table for results*)
- June 10, 2005. MDE received *Subsurface Investigation Report - June 9, 2005*.
- July 20, 2005. MDE directive letter to ExxonMobil requiring quarterly gauging and sampling of all on-site monitoring wells and the on-site drinking water well.
- July 22, 2005. Five monitoring wells installed in compliance with new high-risk groundwater use area regulations.
- January 30, April 28, July 31 and October 31, 2006. MDE received *Quarterly Monitoring Reports*
 - Highest MTBE detected in MW3 at 915 ppb (*See table for results*).
- October 5, 2006. MDE-OCP completed a compliance assistance inspection at the facility.
- January 31, April 30 and July 27, 2007. MDE received *Quarterly Monitoring Reports*.
 - Highest MTBE detected in MW5 at 2,700 ppb (*See table for results*).
- August 24, 2007. MDE sent letter to community informing them of detection of petroleum constituents in the groundwater above certain limits.
- September 28, 2007. Four 10,000-gallon USTs, three containing gasoline and one diesel, were excavated and removed from the site along with the associated piping and product dispensers.
- October 30, 2007. MDE received *Quarterly Monitoring Report*.
 - Highest MTBE detected in MW3 at 29.6 ppb (*See table for results*)
- November 16, 2007. New tank installation. Two 12,000-gallon gasoline, one 8,000-gallon gasoline and one 8,000-gallon diesel USTs installed on-site. All tanks constructed of fiberglass reinforced plastic.
- December 18, 2007. MDE-OCP received the *Tank Excavation and Assessment Report-December 17, 2007*.
 - Soil samples collected during excavation, maximum concentration of MTBE detected was 1.3 ppb.
 - A photoionization detector (PID) was used to field screen the soils, results ranged from 0.0 to 378 units.
- February 1, 2008. MDE-OCP received the *Fourth Quarter 2007 Quarterly Monitoring Report- January 31, 2008*.
 - Highest MTBE detected in MW5 at 238 ppb (*See table for results*)

- March 21, 2008. ExxonMobil submitted report to MDE-OCP confirming the site is located in a High Risk Groundwater Use Area.
- May 16, 2008. MDE-OCP received the *First Quarter 2008 Groundwater Monitoring Report- May 15, 2008*.
 - Highest MTBE detected in MW5 at 162 ppb (*See table for results*)
- July 31, 2008. MDE-OCP received the *Second Quarter 2008 Groundwater Monitoring Report- July 25, 2008*.
 - Highest MTBE detected in MW5 at 813 ppb (*see table for results*).
- October 31, 2008. MDE-OCP received the *Third Quarter 2008 Groundwater Monitoring Report and the Third Quarter 2008 Potable Water Sample Results- October 30, 2008*.
 - Highest MTBE detected in MW5 at 506 ppb (*see table for results*).

Other Related Cases:

- *Case No. 1991-0403-BA3(closed)*
- *Case No. 1995-2210-BA3 (closed)*
- *Case No. 2002-1172-BA2 (closed)*. Graul's Market, 220 Mount Carmel Road, Hereford, Baltimore County. This site is located adjacent to the Exxon Service Station located at 300 Mount Carmel Road. The MDE is evaluating the increasing concentrations of MTBE in the drinking water supply well at Graul's Market. The MDE's Water Management Administration (WMA) collects sampling data for this transient non-community water supply well. In July and October 2001, MTBE was detected at 0.7 ppb and 2 ppb, respectively. In January 2002, MTBE was detected at 3.9 ppb. The WMA collects sampling data from the drinking water well at Graul's Market on an annual basis. The levels of MTBE detected in this well are below the State's action level of 20 ppb.
- *Case No. 2006-0493-BA2*. Rittenhouse Fuel Company, 316 Mount Carmel Road, Hereford, Baltimore County. This facility is located adjacent to the Exxon Service Station located at 300 Mount Carmel Road. The MDE is evaluating the impact of MTBE in the drinking water supply well at Rittenhouse Fuel Company. Rittenhouse Fuel has been an active heating oil service center since at least the 1970s.
 - In July 1998, a 25,000-gallon heating oil UST system was removed. Currently, a 20,000-gallon heating oil UST system, installed in 1998, is in use at Rittenhouse Fuel Company.
 - In November 2005, the MDE-OCP notified MTBE was detected at 193 ppb in the supply well at Rittenhouse Fuel Company. The MDE issued a letter to the property owner requiring the installation of a GAC system on the drinking water well and monthly sampling (samples collected pre-, mid-, and post-filtration).
 - October 20, 2006. MDE-OCP completed a compliance assistance inspection at the facility. Several violations identified (submit pollution liability insurance, automatic tank gauging results, tank and spill bucket test results; conduct release detection).

Future Updates

- Future updates on this case investigation will be posted at www.mde.state.md.us [at the MDE home page, (select) Land, (select) Program, (select) Oil Control, (select) Remediation Sites].

Contacts:

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Disclaimer

The intent of this fact sheet is to provide the reader a summary of site events as they are contained within documents available to MDE. To fully understand the site and surrounding environmental conditions, MDE recommends that the reader review the case file that is available at MDE through the Public Information Act. The inclusion of a person or company's name within this fact sheet is for informational purposes only and should not be considered a conclusion by MDE on guilt, involvement in a wrongful act or contribution to environmental damage.

Off-Site Drinking Water Sample Results in the vicinity of Exxon Service Station at 300 Mount Carmel Road in northern Baltimore County

Date Sampled	Sample Date	MTBE <i>Action level – 20 ppb</i>	Other Petroleum constituents <i>Tertiary butyl alcohol (TBA) – unregulated compound</i>
Off-site Private Drinking Water Wells			
211 Mount Carmel Rd.	01/22/03 -ExxonMobil	ND	ND
220 Mount Carmel Rd.	01/22/03 -ExxonMobil	ND	---
301 Mount Carmel Rd.	01/22/03 -ExxonMobil	Not sampled	
308 Mount Carmel Rd.	06/09/95 - BADEPRM	ND	ND
	12/18/02 -ExxonMobil	0.68	---
310 Mount Carmel Rd.	01/22/03 -ExxonMobil	Vacant –not sampled	
312 Mount Carmel Rd.	01/22/03 -ExxonMobil	Vacant –not sampled	
314 Mount Carmel Rd.	06/09/95 - BADEPRM	ND	ND
	12/18/02 -ExxonMobil	0.67	---
316 Mount Carmel Rd.	12/18/02 -ExxonMobil	332	TBA at 160 ppb

* This value represents the highest level a constituent (i.e., MTBE) was detected for the given year

NS – Not sampled

ND - Non-detect

Groundwater Monitoring Data at the Exxon at 300 Mount Carmel Road, Baltimore County

Monitoring Wells (Installed 04/05/05-04/08/05)	Sampling Date	Petroleum Constituents of Concern		
		Benzene <i>MCL – 5 ppb</i>	MTBE <i>Action Level – 20 ppb</i>	Other Constituents of Concern
MW1 4 inch diameter well Well Depth 35 feet Screened 15 to 35 ft	04/22/05	ND	43.9	
	10/27/05	0.34J	16.1	
	01/20/06	ND	8.7	
	04/21/06	ND	10	
	07/05/06	0.32J	5.3	
	10/06/06	ND	466	
	03/12/07	ND	6.3	
	06/27/07	ND	14.2	
	09/12/07	0.23J	25.2	
	12/07/07	ND	17.8	
	01/23/08	ND	20.9	
	05/23/08	0.44J	9.9	
08/25/08	0.28J	12.5		
MW2 4 inch diameter well Well Depth 26 feet Screened 5 to 25 ft	04/22/05	DRY		
	10/27/05	DRY		
	01/20/06	DRY		
	04/21/06	DRY		
	07/05/06	DRY		
	10/06/06	DRY		
	03/12/07	DRY		
	06/27/07	DRY		
	09/12/07	DRY		
	12/07/07	DRY		
	01/23/08	DRY		
	05/23/08	NS		
08/25/08	DRY			
MW3 4 inch diameter well Well Depth 45 feet Screened 25 to 45 ft	04/22/05	19.8	106	TBA – 3,940 ppb; Naphthalene – NA
	10/27/05	30.8	84.4	TBA – 4,660 ppb; Naphthalene – 17.8 ppb
	01/20/06	16.3	62.5	TBA – 6,280 ppb; Naphthalene – 12.5 ppb
	04/21/06	6.7	46.9	TBA – 7,310 ppb; Naphthalene – 7.8 ppb
	07/05/06	10.7	37.6	TBA – 6,100 ppb; Naphthalene – 12 ppb
	10/06/06	10.9	36.6	TBA – 5,320 ppb; Naphthalene – 11.2 ppb
	03/12/07	3.4	48.9	TBA – 8,830 ppb; Naphthalene – 6.5 ppb

	06/27/07	3.1	34.8	TBA – 6,550 ppb; Naphthalene – 5.1 ppb
	09/12/07	3.0	29.6	TBA – 7,680 ppb; Naphthalene – 4.3J ppb
	12/07/07	3.6	29.6	TBA – 4,490 ppb; Naphthalene – 5.4J pp
	01/23/08	2.7J	132	TBA--11,000ppb; Naphthalene--5.2J ppb
	05/23/08	2.1	188	TBA-23,300ppb:
	08/25/08	0.78J	80.7	TBA 17,100ppb
MW4 4 inch diameter well Well Depth 27.5 feet Screened 7 to 27 ft	04/22/05	DRY		
	10/27/05	DRY		
	01/20/06	DRY		
	04/21/06	DRY		
	07/05/06	DRY		
	10/06/06	DRY		
	03/12/07	DRY		
	06/21/07	DRY		
	09/12/07	DRY		
	12/07/07	DRY		
	01/23/08	DRY		
	05/23/08	DRY		
08/25/08	DRY			
MW 5 4 inch diameter well Well Depth 35 feet Screened 15 to 35 ft	04/22/05	ND	5,570	TBA – 6,510 ppb
	10/27/05	ND	915	TBA – 588 ppb
	01/20/06	2.8	439	TBA – 1,200 ppb
	04/21/06	ND	374	TBA – 558 ppb
	07/05/06	ND	114	TBA – 209 ppb
	10/06/06	ND	2,700	TBA – 9,140 ppb
	03/12/07	ND	92.9	TBA – 44.4 ppb
	06/27/07	ND	0.37	TBA - ND
	09/12/07	ND	2.5	TBA-14.6J ppb
	12/07/07	ND	238	TBA-1,790 ppb
	01/23/08	ND	162	TBA--716 ppb
	05/23/08	ND	813	TBA- 5,110 ppb
08/25/08	ND	506	TBA- 1,550 ppb	

Drinking Water Sample Results at the Exxon Service Station at 300 Mount Carmel Road in northern Baltimore County

Date Sampled	Sample Location	MTBE Action level – 20 ppb	Other Petroleum constituents Benzene – 5 ppb (Maximum Contaminant Level) Tertiary butyl alcohol (TBA) – unregulated compound
Transient Non-community supply well at Exxon Service Station – 300 Mount Carmel Rd.			
1988	Influent	NS	Benzene - 200 ppb*
1989	Influent	NS	
1991	Influent	NS	
1992	Influent	NS	
1993	Influent	NS	
1995	Influent	96 ppb*	
1996	Influent	42 ppb*	
1997	Influent	170 ppb*	
1998	Influent	47 ppb*	
1999	Influent	699 ppb*	
2000	Influent	187 ppb*	
2001	Influent	135 ppb*	
2002	Influent	2,550 pb*	
2003	Influent	485 ppb*	TBA - 229 ppb*
2004	Influent	122 ppb*	TBA - 32.3 ppb*
2005	Influent	83.3 ppb*	
1/2006	Influent	ND	
	Mid	ND	
	Effluent	ND	
2/2006	Influent	ND	
	Mid	ND	
	Effluent	ND	

3/2006	Influent	5.8 ppb	
	Mid	ND	
	Effluent	ND	
4/2006	Influent	1.7 ppb	
	Mid	ND	
	Effluent	ND	
5/2006	Influent	2.4 ppb	
	Mid	ND	
	Effluent	ND	
6/2006	Influent	1.5 ppb	
	Mid	ND	
	Effluent	ND	
07/05/06	Influent	3 ppb	
	Mid	ND	
	Effluent	ND	
08/05/06	Influent	1.5 ppb	
	Mid	ND	
	Effluent	ND	
09/13/06	Influent	1030 ppb	TBA – 913 ppb
	Mid	ND	
	Effluent	ND	
10/6/06	Influent	2050 ppb	
	Mid	ND	
	Effluent	ND	
11/6/06	Influent	904 ppb	TBA – 689 ppb
	Mid	0.24 ppb	TBA – 82.2 ppb
	Effluent	ND	
12/12/06	Influent	407 ppb	TBA – 148 ppb
	Mid	0.75 ppb	TBA – 131 ppb
	Effluent	ND	
01/04/07	Influent	183 ppb	TBA – 20.2 ppb
	Mid	ND	
	Effluent	ND	
02/02/07	Influent	123 ppb	TBA – 15.2 ppb
	Mid	ND	
	Effluent	ND	
03/12/07	Influent	60 ppb	
	Mid	ND	
	Effluent	ND	
04/03/07	Influent	38 ppb	
	Mid	ND	
	Effluent	ND	
05/04/07	Influent	20.6 ppb	
	Mid	ND	
	Effluent	ND	
06/01/07	Influent	9.9 ppb	
	Mid	0.076J ppb	
	Effluent	ND	
07/06/07	Influent	21.1 ppb	TBA-8.0 ppb
	Mid	2.4J ppb	
	Effluent	ND	
08/07/07	Influent	30.1 ppb	TBA-3.2J ppb
	Mid	ND	
	Effluent	ND	
09/07/07	Influent	17.9 ppb	
	Mid	ND	
	Effluent	ND	
12/07/07	Influent	31.6 ppb	
	Mid	ND	
	Effluent	ND	
02/12/08	Influent	23.1ppb	TBA-3.4J ppb
	Mid	ND	
	Effluent	ND	
06/05/08	Influent	8.7	
	Mid	0.18J	
	Effluent	ND	
08/25/08	Influent	11.0	
	Mid	0.20J	
	Effluent	ND	