

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Baltimore Maryland 21230-1719
1-800-633-6101 • <http://www.mde.state.md.us>

**Drinking Water Well Impact
7-Eleven Store No. 22281/Citgo
2400 Pleasantville Road, Fallston
Harford County, Maryland**

(MDE - Case 1990-0801 HA; Case 1995-2622 HA; Case 2005-0120HA)

The Maryland Department of the Environment (MDE) is continuing its evaluation of the methyl tertiary-butyl ether (MTBE) contamination of the water supply well and gasoline retail activities 7-Eleven/Citgo service station located at 2400 Pleasantville Road in Harford County. The Oil Control Program (OCP) has coordinated the investigation with the Harford County Health Department (HCHD).

Gasoline retail activities have been ongoing for over twenty years at the 7-Eleven/ Citgo, under several business entities namely Ewing Oil, Southland Corporation and currently 7-Eleven Inc. This active gas station currently operates three (3) 12,000-gallon gasoline underground storage tank systems (USTs). These USTs are cathodically protected steel tanks with piping material comprising of flexible plastic, double walled with secondary containment. The site has Stage I & II vapor recovery systems. Several monitoring wells are located on-site. A carbon treatment system is currently in-place on the non-community supply well to eliminate petroleum constituents from the drinking water that serves the 7-Eleven convenience store. This drinking water well is located hydrologically up gradient of the tank field and dispenser islands. Groundwater flow appears to the North Northwest.

Site History:

- October 27, 1989. MDE-OCP opened case (1990-0801 HA) in response to a notification concerning well drill cuttings in seven (7) 55-gallon drums stored next to the building. Southland Corp. installed the wells in conjunction with Ewing Oil Company. OCP checked the drums and found no odors of petroleum products. MDE-OCP requested samples to be collected from each of the 3 monitoring well locations.
- April 24, 1991. Letter from HCHD concerning sampling results from the non-community supply well at the 7-Eleven Citgo.
 - August 1990. MTBE detected at 259 ppb
 - September 1990. MTBE detected at 250 ppb.
 - March 1991. Carbon filtration system installed. MTBE at 11 ppb in post-treatment sample.
- May 31, 1991. Monitoring Well Sampling Report-May 21, 1991 prepared by Nutshell Enterprises Ltd. on behalf of Ewing Oil. No liquid petroleum product was found in the wells. Groundwater present in two (MW1, MW3) of three monitoring wells, sampled and analyzed for benzene, toluene, xylene, ethylbenzene (BTEX) and total petroleum hydrocarbons (TPH) yielded non-detects except for toluene which had trace amounts.
- October 18, 1991. Letter from HCHD concerning sampling results from the non-community supply well at the 7-Eleven Citgo, four supply wells serving business entities and a residential property in close proximity to the station.
 - 1990-1991
 - 2402 Pleasantville Road (Pleasantville Professional Building) – trace amounts of solvents below drinking water standards.
 - 2410 Pleasantville Road (Josef's Restaurant) – no petroleum constituents detected.
 - 2108 Fallston Road (Abe's Place) – no petroleum constituents detected.
 - Aldo's Restaurant – no petroleum constituents detected.
 - 2019 Fallston Road – no petroleum constituents detected.
- November 6, 1991. MDE letter to HCHD stating that no active investigation trace levels of solvents detected a supply well to be conducted because this constituent is not found in petroleum UST systems.

- December 11, 1991. Letter from HCHD concerning sampling results from the non-community supply well at the 7-Eleven Citgo.
 - November 1991. MTBE detected at 39 ppb.
- March 4, 1992. Letter from HCHD regarding expansion plans of a nearby restaurant.
- March 16, 1992. Monitoring Well Sampling Report-March 10, 1992 prepared by Nutshell Enterprises Ltd. on behalf of Ewing Oil. No liquid petroleum product in wells. Groundwater collected from one of three monitoring wells (insufficient quantities). MW3 analyzed for BTEX and TPH yielded trace amounts (<3 ppb).
- July 9, 1992. Letter to HCHD from MDE. Based on trace levels of petroleum constituents from the downgradient monitoring well (MW3), no further action being considered.
- May 18, 1994. Monitoring Well Sampling Report-May 13, 1994 prepared by Nutshell Enterprises Ltd. on behalf of Ewing Oil. No liquid petroleum product in wells. Groundwater collected from two of three monitoring wells (insufficient quantities). MW1 and MW3 both analyzed for BTEX and TPH yielded trace amounts (<2 ppb).
- October 1992. OCP inspected site and evaluated pump test data.
- March 9, 1994. MDE closed case #1990-0801 HA.
- June 6, 1995. New case opened: 1995-2622HA. MDE-OCP observed retrofitting of existing tanks for Stage II vapor recovery. 20 tons of contaminated soil disposed of off-site. MDE closed case April 1, 1997.
- July 30, 2004. Case # 2005-0120HA opened. MDE-OCP conducted a compliance assistance inspection at the facility. MDE-OCP required the following tasks to be completed;
 - Submit copies of the pollution liability insurance, last two inspection results for the cathodic protection system, copy of the assessment of the impressed current system performed by a corrosion expert when the UST aged at 5 years, precision tests at the time of installation and upgrade, latest line leak detection test and the latest precision test of pressurized piping.
 - Maintain spill buckets and properly anchor shear valves
 - Remove oily water from submersible pumps
 - Investigate the source of vapor in the tank field
 - Submit Vapor Assist System –Type I Leak test.
- August 2, 2004. MDE-OCP collected a groundwater sample from the non-community well: MTBE pre-treatment at 22.7 ppb, post-treatment – non-detect. Groundwater samples collected from two (2) of 3 on-site monitoring wells.
- August 2004. Lab results provided by HCHD summarizing historic sampling data from the 7-Eleven Citgo service station water supply well.
 - November 1999. MTBE at 109.5 ppb - pre-treatment sample.
 - December 1999. MTBE at 122.5 ppb - pre-treatment sample.
 - January 2001. MTBE at 99.1 ppb- pre-treatment sample, post-treatment sample –102.1 ppb.
 - March 2001. MTBE at 128 ppb- pre-treatment sample, post-treatment sample -125 ppb. Re-sampling of post-treatment sample showed 1.6 ppb –MTBE several days later.
 - May 2001. MTBE at 89 ppb- pre-treatment sample, post-treatment sample -35 ppb.
 - July 2001. MTBE at 66 ppb- pre-treatment sample, post-treatment sample –69.5 ppb.
 - September 2001. MTBE 80 ppb- pre-treatment sample, post-treatment sample -83 ppb.
 - October 2001. MTBE at 60 ppb- pre-treatment sample, post-treatment sample -29 ppb. Retested several days later - MTBE at 72 ppb- pre-treatment sample, post-treatment sample –0.5 ppb.
 - January 2002. MTBE at 118 ppb- pre-treatment sample, post-treatment sample –4.3 ppb.
 - February 2002. MTBE at 64 ppb- pre-treatment sample, post-treatment sample –40 ppb.
 - April 2002. MTBE at 56 ppb- pre-treatment sample, post-treatment sample –0.5 ppb.
 - May 2002. MTBE at 67 ppb- pre-treatment sample, post-treatment sample –0.5 ppb.
 - August 2002. MTBE at 75 ppb- pre-treatment sample, post-treatment sample –7.2 ppb.

- September 2002. MTBE at 97 ppb- pre-treatment sample, post-treatment sample –25 ppb. Resampling showed MTBE at 74 ppb- pre-treatment sample, post-treatment sample –0.5 ppb.
 - November 2002. MTBE at 99 ppb- pre-treatment sample, post-treatment sample –0.5 ppb.
 - January 2003. MTBE at 94 ppb- pre-treatment sample, post-treatment sample –4 ppb.
 - March 2003. MTBE at 60 ppb- pre-treatment sample, post-treatment sample –22 ppb.
 - May 2003. MTBE at 55 ppb- pre-treatment sample, post-treatment sample –49 ppb.
 - July 2003. MTBE at 37 ppb- pre-treatment sample, post-treatment sample –49 ppb. Resampling showed MTBE at 32 ppb- pre-treatment sample, post-treatment sample –0.5 ppb.
 - December 2003. MTBE at 31 ppb- pre-treatment sample, post-treatment sample –29 ppb.
 - January 2004. MTBE at 17 ppb- pre-treatment sample, post-treatment sample –8.6 ppb.
 - February 2004. MTBE at 17 ppb-pre-treatment, post treatment 8.6 ppb.
 - April 2004. MTBE at 21 ppb-pre-treatment, post treatment 15 ppb.
 - July 2004. MTBE at 19 ppb-pre-treatment, post treatment 11 ppb.
 - August 9, 2004. MTBE at 28 ppb-pre-treatment, post treatment 17.3 ppb.
 - August 19, 2004. MTBE at 28 ppb-pre-treatment, post treatment non-detect.
 - August 23, 2004. MTBE at 26 ppb-pre-treatment, post treatment non-detect
- August 12, 2004. 7-Eleven submit facility records related to the operational compliance of the UST systems which were requested during the MDE-OCP July 30, 2004 compliance inspection.
 - August 13, 2004. MDE-OCP received *Hydrostatic Testing Results Sumps – August 11, 2004*.
 - August 17, 2004. MDE-OCP site inspection. Three monitoring wells identified on-site (MW1, MW2 and MW3).
 - MW1 located near a gasoline submersible pump was hand bailed and a sample collected for analysis.
 - MW2 was dry.
 - MW3 located on the property boundary was hand bailed and a sample collected for analysis.
 - MDE identified several non-compliant issues related to the previous site inspection concerning the operational compliance of the USTs.
 - September 7, 2004. MDE letter to 7-Eleven Inc. requesting the following:
 - Enhanced leak detection test to be performed no later than Oct. 8, 2004.
 - Submit a *Subsurface Investigation Work Plan* no later than Sept. 27, 2004.
 - Submit an *Environmental Assessment Report* no later than November 30, 2004.
 - Guidance on monitoring, operation and maintenance of the treatment system deferred to HCHD.
 - September 14, 2004. MDE-OCP received sampling results
 - August 17, 2004 sampling results.
 - MW1 - MTBE at 32.3 ppb
 - MW3 - MTBE at 2091 ppb; tertiary amyl methyl ether (TAME) at 69.5 ppb
 - MDE identified several non-compliant issues related to the previous site inspection concerning the operational compliance of the USTs.
 - September 29, 2004. MDE received the *Subsurface Investigation Work Plan – September 27, 2004*. The *Work Plan* proposed the following activities;
 - Six to eight geoprobe locations on-site.
 - Soil and groundwater samples to be collected from each location
 - Sampling of the on-site drinking water supply well.

- November 18, 2004. MDE approved the Subsurface *Investigation Work Plan – September 27, 2004* contingent upon the following;
 - Install an additional seven (7) geoprobe points for a total of 15 points.
 - Collect soil and groundwater samples for full suite petroleum analyses.
 - Conduct a well survey and submit well completion reports within a 0.5 mile radius.
 - Describe hydrogeologic conditions on-site and off-site.
 - Submit the *Environmental Assessment Report* no later than March 1, 2005.

- January-March 2005. 7-Eleven consultant's (ENSR) implemented approved *Work Plan –September 27, 2004*.
 - 01/12/2005. MDE on-site to observe the installation of select temporary monitoring points.

- March 2, 2005. MDE received *Hydrogeological Investigation- March 2, 2005*. Fifteen (15) temporary monitoring points installed. Groundwater flows north-northwesterly
 - Seventy (70) soil samples from 15 locations. None exceeded MDE's cleanup standards for petroleum compounds.
 - Groundwater analyses revealed elevated levels near the tank field and pump islands.

February 2005

 - SB4 MTBE – 52,000 ppb (estimated); benzene – 38 ppb; TBA 39000 ppb; TAME - 5200 ppb; TPH-GRO – 46000 ppb; naphthalene – 13 ppb; diisopropyl ether - 230 ppb (estimated); Possible oil sheen observed in sample
 - SB5 MTBE – 25 ppb; non-detect for other petroleum constituents
 - SB7 MTBE – 40 ppb; TBA 95 ppb;
 - SB8 MTBE – 27000 ppb; TBA 13000 ppb; TAME - 750 ppb; diisopropyl ether - 67ppb (estimated); TPH-GRO – 27000 ppb
 - SB 12 MTBE – 550 ppb; TBA 190 ppb; TPH-GRO – 440 ppb
 - Drinking water sample collected from the 7-Eleven Citgo's supply well.

September 2004

 - Pre-treatment MTBE - 22 ppb
 - Mid-treatment non-detect for all petroleum constituents
 - Post-treatment non-detect for all petroleum constituents

October 2004

 - Pre-treatment MTBE - 30 ppb
 - Mid-treatment non-detect for all petroleum constituents
 - Post-treatment non-detect for all petroleum constituents

November 2004

 - Pre-treatment MTBE - 18 ppb
 - Mid-treatment non-detect for all petroleum constituents
 - Post-treatment non-detect for all petroleum constituents

December 2004

 - Pre-treatment MTBE - 41 ppb
 - Mid-treatment non-detect for all petroleum constituents
 - Post-treatment non-detect for all petroleum constituents
 - 7-Eleven proposed the installation of 6 permanent monitoring wells (SB2; SB4, SB5; SB8; SB12 and SB-14).

- May 20, 2005. MDE letter approved proposed well installation on-site including the installation of an additional monitoring well.

- June 17, 2005. MDE received *Subsurface Investigation Workplan – June 17, 2005*. 7-Eleven proposed to install a total of eight (8) monitoring wells.

- June 23, 2005. MDE letter approving the *Subsurface Investigation Workplan*.
 - Install permanent monitoring wells in the vicinity of soil borings 2, 4, 5, 8, 12, and 14;
 - Install a permanent monitoring well between the tank field and the on-site production well; and
 - Begin quarterly monitoring of monitoring wells/tank field pipes, and the drinking water well for full suite VOCs.
- July 5-7, 2005. MDE on-site to observe the installation of the additional monitoring wells.
- August 11, 2005. MDE-OCP received a Summary Report of the Tracer Test Results. The gasoline UST systems passed.
- August 16, 2005. MDE received the *Monitoring Well Installation and Sampling Report – August 15, 2005*.
 - Four (4) new monitoring wells were installed (MW4, MW5, MW6 and MW7) corresponding with the 4 geoprobe locations (SB4, SB5, SB7 and SB8) which previously had elevated petroleum constituents.
 - In July 2005, groundwater samples were collected from the eight (8) existing monitoring wells and the thirteen (13) locations. TBA and TAME were not analyzed.
 - Soil samples collected from the 8 monitoring wells were all below the Department’s residential soil standards for petroleum constituents.
 - Groundwater analyses revealed elevated levels downgradient of the tank field (towards Maryland Route 152) and in the vicinity of the tank field and pump islands.

July 2005

Upgradient of UST system

- MW1A non-detect for petroleum constituents (nested well near the drinking water supply well).
- MW1B MTBE – 11 ppb
- SB14 non-detect for petroleum constituents
- SB15 non-detect for petroleum constituents

Cross-gradient of UST system

- SB11 non-detect for petroleum constituents
- SB3 MTBE – 2ppb

Vicinity of the UST system and piping

- MW2 MTBE – 3 ppb
- SB2 MTBE – 1 ppb

- MW3 MTBE – 2400 ppb; TPH-GRO – 2700 ppb
- SB8 MTBE – 3300 ppb; TPH-GRO – 5800 ppb

- MW5 MTBE – 10 ppb; non-detect for other petroleum constituents
- SB5 MTBE – 14 ppb; non-detect for other petroleum constituents

- SB7 MTBE – 38 ppb; non-detect for other petroleum constituents

- MW7 non-detect for petroleum constituents
- SB13 non-detect for petroleum constituents

Downgradient of UST system

- MW4 MTBE – 31,000 ppb; benzene – 11 ppb; TPH-GRO – 30,000 ppb.
- SB4 MTBE – 110,000 ppb; benzene – 140 ppb; TPH-GRO – 140,000 ppb. Note detection levels were elevated @100 ppb.

- SB9 MTBE – 6 ppb

- MW6 MTBE – 760 ppb; TPH-GRO – 840 ppb

– SB 12 MTBE – 290 ppb; TPH-GRO – 300 ppb

- Sampling data for the drinking water supply well at the 7-Eleven Citgo located upgradient of the tank field was also provided for the period August 2004 to July 2005.

February 2005

- Pre-treatment MTBE – 26ppb
- Mid-treatment non-detect for all petroleum constituents
- Post-treatment non-detect for all petroleum constituents

March 2005

- Pre-treatment MTBE – 24ppb
- Mid-treatment non-detect for all petroleum constituents
- Post-treatment non-detect for all petroleum constituents

April 2005

- Pre-treatment MTBE – 22ppb
- Mid-treatment non-detect for all petroleum constituents
- Post-treatment non-detect for all petroleum constituents

June 2005

- Pre-treatment MTBE – 21ppb
- Mid-treatment non-detect for all petroleum constituents
- Post-treatment non-detect for all petroleum constituents

July 2005

- Pre-treatment MTBE – 15.7ppb
- Mid-treatment non-detect for all petroleum constituents
- Post-treatment non-detect for all petroleum constituents

November 2005

- Pre-treatment MTBE – 17ppb
- Mid-treatment Not reported
- Post-treatment non-detect for all petroleum constituents

- Further investigation to determine aquifer characteristics to develop a *Corrective Action Plan* was proposed to control and prevent the migration of the groundwater contaminant plume off-site.

- November 17, 2005. MDE received a faxed copy of a *Supplemental Groundwater Investigation Work Plan – November 17, 2005*.

- Proposed to install three (3) deep bedrock well down gradient and in the vicinity of the tank field/dispenser island.
- Groundwater sampling results for the deep wells to be submitted by February 2006.

Current Activities

- January 18, 2006. MDE received e-mail update on further site investigation activities. Recent groundwater sampling data from the existing monitoring wells was summarized in a table.

November 2005 Sampling Event

Upgradient of UST system

- MW1A non-detect for petroleum constituents (nested well near the drinking water supply well).
- MW1B MTBE – 12 ppb
- SB14 non-detect for petroleum constituents
- SB15 non-detect for petroleum constituents

Cross-gradient of UST system

- SB11 Not analyzed
- SB3 Not analyzed

Vicinity of the UST system and piping

- MW2 MTBE – 37 ppb; non-detect for other petroleum constituents
- SB2 MTBE – 2 ppb ; non-detect for other petroleum constituents

- MW3 MTBE – 260 ppb; non-detect for other petroleum constituents
- SB8 MTBE – 120 ppb; non-detect for other petroleum constituents

- MW5 MTBE – 15 ppb; non-detect for other petroleum constituents
- SB5 MTBE – 12 ppb; non-detect for other petroleum constituents

- SB7 MTBE – 20 ppb; non-detect for other petroleum constituents

- MW7 non-detect for petroleum constituents;
- SB13 non-detect for petroleum constituents

Downgradient of UST system

- MW4 MTBE – 42,000 ppb; benzene – 15 ppb
- SB4 MTBE – 120,000 ppb; benzene – 140 ppb;

- SB9 MTBE – 3 ppb; non-detect for other petroleum constituents

- MW6 MTBE – 1900 ppb; non-detect for other petroleum constituents
- SB 12 MTBE – 1700 ppb; non-detect for other petroleum constituents

- The installation of two (2) of three (3) additional deep wells is expected to be completed by the week of 01/23/2006.

Contacts:

- Maryland Department of the Environment (MDE)
 - Susan Bull: 410-537-3499 (Oil Control Program)
 - Yolande Norman: 410-537-3443 (Oil Control Program)

- Harford County Health Department (HCHD)
 - Gary Browning: 443-643-0322
 - Fred Faulkner: 443-643-0307

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.