

# MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard ● Baltimore Maryland 21230-1719

1-800-633-6101 ● <http://www.mde.state.md.us>

---

**Darlington Citgo  
3940 Conowingo Road, Darlington  
Harford County, Maryland  
1996-1361-HA**

The Maryland Department of the Environment (MDE), Oil Control Program (OCP), in conjunction with the Harford County Health Department (HCHD), continues to evaluate petroleum impacts at the Darlington Citgo, located in Harford County.

Darlington Citgo has been an active service station, maintained by independent operators, since the 1970s. At that time, five underground storage tanks (USTs) were in use (three 4,000-gallon gasoline; a 4,000-gallon kerosene; and a 10,000-gallon diesel). In 1986, ownership was transferred to another independent operator (Mr. Ernest Strauss). In 1987, the three 4,000-gallon gasoline USTs were removed and replaced with three 8,000-gallon gasoline USTs. According to the Department's records, the UST systems were registered to another independent operator, Mr. Man U. Chun, in June 1990.

In December 1995, the remaining USTs (4,000-gallon kerosene and 10,000-gallon diesel) failed precision tests. The kerosene UST was removed in January 1996 and the diesel UST was abandoned-in-place due to its close proximity to the canopy footer. Four monitoring wells were subsequently installed. In 1995, a new 12,000-gallon compartmentalized UST was installed.

In 2004, the property was sold to the current operator. Subsurface investigations identified petroleum impacts on-site and its migration onto the adjacent Harley Davidson property (3938 Conowingo Road). The last round of monitoring well samples in July 2003 detected groundwater contamination [benzene at 12,400 parts per billion (ppb); toluene at 23,320 ppb; ethylbenzene at 5,280; xylene at 18,920 ppb; methyl tertiary-butyl ether (MTBE) at 621,600 ppb; and naphthalene at 920 ppb].

Currently, there are three 8,000-gallon protected steel USTs and a 12,000-gallon compartmentalized double-walled UST with composite steel and fiberglass-reinforced plastic. Seven (7) monitoring wells, four (4) tank field monitoring pipes, and a transient non-community drinking water supply well are located on-site.

Sampling of the drinking water supply well at the Citgo gas station by HCHD in June 2006 detected MTBE at 60.3 ppb and in July 2006 MTBE levels were at 121 ppb. The facility was subsequently retrofitted with a granular activated carbon (GAC) treatment system. To date, petroleum constituents have impacted no off-site private residential wells. The HCHD is regularly sampling the Harley Davidson property at 3938 Conowingo Road.

## **Chronology**

- November 8, 1995. MDE conducted a routine site inspection. Minor violations identified.
- December 5, 1995. MDE received notification of a tank test failure of both the 4,000-gallon kerosene and 10,000-gallon diesel UST systems.
- December 8, 1995. MDE site visit in response to UST failures.
  - USTs excavated and perforations identified in both tanks.
  - MDE required USTs be pumped of product and properly abandoned.
  - The installation of three (3) groundwater monitoring wells was required.

- 1996: UST removal and monitoring well installation.
  - January 3, 1996. MDE observed the removal of the 4,000-gallon steel kerosene UST. The 10,000-gallon diesel UST was to be abandoned in place.
  - October 3, 1996. MDE site visit to demarcate the location of three monitoring wells to be installed.
  - October 28, 1996. MDE met with the property owner at 4000 Conowingo Road regarding the contaminated drinking water well (shallow).
  - November 13, 1996. MDE conducted a routine site inspection. Minor violations noted.
  - November 25, 1996. MDE received the results of sampling performed at 4000 Conowingo Road.
  - December 4, 1996. HCHD letter to Walker Oil requiring annual sampling at the station (3940 Conowingo Road).
  - December 12, 1996. MDE received *Well Sampling and Analysis Report - December 1996*.
    - Three monitoring wells installed and sampled. December 3, 1996 sampling event.
      - MW-A (22 feet)            benzene at 60 ppb; MTBE at 8,020 ppb
      - MW-B (23 feet)            MTBE at 232 ppb
      - MW-C (22 feet)            benzene at 2,030 ppb; ethylbenzene at 1,210 ppb; MTBE at 5,100 ppb
  
- 1997: Groundwater Monitoring.
  - January 30, 1997. MDE received *Results of Analysis of the Walker Oil Darlington Water Sample - January 21, 1997*.
  - July 29, 1997. An additional monitoring well installed to a depth of 30 ft. Moisture observed at 12 ft.
  
- March 20, 1998. HCHD letter to property owner at 4000 Conowingo Road. Sampling of the new drilled well performed on 02/06/98 was non-detect for petroleum constituents.
  
- 2000: MDE required a *Corrective Action Plan*.
  - MDE conducted a routine site inspection. Walker Oil contacted regarding last testing of UST system and last sampling of monitoring wells.
  - May 22, 2000. MDE directive letter to Walker Oil requiring sampling of on-site monitoring wells.
  - July 3, 2000. MDE received results of drinking water sampling performed by HCHD.
  - July 31, 2000. MDE received *Darlington Citgo Groundwater Monitoring Report - July 28, 2000*. Groundwater flow to the southwest.
  - September 11, 2000. MDE letter to Walker Oil requiring quarterly sampling of monitoring wells and a meeting to discuss tank tightness testing and inventory control
  - December 7, 2000. Site meeting with current property owner and prospective purchaser. MDE required a *Corrective Action Plan* be submitted to remediate dissolved phase petroleum constituents.
  - December 21, 2000. MDE received the results of tightness testing for the three 8,000-gallon gasoline USTs. Tightness testing performed 9/26/00; all tanks passed.
  
- 2001: Continued Groundwater Monitoring.
  - February 28, 2001. MDE directive letter to both Walker Oil and property owner requiring quarterly sampling of the four on-site monitoring wells and drinking water supply well.
  - April 26, 2001. MDE received *Spring 2001 Quarterly Groundwater Monitoring Report - April 24, 2001*.
  - May 10, 2001. MDE directive letter to both Walker Oil and property owner requiring quarterly sampling of the four on-site monitoring wells and drinking water supply well.
  - August 8, 2001. MDE received *Summer 2001 Quarterly Groundwater Monitoring Report - August 3, 2001*.
  - May 22, 2001. MDE notified by HCHD of sampling results at 3928 Conowingo Road (Chesapeake Harley Davidson). Sampling performed in August 2001 detected MTBE at 18.94 ppb.

- 2002: MDE issued Notice of Violation *NV-2002-123* due to petroleum impact at an off-site drinking water supply well.
  - June 14, 2002. MDE *NV-2002-123* to both Walker Oil and property owner requiring the parties to:
    - Provide safe drinking water to 3938 Conowingo Road;
    - Purge all contact water from tank field monitoring pipes and monitoring wells;
    - Continue quarterly monitoring of monitoring wells and on-site drinking water supply well; and
    - Begin quarterly sampling of the drinking water supply well at 3938 Conowingo Road.
  - July 12, 2002. MDE conducted a routine site inspection. Minor violations noted.
  - August 7, 2002. MDE *Site Status Letter* to Dean Insurance Agency.
  - August 22, 2002. MDE received 03/15/02 sample results collected at 3938 Conowingo Road by HCHD.
  - September 17, 2002. MDE letter to Walker Oil requesting documentation to determine Walker Oil's extent of liability for Darlington Citgo. The Department also requested a written response of Walker Oil's intention to comply with NV-2002-123.
  - November 4, 2002. Property owner forwarded a copy of the lease agreement to MDE.
  
- 2003: Continued Groundwater Monitoring.
  - January 7, 2003. MDE informed former property owner deceased.
  - January 13, 2003. MDE received *Darlington Citgo Report of Direct Push Sampling and Analysis - January 3, 2003*.
    - One soil boring advanced; one soil sample and one groundwater sample collected
      - SB-1 (28ft): below regulatory levels
      - GW-1: benzene at 170 ppb; MTBE at 29.9 ppb
    - Recommended the installation of three additional monitoring wells
  - February 19, 2003. MDE directive letter to property owner requiring the installation of three additional monitoring wells.
  - April 1, 2003. MDE received *Report of Domestic Supply Well Sampling - March 27, 2003*. A carbon treatment system was in place on the drinking water supply well.
  - June 5, 2003. MDE observed the installation of three additional monitoring wells.
    - MW-5: 32 feet deep Petroleum odors encountered during drilling
    - MW-6: 32 feet deep; Depth to groundwater 19 feet
    - MW-7: 32 feet deep; Depth to groundwater 20 feet
  - August 4, 2003. MDE received *Report of Groundwater Flow Calculation - July 28, 2003*. Groundwater flow southwest. June 12, 2003 sampling event.
  - August 5, 2003. MDE received *Report of Domestic Supply Well Sampling - August 1, 2003*.
  - September 3, 2003. MDE received *Report of Domestic Supply Well Sampling - September 2, 2003*.
  - October 23, 2002. MDE received *Report of Domestic Supply Well Sampling - October 22, 2003*.
  - November 5, 2003. MDE directive letter to property owner requiring a *Corrective Action Plan* to remediate the contamination plume.
  
- 2004: Continued Groundwater Monitoring.
  - January 20, 2004. MDE received a copy of Chesapeake Harley Davidson, Inc.'s Complaint filed against the former and current owner and former and current service providers of the station.
  - January 20, 2004. MDE received *Report of Domestic Supply Well Sampling - January 16, 2004*.
  - February 18, 2004. MDE received *Report of Domestic Supply Well Sampling - February 17, 2004*.
  - March 2, 2004. MDE received Corrective Action Proposal for Darlington Citgo. The proposal included the installation of a vacuum-enhanced total-fluids pump-and-treat system on existing monitoring well MW-5 and soil vapor extraction (SVE) on existing MW-7.
  - March 22, 2004. MDE received *Report of Domestic Supply Well Sampling - March 19, 2004*.
  - March 30, 2004. MDE received the results of drinking water sampling performed by HCHD.
  - April 23, 2004. MDE received *Report of Domestic Supply Well Sampling - April 21, 2004*.
  - June 16, 2004. MDE received *Chesapeake Harley Davidson Subsurface Investigation - August 2003*.

- Investigation conducted using Membrane Interface Probe (MIP) and Soil Conductivity (SC) technologies from 06/02/03-06/03/03;
    - MIP/SC profiling conducted at 14 locations in the parking lot at 3938 Conowingo Road;
    - Two soil samples and one water sample collected;
    - General groundwater flow westerly;
    - The station is the source of contamination in the drinking water at 3938 Conowingo Road;
    - The proposed *Corrective Action Plan* was evaluated and additional remediation activities suggested.
  - August 20, 2004. MDE received *Report of Domestic Supply Well Sampling - August 6, 2004*.
  - September 10, 2004. MDE directive letter to Walker Oil and (former) property owner requiring submittal of a revised *Corrective Action Plan*. The revised *Corrective Action Plan* must incorporate: quarterly monitoring well sampling; further plume delineation; and pilot studies of remedial technologies.
  - October 24, 2004. MDE letter to Walker Oil's attorney indicating that MDE would be pursuing action against Mr. Chun, the responsible party.
- January 27, 2005. MDE *Site Status Letter* to the new property owner.
  - May 27, 2005. MDE received *Reports of Domestic Supply Well Sampling - October 7, 2004, September 24, 2004, December 20, 2004, February 22, 2005, May 24, 2005*.
  - July 14, 2005. MDE received *Report of Domestic Supply Well Sampling - July 12, 2005*. MTBE impact noted in mid-filtration sample. New carbon canisters ordered.
  - October 24, 2005. MDE received *Report of Domestic Supply Well Sampling and Replacement of Carbon Filtration Media - September 2, 2004*.
  - July 17, 2006. MDE received results of on-site drinking water well sampling performed by HCHD.
    - Sampling event 06/20/06. HCHD collected a confirmatory sample. MTBE at 60.3 ppb.
  - August 1, 2006. MDE received email notification from HCHD that sampling of the on-site transient non-community supply well performed 07/14/06 detected MTBE at 121 ppb. MDE recommended a GAC system.
  - August 25, 2006. MDE received the results of area sampling performed by HCHD.
  - August 31, 2006. MDE site visit to verify the presence of a GAC system and demarcate wells to bring the station in compliance with the emergency regulations. A GAC system installed on the drinking water supply well. Three monitoring wells, MW-2, MW-3, and MW-7, were chosen for semi-annual sampling.
  - December 5, 2006. MDE directive letter to property owner requiring the following:
    - Amendment of the UST registration;
    - Perform a helium test to check vapor leaks in the gasoline UST system;
    - Test all spill catchment basins and containment sumps;
    - Conduct a self-audit of UST systems;
    - Conduct quarterly sampling of three monitoring wells and all tank field monitoring pipes;
    - Conduct quarterly sampling of the on-site transient non-community drinking water supply well.
  - February 2, 2007. MDE received UST systems testing data.
    - UST system testing results:
      - Line leak detector test: passed 7/16/04
      - Tank tightness test: passed 2/25/03 and 5/31/04
      - Helium test: passed 1/17/07 (repairs made)
      - Corrosion Testing: passed 2/25/03

- April 4, 2007. MDE-OCP met with the property owner to discuss requirements for the new emergency regulations.
- April 9, 2007. MDE-OCP received an amended facility registration.
- November 21, 2007. MDE received sampling results from HCHD (*see Table*).
- January 9, 2008. MDE issued a Notice of Violation (*NV-2008-041*) to the UST owner/operator, rescinding sampling of three groundwater monitoring wells given that the facility throughput is less than 10,000 gallons and requiring the submittal of:
  - Catchment basin testing results;
  - Cathodic protection testing results; and
  - Drinking water supply well testing results, to be collected on a semi-annual basis.

**Future Updates:**

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

**Other Related Case:**

1988-0882-HA (closed)

**Contacts**

- Maryland Department of the Environment (MDE)                      Oil Control Program: 410-537-3443
- Harford County Health Department (HCHD)                              443-643-0322 or 443-643-0321

**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.

**Monitoring Well Sampling Data for the Darlington Citgo**

Well Information	Sample Dates	Benzene (MCL –5 ppb)	MTBE (Action Level – 20 ppb)	Other petroleum constituents of concern <i>Ethylbenzene – MCL at 700 ppb Toluene – MCL at 1000 ppb Xylene – MCL at 10,000 ppb</i>
<b>MW-1 (30ft deep)</b>				
	6/29/00	55.9	240	---
	4/4/01	33.6	193	---
	7/26/01	26.0	87.6	---
	6/12/03	13.1	67.1	---
<b>MW-A/MW-2 (22 ft deep)</b>				
	12/3/96	60	8020	---
	6/29/00	15.9	8,875	---
	4/4/01	4.05	7,141	---
	7/26/01	8.06	10,890	---
	6/12/03	ND	105	---
<b>MW-B/MW-3 (23 ft deep)</b>				
	12/3/96	ND	232	ND
	6/29/00	ND	222	---
	4/4/01	ND	328	ND
	7/26/01	ND	344	---
	6/12/03	ND	ND	---
<b>MW-C/MW4 (22 ft deep)</b>				
	12/3/96	2,030	5,100	Ethylbenzene at 1,210
	6/29/00	6,884	19,510	Toluene at 2,539; Ethylbenzene at 2,172
	4/4/01	1,524	4,787	Ethylbenzene at 833
	7/26/01	DRY	DRY	DRY
	6/12/03	>442	>829	---
<b>MW-5 (32ft deep)</b>				
	6/12/03	12,400	621,600	Toluene at 23,320; Ethylbenzene at 5,280; Xylene at 18,920
<b>MW6 (32 ft deep)</b>				
	6/12/03	338	>805	
<b>MW-7 (32 ft deep)</b>				
	6/12/03	5,280	41,200	Toluene at 6,680; Ethylbenzene at 2,680

**Drinking Water Sampling Results in the Darlington Area**

Sample Location	Sample Date	Petroleum Constituents of Concern	
		Benzene (MCL - 5 ppb)	MTBE (20 ppb – action level)
<b>Transient Non-Community Supply Wells</b>			
3940 Conowingo Rd (Citgo)	1/20/97	ND	8.5
	6/21/00	ND	ND
	6/29/00	ND	ND
	4/4/01	ND (pre/post filtration)	ND (pre/post filtration)
	7/26/01	ND (pre/post filtration)	ND (pre/post filtration)
	4/20/04	ND	ND
	8/21/04	ND	ND
	12/21/05	ND	ND
	6/20/06	ND (untreated water)	60.3 (untreated water)
	7/14/06	ND (untreated water)	121 (untreated water)
	11/2/06	ND (post-filtration)	ND (post-filtration)
	1/25/07	ND (post-filtration)	ND (post-filtration)
	8/14/07	ND (post-filtration)	2.6 (post-filtration)
3938 Conowingo Road (Chesapeake Harley Davidson)	8/2001	ND	18.94
	3/15/02	ND	49.9
	2/5/03	ND (pre-filtration)	ND (pre-filtration)
		ND (mid-filtration)	ND (mid-filtration)
		ND (post-filtration)	ND (post-filtration)
	3/17/03	ND (pre-filtration)	6.19 (pre-filtration)
		ND (mid-filtration)	ND (mid-filtration)
		ND (post-filtration)	ND (post-filtration)
4/30/03	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)	
5/29/03	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)	

	6/27/03	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	7/8/03	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	8/7/03	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	9/3/03	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	10/9/03	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	11/24/03	ND (pre-filtration) ND (mid-filtration) ND (post-filtration)	183 (pre-filtration) 105 (mid-filtration) 15.1 (post-filtration)
	12/4/03	ND (pre-filtration) ND (mid-filtration) ND (post-filtration)	165 (pre-filtration) 137 (mid-filtration) 20.1 (post-filtration)
	1/23/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	2/26/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	3/24/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	4/27/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	5/26/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	6/30/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	7/30/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	8/31/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	9/23/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	11/30/04	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	2/8/05	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	4/26/05	ND (pre-filtration) ND (mid-filtration) ND (post-filtration)	ND (pre-filtration) 12.8 (mid-filtration) ND (post-filtration)
	5/27/05	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	6/8/05	ND (pre-filtration) ND (mid-filtration) ND (post-filtration)	ND (pre-filtration) 19.8 (mid-filtration) ND (post-filtration)
	7/5/05	ND (pre-filtration) ND (mid-filtration) ND (post-filtration)	ND (pre-filtration) 15.4 (mid-filtration) ND (post-filtration)
	8/25/05	ND (pre/mid/post-filtration)	ND (pre/mid/post-filtration)
	7/31/06	ND	ND
<b>Private Wells</b>			
4000 Conowingo Rd (old well)	10/28/96	ND	ND
4000 Conowingo Rd (new well)	2/6/98	ND	ND
	7/31/06	ND	ND
3931 Conowingo Rd	8/10/06	ND	ND
3933 Conowingo Rd	8/10/06	ND	ND
3935 Conowingo Rd	8/10/06	ND	ND