
2009 Annual Report on the Air Pollutant Watch List Areas in Texas

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Executive Summary

The Toxicology Division (TD) of the Texas Commission on Environmental Quality (TCEQ) routinely reviews and conducts health effects evaluations of ambient air monitoring data from across the state. For the limited areas (less than 7% of the monitoring network in 2008) that have concentrations of pollutants above the TCEQ's comparison values (air toxics and metals) or 30-minute state regulatory standards (sulfur dioxide and hydrogen sulfide), the pollutant and area are put on the Air Pollutant Watch List (APWL). The APWL is a list of chemicals that have been monitored at or above the TCEQ's comparison values or standards and the associated areas of potential sources of those chemicals. Only consistently monitored decreases in concentrations will allow the chemical and/or area to be removed from the APWL. Although a chemical may be removed from the APWL, it can be added again at any point, should concentrations begin to increase above a level of concern.

The APWL allows the TCEQ to concentrate its resources on those areas of greatest concern and encourage emissions reductions. In the past, the APWL was mainly directed to TCEQ staff and industry. However in June 2009, due to increased legislative interest, the TD began notifying legislators whose districts are in an APWL area two weeks prior to any proposed or final changes to the APWL area. In addition to this change in notification process, several changes to the APWL were proposed in 2009, including the removal of nine air contaminants from six areas which, in some cases, resulted in the removal of the entire area from the APWL.

Recent Changes to the APWL:

- Removals effective June 2009
 - Beaumont, Jefferson County – hydrogen sulfide
 - Port Neches, Jefferson County – 1,3-butadiene
 - Milby Park area, Houston, Harris County – 1,3-butadiene
- Removals effective January 2010
 - Beaumont, Jefferson County – benzene
 - Lynchburg Ferry area, Houston, Harris County – benzene
 - Texas City, Galveston County – acrolein, butyraldehyde, and valeraldehyde
 - Corpus Christi, Nueces County – benzene
- Chemicals proposed for addition or removal but not adopted
 - Milby Park area, Houston, Harris County – addition of styrene
 - Bastrop, Bastrop County – removal of hydrogen sulfide

Background

The Texas Commission on Environmental Quality (TCEQ) establishes Air Pollutant Watch List (APWL) areas statewide to focus Agency investigations, enforcement, permitting, and monitoring resources on specific areas of concern. In addition to internal Agency notification, the APWL is posted on the TCEQ Web site (<http://www.tceq.state.tx.us/implementation/tox/AirPollutantMain/APWL.html>) to notify industry, public officials, and local residents of the TCEQ's analysis of air quality data collected statewide.

The TCEQ Toxicology Division (TD) constantly reviews ambient air monitoring data from approximately 75 monitoring sites across the state and extensive data collected during mobile monitoring projects throughout the state. Monitored concentrations of pollutants are compared to TCEQ's health- and welfare-protective comparison values, including Effects Screening Levels (ESLs) and Reference Values (ReVs) or, collectively, air monitoring comparison values (AMCVs). The current list of target analytes and their respective AMCVs can be found on the TD Web site at <http://www.tceq.state.tx.us/implementation/tox/AirToxics.html>. Interestingly, by the end of 2008 (the last full year's worth of data), only 21 of the 75 stationary monitors in Texas monitored concentrations of any chemical above its short- or long-term AMCV, and only five of these monitors indicated a potential health or welfare concern.

If long-term monitored concentrations of pollutants are above the long-term AMCV or if there are frequent exceedances of the short-term AMCV, the TD recommends that the pollutant and the area of potential sources of the pollutant be added to the APWL. As of June 2009, this recommendation process was amended to include advanced notification of the recommendation for legislative officials whose districts are in the proposed area. Once the legislative officials are notified, a 30-day public comment period is opened. Notification of this comment period is put on the APWL Web site and individuals signed up for the TD listserv are sent notifications via email. After the close of the comment period, all comments and any additional monitoring information are re-evaluated. Following a final notification to legislative officials, the pollutant and/or area is placed on the APWL.

An area's listing on the APWL results in more stringent permitting of local industry, prioritized investigative efforts on behalf of TCEQ investigators and monitoring staff, and increased efforts to work with industry to address air quality concerns through pollution control technology and, in some cases, increased monitoring and notification. Through enhancing the TCEQ and industry's awareness of pollutants of concern and their sources, the air quality has been dramatically improved in six APWL areas, and nine pollutants were removed in 2009 and January 2010.

The process of removing a chemical and/or area from the APWL is similar to the addition process. In order to be eligible for removal from the APWL, long-term monitoring in these areas must show a decreasing trend and/or mobile monitoring must show that levels of pollutants are no longer at a level of potential concern. In addition, the TD takes into account industry efforts to control or reduce emissions of the pollutant of concern that could have contributed to the

monitored decrease in ambient concentrations. Legislators whose districts are in these areas are notified of the proposal to remove these pollutants from the APWL and the public is given a 30-day comment period. The public comment period consists of posting relevant data on the APWL Web site along with the public comment form. Those signed up for the TD listserv are notified of the update via email. After all comments and any additional monitoring data are reassessed, a final notification is provided to legislative officials prior to the final removal of the chemical and/or area.

Although a pollutant and/or area may be removed from the APWL, it does not necessarily indicate that monitoring in the area will stop. Mobile monitoring trips are scheduled each year and are dependent on a number of variables, including funding level, complaints, TCEQ regional office investigations, etc. and are not solely based on the area's presence on the APWL. Stationary monitors in former APWL areas may be moved to another location where higher levels of air pollution are suspected, though the monitor may also stay at that location indefinitely. If future mobile or stationary monitoring indicates concentrations of a removed chemical are rising above a level of potential health concern, the TD would recommend that the pollutant and/or area be re-listed on the APWL.

The APWL areas that were active as of January 2010 are noted in Figure 1 below and are listed in Table 1. Those pollutants and/or areas that were removed from the APWL by January 2010 are listed in Table 2. Details concerning these areas are described in the text below. Although the information provided is not intended to be a thorough review of the status of these APWL areas, this information was considered during the re-evaluation of these areas.

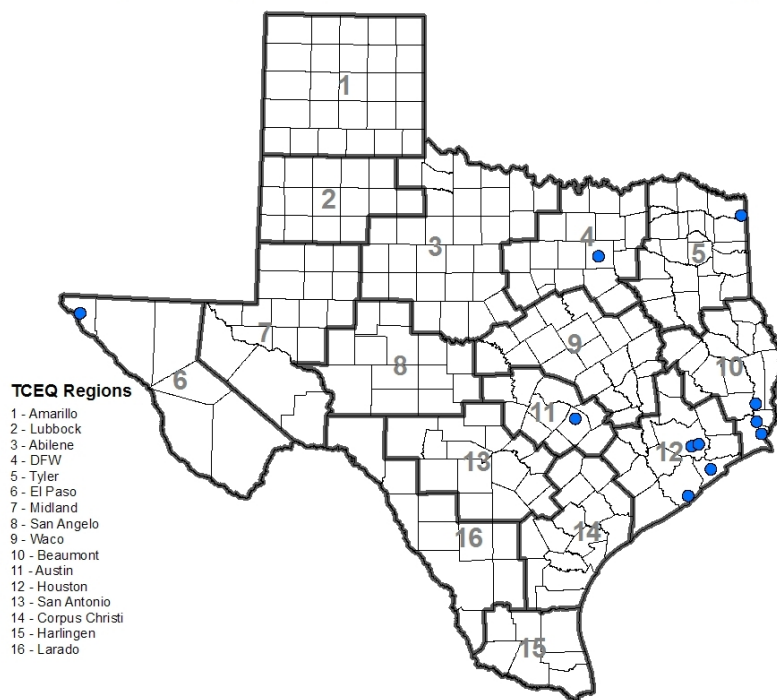


Figure 1. Active Air Pollutant Watch List areas in January 2010.

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Table 1. Active Air Pollutant Watch List areas and pollutants in January 2010.

County	City	TCEQ Region	Year Added	Pollutant of Interest	Status*
Dallas	Dallas	4	2004	Nickel	Improvement
Bowie and Cass	N/A	5	1999	Hydrogen sulfide	Improvement
El Paso	El Paso	6	2004	Hydrogen sulfide	Continued watch
Jasper	Evadale	10	2003	Hydrogen sulfide	Continued watch
Jefferson	Beaumont	10	2003	Sulfur dioxide	Continued watch
Jefferson	Port Arthur	10	2001	Benzene	Continued watch
Bastrop	Bastrop	11	2007	Hydrogen sulfide	Continued watch
Brazoria	Freeport	12	2005	Arsenic, cobalt, nickel, vanadium	Continued watch
Galveston	Texas City	12	2001	Propionaldehyde	Continued watch
			2003	Benzene	Continued watch
			2004	Hydrogen sulfide	Continued watch
Harris	Lynchburg Ferry area	12	2002	Styrene	Improvement
Harris	Galena Park	12	2000	Benzene	Improvement

* Improvement status indicates that monitoring data suggest a downward trend in ambient concentrations and/or there have been a decrease in the number of odor complaints in the area. Continued watch status indicates that there is insufficient monitoring data to determine a trend, or that monitoring data are not suggesting a decreasing trend in concentration.

Table 2. Pollutants removed from the Air Pollutant Watch List from January 2009 to January 2010.

County	City	TCEQ Region	Year Added	Pollutant of Interest	Year Removed
Jefferson	Beaumont	10	2002	Hydrogen sulfide	2009
Jefferson	Beaumont	10	2004	Benzene	2010
Jefferson	Port Neches	10	1996	1,3-Butadiene	2009
Galveston	Texas City	12	2001	Acrolein, butyraldehyde, and valeraldehyde	2010
Harris	Lynchburg Ferry area	12	2002	Benzene	2010
Harris	Houston (Milby Park area)	12	1999	1,3-Butadiene	2009
Nueces	Corpus Christi	14	1998	Benzene	2010

Areas Currently on the APWL

Region 4 – Dallas/Fort Worth

APWL0401 – Nickel in Dallas

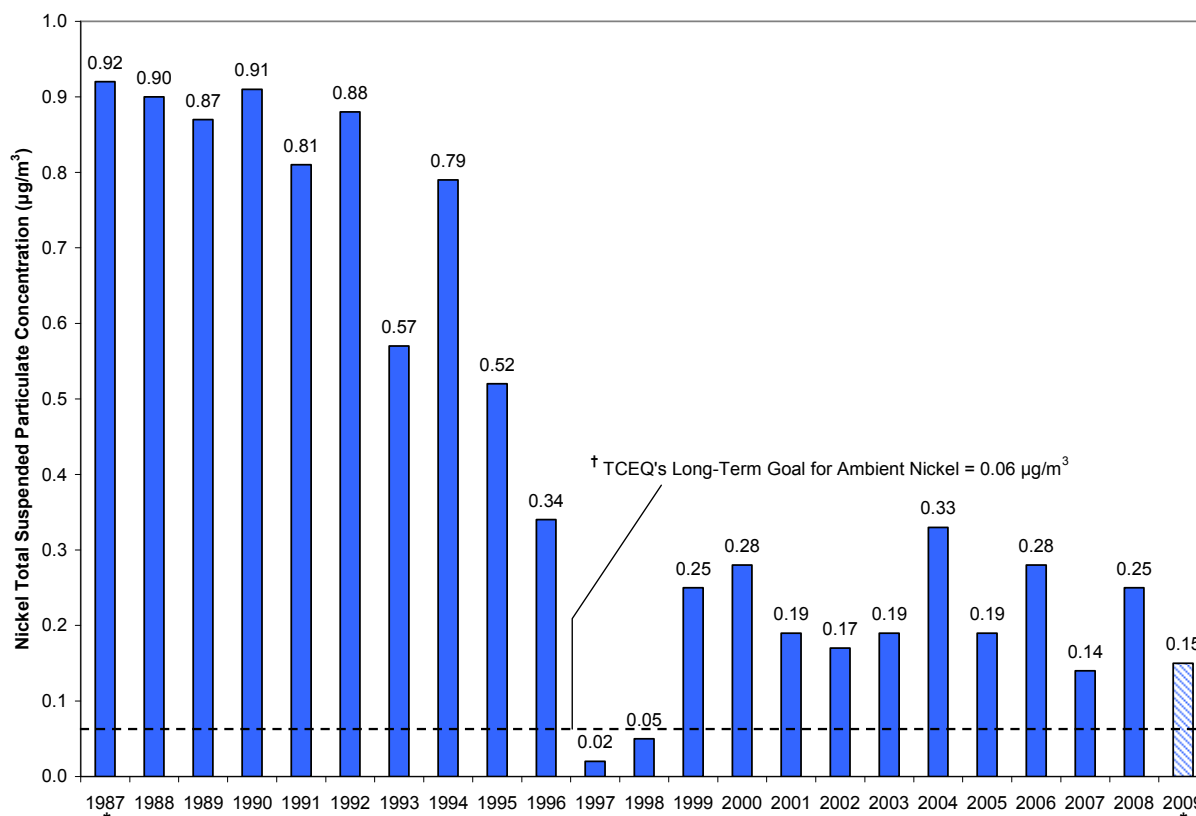
Elevated annual average nickel levels have been detected at the Morrell monitoring site since 1987, as shown in Figure 2. From 1987 through 1994, the annual average nickel total suspended particulate (TSP) concentrations ranged from approximately 0.6 to 0.9 $\mu\text{g}/\text{m}^3$; over the interim long-term AMCV of 0.015 $\mu\text{g}/\text{m}^3$ for respirable particles (i.e., particulate matter less than 10 μm in size, or PM_{10}). Beginning in 1995, the annual average nickel TSP concentrations decreased and have stabilized in the range of 0.1 to 0.3 $\mu\text{g}/\text{m}^3$ from 1998 through 2008. The reductions in annual nickel levels first observed in 1995 are attributed to actions taken by Dal Chrome Co. Inc., which is an automotive chrome bumper recycling facility located upwind from the Morrell site. Although nickel TSP concentrations have been significantly decreased since monitoring began, the annual average concentrations are still over the interim long-term AMCV of 0.015 $\mu\text{g}/\text{m}^3$ for respirable particles.

There are two issues to consider when evaluating the nickel TSP data collected at the Morrell monitoring site. First, because TSP incorporates all particle size fractions, including those that are too large to inhale, the exceedances of the AMCV based on PM_{10} do not necessarily indicate that nickel is a health concern in this area. In addition, further investigation into available toxicity values for nickel indicated that the risk factor published in United States Environmental Protection Agency (USEPA) 1999 National-Scale Air Toxic Assessment is a more up-to-date assessment of nickel than the interim AMCV. Therefore, this risk factor (0.06 $\mu\text{g}/\text{m}^3$) was used as the goal for ambient nickel in ambient air. Currently, the long-term comparison value for nickel is under review by the TD.

Second, the air monitoring data from the monitoring site are representative of total nickel concentrations and do not indicate the specific forms of nickel in the air. The form of nickel determines how potentially toxic nickel concentrations are and what effects they might have on the body. For example, metallic nickel is considered to be a non-carcinogenic form of nickel. The USEPA risk factor of 0.06 $\mu\text{g}/\text{m}^3$ currently used as the ambient air goal conservatively assumes that 65% of total nickel emissions are in a form that may cause cancer. Using this risk factor from the USEPA is extremely conservative, since it is likely that much less than 65% of the total nickel in the air is in a carcinogenic form. Previous investigations in the Morrell area have indicated that Dal Chrome is the predominant source of nickel emissions in the vicinity of the Morrell monitoring site and this facility mainly emits metallic nickel (considered to be a non-carcinogenic form of nickel) from its grinding operation.

In order to address the issue of particle size at the Morrell site, a special one-year monitoring study began in 2009 at the Dallas-Morrell site. As mentioned above, only TSP samples have historically been collected at this site. In April 2009, however, a new monitor capable of collecting inhalable $\text{PM}_{2.5}$ was co-located with the TSP monitor and has been set to the same sampling schedule. The study, in part, will identify the percentage of inhalable $\text{PM}_{2.5}$ out of TSP.

The study will not be able to differentiate the species of nickel in the ambient air due to analytical method constraints, but will provide valuable information necessary to better assess the risk of adverse health effects in this area.



* Incomplete sampling year.

† TCEQ's long-term goal for ambient nickel is based on a risk factor published in the United States Environmental Protection Agency 1999 National-Scale Air Toxic Assessment.

Figure 2. Annual average nickel concentrations in total suspended particulate (TSP) samples at the Dallas-Morrell monitor, 1987-2009. Annual averages are based on every-sixth-day 24-hour canister data. Data from 2009 only include the January to March period.

Nickel will continue to be monitored and assessed at the Dallas-Morrell site and the area will remain on the APWL. The TCEQ will continue to monitor and encourage nickel reductions.

Region 5 - Tyler

APWL0501 – Hydrogen Sulfide near Domino in Bowie and Cass Counties

In 1998-1999, an Environmental Protection Agency (EPA) air monitoring study measured concentrations of hydrogen sulfide (H₂S) that frequently exceeded its odor threshold and the 30-minute state regulatory standard for H₂S near the International Paper Company (IP) in Domino, Texas. A TCEQ mobile monitoring trip in August 2001 near IP measured persistent concentrations of H₂S above its odor threshold, and staff reported rotten egg odors which are characteristic of H₂S, although concentrations above the state regulatory standard were not

measured. In September 2009, TCEQ Small Business and Local Government Assistance (SBLGA) staff conducted air sampling using a Jerome H₂S analyzer. Although not directly comparable to the 30-minute standards, survey measurements using the Jerome H₂S analyzer indicated one instantaneous H₂S concentration above the standard. Staff also reported odors from sources in addition to IP (e.g., animals). Based on the results from the 2009 investigation, TCEQ continues to support efforts to reduce H₂S levels in this area.

This area will remain on the APWL and is currently being reassessed based on recent surveys and investigations of H₂S.

Region 6 – El Paso

APWL0601 – Hydrogen Sulfide in El Paso

Elevated hourly H₂S levels have been detected at the El Paso Lower Valley Sounder monitoring site since monitoring began in 2004. Due to the frequency and intensity of concentrations measured at this location, the TD has determined that H₂S has the potential for acute health effects and odors and placed this area on the APWL in 2004. In addition, numerous H₂S concentrations have been reported above the 30-minute state regulatory standard (see Table 3). Previous investigations have shown that the Juarez North Wastewater Treatment Plant in Mexico is the primary H₂S source. The Texas Department of State Health Services (DSHS) prepared a Health Consultation, dated December 28, 2005, which details the methods, findings, and conclusions of their evaluation of H₂S levels associated with the wastewater treatment plant. According to the DSHS, exposure to the measured levels could potentially cause adverse health effects (e.g., eye irritation, decreased lung function, headache) in sensitive individuals. For more information on the findings of this report, visit http://www.dshs.state.tx.us/epitox/consults/elpaso_juarez_final.pdf.

Table 3. Number of 30-minute exceedances of the hydrogen sulfide state regulatory standard and number of days with an exceedance at the El Paso Lower Valley Sounder monitoring site.

Year	Number of 30-minute exceedances	Number of days with at least one 30-minute exceedance
2004*	2865	90
2005	5196	184
2006	2855	138
2007	376	54
2008	630	56
2009	218	33

* Incomplete sampling year. The monitor was activated in August 2004.

Due to the monitored concentrations of H₂S in the El Paso area, the pollutant will remain on the APWL and the TCEQ will continue to monitor and encourage H₂S reductions.

Region 10 – Beaumont

APWL1001 – Hydrogen Sulfide in Evadale

Hydrogen sulfide was placed on the APWL in 2003 because of elevated levels detected during a 2003 mobile air monitoring trip. Additional mobile monitoring trips conducted annually within TCEQ Region 10 from 2003 through 2007, similarly detected elevated levels of H₂S. Several measured H₂S levels downwind of the Mead Westvaco paper mill in Evadale were in excess of the 30-minute H₂S state regulatory standard and were consistent with reports of odorous conditions by mobile monitoring personnel.

Due to the monitored concentrations of H₂S in the Evadale area, the pollutant will remain on the APWL and the TCEQ will continue to monitor and encourage H₂S reductions.

APWL1002 – Sulfur Dioxide in Beaumont

Sulfur dioxide (SO₂) levels at the former Carroll Street Park monitoring site frequently exceeded the TCEQ regulatory standard from 1997 to 2002 (see Table 4). In addition to this stationary monitoring, SO₂ levels were reported above the 30-minute state regulatory standard during annual mobile monitoring trips from 2003 through 2007. A member of the monitoring staff required medical attention for a burning sensation in the lungs while monitoring downwind of Chemtrade Logistics (formerly Peak Sulfur, Incorporated) during the 2003 mobile monitoring trip. Because of these concentrations, SO₂ was added to the Beaumont APWL in 2003. Although there have been fewer exceedances of the standard since this area was put on the APWL, there were several exceedances detected in 2006 and 2007. In order to place the monitor so that it best represents community exposure, the Carroll Street Park monitor was deactivated in 2008. The monitor is being moved to a nearby residential location and is expected to be activated at this new location in 2010.

The Beaumont – Lamar monitoring site, which is located immediately west of APWL1002 has indicated a downward trend in the number of exceedances of the 30-minute state regulatory standard since 2005. However, during two days in 2009, there were several exceedances of the 30-minute standard. A prompt investigation conducted by the regional staff indicated that these were due to accidental releases from the adjacent Chemtrade Logistics facility.

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Table 4. Number of 30-minute exceedances of the sulfur dioxide state regulatory standard and number of days with an exceedance at the former Carroll Street Park and Beaumont Lamar monitoring sites.

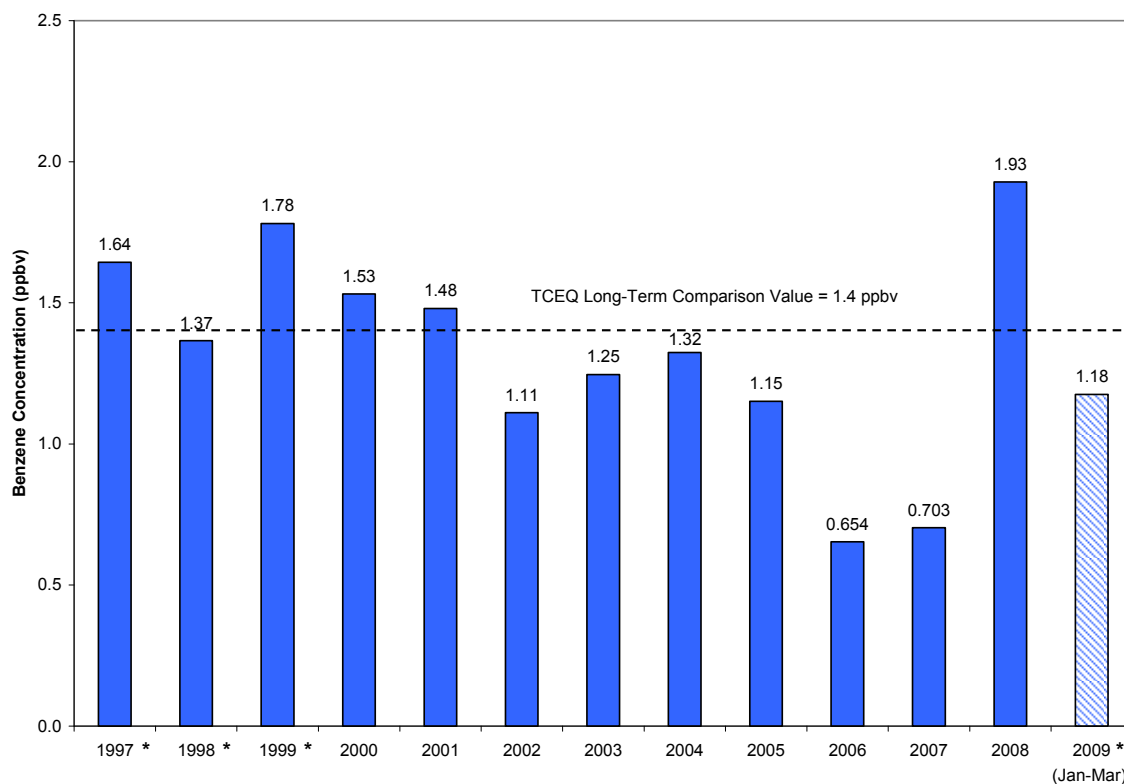
Monitor	Year	Number of 30-minute exceedances	Number of days with at least one 30-minute exceedance
Carroll St. Park	1997	2	1
Carroll St. Park	1998	12	3
Carroll St. Park	1999	16	3
Carroll St. Park	2000	0	0
Carroll St. Park	2001	4	1
Carroll St. Park	2002	13	2
Carroll St. Park	2003-2005	0	0
Carroll St. Park	2006	9	1
Carroll St. Park	2007	3	1
Carroll St. Park	2008*	0	0
Beaumont Lamar	1997	0	0
Beaumont Lamar	1998	3	1
Beaumont Lamar	1999-2002	0	0
Beaumont Lamar	2003	27	2
Beaumont Lamar	2004	21	1
Beaumont Lamar	2005-2008	0	0
Beaumont Lamar	2009	16	2

* Incomplete sampling year due to the monitor being deactivated.

This area will remain on the APWL and will be reassessed as new data are received from the new monitoring location in 2010.

APWL1003 – Benzene in Port Arthur

Benzene concentrations in the Port Arthur APWL have previously been considered elevated because, prior to 2006, the annual average benzene levels at the Port Arthur City Service Center monitor exceeded the previous long-term AMCV (1 ppb_v) in use at that time (see Figure 3). Annual average benzene levels in 2006 and 2007 dropped to 0.7 ppb_v, and annual average levels from 2002 to 2007 were below the current AMCV of 1.4 ppb_v. However, in 2008, the annual average benzene concentration for this site was 2.0 ppb_v and was above the current long-term AMCV. In response to these monitored levels, regional staff developed an aggressive source investigation plan to address the exceedance. In addition, the region requested that the August 2009 remote sensing flyovers be conducted in the specific areas identified in the investigation. Review of the data showed that the elevated annual average benzene concentration for the City Service Center was driven by two very high exceedance days (January 19 and October 15, 2008). The regional investigation indicated that the exceedances were due to single events on each of those days and not due to an increase in daily benzene emissions from the surrounding facilities. Specifically, the exceedance on January 19, 2008, was due to a spill from Flint Hills Resources, Inc. and the exceedance identified on October 15, 2008, was most likely due to start-up operations from Chevron Phillips after Hurricane Ike. For more information, see the document, *Port Arthur City Service Center, Continuous Air Monitoring Station (CAMS) 131*.



* Incomplete sampling year.

Figure 3. Annual average benzene concentrations at the Port Arthur City Service Center monitor, 1997-2009. Annual averages are based on every-sixth-day 24-hour canister data. Data from 2009 only include the January to March period.

Due to the elevated monitored concentrations of benzene in the Port Arthur area in 2008, the pollutant will remain on the APWL, and the TCEQ will continue to monitor and encourage benzene reductions.

Region 11 – Austin

APWL1101 – Hydrogen Sulfide in Bastrop

In February 2006 and March 2007, mobile monitoring trips measured H₂S levels downwind of Griffin Industries, located in Bastrop, Bastrop County, Texas, that exceeded the 30-minute state regulatory standard and odor threshold. These findings were consistent with the numerous odor complaints reported to the region over the years and with monitoring staff reports of intermittent strong odors observed throughout the sampling events. Due to TCEQ enforcement actions, Griffin has implemented corrective actions, which have resulted in a decline of odor complaints in this area. Subsequently, Griffin hired URS Corporation to monitor H₂S on December 10 – 11, 2008. All reported 30-minute average H₂S concentrations downwind of Griffin were below the H₂S net 30-minute state regulatory standard. The TD proposed the removal of H₂S from APWL1101 in September of 2009. However, during the 30-day public comment period, which ended on October 5, 2009, the TCEQ Austin regional office received several odor complaints from citizens. In addition, strong odors were confirmed by TCEQ staff during a follow-up investigation in the area near Griffin.

Due to this new information, the TD has determined that the H₂S is still a potential issue in this area. The area will remain on the APWL and the TCEQ will continue to encourage reductions.

Region 12 – Houston

APWL1201 – Arsenic, Cobalt, Nickel, and Vanadium in Freeport

Elevated levels of arsenic, cobalt, nickel, and vanadium were detected in one- and three-hour samples collected near Gulf Chemical and Metallurgical, Incorporated in Freeport during a November 2005 mobile monitoring trip. These levels could cause respiratory symptoms that are consistent with the reports of Freeport citizens, including eye irritation, burning and soreness of the throat, breathing difficulties, unpleasant odors, unpleasant tastes, headache, and nausea. Reports from citizens also note that the health symptoms, odors, and tastes frequently occur when winds are easterly (i.e., from the direction of Gulf) and during heavy, visible, nighttime emissions from Gulf. In addition, mobile monitoring personnel reported acidic and metallic odors, metallic tastes, and visible particulate emissions during the 2005 trip while near Gulf. A second mobile monitoring project was conducted in July 2007, and elevated levels of arsenic and nickel in particulate samples were measured downwind and on the fenceline of Gulf Chemical and Metallurgical, Inc. Regional investigators have conducted numerous investigations near this facility, including after-hours surveillance investigations. As a result, several compliance actions, including notices of violation and enforcement, have been issued for air and water violations. A subsequent mobile monitoring project was conducted in February 2009, though data from this project have not been completely evaluated at this time. Preliminary data from this report, however, indicate elevated fenceline levels of arsenic, nickel, and vanadium downwind of the facility.

Due to the monitored concentrations of these metals in the Freeport area, the pollutants will remain on the APWL and the TCEQ will continue to monitor and encourage reductions.

APWL1202 – Texas City

Benzene

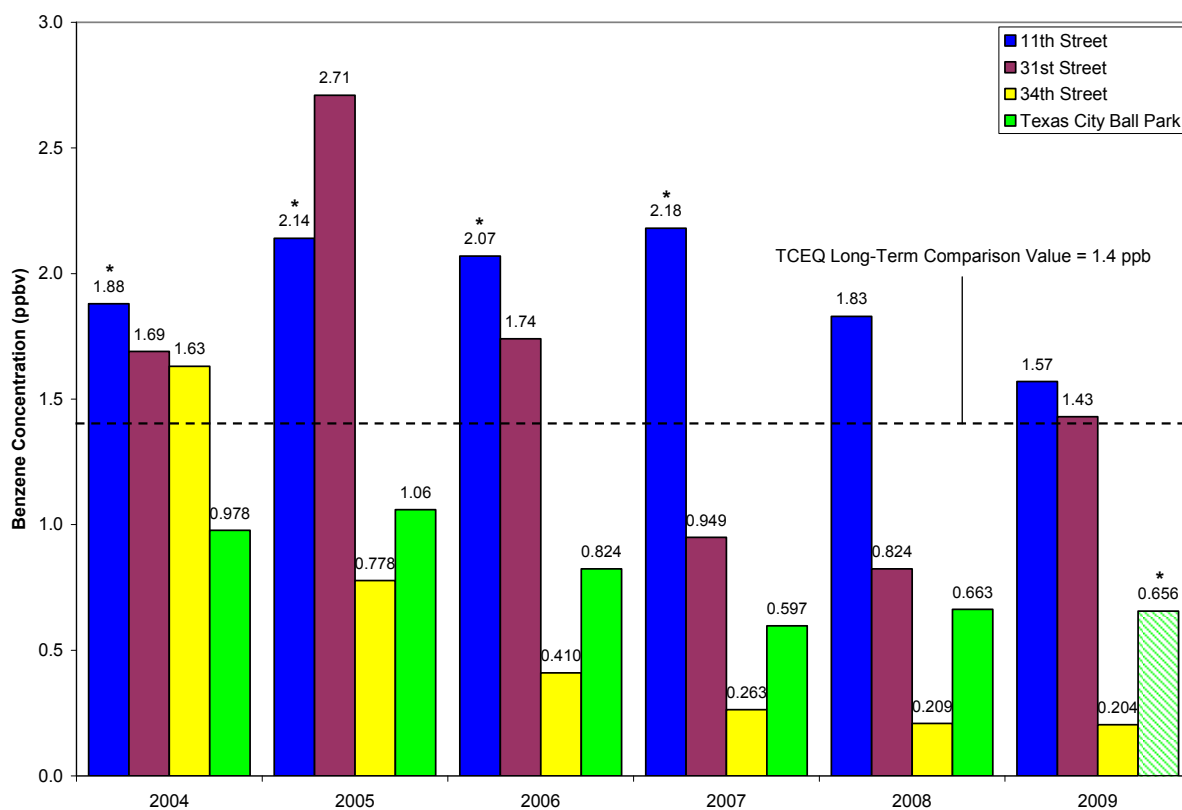
Three stationary monitors in the Texas City area have historically detected annual ambient concentrations of benzene above the long-term AMCV (see Figure 4). Data from one of these monitors, the 34th Street monitor, has indicated a 73% decrease in annual average benzene concentrations from 2005 to 2008, and continues to remain below the long-term AMCV. The other two monitors are located closer to the industrial area in Texas City and are funded by BP North America Products, Incorporated (BP) and Marathon Petroleum Company (Marathon) through individual agreements with the TCEQ and/or EPA and US Department of Justice. The 31st Street monitor, funded by BP, has exhibited a 70% decrease in annual average benzene concentrations from 2005 to 2008; however, due to a leaking benzene storage tank discovered in May 2009 and a second emission event in September 2009, the average benzene concentration for 2009 is 1.43 ppb_v, just over the long-term AMCV. The 11th Street monitor, funded by Marathon, has consistently had annual average benzene concentrations above the long-term

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comparison value since monitoring began in 2004. The average benzene concentration for 2009 is 1.57 ppbv. Annual average benzene concentrations from these monitors have been highlighted in the Region 12 annual ambient air evaluations.

In addition to long-term stationary monitoring, elevated benzene levels have likewise been detected during mobile monitoring projects from 2001 to 2008, downwind of various facilities throughout the Texas City area. Some of the concentrations detected during these projects have exceeded the short-term AMCV and several detections could contribute to elevated long-term concentrations.

Not only have efforts been made to identify potential sources of benzene and monitor ambient levels, but regional investigators have also conducted focused benzene investigations and reconnaissance investigations in the Texas City area. In 2008, the Houston Regional Office issued 27 notices of enforcement and 10 notices of violation to facilities in Texas City.



* Incomplete sampling year.

Figure 4. Annual average benzene concentrations at the 11th Street, 31st Street, 34th Street, and Texas City Ball Park monitors, 2003-2009. Annual averages at the 11th Street, 31st Street, and 34th Street monitors are based on hourly autoGC data. Annual averages at the Texas City Ball Park monitor are based on every-sixth-day 24-hour canister data. Data from the Texas City Ball Park monitor for 2009 only include the January to March period. Not all 2009 data from the 34th Street monitor have been validated.

Due to the monitored concentrations of benzene in the Texas City APWL, the TCEQ will continue to monitor this area and encourage benzene reductions.

Hydrogen Sulfide

A 2004 mobile monitoring trip reported H₂S levels that exceeded the H₂S 30-minute state regulatory standard. These reported levels had the potential to cause short-term odor-related health effects downwind of Gulf Coast Waste Disposal Authority (GCWDA) and Valero. A member of the monitoring staff experienced nausea symptoms and also reported moderate odors downwind of GCWDA. A subsequent mobile monitoring project in 2008 did not detect any concentrations of H₂S above the regulatory standard.

In addition to mobile monitoring, long-term stationary monitoring for H₂S has been conducted at the Texas City and Texas City Ball Park sites from 2002-2004 and 2004-present, respectively (see Table 5). This limited monitoring data indicated a decreasing trend in H₂S concentrations until 2008. In 2009, however, there were 16 exceedances of the 30-minute regulatory standard at the Texas City Ball Park monitor.

Table 5. Number of 30-minute exceedances of the hydrogen sulfide state regulatory standard and number of days with an exceedance at the monitoring sites in Texas City.

Monitor	Year	Number of 30-minute exceedances	Number of days with at least one 30-minute exceedance
Texas City	2002*	1	1
Texas City	2003	42	1
Texas City Ball Park	2004*	69	3
Texas City Ball Park	2005-2008	0	0
Texas City Ball Park	2009	16	2

* Incomplete sampling year. The Texas City monitor was activated in January 2002 and was deactivated in February 2004. The Texas City Ball Park monitor was activated in February 2004.

Due to the monitored concentrations of H₂S in Texas City, the pollutant will remain on the APWL and the TCEQ will continue to monitor and encourage reductions.

Propionaldehyde

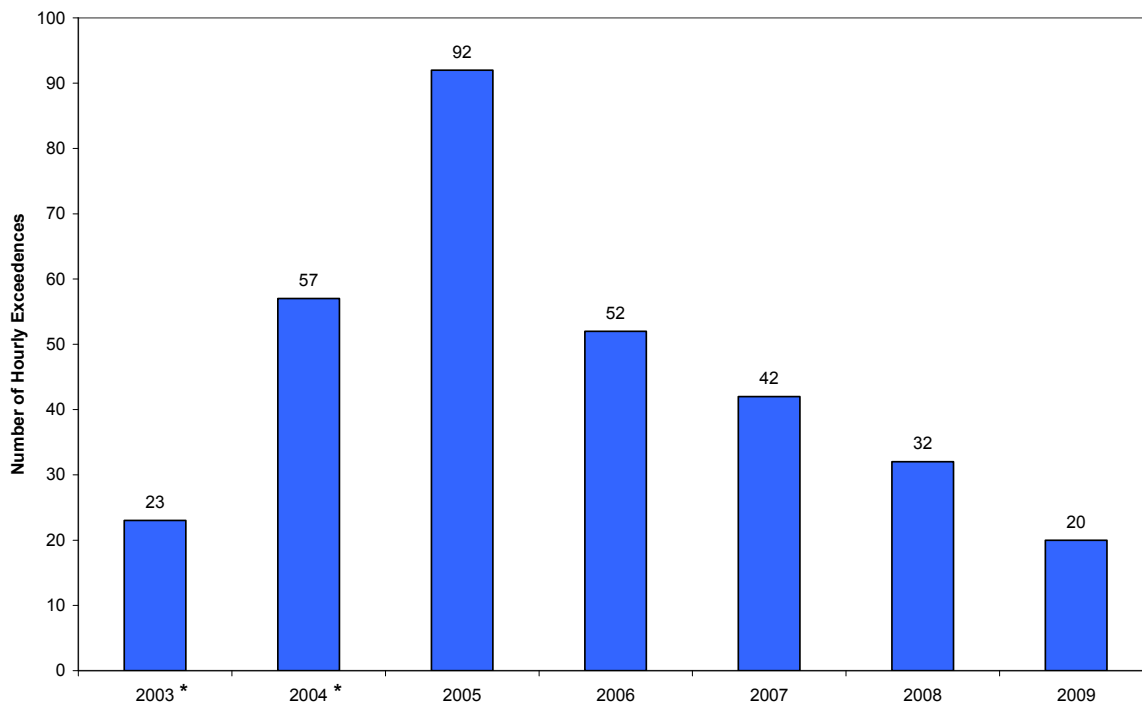
In 2000, five samples from a TCEQ mobile monitoring project detected concentrations of propionaldehyde above the odor-based AMCV. During the 2001 mobile monitoring project, three samples measured elevated levels of propionaldehyde downwind of Dow Chemical (formerly Union Carbide). Although no samples detected propionaldehyde above the AMCV in the 2004 project, three samples collected during the 2008 mobile monitoring project were above the AMCV. One of these samples was taken in a residential neighborhood.

Due to the monitored concentrations of propionaldehyde in the Texas City area during mobile monitoring projects, the pollutant will remain on the APWL and the TCEQ will continue to monitor and encourage reductions.

APWL1204 – Styrene in the Lynchburg Ferry area of Houston

Hourly styrene levels that exceed the odor threshold value have been reported at the Lynchburg Ferry air monitoring site with significant frequency since monitoring began at this location in 2003; however, concentrations appear to be on a downward trend since 2006 (see Figure 5). The odorous styrene concentrations have been highlighted in the 2003-2008 annual ambient air evaluations for Region 12.

In 2008, there were 32 hourly styrene concentrations reported above the odor-based AMCV of 25 ppb_v, with a maximum concentration of 494 ppb_v. When compared to the 92 odorous styrene concentrations reported for the Lynchburg Ferry site in 2005, which included a maximum concentration of 433 ppb_v, the 32 occurrences in 2008 represent a reduction of approximately 65%. Data from 2009 indicate further reductions in the frequency of exceedances, with a maximum concentration of 102 ppb_v. While there have been significant improvements in the frequency of styrene odor-based comparison value exceedances over the last four year period, the intensity of the reported styrene concentrations increased in 2008 (maximum reported concentration for 2008 is somewhat higher than those reported for 2005-2007).



* Incomplete sampling year.

Figure 5. Number of hourly exceedances of the styrene odor-based air monitoring comparison value at the Lynchburg Ferry monitor, 2003- 2009. Based on hourly autoGC data.

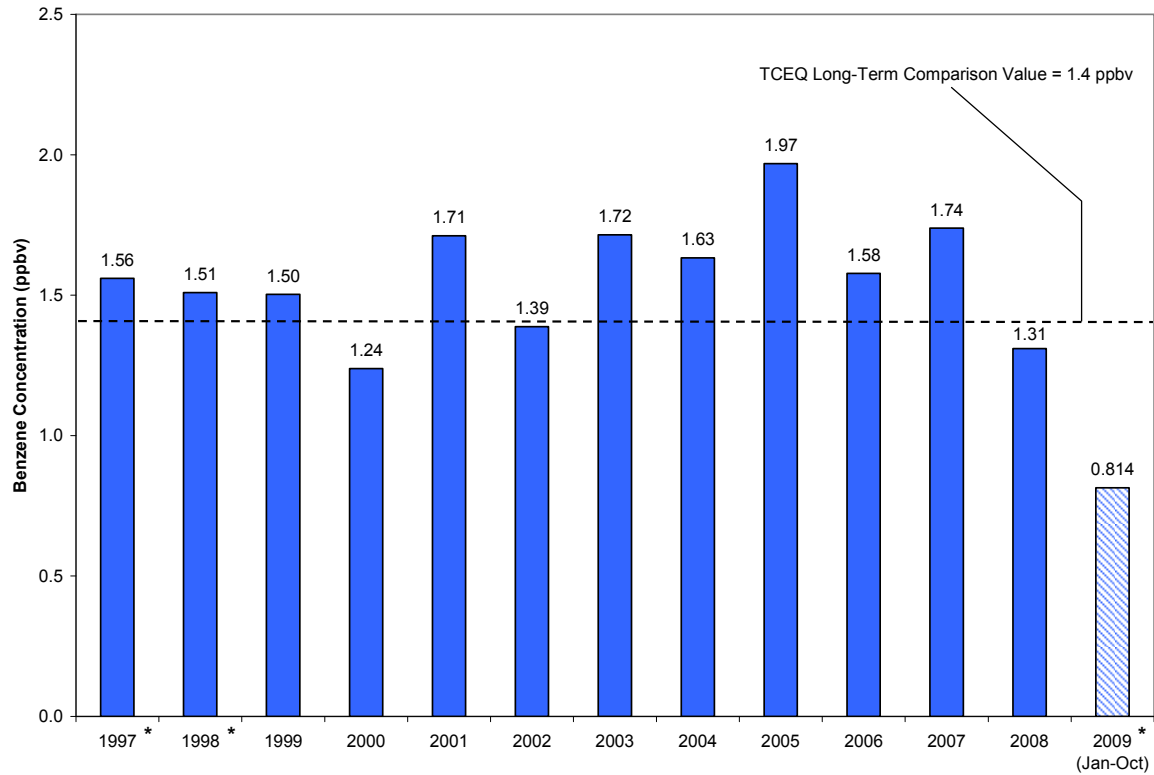
Due to the continued exceedance of the short-term odor-based AMCV, styrene will remain on the APWL and the TCEQ will continue to monitor and encourage reductions in the Lynchburg Ferry area.

APWL1206 – Benzene in Galena Park

Elevated annual average benzene concentrations have been detected at the Galena Park monitoring site since 1998 with the highest annual concentration of 1.97 ppb_v reported in 2005 (see Figure 6). The reported annual benzene concentrations from 1998 to 2007 exceeded the AMCV. However, the reported 2008 average benzene concentration based on every sixth-day 24-hour canister samples at the Galena Park site was 1.3 ppb_v, and is below the long-term, health-based AMCV (1.4 ppb_v) for the first time in several years.

The reduction in ambient levels of benzene at Galena Park represents a significant improvement in air quality and is likely the result of significant efforts in the area by TCEQ (e.g., focused agency resources, special investigations utilizing the latest technology, enhanced compliance and enforcement), along with the cooperation of industry (e.g., Emission Reduction Agreements (ERAs)). For example, this reduction in the annual benzene concentration may partially reflect the results of ERAs entered into in 2006 by TCEQ with several facilities identified during an earlier Find-and-Fix investigation (Kinder Morgan Terminals, Vopak Terminals, TEPPCO Pipeline) to reduce VOCs, including benzene. Focused investigations and reconnaissance investigations conducted by the Houston Regional Office staff have resulted in eight notices of enforcement and two notices of violation in 2008. The 2008 average concentration is approximately 35% lower than the 2005 annual average of 2.0 ppb_v. In addition, available preliminary 24-hour canister data for January through October 2009 suggest continued improvement in benzene concentrations. The January through October 2009 average for benzene of 0.8 ppb_v at the Galena Park site is approximately 33% lower than the average over the same period in 2008 (1.2 ppb_v). Annual benzene concentrations reported at the Galena Park monitoring site were highlighted in the 2003-2007 annual ambient air evaluations for Region 12.

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* Incomplete sampling year.

Figure 6. Annual average benzene concentrations at the Galena Park monitor, 1997-2009. Annual averages are based on every-sixth-day 24-hour canister data. Not all data from 2009 have been validated.

Concentrations of benzene in Galena Park will continue to be monitored to determine if the downward trend in 2008 continues. Currently, the pollutant will remain on the APWL and the TCEQ will continue to encourage reductions.

Pollutants and/or Areas That Have Been Removed from the APWL

Region 10 - Beaumont

APWL1002 - Beaumont

Hydrogen Sulfide (Removed June 2009)

Hydrogen sulfide was placed on the Beaumont APWL in 2002 due to detected concentrations above the TCEQ regulatory standard at the TCEQ former Carroll Street Park monitoring site (see Table 6). The number of days on which H₂S concentrations exceeded the 30-minute state regulatory standard decreased from two days in 2002 to one day in 2003. No exceedances were measured during 2005 through June 19, 2008, when the monitor was deactivated.

Table 6. Number of 30-minute exceedances of the hydrogen sulfide state regulatory standard and number of days with an exceedance at the former Carroll Street Park monitoring site.

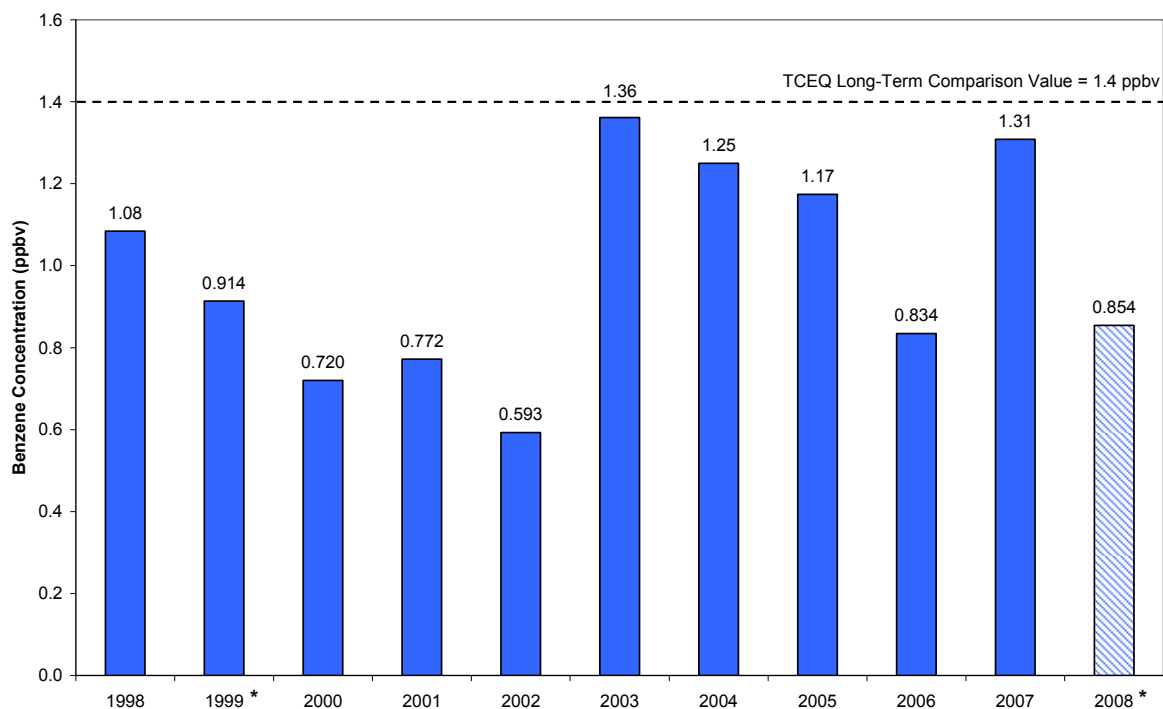
Year	Number of 30-minute exceedances	Number of days with at least one 30-minute exceedance
1999	46	2
2000	2	1
2001	1	1
2002	11	2
2003	3	1
2004	6	1
2005-2008*	0	0

* Incomplete sampling year.

Hydrogen sulfide was removed from this APWL in June 2009.

Benzene (Removed January 2010)

Benzene concentrations in the Beaumont APWL have previously been considered elevated because, prior to 2006, the annual average benzene levels at the Beaumont Carroll Street Park monitor exceeded the long-term AMCV of 1 ppb_v in use at that time (see Figure 7). In 2006, the annual average benzene concentration dropped to 0.8 ppb_v, only to increase to 1.3 ppb_v in 2007. However, in October 2007, the TD released a new assessment of benzene, which changed the long-term comparison value from 1 ppb_v to 1.4 ppb_v. Therefore, using the most up-to-date information on benzene, the long-term average benzene concentrations measured at Carroll Street Park have always been below a level of potential health concern. In 2008, this monitoring site was in the process of being relocated to a nearby residential area to allow for the expansion of the adjacent industrial facility.



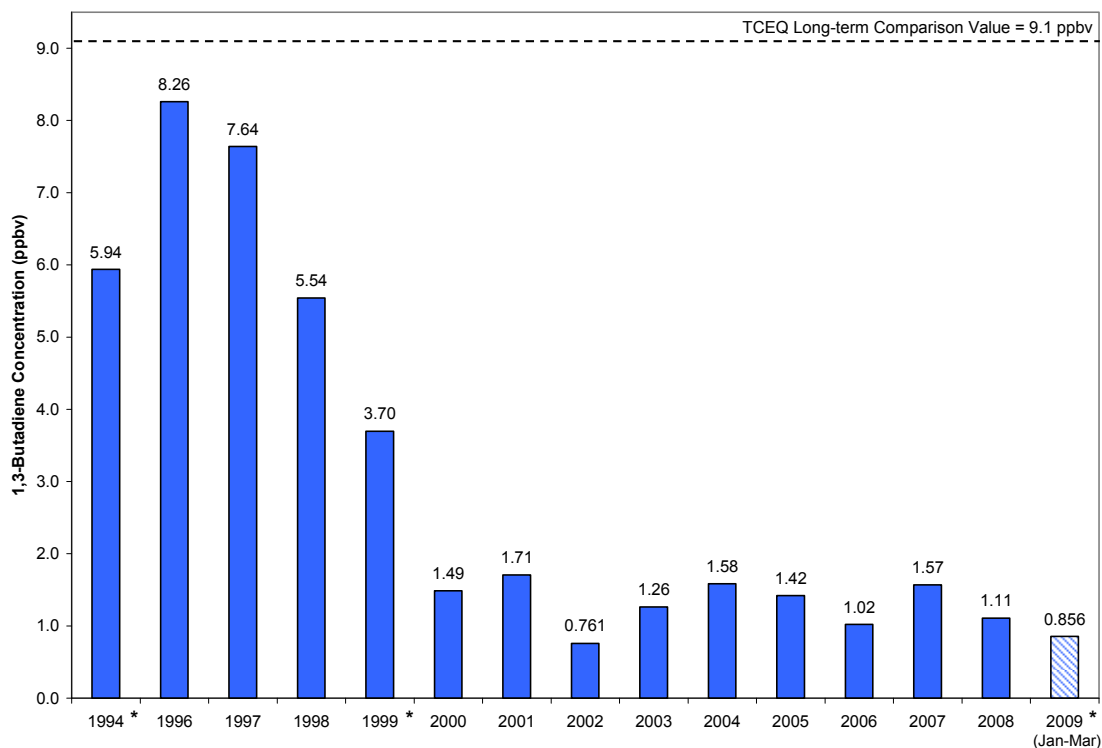
* Incomplete sampling year.

Figure 7. Annual average benzene concentrations at the Carroll Street Park monitor, 1998-2008. Annual averages are based on every-sixth-day 24-hour canister data. The monitor was deactivated in July 2008.

Benzene was removed from this APWL in January 2010.

APWL1004 – 1,3-Butadiene in Port Neches (Removed June 2009)

Annual average 1,3-butadiene levels from 1994 to 1998 at the Port Neches Merriman Street site exceeded the former long-term screening value of 5 ppb_v (see Figure 8) and levels at that time were thought to be a health concern. Beginning in 1996, annual average 1,3-butadiene concentrations indicated a more than seven year decline, due in part to several cooperative agreements between TCEQ and industrial sources such as Huntsman’s C-4 facility/Texas Petrochemical’s Port Neches Operations and ISP Synthetic Elastomers LP (formerly Ameripol Synpol). These agreements implemented a fence-line monitoring program that focused on 1,3-butadiene emissions. The monitoring system was instrumental in identifying otherwise obscure emission sources and activities with the potential to impact ambient concentrations at the fence-line and in the community. The program gave the industrial facility opportunities to successfully address such sources and ultimately lead to a reduction in 1,3-butadiene emissions to levels that are no longer a health concern. In addition, in August 2008, the TD released a new assessment of 1,3-butadiene, which changed the comparison value from 5 ppb_v to 9.1 ppb_v. Therefore, using the most up-to-date information on 1,3-butadiene, annual average concentrations at the Merriman Street site have consistently remained below the current AMCV and are well below levels that would be a health concern.



* Incomplete sampling year.

Figure 8. Annual average 1,3-butadiene concentrations at the Port Neches monitor, 1994-2009. Annual averages are based on every-sixth-day 24-hour canister data. Data from 2009 only include the January to March period.

Butadiene was removed from this APWL in June 2009.

Region 12 - Houston

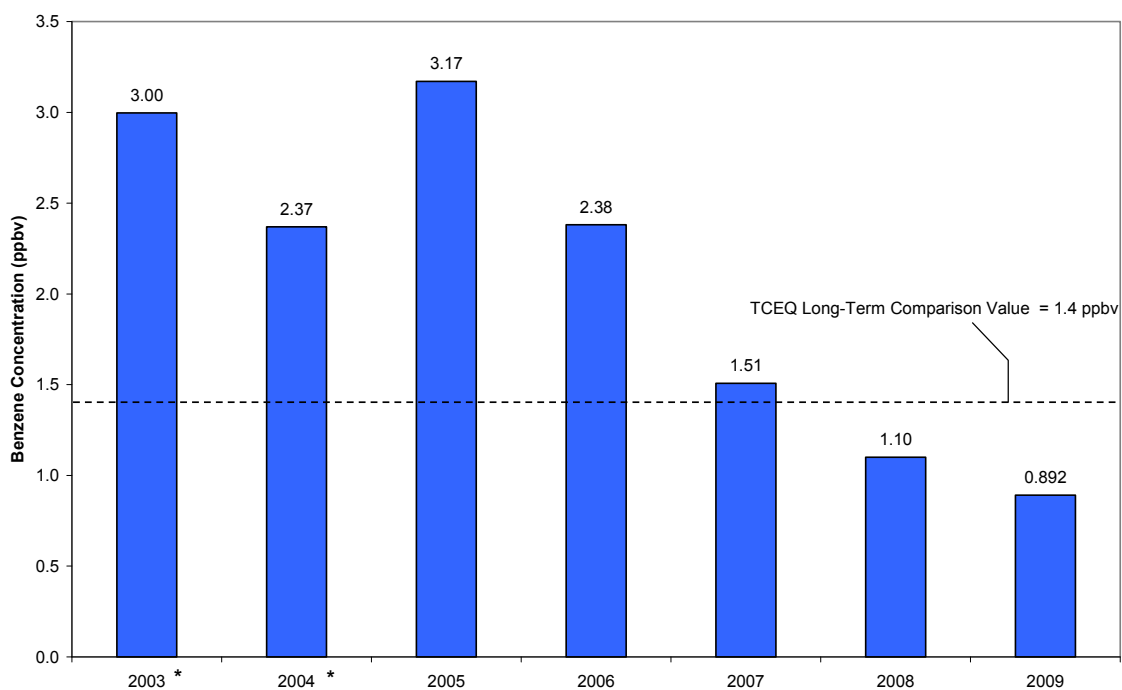
APWL1202 – Acrolein, Butyraldehyde, and Valeraldehyde in Texas City (Removed January 2010)

Concentrations of acrolein, butyraldehyde, and valeraldehyde were detected above their respective odor-based AMCV during mobile monitoring investigations in 2001. Follow-up mobile monitoring investigations in 2004 and 2008 indicated that concentrations of acrolein and valeraldehyde have remained below the odor-based comparison value since the 2001 investigation. The same mobile monitoring investigations detected a single, 1-hour exceedance of the butyraldehyde odor-based comparison value in both 2004 and 2008. In addition, the Galveston County Health District did not identify any citizen complaints relating to aldehyde odors in the Texas City area in 2008. Due to the apparent decrease in the frequency of exceedances of the odor-based comparison values, coupled with the decrease in odor complaints in the Texas City area, the TD has determined that ambient concentrations of acrolein, butyraldehyde, and valeraldehyde are no longer at a level that would be expected to cause nuisance odor conditions.

Acrolein, butyraldehyde, and valeraldehyde were removed from this APWL in January 2010.

APWL1204 – Benzene in the Lynchburg Ferry area of Houston (Removed January 2010)

Annual benzene concentrations in the Lynchburg Ferry area have been elevated above the long-term AMCV since 2003 (see Figure 9). Benzene levels have also been highlighted in the annual ambient air evaluations for Region 12 from 2003-2007. However, from 2005 through 2008, industries in the Lynchburg Ferry area and various divisions within the TCEQ have made considerable efforts to reduce benzene emissions. Industry initiatives in this area include signing emission reduction agreements with the TCEQ and implementing innovative strategies, such as forming the Monument Area Air Quality Focus Group and using an Environmental Monitoring Response System to automatically alert area industries when the monitor reads an elevated concentration so that investigations and processes changes can be made. In addition, the TCEQ has conducted frequent and thorough investigations of facilities in the area, which have led to a variety of corrective actions aimed at reducing benzene emissions. The TCEQ has also coordinated investigations with the industry monitoring group and the United States Coast Guard to identify and reduce benzene emissions from barges in the Houston Ship Channel. Because of the large collaborative effort to reduce emissions, monitored concentrations at this monitoring site have indicated an overall decrease in annual benzene concentrations of 65% from 2005 to 2008 and almost 72% from 2005 to 2009.



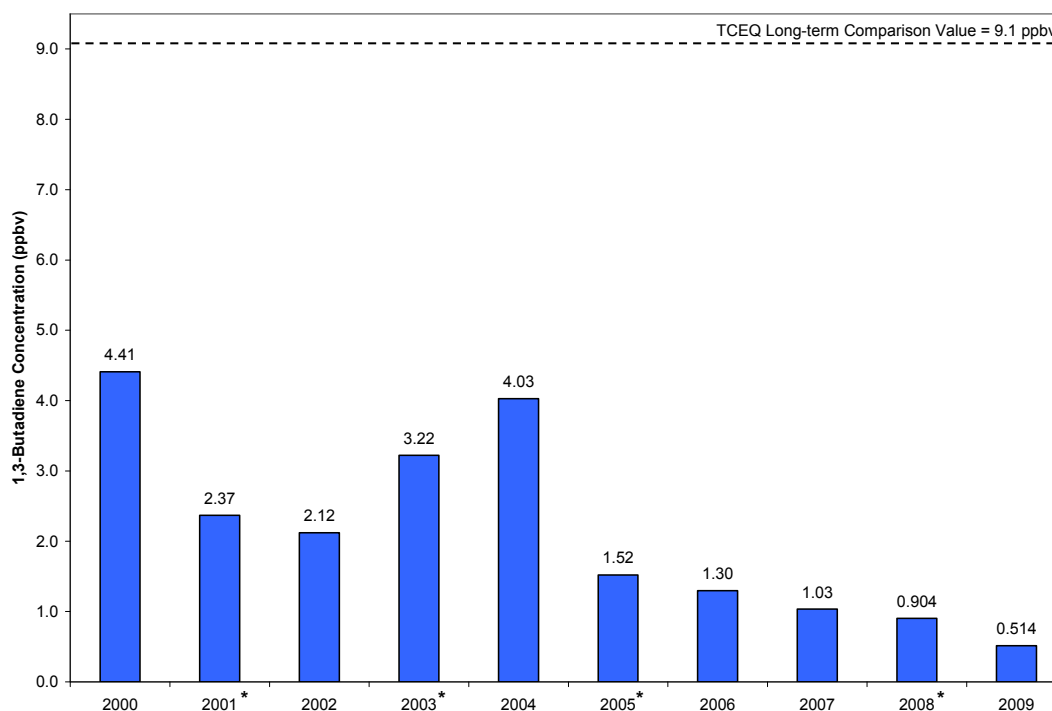
* Incomplete sampling year.

Figure 9. Annual average benzene concentrations at the Lynchburg Ferry monitor, 2003-2009. Annual averages are based on hourly autoGC data.

Benzene was removed from this APWL in January 2010.

APWL1207 – 1,3-Butadiene in Milby Park (Removed June 2009)

Annual average 1,3-butadiene concentrations at the Milby Park monitor were previously considered to be elevated. Although the annual averages were below the interim TCEQ comparison value, the concentrations were above the recommended long-term average concentration of 1 ppb from the USEPA’s 2002 health assessment of 1,3-butadiene. The TCEQ has implemented a number of strategies in the Milby Park area to reduce 1,3-butadiene concentrations, including entering into voluntary ERAs with area companies. These agreements established specific timelines for facilities to implement additional controls, required the companies to install fenceline monitors and use the GasFindIR camera to identify leaks, and established a notification system that enabled the companies to immediately investigate their plant activities in response to elevated 1,3-butadiene levels monitored at Milby Park. The ERAs also resulted in substantial 1,3-butadiene emissions reductions that were incorporated into their air permits, making them enforceable. As a result of the actions in the Milby Park area, 1,3-butadiene levels at the Milby Park monitor are 87% lower in 2009 than in 2004 (see Figure 10). In addition, the TD released its own assessment of 1,3-butadiene in August 2008, which changed the long-term AMCV to 9.1 ppb. This assessment is a more up-to-date assessment of 1,3-butadiene toxicity and was peer-reviewed by world-renowned experts in the field of risk assessment. Therefore, because of the dramatic reductions in ambient concentrations of 1,3-butadiene at the Milby Park monitor and the TCEQ’s updated AMCV, the TCEQ has determined that 1,3-butadiene is no longer considered to be a potential health concern in the Milby Park area.



* Incomplete sampling year.

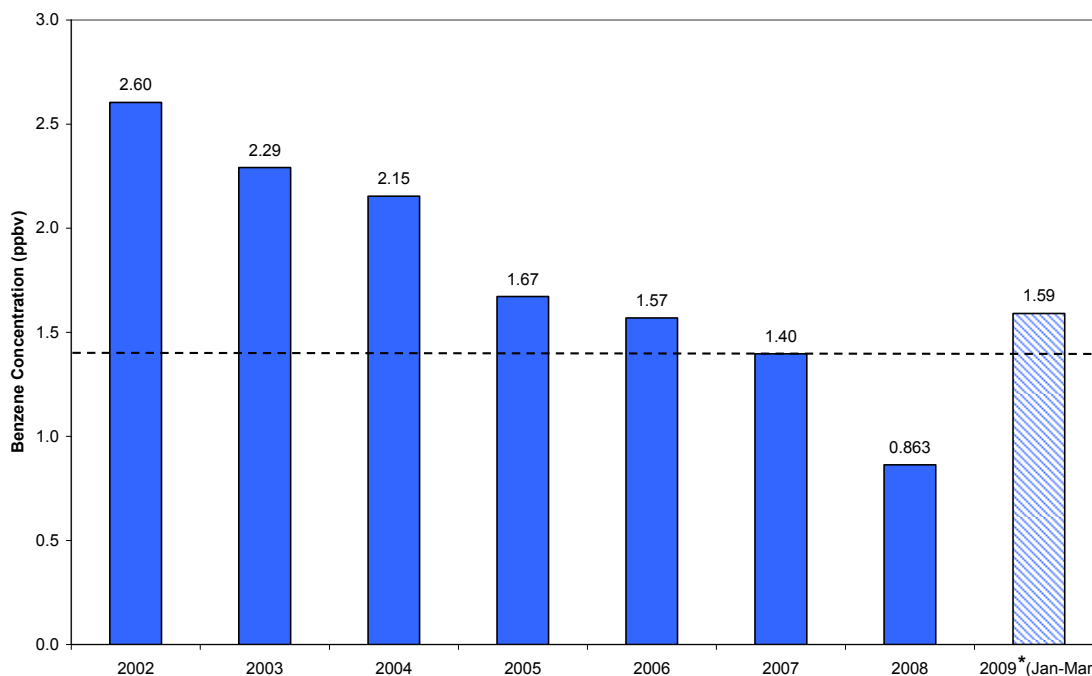
Figure 10. Annual average benzene concentrations at the Milby Park monitor, 2003-2009. Annual averages from 2000 to 2004 are based on every-sixth-day 24-hour canister data. Annual averages from 2005 to 2009 are based on hourly autoGC data.

Butadiene was removed from this APWL in June 2009.

Region 14 – Corpus Christi

APWL1402 – Benzene in Corpus Christi (Removed January 2010)

Benzene concentrations at the Huisache monitoring site had been elevated above the long-term benzene AMCV since monitoring began at the site in 1998 (see Figure 11). However, beginning in 2002, annual average benzene concentrations have indicated a seven-year downward trend, and the 2008 annual average benzene concentration of 0.86 ppb_v was below benzene’s long-term AMCV of 1.4 ppb_v. Although the first quarter of 2009 appears to indicate increased benzene concentrations at the Huisache monitor, monitoring data from an industry-sponsored monitor located near the Huisache monitor indicate that benzene concentrations from March to September were much lower and would average out to be lower than benzene’s long-term comparison value. Since the industry-sponsored monitor has historically been highly correlated with the TCEQ monitor, the TD expects to see the same trend at the Huisache monitor.



* Incomplete sampling year.

Figure 11. Annual average benzene concentrations at the Huisache monitor, 1998-2009. Annual averages are based on every-sixth-day 24-hour canister data. Data from 2009 only include the January to March period.

Benzene was removed from this APWL in January 2010.

Considered but Not Adopted

APWL1101 – Hydrogen Sulfide in Bastrop (Proposed August 2009)

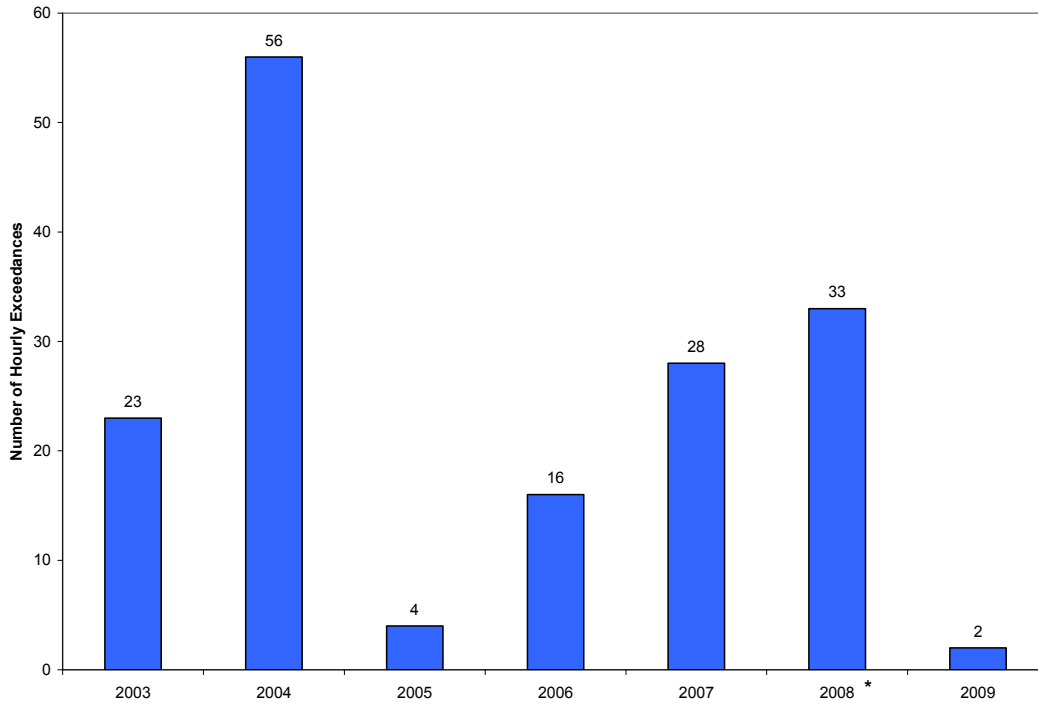
The TD originally proposed the removal of H₂S and the Bastrop area from the APWL in August 2009. However, during the public comment period the TD was provided information regarding citizen odor complaints and an investigation by the Austin Regional Office. The information received indicated that H₂S is still a potential issue in this area. More detailed information is included on page 11 of this report.

The final decision to not remove H₂S from the Bastrop APWL was effective January 2010.

APWL1207 – Styrene in Milby Park (Proposed May 2009)

The TD originally proposed the addition of styrene to the Milby Park APWL because hourly styrene levels that exceed the odor threshold value were reported at the Milby Park air monitoring site with increasing frequency since 2005 (see Figure 12). The odorous styrene concentrations were highlighted in the 2003 through 2007 annual ambient air evaluations for Region 12. However, during the public comment period for this proposed addition, several factors were brought to the attention of the TD. Goodyear Tire and Rubber Company took steps during 2008 to address the source of the elevated styrene emissions detected at the Milby Park monitor. Specifically, they have altered operational practices, amended their permit to include a 25% reduction in allowable styrene emissions, and signed a voluntary emissions reduction agreement with the TCEQ. As a result of these efforts, there was only one exceedance of the odor-based effects screening level for styrene between July and December 2008 and the monitoring data available for 2009 show a consistent decreasing trend. Therefore, based on the proactive steps taken by Goodyear Tire and Rubber Company along with the downward trend in monitoring data for styrene, styrene will currently not be added to APWL1207; however, this area will continue to be monitored for improvement.

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* Incomplete sampling year.

Figure 12. Number of hourly exceedances of the styrene odor-based air monitoring comparison value at the Milby Park monitor, 2003-2009. Data from 2003 to 2004 are based on every-sixth-day 24-hour canister data. Data from 2005 to 2009 are based on hourly autoGC data. Not all data from 2009 have been validated.

The final decision to not add styrene to the Milby Park APWL was effective June 2009.

Conclusions

Through proactive use of the APWL, the air quality in numerous areas in Texas has been greatly improved. Evidence of this improvement is apparent in the success stories mentioned in this report and the numbers of pollutants that have been removed from the APWL (see Figure 13). These successes, however, underscore the need for continued work in those areas that remain on the APWL.

As the TCEQ works to achieve emission reductions in these areas and additional monitoring data are collected and reviewed, the TD will reassess a chemical's listing on the APWL. Annual evaluations of monitoring data are provided on the TD Web site at <http://www.tceq.state.tx.us/implementation/tox/regmemo/AirMain.html>. The TD also maintains a list of interested members of the public, which receive an automatic email when updates are made to the Web site. To join this announcement list, members of the public should email join-tox@listserv.tceq.state.tx.us. In addition to these monitoring evaluations, the TD hopes to provide an updated annual APWL report, which will also be available online. During all stages of the APWL process, members of the public and/or organizations are encouraged to submit their recommendations for the addition and/or removal of chemicals from the APWL by submitting the online comment form found at <http://www.tceq.state.tx.us/implementation/tox/AirPollutantMain/info.html>.

Please contact the TD with any questions or comments regarding AMCVs, documents referenced in this report, or any other information in this APWL report via the toll-free main number at (877) 992-8370 or via email at tox@tceq.state.tx.us.

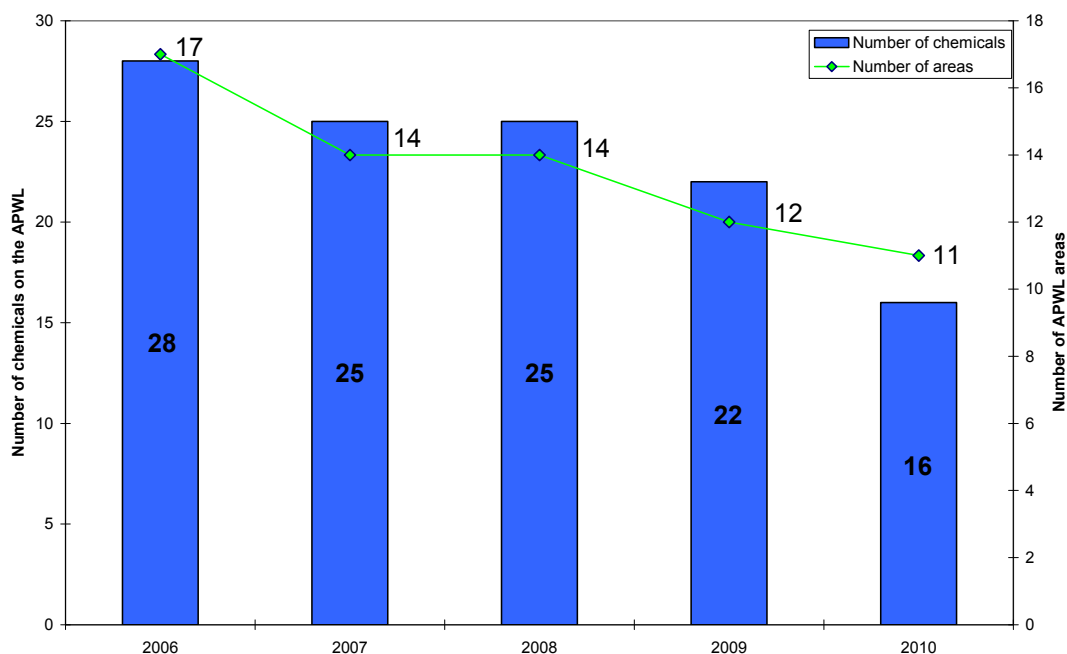


Figure 13. Number of chemicals on the Air Pollutant Watch List and number of areas on the APWL, 2006-2010.