

Air Pollutant Watch List Proposed Change

***Removal of Lynchburg Ferry
(Currently Listed for the Air
Toxic Styrene)***

**Texas Commission on
Environmental Quality**

Air Permits Division

July 8, 2013

Overview

The Texas Commission on Environmental Quality (TCEQ) established the [Air Pollutant Watch List](#) (APWL) to address areas of the state where ambient air toxic concentrations were monitored at levels of potential concern. The TCEQ added the area near the Houston Ship Channel's Lynchburg Ferry in Harris County in 2003 to address short-term, odorous concentrations of the air toxic styrene, and also to address concentrations of the air toxic benzene that previously exceeded levels of potential health concern on both a short- and long-term basis. The TCEQ removed benzene in Lynchburg Ferry from the APWL in 2010 because collaborative efforts led to a significant reduction in benzene concentrations such that levels were no longer of potential concern. After benzene in the area was removed from the APWL, Lynchburg Ferry remained listed for the air toxic styrene. Because the Lynchburg Ferry APWL area was developed for both styrene and benzene, the TCEQ conducted a boundary reevaluation to better enable the TCEQ to focus limited state resources on the styrene sources that could potentially affect ambient concentrations. The TCEQ finalized the change to the Lynchburg Ferry APWL boundary in April 2012, which reduced its geographical size.

The TCEQ has now determined that styrene concentrations, too, are below a level of potential concern. Exposure to sufficiently high and persistent levels of styrene has the potential to cause odor-related health effects, such as nausea and headaches. The TCEQ's Toxicology Division established styrene's short-term, odor-based air monitoring comparison value (AMCV) at 25 parts per billion by volume (ppb_v), and nuisance conditions and odor-related health effects would not be expected at concentrations below this level. The Lynchburg Ferry monitor—originally sited on the north side of the Houston Ship Channel and moved to the south side of the Houston Ship Channel in 2011—provides continuous hourly ambient concentration data, and the TCEQ is able to evaluate the number of hours each year that exceed the 25 ppb_v odor-based AMCV as well as the magnitude of the exceedances. The year with the most exceedances of the styrene odor-based AMCV at the Lynchburg Ferry monitor was 2005, in which 92 hours were monitored over 25 ppb_v (and the highest concentration was 433 ppb_v). The number of hours with an ambient concentration above 25 ppb_v and the magnitude of exceedances have been reduced significantly since 2005. Three hourly styrene concentrations were monitored above 25 ppb_v in 2011 (in which the highest concentration was 38 ppb_v), and six hourly concentrations were monitored above 25 ppb_v in 2012 (in which the highest concentration was 57 ppb_v).

Companies in the Lynchburg Ferry area have implemented controls and operational changes to mitigate styrene emissions. Further, several of the styrene sources in the area, in collaboration with Houston Regional Monitoring Corporation (a privately sponsored ambient air monitoring network), have implemented an email alert system to automatically notify some of the area's largest styrene emitters when the monitor reads an elevated concentration of styrene. This type of near-real time notification enables companies to better evaluate the potential effect of their operations on ambient styrene concentrations and helps assure that concentrations remain below a level of concern. The TCEQ has determined that ambient styrene concentrations are no longer of potential concern and can reasonably expect concentrations to be maintained below

levels of concern. Therefore, the TCEQ is proposing to remove the Lynchburg Ferry area from the APWL.

Area and Pollutant of Concern

The TCEQ established the APWL to address areas of the state where air toxics were monitored at levels of potential concern. An area near the Houston Ship Channel's Lynchburg Ferry is currently on the APWL for odorous concentrations of the air toxic styrene measured at the [Lynchburg Ferry monitor](#) (AQS number 482011015). Styrene is a colorless to slightly yellowish oily liquid with a sweet, sharp odor. Styrene is widely used for the manufacture of polystyrene, rubber resins, and insulators, and it is a common cross-linking agent in glass fiber-reinforced and unsaturated polyester resins.

Styrene is an odorous compound. Exposure to sufficiently high and persistent levels of styrene has the potential to cause odor-related health effects, such as nausea and headaches. The TCEQ's Toxicology Division established styrene's short-term, odor-based AMCV at 25 ppb_v, and nuisance conditions and odor-related health effects would not be expected at concentrations below this level. Additional, detailed information on the potential toxicological effects of styrene is available in [TCEQ's styrene Development Support Document](#).

The TCEQ defined the APWL boundary as the geographical area:

- North of San Jacinto Boulevard and Old Battleground Road
- South of Interstate Highway 10 (IH-10)
- East of Sheldon Road and Tucker Bayou
- West of Independence Parkway and South Lynchburg Road/Crosby Lynchburg Road/Lynchburg Road

The APWL boundary includes the companies that are listed in Table 1, *Lynchburg Ferry Companies*. The locations of these companies are illustrated in Figure 1, *Lynchburg Ferry APWL Area*, which is an excerpt of [TCEQ's current APWL boundary map](#). The [TCEQ's Lynchburg Ferry boundary reevaluation document](#) provides a detailed explanation of the TCEQ's evaluation to redefine the APWL area. The evaluation involved the analysis of ambient monitoring data obtained from the Lynchburg Ferry monitor and other nearby monitors, including the [Jacinto Port monitor](#) (AQS number 482010036), [Baytown monitor](#) (AQS number 482010058), [Channelview monitor](#) (AQS number 482010026), and the now-deactivated [San Jacinto Monument monitor](#) (AQS number 482011041). The TCEQ's boundary reevaluation also included source determinations, designated land use, emissions inventory, and other information for the APWL area.

Figure 1 shows the location of Lynchburg Ferry monitor, which provided the data used to add the area to the APWL and also provided the data that shows the improvement in air quality, which will be discussed throughout this document. Figure 1 also shows the nearby Jacinto Port monitor.

Table 1: Lynchburg Ferry Companies

| Map Identifier | Regulated Entity | RN Number |
|----------------|---|-------------|
| 1 | Channel Shipyard | RN100218429 |
| 2 | Southwest Shipyard | RN100248749 |
| 3 | Vopak Terminal Deer Park | RN100225093 |
| 4 | Vopak Logistics Services USA Deer Park | RN100223007 |
| 5 | Kirby Inland Marine, LP | RN102204211 |
| 6 | K-SOLV | RN100616721 |
| 7 | Stolt Tank Cleaning Facility and Depot | RN102562063 |
| 8 | Stolt Barge Services | RN104267133 |
| 9 | Intercontinental Terminals Deer Park Terminal | RN100210806 |
| 10 | Slay Transportation | RN100558600 |
| 11 | Johann Haltermann | RN100219237 |
| 12 | Glendale Boat Works | RN103038766 |
| 13 | Pelican Refining Company LLC | RN100210483 |
| 14 | Sneed Shipbuilding, Inc. | RN100867498 |
| 15 | Solar Turbines | RN100214477 |
| 16 | DTX Oil Zavalla Road Facility | RN105052500 |
| 17 | Targa Terminals LLC | RN100542489 |
| 18 | Trimac Transportation South | RN102525573 |
| 19 | TM Deer Park Services | RN100209568 |
| 20 | T-Rex Engineering & Construction | RN102574936 |
| 21 | Precoat Metals Division Sequa | RN100217926 |
| 22 | Powell Industries Offshore | RN100582352 |
| 23 | Houston Fuel Oil Terminal | RN100223445 |
| 24 | Houston Fuel Oil Terminal West | RN102610912 |
| 25 | Duco Pipe Manufacturing Facility | RN102183647 |
| 26 | Techcote Industrial Coating, Ltd. | RN101078210 |
| 27 | GE AEP APS Houston Facility | RN100217959 |
| 28 | CEMEX Construction Materials South, LP | RN105449847 |
| 29 | Oil States Industries, Inc. | RN103886057 |

Figure 1: Lynchburg Ferry APWL Area



The Lynchburg Ferry monitor was originally sited on the north side of the Houston Ship Channel at 1001 B Lynchburg Road. In September 2011, monitoring at this location was temporarily suspended because the Federal Department of Homeland Security requested that the monitoring site be vacated. The monitor was moved to the south side of the ship channel at 4407 Independence Parkway South and came back online in December 2011. Figure 2, *Movement of Lynchburg Ferry Monitor*, shows the monitor's previous location and new location. The new location of the monitor is further away

from some styrene sources, such as the shipyards, but is closer to some of the larger sources of styrene in the APWL area, such as the terminals, and the monitor is sited in a location that will continue to provide data that will enable the TCEQ to effectively evaluate ambient air quality in the Lynchburg Ferry area. This document will describe how the styrene monitoring data show an improvement in air quality, initially at the Lynchburg Road location, and now, for over a full calendar year, at the Independence Parkway location.

Figure 2: Movement of Lynchburg Ferry Monitor



Reasons for Lynchburg Ferry's Inclusion on the APWL for Styrene

The TCEQ has evaluated ambient air monitoring data in and around the Lynchburg Ferry area from mobile monitoring trips and from the Lynchburg Ferry stationary monitoring site. The TCEQ conducted mobile monitoring trips—both on land near industrial sources and from boats in the Houston Ship Channel.¹ The Lynchburg Ferry monitoring site contains an automated gas chromatograph monitor, which supplies continuous hourly ambient concentration data for styrene and other air toxics.

Lynchburg Ferry is on the APWL because data collected from the Lynchburg Ferry monitor demonstrated persistent hourly concentrations of styrene that exceeded the TCEQ's short-term, odor-based AMCV of 25 ppb_v, dating back to the monitor's installation in 2003. The TCEQ's Toxicology Division has conducted [health effects evaluations](#) of the ambient air monitoring data from Lynchburg Ferry for many years, and has previously recommended styrene reductions in the area.

TCEQ and Industry Actions to Reduce Styrene Emissions

The purpose of the APWL is to help the TCEQ reduce ambient air toxic concentrations below levels of potential concern by properly focusing limited state resources on areas with the greatest need. The Lynchburg Ferry area was also previously listed for the air toxic benzene, and the TCEQ has worked in collaboration with area industries to reduce both benzene and styrene emissions to concentrations below levels of potential concern.

Strategies developed to reduce benzene emissions in the area have also likely reduced emissions of other volatile organic compounds and may also have mitigated emissions of styrene. Concurrent with benzene reductions, the number of styrene exceedances also stepped down in 2006, 2007, 2008, and 2009. In regard to styrene specifically, two of the shipyards in the Lynchburg Ferry area have made operational changes through the TCEQ's air permitting process, and these changes resulted in further reductions in styrene emissions. Both of these shipyards were discussed in the Lynchburg Ferry boundary reevaluation document, and the improvements are provided in more detail here.

Southwest Shipyard, a barge cleaning and repair facility located at the intersection of IH-10 and the San Jacinto River in Channelview, voluntarily amended its barge degassing permit requirements in October 2010, significantly reducing volatile organic compound emissions including styrene. The company's permit requires that vapors from degassing of styrene barges be routed to a flare until the barge vapors reach a certain concentration, then the remaining residual vapors are allowed to vent to the atmosphere. Prior to the voluntary amendment, the company's permit specified a different concentration for each chemical that would be degassed.² For example, the permit specified that styrene would be controlled to a concentration of 1,400 parts per

¹ Mobile monitoring was conducted in the Lynchburg Ferry area most recently in 2009, 2007, and 2006.

² The concentrations for each chemical were based on control technology and impacts reviews conducted during the New Source Review air permitting process.

million by volume (ppm_v). The voluntary amendment standardized the minimum degassing level for all chemicals with a more stringent value, reducing the minimum degassing level to 50 ppm_v. Therefore, after the permit was amended, styrene vapors from barge degassing were controlled to a concentration 28 times lower, from 1,400 ppm_v to 50 ppm_v. Thus, more barge vapors are controlled from degassing, resulting in a significant reduction in styrene emissions.

Channel Shipyard is a barge cleaning facility located at 999 South Lynchburg Road in Baytown, and the TCEQ previously identified Channel Shipyard as a primary styrene contributor in its Lynchburg Ferry boundary reevaluation. As discussed in that evaluation, Channel Shipyard, through the review of an air permit amendment, agreed to implement a significant operational/control strategy to mitigate styrene emissions, essentially agreeing to eliminate uncontrolled styrene barge handling at its site. Specifically, Channel Shipyard previously controlled barge handling operations at its south dock with a vapor destruction unit, and the company agreed to install a vapor destruction unit at its north dock and ensure that all styrene barge degassing operations be routed to one of the vapor destruction units. The permitted changes result in an estimated 70% decrease in maximum hourly styrene emission rate from the site. These permit terms went into effect in March 2011.

In addition to the specific actions by the shipyards to mitigate styrene emissions, several area industries formed the Lynchburg Area Styrene Reduction (LASR) Committee in 2012. The LASR Committee conducted its initial meeting in early 2012 to discuss the operational and process changes taken by its members to reduce emissions. The LASR Committee has reported to the TCEQ that several of the companies in the APWL area have implemented operational changes to mitigate emissions, such as degassing to volatile organic compound concentrations lower than mandatory limits specified in TCEQ regulations, limiting night time degassing, and staggering compartment degassing to reduce hourly styrene emissions. Additionally, the LASR group reported that certain major chemical companies have implemented operational changes to decrease the need for styrene barge cleaning within the Houston Ship Channel.

The three largest styrene emitters in the LASR Committee also collaborated with Houston Regional Monitoring Corporation (who operates the Lynchburg Ferry monitoring site) to establish styrene trigger notifications, which began in February 2012. This type of email notification is similar to the Environmental Monitoring Response System alerts for benzene that were established for the Monument Area Air Quality Focus Group—a strategy that was instrumental in the benzene improvements for the Lynchburg Ferry benzene APWL area. If the monitor reads a concentration of styrene above 25 ppb_v, the participating companies will receive a near-real time, automatic email alert. Further, the email alert system also sends a “negative” notification each day if no elevated styrene concentrations are monitored. The email notifications will enable companies to be continually aware of ambient styrene concentrations in the area and better evaluate the potential effect of their operations on ambient levels. This system will further help assure that styrene concentrations remain below a level of concern.

Monitored Decline in Ambient Styrene Concentrations

Monitoring data show that ambient, hourly styrene concentrations frequently exceeded 25 ppb_v in the years 2003 – 2005, with the largest number (or hours) of exceedances occurring in 2005, in which there were 92. The magnitudes of the exceedances during this time period were also high, with the highest recorded concentration of 987 ppb_v occurring in 2003. In 2006, the number of exceedances over the AMCV started to decline, and the number of exceedances had decreased to 20 in 2009. In 2010, the number increased slightly to 27.

Since that time, the number of exceedances has decreased significantly. There was a total of three hours, occurring in three separate instances, in 2011 that exceeded 25 ppb_v. As discussed previously in this document, the Lynchburg Ferry monitor was moved from the north side of the Houston Ship Channel to the south side in 2011. As such, there was a three-month period in which limited or no data was collected by the Lynchburg Ferry monitor (from September 13, 2011, to December 13, 2011). Nonetheless, the monitor was operational at its new location for the entire calendar year of 2012, and only six hours in 2012 exceeded 25 ppb_v.

In each case, the exceedances in 2011 and 2012 occurred in an individual, one-hour time period, in which a spike occurred, but the hours immediately before and after were below the 25 ppb_v AMCV. Thus, in 2011 and 2012, the monitor did not record any extended periods of time that the ambient concentration exceeded the AMCV. All exceedances that occurred over the last two calendar years are listed in Table 2, *2011 and 2012 Styrene Odor-based AMCV Exceedances*.

Table 2: 2011 and 2012 Styrene Odor-based AMCV Exceedances

| Date | Time (Central Standard Time) | Concentration (ppb _v) |
|--------------------|------------------------------|-----------------------------------|
| January 18, 2011 | 8:00 p.m. | 38.42 |
| March 10, 2011 | 11:00 p.m. | 38.39 |
| July 19, 2011 | 11:00 a.m. | 27.24 |
| January 5, 2012 | 2:00 a.m. | 47.51 |
| June 13, 2012 | 4:00 a.m. | 29.61 |
| July 18, 2012 | 6:00 a.m. | 37.82 |
| August 28, 2012 | 9:00 p.m. | 38.59 |
| September 28, 2012 | 5:00 p.m. | 56.58 |
| November 16, 2012 | 9:00 p.m. | 39.91 |

Additionally, the magnitude of the exceedances in 2011 and 2012 are below those monitored in previous years, as the highest monitored concentration was 38 ppb_v in 2011 and 57 ppb_v in 2012. The monitoring data show a decreasing trend, and the improvements in frequency and magnitude of odorous styrene concentrations were

highlighted in the [TCEQ's most recent health effects evaluation memorandum of the Region 12 network monitoring data](#). Specifically, the TCEQ's Toxicology Division stated in the health effects evaluation memorandum of the 2011 network monitoring data that reported concentrations are no longer of concern for persistent, strong odors. Further, the Lynchburg Ferry monitoring data in Table 2 show that concentrations exceeded the odor-based AMCV no more than one hour in any given month in 2011 – 2012, and monitoring data show that several months have not had a single hourly exceedance of the AMCV. The following representations further illustrate the monitored improvements.

Figure 3: Number of Styrene Exceedances Each Year has Decreased

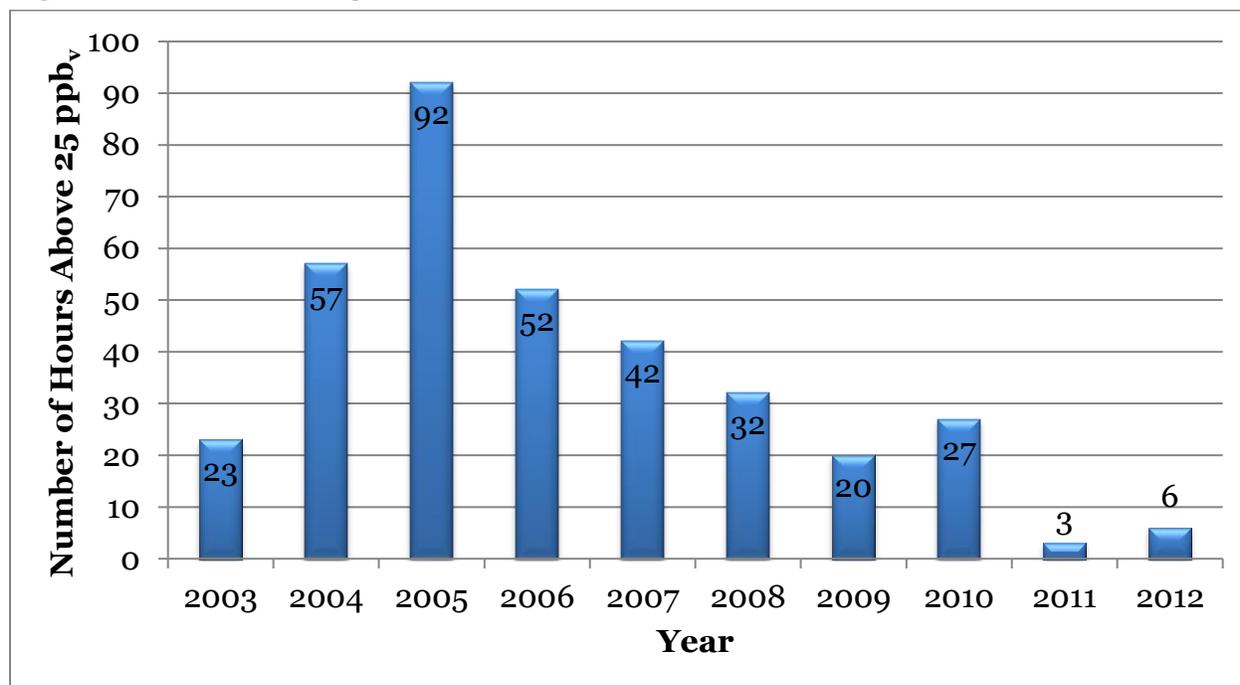


Table 3: Number and Magnitude of Exceedances Have Decreased

| Year | Number of Exceedances | Highest Concentration (ppbv) |
|--------------------|-----------------------|------------------------------|
| 2003 [*] | 23 | 987 |
| 2004 | 57 | 258 |
| 2005 | 92 | 433 |
| 2006 | 52 | 358 |
| 2007 | 42 | 155 |
| 2008 | 32 | 494 |
| 2009 | 20 | 102 |
| 2010 | 27 | 265 |
| 2011 ^{**} | 3 | 38 |
| 2012 | 6 | 57 |

* Represents an incomplete year of data.

** Monitor was moved and did not collect data from September 13, 2011, to December 13, 2011.

TCEQ Determines that Monitored Styrene Concentrations are No Longer a Potential Concern

The collective efforts in the Lynchburg Ferry area to mitigate emissions have resulted in significant improvements in ambient styrene concentrations. Further, in February 2012, Houston Regional Monitoring Corporation, which previously established the Environmental Monitoring Response System alerts for benzene, began sending trigger notifications to the area's three largest styrene emitters if concentrations exceed 25 ppbv, further helping to assure that concentrations remain below a level of concern. Based on available information, the TCEQ determines that monitored concentrations can reasonably be expected to be maintained below levels of potential concern, and the TCEQ is proposing to remove Lynchburg Ferry from the APWL.

Public Comment Period

The TCEQ will accept comments on the proposed delisting of Lynchburg Ferry from the APWL, which is currently listed for the air toxic styrene. Interested persons may send comments to APWL@tceq.texas.gov or may send comments to the APWL coordinator at the following mailing address:

Ms. Tara Capobianco, P.E.
Air Pollutant Watch List Coordinator
Texas Commission on Environmental Quality
6300 Ocean Drive, NRC Building
Suite 1200, Unit 5839
Corpus Christi, Texas 78412-5839

The comment period began on July 8, 2013, and the TCEQ will accept comments through August 23, 2013. Any questions regarding the proposed delisting or the APWL process may be forwarded to Ms. Capobianco at (361) 825-3386.

Public Meeting

The TCEQ will conduct a public meeting to receive comments on the proposed delisting of Lynchburg Ferry from the APWL. The public meeting will be held on Monday, August 19, 2013, at 6:00 p.m. at the North Channel Branch Library, located at 15741 Wallisville Road, Houston, Texas. The TCEQ will give a short presentation of the delisting at 6:00 p.m. After a short question and answer session, the TCEQ will officially open the public meeting. The public meeting will be structured for the receipt of oral or written comments by interested persons.

Individuals may present statements when called upon in order of registration. Open discussion within the audience will not occur during the public meeting; however, the TCEQ's staff will be available to discuss the proposed delisting and answer any additional questions after the meeting.

Persons who have special communication or other accommodation needs who are planning to attend the meeting should contact the Office of the Chief Clerk at (512) 239-3300 or 1-800-RELAY-TX (TDD) at least one week prior to the meeting.