



December 6, 2021

VIA: ELECTRONIC MAIL ONLY

Attn: Susan Nakamura, Assistant DEO (snakamura@aqmd.gov)
Mike Morris, Planning and Rules Manager (mmorris@aqmd.gov)
South Coast Air Quality Management District

Re: Comments on Proposed Amended Rule 1178

Dear Ms. Nakamura and Mr. Morris,

The undersigned organizations submit these comments on Proposed Amended Rule 1178. The South Coast Air Quality Management District ("Air District") must strengthen the rule to reduce fugitive volatile organic compound ("VOC") emissions from storage tanks. These emissions cause ozone formation and expose fenceline communities to hazardous pollutants.

The Air District's amendments must include both preventative and remedial measures to reduce VOC leaks. Such measures must require operators to:

- (1) Install best available emissions control technology, including internal floating roofs or domed external floating roofs, suspended floating roofs, secondary seals, and vapor recovery units.
- (2) Use best available monitoring technology, including optical gas imaging, solar occultation flux, and forward-looking infrared technologies.
- (3) Inspect storage tanks for leaks with greater frequency.
- (4) Reinspect storage tanks after conducting any leak repairs and submit to regular third-party audits.
- (5) Implement stricter gap requirements and lower leak thresholds to prevent and detect excess emissions.

- (6) Conduct both performance tests and weekly Method 21 tests to ensure that portable storage tanks are not leaking.

Under the Community Emissions Reduction Plan for Wilmington, Carson, and West Long Beach (“Community Emissions Reduction Plan”), the Air District committed to reduce VOCs from petroleum refineries in fence-line communities by strengthening Rule 1178. To fulfill its commitment, the Air District must proactively and aggressively prevent leaks from storage tanks. Monitoring and inspection requirements must require best available technology that quickly identifies leaks and prompts immediate repair. But improved monitoring and inspection requirements are not enough. Operators must prevent leaks in the first place by installing emissions controls. The Air District’s prioritization of leak prevention is vital to the development of a strong Rule 1178.

I. Leaking Storage Tanks Emit Harmful VOCs that Contribute to Ozone Standard Non-Attainment in the South Coast Air Basin

Fugitive emissions from storage tanks cause a range of health burdens. VOCs contribute to ground-level ozone formation in the region, which remains in extreme non-attainment of both state and federal ozone standards.¹ Ozone forms through a chemical reaction between VOCs and nitrogen oxides in the presence of sunlight.² Ozone has a range of respiratory health impacts, including lung irritation, inflammation, and worsening of existing chronic health conditions.³ On their own, VOCs, including benzene, toluene, and ethylbenzene, are considered hazardous air pollutants that can cause long-term health consequences, including cancer, developmental defects, and nervous system damage.⁴

Excess emissions from storage tanks disproportionately impact low-income communities and communities of color. A majority of storage tanks subject to Rule 1178 are in Wilmington,

¹ See S. Coast Air Quality Mgmt. Dist., *National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin* (Sept. 2018), <https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf?sfvrsn=14>; EPA, *8-Hour Ozone (2015) Nonattainment Area State/Area/County Report* (last updated Oct. 31, 2021), <https://www3.epa.gov/airquality/greenbook/jncs.html#CA>.

² EPA, *Ground-level Ozone Basics* (last updated May 5, 2021), <https://oehha.ca.gov/calenviroscreen/indicator/air-quality-ozone>.

³ Cal. Off. of Env’t Health Hazard Assessment, *Air Quality: Ozone*, <https://oehha.ca.gov/calenviroscreen/indicator/air-quality-ozone> (last visited Nov. 30, 2021).

⁴ See, e.g., Am. Cancer Soc’y, *Benzene and Cancer Risk* (last revised Jan. 5, 2016), <https://www.cancer.org/cancer/cancer-causes/benzene.html>; Cal. Off. of Env’t Health Hazard Assessment, *Chemicals Known to the State to Cause Cancer or Reproductive Toxicity* (Sept. 13, 2019), <https://oehha.ca.gov/media/downloads/proposition-65/p65list091319.pdf>.

Carson, and West Long Beach.⁵ Residents in these communities already experience significant diesel pollution, toxic releases, and hazardous waste exposures from a range of industrial sources in the area, including freeways, the Ports of Los Angeles and Long Beach, and several petroleum refineries.⁶ In accordance with AB 617, the Wilmington, Carson, and West Long Beach Community Steering Committee (“Community Steering Committee”) developed a Community Emissions Reduction Plan to address the community’s air quality priorities. The Community Steering Committee specifically prioritized more stringent requirements for “fugitive VOC emissions from storage tanks” in its plan.⁷

The Community Steering Committee’s decision to prioritize excess emissions from storage tanks arose, in part, from the results of the Air District’s FluxSense study.⁸ In April 2017, the Air District published a study with FluxSense revealing excess emissions from leaking storage tanks at petroleum refineries in the South Coast Air Basin.⁹ Researchers used optical remote sensing methods to measure VOC, nitrogen oxide, and sulfur dioxide emissions from six major petroleum refineries in the area.¹⁰ Each of these petroleum refineries includes significant numbers of storage tanks.¹¹ As part of the study, researchers found that approximately half of one refinery’s total measured emissions came from its storage tanks alone.¹² Petroleum refineries are among the largest stationary sources of VOC emissions in Wilmington, Carson, and West Long Beach, contributing approximately 32 percent of the total VOC emissions in these communities.¹³ The FluxSense study showed that leaking storage tanks are a significant source of these emissions.

⁵ Email from Melissa Gamoning, SCAQMD Air Quality Specialist, to Lisa Fuhrmann, Earthjustice Sr. Research & Policy Analyst (Aug. 13, 2021, 11:55 PDT) (on file with author).

⁶ Cal. Off. of Env’t Health Hazard Assessment, CalEnviroScreen 4.0 (Oct. 20, 2021), <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40> (choose “ArcGIS World Geocoding Service” from drop-down arrow next to location search bar; then type “Wilmington, CA, USA”, “Carson, CA, USA”, or “Westside, Long Beach, CA, USA”, selecting the top autocomplete entry from the search drop-down menu for each location).

⁷ S. Coast Air Quality Mgmt. Dist., *Community Emissions Reduction Plan for Wilmington, Carson, West Long Beach*, at 5b-3 (Sept. 2019), <https://www.aqmd.gov/docs/default-source/ab-617-ab-134/steering-committees/wilmington/cerp/final-cerp-wcwlb.pdf?sfvrsn=8> [hereinafter *Community Emissions Reduction Plan*].

⁸ *Id.* at ES-15, RTC-199, and RTC-204.

⁹ Johan Mellqvist et al., *Emission Measurements of VOCs, NO₂, and SO₂ from the Refineries in the South Coast Air Basin Using Solar Occultation Flux and Other Optical Remote Sensing Methods*, at 91–92 (Apr. 11, 2017) [hereinafter *Fluxsense*].

¹⁰ *Id.* at 2.

¹¹ Earthjustice, Spreadsheet Summary of SCAQMD-approved Storage Tanks (Exhibit A).

¹² *Fluxsense*, *supra* note 9, at 83.

¹³ *Community Emissions Reduction Plan*, *supra* note 7, at 5b-1, 3b-3.

In fact, researchers discovered several leaking storage tanks while taking measurements at the petroleum refineries.¹⁴ In one instance, researchers discovered a leaking storage tank that “showed large emissions during several days.”¹⁵ Researchers notified refinery personnel and the Air District of the leak. Ultimately, “service personnel carried out an inspection showing that one of the valves was leaking” due to a malfunctioning vent gauge.¹⁶ Fenceline communities should not have to rely on the chance investigation by researchers to identify and address leaking storage tanks. A strong Rule 1178 is necessary to prevent such leaks from happening in the first place.

II. The Air District Must Amend Rule 1178 to Prevent Fugitive Emissions from Storage Tanks

A. Emissions Control Technology

Rule 1178 fails to incorporate readily available and cost-effective emissions controls. Such controls include internal floating roofs or domed external floating roofs, suspended floating roofs, secondary seals, and vapor recovery units.

i. Internal floating roofs or domed external floating roofs

The Air District must require operators to install either internal floating roofs or domed external floating roofs on all storage tanks. Unlike fixed roof tanks and external floating roof tanks, internal floating roof tanks and domed external floating roof tanks have both floating roofs and geodesic domes.

Rule 1178 currently applies to 1,108 storage tanks.¹⁷ Of those, 308 are fixed roof tanks.¹⁸ Fixed roof tanks are the most basic type of storage tank.¹⁹ Fixed roofs are permanently affixed to the top of the tank, which creates significant space for vapors to accumulate when the tank is less than full.²⁰ Conversely, floating roofs float on top of stored materials so there is little to no vapor space between the liquid surface and the roof.²¹ This greatly reduces emissions

¹⁴ *Fluxsense, supra* note 9, at 4.

¹⁵ *Fluxsense, supra* note 9, at 87.

¹⁶ *Ibid.*

¹⁷ S. Coast Air Quality Mgmt. Dist., PowerPoint Presentation at Proposed Amended Rule 1178 Working Group Meeting 2, at 19 (July 15, 2021) [hereinafter *Rule 1178 Working Group Meeting 2 Presentation*].

¹⁸ *Ibid.*

¹⁹ EPA, *Emission Factor Documentation for AP-42 Section 7.1: Organic Liquid Storage Tanks*, at 2-1 (Sept. 2006), <https://www3.epa.gov/ttnchie1/ap42/ch07/bgdocs/b07s01.pdf>.

²⁰ *Ibid.*

²¹ Alex Chamberlain, *Working & Standing Losses: Understanding Tank Emissions Inside & Out*, ERA Environmental, <https://www.era-environmental.com/blog/understanding-tank-emissions-inside-out> (last visited Nov. 30, 2021).

generation and resulting evaporative losses compared to fixed roofs.²² Further, the elimination of the vapor space minimizes the hazards of fire and explosion from the buildup of VOC-laden vapors.²³

Currently, Rule 1178 does not require operators to install floating roofs on storage tanks that contain organic liquids with a true vapor pressure of less than or equal to 3 pounds per square inch absolute (“psia”).²⁴ This contrasts with the storage tank rule from the Bay Area Air Quality Management District (“BAAQMD”), which requires floating roofs on storage tanks that have a capacity of 39,600 gallons or greater and true vapor pressure between 0.5 psia and 11 psia.²⁵ This difference is significant because external floating roofs can reduce evaporative emissions from fixed roof tanks by over 98 percent.²⁶ BAAQMD’s rule places stricter controls on larger storage tanks. A similar requirement from the Air District would result in emissions reductions from a significant number of larger storage tanks with fixed roofs. According to the Air District, 78 percent of fixed roof tanks subject to Rule 1178 have a capacity of greater than or equal to 50,000 gallons; 45 percent have a capacity of greater than or equal to 1,000,000 gallons.²⁷

Although floating roofs provide significant emissions reductions compared to fixed roofs, floating roofs alone are not the most effective technology to reduce VOC emissions. Further reductions are possible through the installation of a geodesic dome over the floating roof. Such an installation involves converting an external floating roof tank into an internal floating roof tank or a domed external floating roof tank. The geodesic dome over the floating roof prevents wind-induced evaporative losses.²⁸ Most rim seal vapor losses for external floating roof tanks stem from wind effects.²⁹ In contrast, internal floating roof tanks and domed external floating roof tanks do not experience wind-induced rim seal vapor losses because of their geodesic domes.³⁰ The elimination of such vapor losses results in significant emissions reductions. For example, the Torrance Refinery reduced VOC emissions by 80 percent when it installed

²² EPA, *AP 42 Chapter 7: Liquid Storage Tanks*, at 7.1-8, 7.1-9 (June 2020), <https://www3.epa.gov/ttnchie1/ap42/ch07/final/ch07s01.pdf>.

²³ C. A. Day, *Economics of Vapor Recovery from Storage Tanks*, *Journal of the Air Pollution Control Association*, 5:1, 17-63, at 18 (1955), <https://doi.org/10.1080/00966665.1955.10467678>.

²⁴ *Rule 1178 Working Group Meeting 2 Presentation*, *supra* note 17, at 32, 37.

²⁵ Bay Area Air Quality Mgmt. Dist., Regulation 8, Rule 5, Section 301 (revised Apr. 24, 2018).

²⁶ Terry Gallagher & Christian R. Desjardins, *Floating-Roof Tanks: Design and Operation in the Petroleum Industry*, 2000 International Pipeline Conference, at 671 (Oct. 21, 2016), <https://doi.org/10.1115/IPC2000-117>.

²⁷ *Rule 1178 Working Group Meeting 2 Presentation*, *supra* note 17, at 18–19.

²⁸ Maine Dep’t of Env’t Protection, *Measurement and Control of Emissions from Aboveground Petroleum Storage Tanks*, at 50 (Jan. 1, 2021) [hereinafter *Maine DEP*], <https://mainebeacon.com/wp-content/uploads/2021/01/Report-to-the-Joint-Standing-Committee-on-the-Environment-and-Natural-Resources.pdf>.

²⁹ *Id.* at 31.

³⁰ *Ibid.*

geodesic domes over its external floating roof tanks in 2010.³¹ Thus, the Air District cannot stop at mandating floating roofs on all storage tanks. The Air District must also require operators to install geodesic domes over the floating roofs to reduce remaining VOC emissions.

ii. Suspended floating roofs

Operators can further reduce emissions from floating roofs by eliminating supporting deck legs and instead suspending floating roofs with cables. Cable-suspended floating roofs have full contact with the stored materials and eliminate emissions from the openings in the floating roofs for deck legs.³² The Massachusetts Department of Environmental Protection identifies cable-suspended floating roofs as BACT for bulk gasoline storage tanks.³³

iii. Secondary seals

The Air District must require secondary seals on all floating roof tanks. Secondary seals provide additional control of fugitive VOC emissions compared to primary seals alone.³⁴ Rule 1178 only requires operators to install secondary seals on external floating roof tanks and domed external floating roof tanks installed after January 1, 2002.³⁵ Rule 1178 does not require secondary seals on internal floating roof tanks or older domed external floating roof tanks.³⁶ Secondary seals are widely available and important to protect against primary seal failures.³⁷ Thus, the Air District must require operators to install secondary seals on all floating roof tanks.

iv. Vapor Recovery Units

Rule 1178 requires operators to install vapor recovery units with an overall control efficiency of at least 95 percent on fixed roof tanks.³⁸ However, vapor recovery units can achieve greater control efficiency. For example, BAAQMD's Best Available Control Technology Guidelines

³¹ ExxonMobil, *Torrance Refinery: An Overview of Our Environmental and Social Programs*, at 1, 10 (2010) (Exhibit B).

³² Jeff Eickhoff, HMT Inc., PowerPoint Presentation at 6th Annual Aboveground Storage Tank Conference & Trade Show: *Reducing Storage Tank Emissions without Compromising Operational Performance*, at 23 (Sept. 9, 2013), <https://www.nistm.org/PDF/Morning/Eickhoff.pdf>.

³³ Mass. Dep't of Env't Protection, *Top Case Best Available Control Technology Guidelines for VOC Emitting Sources*, at 47 (June 2011), <https://www.mass.gov/doc/top-case-bact-guidelines/download>.

³⁴ *Maine DEP*, *supra* note 28, at 36.

³⁵ S. Coast Air Quality Mgmt. Dist., Rule 1178(d)(1)(B)(ii), (d)(2)(E).

³⁶ S. Coast Air Quality Mgmt. Dist., Rule 1178(d)(3)(d), (j)(2).

³⁷ *Maine DEP*, *supra* note 28, at 50.

³⁸ S. Coast Air Quality Mgmt. Dist., Rule 1178(d)(4)(A)(i).

provide for a vapor recovery system with at least 98 percent control efficiency.³⁹ The Air District must require an equally stringent control efficiency for vapor recovery units. Operators can connect several storage tanks to a single vapor recovery unit, thus providing for cost savings as operators reduce fugitive emissions.⁴⁰

The Air District must also require operators to install vapor recovery units on floating roof tanks. Such units are necessary to control vapors when the roofs are not floating.⁴¹ During such times, including when operators empty and clean floating roof tanks, stored materials evaporate from the surfaces of tank walls and supporting columns.⁴² Vapor recovery units are critical to manage these evaporative losses.

B. Monitoring Technology

In addition to leak prevention, the Air District must mandate the use of updated monitoring technology. In particular, the Air District must require the use of optical gas imaging (“OGI”), solar occultation flux (“SOF”), and forward-looking infrared (“FLIR”) technologies, in combination with other leak detection instruments.⁴³

OGI technology provides a wide-field, rapid scan of an area and quickly identifies major leaks.⁴⁴ In comparison, the Toxic Vapor Analyzer currently used to detect gaseous substances can only detect leaks when placed directly on the equipment component or in the suspected stream of emissions, inspecting one point at a time.⁴⁵ Implementing OGI technology would enable operators to rapidly identify and control significant VOC emissions by screening for large releases.

³⁹ Bay Area Air Quality Mgmt. Dist., *BACT/TBACT Workbook*, <https://www.baaqmd.gov/~media/files/engineering/bact-tbact-workshop/organic-liquid-storage-tanks/167-3-1.pdf?la=en> (last visited Nov. 30, 2021).

⁴⁰ EPA, *Installing Vapor Recovery Units on Storage Tanks*, at 1 (Oct. 2006), https://www.epa.gov/sites/default/files/2016-06/documents/ll_final_vap.pdf.

⁴¹ Mass. Dep’t of Env’t Protection, *Top Case Best Available Control Technology Guidelines*, *supra* note 33, at 47 (June 2011).

⁴² EPA, *AP 42 Chapter 7: Liquid Storage Tanks*, *supra* note 22, at 7.1-9 (Sept. 2006).

⁴³ Fenceline monitoring installed in accordance with Rule 1180 is insufficient to detect and address excess emissions from storage tanks for several reasons. First, fenceline monitoring does not completely enclose all storage tanks at petroleum refineries. The resulting monitoring gaps impede the detection of excess emissions. Second, Rule 1180 does not require a root cause analysis even if fenceline monitors detect excess emissions. Operators do not need to identify the source of excess emissions and address potential leaks from storage tanks under Rule 1180.

⁴⁴ Hazem Abdel-Moati, et al., *New Optical Gas Imaging Technology for Quantifying Fugitive Emission Rates*, International Petroleum Technology Conference (Dec. 6, 2015), <https://doi.org/10.2523/IPTC-18471-MS>.

⁴⁵ *Maine DEP*, *supra* note 28, at 88.

OGI technology can be coupled with SOF and FLIR technologies. SOF is considered best available technology for measuring fugitive VOC emissions from petroleum refineries in Europe.⁴⁶ In Sweden, SOF and OGI technologies are used annually to screen emissions from petroleum refineries and petrochemical industries.⁴⁷ FLIR technology can detect and visualize methane, sulfur hexafluoride, and other industrial gases.⁴⁸ In the FluxSense study, researchers used SOF and FLIR technologies to identify emissions from storage tanks.⁴⁹ Operators must adopt and use such technologies to enhance their leak detection and repair programs.

Further, operators must use VOC monitoring instruments to inspect all storage tanks, regardless of roof type. Currently, Rule 1178 does not require operators to inspect internal floating roof tanks and domed external floating roof tanks for leaks with VOC monitoring instruments. Rule 1178 only requires operators to “visually inspect the rim seal system and roof openings” and “perform complete gap measurements.”⁵⁰ But internal floating roof tanks and domed external floating roof tanks are not immune to leaks. Visual inspections and gap measurements alone are insufficient to detect and prevent fugitive emissions. Operators must also use VOC monitoring instruments, including OGI, SOF, and FLIR technologies, to ensure that internal floating roof tanks and domed external floating roof tanks are not leaking.

C. Frequency of Inspections

The Air District must increase the frequency of inspections under Rule 1178. Rule 1178 only requires inspections quarterly for fixed roof tanks⁵¹; inspections semiannually and each time a tank is emptied and degassed for external floating roof tanks⁵²; and inspections semiannually and each time a tank is emptied and degassed “but no less than once every ten years” for internal floating roof tanks and domed external floating roof tanks.⁵³ These extended periods between inspections heighten the potential for prolonged leaks. Leaks do not resolve themselves and may grow larger due to corrosion from adverse weather conditions (UV rays and rain) and the working environment (chemicals).⁵⁴ Thus, it is vital that operators inspect storage tanks for leaks with greater frequency. At a minimum, monthly inspection of all storage tanks is necessary.

⁴⁶ *Fluxsense, supra* note 9, at 2.

⁴⁷ *Ibid.*

⁴⁸ *Ibid.*

⁴⁹ *Fluxsense, supra* note 9, at 5, 85.

⁵⁰ S. Coast Air Quality Mgmt. Dist., Rule 1178(f)(2).

⁵¹ S. Coast Air Quality Mgmt. Dist., Rule 1178(f)(3)(B).

⁵² S. Coast Air Quality Mgmt. Dist., Rule 1178(f)(1)(A), (f)(1)(B).

⁵³ S. Coast Air Quality Mgmt. Dist., Rule 1178(f)(2)(B), (f)(2)(C).

⁵⁴ Belzona, *Solutions for Storage Tanks*, https://www.belzona.com/en/focus/storage_tanks.aspx (last visited Nov. 30, 2021).

D. Reinspections and Third-Party Audits

In addition to conducting inspections with greater frequency, operators must separately reinspect storage tanks after conducting any leak repairs. Reinspections are separate from post-leak measurements and ensure that repairs provide a long-term solution to excess emissions.

Further, third-party audits must confirm that operators are conducting inspections and repairs correctly. Currently, Rule 1178 relies on self-inspection and self-reporting with minimal oversight of either process.⁵⁵ Such an approach limits the transparency and effectiveness of Rule 1178. Thus, the Air District must require third-party audits at least every two years to ensure that operators are properly following the requirements of Rule 1178.

E. Gap Requirements and Leak Thresholds

The Air District must adopt stricter gap requirements to prevent excess emissions. The San Joaquin Valley Unified Air Pollution Control District (“Valley Air”) and BAAQMD have stricter gap requirements for primary seals than the Air District.⁵⁶ Primary seals are an important emissions control for floating roof tanks as primary seals close the space between the edge of the floating roof and the storage tank wall.⁵⁷ The Air District’s less stringent gap requirements allow for larger amounts of VOC-laden vapors to escape from storage tanks and into fenceline communities.

The Air District must also lower the threshold for detecting leaks. The Air District’s leak threshold under Rule 1178 is 500 parts per million (“ppm”).⁵⁸ In contrast, BAAQMD’s leak threshold under Regulation 8, Rule 5 is 100 ppm.⁵⁹ Even though the South Coast Air Basin is the most ozone-polluted region in the country⁶⁰, the Air District’s leak threshold is five times greater than BAAQMD’s leak threshold.⁶¹ The Air District’s leak threshold is unacceptable and must be lowered to require the identification and repair of leaks that are currently acceptable under Rule 1178. At a minimum, the Air District must adopt a leak threshold of 100 ppm and require operators to conduct an initial assessment of all storage tanks using this lower threshold.

⁵⁵ S. Coast Air Quality Mgmt. Dist., Rule 1178(f)(1), (f)(2), (f)(3)(B).

⁵⁶ *Rule 1178 Working Group Meeting 2 Presentation*, *supra* note 17, at 32, 37.

⁵⁷ *Maine DEP*, *supra* note 28, at 34.

⁵⁸ S. Coast Air Quality Mgmt. Dist., Rule 1178(c)(43).

⁵⁹ Bay Area Air Quality Mgmt. Dist., Regulation 8, Rule 5, Section 206.

⁶⁰ American Lung Ass’n, *Ozone Trends*, <https://www.lung.org/research/sota/key-findings/ozone-pollution> (last visited Nov. 30, 2021).

⁶¹ *Rule 1178 Working Group Meeting 2 Presentation*, *supra* note 17, at 38.

F. Portable Storage Tanks

Rule 1178 exempts portable storage tank operators from conducting performance tests to ensure that emissions controls are properly functioning. Specifically, Rule 1178 does not require operators to conduct performance tests when operators install or modify emissions controls, or change operating parameters in a way that affects control efficiency.⁶² Rule 1178 only requires operators to take weekly EPA Reference Test Method 21 measurements to determine whether emissions are below the leak threshold.⁶³

Rule 1178's exemption for portable storage tanks is unwarranted. Both weekly Method 21 measurements and performance tests are necessary to ensure that portable storage tanks are not releasing excess emissions. By only requiring weekly Method 21 measurements, the Air District fails to ensure that operators promptly address leaks that may arise from faulty emissions controls or operating parameters.

Fugitive emissions from leaking storage tanks release hazardous VOCs into fenceline communities and contribute to the South Coast Air Basin's extreme non-attainment of both state and federal ozone standards. The dire air quality in the South Coast Air Basin demands that the Air District take bold measures to effectively reduce fugitive emissions. Neither Valley Air nor BAAQMD is confronting the degree of ozone pollution that the Air District is responsible for addressing. Thus, Valley Air and BAAQMD's rules may be appropriate models for the Air District to evaluate, but the Air District must strive for more stringent requirements that result in greater emissions reductions.

The Air District has a responsibility and an opportunity to reduce leaks from storage tanks by mandating best available emissions control technology. Such controls, coupled with modern monitoring technology, greater inspection frequency, reinspections and third-party audits; more stringent gap requirements and lower leak thresholds; and performance tests for portable storage tanks, are necessary for the Air District to effectively control leaking storage tanks and take an important step towards cleaning our dirty air.

⁶² S. Coast Air Quality Mgmt. Dist., Rule 1178(j)(4).

⁶³ S. Coast Air Quality Mgmt. Dist., Rule 1178(j)(4).

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We look forward to working with the Air District to significantly strengthen Rule 1178.

Sincerely,

Byron Chan, Senior Associate Attorney
Oscar Espino-Padron, Senior Attorney
Community Partnerships Program
EARTHJUSTICE

Whitney Amaya, Incinerator Organizer
Taylor Thomas, Co-Executive Director
Jan Victor Andasan, Community Organizer
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cc: Melissa Gamoning, Air Quality Specialist (mgamoning@aqmd.gov)
Rodolfo Chacon, Program Supervisor (rchacon@aqmd.gov)

EXHIBIT A

*Spreadsheet Summary of Facilities with Storage Tanks
Permitted by SCAQMD from 2010 – 2020*

FACILITIES WITH STORAGE TANKS PERMITTED BY SCAQMD FROM 2010 -2020

Facility ID	Facility Name	Address	City	Zip Code	No. of Tanks	Notes		City	No. of Tanks
182752	Torrance Logistics Company LLC	2619 E. 37th St.	Vernon	90058	14				
171326	Phillips 66 Pipeline LLC	13500 S. Broadway	Los Angeles	90061	14			City	No. of Tanks
800030	Chevron Products Co.	324 W. El Segundo Blvd.	El Segundo	90245	27	Includes 2 in process.		Carson	282
174710	Tesoro Logistics Vinvale Terminal	8601 S. Garfield Ave.	South Gate	90280	11			Torrance	229
174727	Tesoro Refining Marketing Company LLC	8601 S. Garfield Ave.	South Gate	90280	2	Includes 1 in process.		Wilmington	173
800080	Lunday-Thagard Co. DBA World Oil Refining	9301 Garfield Ave.	South Gate	90280	44			Long Beach	93
181667	Torrance Refining Company LLC	3700 W. 190th St.	Torrance	90504	207	Includes 4 in process.		South Gate	57
171327	Phillips 66 Pipeline LLC	2650 Lomita Blvd.	Torrance	90505	22			El Segundo	27
158910	Rancho LPG Holdings	2110 N. Gaffey St.	San Pedro	90731	9			Terminal Island	22
182753	Torrance Logistics Company LLC	799 S. Seaside Ave.	Terminal Island	90731	22			Bloomington	17
167981	Tesoro Logistics, Wilmington Terminal	1930 E. Pacific Coast Hwy	Wilmington	90744	5			Los Angeles	14
171107	Phillips 66 Co./LA Refinery Wilmington	1660 W. Anaheim St.	Wilmington	90744	126	Includes 4 in process.		Vernon	14
800026	Ultramar Inc.	2402 E. Anaheim St.	Wilmington	90744	13			San Pedro	9
800198	Ultramar Inc.	961 La Paloma Ave.	Wilmington	90744	8			Rialto	3
800436	Tesoro Refining & Marketing Co., LLC	2101 E. Pacific Coast Hwy	Wilmington	90744	18	Includes 1 in process.			
117560	Equilon, LLC-Shell Oil	Berth 167-169	Wilmington	90744	3				
171109	Phillips 66 Co./Los Angeles Refinery	1520 E. Sepulveda Blvd.	Carson	90745	54				
174694	Tesoro Logistics Carson Crude Terminal	24696 S. Wilmington Ave.	Carson	90745	12	Includes 6 in process.			
111238	Ribost Terminal LLC	1405 Pier C St.	Long Beach	90802	9	Includes 2 in process.			
174704	Tesoro Logistics East Hynes Terminal	5905 Paramount Blvd.	Long Beach	90805	28				
174655	Tesoro Refining & Marketing Co., LLC	2350 E. 223rd St.	Carson	90810	164	Includes 1 in process.			
800057	Kinder Morgan Liquids Terminals LLC	2000 E. Sepulveda Blvd.	Carson	90810	52	Includes 1 in process.			
172878	Tesoro Logistics Long Beach Terminal	820 Carrack Ave.	Long Beach	90813	6				
174591	Tesoro Ref. & Mktg. Co. LLC, Calciner	2450 Pier B St.	Long Beach	90813	7				
176377	Tesoro Logistics Marine Terminal 2	1350 Pier B St.	Long Beach	90813	29				
171320	Phillips 66 Colton Terminal - West	2301 S. Riverside Ave.	Bloomington	92316	5				
174705	Tesoro Logistics, Colton Terminal	2395 Riverside Ave.	Bloomington	92316	12	Includes 2 in process.			
171329	Phillips 66 Colton Terminal - East	231 E. Slover	Rialto	92376	3				
178769	Chemoil Terminals	1004 Pier F Ave.	Long Beach	90802	14				
				Total:	940				
		In Carson, Wilmington, Long Beach:			579				

EXHIBIT B

*2010 Report by ExxonMobil on Torrance Refinery's
Environmental and Social Programs*

2010



Protect Tomorrow.
Today.

Torrance Refinery

An Overview of our Environmental and Social Programs



ExxonMobil

Taking on the world's toughest energy challenges.™

A Note from Max	1
Growing up with Torrance	2
Protect Tomorrow. Today.	3
Our Location	4
Our Industry	6
ExxonMobil Torrance Refinery	8
Environmental Management	9
Programs & Performance	10
Reducing Air Emissions	10
Examining Our Equipment	10
TRI Program / Electrostatic Precipitator	11
What Are Those Clouds?	12
Flare Reduction	12
Spill Prevention	13
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Max Ocansey, Refinery Manager

A Note from Max

Some key improvements we have made:

- By adding new technologies to our refinery operations, we have further cut emissions of sulfur dioxides by 78 percent and nitrogen oxides by 74 percent from 1995 levels.
- By covering our floating roof tanks with geodesic domes, we have additionally reduced emissions of volatile organic compounds by 80 percent.
- From 2007 to 2009, the Torrance Refinery reduced its ammonia emissions by 84 percent, largely as a result of the installation of a new Electrostatic Precipitator, one of the largest single environmental upgrades in the 80-year history of the refinery.
- By implementing a stringent pipe inspection program, we have continued to reduce the total number of spills and releases.
- Our energy improvements from 2008 to 2009 resulted in reduced carbon dioxide emissions equivalent to removing approximately 50,000 cars off the road.

Dear Neighbor,

Torrance is a truly unique city, with an ideal balance of residences and businesses. The people, amenities and of course, the weather, make this city a wonderful place to live, work and visit.

As the manager of the ExxonMobil Torrance Refinery, I've truly enjoyed being a part of this community. In my time here, I've had the pleasure of meeting many of our neighbors, several of whom have become my good friends. I feel a deep sense of ownership and pride about this thriving and active city and as Refinery Manager, a strong responsibility to operating our plant in a way that protects the environment and plays a constructive role in this city's economic and social development.

As many of you know, the Torrance Refinery has been a part of this community for more than 80 years. We're one of the few ExxonMobil refineries in the world to operate in the middle of such a densely populated community. We believe our primary role – and most important benefit to our community – is to safely provide reliable and affordable supplies of energy to Southern California and do so in an economically, environmentally and socially responsible manner.

In the past 10 years, the Torrance Refinery has made enormous strides in our environmental performance. We've invested in new, cleaner-operating equipment and improved our energy efficiency. We've introduced new technologies to further reduce emissions of sulfur oxides and nitrogen oxides. We've significantly reduced spills and flaring and installed two electrostatic precipitators – each the size of a 12-story building – to help further lower particulate matter emissions.

At ExxonMobil, we believe making the most of energy resources is about more than just oil and gas production — it is also about forming relationships that deliver sustainable, long-term benefits to our neighbors. This is why we partner with people, our schools and our government to support their efforts to build a stronger community. In this report, you will read about how our Pegasus Awards program provides funding to Torrance teachers for innovative classroom projects. Our company supports the professional development of teachers, and many of our programs encourage Torrance students to take an active interest in the math and science fields. We also encourage all of our employees and managers to contribute to and participate in local organizations and activities.

I want to thank you for taking the time to learn more about the Torrance Refinery's dedication to environmental stewardship and this community. As your neighbor, we believe in maintaining regular and open communication and swiftly addressing your concerns. If you have any questions about this report or about our operations in general, please contact us at any time through our 24-Hour Neighborhood Hotline at (310) 505-3158. During regular business hours, you can also reach our Public and Government Affairs team at (310) 212-1852.

Thank you,

Max Ocansey, Refinery Manager
ExxonMobil Torrance Refinery

The Torrance Refinery in 1934, surrounded by little more than fields.



Growing up with Torrance

The year was 1929. The City of Torrance had only been incorporated for nine years when an oil refinery sprouted from acres of fields. Tracing its beginnings from a Scottish sea captain named John Barneson, the facility was built in response to the mariner's vision of fueling ships in the Los Angeles harbor with recently discovered crude oil from California's San Joaquin Valley. Pipelines soon followed, and during the Great

Depression, the refinery, then known as the General Petroleum Corporation, helped lend a much-needed boost to the local economy.

When placed in operation in 1929, the early Torrance Refinery had the capacity to process about 30,000 barrels of crude oil a day. Today, the refinery can process a daily yield of up to 150,000 barrels of crude oil. More than 70 percent of each barrel is refined into high quality, specially formulated low emissions gasoline — considered to be the cleanest burning gasoline in the world. Our refinery helps keep California

and the West “on the move” by producing approximately 10 percent of the gasoline that is refined in California, fueling three to four million vehicles in the state each year.

As we've grown, so too has the Torrance community around us. While we may have started off surrounded by fields, we are well aware that today, the ExxonMobil Torrance Refinery is situated in the midst of a bustling and vibrant city. We consider ourselves an integral part of Torrance and work hard every day to ensure our operations have minimal impact on our neighbors and the surrounding community.



More than 70 percent of each barrel is refined into high quality, specially formulated low emissions gasoline – considered to be the cleanest burning gasoline in the world.

Torrance Refinery volunteers at Madrona Marsh.

“I’m fortunate to work for a company and with people who are enthusiastic about reducing the environmental impact of our operations. We have a lot of experience and expertise in our team, including environmental scientists, chemical, mechanical, civil and environmental engineers. Our team plays an important role to ensure we comply with regulations and focus on continuous improvement. We’re passionate about what we do because we affect the daily operations of the plant, and our commitment and guidance help to minimize the environmental impact of our business.”

- Jon Child, Safety, Health and Environment Manager



Protect Tomorrow. Today.

ExxonMobil is committed to conducting business in a manner that protects the environment. From our operators and engineers to our management, every employee at the ExxonMobil Torrance Refinery is committed to steadily improving our environmental performance with the goal of driving incidents with real environmental impact to zero.

We’ve accomplished this by reinforcing expectations to all employees for superior environmental performance through our initiative, **Protect Tomorrow. Today.** which guides our environmental management processes. It also enables us to identify environmental improvement opportunities early in project planning when they can be implemented most effectively. Our policy emphasizes individual responsibility and fosters appropriate operating practices and training. It requires our facility to be designed, operated and managed with the goal of preventing incidents and controlling emissions and waste.

Pursuing these policies year after year has helped us deliver considerable improvements in Torrance Refinery’s environmental performance. In the last 10 years, we have seen significant emissions reductions and a decrease in the number of spills from our operations. We continue to improve our energy efficiency and have worked to reduce flaring of gas. We have achieved these improvements while making marked strides in our employee and contractor safety record and continuing to reliably supply the energy that Southern Californians need.



**Protect Tomorrow.
Today.**



Our Location

To help understand our environmental record, we believe it is important to examine it in the context of the region in which we operate. The City of Torrance is an important part of the South Bay community and the greater Los Angeles area. The South Bay region has long been an eclectic mix of residential, commercial and industrial properties. With six major refineries, the local petroleum refining industry is considered a vital component of the South Bay's economy and has historically played an important role in the development of the region.

As one of the most culturally, economically and ethnically diverse areas in the United States, the South Bay's proximity to Los Angeles has also ensured its place as one of the most populous regions in Southern California. Historically, as the area's population and motor vehicle fleet grew rapidly, so did air emissions. According to the website for the South Coast Air Quality Management District, the air pollution control agency for the South Coast, the air quality problem was first recognized in 1943 when a Smoke and Fumes Commission was appointed to study the "smog problem." In 1946, when the Los Angeles Times hired an air pollution expert to examine the problem, he commented: "*Caution should be exercised in placing the entire blame on any one industry, plant or group of individuals. Each contributes its share.*"

The expert's recommendations led to the birth of the first unified air pollution agency in the nation — the Los Angeles County Air Pollution Control District. Over the years, similar agencies sprung up in Orange County, Riverside and San Bernardino. In 1977, all four county agencies were integrated to form what we know today as the South Coast Air Quality Management District (South Coast AQMD).

With six major refineries, the local petroleum refining industry is considered a vital component of the South Bay's economy.





Despite the enactment of several air quality regulations, peak ozone levels remained high. According to the South Coast AQMD, regulators soon determined the primary source of pollution was the increasing number of motor vehicles, “fueled by a lack of public transit, long distances between communities, a widespread freeway network and a relatively prosperous economy.”

Over the next few decades, regulators and industries worked toward combating this source, resulting in improved emissions control technology, rigorous monitoring, cleaner-burning gasoline and tighter air quality standards. As a result, even as population levels increased considerably, the region made considerable progress toward improving air quality. Of particular

significance was the introduction of cleaner-burning gasoline by California refineries in 1996, in accordance with state regulations. Consistent with analyses by the California Air Resources Board (CARB), this helped further decrease motor vehicle emissions.

“Air quality in this area has continually improved despite an enormous increase in population and cars. For example, maximum levels of ozone, one of our worst smog problems, have been cut to less than one quarter of what they were in the 1950s, even though today we have nearly three times as many people and four times as many vehicles. In the past decade, we have eliminated Stage I smog alerts, which used to occur 100-120 times a year. We have not reached Stage II levels since the 1980s.”

- South Coast Air Quality Management District

The U.S. oil and natural gas industry has invested \$175 billion since 1990 toward improving the environmental performance of its products, facilities and operations.

Our Industry

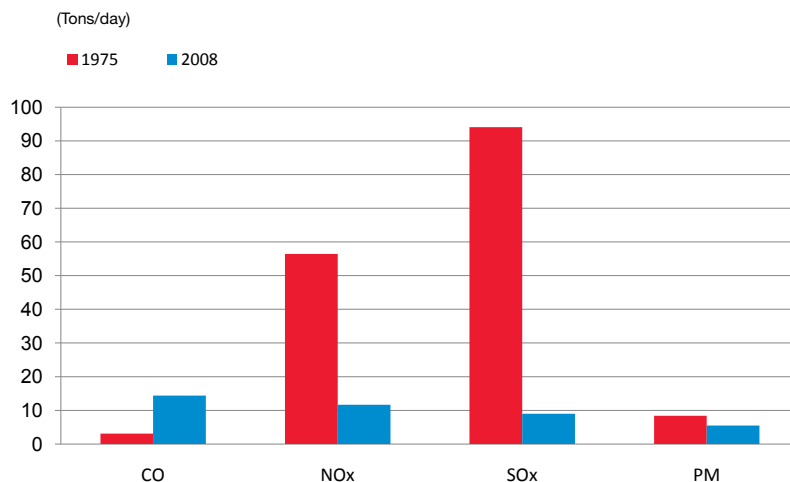
The petroleum industry has contributed to the agencies' efforts by making significant strides in combating pollution. According to the Western States Petroleum Association, "California refiners are required to produce some of the cleanest-burning fuels made anywhere on the planet." Common pollutants such as nitrogen oxide (NOx), sulfur dioxide (SO₂) and particulate matter (PM) emitted by petroleum refining in the South Coast Air Basin of Los Angeles County were at considerably reduced levels in 2008 when compared to 1975. While carbon monoxide (CO) emissions saw an increase during the same period, they still remain below mandated limits.

The reductions to some of the key pollutants have come about as a result of the addition of new pollution control equipment, improvements in processing techniques and the application of new technologies. According to the American Petroleum Institute, "The U.S. oil and natural gas industry has invested \$175 billion since 1990 toward improving the environmental performance of its products, facilities and operations. Refineries across the nation implemented new processes designed to dramatically reduce the presence of sulfur in gasoline and diesel – years ahead of the federal requirement."

What are Criteria Pollutants?

The Clean Air Act authorized the Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for six common pollutants, which include carbon monoxide (CO), nitrogen dioxide (NO_x), particulate matter (PM), and sulfur dioxide (SO₂). According to EPA, if released in high amounts, these substances, known as "criteria pollutants," can injure health, harm the environment, and cause property damage. Each year air quality agencies look at the levels of these pollutants in the air and the amounts of emissions from various sources to see how both have changed over time and to summarize the current status of air quality.

South Coast Air Basin (LA County) Petroleum Refining Emissions



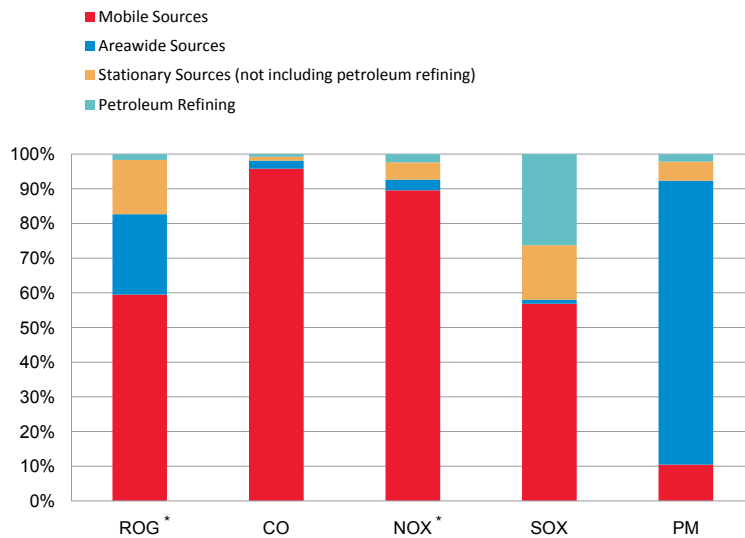
Comparison between levels of pollutants emitted by petroleum refining in 1975 to levels measured in 2008

Source: California Air Resources Board



According to South Coast AQMD, more than 75 percent of Southern California’s ozone-forming air pollution comes from “mobile sources – mainly cars, trucks and buses, but also construction equipment, ships, trains and airplanes.” For instance, in the Los Angeles basin, except for sulfur oxide (SOx) emissions, processes like petroleum refining account for less than 7 percent of the region’s total air emissions. SOx emissions in petroleum refining are a result of manufacturing processes that minimize sulfur from appearing in transportation fuels. These processes reduce the sulfur content in gasoline, so consumers are able to drive their cars with cleaner-burning fuel. SOx emissions are strictly regulated by South Coast AQMD, and a new measure passed in 2010 aims to cut SOx emissions from refineries and other industrial facilities by half in the years ahead.

South Coast Air Basin (LA County) 2008 Emissions by Source



Comparison of different sources of pollution in the LA County region
Source: California Air Resources Board (CARB)

*NOTE: According to CARB, ozone is formed when reactive organic gases (ROG) and nitrogen oxides (NOx) react in the presence of sunlight

Sources of Pollution

Mobile: Mobile sources include on-road and off-road sources, such as light duty passenger vehicles, truck and off-road equipment. Emission standards for mobile sources are established by the California Air Resources Board (CARB) and EPA.

Stationary: Stationary sources are large, fixed sources of air pollution and include power plants, refineries and factories. The South Coast AQMD is responsible for controlling emissions primarily from stationary sources of air pollution.

Areawide: Areawide source emission categories include both stationary and off-road mobile sources. These can range from gas stations and dry cleaners to naturally occurring emissions such as wildfires.

Source: CARB and South Coast AQMD



ExxonMobil

Torrance Refinery

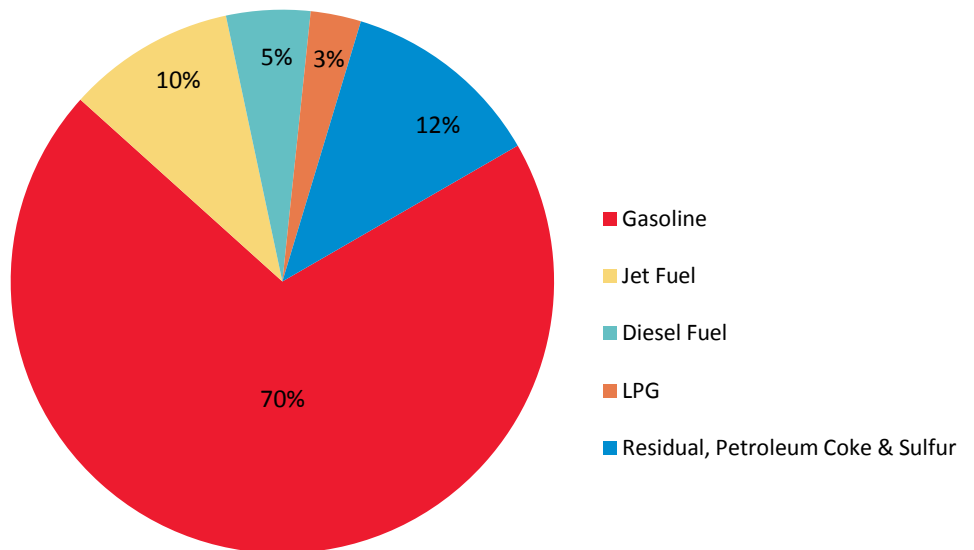
The Torrance Refinery's primary role – and most important benefit to its community – is to safely provide reliable and affordable supplies of energy to Southern California in an economically, environmentally and socially responsible manner. We are a key player within South Bay's petroleum refining industry. Our refinery, which covers 750 acres, produces approximately 10 percent of the gasoline that is refined in California, most of which is sold in Southern California.

The refinery's crude oil supply comes primarily from the San Joaquin Valley. ExxonMobil's M-70 pipeline, one of the country's most advanced, carries some

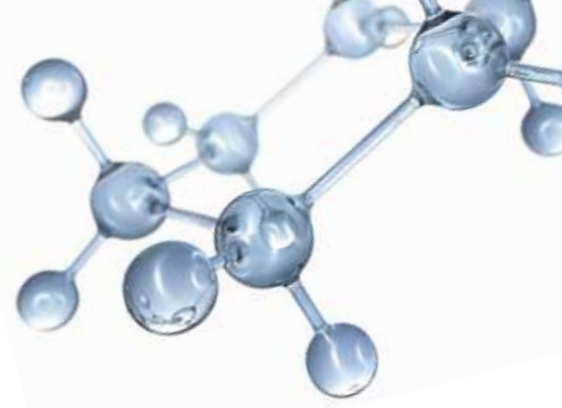
of the heaviest crude oil in the world from Central California to the refinery. More than 70 percent of each barrel is refined into high-quality, specially formulated low emissions gasoline and sold in Southern California, Arizona and Nevada. Other products of the Torrance Refinery include aviation fuel, diesel fuel, liquefied petroleum gases (LPG), petroleum coke (a solid, coal-like material sold as industrial fuel) and sulfur.

The refinery's environmental performance is regulated by several governmental agencies, which include the South Coast AQMD at the local level, CARB at the state level and EPA at the federal level. At ExxonMobil, we go to great lengths to stay in compliance with strict regulatory guidelines and to continually improve our environmental performance.

Our refinery produces approximately 10 percent of the gasoline that is refined in California, most of which is sold in Southern California.



Torrance Refinery Product Distribution



Environmental

Management

To achieve our environmental goals at the Torrance Refinery, we rely primarily on our Safety, Health and Environment (SHE) department. This department is responsible for protecting the safety, health and environment of the refinery's workforce as well as that of our surrounding community. Of the 50 employees and contractors who work for SHE, more than half of them work exclusively to ensure the refinery adheres to hundreds of federal, state and local environmental requirements.

Every year, we continue to drive improvements in our environmental performance by incorporating annual Environmental Business Planning (EBP) into our overall business plans and strategies. We use EBP to identify key environmental drivers, set targets in important focus areas, and identify projects and actions to achieve those targets. The EBP approach has been an effective tool to integrate environmental improvements into the refinery's overall business plan.

Furthermore, for new projects and developments, we conduct environmental and social impact assessments to review factors such as community concerns, sensitive environmental habitats and future regulatory requirements. We subsequently integrate the assessment results into project decision-making. For example, before we began construction activities to install a new Electrostatic Precipitator (ESP) at the refinery (see page 11), we met with city officials, held a public meeting to assess community concerns, and engaged an external contractor to assist with monitoring and mitigating noise.



Our Safety, Health and Environment (SHE) department is responsible for protecting the safety, health and environment of the refinery's workforce as well as that of our surrounding community.

“We focus on reducing emissions from all areas of the refinery. We conduct routine inspections of the largest emission stack to the smallest component to ensure that we comply with state and federal air quality regulations and to protect our community.”

- Meena Nainan, Environmental Group Leader (Air)



Programs &

Performance

Reducing Air Emissions

ExxonMobil Torrance Refinery is working to further reduce the emissions of sulfur oxides (SOx) and nitrogen oxides (NOx) from our operations. We have implemented new technologies and adopted operating practices to reduce air emissions in compliance with regulatory requirements, which are in response to community priorities. For instance, in 2000, we proactively added a Selective Catalytic Reduction System (SCR) to the refinery's Fluid Catalytic Cracker (FCC), the first application of its kind in the United States, in order to control NOx emissions. As a result of these efforts, our emissions of SOx and NOx decreased by 78 percent and 74 percent respectively from 1995 levels.

In compliance with South Coast AQMD Rule 1178, the refinery completed the process of covering all floating roof tanks with geodesic domes to reduce volatile organic compounds (VOCs) emissions from facility storage tanks in 2008. By installing domes on our storage tanks, we've reduced our VOC emissions from these tanks by 80 percent. These domes, installed on tanks that are used to store gasoline and other similar petroleum-derived materials, help reduce VOC emissions by blocking much of the wind that constantly flows across the tank roofs, thus decreasing evaporation from these tanks.

Examining Our Equipment

With our Leak Detection and Repair program, we routinely perform inspections and use equipment to “sniff” each of more than 200,000 components in the refinery to check for leaks or fugitive emissions. Fugitive emissions are unintended emissions that can be the result of equipment leaks, evaporative processes or windblown disturbances. One part of this program uses innovative optical imaging technology to efficiently inspect valves, connectors, pumps and other components for leaks. This infrared video camera system also helps us detect emissions from storage tanks, heating and cooling equipment, and other sources, enabling rapid repair.

Understanding Pollutants

It is important to note that at the concentrations of these pollutants typically associated with the communities near our facilities, we do not expect to see adverse health effects.

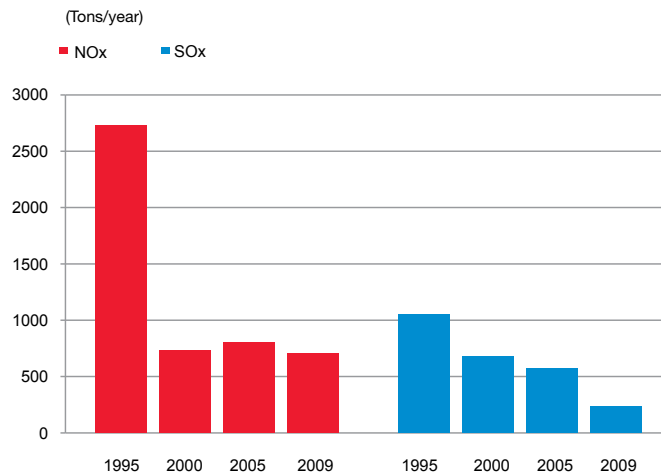
NOx - Nitrogen dioxide is a reddish-brown gas. It plays a major role in the formation of ozone, particulate matter, haze and acid rain. It is categorized as a criteria pollutant.

SO₂ - Sulfur dioxide is a colorless gas with a pungent odor. It is classified as a criteria pollutant. Sulfur dioxide emissions most frequently result from activities associated with the burning of coal and oil – namely by power plants and refineries.

VOCs - Volatile organic compounds (VOCs) comprise a wide range of individual organic chemicals, including most hydrocarbons (e.g., propane, butane, ethylene). They are emitted by refinery and chemical plant operations and are also found in many common household products.

Emissions of NOx, SO₂ and VOCs from our facility comply with emission limits and other requirements established by EPA and South Coast AQMD. These agencies establish our permit limits and other emission requirements based on what is needed to achieve cleaner air.

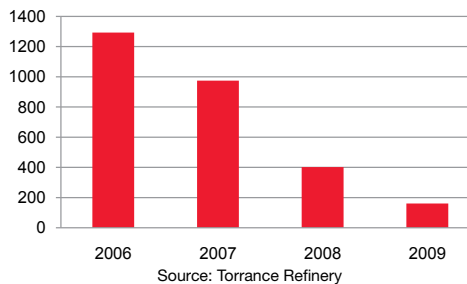
Torrance Refinery SOx and NOx Reductions



Source: California Air Resources Board and South Coast AQMD
Note: Data prior to 2000 was obtained from the California Air Resources Board

Torrance Refinery Ammonia Reductions*

(Thousands Pounds/year)



*Note: Ammonia emissions from combustion sources

TRI Program

As part of EPA's Toxics Release Inventory (TRI) program, the Torrance Refinery annually reports toxic chemical releases to the environment. TRI is a publicly available EPA database that contains information on toxic chemical releases and waste management activities reported annually by certain industries as well as federal facilities.

TRI includes numerous chemicals and chemical compounds. Chemical releases reported under EPA's TRI program are permitted releases, which by definition, have been determined to be at levels that do not pose an unacceptable risk to human health and the environment by regulatory agencies.

The largest share of total TRI releases from the ExxonMobil Torrance Refinery is due to one chemical: ammonia. Ammonia is a common chemical used in industry. It can either occur naturally or be manufactured for use in fertilizers, household cleaners and refrigeration systems. In the refinery, ammonia is used in pollution control equipment to accomplish two things:

- Control / decrease the formation of nitrogen oxides
- Control / decrease particulate matter levels

From 2007 to 2009, the Torrance Refinery's overall TRI reported releases decreased 67 percent, primarily the result of an 84 percent decrease in ammonia emissions. This considerable progress is the result of a sustained effort to reduce our ammonia emissions. For instance, the refinery recently installed a new Electrostatic Precipitator (ESP) at the Fluid Catalytic Cracking (FCC) Unit to reduce particulate matter and ammonia emissions from the FCC (see insert for more on the ESP project).

This ESP module, shown being moved to its installation site inside the Torrance Refinery, stands 12 stories tall and had a transport weight of 1,200 tons. The ESP was constructed to reduce particulate matter (PM₁₀) and ammonia (NH₃) emissions.



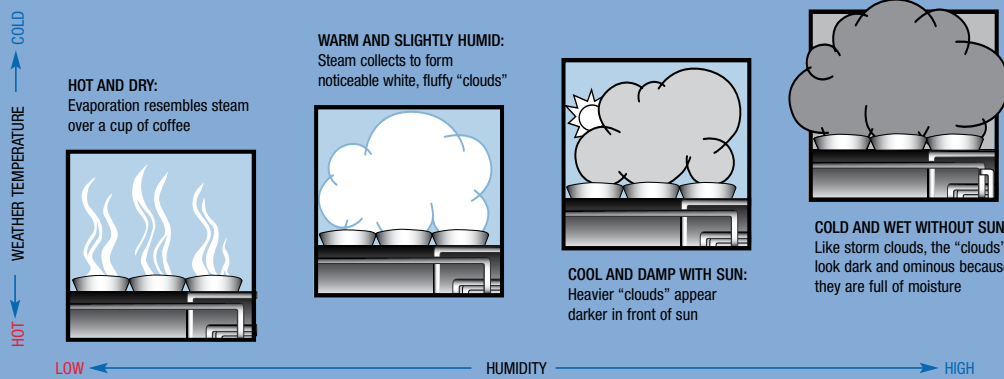
Torrance Refinery's Electrostatic Precipitator

One of the largest single environmental upgrades in the 80-year history of the Torrance Refinery was the installation of two electrostatic precipitators (ESPs) at the refinery's Fluid Catalytic Cracking (FCC) unit. This project, in compliance with the South Coast AQMD Rule 1105.1, helps reduce particulate matter (PM₁₀) and ammonia (NH₃) emissions. With this equipment, the refinery has achieved PM₁₀ reductions of approximately 200 pounds per day and NH₃ emission reductions of approximately 2,000 pounds per day. The captured particulate matter is hauled off-site to be used in the manufacture of cement.

About the size of a 12-story building, each ESP was assembled at a remote site within the refinery. The project elected to follow unconventional modular construction due to facility congestion around the FCC. Each module was prefabricated at a safer location inside the refinery, then lifted and transported to the FCC for installation. The module approach allowed the project to install piling, foundations and structural steel in parallel with ESP assembly, shortening the construction span significantly. The dimensions of the ESPs and various components are impressive; ESP-1 module weighs 1,200 tons while the ESP-2 weighs almost 1,600 tons. Fully erected, the completed units measure 125 feet tall, 174 feet long and 85 feet wide.

The flare system functions like a safety relief valve for the refinery.

Cooling Tower Condensation



This illustration depicts the look of the "clouds" based on the atmospheric conditions on a given day. Beyond the temperature and humidity of the surrounding air, the appearance of the "clouds" is also affected by the angle of the sun: if it is behind the "clouds" they appear darker. The wind also affects the appearance: on a windier day the steam mixes with the surrounding air more quickly.

What Are Those Clouds?

Contrary to popular belief, those clouds you see forming over the refinery are not smoke but actually steam clouds that form over the refinery's cooling towers. Water is used throughout the refinery to heat fluids during the refining process and to cool various production units while they perform refining functions. In some units, water temperature reaches more than 140 degrees Fahrenheit. In order to continually reuse and conserve the water, it is sent to the cooling towers located alongside Crenshaw Boulevard. Once in the cooling towers, hot water is cooled by an airstream that is blown at it as it enters the tower. The cooling process causes some of the water to evaporate, while the major portion is cooled and stored to be reused in the refinery. The evaporated water mixes with the airstream on its way out of the top of the towers forming the visible "cloud" over the cooling units. Depending on local air temperature and humidity, these clouds change color and density.

Flare Reduction

So why do we flare? The flare system functions like a safety relief valve for the refinery, which means it actually helps us avoid emergencies. During normal operations, materials are constantly flowing through our units. However, when the refinery experiences an interruption, such as an unplanned loss of power, the constant flow is disrupted. We are frequently able to restart the flow without flaring. This is the ideal practice because sending materials to the flare – materials that would otherwise be used to make products – costs money and results in some emissions. But sometimes there is just not a safe alternative to get the materials moving again. In this instance, we route the materials to the flare, combine them with steam, and burn them to minimize the environmental impact. Basically, the flare system allows us to avoid potentially dangerous pressure increases by providing an outlet for materials that have nowhere else to go.

Hydrocarbons are by far the most common substances sent to the flare and virtually all of them – typically between 95-99 percent – are burned in the flaring process. This means that 95-99 percent of hydrocarbons that would otherwise be directly emitted to the air are converted into carbon dioxide and water, which are naturally present in outdoor air. Flaring can result in emissions of carbon monoxide, nitrogen oxides, sulfur dioxide and particulate matter.

Across our operations, we are working to reduce flaring of gas through our continued implementation of *Flaring Best Practices*, improving operations reliability and thereby reducing the flaring associated with unexpected operating events and equipment maintenance. All emissions are reported to the EPA and local agencies such as South Coast AQMD or the Governor's Office of Emergency Services in a consistent and timely manner as required by law.

Across our operations, we are working to reduce flaring of gas through our continued implementation of Flaring Best Practices.

“At the refinery, we consider all opportunities to reduce, reuse and recycle. We have partnered with the West Basin Municipal Water District for many years to use recycled water for the majority of our process water. The wastewater generated from our processes is treated on-site to eliminate specific pollutants and ultimately sent to Los Angeles County Sanitation District (LACSD) for further processing. State and federal permits establish strict limits on the quality of our water, so we set very high standards in order to comply.”

- Penny Wirsing, Environmental Group Leader (Water)



Spill Prevention

ExxonMobil is committed to the prevention of spills from our operations. In 2004, the refinery enhanced onsite and offsite piping programs to help reduce the number of spills to the ground. These programs closely inspect the thousands of miles of piping lines that run above ground and underground to check for signs of corrosion or cracks. The programs also seek to excavate buried piping for long-term inspection, maintenance and replacement. Due to our efforts in this area, as well as increasing operational awareness, the Torrance Refinery

experienced a decrease in the total number of spills and releases over one barrel from 25 in 2004 to two in 2009. It is important to remember most of these spills were contained within our site and presented little or no risk to the community.

Waste Management

ExxonMobil uses a tiered approach to reduce both hazardous and nonhazardous waste. We first work to reduce waste at its source. When source reduction is not feasible or practical, we consider recycling of materials. Examples of wastes we recycle include spent catalysts, scrap metal, paper, cardboard, beverage containers and batteries. We also have systems in place that allow us to reuse waste materials such as sludge, sulfur and oily liquid recovered from our operations and put back into the refinery’s process streams. Wastes that cannot be recycled or reused are sent out for treatment to render it nonhazardous or disposed of in compliance with local regulations.

We continue to evaluate and assess the use of various technologies and programs that will help us further reuse or recycle the waste generated during our operations.

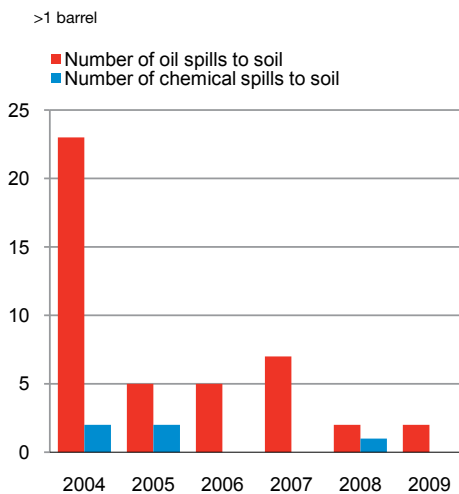
Water Management

Water is essential in the production and processing of oil and gas, in terms of both technical and safety issues. ExxonMobil is actively engaged in managing water use in our operations around the world, including at our refinery here in Torrance. We believe we have a responsibility to surrounding communities and the environment for managing our water use, especially in areas where water availability is limited.

At Torrance, we track our water use and consider opportunities to reduce consumption. About 65 percent of the process water used by the refinery is recycled water. Most of that recycled water is processed through a treatment plant located within the Torrance facility operated by the West Basin Municipal Water District.

The industrial wastewater generated by the refinery is treated on site to remove hydrocarbons and specific pollutants before it is discharged for further treatment to one of Los Angeles County Sanitation Districts’ (LACSD) water reclamation plants. A few years ago, the refinery installed a Selenium Treatment Unit for the removal of selenium from refinery wastewater discharges. The EPA, LACSD and Department of Toxic Substances Control (DTSC) regulate selenium in water to protect public health.

Total Number of Oil/Chemical Spills to Soil



Source: Torrance Refinery

The International Energy Agency estimates that, on average, about 10 percent of petroleum-related GHG emissions are from industry operations while 90 percent are from consumer use. This being the case, we recognize the importance of developing technologies that help consumers reduce their environmental impacts while continuing to focus on reducing energy in our operations.

Energy

Efficiency

ExxonMobil has a comprehensive Global Energy Management System (GEMS) focused on continually improving energy efficiency and reducing greenhouse gas emissions. Since GEMS' launch here in 2003, the Torrance Refinery has found innovative ways to:

- improve heat transfer and heater efficiency by reducing heat loss
- increase power generation from existing high-efficiency cogeneration facilities
- manage operation of motors and turbines more efficiently
- reduce steam venting and steam losses
- run furnaces more efficiently, saving fuel and cutting emissions

Through GEMS we have identified opportunities to improve energy efficiency by 15 to 20 percent at our refinery. In 2009, our operations achieved best-ever energy efficiency since the GEMS rollout and our energy improvements from 2008 to 2009 resulted in reduced carbon dioxide (CO₂) emissions equivalent to removing approximately 50,000 cars off the road.

How Do You Make a Refinery Energy Efficient?

At the ExxonMobil Torrance Refinery, our strategies to achieve energy excellence include a systematic approach to addressing energy fundamentals such as programs to reduce heat and steam losses, improve heat integration and optimize operating conditions to use less energy. We are also constantly on the lookout for new ideas, projects and technologies that will help us save energy. You'll be surprised to know that in the end, our solutions to achieve energy efficiency at our plant are just like your solutions to conserve energy at home!

What You Do*:

- To prevent heat loss, you use a caulking compound to seal air leaks in a variety of places throughout your home.
- To increase the efficiency of your furnaces and boilers, you regularly clean your filters and coils.
- To save on electricity usage, you use the power-down or sleep mode feature on your personal computer when not in use.

What We Do:

- To prevent heat loss, we have a program to identify and repair air leaks and damaged insulation on piping and vessels.
- To improve heat integration, we clean exchangers, heater burners and air fans... sometimes with soap and water!
- To save on electricity usage, we turn off our air fans (used to cool down the equipment) when surrounding temperatures are cooler and switch off our motors and turbines when running at reduced rates.

* Based on recommendations from the U.S. Department of Energy. To learn more, visit <http://www.energysavers.gov>

We strive for an incident-free workplace and have set a safety and health goal of zero injuries and illnesses.



Torrance Refinery fire brigade and City of Torrance responders.

Security &

Safety

As a refinery, we realize that in our business, there are inherent risks associated with safety, security, health and the environment. Recognizing these risks, we take a disciplined and systematic approach to business continuity planning and emergency preparedness.

Safety

At the Torrance Refinery, safety in the workplace is a core value. We strive for an incident-free workplace and have set a safety and health goal of zero injuries and illnesses. We believe our commitment to safe, secure and incident-free operations will contribute to improved operations reliability, lower costs and higher productivity.

Safety standards and procedures are incorporated in our facility design, construction and start-up activities. Our quality assurance processes verify that materials received meet design specifications and that construction is in accordance with applicable standards. To help ensure compliance with applicable regulations, we have structured inspection and maintenance programs, regular testing of integrity-critical equipment, and strict procedures to maintain safe operations. Additionally, we apply advanced technologies in many of our manufacturing facilities to alert operators to investigate potentially abnormal operating events.

Security

At the Torrance Refinery, we believe *Security is Everybody's Business*. The primary objectives of our security programs are the safety and security of our workforce and the surrounding community. Efforts to strengthen our facility are well underway. A sustained relationship with local, state and federal agencies, as well as the use of advanced surveillance devices and security techniques, prevents unauthorized access to our facility.

Emergency Response

With a fully equipped fire department on site, the refinery has the capability to respond quickly and effectively to operational incidents and proactively tests its crisis response. Our 96 firefighters, including 17 emergency medical technicians, 33 hazardous materials technicians and 37 rescue responders, routinely train on a range of possible scenarios, including responding to simulated product spills, fires, explosions, natural disasters and security incidents. Our regular joint drills with Torrance Fire and Police Departments ensure we remain prepared and always ready to respond.



Joint rescue drill with Torrance Fire Department.

“The Torrance Unified School District is proud to have such a strong working relationship with ExxonMobil. Each year, ExxonMobil significantly donates to our district through the Pegasus Awards Teacher Grants and by sponsoring our teachers’ participation in the Mickelson ExxonMobil Teacher Academy and Sally Ride Science Academy. The financial support to further develop our teachers and educational programs would otherwise cease to exist in light of California’s budgetary shortfalls. With this support, we as a district have reaped the rewards of equipping our students and teachers with increased resources as we work together toward a common goal of providing quality education to the youth of our community.”

- Dr. Ramona Chang, Director of Curriculum, Torrance Unified School District

Social

Responsibility



An ExxonMobil engineer demonstrates to middle school girls during Introduce A Girl to Engineering day at the refinery.

As a member of the Torrance community for more than 80 years, we believe business success and social responsibility go hand-in-hand. That is why we have a long history of supporting Torrance through various educational programs, and we advocate individual and team employee volunteerism.

the fun and excitement of engineering and also see successful women in high-profile jobs. Through the Mickelson ExxonMobil Teachers Academy and The Sally Ride Science Academy, teachers from Torrance have joined educators from around the country to participate in

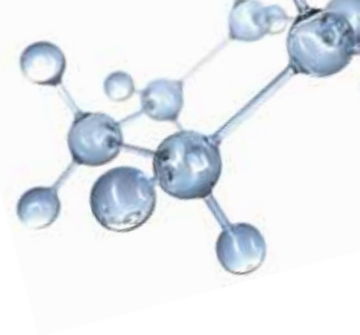
workshops designed to help bolster their knowledge in math and science and inspire their students in these subjects at an early age.

Our Commitment to Education

For ExxonMobil, supporting education in the communities where we operate, especially in the areas of math and science, is an important business priority. Based on the company’s strategic focus and local community feedback, a significant portion of the Torrance Refinery’s contributions program is focused on partnering with and supporting the efforts of the Torrance Unified School District. For instance, our Pegasus Awards program has supported the efforts of hundreds of Torrance’s teachers to enhance their curriculum by funding innovative projects in their classrooms. As part of our company’s participation in Introduce a Girl to Engineering Day, we invite more than 300 girls each year to our facility to experience



Torrance teachers representing the Torrance Unified School District at the 2009 Mickelson Academy.



Community

Investment

We believe community investment goes beyond financial support. We encourage employees, retirees and their families to contribute their own time to pursue civic activities in both the Torrance community and their own resident communities. By providing contributions to the organizations supported by employees and their families, the company encourages and recognizes their efforts.

Our refinery has an active Workforce Involvement Program that encourages team volunteer efforts in our local communities. Through their community service, our

employees are able to earn much-needed grant dollars for local charitable non-profit organizations from the ExxonMobil Foundation. Through our cumulative efforts with the ExxonMobil Foundation, the refinery has given a record-breaking contribution to the United Way of Greater Los Angeles, which awarded the refinery with the first ever "Model Campaign of the Year" award.

The Torrance Management Involvement Program also encourages refinery representatives to share their time and expertise by serving nonprofit, civic and social service organizations in the interest of

good corporate and individual citizenship. This program provides the refinery with the greatest opportunity to create a positive and lasting social impact where we do business. Our leadership representatives serve on the boards of numerous local nonprofits, such as the Torrance Education Foundation, Pediatric Therapy Network and the Madrona Marsh Preserve & Nature Center, to name a few.



An engineer from the Torrance Refinery interacts with students at the ExxonMobil Bernard Harris Summer Science Camp. The camp, held at the University of Southern California, houses middle school students for two-week residential summer programs at no fee to their families.



Torrance teachers who won the 2010-2011 Science, Technology, Engineering and Math Pegasus Awards.



ExxonMobil employees volunteering at the Madrona Marsh.

“We have lived next to the Torrance Refinery for more than 80 years. My husband and I have served on the refinery’s community advisory panel for several years now, and we have learned so much about their operations. ExxonMobil has been really good to the community. They are always good about letting their neighbors know if any of their work might impact the community.”

- Mrs. Irene Ordaz, Torrance resident



Talking to Us

At the Torrance Refinery, we believe we have a responsibility to engage a variety of audiences on an ongoing basis in open, forthright and proactive dialogue. It is through this type of active communication that we can understand and respond to community needs.

The refinery maintains effective communication and neighbor involvement through its Community Advisory Panel (CAP). CAP is comprised of neighbors and community leaders with whom the refinery’s management team and refinery representatives meet every other month to identify, prioritize and communicate neighbors’ concerns regarding the economic, health and quality of life issues in the City of Torrance.

Periodically, the Torrance Refinery opens its doors to neighbors during our Open House. Here, community members have the opportunity to engage in direct dialogue with staff and learn about different aspects of refinery operations.

Every resident in Torrance also receives the refinery’s periodic newsletter, Neighbor to

Neighbor, which provides a glimpse into the refinery’s operational and community activities. As Torrance grows and new families enter our community, the refinery distributes a New Resident Mailer every six months to welcome neighbors to Torrance and provide them with introductory information and resources about the refinery.

Finally, through our 24-hour Neighborhood Hotline number, Torrance

residents can speak with the refinery’s environmental supervisor at any hour of the day or night. Neighbors can also call the refinery’s Public & Government Affairs office during regular business hours with questions or concerns. We encourage our neighbors to report any concerns immediately to ensure rapid response by refinery personnel.



Torrance community members at the 2008 Open House.



Torrance Refinery volunteers at a beach clean up.



The "Green Team" Class of 2010 during a tour of the refinery. The program gives Torrance students the opportunity to work in city or school district offices.



Refinery employees plant trees at the Madrona Marsh Nature Preserve on Arbor Day.



The ExxonMobil Homework Center at the North Torrance Library. The center was made possible by an \$80,000 donation from the ExxonMobil Foundation in honor of the Torrance Refinery's 80th anniversary.



Refinery volunteers hard at work during a volunteer event at the Salvation Army Torrance Corps Preschool.



Teaching kids to love math and science during Super Science Saturdays at the Torrance Cultural Arts Center.

Acknowledgements

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Mrs. Irene Ordaz, Torrance resident

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We value your feedback on this report. For questions or concerns, please call our Public and Government Affairs office during regular business hours at (310) 212-1852.
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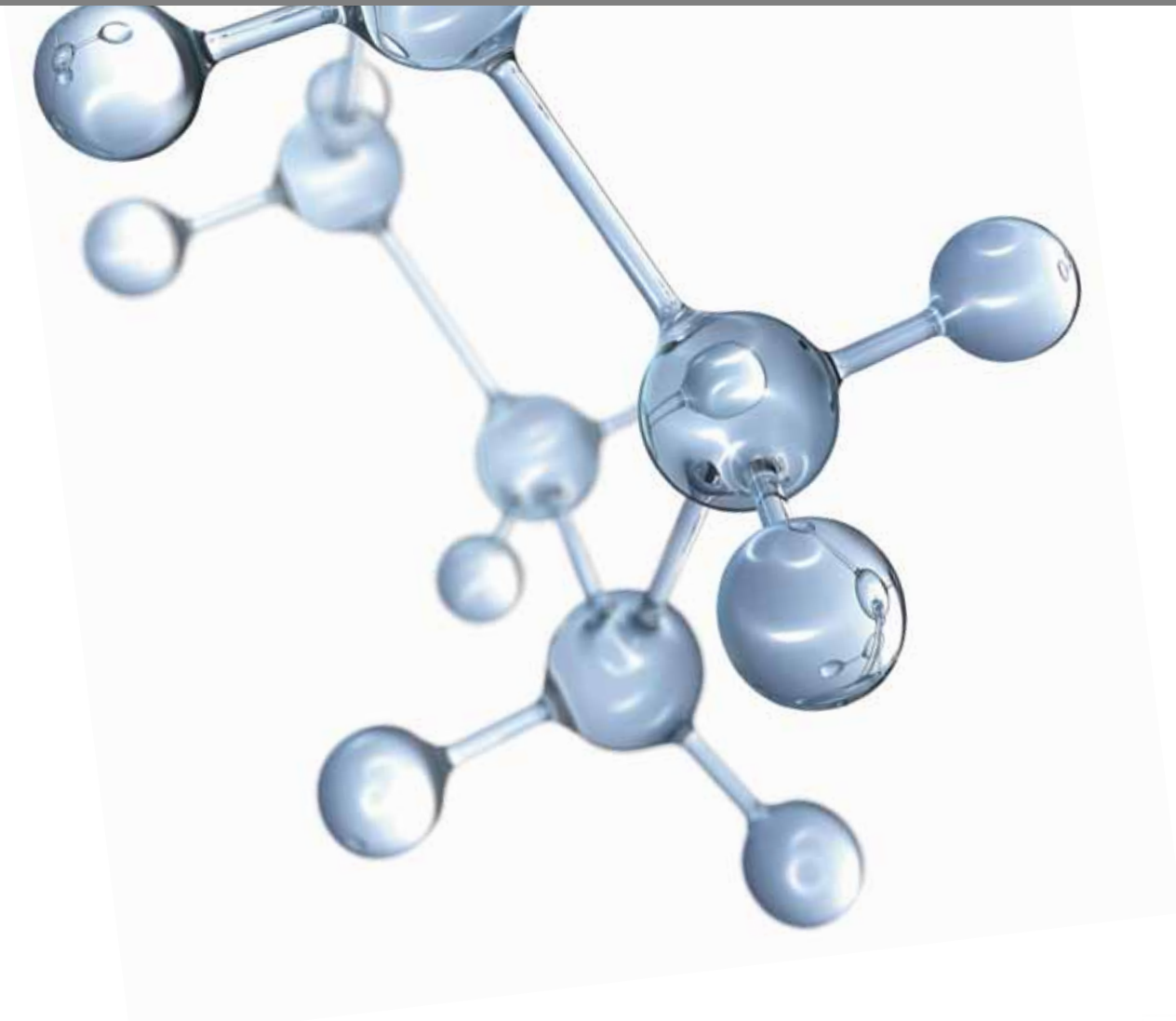


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