

**Status Update to the South Coast AQMD Refinery Committee  
on Implementation of Hydrogen Fluoride Safety  
Enhancements in Proffer Letters for  
Torrance Refining Company and Valero Refinery**

**March 2022**



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## **Executive Summary**

Torrance Refining Company (TORC) and Ultramar (Valero Refinery) petroleum refineries use modified hydrogen fluoride (MHF), a highly toxic chemical, in their alkylation units. In 2019, South Coast AQMD Governing Board accepted the refineries' proffers<sup>1</sup> to install safety enhancements including improved monitoring for MHF, increased water mitigation, and protective structures around the alkylation units.

According to their February 2022 quarterly report, **TORC has completed the implementation of all proposed safety enhancements at the end of 2021.** South Coast AQMD conducted two inspections to assess the safety enhancements around TORC's alkylation unit. The inspector's latest observations this month confirmed the installation of the enhanced safety elements that could visually be observed, including construction of the steel structure surrounding the unit, installation of open path monitors, and additional water mitigation. For more detailed information, see the summary tables starting on page 3.

According to their January 2022 quarterly report, **Valero is on track to complete the implementation of all proposed safety enhancements at the end of the first quarter of 2022.** Valero's open path perimeter monitoring is installed and in operation, construction of Acid Settler Debris Grid and Riser and Legs is complete, and the installation of the other safety enhancements are on schedule for implementation by the first quarter of 2022. South Coast AQMD inspectors conducted an onsite inspection in February 2022 and confirmed the progress of the installation of mitigation measures that could visually be observed, as described in Valero's quarterly reports. For more detailed information, see the summary tables starting on page 12.

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<sup>1</sup> TORCs proffer letter can be found here: <http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1410/1410-comment-letters/torrance-proffer-letter-8-30-19.pdf?sfvrsn=6>.

Valero's Proffer Letter can be found here: <http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1410/1410-comment-letters/valero-proffer-letter-8-30-19.pdf?sfvrsn=6>.

## **Background**

On September 6, 2019, the South Coast AQMD Governing Board approved Resolution 19-19 Accepting the Proffered Voluntary Implementation of Additional Safety Enhancements for the Use of Modified Hydrofluoric Acid at the Torrance and Valero Refineries. The safety enhancements and control measures proffered by TORC and Valero Refineries were accepted with the following conditions:

- South Coast AQMD Executive Officer is directed to not continue with any Proposed Rule 1410 rulemaking activities or other efforts seeking additional commitments from TORC or Valero regarding the use of HF or MHF;
- Until the new safety enhancements and control measures are fully implemented by TORC and Valero as set forth in their respective Proffer Letters, the South Coast AQMD Executive Officer shall report back to the Refinery Committee annually on the progress of the implementation of the new safety enhancements and control measures at the Torrance and Valero Refineries; and
- Nothing in this resolution or in the South Coast AQMD Governing Board's acceptance of TORC's or Valero's respective Proffer Letters shall modify or alter the 2003 MOU or Torrance Consent Decree.

This report is the second annual report to the Refinery Committee on the progress of the implementation of new safety enhancements and control measures at TORC and Valero. Similar to the [first annual report](#), this report includes a summary each refinery's quarterly updates submitted over the past year on the progress of implementing new safety enhancements and an update on the development and commercialization of alternative alkylation technologies to HF.

## TORC's Proffer Letter and Annual Status Update

The August 30, 2019 Proffer Letter from TORC included five voluntary safety enhancements described below to the modified hydrogen fluoride (MHF) Alkylation unit, with anticipated completion in 2021. To date, TORC submitted eight quarterly reports since January 2020. All four quarterly reports for 2021 have stated that enhancements are on schedule for implementation in 2021 and are available on the South Coast AQMD website [here](#) and included in Appendix I of this report. A summary of the TORC quarterly reports is provided in Table 1. Images of the completed protective steel structure and enhanced water mitigation are including in this status update and in the attached November 2021 Quarterly Report.

In addition to the 2021 quarterly reports, TORC submitted their first quarterly report of 2022 in February. Based on that report, TORC completed all the voluntary MHF alkylation unit safety enhancements and met all the commitments and obligations under the Proffer Letter.

South Coast AQMD conducted two inspections to assess the safety enhancements around TORC's alkylation unit. On September 3, 2021, an inspector confirmed the progress of the safety enhancement installation. On February 18, 2022, an inspector confirmed the safety enhancements committed to in the Proffer Letter, which could visually be observed, have been installed. The inspector's observations are included in the summary tables below.

### 1. Settler Acid Protective Steel Structure

TORC will install, maintain, and operate a protective steel structure around and over the MHF Alkylation unit's acid settler area as an additional passive mitigation to the existing settler pans designed to:

Action	Status	
	Quarterly Report	Staff Verification
Provide an additional barrier in the settler area	✓	✓
Automatically deploy water to mitigate HF/MHF release.	✓	✓ <sup>2</sup>

<sup>2</sup> Staff verified water deployment from photographs provided by the facility and is scheduling an in-person demonstration of the water deployment system.

2. Settler Area Water Mitigation Dome and Curtain

TORC will install, maintain, and operate a water mitigation dome and curtain over and around the MHF Alkylation unit’s acid settlers, as an additional active mitigation. Water mitigation designed to automate water mitigation to allow rapid and focused response and includes a new high-volume water mitigation system around and over the acid settlers that will include three stages of water mitigation:

Action	Status	
	Quarterly Report	Staff Verification
Four overhead water monitors to form an umbrella dome inside the structure	✓	✓ <sup>3</sup>
Spray curtain around the base of the structure	✓	✓ <sup>3</sup>
Augment MHF Alkylation unit’s existing water mitigation	✓	✓ <sup>3</sup>

3. Settler Area Enhanced HF/MHF Detection System

TORC will install, maintain, and operate an enhanced HF/MHF detection system in and around the MHF Alkylation unit’s acid settlers’ area. The detection system will include:

Action	Status	
	Quarterly Report	Staff Verification
New open path laser detectors to monitor acid settler area and inside the structure	✓	✓
New point source detectors	✓	✓
New camera within the structure to provide visual monitoring	✓	✓

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<sup>3</sup> Staff verified water deployment from photographs provided by the facility and is scheduling an in-person demonstration of the water deployment system.

4. Northern Water Mitigation Monitors

TORC will upgrade, maintain, and operate the northern water mitigation monitors to optimize the water mitigation, as enhanced active mitigation that will include:

Action	Status	
	Quarterly Report	Staff Verification
Automation of water mitigation that can be automatically or manually activated	✓	✓ <sup>4</sup>

5. Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over-Pressure Mitigation

TORC will install and maintain FCCU ESP mitigation designed to minimize the potential for a large section of the FCCU ESP to detach during an over-pressurization incident by providing an anchoring system for the ESP intake ducting that will include.

Action	Status	
	Quarterly Report	Staff Verification
Installation and maintaince FCCU ESP mitigation	✓	✓

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<sup>4</sup> Staff verified water deployment from photographs provided by the facility and is scheduling an in-person demonstration of the water deployment system.

New Northern Firewater Monitor (FMW #5) – Flow Test



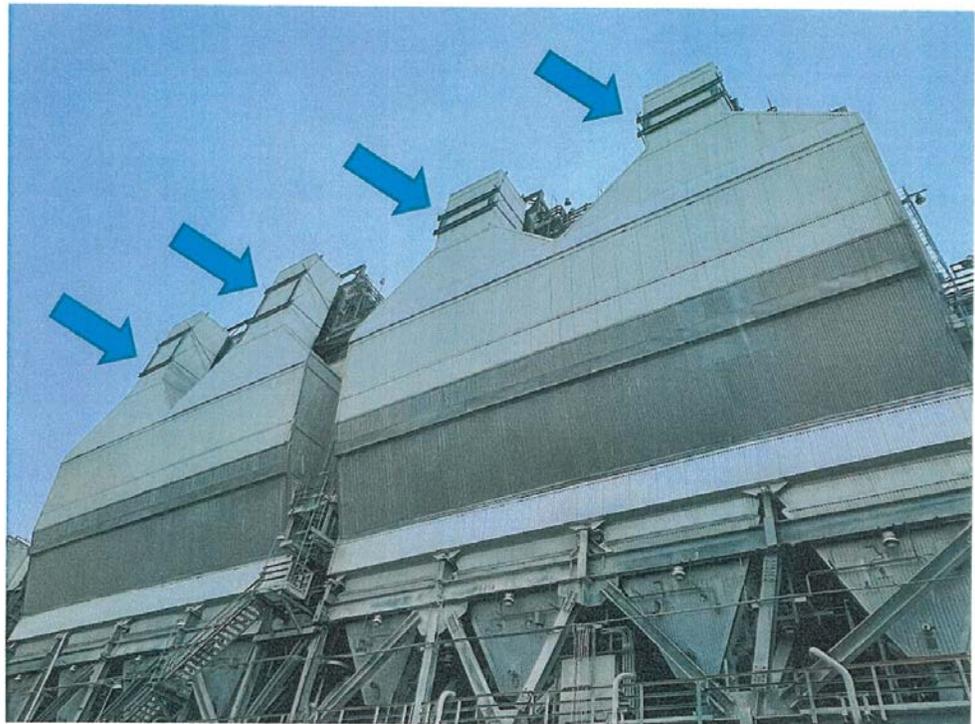
Structure North Wall View



**Overall Protective Structure and Area Firewater Monitors Completed**



**FCCU ESP Over Pressure Mitigation Enhancement Completed**



**Table 1**  
**Summary of Progress of Implementing Safety Enhancements for HF/MHF at TORC**

Safety Enhancements	January 2021 Report	May 2021 Report	August 2021 Report	November 2021 Report	February 2022 Report
<p>1. Settler Acid Protective Steel Structure</p>	<ul style="list-style-type: none"> <li>• Funding approved for detailed engineering and procurement</li> <li>• Detailed engineering in progress                             <ul style="list-style-type: none"> <li>- Construction work packages being finalized; last package due March 2021</li> </ul> </li> <li>• Completed underground verifications for piping and electrical design and foundation design</li> <li>• Construction planning in progress</li> <li>• Ordered long lead materials:                             <ul style="list-style-type: none"> <li>- Elevated water monitors with water supply on/off valve and control panel assemblies</li> <li>- Control valves for area revamp work to accommodate new steel structure</li> </ul> </li> <li>• Materials planned to be delivered onsite by second or third quarter 2021</li> <li>• Submitted building plans to City of Torrance permitting department</li> </ul>	<ul style="list-style-type: none"> <li>• Funding approved for construction of settler area protective steel structure and northern water mitigation monitors</li> <li>• Detailed engineering in progress:                             <ul style="list-style-type: none"> <li>- Construction work packages were finalized in March 2021</li> <li>- One remaining construction work package to be issued mid-May 2021</li> </ul> </li> <li>• Construction commenced for Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</li> <li>• Construction planning progressing for FCCU ESP Overpressure Mitigation</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed engineering has been completed</li> <li>• Construction continues for Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</li> <li>• All long lead materials have been received</li> <li>• Building plans approved by City of Torrance permitting department</li> </ul>	<ul style="list-style-type: none"> <li>• Northern water mitigation monitors have been completed and are in the process of being fully commissioned</li> <li>• Enhancements currently on schedule for implementation in 2021</li> <li>• Construction progressing for FCCU ESP overpressure mitigation</li> </ul>	<ul style="list-style-type: none"> <li>• Enhancements implemented in 2021</li> <li>• Construction completed for FCCU ESP overpressure mitigation</li> </ul>

Safety Enhancements	January 2021 Report	May 2021 Report	August 2021 Report	November 2021 Report	February 2022 Report
	<ul style="list-style-type: none"> <li>Enhancements currently on schedule for implementation in 2021</li> </ul>				
<p>2. Settler Area Water Mitigation Dome and Curtain</p>	<ul style="list-style-type: none"> <li>Funding approved for detailed engineering and procurement</li> <li>Detailed engineering in progress                             <ul style="list-style-type: none"> <li>Construction work packages being finalized; last package due March 2021</li> </ul> </li> <li>Construction planning in progress</li> <li>Ordered long lead materials:                             <ul style="list-style-type: none"> <li>Dome water monitors, spray curtain headers with nozzles, and water supply on/off valve and control panel assemblies</li> <li>Materials planned to be delivered onsite by second or third quarter 2021</li> </ul> </li> <li>Enhancements currently on schedule for implementation in 2021</li> </ul>	<ul style="list-style-type: none"> <li>Detailed engineering has been completed                             <ul style="list-style-type: none"> <li>Construction work packages were finalized in March 2021</li> </ul> </li> <li>Construction commenced for these safety enhancements</li> </ul>	<ul style="list-style-type: none"> <li>All long lead materials have been received</li> <li>Enhancements currently on schedule for implementation in 2021</li> </ul>	<ul style="list-style-type: none"> <li>Construction of water mitigation dome monitors and spray curtains completed, being tested, and are in the process of being fully commissioned</li> </ul>	<ul style="list-style-type: none"> <li>Enhancements implemented in 2021</li> </ul>
<p>3. Settler Area Enhanced HF/MHF Detection System</p>	<ul style="list-style-type: none"> <li>Funding approved for detailed engineering and procurement</li> <li>Detailed engineering in progress</li> </ul>	<ul style="list-style-type: none"> <li>Detailed engineering has been completed                             <ul style="list-style-type: none"> <li>Construction work packages were finalized in March 2021</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>All long lead materials have been received</li> <li>Enhancements currently on schedule for implementation in 2021</li> </ul>	<ul style="list-style-type: none"> <li>Construction of settler area enhanced HF/MHF detection system completed, being tested, and are in the</li> </ul>	<ul style="list-style-type: none"> <li>Enhancements implemented in 2021</li> </ul>

Safety Enhancements	January 2021 Report	May 2021 Report	August 2021 Report	November 2021 Report	February 2022 Report
	<ul style="list-style-type: none"> <li>- Construction work packages being finalized; last package due March 2021</li> <li>• Completed underground verifications for piping and electrical and foundation design</li> <li>• Construction planning in progress</li> <li>• Materials planned to be delivered onsite by second or third quarter 2021</li> <li>• Enhancements currently on schedule for implementation in 2021</li> <li>• Ordered long lead materials:                             <ul style="list-style-type: none"> <li>- HF detection instrumentation</li> <li>- Programmable Logic Controller (PLC)</li> </ul> </li> <li>• Materials planned to be delivered onsite by second or third quarter 2021</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>	<ul style="list-style-type: none"> <li>• Construction commenced for these safety enhancements</li> </ul>		<p>process of being fully commissioned</p>	
<p>4. Northern Water Mitigation Monitors</p>	<p>Same as #1</p>				

Safety Enhancements	January 2021 Report	May 2021 Report	August 2021 Report	November 2021 Report	February 2022 Report
5. FCCU Electrostatic Precipitator Over Pressure Mitigation	Same as #1				

**Valero’s Proffer Letter and Annual Status Update**

The August 30, 2019 Proffer Letter from Valero included six voluntary safety enhancements to the MHF Alkylation unit described below. Valero committed to install many of the safety enhancements by January 2022. To date, Valero Refinery has submitted eight quarterly reports since January 2020. All four quarterly reports in 2021 have stated that enhancements are on schedule for implementation and are available on the South Coast AQMD website [here](#) and in Appendix II of this report. A summary of the quarterly reports is provided in Table 2.

The schedule outlined in Valero’s Proffer Letter indicated retrofits would be installed no later than the completion of the next scheduled Alky ReVAP turnaround; however, if issues are identified in the design and engineering phase that preclude installation of the enhanced mitigation during the next scheduled Alky ReVAP turnaround, the enhanced mitigation shall be installed no later than completion of the subsequent Alky ReVAP turnaround. Based on the quarterly updates, Valero is on track to complete the mitigation on the next scheduled turnaround. Due to confidentiality, the dates of the turnaround are not disclosed in this report.

Valero submitted their first quarterly report of 2022 in January and based on that report the construction of Acid Settler Debris Grid and Acid Settler Riser and Legs that was started in August 2021 was completed on December 17, 2021. The remaining safety enhancements were projected to be installed during the turnaround in the first quarter of 2022.

South Coast AQMD conducted an inspection to assess the safety enhancements around Valero’s alkylation unit. On February 18, 2022, an inspector confirmed the progress of the safety enhancement installation as reported in the latest quarterly report. The inspector’s observations are included in the summary tables below.

1. Open Path Perimeter HF Sensors

Valero will install open path perimeter HF sensors around the Alky ReVAP Unit for early detection of an HF leak within one year of accepting the proffer.

Action	Status	
	Quarterly Report	Staff Verification
Installation of open path perimeter HF sensors around the Alky ReVAP Unit	✓	✓

## 2. Flange Guards

Valero will install guards on each flange in the Alky ReVAP unit in the main acid service lines greater than 2 inches in diameter.

Action	Status	
	Quarterly Report	Staff Verification
Installation of flange guards in the Alky ReVAP unit	✓ <sup>5</sup>	✓

## 3. Automation of Water Curtain System

Valero will install a system to automate operation of existing water curtain system in the Alky ReVAP Unit.

Action	Status	
	Quarterly Report	Staff Verification
Installation of automated system for existing water curtain in the Alky ReVAP Unit	✓ <sup>5</sup>	✓ <sup>6</sup>

## 4. Additional Point Source Detectors

Valero will install additional point source detectors at locations optimized to further facilitate precise and rapid detection and response to any potential release of MHF within one year of accepting proffer.

Action	Status	
	Quarterly Report	Staff Verification
Installation of additional point source detectors	✓ <sup>5</sup>	✓

<sup>5</sup> January 2022 quarterly report indicated the installation would be completed by the end of the first quarter of 2022.

<sup>6</sup> Water curtain previously installed; staff is scheduling an in-person demonstration of water deployment system.

5. Acid Settler Debris Grid

Valero will evaluate, design, and install a debris grid to mitigate impacts to the elevated section of the acid settler within 180 days of accepting proffer. The debris grid will be designed to avoid interference with existing HF mitigation systems.

Action	Status	
	Quarterly Report	Staff Verification
Installation of the debris grid around the elevated section of the acid settler	✓	✓

6. Acid Settler Riser/Leg Rain Out Barrier/Shroud and Depropanizer Acid Boot Rain Out Barrier/Shroud

Valero will design, engineer, and install Rain Out Barrier/Shroud for the Acid Settler Risers and Legs, and Depropanizer Acid Boots. The Rain Out Barrier/Shroud is designed to reduce the momentum of any potential release from these systems and to redirect the material downward to increase rain out and capture by the water mitigation systems within 180 days of accepting proffer.

Action	Status	
	Quarterly Report	Staff Verification
Installation of the Rain Out Barrier/Shroud systems for the Acid Settler Risers and Legs, and Depropanizer Acid Boots	✓	✓
Installation of additional barriers or shrouding on the elevated acid piping that feeds the settler	✓	✓

**Table 2  
Summary of Progress of Implementing Safety Enhancements for HF/MHF at Valero**

Safety Enhancements	January 2021 Report	April 2021 Report	July 2021 Report	October 2021 Report	January 2022 Report
1. Open Path Perimeter Monitoring with HF Sensors (Commitment to complete by Sept 30, 2020)	<ul style="list-style-type: none"> <li>Completed and fully commissioned the installation – August 28, 2020</li> </ul>				
2. Flange Guards (Commitment to complete by next turnaround)	<ul style="list-style-type: none"> <li>On schedule for next Alky Unit turnaround</li> </ul>	<ul style="list-style-type: none"> <li>Orders of 260 guards will be competed after full funding of project</li> <li>On schedule for next Alky Unit turnaround</li> </ul>	<ul style="list-style-type: none"> <li>No additional information</li> <li>On schedule for next Alky Unit turnaround<sup>7</sup></li> </ul>		
3. Automated Water Curtain	<ul style="list-style-type: none"> <li>Refinement engineering phase funded and is over 80% complete</li> <li>13 additional point source detectors and 24 additional open path detectors will be installed</li> <li>On schedule for next Alky Unit turnaround</li> </ul>	<ul style="list-style-type: none"> <li>Refinement engineering phase was completed in March 2021</li> <li>Associated sensor electronics and PLC were received in mid-April</li> <li>On schedule for next Alky turnaround</li> </ul>	<ul style="list-style-type: none"> <li>No additional information</li> <li>On schedule for next Alky Unit turnaround</li> </ul>		
4. Additional Point Source Detectors					
5. Acid Settler Debris Grid	<ul style="list-style-type: none"> <li>Structural steel package submitted to City of LA on January 18,2021</li> </ul>	<ul style="list-style-type: none"> <li>No additional information</li> <li>On schedule for next Alky Unit turnaround</li> </ul>	<ul style="list-style-type: none"> <li>Received approval for associated structural steel from City of LA on July 6, 2021</li> <li>On schedule for next Alky Unit turnaround</li> </ul>	<ul style="list-style-type: none"> <li>No additional information</li> <li>On schedule for next Alky Unit turnaround</li> </ul>	<ul style="list-style-type: none"> <li>Construction started in August 2021, and was completed on December 17, 2021</li> </ul>
6. Acid Settler Riser/Leg Rain Out Barrier/Shroud	<ul style="list-style-type: none"> <li>No issues identified to date</li> <li>On schedule for next Alky Unit turnaround</li> </ul>				

<sup>7</sup> Next Alky Unit Turnaround is scheduled for First Quarter 2022.

## Alternative and Emerging Alkylation Technologies

### *Background*

Over the last two decades, alternative catalyst technology has been emerging to replace HF, MHF, and sulfuric acid in the alkylation process. The emerging technologies seek to mitigate the potential risk from release as well as increase the efficiency of the alkylation process. This technology has been developed in the form of solid acid, liquid ionic, and advanced sulfuric acid alkylation.

### *Traditional Alkylation*

Traditional acid-based alkylation processes use either HF, MHF, or sulfuric acid to create alkylate, a blending component required to make high-octane gasoline. HF, MHF, and sulfuric acid are all highly corrosive, strong acids that have safety and environmental risks. If released, HF and MHF have the propensity to become airborne as a dense, toxic vapor cloud putting both the workers and the public at risk for exposure. Both refineries have stated they would not consider transitioning to a sulfuric acid alkylation unit. Sulfuric acid units require a significant volume of acid that must be regenerated for re-use. If a facility does not have the ability to regenerate the acid on site, it could lead to increased truck traffic, and the associated emissions, transporting the spent and re-generated acid.

Since 2015, a series of high-profile refinery explosions in California, Wisconsin, and Pennsylvania renewed the concern over using HF and MHF in refinery operations, especially near densely populated urban centers. Regulatory agencies and local community groups have called on refiners to examine their options for mitigating the risks of aging HF alkylation units.

### *New Alkylation Technologies*

#### Ionic Liquid Alkylation

On April 13, 2021, [Chevron Corp.](#) announced the commissioning and start-up of the world's first commercial-scale ISOALKY™ process unit that utilizes ionic liquids to produce alkylate in their 53,000-barrel per day refinery in Salt Lake City, Utah. The ISOALKY™ technology represents a major innovation in alkylation technology. The following pictures show the installation of the ISOALKY process unit:

Arial view of the site where the ISOALKY process unit was installed



Arial view of the site where the ISOALKY process unit was installed



## Images of ISOALKY process unit being installed



The ISOALKY™ technology was developed as a cost-effective alternative to conventional liquid acid systems that offers process safety advantages. The non-aqueous liquid salt, or ionic liquid, is a new catalytic process that can be handled with standard personal protective equipment while still producing a high-octane blending component that helps lower the environmental impact of gasoline. The ISOALKY™ technology was developed by Chevron U.S.A., Inc., a subsidiary of Chevron, and licensed to Honeywell UOP.

ISOALKY™ technology can be used in new refineries as well as in existing facilities undergoing capital expansion or retrofit applications. ISOALKY™ technology has wider and improved feed flexibility relative to conventional alkylation technologies. Ionic liquids are regenerated on-site, eliminating the need for road or marine transportation for offsite regeneration and polymer byproduct handling.

FJ Management Inc. subsidiary Big West Oil LLC announced their contract with Honeywell UOP to convert their HF unit to ISOALKY alkylation unit at their 33,000 barrel per day refinery in North Salt Lake City, Utah, following the startup of the first commercial scale HF to ISOALKY unit revamp earlier at nearby Chevron's Salt Lake City refinery. In addition to delivering low-sulfur gasoline to Utah market, the planned unit revamp will also improve the refinery's operational efficiency.

Furthermore, following the announcement of Big West Oil LLC, Honeywell UOP announced that Tüpräs refineries in Turkey has selected ISOALKY™ technology to produce high quality alkylate, making the Turkish company the latest to convert from HF to the new liquid alkylation process. Neither Tüpräs nor Honeywell UOP provided additional details about the number or capacities of ISOALKY™ units to be installed or the implementation timeline or the proposed units.

## Ionikylation

Ionikylation, a composite ionic liquid catalyzed alkylation technology developed by the China University of Petroleum–Beijing and licensed by Well Resources Inc, is an inherently safe, commercial process that uses a proprietary composite ionic liquid catalyst, a non-volatile, non-aqueous liquid salt, to facilitate the alkylation reaction. The alkylation catalyst is non-hazardous and non-corrosive, allowing all process equipment to be manufactured using low-cost carbon steel. The catalyst is regenerated onsite under moderate operating conditions, which provides the added benefits of emissions reduction compared to alternative technologies.

The technology has been under development for 20 years. Significant process improvements have been made in recent years, concurrent with widespread commercial adoption in Asia-Pacific (Table 3). In 2005, the first retrofit project was successfully performed at the PetroChina Lanzhou refinery by retrofitting an existing, 65,000-metric-ton per year sulfuric acid alkylation unit with the proprietary catalyst.

**Table 3**  
**Commercial Implementation of Ionikylation Technology in China**

Facility name/location	Production capacity		Startup date
	Thousands ton per year	Barrels per day	
Dayan Chemical Co, Dongying, Shandong, China	100	2,450	Q3 2013
PetroChina Harbin Petrochemical Co., Harbin, China	150	3,700	Q4 2018
PetroChina Qinghai Oilfield Co, Qinghai, China	50	1,250	Q1 2019
Sinopec Jiujiang Co., Jiangxi, China	300	7,400	Q1 2019
Wuhan Petrochemical Co., Wuhan, China	300	7,400	Q1 2020
Sinopec Anqing Co., Anhui, China	300	7,400	Q1 2020

In 2013, an independent refiner, Dayan Chemical Co. Ltd., commissioned a 100,000-metric-ton per year unit. The commercial process performance data from this operation were published in the March 2018 issue of *Hydrocarbon Processing*. From 2017–2018, 10 new units were licensed to both state-owned and private Chinese refiners.

Notably, the commissioning of the Sinopec Wuhan unit is the world’s first commercial-scale revamp from an HF-based alkylation process. This revamped unit was one of two remaining HF-based alkylation processes in operation in China.

In March 2019, the 150,000-metric-ton per year unit at PetroChina Harbin Petrochemical Co. conducted a calibration test to benchmark and compare commercial process performance data against design specifications and identify optimization opportunities. To date, no safety-related incidents or concerns have been identified by the operator. The robustness of the technology is

demonstrated through its ability to produce alkylate that meets or exceeds design specifications, even during deviation from prescribed design feed specifications. If required, the Harbin Petrochemical unit is capable of producing even higher quality alkylate products by operating at lower temperatures.

**Next Steps**

- Continue to follow the progress of emerging alternative alkylation technologies at petroleum refineries with translatable operations
- Report back to Refinery Committee first quarter of 2023

## References

Chevron 2021 ISOALKY press release, available at <https://www.chevron.com/stories/chevron-and-honeywell-announce-start-up-of-isoalky-ionic-liquids-alkylation-unit>

Chevron 2019 supplement to the annual report, available at <https://www.chevron.com/-/media/shared-media/documents/annual-report-supplement-2019.pdf>

Zhang, S., L. Wilkinson, L. Ogunde, R. Todd, C. Steves and S. Haydel, "Alkylation technology study final report—South Coast Air Quality Management District (SCAQMD)," Norton Engineering, September 2016

[Chung, W.](#) , [Zhang, R.](#) , [Song, D.](#) , "Safe and sustainable alkylation: Performance and update on composite ionic liquid alkylation technology," *Hydrocarbon Processing*, April 2020

Liu, Z., R. Zhang, X. Meng, H. Liu, C. Xu, X. Zhang and W. Chung, "Composite Ionic Liquid Alkylation technology gives high product yield and selectivity," *Hydrocarbon Processing*, March 2018.

## Appendices – Facility Quarterly Reports

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### Appendix I: Torrance Refining Company Quarterly Reports

- 2021
  - First Quarter: January 2021
  - Second Quarter: May 2021
  - Third Quarter: August 2021
  - Fourth Quarter: November 2021
- 2022
  - First Quarter: February 2022

### Appendix II: Valero Quarterly Reports

- 2021
  - First Quarter: January 2021
  - Second Quarter: April 2021
  - Third Quarter: July 2021
  - Fourth Quarter: October 2021
- 2022
  - First Quarter: January 2022

Appendix I – Torrance Refining Company Quarterly Reports  
*First 2021 Quarterly Report*



**Torrance Refining Company LLC**  
3700 W 190<sup>th</sup> Street  
Torrance, CA 90504  
[www.torrancerefinery.com](http://www.torrancerefinery.com)

January 20, 2021

***VIA E-MAIL AND OVERNIGHT MAIL***

Wayne Natri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

**Subject: *Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update***

Dear Mr. Natri,

On behalf of Torrance Refining Company LLC (“TORC”), consistent with our November 25, 2019 letter, and as requested by you in your November 15, 2019 letter, below is the fourth quarter 2020 update regarding the voluntary modified hydrogen fluoride (“MHF”) alkylation unit safety enhancement commitments and control measures as proffered TORC’s August 30, 2019 Proffer Letter accepted and approved on September 6, 2019 by the South Coast Air Quality Management District (“South Coast AQMD”) Governing Board pursuant to Board Resolution No. 19-19 (the “Proffer Letter”). Capitalized terms used in this letter and not otherwise defined shall have the meanings ascribed in the Proffer Letter.

Attached as Annex A is a summary of the current status of the design, purchase, installation, testing, and operational start date of the proffered safety enhancements as of the fourth quarter 2020. We provide additional detail regarding the status of the enhancements below.

**Settler Area Protective Steel Structure, Northern Water Mitigation Monitors, and Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over Pressure Mitigation**

With respect to the Settler Area Protective Steel Structure, Northern Water Mitigation Monitors, and FCCU ESP Over Pressure Mitigation enhancements, as you are aware, TORC previously approved funding for detailed engineering and procurement and the detailed engineering is in progress. Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC’s 2021 planned budget includes the amounts required to be expended with respect to the remaining costs of these enhancements.

The construction work packages for the protective steel structure, the water mitigation monitors, and the FCCU ESP over pressure mitigation enhancements are still in the process of being finalized, but expected to be completed by March 2021. However, we have completed underground verifications for piping and electrical design as well as underground verifications for foundation design related to these enhancements.

We are now in the construction planning phase for these enhancements, with long lead materials including elevated water monitors with water supply on/off valve and control panel assemblies as well as control

Mr. Wayne Nastri, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update*  
January 20, 2021  
Page 2

valves for area revamp work to accommodate new steel structure having been ordered. These items are generally expected to be delivered to the Refinery in the second or third quarter 2021 unless there are delays due to the pandemic.

The building plans for these enhancements have been submitted to City of Torrance permitting department and we expect feedback or approval by second or third quarter 2021.

At this time, TORC believes these enhancements are on schedule for implementation in 2021.

#### **Settler Area Water Mitigation Dome and Curtain**

With respect to the Settler Area Water Mitigation Dome and Curtain enhancements, as you are aware, TORC previously approved funding for detailed engineering and procurement and the detailed engineering is in progress. Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget includes the amounts required to be expended with respect to the remaining costs of these enhancements.

The construction work packages for the water mitigation dome and curtain are still in the process of being finalized, but expected to be completed by March 2021.

We are now in the construction planning phase for these enhancements, with long lead materials including dome water monitors, spray curtain headers with nozzles, and water supply on/off valve and control panel assemblies having been ordered. These items are generally expected to be delivered to the Refinery in the second or third quarter 2021 unless there are delays due to the pandemic.

At this time, TORC believes these enhancements are on schedule for implementation in 2021.

#### **Settler Area Enhanced HF/MHF Detection System**

With respect to the Settler Area Enhanced HF/MHF Detection System enhancements, as you are aware, TORC previously approved funding for detailed engineering and procurement and the detailed engineering is in progress. Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget includes the amounts required to be expended with respect to the remaining costs of these enhancements.

The construction work packages for the enhanced HF/MHF detection system is still in the process of being finalized, but expected to be completed by March 2021. However, we have completed underground verifications for piping and electrical design as well as underground verifications for foundation design related to these enhancements.

We are now in the construction planning phase for these enhancements, with long lead materials including HF detection instrumentation and Programmable Logic Controller (PLC) having been ordered. These items are generally expected to be delivered to the Refinery in the second or third quarter 2021 unless there are delays due to the pandemic.

At this time, TORC believes these enhancements are on schedule for implementation in 2021.

Mr. Wayne Nastro, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update*  
January 20, 2021  
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As we have previously reported, due to COVID-19 pandemic impacts, the MHF Alkylation Unit turnaround has been moved to 2022, along with the Fluid Catalytic Cracker turnaround, however, as noted above, the safety enhancements are still on schedule to be completed by the end of 2021.

TORC will continue to closely monitor Engineering, Construction, and Materials availability in connection with the COVID-19 pandemic, and will notify South Coast AQMD of any additional impacts that could result in further schedule delays.

If you have any questions or require any additional information regarding this quarterly update of the safety enhancements, please do not hesitate to contact me at (310) 212-4500.

Sincerely,



Steve Steach  
Refinery Manager

cc: Paul Davis, President, Western Region  
Trecia Canty, Senior Vice President & General Counsel  
Darren Stroud, Refinery Attorney  
Jill Whynot, South Coast AQMD  
✓ Philip Fine, South Coast AQMD  
Susan Nakamura, South Coast AQMD  
Barbara Baird, South Coast AQMD  
Daphne Hsu, South Coast AQMD  
Michael Krause, South Coast AQMD

## ANNEX A

<b>Safety Enhancements</b>	<b>Fourth Quarter 2020 Status</b>
Settler Area Protective Steel Structure  Northern Water Mitigation Monitors  Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over Pressure Mitigation	<ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement</li> <li>• Detailed Engineering in progress               <ul style="list-style-type: none"> <li>○ Construction work packages being finalized; last package due March 2021</li> </ul> </li> <li>• Completed underground verifications for piping and electrical design</li> <li>• Completed underground verifications for foundation design</li> <li>• Construction planning in progress</li> <li>• Ordered long lead materials:               <ul style="list-style-type: none"> <li>○ Elevated water monitors with water supply on/off valve and control panel assemblies</li> <li>○ Control valves for area revamp work to accommodate new steel structure</li> </ul> </li> <li>• Materials planned to be delivered onsite by second or third quarter 2021</li> <li>• Submitted building plans to City of Torrance permitting department</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>
Settler Area Water Mitigation Dome and Curtain	<ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement</li> <li>• Detailed Engineering in progress               <ul style="list-style-type: none"> <li>○ Construction work packages being finalized; last package due March 2021</li> </ul> </li> <li>• Construction planning in progress</li> <li>• Ordered long lead materials:               <ul style="list-style-type: none"> <li>○ Dome water monitors, spray curtain headers with nozzles, and water supply on/off valve and control panel assemblies</li> <li>○ Materials planned to be delivered onsite by second or third quarter 2021</li> </ul> </li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>

## ANNEX A

Safety Enhancements	Fourth Quarter 2020 Status
Settler Area Enhanced HF/MHF Detection System	<ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement</li> <li>• Detailed Engineering in progress               <ul style="list-style-type: none"> <li>○ Construction work packages being finalized; last package due March 2021</li> </ul> </li> <li>• Completed underground verifications for piping and electrical design</li> <li>• Completed underground verifications for foundation design</li> <li>• Construction planning in progress</li> <li>• Ordered long lead materials:               <ul style="list-style-type: none"> <li>○ HF detection instrumentation</li> <li>○ Programmable Logic Controller (PLC)</li> </ul> </li> <li>• Materials planned to be delivered onsite by second or third quarter 2021</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>

*Second 2021 Quarterly Report*

**Torrance Refining Company LLC**  
3700 W 190<sup>th</sup> Street  
Torrance, CA 90504  
[www.torrancerefinery.com](http://www.torrancerefinery.com)

May 4, 2021

***VIA E-MAIL AND OVERNIGHT MAIL***

Wayne Nastri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

**Subject: *Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update***

Dear Mr. Nastri,

On behalf of Torrance Refining Company LLC ("TORC"), consistent with our November 25, 2019 letter, and as requested by you in your November 15, 2019 letter, below is the first quarter 2021 update regarding the voluntary modified hydrogen fluoride ("MHF") alkylation unit safety enhancement commitments and control measures as proffered TORC's August 30, 2019 Proffer Letter accepted and approved on September 6, 2019 by the South Coast Air Quality Management District ("South Coast AQMD") Governing Board pursuant to Board Resolution No. 19-19 (the "Proffer Letter"). Capitalized terms used in this letter and not otherwise defined shall have the meanings ascribed in the Proffer Letter.

Attached as Annex A is a summary of the current status of the design, purchase, installation, testing, and operational start date of the proffered safety enhancements as of the first quarter 2021. We provide additional detail regarding the status of the enhancements below.

**Settler Area Protective Steel Structure, Northern Water Mitigation Monitors, and Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over Pressure Mitigation**

With respect to the Settler Area Protective Steel Structure, Northern Water Mitigation Monitors, and FCCU ESP Over Pressure Mitigation enhancements, as you are aware, TORC previously approved funding for detailed engineering and procurement and the detailed engineering is in progress. TORC has now approved funding to complete construction of the Settler Area Protective Steel Structure and Northern Water Mitigation Monitors safety enhancements. Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget continues to include the amounts required to be expended with respect to the remaining costs of these enhancements.

The construction work packages for the protective steel structure, the water mitigation monitors, and the FCCU ESP over pressure mitigation enhancements were finalized in March 2021, with one remaining construction work package to be issued in mid-May for post unit outage work to be completed in 2021.

Mr. Wayne Nastri, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update*  
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Page 2

Construction commenced in March 2021 for the Settler Area Protective Steel Structure, and Northern Water Mitigation Monitors safety enhancements. Construction planning is progressing for the FCCU ESP Over Pressure Mitigation safety enhancements. All long lead materials including elevated water monitors with water supply on/off valve and control panel assemblies as well as control valves for area revamp work to accommodate new steel structure have been ordered. These items are still generally expected to be delivered to the Refinery in the second or third quarter 2021 unless there are delays due to the pandemic.

The building plans for the protective steel structure and water mitigation monitor safety enhancements have been approved by City of Torrance permitting department, and the contractors hired by TORC to complete this work pulled these permitted plans in March 2021.

At this time, TORC believes these enhancements are on schedule for implementation in 2021.

#### **Settler Area Water Mitigation Dome and Curtain**

With respect to the Settler Area Water Mitigation Dome and Curtain enhancements, as you are aware, TORC previously approved funding for detailed engineering and procurement. Detailed engineering has been completed, and TORC has also received approved funding to complete construction of these safety enhancements. Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget includes the amounts required to be expended with respect to the remaining costs of these enhancements.

The construction work packages for the water mitigation dome and curtain were finalized in March 2021.

Construction was kicked off in March 2021. All long lead materials including dome water monitors, spray curtain headers with nozzles, and water supply on/off valve and control panel assemblies having been ordered. These items are still generally expected to be delivered to the Refinery in the second or third quarter 2021 unless there are delays due to the pandemic.

At this time, TORC believes these enhancements are on schedule for implementation in 2021.

#### **Settler Area Enhanced HF/MHF Detection System**

With respect to the Settler Area Enhanced HF/MHF Detection System enhancements, as you are aware, TORC previously approved funding for detailed engineering and procurement. Detailed engineering has been completed, and TORC has also received full funding to complete construction of these safety enhancements. Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget continues to include the amounts required to be expended with respect to the remaining costs of these enhancements.

The construction work packages for the enhanced HF/MHF detection system were finalized in March 2021.

Construction commenced in March 2021. All long lead materials including HF detection instrumentation and Programmable Logic Controller (PLC) having been ordered. These items are still generally expected to be delivered to the Refinery in the second or third quarter 2021 unless there are delays due to the pandemic.

At this time, TORC believes these enhancements are on schedule for implementation in 2021.

Mr. Wayne Nastri, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update*  
May 4, 2021  
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As we have previously reported, due to COVID-19 pandemic impacts, the MHF Alkylation Unit turnaround has been moved to 2022, along with the Fluid Catalytic Cracker turnaround, however, as noted above, the safety enhancements are still on schedule to be completed by the end of 2021.

TORC will continue to closely monitor Engineering, Construction, and Materials availability in connection with the COVID-19 pandemic, and will notify South Coast AQMD of any additional impacts that could result in further schedule delays.

If you have any questions or require any additional information regarding this quarterly update of the safety enhancements, please do not hesitate to contact me at (310) 212-4500.

Sincerely,



Steve Steach  
Refinery Manager

cc: Paul Davis, President, Western Region  
Trecia Canty, Senior Vice President & General Counsel  
Darren Stroud, West Coast Refinery Attorney  
Jill Whynot, South Coast AQMD  
Sarah Rees, South Coast AQMD  
Susan Nakamura, South Coast AQMD  
Barbara Baird, South Coast AQMD  
Daphne Hsu, South Coast AQMD  
Michael Krause, South Coast AQMD

## ANNEX A

<b>Safety Enhancements</b>	<b>First Quarter 2021 Status</b>
Settler Area Protective Steel Structure  Northern Water Mitigation Monitors  Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over Pressure Mitigation	<ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement</li> <li>• Funding approved for Construction of Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</li> <li>• Detailed Engineering in progress               <ul style="list-style-type: none"> <li>○ Construction work packages were finalized in March 2021</li> <li>○ One remaining construction work package to be issued mid-May 2021</li> </ul> </li> <li>• Construction commenced for Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</li> <li>• Construction planning progressing for FCCU ESP Overpressure Mitigation</li> <li>• Ordered long lead materials:               <ul style="list-style-type: none"> <li>○ Elevated water monitors with water supply on/off valve and control panel assemblies</li> <li>○ Control valves for area revamp work to accommodate new steel structure</li> </ul> </li> <li>• Materials planned to be delivered onsite by second or third quarter 2021</li> <li>• Building plans approved by City of Torrance permitting department</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>
Settler Area Water Mitigation Dome and Curtain	<ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement, and Construction</li> <li>• Detailed Engineering has been completed               <ul style="list-style-type: none"> <li>○ Construction work packages were finalized in March 2021</li> </ul> </li> <li>• Construction commenced for these safety enhancements</li> <li>• Ordered long lead materials:               <ul style="list-style-type: none"> <li>○ Dome water monitors, spray curtain headers with nozzles, and water supply on/off valve and control panel assemblies</li> <li>○ Materials planned to be delivered onsite by second or third quarter 2021</li> </ul> </li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>

## ANNEX A

Safety Enhancements	First Quarter 2021 Status
Settler Area Enhanced HF/MHF Detection System	<ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement, and Construction</li> <li>• Detailed Engineering has been completed               <ul style="list-style-type: none"> <li>○ Construction work packages were finalized in March 2021</li> </ul> </li> <li>• Construction commenced for these safety enhancements</li> <li>• Ordered long lead materials:               <ul style="list-style-type: none"> <li>○ HF detection instrumentation</li> <li>○ Programmable Logic Controller (PLC)</li> </ul> </li> <li>• Materials planned to be delivered onsite by second or third quarter 2021</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>

*Third 2021 Quarterly Report*

**Torrance Refining Company LLC**  
3700 W 190<sup>th</sup> Street  
Torrance, CA 90504  
[www.torrancerefinery.com](http://www.torrancerefinery.com)

August 30, 2021

***VIA E-MAIL AND OVERNIGHT MAIL***

Wayne Nastri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

**Subject: *Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update***

Dear Mr. Nastri,

On behalf of Torrance Refining Company LLC ("TORC"), consistent with our November 25, 2019 letter, and as requested by you in your November 15, 2019 letter, below is the second quarter 2021 update regarding the voluntary modified hydrogen fluoride ("MHF") alkylation unit safety enhancement commitments and control measures as proffered TORC's August 30, 2019 Proffer Letter accepted and approved on September 6, 2019 by the South Coast Air Quality Management District ("South Coast AQMD") Governing Board pursuant to Board Resolution No. 19-19 (the "Proffer Letter"). Capitalized terms used in this letter and not otherwise defined shall have the meanings ascribed in the Proffer Letter.

Attached as Annex A is a summary of the current status of the design, purchase, installation, testing, and operational start date of the proffered safety enhancements as of the second quarter 2021. We provide additional detail regarding the status of the enhancements below. Also, attached is Annex B, which are design diagrams and photographs of the progress we have made during the recent July 2021 Torrance Refinery turnaround ("Turnaround").

**Settler Area Protective Steel Structure, Northern Water Mitigation Monitors, and Fluidized Catalytic Cracking Unit ("FCCU") Electrostatic Precipitator ("ESP") Over Pressure Mitigation**

With respect to the Settler Area Protective Steel Structure and Northern Water Mitigation Monitors enhancements, TORC has completed detailed engineering and procurement. All long lead materials including elevated water monitors with water supply on/off valve, control panel assemblies, and control valves for area revamp work have been received.

The building plans for the protective steel structure and water mitigation monitors have been approved by City of Torrance permitting department ("City"), and the contractors hired by TORC to complete this work, pulled the plan permits in March 2021.

The construction work packages for the protective steel structure and the water mitigation monitors safety enhancements have been completed. As a result, as shown in Annex B, during July 2021, construction

Mr. Wayne Nastri, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update*  
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has progressed under the building permits as approved by the City during the Turnaround. Specifically, the new protective steel structure, all foundations have been set, and all structural columns, beams, bracing and roof panels have been erected. Additionally, new northern firewater monitor has been installed and tested, and two other new area perimeter firewater monitors are nearing construction completion.

With respect to the FCCU ESP Over Pressure Mitigation enhancement, TORC has completed detailed engineering and is in the process of procuring the necessary materials for this safety enhancement.

Additionally, TORC has received approved funding to complete construction of this safety enhancement. The construction work package for this safety enhancement has been completed. As a result, construction planning is progressing for this safety enhancement.

Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget continues to include the amounts required to be expended with respect to the remaining costs of these enhancements. At this time, TORC believes these enhancements are on schedule for implementation in 2021.

#### **Settler Area Water Mitigation Dome and Curtain**

With respect to the Settler Area Water Mitigation Dome and Curtain enhancements, TORC has completed detailed engineering and procurement. All long lead materials including dome water monitors, spray curtain headers with nozzles, water supply on/off valve, and control panel assemblies have been received.

The construction work packages for the water mitigation dome and curtain were finalized in March 2021. As a result, as shown in Annex B, during July 2021, construction has progressed under the building permits as approved by the City during the Turnaround. Specifically, the new water mitigation dome monitors and spray curtains have been installed and tested and are in the process of being fully commissioned.

Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget includes the amounts required to be expended with respect to the remaining costs of these enhancements. At this time, TORC believes these enhancements are on schedule for implementation in 2021.

#### **Settler Area Enhanced HF/MHF Detection System**

With respect to the Settler Area Enhanced HF/MHF Detection System enhancements, TORC has completed detailed engineering and procurement. All long lead materials including hydrogen fluoride detection instrumentation and Programmable Logic Controller (PLC) have been received.

The construction work packages for the enhanced HF/MHF detection system were finalized in March 2021. As a result, as shown in Annex B, during July 2021, construction has progressed under the building permits as approved by the City during the Turnaround. Specifically, the new HF/MHF detection systems have been installed and tested and are in the process of being fully commissioned.

Mr. Wayne Nastri, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update*  
August 30, 2021  
Page 3

Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget continues to include the amounts required to be expended with respect to the remaining costs of these enhancements. At this time, TORC believes these enhancements are on schedule for implementation in 2021.

\* \* \*

As we have previously reported, due to COVID-19 pandemic impacts, the MHF Alkylation Unit turnaround has been moved to 2022, along with the FCCU turnaround, however, as noted above, the safety enhancements are still on schedule to be completed by the end of 2021.

TORC will continue to closely monitor Engineering, Construction, and Materials availability in connection with the COVID-19 pandemic and will notify South Coast AQMD of any additional impacts that could result in further schedule delays.

If you have any questions or require any additional information regarding this quarterly update of the safety enhancements, please do not hesitate to contact me at (310) 212-4500.

Sincerely,



Steve Steach  
Refinery Manager

cc: Paul Davis, President, Western Region  
Trecia Canty, Senior Vice President & General Counsel  
Darren Stroud, West Coast Refinery Attorney  
Jill Whynot, South Coast AQMD  
Sarah Rees, South Coast AQMD  
Susan Nakamura, South Coast AQMD  
Barbara Baird, South Coast AQMD  
Daphne Hsu, South Coast AQMD  
Michael Krause, South Coast AQMD

## ANNEX A

<b>Safety Enhancements</b>	<b>Second Quarter 2021 Status</b>
<p>Settler Area Protective Steel Structure</p> <p>Northern Water Mitigation Monitors</p> <p>Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over Pressure Mitigation</p>	<p><u>Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</u></p> <ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement</li> <li>• Funding approved for Construction of Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</li> <li>• Detailed Engineering has been completed</li> <li>• Construction continues for Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</li> <li>• All long lead materials have been received</li> <li>• Building plans approved by City of Torrance permitting department</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul> <p><u>Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over Pressure Mitigation</u></p> <ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement and Construction</li> <li>• Detailed Engineering has been completed</li> <li>• Construction planning progressing for FCCU ESP Overpressure Mitigation</li> <li>• All long lead materials have been ordered and are planned to be delivered onsite by third or fourth quarter 2021</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>
<p>Settler Area Water Mitigation Dome and Curtain</p>	<ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement, and Construction</li> <li>• Detailed Engineering has been completed</li> <li>• Construction continues for these safety enhancements</li> <li>• All long lead materials have been received</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>

**ANNEX A**

<b>Safety Enhancements</b>	<b>Second Quarter 2021 Status</b>
Settler Area Enhanced HF/MHF Detection System	<ul style="list-style-type: none"><li>• Funding approved for Detailed Engineering and Procurement, and Construction</li><li>• Detailed Engineering has been completed</li><li>• Construction work packages were finalized in March 2021</li><li>• Construction continues for these safety enhancements</li><li>• All long lead materials have been received</li><li>• Enhancements currently on schedule for implementation in 2021</li></ul>

*Fourth 2021 Quarterly Report*

**Torrance Refining Company LLC**  
3700 W 190<sup>th</sup> Street  
Torrance, CA 90504  
[www.torrancerefinery.com](http://www.torrancerefinery.com)

November 29, 2021

***VIA E-MAIL AND OVERNIGHT MAIL***

Wayne Nastri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

**Subject: *Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update***

Dear Mr. Nastri,

On behalf of Torrance Refining Company LLC ("TORC"), consistent with our November 25, 2019 letter, and as requested by you in your November 15, 2019 letter, below is the third quarter 2021 update regarding the voluntary modified hydrogen fluoride ("MHF") alkylation unit safety enhancement commitments and control measures as proffered TORC's August 30, 2019 Proffer Letter accepted and approved on September 6, 2019 by the South Coast Air Quality Management District ("South Coast AQMD") Governing Board pursuant to Board Resolution No. 19-19 (the "Proffer Letter"). Capitalized terms used in this letter and not otherwise defined shall have the meanings ascribed in the Proffer Letter.

Attached as Annex A is a summary of the current status of the design, purchase, installation, testing, and operational start date of the proffered safety enhancements as of the third quarter 2021. We provide additional detail regarding the status of the enhancements below. Also, attached is Annex B, which are photographs of the progress made during the recent July 2021 Torrance Refinery turnaround ("Turnaround") and subsequent.

**Settler Area Protective Steel Structure, Northern Water Mitigation Monitors, and Fluidized Catalytic Cracking Unit ("FCCU") Electrostatic Precipitator ("ESP") Over Pressure Mitigation**

The construction work packages for the protective steel structure and the water mitigation monitors safety enhancements have been completed. As a result, as shown in Annex B, during the Turnaround, construction progressed under the building permits as approved by the City of Torrance. Specifically, for the new protective steel structure, all foundations have been set, and all structural columns, beams, and bracing have been erected. Additionally, the roof, north, and west side steel panels have been installed. Remaining construction activities are to complete steel girts, platform modifications, and install east side steel panel, and south side sheeting.

Regarding the water monitors, the new northern firewater monitor has been installed, tested, and in the process of being fully commissioned. See Annex B. The two other new area perimeter firewater monitors have been completed and are in the process of being fully commissioned.

Mr. Wayne Nastri, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update*  
November 29, 2021

Page 2

With respect to the FCCU ESP Over Pressure Mitigation enhancement, TORC has completed detailed engineering and an order has been placed for the necessary materials for this safety enhancement. The construction work package for this safety enhancement has been completed. As a result, as shown in Annex B, construction is progressing for this safety enhancement.

Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget continues to include the amounts required to be expended with respect to the remaining costs of these enhancements. At this time, TORC believes these enhancements are on schedule for implementation in 2021.

#### **Settler Area Water Mitigation Dome and Curtain**

The construction work packages for the water mitigation dome and curtain were finalized in March 2021. As a result, as shown in Annex B, during the Turnaround, construction progressed under the building permits as approved by the City. Specifically, the new water mitigation dome monitors and spray curtains have been installed, tested, and are in the process of being fully commissioned. See Annex B.

Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget includes the amounts required to be expended with respect to the remaining costs of these enhancements. At this time, TORC believes these enhancements are on schedule for implementation in 2021.

#### **Settler Area Enhanced HF/MHF Detection System**

The construction work packages for the enhanced HF/MHF detection system were finalized in March 2021. As a result, as shown in Annex B, during the Turnaround, construction progressed under the building permits as approved by the City. Specifically, the new HF/MHF detection systems have been installed, tested, and are in the process of being fully commissioned. See Annex B.

Notwithstanding the impact of the COVID-19 pandemic on the current economic environment, TORC's 2021 planned budget continues to include the amounts required to be expended with respect to the remaining costs of these enhancements. At this time, TORC believes these enhancements are on schedule for implementation in 2021.

\* \* \*

As we have previously reported, due to COVID-19 pandemic impacts, the MHF Alkylation Unit turnaround has been moved to 2022, along with the FCCU turnaround, however, as noted above, the safety enhancements are still on schedule to be completed by the end of 2021.

TORC will continue to closely monitor Engineering, Construction, and Materials availability in connection with the COVID-19 pandemic and will notify South Coast AQMD of any additional impacts that could result in further schedule delays.

Mr. Wayne Nastro, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly Update*  
November 29, 2021  
Page 3

If you have any questions or require any additional information regarding this quarterly update of the safety enhancements, please do not hesitate to contact me at (310) 212-4500.

Sincerely,



Steve Steach  
Refinery Manager

cc: Paul Davis, President, Western Region  
Trecia Canty, Senior Vice President & General Counsel  
Darren Stroud, West Coast Refinery Attorney  
Jill Whynot, South Coast AQMD  
Sarah Rees, South Coast AQMD  
Susan Nakamura, South Coast AQMD  
Barbara Baird, South Coast AQMD  
Daphne Hsu, South Coast AQMD  
Michael Krause, South Coast AQMD

## ANNEX A

Safety Enhancements	Third Quarter 2021 Status
Settler Area Protective Steel Structure  Northern Water Mitigation Monitors  Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over Pressure Mitigation	<u>Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</u> <ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement</li> <li>• Funding approved for Construction of Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</li> <li>• Detailed Engineering has been completed</li> <li>• All long lead materials have been received</li> <li>• Building plans approved by City of Torrance permitting department</li> <li>• Construction continues for Settler Area Protective Steel Structure</li> <li>• Northern Water Mitigation Monitors have been completed and are in the process of being fully commissioned</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul> <u>Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over Pressure Mitigation</u> <ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement and Construction</li> <li>• Detailed Engineering has been completed</li> <li>• All long lead materials have been ordered and are planned to be delivered onsite by third or fourth quarter 2021</li> <li>• Construction progressing for FCCU ESP Overpressure Mitigation</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>
Settler Area Water Mitigation Dome and Curtain	<ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement, and Construction</li> <li>• Detailed Engineering has been completed</li> <li>• All long lead materials have been received</li> <li>• Construction of water mitigation dome monitors and spray curtains completed, being tested, and are in the process of being fully commissioned</li> <li>• Enhancements currently on schedule for implementation in 2021</li> </ul>

## ANNEX A

Safety Enhancements	Third Quarter 2021 Status
Settler Area Enhanced HF/MHF Detection System	<ul style="list-style-type: none"><li>• Funding approved for Detailed Engineering and Procurement, and Construction</li><li>• Detailed Engineering has been completed</li><li>• Construction work packages were finalized in March 2021</li><li>• All long lead materials have been received</li><li>• Construction of settler area enhanced HF/MHF detection system completed, being tested, and are in the process of being fully commissioned</li><li>• Enhancements currently on schedule for implementation in 2021</li></ul>

## ANNEX B

**Structure North Wall View With Roof, North, and West Panels Installed**



**ANNEX B**

**New Northern Firewater Monitor Flow Test**



**ANNEX B**

**FCCU ESP Over Pressure Mitigation Enhancement Construction**



## ANNEX B

**FCCU ESP Over Pressure Mitigation Enhancement Construction**



**ANNEX B**

**Dome Monitor and Spray Curtain – Flow Test (Before Side Panels Installed)**



*First 2022 Quarterly Report*

**Torrance Refining Company LLC**  
3700 W 190<sup>th</sup> Street  
Torrance, CA 90504  
[www.torrancerefinery.com](http://www.torrancerefinery.com)

February 11, 2022

***VIA E-MAIL AND OVERNIGHT MAIL***

Wayne Nastri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

**Subject: *Torrance Refining Company LLC Proffer Letter Commitments  
Quarterly and Final Update***

Dear Mr. Nastri,

On behalf of Torrance Refining Company LLC ("TORC"), consistent with our November 25, 2019 letter, and as requested by you in your November 15, 2019 letter, below is the fourth quarter 2021, and final, update regarding the voluntary modified hydrogen fluoride ("MHF") alkylation unit safety enhancement commitments and control measures as proffered TORC's August 30, 2019 Proffer Letter accepted and approved on September 6, 2019 by the South Coast Air Quality Management District ("South Coast AQMD") Governing Board pursuant to Board Resolution No. 19-19 (the "Proffer Letter"). Capitalized terms used in this letter and not otherwise defined shall have the meanings ascribed in the Proffer Letter.

Attached as Annex A is a summary of the final status of the design, purchase, installation, testing, and implementation of the proffered safety enhancements as of the fourth quarter 2021. We provide additional detail regarding the final status of the enhancements below. Also, attached is Annex B, which are photographs of the progress of the enhancements since the July 2021 Torrance Refinery turnaround.

**Settler Area Protective Steel Structure, Northern Water Mitigation Monitors, and Fluidized Catalytic Cracking Unit ("FCCU") Electrostatic Precipitator ("ESP") Over Pressure Mitigation**

For the new protective steel structure:

- All foundations are set;
- All structural columns, beams, and bracing are erected;
- All side steel panels are installed; and
- The steel girts and platform modifications are completed.

See Annex B.

Mr. Wayne Nastri, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly and*  
February 11, 2022 *Final Update*  
Page 2

Regarding the water monitors, the new northern firewater monitor and the other two new area perimeter firewater monitors are installed, tested, and commissioned. See Annex B.

With respect to the FCCU ESP Over Pressure Mitigation enhancement, this safety enhancement is completed. See Annex B.

TORC completed these safety enhancements in 2021 as planned.

#### **Settler Area Water Mitigation Dome and Curtain**

The new water mitigation dome monitors and spray curtains are installed, tested, and commissioned. See Annex B.

TORC completed these safety enhancements in 2021 as planned.

#### **Settler Area Enhanced HF/MHF Detection System**

The new HF/MHF detection systems are installed, tested, and commissioned. See Annex B.

TORC completed these safety enhancements in 2021 as planned.

\* \* \*

In conclusion, TORC has successfully completed all the voluntary MHF alkylation unit safety enhancements in year 2021. As a result, TORC has met all its commitments and obligations under the Proffer Letter.

If you have any questions or require any additional information regarding this final quarterly update of the safety enhancements, please do not hesitate to contact me at (310) 212-4500.

Sincerely,



Jerry Forstell  
Refinery Manager

Mr. Wayne Nastri, *Re: Torrance Refining Company LLC Proffer Letter Commitments Quarterly and*  
February 11, 2022 *Final Update*  
Page 3

cc: Paul Davis, President, Western Region  
Trecia Canty, Senior Vice President & General Counsel  
Steve Steach, Senior Vice President, Head of Refining  
Darren Stroud, West Coast Refinery Attorney  
Jill Whynot, South Coast AQMD  
Sarah Rees, South Coast AQMD  
Susan Nakamura, South Coast AQMD  
Barbara Baird, South Coast AQMD  
Daphne Hsu, South Coast AQMD  
Michael Krause, South Coast AQMD

## ANNEX A

Safety Enhancements	Fourth Quarter 2021 and Final Status
Settler Area Protective Steel Structure  Northern Water Mitigation Monitors  Fluidized Catalytic Cracking Unit (FCCU) Electrostatic Precipitator (ESP) Over Pressure Mitigation	<u>Settler Area Protective Steel Structure and Northern            Water Mitigation Monitors</u> <ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement</li> <li>• Funding approved for Construction of Settler Area Protective Steel Structure and Northern Water Mitigation Monitors</li> <li>• Detailed Engineering completed</li> <li>• All long lead materials received</li> <li>• Building plans approved by City of Torrance permitting department</li> <li>• Construction completed for Settler Area Protective Steel Structure</li> <li>• Northern Water Mitigation Monitors installed, tested, and commissioned</li> <li>• Enhancements implemented in 2021</li> </ul> <u>Fluidized Catalytic Cracking Unit (FCCU)            Electrostatic Precipitator (ESP) Over Pressure            Mitigation</u> <ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement and Construction</li> <li>• Detailed Engineering completed</li> <li>• All long lead materials ordered and received</li> <li>• Construction completed for FCCU ESP Overpressure Mitigation</li> <li>• Enhancement implemented in 2021</li> </ul>
Settler Area Water Mitigation Dome and Curtain	<ul style="list-style-type: none"> <li>• Funding approved for Detailed Engineering and Procurement, and Construction</li> <li>• Detailed Engineering completed</li> <li>• All long lead materials received</li> <li>• Construction of water mitigation dome monitors and spray curtains installed, tested, and commissioned</li> <li>• Enhancements implemented in 2021</li> </ul>

**ANNEX A**

<b>Safety Enhancements</b>	<b>Fourth Quarter 2021 Status</b>
Settler Area Enhanced HF/MHF Detection System	<ul style="list-style-type: none"><li>• Funding approved for Detailed Engineering and Procurement, and Construction</li><li>• Detailed Engineering completed</li><li>• Construction work packages finalized</li><li>• All long lead materials received</li><li>• Construction of settler area enhanced HF/MHF detection system installed, tested, and commissioned</li><li>• Enhancements implemented in 2021</li></ul>

## ANNEX B

### Overall Protective Structure and Area Firewater Monitors Completed



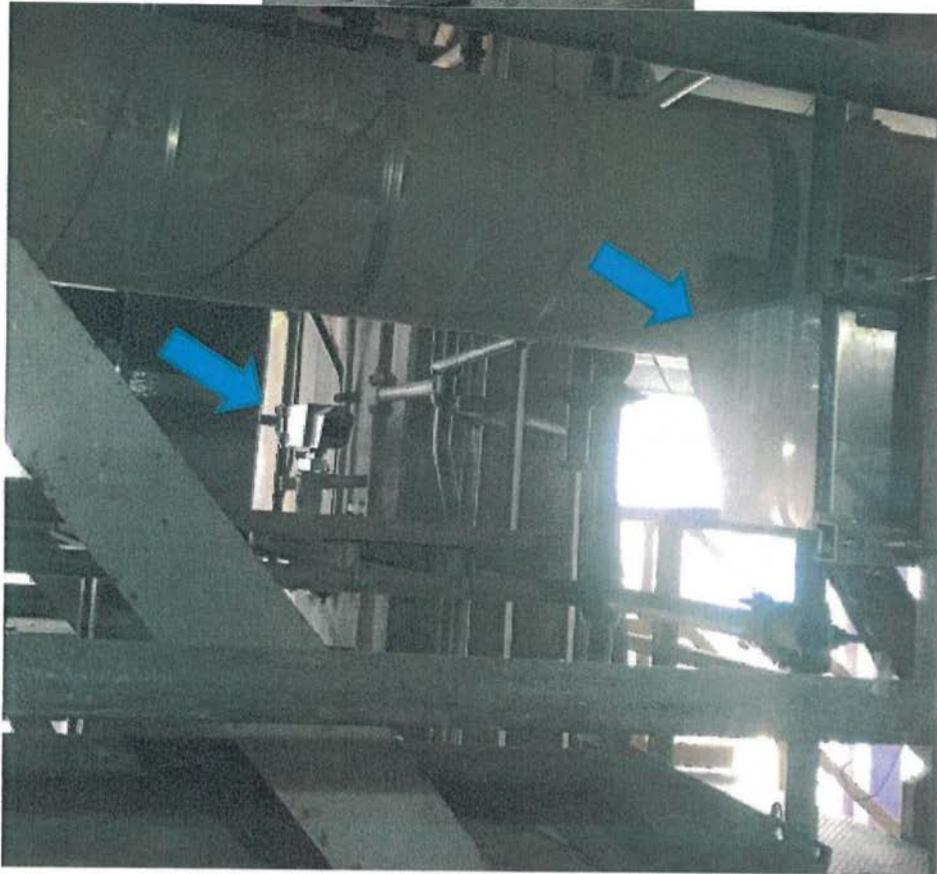
## ANNEX B

### New Northern Firewater Monitor Flow Test



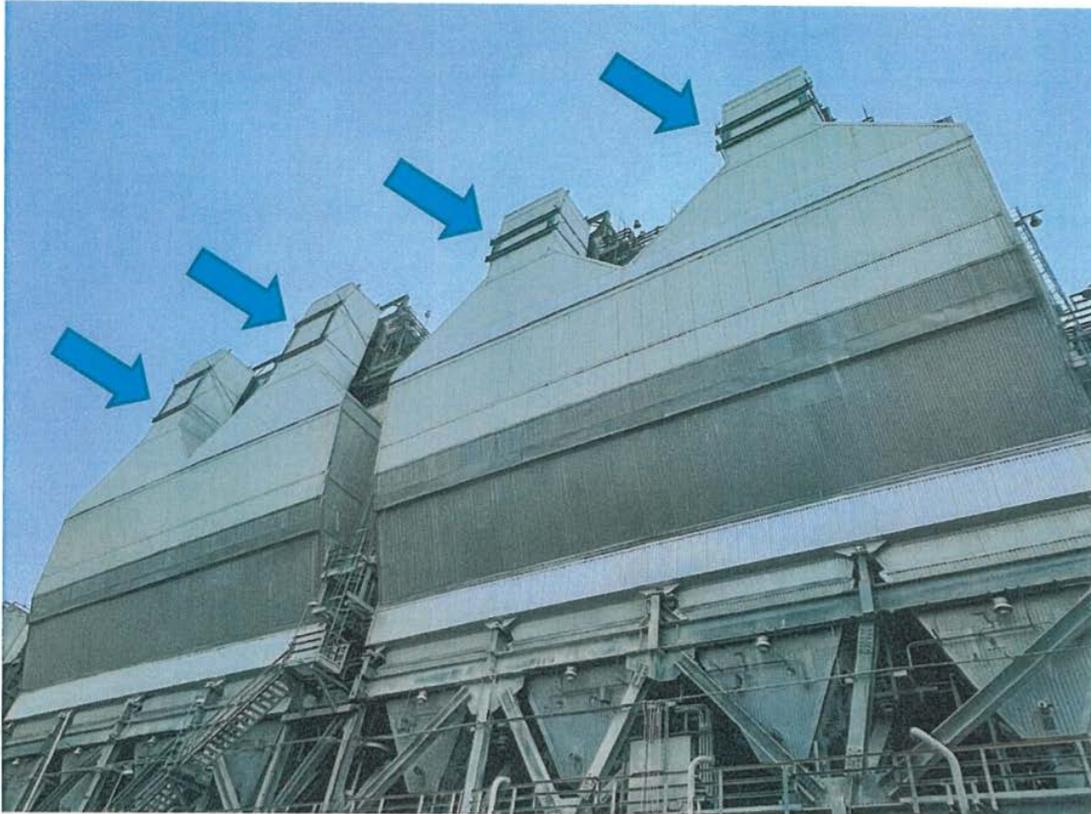
### ANNEX B

#### Examples of New Enhanced HF Detection



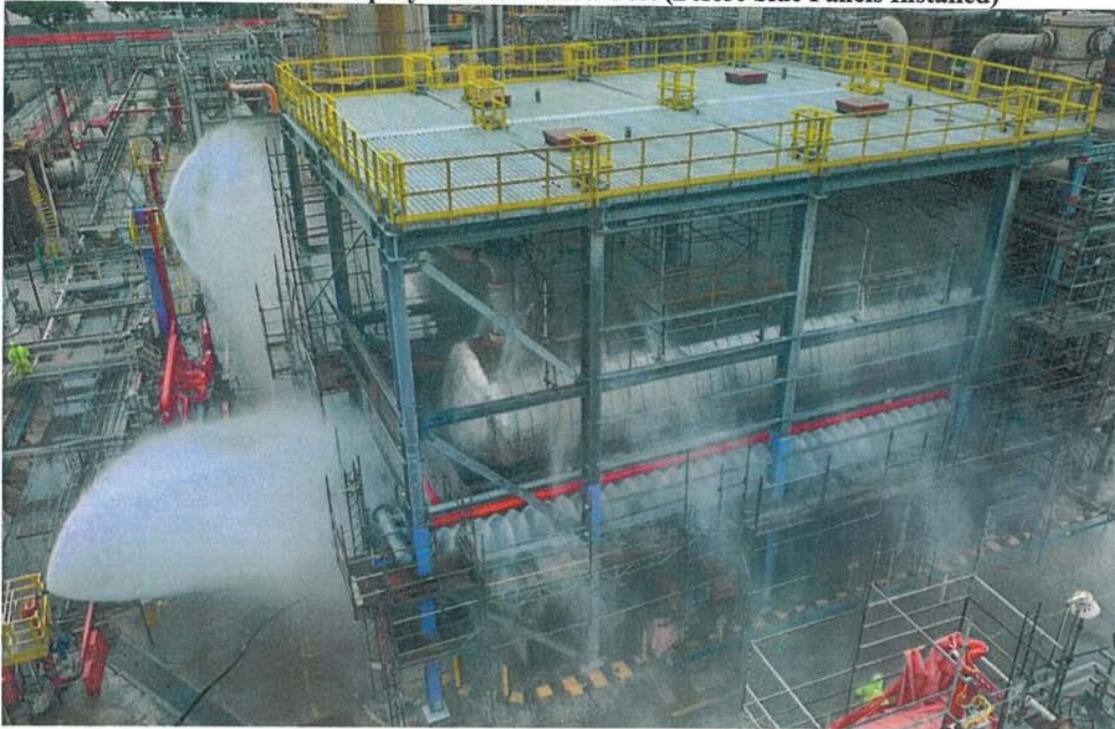
## ANNEX B

### FCCU ESP Over Pressure Mitigation Enhancement Completed



## ANNEX B

**Dome Monitor and Spray Curtain – Flow Test (Before Side Panels Installed)**



Appendix II – Ultramar (Valero Refinery) Quarterly Reports  
First 2021 Quarterly Report



January 29, 2021

Mr. Wayne Natri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

Dear Mr. Natri,

In response to your November 15, 2019 request for quarterly updates regarding implementation of the enhanced mitigation measures described in my August 30, 2019 letter to the Hon. Larry McCallon, Chair of the Refinery Committee of the Board of the South Coast Air Quality Management District, Ultramar Inc. (hereafter “Valero”) provides the following update for the fourth quarter of 2020.

Valero continues to actively progress all aspects of the commitments detailed in our August 30, 2019 Proffer letter and is on track to complete all projects based on the milestones outlined in our letter notwithstanding the COVID-19 pandemic that continues to impact society. While it is possible that the continuing fallout of the pandemic could lead to material, labor and / or agency approval delays, we are not aware of any specific potential delays at this time. The projects outlined in our letter include:

- *Item 1 - Installation of Open Path Perimeter HF Sensors.* Valero committed to install open path detection monitors around the perimeter of the alkylation unit within one year of adoption of the Board’s resolution in this matter, i.e., by September 6, 2020. This project has been completed and was fully commissioned by August 28, 2020, as noted in our September 2, 2020 letter.
- *Item 2 - Installation of Flange Guards.* Valero committed to install flange guards on each flange in the alkylation unit in main acid service greater than 2 inches in diameter by the completion of the next scheduled turnaround. To date, we have installed several flange guards for trial use to confirm they meet the objectives. The number and locations of these flange guards has been finalized. Orders for these guards will be completed after full funding of the project, but well before the end of this year. We remain on schedule to have all committed flange guards in place by completion of the next scheduled Alky ReVAP turnaround.
- *Item 3 - Automation of Water Curtain System.* Valero committed to automation of the water curtain system upon completion of the next scheduled Alky ReVAP turnaround. Engineering funding was approved in September 2019 for this project. Preliminary engineering design was completed in May. The refinement engineering phase has been funded and this work is over 80% complete with associated sensor electronics and PLC orders placed in early November, 2020. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.
- *Item 4 - Installation of Additional Point Source Detectors.* In conjunction with the water curtain automation project described above, Valero committed to install additional point source detectors by completion of the next scheduled Alky ReVAP turnaround. As noted above, engineering funding was approved in September 2019, preliminary engineering was completed in May, with refinement engineering over 80% complete. There will be 13 additional point source detectors installed. It should be noted that we will also be installing an additional 24 open path detectors as part of the

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water automation scope. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.

- **Item 5 - Acid Settler Debris Grid.** Valero committed to develop a preliminary engineering design for a debris grid as described in Valero's August 30, 2019 letter within 180 days of the District's acceptance of Valero's proffer; based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the debris grid preliminary design is to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was funded and is over 80% complete. The associated structural steel package was submitted to City of LA for plan check on January 18, 2021. No issues have been identified to date in the preliminary design work that would prevent implementation of this project by completion of the next scheduled Alky ReVAP turnaround.
- **Item 6 - Acid Settler Riser/Leg Rain Out Barrier/Shroud.** Valero committed to develop a preliminary engineering design for barrier/shroud systems for the acid settler risers and legs and the depropanizer acid boot, as described in Valero's August 30, 2019 letter, within 180 days of the District's acceptance of Valero's proffer. Based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the barrier/shroud preliminary engineering designs are to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was funded and is over 80% complete. The associated structural steel package was submitted to City of LA for plan check on January 18, 2021. No issues have been identified to date in the preliminary design work that would prevent implementation of this project by completion of the next scheduled Alky ReVAP turnaround.

We hope this information is helpful to you. We will provide another update on or before April 30, 2021.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Mark Phair'.

Mark Phair  
Vice President and General Manager

CC (e-mail): Hon. Dr. William A. Burke, SCAQMD Governing Board Chair  
Hon. Mayor Larry McCallon, SCAQMD Governing Board Member/Refinery Committee Chair

*Second 2021 Quarterly Report*

April 30, 2021

Mr. Wayne Nastri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

Dear Mr. Nastri,

In response to your November 15, 2019 request for quarterly updates regarding implementation of the enhanced mitigation measures described in my August 30, 2019 letter to the Hon. Larry McCallon, Chair of the Refinery Committee of the Board of the South Coast Air Quality Management District, Ultramar Inc. (hereafter "Valero") provides the following update for the fourth quarter of 2020.

Valero continues to actively progress all aspects of the commitments detailed in our August 30, 2019 Proffer letter and is on track to complete all projects based on the milestones outlined in our letter notwithstanding the COVID-19 pandemic that continues to impact society. While it is possible that the continuing fallout of the pandemic could lead to material, labor and / or agency approval delays, we are not aware of any specific potential delays at this time. Full funding for all portions of our commitments which have not already been completed is expected by May, 2021, with all installations to be completed by end of the next scheduled Alky ReVAP unit turnaround. The projects outlined in our letter include:

- *Item 1 - Installation of Open Path Perimeter HF Sensors.* Valero committed to install open path detection monitors around the perimeter of the alkylation unit within one year of adoption of the Board's resolution in this matter, i.e., by September 6, 2020. This project has been completed and was fully commissioned by August 28, 2020, as noted in our September 2, 2020 letter.
- *Item 2 - Installation of Flange Guards.* Valero committed to install flange guards on each flange in the alkylation unit in main acid service greater than 2 inches in diameter by the completion of the next scheduled turnaround. To date, we have installed several flange guards for trial use to confirm they meet the objectives, and the number and locations of these flange guards has been finalized. Orders for approximately 260 guards will be completed after full funding of the project, but well before the end of this year. We remain on schedule to have all committed flange guards in place by completion of the next scheduled Alky ReVAP turnaround.
- *Item 3 - Automation of Water Curtain System.* Valero committed to automation of the water curtain system upon completion of the next scheduled Alky ReVAP turnaround. Engineering funding was approved in September 2019 for this project. Preliminary engineering design was completed in May. The refinement engineering phase was completed in March, 2021, including finalization of the Cause and Effect logic. Associated sensor electronics and PLC were received in mid-April. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.

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- *Item 4 - Installation of Additional Point Source Detectors.* In conjunction with the water curtain automation project described above, Valero committed to install additional point source detectors by completion of the next scheduled Alky ReVAP turnaround. As noted above, engineering funding was approved in September 2019, preliminary engineering was completed in May, with refinement engineering completed in March, 2021. As outlined in our January update there will be 13 additional point source detectors installed as well as an additional 21 open path detectors as part of the water automation scope. An additional 3 open path detectors will be installed around the acid boots. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.
- *Item 5 - Acid Settler Debris Grid.* Valero committed to develop a preliminary engineering design for a debris grid as described in Valero's August 30, 2019 letter within 180 days of the District's acceptance of Valero's proffer; based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the debris grid preliminary design is to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was completed in March, 2021. The associated structural steel package was submitted to the City of Los Angeles for plan check on January 18, 2021, with comments received in March. No issues have been identified to date in the preliminary design work that would prevent implementation of this project by completion of the next scheduled Alky ReVAP turnaround.
- *Item 6 - Acid Settler Riser/Leg Rain Out Barrier/Shroud.* Valero committed to develop a preliminary engineering design for barrier/shroud systems for the acid settler risers and legs and the depropanizer acid boot, as described in Valero's August 30, 2019 letter, within 180 days of the District's acceptance of Valero's proffer. Based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the barrier/shroud preliminary engineering designs are to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was completed in March, 2021. The associated structural steel package was submitted to the City of Los Angeles for plan check on January 18, 2021, with comments received in March. No issues have been identified to date in the preliminary design work that would prevent implementation of this project by completion of the next scheduled Alky ReVAP turnaround.

We hope this information is helpful to you. We will provide another update on or before July 31, 2021.

Very truly yours,



Mark Phair  
Vice President and General Manager

CC (e-mail): Hon. Dr. William A. Burke, SCAQMD Governing Board Chair  
Hon. Mayor Larry McCallon, SCAQMD Governing Board Member/Refinery Committee Chair

*Third 2021 Quarterly Report*

July 30, 2021

Mr. Wayne Nastri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

Dear Mr. Nastri,

In response to your November 15, 2019 request for quarterly updates regarding implementation of the enhanced mitigation measures described in my August 30, 2019 letter to the Hon. Larry McCallon, Chair of the Refinery Committee of the Board of the South Coast Air Quality Management District, Ultramar Inc. (hereafter “Valero”) provides the following update for the fourth quarter of 2020.

Valero continues to actively progress all aspects of the commitments detailed in our August 30, 2019 Proffer letter and is on track to complete all projects based on the milestones outlined in our letter notwithstanding the COVID-19 pandemic that continues to impact society. While it is possible that the continuing fallout of the pandemic could lead to material, labor and / or agency approval delays, we are not aware of any specific potential delays at this time. Full funding for all portions of our commitments which have not already been completed was approved on May 7, 2021, with all installations to be completed by end of the next scheduled Alky ReVAP unit turnaround. The projects outlined in our letter include:

- *Item 1 - Installation of Open Path Perimeter HF Sensors.* Valero committed to install open path detection monitors around the perimeter of the alkylation unit within one year of adoption of the Board’s resolution in this matter, i.e., by September 6, 2020. This project has been completed and was fully commissioned by August 28, 2020, as noted in our September 2, 2020 letter.
- *Item 2 - Installation of Flange Guards.* Valero committed to install flange guards on each flange in the alkylation unit in main acid service greater than 2 inches in diameter by the completion of the next scheduled turnaround. To date, we have installed several flange guards for trial use to confirm they meet the objectives, and the number and locations of these flange guards has been finalized. Orders for approximately 260 guards will be completed in the very near future. We remain on schedule to have all committed flange guards in place by completion of the next scheduled Alky ReVAP turnaround.
- *Item 3 - Automation of Water Curtain System.* Valero committed to automation of the water curtain system upon completion of the next scheduled Alky ReVAP turnaround. Engineering funding was approved in September 2019 for this project. Preliminary engineering design was completed in May, 2020. The refinement engineering phase was completed in March, 2021, including finalization of the Cause and Effect logic. Associated sensor electronics and PLC were received in mid-April. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.
- *Item 4 - Installation of Additional Point Source Detectors.* In conjunction with the water curtain automation project described above, Valero committed to install additional point source detectors by completion of the next scheduled Alky ReVAP turnaround. As noted above, engineering funding was approved in September 2019, preliminary engineering was completed in May, 2020, with

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refinement engineering completed in March, 2021. As outlined in our January update there will be 13 additional point source detectors installed as well as an additional 21 open path detectors as part of the water automation scope. An additional 3 open path detectors will be installed around the acid boots. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.

- *Item 5 - Acid Settler Debris Grid.* Valero committed to develop a preliminary engineering design for a debris grid as described in Valero's August 30, 2019 letter within 180 days of the District's acceptance of Valero's proffer; based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the debris grid preliminary design is to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was completed in March, 2021. On July 6, 2021, we received approval from the City of Los Angeles for the associated structural steel. No issues have been identified to date in the design work that would prevent implementation of this project by completion of the next scheduled Alky ReVAP turnaround.
- *Item 6 - Acid Settler Riser/Leg Rain Out Barrier/Shroud.* Valero committed to develop a preliminary engineering design for barrier/shroud systems for the acid settler risers and legs and the depropanizer acid boot, as described in Valero's August 30, 2019 letter, within 180 days of the District's acceptance of Valero's proffer. Based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the barrier/shroud preliminary engineering designs are to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was completed in March, 2021. On July 6, 2021, we received approval from the City of Los Angeles. No issues have been identified to date in the design work that would prevent implementation of this project by completion of the next scheduled Alky ReVAP turnaround.

Some additional key milestones include:

- On June 30, 2021, we responded to comments from the City of Los Angeles concerning the electrical plan check package.
- All contractors will be mobilized for field work by the end of July.
- All purchase orders for engineered items have been issued.
- The California Coastal Commission has issued a CDP waiver.

We hope this information is helpful to you. We will provide another update on or before October 31, 2021.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Mark Phair'.

Mark Phair  
Vice President and General Manager

CC (e-mail): Hon. Ben Benoit, SCAQMD Governing Board Chair  
Hon. Mayor Larry McCallon, SCAQMD Governing Board Member/Refinery Committee Chair

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*Fourth 2021 Quarterly Report*

October 29, 2021

Mr. Wayne Natri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

Dear Mr. Natri,

In response to your November 15, 2019 request for quarterly updates regarding implementation of the enhanced mitigation measures described in my August 30, 2019 letter to the Hon. Larry McCallon, Chair of the Refinery Committee of the Board of the South Coast Air Quality Management District, Ultramar Inc. (hereafter "Valero") provides the following update for the third quarter of 2021.

Valero continues to actively progress all aspects of the commitments detailed in our August 30, 2019 Proffer letter and is on track to complete all projects based on the milestones outlined in our letter notwithstanding the COVID-19 pandemic that continues to impact society. While it is possible that the continuing fallout of the pandemic could lead to material, labor and / or agency approval delays, we are not aware of any specific potential delays at this time. Full funding for all portions of our commitments which have not already been completed was approved on May 7, 2021, with all installations to be completed by end of the next scheduled Alky ReVAP unit turnaround. The projects outlined in our letter include:

- *Item 1 - Installation of Open Path Perimeter HF Sensors.* Valero committed to install open path detection monitors around the perimeter of the alkylation unit within one year of adoption of the Board's resolution in this matter, i.e., by September 6, 2020. This project has been completed and was fully commissioned by August 28, 2020, as noted in our September 2, 2020 letter.
- *Item 2 - Installation of Flange Guards.* Valero committed to install flange guards on each flange in the alkylation unit in main acid service greater than 2 inches in diameter by the completion of the next scheduled turnaround. To date, we have installed several flange guards for trial use to confirm they meet the objectives, and the number and locations of these flange guards has been finalized. Orders for approximately 260 guards will be completed in the very near future. We remain on schedule to have all committed flange guards in place by completion of the next scheduled Alky ReVAP turnaround.
- *Item 3 - Automation of Water Curtain System.* Valero committed to automation of the water curtain system upon completion of the next scheduled Alky ReVAP turnaround. Engineering funding was approved in September 2019 for this project. Preliminary engineering design was completed in May, 2020. The refinement engineering phase was completed in March, 2021, including finalization of the Cause and Effect logic. Associated sensor electronics and PLC were received in mid-April. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.
- *Item 4 - Installation of Additional Point Source Detectors.* In conjunction with the water curtain automation project described above, Valero committed to install additional point source detectors by completion of the next scheduled Alky ReVAP turnaround. As noted above, engineering funding

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was approved in September 2019, preliminary engineering was completed in May, 2020, with refinement engineering completed in March, 2021. As outlined in our January update there will be 13 additional point source detectors installed as well as an additional 21 open path detectors as part of the water automation scope. An additional 3 open path detectors will be installed around the acid boots. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.

- **Item 5 - Acid Settler Debris Grid.** Valero committed to develop a preliminary engineering design for a debris grid as described in Valero's August 30, 2019 letter within 180 days of the District's acceptance of Valero's proffer; based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the debris grid preliminary design is to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was completed in March, 2021. On July 6, 2021, we received approval from the City of Los Angeles for the associated structural steel. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.
- **Item 6 – Acid Settler Riser/Leg Rain Out Barrier/Shroud.** Valero committed to develop a preliminary engineering design for barrier/shroud systems for the acid settler risers and legs and the depropanizer acid boot, as described in Valero's August 30, 2019 letter, within 180 days of the District's acceptance of Valero's proffer. Based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the barrier/shroud preliminary engineering designs are to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was completed in March, 2021. On July 6, 2021, we received approval from the City of Los Angeles. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround.

Some additional key milestones include:

- We have received construction permit approval from the City of Los Angeles.
- All contractors have been mobilized for field work.
- We have received all of the steel for the Acid Settler Debris Grid.
- We have received all material for the Acid Settler Riser / Leg Rain Out Barrier / Shroud.

We hope this information is helpful to you. We will provide another update on or before January 31, 2021.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Mark Phair'.

Mark Phair  
Vice President and General Manager

CC (e-mail): Hon. Ben Benoit, SCAQMD Governing Board Chair  
Hon. Mayor Larry McCallon, SCAQMD Governing Board Member/Refinery Committee Chair

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*First 2022 Quarterly Report*

January 31, 2022

Mr. Wayne Natri  
Executive Officer  
South Coast Air Quality Management District  
21865 Copley Drive  
Diamond Bar, CA 91765

Dear Mr. Natri,

In response to your November 15, 2019 request for quarterly updates regarding implementation of the enhanced mitigation measures described in our August 30, 2019 letter to the Hon. Larry McCallon, Chair of the South Coast Air Quality Management District Refinery Committee, Ultramar Inc. (hereafter "Valero") provides the following update for the fourth quarter of 2021.

Valero continues to actively progress all aspects of the commitments detailed in our August 30, 2019 Proffer letter and is on track to complete all projects based on the milestones outlined in our letter, notwithstanding the COVID-19 pandemic that continues to impact society. While it is possible that the continuing fallout of the pandemic could lead to material, labor and / or agency approval delays, we are not aware of any specific potential delays at this time. Full funding for all portions of our commitments, which have not already been completed were approved on May 7, 2021. All installations will be completed by end of the next scheduled Alky ReVAP unit turnaround in 1Q2022. The projects outlined in our letter include:

- *Item 1 - Installation of Open Path Perimeter HF Sensors.* Valero committed to install open path detection monitors around the perimeter of the alkylation unit within one year of adoption of the Board's resolution in this matter, i.e., by September 6, 2020. This project has been completed and was fully commissioned by August 28, 2020, as noted in our September 2, 2020 letter.
- *Item 2 - Installation of Flange Guards.* Valero committed to install flange guards on each flange in the alkylation unit in main acid service greater than 2 inches in diameter by the completion of the next scheduled turnaround. To date, we have installed 114 flange guards. Delivery of flange guards has been delayed due to material supply and labor shortages. The remaining flange guards are expected to be delivered by January 24, 2022, and installed during the unit turnaround. We remain on schedule to have all committed flange guards in place by completion of the next scheduled Alky ReVAP turnaround in 1Q2022.
- *Item 3 - Automation of Water Curtain System.* Valero committed to automation of the water curtain system upon completion of the next scheduled Alky ReVAP turnaround. Engineering funding was approved in September 2019 for this project. Preliminary engineering design was completed in May, 2020. The refinement engineering phase was completed in March, 2021, including finalization of the Cause and Effect logic. Associated sensor electronics and PLC were received in mid-April. Installation of the water valve modifications and PLC modifications started in August, 2021, and are now 80% complete. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround in 1Q2022.

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- *Item 4 - Installation of Additional Point Source Detectors.* In conjunction with the water curtain automation project described above, Valero committed to install additional point source detectors by completion of the next scheduled Alky ReVAP turnaround. As noted above, engineering funding was approved in September 2019, preliminary engineering was completed in May, 2020, with refinement engineering completed in March, 2021. As outlined in our January update there will be 13 additional point source detectors installed, as well as an additional 21 open path detectors as part of the water automation scope. An additional 3 open path detectors will be installed around the acid boots. Installation of the new point source detectors started August, 2021, and is 85% complete. Installation of new open path detectors started August, 2021, and is 80% complete. We are on schedule to have this project implemented by completion of the next scheduled Alky ReVAP turnaround in 1Q2022.
- *Item 5 - Acid Settler Debris Grid.* Valero committed to develop a preliminary engineering design for a debris grid as described in Valero's August 30, 2019 letter within 180 days of the District's acceptance of Valero's proffer; based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the debris grid preliminary design is to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was completed in March, 2021. On July 6, 2021, we received approval from the City of Los Angeles for the associated structural steel. Construction started in August, 2021, and was completed December 17, 2021.
- *Item 6 - Acid Settler Riser/Leg Rain Out Barrier/Shroud.* Valero committed to develop a preliminary engineering design for barrier/shroud systems for the acid settler risers and legs and the depropanizer acid boot, as described in Valero's August 30, 2019 letter, within 180 days of the District's acceptance of Valero's proffer. Based on the Board's adoption of Resolution No. 19-19 on September 6, 2019, the barrier/shroud preliminary engineering designs are to be completed by March 4, 2020. Preliminary design engineering has been completed, with the results sent to you on March 3, 2020. The refinement phase of engineering was completed in March, 2021. On July 6, 2021, we received approval from the City of Los Angeles. Construction started in August, 2021, and was completed December 17, 2021.

Some additional key milestones include:

- We have received City of Los Angeles Structural Inspection final sign off.
- We have received final Electrical sign off from the City of LA electrical inspector.

We hope this information is helpful to you. We will provide another update on or before April 29, 2022.

Very truly yours,



Kyle Sharon  
Vice President and General Manager

CC (e-mail): Hon. Ben Benoit, SCAQMD Governing Board Chair  
Hon. Mayor Larry McCallon, SCAQMD Governing Board Member/Refinery Committee Chair

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