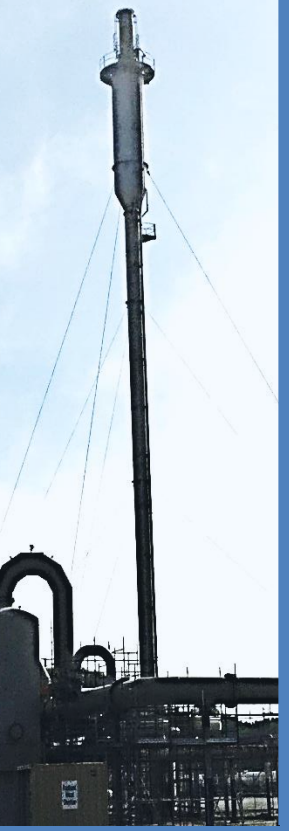
Proposed Amended Rule 1118 – Control of Emissions from Refinery Flares

PUBLIC WORKSHOP

5/11/2017

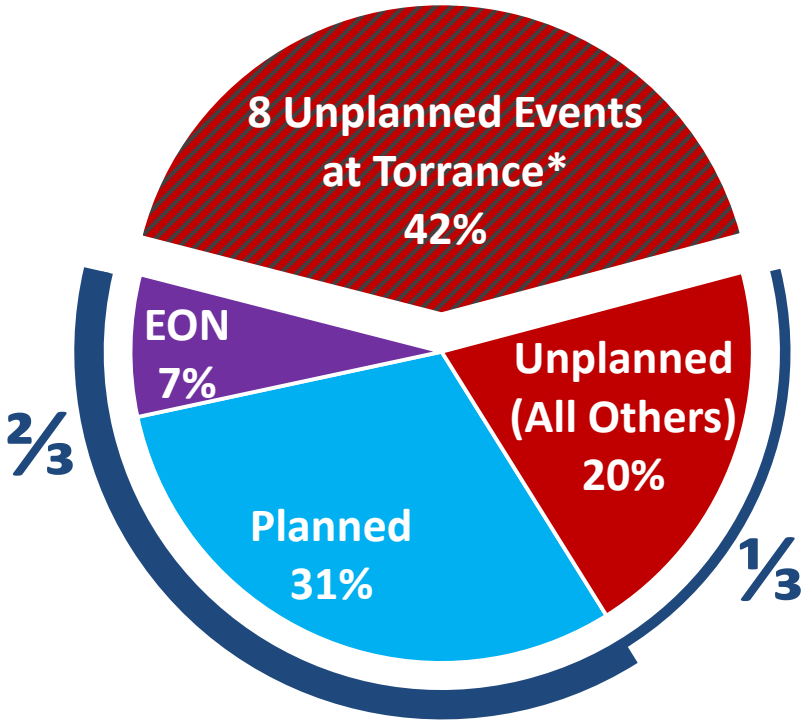


Background

- Flaring events and related emissions from refineries have declined in past decades, but significant flaring still occurs
  - 1,179 tons SOx reported between 2012-2016, or ~3% of air basin total SOx
- Flaring provides two important functions in the refining process
  - Critical safety feature to control combustible gas releases
  - Reduces emissions of some pollutants through combustion
- Flaring emissions includes pollutants such as SOx, VOCs, PM, and toxic air contaminants
- Rule 1118 applies to 31 flares operated at 12 facilities

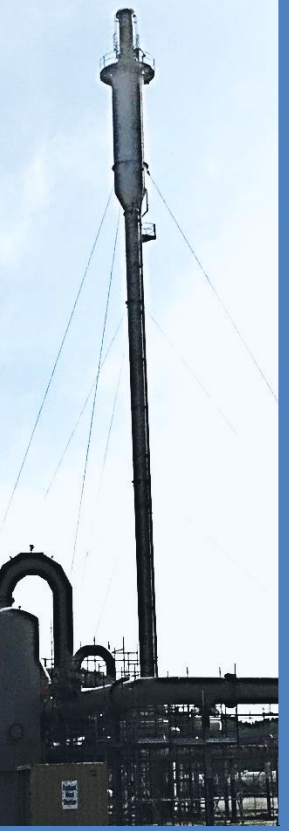
Unplanned vs. Planned Flaring (cont'd)

- Refineries report 15 detailed categories of flaring to SCAQMD
- Three primary categories
  - Essential Operational Need
    - Fuel gas system imbalances, venting of inert or clean service gases, etc.
  - Planned Events
    - Start-ups / Shut-downs / Turnarounds / Maintenance
  - Unplanned Events
    - Emergencies, power disruptions, natural disasters, etc.
    - Solutions for Torrance Refinery outages being pursued through Hearing Board Order



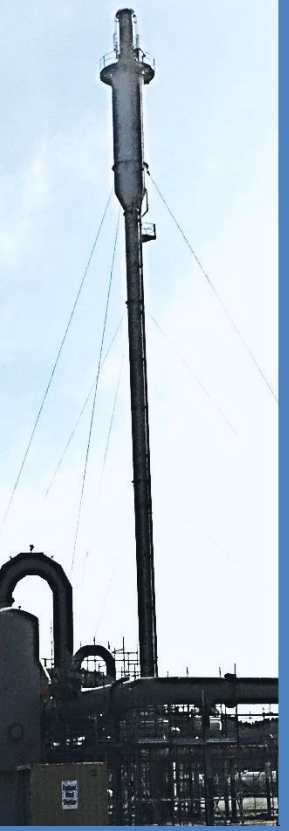
Total Flaring SOx Emissions 2012-2016

**Revisions Pending for Torrance Refinery 2016*



Key Factors Affecting Facility's Ability to Recover Vent Gases Before Flaring

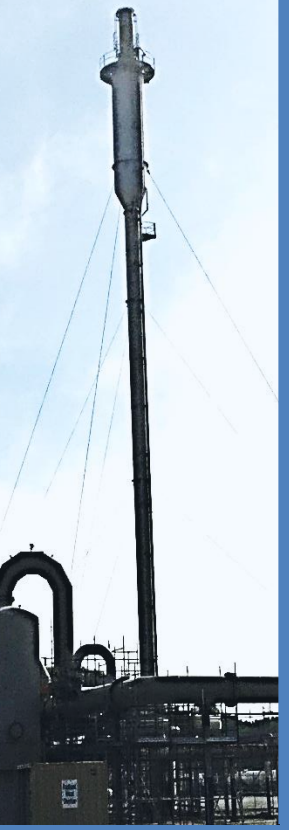
- Capacity of facility's flare gas recovery system (e.g., compressor size)
- Capacity of refinery gas treatment system
- Ability of flare gas to be used as a fuel (e.g., heating value)
- Ability of units in facility to consume recovered flare gas (e.g., cogens, boilers, etc.)
- Timing of start-up / shut-down of individual fuel gas producers and consumers
- Amount of time taken to conduct start-up / shut-down
- Refinery processes/procedures during events that could produce flare gas



Flare Destruction Efficiency

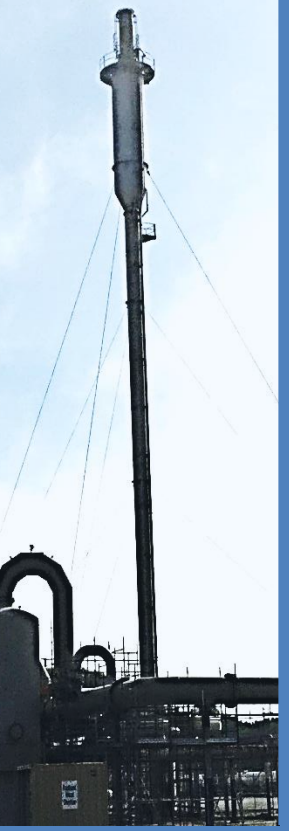
- Flare destruction efficiency a significant factor for reducing VOCs emitted during flaring
- EPA studies evaluating destruction efficiency found VOC emission factor ~10X higher than what is used in Rule 1118
- Recent SCAQMD-funded study that investigated total refinery VOC emissions using optical remote sensing technologies observed one flaring event in 2015

Estimation Method	Pollutants Measured	Emissions (pounds)
Rule 1118 VOC Emission Factor (Reported for 24-hour period)	Total VOC	244
New EPA AP-42 Emission Factor (Using same 24-hour period)	Total VOC	2,556
SCAQMD-funded study (Observed over 4 hour period)	Fraction of VOC (non-methane alkanes only)	6,355 ± 4,103



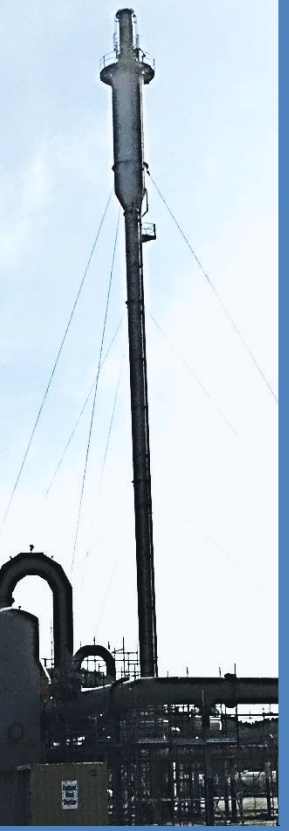
Existing Flaring Requirements

- Significant update to EPA Refinery Sector Rule adopted in 2015
- Rule 1118 last amended in 2005
- 2012 AQMP includes Control Measure MCS-03 regarding improved start-up/shut-down/turnaround procedures, including flaring
  - Proposed phased approach to update Rule 1118 with initial information gathering followed by later potential rule amendments



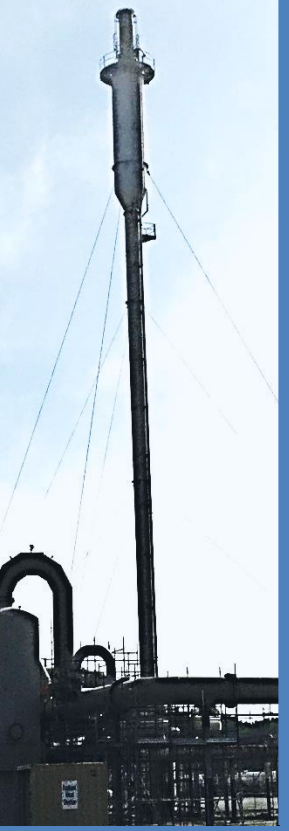
Summary of Key Requirements in Current Rule 1118

- Requirements
  - No visible emissions
  - No combusting vent gas except during start-up, shut-down, turnarounds, emergencies, or essential operational needs
  - Specific Cause Analysis for unplanned events over emission/flow thresholds
- Annual Performance Target
  - 0.5 tons of SOx per million barrels of crude capacity
  - Exceedance of Performance Target requires:
    - Mitigation Fees between $25k and $100k per ton
    - Facilities must prepare and implement a Flare Minimization Plan
  - Externally caused flare events exempt (e.g., power disruption, natural disaster)



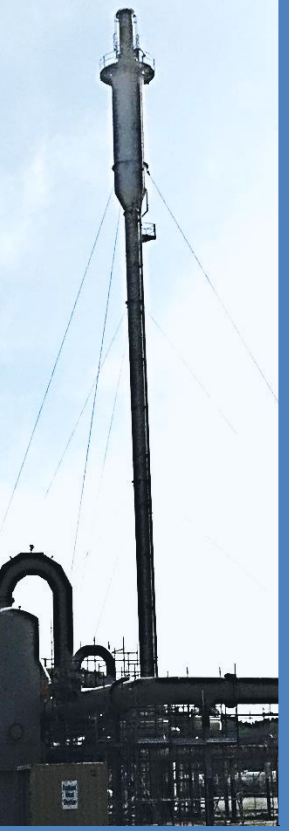
Summary of Key Requirements in Current Rule 1118 (continued)

- Flare Monitoring
  - Facilities must prepare and implement a Flare Monitoring Plan
  - Continuously monitor and record data from flare gas flow rate, heating value, sulfur content
- Reporting and Recordkeeping
  - Facilities must prepare a quarterly report of all flaring events and emissions
  - Record video of flare tip (one frame per minute)
  - Keep records for five years, (90 days for video)
- Notification
  - Notify District 24 hours prior to planned flare event above threshold and within 1 hour after unplanned flare event
    - Standardized email sent to public by District



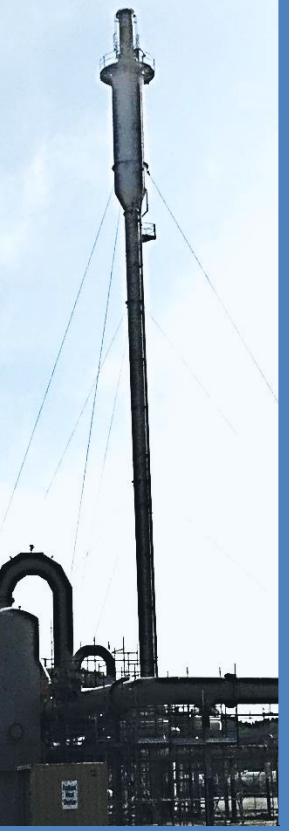
Key Updates to Flaring Portions of EPA Refinery Sector Rule

- Require minimum destruction efficiency of flared gases
  - Ensure adequate heating value of gases in combustion zone
  - Ensure flare tip velocity within limits
- 'Three Strikes' Violations
  - One flare event above smokeless capacity and above either visible emission or flare tip velocity limits if caused by operator error
  - Two flare events above smokeless capacity and either visible emission or flare tip velocity limits with same specific cause in any three year period
  - Three flare events above smokeless capacity and either visible emission or flare tip velocity limits with any cause in any three year period
- Effective date generally January 30, 2019



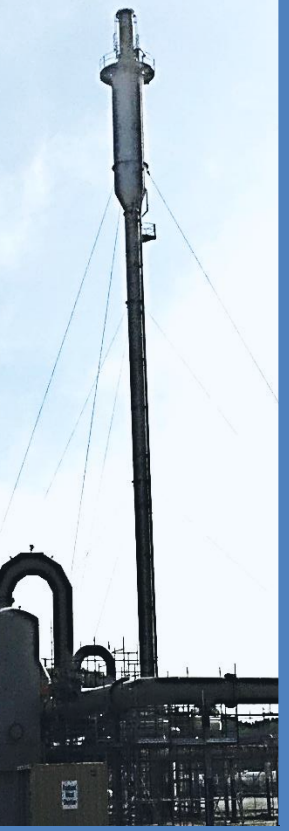
Proposed Rulemaking Approach

- Amend Rule 1118 in two phases
  - Second phase will build upon data collected in first phase
- Phase I
  - Incorporation of key portions of EPA Refinery Sector Rule
  - Requirement that facilities prepare Scoping Document to evaluate feasibility of avoiding or eliminating flaring
  - Remove $4 million annual cap on Mitigation Fees
  - Update Notification and Reporting requirements
  - Update VOC emission factor
  - Remove outdated provisions



Proposed Amendments to Rule 1118 - Harmonization with EPA Rule

- Incorporates 'Three Strikes' violations
  - New steam assist monitoring requirements
  - New calculation of heating value in combustion zone
- Incorporates new limits on heating value of gases in combustion zone
- Effective date generally same as EPA (January 30, 2019)
  - Time is needed for facilities to install new monitoring instruments
  - Moved up submittal of Flare Monitoring Plan to ensure staff has adequate time to review and approve before modifications are made

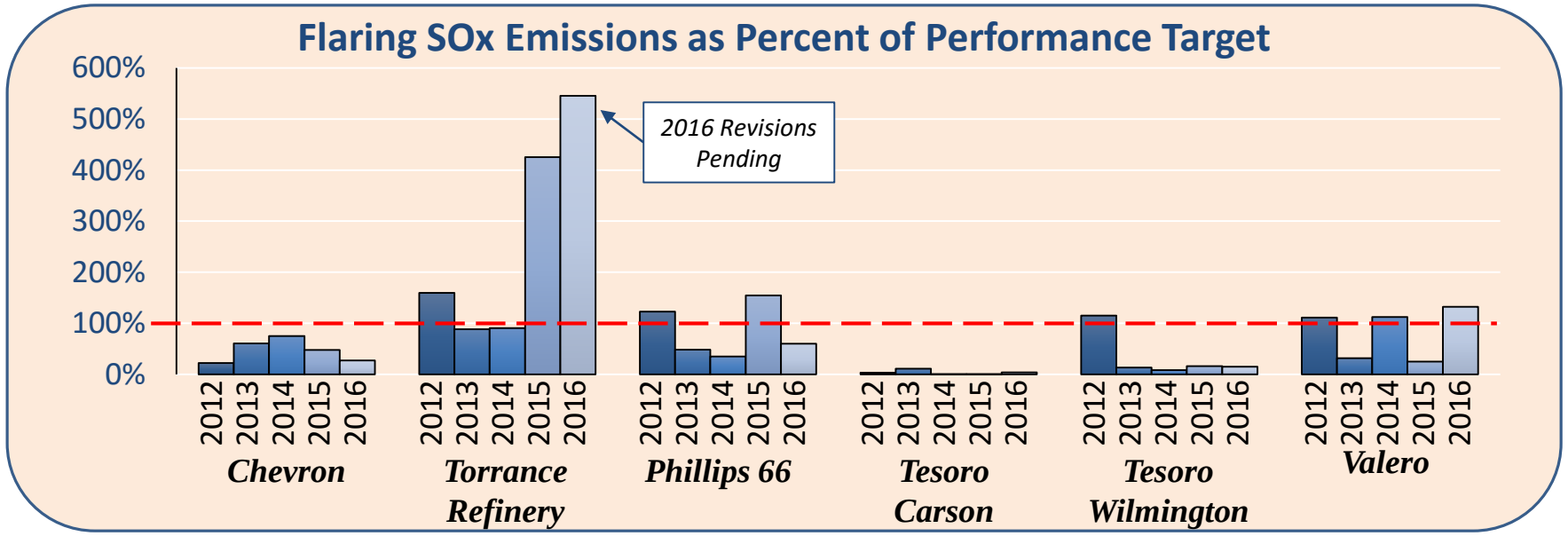


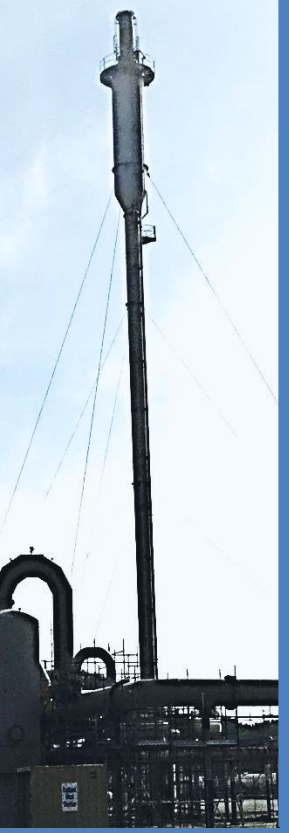
Proposed Amendments to Rule 1118 Scoping Document

- Facilities must submit a Scoping Document by February 2018
  - Evaluate feasibility of reducing emissions from Planned Flare Events to Performance Targets of 0.1, 0.05, and 0.0 tons SOx/mmbbl
  - Evaluate feasibility of reducing emissions from Emergency Flare Events
    - Analyze three alternatives to avoid emergency flaring by January 1, 2021
      - Example: External power disruption → flare gas recovery system + cogeneration units that can utilize flare gases + steam power backup at process units for power loss
  - Potential role for 3rd party technical expert to assist in review of Scoping Documents

Proposed Amendments to Rule 1118 Annual Mitigation Fee Cap Removal

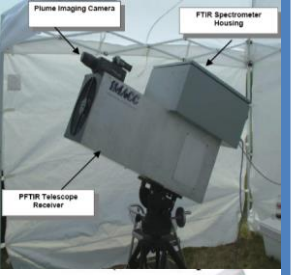
- $4 million annual cap only exceeded in two instances, both times at ExxonMobil (now Torrance Refinery)
  - 2015 explosion resulted in non-standard operations for rest of year
  - Bypass of flare monitor discovered (and removed) in 2013

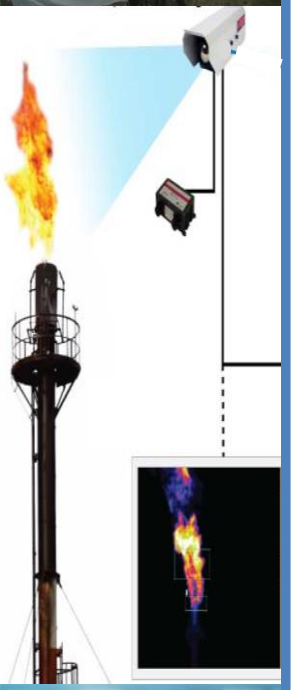




Proposed Amendments to Rule 1118 Updated Notification and Reporting

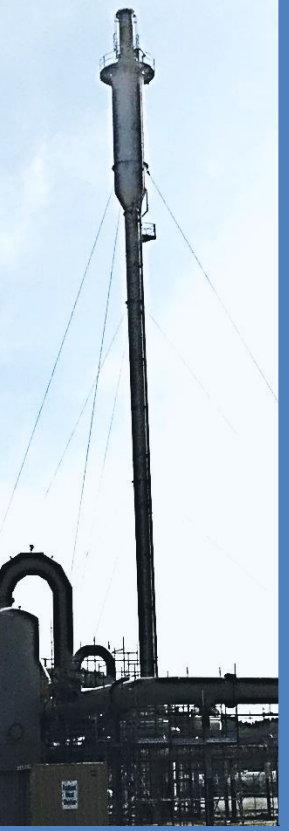
- Specific Cause Analysis now required for Planned Flare Event when:
  - Above visibility or flare tip velocity threshold (EPA requirement)
  - Above emissions threshold and resulting from non-standard operating practice
- Reporting of Planned and Unplanned Flare Events via flaring web-tool
  - Email automatically sent to public for flare events above threshold
- Unplanned Flare Events occurring during a planned start-up, shut-down, or turnaround now must be reported as separate event
  - May require new Specific Cause Analyses





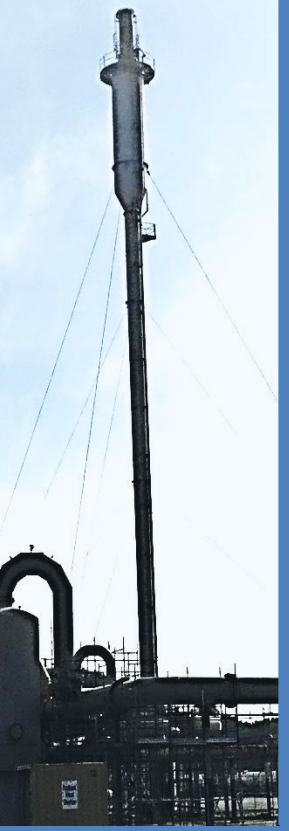
Proposed Flare Optical Remote Sensing Pilot Program

- Goal of Pilot Program is to evaluate ability of ORS technologies to:
  - Provide more accurate quantification of emissions
  - Provide real-time feedback to operator to reduce flaring emissions
- Proposed approach
  - Release Request-For-Information regarding commercially available technologies
  - If ORS technologies available that meet criteria, then release RFP and work with facilities to conduct Pilot Study
  - Validation study may be needed before conducting Pilot Study
  - Successful ORS technologies from Pilot Study would be incorporated into Phase II



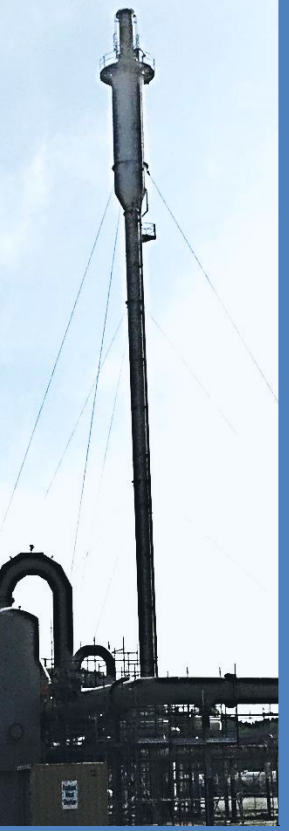
Stakeholder Comments

- Industry feedback
  - Concerned about multiple requirements in short period with 1118 and EPA rule
    - Most new requirements in PAR 1118 are same as EPA rule
    - Differences include Scoping Document and earlier Flare Monitoring Plan submittal date
  - Concerned about second phase of rulemaking
    - Scoping Document provides opportunity for detailed feasibility analysis
  - Video storage
- Community feedback
  - Want less flaring
  - Want more access to flaring emissions data
  - Concern raised about hydrogen cyanide (HCN) emissions
    - No specific data found about HCN emissions from flaring, other refinery processes do emit HCN



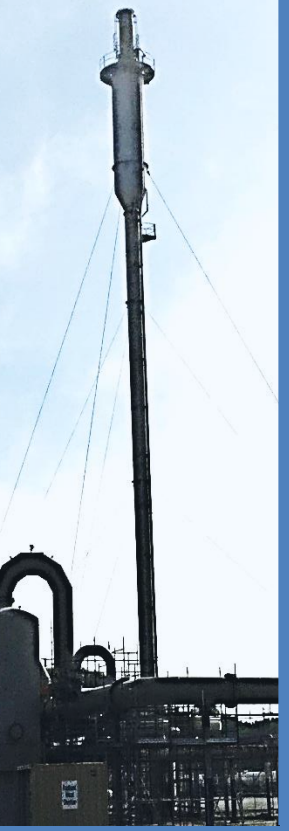
California Environmental Quality Act (CEQA)

- PAR 1118 is considered a project subject to CEQA
- SCAQMD determined that PAR 1118 is exempt from CEQA because:
  - It will consist of basic data collection, research and resource evaluation activities and will not result in a serious or major disturbance to an environmental resource
  - It can be seen with certainty that there is no possibility that the proposed project may have a significant adverse effect on the environment.
- SCAQMD staff will prepare a Notice of Exemption (NOE) per:
  - CEQA Guidelines § 15306 which exempts projects for information-gathering purposes, or as part of a study leading to future action which the agency has not yet taken
  - CEQA Guidelines § 15061(b)(3) – Activities Covered by General Rule
- If PAR 1118 is approved by SCAQMD Governing Board, NOE will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties



Socioeconomic Impact Assessment

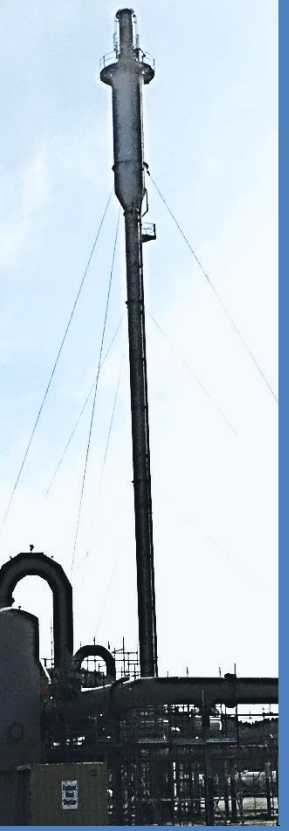
- 12 affected facilities and 31 flares
  - 8 petroleum refinery facilities (NAICS 324110)
  - 4 Chemical manufacturing plants (325120)
  - All located in Los Angeles County
- Key Cost Elements
  - Preparation of the Scoping Document to reduce planned flaring
  - Potential cost of removing the $4 million annual cap on mitigation fees
    - In one instance in 2015, facility would have paid $7.7 million, but only paid $4 million
    - In other instance (bypass valve discovered in 2013), cap would have potentially been exceeded in previous years, but by lower amount



Public Process

- Three Working Group meetings held between February-April 2017
  - One WG in Wilmington, and one in Torrance
- Public Workshop held May 11, 2017
- Stationary Source Committee briefing May 19, 2017
- Set Hearing scheduled for June 2, 2017 Board Meeting
- Adoption Hearing scheduled for July 7, 2017 Board Meeting

- Requesting comments by June 1, 2017



Staff Contacts and Rulemaking Materials

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- Socioeconomic Assessment
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- PAR 1118 Materials available online: http://www.aqmd.gov/home/regulations/rules/proposed-rules#1118