



Benicia Refinery • Valero Refining Company - California

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Submitted via email to vdouglas@baaqmd.gov

April 15, 2022

Draft Language Industrial Hydrogen Plants
Regulation 13, Rule 5
Valero Comments

Victor Douglas
Engineering Division
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105

Dear Mr. Douglas:

Valero Refining Company – California (Valero) offers the following comments regarding the Bay Area Air Quality Management District’s (BAAQMD) draft language on Regulation 13, Rule 5 Industrial Hydrogen Plants (“the proposed Rule”) as revised in March 2022. Valero’s Benicia Refinery is located within the BAAQMD jurisdiction, providing transportation fuels and quality employment opportunities in the Bay Area. The Benicia Refinery will be significantly impacted by the proposed Rule. Valero supports and incorporates by reference the comments submitted by the Western States Petroleum Association (WSPA), of which Valero is a member. Of particular importance, the WSPA letter highlights that the way this proposed Rule is currently written conflicts with guidance from the Intergovernmental Panel on Climate Change. Specifically, this proposed Rule will cause emission leakage, and not net any real reductions in greenhouse gas emissions since the Hydrogen Plant sources are already subject to the California Air Resources Board’s Cap-and-Trade Program.

Valero appreciates BAAQMD staff’s previous efforts to familiarize themselves with the hydrogen system at the Benicia Refinery and understand Valero’s concerns. During multiple site visits, Valero staff spent significant time working with BAAQMD staff regarding our hydrogen plants and configuration and the challenge in balancing the supply and consumption of hydrogen. These visits were followed by multiple online meetings between BAAQMD and Valero staff during which Valero raised specific concerns as summarized herein .

Our main concern is this proposed Rule as written will provide little, if any, positive impact to the environment. As Valero noted in meetings with BAAQMD staff, we believe the best option for the environment is to treat hydrogen venting in a similar way to flaring minimization, through a Hydrogen Venting Minimization Plan. Regulation 12-12

was designed to reduce flaring through a required minimization plan and 60 day reports have been incredibly effective in reducing flaring from the Bay Area refineries. The way the proposed Rule is currently written, flaring is the only feasible path to compliance for the impacted facilities, and there will be a drastic increase in flaring in the Bay Area if the proposed Rule is adopted and implemented. At the Stationary Source and Climate Impacts Committee on February 28th, 2022, BAAQMD staff noted that excess hydrogen could be routed back to the refinery fuel gas system. However, there is limited capacity in terms of volume and heating value in Valero's fuel gas system to accommodate hydrogen venting, so it is not a viable path to compliance. Low BTU (measurement of heating value) will cause instability of the fuel gas system causing significant upset to furnaces/boilers due to swings in the heating value. Valero's hydrogen minimization plan would include routing **some** hydrogen to the fuel gas system.

Valero believes that the overall impact to the environment would be minimized with a Hydrogen Venting Minimization Plan because a large capital project (which creates criteria and toxic emissions during both the construction and operation) would not need to be built. Valero can achieve large reductions in methane emissions through improving control systems and exploring potential operational changes, but it is unlikely these improvements could achieve a 90% reduction.

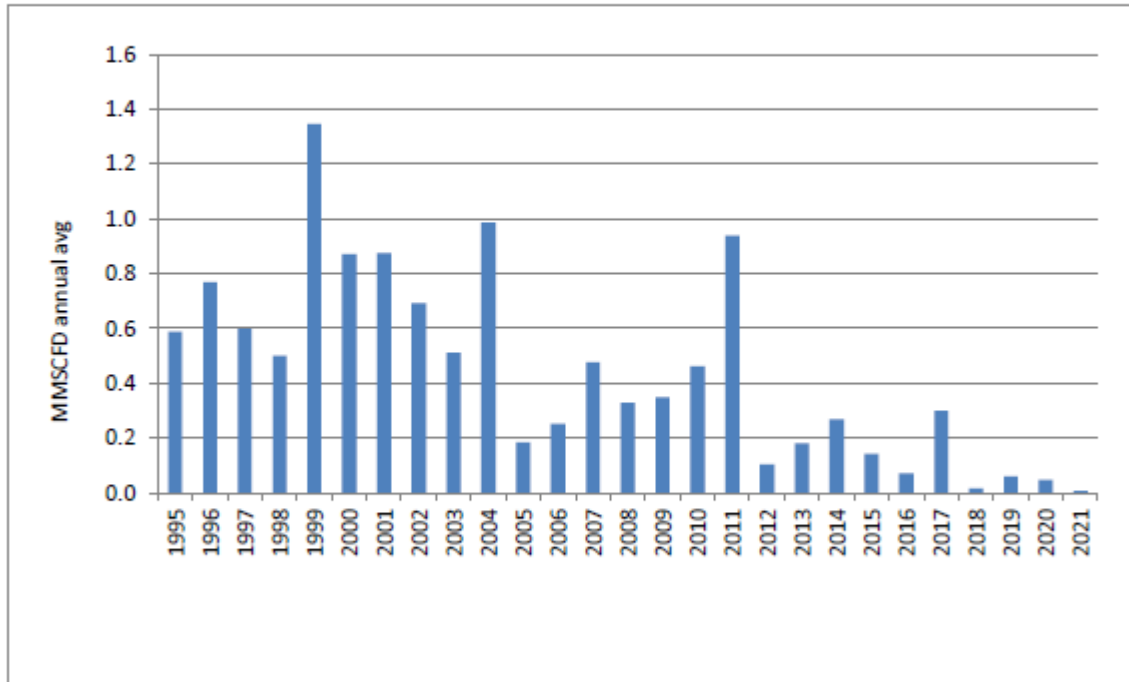
Valero does not support the current draft of the proposed Rule, and believes significant changes need to be made before adoption. Valero offers the following comments and suggests clarifying changes in the rule language.

1. *Build Rule 13-5 around a Hydrogen Venting Minimization Plan*

As noted above and expressed to BAAQMD staff, Valero supports adoption of a Hydrogen Venting Minimization Plan instead of a strict methane or TOC limit. In order to comply with the strict limit, the only feasible method of compliance is using a new and or existing flare. The flare will be a permanent source of criteria, toxic, and greenhouse gas emissions including an increase in NOx emissions by 1.3% as noted by BAAQMD staff at the Feb. 28th, 2022 Stationary Source and Climate Impacts Committee meeting. A minimization plan will still result in some methane emissions from hydrogen plants, but will result in less overall impact to the environment.

The graph below illustrates the success of reducing flaring at our facility through the Flare Minimization Plan.

Figure 1 – Flare Vent Gas Volume

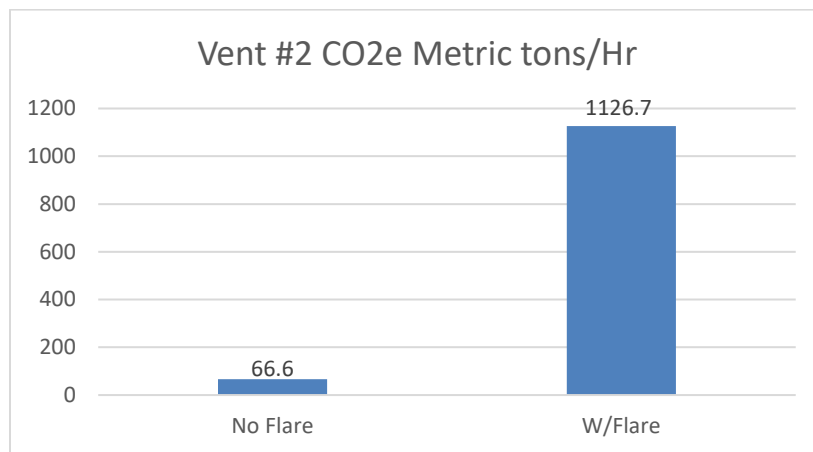


2. Limited Exemption, Deaerator Vents and Carbon Dioxide Scrubbing Vents, and add a limited exemption for high moisture vents: 13-5-104

Valero has a hydrogen vent (Vent #2) that is used during startups and shutdowns that is primarily steam. Frequency of startups and shutdowns is approximately once every three years for each train. The steam makes the vent gas infeasible to combust and will substantially increase GHG emissions due to adding assist gas in an attempt to make the vent gas combustible. Assist gas is required to maintain 98% or better combustion efficiency in the flare. Any vent that has a composition similar to that of the deaerator vent or the CO₂ vent should be added to the limited exemption.

The graph below illustrates that if an exemption for a high steam content vent (Vent #2) is not allowed, the CO₂e emissions will increase from 67 to 1130 metric tons per hour.

Figure 2 – Vent #2 CO2e Metric tons/Hr



Valero has evaluated the option of cooling down the steam in order to remove the water vapor from this vent. However, there is a high risk of corrosion to this equipment due to the intermittent use (once every 2 to 3 years) of the vent, which makes this option infeasible.

Valero offers the language below. Proposed insertions are indicated in bold and italics, with proposed deletions in strikeout:

13-5-104 Limited Exemption, Deaerator Vents and Carbon Dioxide Scrubbing Vents and High Moisture Vents: Deaerator vents, carbon dioxide scrubbing vents, ***or vents with a moisture content above 50% and emissions below 10% of total emissions*** shall be exempt from the requirements in Section 13-5-300 of this Rule.

3. *Emergency, Startup and Shutdown Exemption Lacking*

Valero has hydrogen vents that are used during startup, shutdowns, or emergencies. There are many ways to structure such exemptions— for example, by frequency, duration and percentage of total emissions. Without any emergency startup/shutdown exemptions, Valero would be required to route such vents to a new or existing flare (operating constantly) to accommodate infrequent emergency/shutdown scenarios. Flares require use of additional fossil fuels for pilot and purge gas. They are also a source of criteria air pollutants and toxic air contaminants.

4. *Timeline for Compliance— 13-5-301 & 13-5-401*

As Valero previously noted, the deadline for compliance should provide a reasonable period of time for a regulated entity that must install a control device to commence and complete construction of a project to control following issuance of the ATC. Proposed 13-5-401.1 allows three years after rule adoption for permit application submittal, which

in our view is a reasonable and necessary period of time to complete the detailed engineering required for preparation of a complete permit application.

Proposed 13-5-401.3 states that once the ATC is received, the owner shall commence operation of the control device within three years and does not reference any refinerywide turnaround considerations. While Valero appreciates the change in language from one year to three years for commencement of operations from issuance of ATC, refinery-wide turnaround considerations must be addressed. We propose that the language be altered to include the “next applicable turnaround as indicated in the facility permit application”.

Valero has a unique integrated refinery design which requires refinery wide turnarounds to accomplish certain critical construction tasks.

Valero offers the language below. Proposed insertions are indicated in bold and italics, with proposed deletions in strikeout:

401.3 Within three years of receiving an Authority to Construct from the Air District ***or after the next applicable turnaround***, the owner and/or operator of an industrial hydrogen plant shall commence operation of the control device to comply with Section 13-5-301 requirements.

Valero respectfully requests that proposed 13-5-401 be revised to allow the necessary amount of time to plan and construct a project.

5. Definition of Industrial Hydrogen Plant—13-5-208

“Hydrogen Plant” has been used in the Refining industry for decades to mean a “unit that produces hydrogen via steam methane reformer, shift conversion reactors, etc.” The District should not redefine this term unilaterally for something that is so commonly used in the industry. Valero respectfully requests that the definition be limited to hydrogen units as proposed by the District previously. The distribution/delivery system need not be part of the definition since piping and connections are covered by Regulation 8-18, and therefore would fall under the 13-5-103 exemption. Hydrogen consuming units vary a lot in terms of their processes and are totally different than hydrogen plants. The District’s NSR rules are written for individual sources and are not conducive to permitting “refinery-wide Plants” such as hydrogen, flare and steam plants. The definition should be limited to hydrogen production sources. Regulation 8-2 covers other atmospheric vents. Please note that Valero does not have any atmospheric vents in hydrogen consuming units.

Valero offers the language below. Proposed insertions are indicated in bold and italics, with proposed deletions in strikeout:

13-5-208 Industrial Hydrogen Plant: For purposes of this rule, an industrial hydrogen plant is a comprehensive hydrogen operation including, ~~but not limited to,~~ all operations that produce hydrogen via steam-methane reformation, ~~the hydrogen distribution system, including all compression operations, the hydrogen delivery system that delivers hydrogen streams to the process unit consumers, and any~~

~~disposed, recycled or spent hydrogen streams (or “tail gas”) from the hydrogen consuming process units.~~

6. Monitoring—13-5-501 & 13-5-502

The proposed Rule requires installation of sampling ports for atmospheric vents by the next turnaround and no later than five years after the adoption of the rule. However, as previously discussed between WSPA and BAAQMD, it is unnecessary to monitor atmospheric vents once they are being abated. Therefore, sections 13-5-501 and 13-5-502 need to either be removed or re-written to reflect that once an atmospheric vent is abated these monitoring requirements no longer apply. Also, please see Section 7 below for a suggestion on the definition of “Atmospheric vent”.

Furthermore, Valero proposes periodic source testing rather than daily monitoring for such vents. Source testing is widely accepted, but cannot be performed daily.

In addition, for vents that open during startups/shutdowns and emergencies only, an engineering calculation to estimate emissions would be more appropriate since a “source test” during startups/shutdowns cannot meet the proposed timeline, and emergencies are not scheduled.

Valero assumes that an Authority to Construct will not be required for the installation of flowmeters, temperature, pressure measurement.

7. Reporting & Recordkeeping—13-5-402 & 13-5-06

Reporting should apply to atmospheric vents that are not being abated and only when TOCs are being emitted from them. Typically, a standard is not applied after the control device.

Requiring immediate notification upon discovery not feasible. Monitoring for this Rule will include lab samples and/or source tests, for which results are not obtained until weeks or months after the collection of the sample. Valero suggests event reporting timeline to be consistent with Title V deviation reporting.

Furthermore, 30 days to submit the report is not sufficient to thoroughly evaluate the cause of occurrence. Valero suggests using the timeline in 12-12 flare causal event reporting.

Find below suggested modifications for 13-5-402.

13-5-402.1 Notify the APCO of the venting occurrence ~~immediately upon discovery~~ **within 96 hours of discovery** ~~the beginning~~ of the occurrence if the TOC emissions exceed limits in Section 13-5-301.

402.2 ~~Within 30 days of the discovery of the occurrence~~ the owner or operator shall report the following information to the APCO: the cause of the occurrence; the date and time of the occurrence; data for the duration of the occurrence; the make, model and type of control device; the operating parameters of the control device including temperature, pressure, flow rate, and concentrations of each constituent in the gaseous stream; and the mass emissions for each constituent in the gaseous stream including TOC. **The report is due 60 days following the**

end of the month in which a required notification of the TOC gas venting occurs.

8. General— 13-5-100

Valero requests the following definitions be modified to add clarity and remove ambiguity. Valero offers the language below. Proposed insertions are indicated in bold and italics, with proposed deletions in strikeout:

13-5-101 Description: The purpose of this rule is to limit total organic compounds (TOC) emissions—including methane—from ***atmospheric vents in*** Industrial hydrogen plants.

13-5-102 Applicability: Upon adoption this rule applies to ***atmospheric vents in*** Industrial hydrogen plants including third parties ***that produce hydrogen in industrial hydrogen plants.***

Additionally, an exemption should be added so that atmospheric vents abated by a flare or a thermal oxidizer would be exempted from this rule. Flares are governed by Regulations 12-11 and 12-12. Valero proposes the following language below:

13-5-106 Exemptions, Flares: Atmospheric vents abated by a flare or a thermal oxidizer shall be exempted from this Rule.

9. Definitions 13-5-200

Valero requests the following definition be modified to add clarity and remove ambiguity.

13-5-202 Atmospheric Vent: Replace “during hydrogen plant operations” with “in hydrogen producing units and remove the control device reference. Once a vent is abated, it is no longer an atmospheric vent. It becomes part of the abatement device system such as flare, gas recovery, etc.

13-5-202 Atmospheric Vent: An opening where a gas stream is continuously or periodically discharged ***in hydrogen producing units*** during hydrogen plant operations. Atmospheric vents include openings where a gas or gases are discharged directly to the atmosphere. For the purposes of this rule, an atmospheric vent may be physically located in any portion of a Industrial Hydrogen Plant.

Please contact me at (707) 745-7475 if you have any questions.

Sincerely,



Taryn Wier
Manager Environmental Engineering

April 15th, 2022

Page 8

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