# Bay Area Air Quality Management District

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# Statement of Basis
# For
# Renewal
**of the**
# MAJOR FACILITY REVIEW PERMIT

**for**
## Air Products and Chemicals, Inc.
## Facility #B0295

**A support facility for:**
## Tesoro Refining and Marketing Company
## Facility #B2758 & Facility #B2759

**Facility Address:**
Marathon Refinery
150 Solano Way
Martinez, CA 94553

**Mailing Address:**
1515 Norman Avenue
Santa Clara, CA 95054

October 30, 2022

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# Title V Statement of Basis

This is the renewal permit for a hydrogen gas production process unit that is a support facility for the Marathon Refinery, Tesoro Refining and Marketing Company, LLC (Site No. B2758). Explained in detail in this Statement of Basis, as a support facility, this Air Products and Chemicals, Inc. Title V permit includes the applicable regulatory requirements that would otherwise apply to the No 2 Hydrogen Plant if it was included as part of the Marathon refinery's Title V permit.

## A. Background

This facility is subject to the Operating Permit requirements of Title V of the federal Clean Air Act, Part 70 of Volume 40 of the Code of Federal Regulations (CFR), and BAAQMD Regulation 2, Rule 6, Major Facility Review because it is a support facility of the Marathon Refinery, a major facility as defined by BAAQMD Regulation 2-6-212. The Marathon refinery is a major facility because it has the "potential to emit," as defined by BAAQMD Regulation 2-6-218, of more than 100 tons per year of a regulated air pollutant, than 10 tons per year of a hazardous air pollutant or more than 25 tons per year of a combination of hazardous air pollutants.

Major Facility Operating permits (Title V permits) must meet specifications contained in 40 CFR Part 70 as contained in BAAQMD Regulation 2, Rule 6. The permits must contain all applicable requirements (as defined in BAAQMD Regulation 2-6-202), monitoring requirements, recordkeeping requirements, and reporting requirements. The permit holders must submit reports of all monitoring at least every six months and compliance certifications at least every year.

In the Bay Area, state and District requirements are also applicable requirements and are included in the permit. These requirements can be federally enforceable or non-federally enforceable. All applicable requirements are contained in Sections I through VI of the permit.

Each facility in the Bay Area is assigned a facility number that consists of a letter and a 4-digit number. This facility number is also considered to be the identifier for the permit. The identifier for this facility is A0295.

The proposed 2022 Renewal permit application incorporates the following recent Title V permit application into the permit:

| Application Number(s) (Title V) | Description |
|---|---|
| 23933 | SMR Furnace Burner Replacement Alteration |
| 24173 | S-1031 SMR Furnace Change of Conditions |
| 31854 | Administrative change of Responsible Officer |

## B. Facility Description

Air Products and Chemicals, Inc., (Air Products) owns a Hydrogen Manufacturing Facility that is integrated into the overall Marathon Refinery facility. Hydrocarbon based gases (including

propane, natural gas and/or butane) are received from the refinery via pipeline and used as feedstock. The feedstock is then compressed and passed through a hydrotreater and desulfurizer to remove sulfur (sulfur based odorants are added to natural gas to help detect leaks). Hydrogen is manufactured by reacting hydrocarbon feedstock with steam at high temperatures. By exposing the feedstock to a catalyst in the presence of heat (approximately 1,500 degrees F.) and steam, a chemical reaction takes place that converts the feedstock into hydrogen, carbon monoxide and carbon dioxide. The reaction occurs in a fired process heater called a Steam-Methane Reformer (SMR). The reactants are then passed through a high temperature shift reaction to improve the hydrogen recovery. The carbon monoxide and carbon dioxide are then separated from the hydrogen in the pressure swing adsorbers (PSA). The pure hydrogen is then delivered to the refinery via pipeline. The byproduct carbon monoxide and carbon dioxide waste gas is a low Btu gas used, in addition to natural gas and/or refinery fuel gas, as fuel in the SMR unit.

General Description of an Oil Refinery:

An oil refinery is an intermediary between crude oil and a refined product. It takes dirty, low-value oil originating from the ground and distills it under atmospheric pressure into its primary components: gases (light ends), gasolines, kerosene and diesels (middle distillates), heavy distillates, and heavy bottoms. The heavy bottoms go on to a vacuum distillation unit to be distilled again, this time under a vacuum, to salvage any light ends or middle distillates that did not get separated under atmospheric pressure; the heaviest bottoms continue on to a coker to obtain more components of value.

Other product components are processed by downstream units to be cleaned (hydrotreated), cracked (catalytic or hydrocracking), reformed (catalytic reforming), or alkylated (alkylation) to form gasolines and high-octane blending components, or to have sulfur or other impurities removed to make diesel fuel. Many of these downstream units rely on high purity hydrogen to function as designed. Depending on the process units in a refinery and the crude oil input, an oil refinery can produce a wide range of salable products: many different grades of gasoline and gasoline blend stocks, several grades of diesel, kerosene, jet and aviation fuel, fuel oil, bunker fuels, waxes, solvents, sulfur, coke, asphalt, or chemical plant feedstocks.

A more detailed description of petroleum refinery processes and the resulting air emissions may be found in Chapter 5 of EPA's publication AP-42, Compilation of Air Pollutant Emission Factors. This document may be found at:

http://www.epa.gov/ttn/chief/ap42/ch05/

The principal sources of air emissions from refineries are:

- Combustion units (furnaces, boilers, and cogeneration facilities)
- FCC (Fluidized Catalytic Cracking)
- Storage tanks
- Fugitive emissions from pipe fittings, pumps, and compressors
- Sulfur plants
- Wastewater treatment facilities

The primary source of emissions from the Air Products and Chemicals, Inc. facility is from the SMR combustion units. Combustion unit emissions are generally controlled through the use of burner technology, steam injection, or selective catalytic reduction.

The Air Products and Chemicals, Inc. facility is an integral part of the Marathon Refinery (MR) owned by Tesoro Refining & Marketing Company, LLC Facility B2758-2759. The major integration is as follows:

- Hydrogen Product is delivered to the MR process units
- Process waste gas from startup, shutdown and malfunctions is sent to the MR flare system where is can be recovered as fuel gas or combusted in the GER main flare system.
- Process wastewater is delivered to the MR wastewater system where it is treated in the MR wastewater treatment facility. Emissions from process wastewater are included in the fugitive emissions.
- Electrical Power is provided, in part, by the Martinez Cogen Limited Partnership Facility No. A1820 located in the MR.

Emissions for the facility are shown in the following table. No change from the last renewal permit application.

| **Description** | **Potential to Emit, Tons/yr** | | | | |
|---|---|---|---|---|---|
| | **Organic** | **NOx** | **CO** | **PM** | **SO2** |
| **Hydrogen Plant S-1030 Fugitive Emissions** | **13.35** | **0** | **0** | **0** | **0** |
| **SMR Furnace S-1031 Emissions** | **3.87** | **16.13** | **21.93** | **12.90** | **4.46** |
| **Total Direct Emissions** | **17.22** | **16.13** | **21.93** | **12.90** | **4.46** |
| **Electrical Power** | **0.60** | **3.10** | **3.7** | **0.70** | **1.60** |
| **Flare Emissions** | **0.03** | **0.01** | **0.04** | **0** | **0** |
| **Total Indirect Emissions** | **0.63** | **3.11** | **3.74** | **0.7** | **1.6** |
| **Total Facility Emissions** | **17.85** | **19.24** | **25.67** | **13.6** | **6.06** |

Hazardous Air Pollutants are shown in the following table and are solely based on combustion emissions. Emission factors are the highest found in the Petroleum Refinery Emissions Inventory Guideline, July 2019, Heaters firing Natural Gas and Refinery Gas. Emissions are based on a maximum firing rate of 294 MMBtu/hr, 8760 hours per year, and a 1020 Btu/SCF heating value for the refinery fuel gas. These emissions are conservative since fuel gas is typically recycled PSA gas supplemented by natural gas.

| Category | Substance | Emision Factor | Unit | Hourly Rate (lb/hr) | Yearly Rate (lb/yr) | Yearly Rate (ton/yr) |
|---|---|---|---|---|---|---|
| Halogens | HCl | 8.13E-01 | lbs/MMcf | 2.34E-01 | 5.92E+02 | 2.96E-01 |
| Metals | Antimony | 4.55E-04 | lbs/MMcf | 1.31E-04 | 3.31E-01 | 1.66E-04 |
| Metals | Arsenic | 8.39E-04 | lbs/MMcf | 2.42E-04 | 6.11E-01 | 3.05E-04 |
| Metals | Barium | 3.91E-03 | lbs/MMcf | 1.13E-03 | 2.85E+00 | 1.42E-03 |
| Metals | Beryllium | 1.46E-05 | lbs/MMcf | 4.21E-06 | 1.06E-02 | 5.31E-06 |
| Metals | Cadmium | 5.96E-04 | lbs/MMcf | 1.72E-04 | 4.34E-01 | 2.17E-04 |
| Metals | Chromium (Hex) | 1.28E-03 | lbs/MMcf | 3.69E-04 | 9.32E-01 | 4.66E-04 |
| Metals | Chromium (Total) | 1.16E-03 | lbs/MMcf | 3.34E-04 | 8.44E-01 | 4.22E-04 |
| Metals | Cobalt | 2.13E-04 | lbs/MMcf | 6.14E-05 | 1.55E-01 | 7.75E-05 |
| Metals | Copper | 5.71E-03 | lbs/MMcf | 1.65E-03 | 4.16E+00 | 2.08E-03 |
| Metals | Lead | 2.47E-03 | lbs/MMcf | 7.12E-04 | 1.80E+00 | 8.99E-04 |
| Metals | Manganese | 4.63E-03 | lbs/MMcf | 1.33E-03 | 3.37E+00 | 1.68E-03 |
| Metals | Mercury | 2.41E-04 | lbs/MMcf | 6.95E-05 | 1.75E-01 | 8.77E-05 |
| Metals | Nickel | 4.95E-03 | lbs/MMcf | 1.43E-03 | 3.60E+00 | 1.80E-03 |
| Metals | Phosphorus | 3.52E-04 | lbs/MMcf | 1.01E-04 | 2.56E-01 | 1.28E-04 |
| Metals | Selenium | 4.95E-03 | lbs/MMcf | 1.43E-03 | 3.60E+00 | 1.80E-03 |
| Metals | Silver | 9.69E-04 | lbs/MMcf | 2.79E-04 | 7.05E-01 | 3.53E-04 |
| Metals | Thallium | 1.83E-05 | lbs/MMcf | 5.27E-06 | 1.33E-02 | 6.66E-06 |
| Metals | Zinc | 1.46E-02 | lbs/MMcf | 4.21E-03 | 1.06E+01 | 5.31E-03 |
| PAH | Acenaphthene | 4.08E-06 | lbs/MMcf | 1.18E-06 | 2.97E-03 | 1.48E-06 |
| PAH | Acenaphthylene | 4.00E-06 | lbs/MMcf | 1.15E-06 | 2.91E-03 | 1.46E-06 |
| PAH | Anthracene | 5.83E-06 | lbs/MMcf | 1.68E-06 | 4.24E-03 | 2.12E-06 |
| PAH | Benzo(a)anthracene | 2.02E-05 | lbs/MMcf | 5.82E-06 | 1.47E-02 | 7.35E-06 |
| PAH | Benzo(a)pyrene | 5.19E-05 | lbs/MMcf | 1.50E-05 | 3.78E-02 | 1.89E-05 |
| PAH | Benzo(b)fluoranthene | 2.51E-05 | lbs/MMcf | 7.23E-06 | 1.83E-02 | 9.13E-06 |
| PAH | Benzo(e)pyrene | 1.25E-06 | lbs/MMcf | 3.60E-07 | 9.10E-04 | 4.55E-07 |
| PAH | Benzo(g,h,i)perylene | 1.11E-06 | lbs/MMcf | 3.20E-07 | 8.08E-04 | 4.04E-07 |
| PAH | Benzo(k)fluoranthene | 1.47E-05 | lbs/MMcf | 4.24E-06 | 1.07E-02 | 5.35E-06 |
| PAH | Chrysene | 1.88E-06 | lbs/MMcf | 5.42E-07 | 1.37E-03 | 6.84E-07 |
| PAH | Dibenz(a,h)anthracene | 1.79E-07 | lbs/MMcf | 5.16E-08 | 1.30E-04 | 6.51E-08 |
| PAH | Fluoranthene | 8.71E-06 | lbs/MMcf | 2.51E-06 | 6.34E-03 | 3.17E-06 |
| PAH | Fluorene | 1.66E-05 | lbs/MMcf | 4.78E-06 | 1.21E-02 | 6.04E-06 |
| PAH | Indeno(1,2,3-cd)pyrene | 6.06E-05 | lbs/MMcf | 1.75E-05 | 4.41E-02 | 2.21E-05 |
| PAH | Naphthalene | 4.74E-04 | lbs/MMcf | 1.37E-04 | 3.45E-01 | 1.72E-04 |
| PAH | Phenanthrene | 5.20E-05 | lbs/MMcf | 1.50E-05 | 3.78E-02 | 1.89E-05 |
| PAH | Pyrene | 6.29E-06 | lbs/MMcf | 1.81E-06 | 4.58E-03 | 2.29E-06 |
| SVOC | 2-Methylnaphthalene | 7.80E-05 | lbs/MMcf | 2.25E-05 | 5.68E-02 | 2.84E-05 |
| SVOC | Ethylbenzene | 1.77E-02 | lbs/MMcf | 5.10E-03 | 1.29E+01 | 6.44E-03 |

| Category | Substance | Emision Factor | Unit | Hourly Rate (lb/hr) | Yearly Rate (lb/yr) | Yearly Rate (ton/yr) |
|---|---|---|---|---|---|---|
| SVOC | Perylene | 1.76E-07 | lbs/MMcf | 5.07E-08 | 1.28E-04 | 6.40E-08 |
| SVOC | Phenol | 4.63E-03 | lbs/MMcf | 1.33E-03 | 3.37E+00 | 1.68E-03 |
| VOC | Acetaldehyde | 5.18E-02 | lbs/MMcf | 1.49E-02 | 3.77E+01 | 1.88E-02 |
| VOC | Ammonia | 1.42E-01 | lbs/MMcf | 4.09E-02 | 1.03E+02 | 5.17E-02 |
| VOC | Benzene | 4.76E-02 | lbs/MMcf | 1.37E-02 | 3.46E+01 | 1.73E-02 |
| VOC | Carbonyl Sulfide | 4.56E-01 | lbs/MMcf | 1.31E-01 | 3.32E+02 | 1.66E-01 |
| VOC | Cyanide | 2.66E-03 | lbs/MMcf | 7.67E-04 | 1.94E+00 | 9.68E-04 |
| VOC | Formaldehyde | 9.93E-02 | lbs/MMcf | 2.86E-02 | 7.23E+01 | 3.61E-02 |
| VOC | Hydrogen Sulfide | 8.05E-02 | lbs/MMcf | 2.32E-02 | 5.86E+01 | 2.93E-02 |
| VOC | Propylene | 2.05E-03 | lbs/MMcf | 5.91E-04 | 1.49E+00 | 7.46E-04 |
| VOC | Toluene | 8.39E-02 | lbs/MMcf | 2.42E-02 | 6.11E+01 | 3.05E-02 |
| VOC | Xylene (m,p) | 3.49E-03 | lbs/MMcf | 1.01E-03 | 2.54E+00 | 1.27E-03 |
| VOC | Xylene (o) | 8.80E-03 | lbs/MMcf | 2.54E-03 | 6.40E+00 | 3.20E-03 |
| VOC | Xylene (Total) | 4.16E-02 | lbs/MMcf | 1.20E-02 | 3.03E+01 | 1.51E-02 |
| Halogens | HCl | 8.13E-01 | lbs/MMcf | 2.34E-01 | 5.92E+02 | 2.96E-01 |
| Metals | Arsenic | 8.39E-04 | lbs/MMcf | 2.42E-04 | 6.11E-01 | 3.05E-04 |
| Metals | Beryllium | 1.46E-05 | lbs/MMcf | 4.21E-06 | 1.06E-02 | 5.31E-06 |
| Metals | Cadmium | 5.96E-04 | lbs/MMcf | 1.72E-04 | 4.34E-01 | 2.17E-04 |
| Metals | Chromium (Hex) | 1.28E-03 | lbs/MMcf | 3.69E-04 | 9.32E-01 | 4.66E-04 |
| Metals | Chromium (Total) | 1.16E-03 | lbs/MMcf | 3.34E-04 | 8.44E-01 | 4.22E-04 |
| Metals | Copper | 5.71E-03 | lbs/MMcf | 1.65E-03 | 4.16E+00 | 2.08E-03 |
| Metals | Lead | 9.02E-04 | lbs/MMcf | 2.60E-04 | 6.56E-01 | 3.28E-04 |
| Metals | Manganese | 1.98E-03 | lbs/MMcf | 5.71E-04 | 1.44E+00 | 7.20E-04 |
| Metals | Mercury | 2.41E-04 | lbs/MMcf | 6.95E-05 | 1.75E-01 | 8.77E-05 |
| Metals | Nickel | 5.87E-03 | lbs/MMcf | 1.69E-03 | 4.27E+00 | 2.14E-03 |
| Metals | Selenium | 1.99E-03 | lbs/MMcf | 5.74E-04 | 1.45E+00 | 7.24E-04 |
| Metals | Zinc | 8.61E-03 | lbs/MMcf | 2.48E-03 | 6.27E+00 | 3.13E-03 |
| PAH | Acenaphthene | 1.95E-04 | lbs/MMcf | 5.62E-05 | 1.42E-01 | 7.10E-05 |
| PAH | Acenaphthylene | 8.14E-05 | lbs/MMcf | 2.35E-05 | 5.92E-02 | 2.96E-05 |
| PAH | Anthracene | 3.22E-04 | lbs/MMcf | 9.28E-05 | 2.34E-01 | 1.17E-04 |
| PAH | Benzo(a)anthracene | 1.31E-04 | lbs/MMcf | 3.78E-05 | 9.53E-02 | 4.77E-05 |
| PAH | Benzo(a)pyrene | 4.68E-05 | lbs/MMcf | 1.35E-05 | 3.41E-02 | 1.70E-05 |
| PAH | Benzo(b)fluoranthene | 3.22E-04 | lbs/MMcf | 9.28E-05 | 2.34E-01 | 1.17E-04 |
| PAH | Benzo(e)pyrene | 1.80E-04 | lbs/MMcf | 5.19E-05 | 1.31E-01 | 6.55E-05 |
| PAH | Benzo(g,h,i)perylene | 2.64E-05 | lbs/MMcf | 7.61E-06 | 1.92E-02 | 9.61E-06 |
| PAH | Benzo(k)fluoranthene | 1.01E-04 | lbs/MMcf | 2.91E-05 | 7.35E-02 | 3.68E-05 |
| PAH | Chrysene | 4.76E-04 | lbs/MMcf | 1.37E-04 | 3.46E-01 | 1.73E-04 |
| PAH | Dibenz(a,h)anthracene | 1.63E-05 | lbs/MMcf | 4.70E-06 | 1.19E-02 | 5.93E-06 |

| Category | Substance | Emision Factor | Unit | Hourly Rate (lb/hr) | Yearly Rate (lb/yr) | Yearly Rate (ton/yr) |
|---|---|---|---|---|---|---|
| PAH | Fluoranthene | 7.73E-04 | lbs/MMcf | 2.23E-04 | 5.63E-01 | 2.81E-04 |
| PAH | Fluorene | 1.99E-03 | lbs/MMcf | 5.74E-04 | 1.45E+00 | 7.24E-04 |
| PAH | Indeno(1,2,3-cd)pyrene | 2.69E-05 | lbs/MMcf | 7.75E-06 | 1.96E-02 | 9.79E-06 |
| PAH | Naphthalene | 1.25E-02 | lbs/MMcf | 3.60E-03 | 9.10E+00 | 4.55E-03 |
| PAH | Phenanthrene | 1.52E-03 | lbs/MMcf | 4.38E-04 | 1.11E+00 | 5.53E-04 |
| PAH | Pyrene | 9.37E-04 | lbs/MMcf | 2.70E-04 | 6.82E-01 | 3.41E-04 |
| SVOC | 2-Methylnaphthalene | 2.29E-03 | lbs/MMcf | 6.60E-04 | 1.67E+00 | 8.33E-04 |
| SVOC | Ethylbenzene | 4.73E-02 | lbs/MMcf | 1.36E-02 | 3.44E+01 | 1.72E-02 |
| SVOC | Perylene | 1.62E-05 | lbs/MMcf | 4.67E-06 | 1.18E-02 | 5.89E-06 |
| SVOC | Phenol | 2.23E-02 | lbs/MMcf | 6.43E-03 | 1.62E+01 | 8.11E-03 |
| VOC | 1,1,1-Trichloroethane | 2.90E-02 | lbs/MMcf | 8.36E-03 | 2.11E+01 | 1.06E-02 |
| VOC | 1,2-Dichloroethane | 9.25E-01 | lbs/MMcf | 2.67E-01 | 6.73E+02 | 3.37E-01 |
| VOC | Acetaldehyde | 5.05E-02 | lbs/MMcf | 1.46E-02 | 3.68E+01 | 1.84E-02 |
| VOC | Ammonia | 2.76E+00 | lbs/MMcf | 7.96E-01 | 2.01E+03 | 1.00E+00 |
| VOC | Benzene | 2.14E-01 | lbs/MMcf | 6.17E-02 | 1.56E+02 | 7.79E-02 |
| VOC | Carbon Tetrachloride | 5.40E-03 | lbs/MMcf | 1.56E-03 | 3.93E+00 | 1.96E-03 |
| VOC | Carbonyl Sulfide | 9.05E-01 | lbs/MMcf | 2.61E-01 | 6.59E+02 | 3.29E-01 |
| VOC | Chloroform | 2.60E-02 | lbs/MMcf | 7.49E-03 | 1.89E+01 | 9.46E-03 |
| VOC | Cyanide | 4.64E-03 | lbs/MMcf | 1.34E-03 | 3.38E+00 | 1.69E-03 |
| VOC | Formaldehyde | 1.88E+00 | lbs/MMcf | 5.42E-01 | 1.37E+03 | 6.84E-01 |
| VOC | Hydrogen Sulfide | 8.05E-02 | lbs/MMcf | 2.32E-02 | 5.86E+01 | 2.93E-02 |
| VOC | Methylene Chloride | 1.09E+00 | lbs/MMcf | 3.14E-01 | 7.93E+02 | 3.97E-01 |
| VOC | Tetrachloroethene | 5.90E-03 | lbs/MMcf | 1.70E-03 | 4.29E+00 | 2.15E-03 |
| VOC | Toluene | 4.09E-02 | lbs/MMcf | 1.18E-02 | 2.98E+01 | 1.49E-02 |
| VOC | Trichloroethene | 2.57E-02 | lbs/MMcf | 7.41E-03 | 1.87E+01 | 9.35E-03 |
| VOC | Trichlorofluoromethane | 4.45E-03 | lbs/MMcf | 1.28E-03 | 3.24E+00 | 1.62E-03 |
| VOC | Xylene (Total) | 4.73E-02 | lbs/MMcf | 1.36E-02 | 3.44E+01 | 1.72E-02 |

Combustion greenhouse gases (GHG) are shown in the following table. Emissions are based on a maximum firing rate of 294 MMBtu/hr, 8760 hours per year, and a 1020 Btu/SCF heating value for the refinery fuel gas. These emissions are conservative since fuel gas is typically recycled PSA gas supplemented by natural gas.

| GHG | Emission Factor | | Potential to Emit | | |
|---|---|---|---|---|---|
| | Kg/MMBtu | Lb/MMbtu | Lb/hour | Tons/year | MT/year |
| Carbon Dioxide | 66.72 | 147 | 43,218 | 189,295 | 171,725 |

## C. Permit Content

The legal and factual basis for the permit follows. The permit sections are described in the order that they are presented in the permit. Changes to the standard permit text have been made since the initial Title V Permit for this site was issued. These changes are reflected in the new proposed permit in strikeout/underline format.

### I. Standard Conditions

This section contains administrative requirements and conditions that apply to all facilities. If the Title IV (Acid Rain) requirements for certain fossil-fuel fired electrical generating facilities or the accidental release (40 CFR § 68) programs apply, the section will contain a standard condition pertaining to these programs. Many of these conditions derive from 40 CFR § 70.6, Permit Content, which dictates certain standard conditions that must be placed in the permit. The language that the Air District has developed for many of these requirements has been adopted into the BAAQMD Manual of Procedures, Volume II, Part 3, Section 4, and therefore must appear in the permit.

The standard conditions also contain references to BAAQMD Regulation 1 and Regulation 2. These are the District's General Provisions and Permitting rules.

Changes to permit:

- Section I. Standard Conditions, Part A. Administrative requirements. Updated the amended rule revision dates.

### II. Equipment

This section of the permit lists all permitted or significant sources. Each source is identified by an S and a number (e.g., S24 or S-24).

Permitted sources are those sources that require a BAAQMD operating permit pursuant to BAAQMD Rule 2-1-302.

Significant sources are those sources that have a potential to emit of more than 2 tons of a "regulated air pollutant," as defined in BAAQMD Rule 2-6-222, per year or 400 pounds of a "hazardous air pollutant," as defined in BAAQMD Rule 2-6-210, per year.

All abatement (control) devices that control permitted or significant sources are listed. Each abatement device whose primary function is to reduce emissions is identified by an A and a number (e.g., A-24). If a source is also an abatement device, such as when an engine controls VOC emissions, it will be listed in this table but will have an "S" number. An abatement device that is also a source (such as a thermal oxidizer that burns fuel) will have an "A" number.

The equipment section is considered to be part of the facility description. It contains information that is necessary for applicability determinations, such as fuel types, contents or sizes of tanks, etc. This information is part of the factual basis of the permit.

Each of the permitted sources has previously been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. These permits are issued in accordance with state law and the District's regulations. The capacities in this table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-403.

Change to permit:

- Table II C - Exempt Source, Gas Chromatography (GC) was changed from Calorimeter
- Table II C – Deleted the exempt for Abrasive Blasting operation. Abrasive Blasting Operation was removed from the facility

## III. Generally Applicable Requirements

This section of the permit lists requirements that generally apply to all sources at a facility including insignificant sources and portable equipment that may not require a District permit. If a generally applicable requirement applies specifically to a source that is permitted or significant, the standard will also appear in Section IV and the monitoring for that requirement will appear in Sections IV and VII of the permit. Parts of this section apply to all facilities (e.g., particulate, architectural coating, odorous substance, and sandblasting standards). In addition, standards that apply to insignificant or unpermitted sources at a facility (e.g., refrigeration units that use more than 50 pounds of an ozone-depleting compound), are placed in this section.

Unpermitted sources are exempt from normal District permits pursuant to an exemption in BAAQMD Regulation 2, Rule 1. They may, however, be specifically described in a Title V permit if they are considered a significant source pursuant to the definition in BAAQMD Rule 2-6-239.

Changes to permit:

- Updated the amended rule revision dates
- Added newly adopted 11-18: Reduction of Risk from Air Toxic Emission at Existing Facilities
- Added newly adopted 12-15: Miscellaneous Standards of Performance- Petroleum Refining Emissions Tracking
- Added newly adopted 13-5: Climate Pollutants-Industrial Hydrogen Plants

## IV. Source-Specific Applicable Requirements

This section of the permit lists the applicable requirements that apply to permitted or significant sources. These applicable requirements are contained in tables that pertain to one or more sources that have the same requirements. The order of the requirements is:

- District Rules
- SIP Rules (if any) listed following the corresponding District Rules. SIP rules are District rules that have been approved by EPA into the California State Implementation Plan. SIP rules are "federally enforceable" and a "Y" (yes) indication will appear in the "Federally Enforceable" column. If the SIP rule is the current District rule, separate citation of the SIP rule is not necessary and the "Federally Enforceable" column will have a "Y" for "yes". If

the SIP rule is not the current District rule, the SIP rule or the necessary portions of the SIP rule are cited separately after the District rule. The SIP portions will be federally enforceable; the non-SIP versions will not be federally enforceable, unless EPA has approved them through another program.

- Other District requirements, such as the Manual of Procedures, as appropriate.
- Federal requirements (other than SIP provisions)
- BAAQMD permit conditions. The text of BAAQMD permit conditions is found in Section VI of the permit.
- Federal permit conditions. The text of Federal permit conditions, if any, is found in Section VI of the permit.

Section IV of the permit contains citations to all of the applicable requirements. The text of the requirements is found in the regulations, which are readily available on the District's or EPA's websites, or in the permit conditions, which are found in Section VI of the permit. All monitoring requirements are cited in Section IV. Section VII is a cross-reference between the limits and monitoring requirements. A discussion of monitoring is included in Section C.VII of this permit evaluation/statement of basis.

**Complex Applicability Determinations:**

This facility has had a complex permitting history. This permitting history results in complex applicability determinations.

The equipment and sources owned by Air Products were initially permitted by former Golden Eagle Refinery (then referred to as the Avon Refinery) owner Tosco Corporation (Tosco). The initial Authority to Construct for a 25 MMSCFD hydrogen plant was granted via 1989 NSR Application 3318 Refinery Modernization and Energy Conservation Project (RMEC). NSR emission increases were addressed by the Tosco Refinery Emissions Cap (aka "Bubble", established by the Tosco No 3 HDS Project Application 27769 in the early 1980's) and were offset by emission control measures added to other sources in the Bubble. The facility was built by Air Products under contract with Tosco at a location formerly occupied by another Tosco processing unit. Commercial hydrogen production commenced December 11, 1993. A second Authority to Construct was granted January 27, 1995 to new refinery owner Ultramar, Inc. via 1993 Application 10912 Clean Fuels Project (CFP) for a 50 MMSCFD hydrogen plant. The original Tosco Authority to Construct was cancelled June 23, 1995. Facility Ownership was formally transferred to Air Products via 1995 Application 14929. A Permit to Operate was first granted to Air Products on May 5, 1995 for a 25 MMSCFD hydrogen plant including a 222 MMBtu/hr SMR furnace. Modifications were made to the facility in 1996 to fully utilize pre-invested capacity. In 2002, via Application 5222, a permit to operate was granted to Air Products for a peak hydrogen production capacity of 38 MMSCFD including a 294 MMBtu/hr SMR furnace.

Since the facility emissions were subject to and included in the (current refinery owner) Marathon Refinery Emissions Cap, Air Products was subject to Permit Condition 8077, which details the limits and requirements of the Marathon Bubble. In 2012, with Marathon concurrence, Air Products requested and the District granted a revision where the Air Products facility emissions were "carved out" of the Marathon Bubble, and transferred to and

subsequently owned by Air Products. To accomplish this, the NSR emissions increases, initially calculated and permitted through the 1989 Tosco RMEC Project, were transferred to Air Products and codified in Permit Condition 25199. The Marathon Bubble will be reduced by the identical emissions quantities.

The Air District has determined that Air Products' No. 2 Hydrogen Plant qualifies as part of the same facility as the Marathon Petroleum Refinery Facility pursuant to the definition of "Facility" in Regulation 2-6-206. In order to be considered the same facility, or one major source for the purposes of District Regulation 2-6, Title V and federal permitting purposes, sources must be:

1. located on contiguous or adjacent property
2. under common control, and
3. belonging to the same "industrial grouping" (or one is a support facility for the other).

In the case of the Air Products No. 2 Hydrogen Plant, factors one and three are clearly met. First, the facility is located in the "Process Block" of the Marathon Refinery; it serves as a process unit of the refinery. In addition, the hydrogen plant is a support facility for the refinery. All hydrogen product gas is delivered to the Marathon Petroleum Refinery for use in the petroleum processing equipment of the petroleum refinery; the hydrogen plant supports the operation of the refinery. The Air District has also determined that the hydrogen plant and refinery are under "common control." The Air Products facility was initially permitted by Tosco Corporation, previous owner of the petroleum refinery, and after initial operation, was again permitted by Ultramar, Inc., the subsequent owner of the petroleum refinery. The No 2 Hydrogen Plant is integrated in the Marathon petroleum refinery by connecting and using Marathon supporting utilities (e.g. cooling water, wastewater, flare). When the Air Products facility was originally permitted by the petroleum refinery, the requirements of District Regulation 2, Rule 2 New Source Review were addressed, in part, by including the No 2 Hydrogen Plant emissions in the Tosco Refinery Emissions Cap (aka "Bubble") where emissions were offset by installing controls on other sources included in the Bubble.

The fact that there are no shared personnel or administrative functions between Marathon and Air Products weigh against a finding for common control. However, the contract for services (hydrogen gas) between Marathon and Air Products is controlled by Marathon. If Marathon refinery operation does not require all of the hydrogen production Air Products can produce, Air Products must curtail operations. In addition, 100% of the Air Products hydrogen product is and will be used by Marathon. Therefore, the District has determined that the Air Products No. 2 Hydrogen Plant should be treated as part of the same "facility" as the Marathon Petroleum Refinery.

Because it has been determined that the Air Products hydrogen plant is part of the Marathon refinery Title V facility, Air Products must obtain a Title V permit. While Air Products may obtain its own permit (rather than be included in Marathon's Title V permit), as it has chosen, the applicable requirements that would otherwise be required under a single permit for the sources must be included in Air Products' individual permit as "a major source may not be divided in a way that changes how it would be subject to or comply with applicable requirements compared with what would otherwise occur if a single title V permit were issued to that major source." *See* Memorandum from John S. Seitz, EPA, *Major Source Determinations for Military Installations*

*under the Air Toxics, New Source Review, and Title V Operating Permit Programs of the Clean Air Act*, August 2, 1996. For these reasons, the Air District has determined that the Air Products No. 2 Hydrogen Plant's Title V permit must include the regulatory requirements that would otherwise apply to the No. 2 Hydrogen Plant if it was included as part of Marathon refinery's Title V permit.

The determination to permit the No 2 Hydrogen Plant as part of the Marathon petroleum refinery "facility" within which it is located and for which it serves as a process unit, is consistent with the permitting of the Marathon owned No 1 Hydrogen Plant and with the permitting of other independently owned hydrogen plants located in the Bay Area, including the Air Products Hydrogen Manufacturing facility located at the Shell Martinez Refinery.

Regulation 8, Rule 2, Miscellaneous Operations – Interim limit until Regulation 13-5 becomes effective on 5/4/2024

S-1030 No 2 Hydrogen Plant is subject to Regulation 8, Rule 2, Miscellaneous Operations because the plant includes equipment that emits precursor organic compounds and is not limited by other Rules in Regulation 6-1, Regulation 8, Regulation 10, Regulation 11, Rule 18, Regulation 12, Rule 11, Regulation 12, Rule 12, and/or Regulation 12, Rule 15. Regulation 8-2-301 limits any discharge into the atmosphere to 15 lb/day and to a concentration of 300 ppm total carbon on a dry basis.

Regulation 6, Rule 1 – Particulate Matter-General Requirement

The Air Product No 2 Hydrogen Reformer Furnace (S-1031) is subject to Regulation 6, Rule 1, Particulate Matter General Requirement because the plant includes equipment that emits particulate matter into the atmosphere. The general provisions and definitions in Regulation 1 and Regulation 6 shall apply to Regulation 6, Rule 1.

- Regulation 6-1-301-Ringelmann No.1 Limitation limits a visible emission that is as dark or darker than No.1 on the Ringelmann Chart,
- Regulation 6-1-302- Opacity Limitation Regulation limits any source for a period or aggregate periods of more than three minutes in any hour an emission equal to or greater than 20% opacity, and
- Regulation 6-1-310.2 limits Total Suspended Particulate emissions of 87.3 mg per dscm (0.0382 gr per dscf) @ 6% $O_2$ of exhaust gas volume from the Air Product's Hydrogen Reformer Furnace, S-1031. The TSP emissions are from the reformer Furnace's exhaust stacks and a Potential to Emit TSP greater than 1,000 kg/year.

S-1030, Hydrogen Plant is not subject to Regulation 6, Rule 1 because there is no TSP emissions from the source.

TSP flow rate and Compliance

| Source | Exhaust Flow Rate | TSP Limit/ TSP Concentration | Compliance |
|---|---|---|---|
| S-1031 | 79,800 dscf/min | 0.0382 gr/dscf | 6-1-310.2 |

Regulation 8, Rule 8 -- Wastewater Collection and Separation Systems

The Air Products No 2 Hydrogen Plant is located in the process unit section of the Marathon Refinery. This process section includes a refinery wastewater collection system. Air Products uses this refinery wastewater system. Wastewater from other refinery units does not enter the Air Products site. Air Products wastewater is collected on site and added to the refinery wastewater system off-plot. There is no comingled refinery wastewater on the Air Products site. Because the Air Products No. 2 Hydrogen Plan exclusively serves the Marathon Refinery and uses the Marathon Refinery's wastewater collection system, the No. 2 Hydrogen Plant is subject to the requirements of Regulation 8, Rule 8 that apply to wastewater collection system components at petroleum refineries, including Regulations 8-8-312, 8-8-313, 8-8-314, 8-8-402, 8-8-403, 8-8-404 and 8-8-505, as enumerated below. Although Air Products No. 2 Hydrogen Plant is therefore subject to the enumerated requirements for wastewater collection systems at petroleum refineries, that does not necessarily mean that the No. 2 Hydrogen Plant constitutes a "petroleum refinery" in all instances, as that term may be defined by other laws and regulations (including other District regulations), the applicability of which must each be evaluated in accordance with its own terms.

S-1030 No 2 Hydrogen Plant is subject to Regulation 8, Rule 8 Wastewater Collection and Separation Systems as described in Regulation 8-8-101, Description:

> **8-8-101 Description**: The purpose of this Rule is to limit the emissions of organic compounds from wastewater collection and separation systems that handle liquid organic compounds from industrial processes.

Wastewater components are defined in Regulation 8-8-200 Definitions. The wastewater components located at the No. 2 Hydrogen Plant and the reference definitions are as follows:

- Junction Box, Regulation 8-8-217
- Manholes, Regulation 8-8-222
- Process Drains, Regulation 8-8-225
- Reaches, Regulation 8-8-226
- Vent Pipes, Regulation 8-8-229

The Regulation 8, Rule 8 emissions standards, administrative requirements and recordkeeping requirements that are applicable to the listed components are as follows:

- Regulation 8-8-308, Junction Box
- Regulation 8-8-312, Controlled Wastewater Collection System Components at Petroleum Refineries
- Regulation 8-8-313, Uncontrolled Wastewater Collection System Components at Petroleum Refineries
- Regulation 8-8-314, New Wastewater Collection System Components at Petroleum Refineries
- Regulation 8-8-402, Wastewater Inspection and Maintenance Plan at Petroleum Refineries
- Regulation 8-8-403, Petroleum Refinery Compliance Schedule

- Regulation 8-8-404, Uncontrolled Wastewater Collection System Components Election
- Regulation 8-8-505, Records for Wastewater Collection System Components at Petroleum Refineries

Regulation 8, Rule 18 -- Equipment Leaks

The Air Products No. 2 Hydrogen Plant is subject to Regulation 8, Rule 18, Equipment Leaks, which limits emissions of organic compounds and methane from leaking equipment at petroleum refineries, chemical plants, bulk plants and bulk terminals. The type of equipment covered in this regulation are valves, connectors, pumps, compressors, pressure relief devices, diaphragms, hatches, sight-glasses, fittings, sampling ports, meters, pipes, and vessels. The specific reference definitions are as follows:

- Regulation 8-18-204, Connection
- Regulation 8-18-214, Pressure Relief Device
- Regulation 8-18-221, Valve

However, all Pressure Relief Devices in organic service are vented to the No. 2 Hydrogen Plant flare header, which in turn is connected to the Marathon flare header. Under normal operation, any gas from the Pressure Relief Valves are recovered by the Marathon Flare Gas Recovery Compressors and used in the Marathon fuel gas system(s). Therefore, according to Regulation 8-18-110, the Air Products Pressure Relief Devices are exempt from Regulation 8, Rule 18. The emission standards and exemptions that are applicable to the Air Products No. 2 Hydrogen Plant are as follows:

- Regulation 8-18-110, Exemption, Controlled Seal Systems and Pressure Relief Devices
- Regulation 8-18-301, General
- Regulation 8-18-302, Valves
- Regulation 8-18-303, Pumps and Compressors
- Regulation 8-18-304, Connections
- Regulation 8-18-305, Pressure Relief Devices (exempt per 8-18-110)

In addition, the administrative, monitoring, recordkeeping and procedure requirements are as follows:

- Regulation 8-18-401, Inspection
- Regulation 8-18-402, Identification
- Regulation 8-18-403, Visual Inspection Schedule
- Regulation 8-18-404, Alternate Inspection Schedule
- Regulation 8-18-502, Records
- Regulation 8-18-503, Reports
- Regulation 8-18-603, Determination of Control Efficiency

Regulation 8, Rule 28 -- Episodic Releases from Pressure Relief Devices at Petroleum Refineries and Chemical Plants

The Air Products No 2 Hydrogen Plant is subject to Regulation 8, Rule 28, which prevents episodic emissions of organic compounds from pressure relief devices. However, all of the Air Products pressure relief devices discharge to a vapor recovery system, which normally is recovered and used at Marathon for fuel gas. Therefore, there are no "Release Events" as defined in Regulation 8-28-214.

The following Regulation 8-28 emission standards are applicable to the No. 2 Hydrogen Plant .

- Regulation 8-28-302, Pressure Relief Devices at New or Modified Sources at Petroleum Refineries. The modification that triggers this standard was completed in 1996. However, it was 2002 Application 5222 that permitted the modification and included the required BACT determination.
- Regulation 8-28-303 Existing Pressure Relief Devices at Petroleum Refineries

The administrative, monitoring and recordkeeping requirements applicable to the No. 2 Hydrogen Plant are as follows:

- Regulation 8-28-404, Identification
- Regulation 8-28-502.2, Records

All of the other administrative, monitoring and recordkeeping requirements in Regulation 8, Rule 28 are only applicable to "release events" or discharges to atmosphere.

Regulation 9, Rule 1 -- Sulfur Dioxide

Normally the Air Products No. 2 Hydrogen Plant S-1031 SMR furnace fires natural gas and recycled PSA off-gas, both of which are low in sulfur content. However, the S-1031 SMR furnace is permitted to fire refinery fuel gas that can have H2S content as high as the 163 ppm limit of NSPS 40 CFR 60 Subpart J. Therefore, the No. 2 Hydrogen Plant has a potential to emit sulfur dioxide and is subject to the requirements of Regulation 9, Rule 1. The emission standards that are applicable to the No 2 Hydrogen Plant are as follows:

- Regulation 9-1-301, Limitations on Ground Level Concentrations
- Regulation 9-1-302, General Emission Limitation

The administrative, monitoring and recordkeeping requirements applicable to the No. 2 Hydrogen Plant are only Regulation 9-1-501, Area Monitoring Requirements, upon request of the APCO.

Regulation 9, Rule 2 -- Hydrogen Sulfide

Normally the Air Products No 2 Hydrogen Plant S-1031 SMR furnace fires natural gas and recycled PSA waste gas, both of which are low in sulfur content. However, the S-1031 SMR furnace is permitted to fire refinery fuel gas that can have H2S content as high as the 163 ppm limit of NSPS 40 CFR 60 Subpart J. In addition, all process feed gas is treated to remove sulfur compounds and while there is a theoretical potential for this treatment process to release small amounts of hydrogen sulfide into the process gas, this event is very unlikely since it would result in poisoning of the SMR catalyst and an eventual plant shutdown, and in any event would not result in a direct $H_2S$ release to the atmosphere. Therefore, the No. 2 Hydrogen Plant has a potential to emit hydrogen sulfide only when it is firing refinery fuel gas as fuel and is subject to the requirements of Regulation 9, Rule 2. The emission standard that is applicable to the No. 2 Hydrogen Plant is as follows:

- Regulation 9-2-301, Limitations on Hydrogen Sulfide

The APCO may require Air Products to comply with the administrative, monitoring and recordkeeping requirements applicable of Regulation 9-2-501, Area Monitoring Requirements.

Regulation 9, Rule 3 -- Nitrogen Oxides from Heat Transfer Operations.

The Air Products S-1031 SMR furnace is subject to Regulation 9, Rule 3 that limits the emissions of nitrogen oxides from existing, new or modified heat transfer operations. S-1031 is a new heat transfer operation as defined in Regulation 9-3-201 since the Authority to Construct was granted after April 19, 1975. The emission standard applicable to S-1031 is as follows:

- Regulation 9-3-303, New or Modified Heat Transfer Operation Limits

There are no administrative, monitoring or recordkeeping requirements for S-1031 in Regulation 9, Rule 3.

Regulation 9, Rule 7 -- Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters

Air Products S-1031 SMR Furnace is potentially subject to the requirements of Regulation 9, Rule 7. However, S-1031 is exempt from Regulation 9, Rule 7 pursuant to Regulation 9-7-110.3:

> **9-7-110 Exemptions:** The requirements of this rule shall not apply to the following:
> 110.3 Boilers, steam generators and process heaters that are used in petroleum refineries;

Regulation 9, Rule 10 -- NOx and CO from Boilers, Steam Generators, and Process Heaters in Petroleum Refineries

Air Products S-1031 SMR Furnace is potentially subject to the requirements of Regulation 9, Rule 10. However, S-1031 SMR furnace was granted an Authority to Construct on 10/22/2002 via Application 5222 when it was modified to a capacity of 294 MMBtu/hr. In Application

5222, S-1031 was subject to a NOx BACT determination. Therefore, S-1031 is exempt from Regulation 9, Rule 10 pursuant to Regulation 9-10-110.6:

> **9-10-110 Exemptions:** The requirements of this rule shall not apply to the following:
> 110.6 Boilers, steam generators and process heaters, including CO boilers, that receive an Authority to Construct subject to BACT requirements for NOx on or after January 5, 1994.

Regulation 11, Rule 18 – Reduction of Risk from Air Toxic Emissions at Existing Facilities

The Air Product No 2 Hydrogen Plant requires to report the toxic air contaminant emission inventory of the facility to the Air District pursuant to the Air Toxics "Hot Spots" Information and Assessment Act of 1987, California Health and Safety Code, Section 44300 et seq. Therefore, The Air Product No 2 Hydrogen Plant is subject to Regulation 11, Rule 18. The Air Products No 2 Hydrogen Plant S-1031 SMR furnace fires natural gas and recycled PSA waste gas content produces Toxic Air contaminants. The standards and administrative requirements of Regulation 11, Rule 18 applicable to S-1031 are as follows:

- 11-18-301-Compliance with Risk Reduction Plan
- 11-18-401-HealthRisk Assessment Information Requirement

Regulation 12, Rule 11 – Flare Monitoring at Petroleum Refineries

The Air Products No 2 Hydrogen Plant contains control valves, manual vents and pressure safety valves that discharge waste gas into the Marathon flare header. Similar to all refinery waste gas, Air Products waste gas that is routinely discharged into the flare header is normally recovered by the Marathon Flare Gas Recycle Compressors CP-539 and CP-540, sent to the No. 5 Gas Plant, and treated for use as refinery fuel gas. Also similar to all refinery waste gas, when the compressors are unable to recycle all of the Air Products waste gas along with the refinery waste gas, then the combined excess waste gas is combusted in the Marathon Main Flare System (S-854, S-944, S-945, S-992, S-1012, S-1517, a six flare staged system).

The purpose of Regulation 12, Rule 11 is to require monitoring and recording of emissions data for flares at petroleum refineries. While Regulation 12, Rule 11 contains monitoring and reporting requirements, these requirements are only applicable to the owner or operator of the flare device itself. Since Air Products does not own or operate a flare, the requirements of Regulation 12, Rule 11 are not applicable to Air Products. Indeed, Marathon Marketing and Refining, LLC, the owner and operator of the flares, is subject to, and in compliance with, the requirements of Regulation 12, Rule 11.

Regulation 12, Rule 12 – Flares at Petroleum Refineries

The No. 2 Hydrogen Plant can produce vent gas that is directed to the flare gas recovery system at the Marathon Refinery. Marathon owns and operates the flare gas recovery system that includes six flares subject to Regulation 12, Rule 12. The current practice is that Air Products provides the necessary information to Marathon and Marathon is responsible for complying with the administrative requirements of Regulation 12, Rule 12. Marathon is responsible for maintaining a Flare Management Plan approved by the Air District. A permit condition that clarifies Air Products' obligations to minimize flaring events and effectuate Marathon's

compliance with Regulation 12, Rule 12, Permit Condition 25995, has been added to the permit via Application No. 27043.

Regulation 12, Rule 15 – Petroleum Refinery Emissions Tracking

The Air Products No 2 Hydrogen Plant is located in the process unit section of the Marathon Refinery. Therefore, the Air Product No 2 Hydrogen Plant is potentially subject to Regulation 12, Rule 15- Petroleum Refinery Emissions Tracking. The administrative requirements of Regulation 12, Rule 15 applicable to the Air Product No 2 Hydrogen Plant are as follows:

- 12-15-401-Annual Emissions Inventory
- 12-15-402-Review and Approval of Annual Emissions Inventory
- 12-15-403-Air Monitoring Plans
- 12-15-404-Review and Approval of Air Monitoring Plans
- 12-15-405-Emissions Inventory Guidelines
- 12-15-406-Designation of Confidential Information
- 12-15-500-Monitoring and Records
- 12-15-501 Fence-line Monitoring System
- 12-15-502-Recordkeeping

Regulation 13 Rule 5, Climate Pollutants-Industrial Hydrogen Plants
S-1030 No. 2 Hydrogen Plant is subject to Regulation 13 Rule 5 because the plant is an industrial Hydrogen plant, which is located in the process section of the Marathon Refinery. The requirements of Regulation 13, Rule 5 applicable to the Air Product No 2 Hydrogen Plant are as follows:

- 13-5-301- Emission Limits for Industrial Hydrogen Plants
- 13-5-302- Prohibition of Comingling and Dilution
- 13-5-303- Alternative Methane and Other Greenhouse Gas Emissions Standard Option
- 13-5-401-Reporting Requirement for Total Organic Compounds Vented From Industrial Hydrogen Plants
- 13-5-404- Plan Submission for the Alternative Methane and Other Greenhouse Gas Emissions Standard Option
- 13-5-405- Implementation of the Alternative Methane and Other Greenhouse Gas Emissions Standard Option
- 13-5-501- Monitoring Requirements, General
- 13-5-502- Monitoring Requirements, Alternative Methane and Other Greenhouse Gas Emissions Standard Option
- 13-5-503- Reporting Requirements, Alternative Methane and Other Greenhouse Gas Emissions Standard Option
- 13-5-504-Monitoring Requirements, Deaerator Vents and Carbon Dioxide Scrubbing Vents
- 13-5-505- Monitoring Requirements, Pressure Swing Adsorption Vents
- 13-5-506- Recordkeeping Requirements

40 CFR 60 Subpart J -- NSPS for Petroleum Refineries

The Air Products S-1031 SMR Furnace is potentially subject to 40 CFR 60, Subpart J because it is a "fuel gas combustion device" as defined in 40 CFR 60.101(g), constructed between June 11, 1973 and May 14, 2007, and located in a petroleum refinery.

S-1031 normally combusts natural gas and PSA off-gas. However, S-1031 is permitted to combust "fuel gas" as defined in 40 CFR 60.101(d). The 40 CFR 60.102 Standard for particulate matter and 40 CFR 60.103 Standard for carbon monoxide do not apply to fuel gas combustion devices. Only 40 CFR 60.104 Standards for sulfur oxides are applicable to S-1031. Monitoring requirements are detailed in 40 CFR 60.105. However, under normal operation where only natural gas and PSA off-gas are used for combustion, and in cases where propane or butane meeting LPG product specifications are combusted, Air Products is exempt from the monitoring requirements pursuant to 40 CFR 60.105(a)(4)(iv)(B) and 60.105(a)(4)(iv)(C). During the operation where S-1031 is combusting refinery fuel gas, Air Products must comply with the monitoring requirements, either 40 CFR 60.105(a)(3) or 60.105(a)(4).

40 CFR 60 Subpart GGG -- NSPS for Equipment Leaks in Petroleum Refineries
40 CFR 60 Subpart VV -- NSPS SOCMI Equipment Leaks

The Air Products No. 2 Hydrogen Plant is subject to 40 CFR 60 Subpart GGG because the facility is located within a of "Petroleum Refinery that was constructed after January 4, 1983, and on or before November 7, 2006. Additionally, the No. 2 Hydrogen Plant is not directly subject to Subpart VV because it does not produce one or more of the chemicals listed in Section 60.489 per the definition of "synthetic organic chemical manufacturing industry" in Section 60.481. The Standards of Subpart GGG per Section 60.592 nonetheless require compliance with Subpart VV §§ 60.482-1 to 60.482-10. These standards are as follows:

§ 60.482-1 Standards: General.
§ 60.482-2 Standards: Pumps in light liquid service.
§ 60.482-3 Standards: Compressors.
§ 60.482-4 Standards: Pressure relief devices in gas/vapor service.
§ 60.482-5 Standards: Sampling connection systems.
§ 60.482-6 Standards: Open-ended valves or lines.
§ 60.482-7 Standards: Valves in gas/vapor service and in light liquid service.
§ 60.482-8 Standards: Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and connectors.
§ 60.482-9 Standards: Delay of repair.
§ 60.482-10 Standards: Closed vent systems and control devices.

40 CFR 60 Subpart QQQ -- NSPS Petroleum Refinery Wastewater Systems

The Air Products No 2 Hydrogen Plant is located in the process unit section of the Marathon Refinery. This process section includes a refinery wastewater collection system. Air Products uses this refinery wastewater system. Wastewater from Marathon refinery units does not enter the Air Products site, Air Products wastewater is collected on site and added to the Marathon

refinery wastewater off-plot. There is no comingled refinery wastewater on the Air Products site.

The Air Products No 2 Hydrogen Plant is subject to 40 CFR 60 Subpart QQQ because the facility has a wastewater system (as defined in 40 CFR 60.691) located in a petroleum refinery modified after May 4, 1987. The wastewater system components, as defined in 40 CFR 60.691, that are in the No 2 Hydrogen Plant are the following:

- Catch Basin
- Individual Drain System
- Junction Box
- Sewer Line
- Stormwater Sewer System
- Wastewater System
- Water Seal Controls

However, Section 60.692-1(d)(1) exempts stormwater sewer systems and 60.692-1(d)(2) exempts ancillary equipment "which is physically separate from the wastewater system and does not come in contact with or store oily wastewater" from the requirements of Subpart QQQ. The Standards of 40 CFR 60.692 that are applicable are as follows:

§ 60.692-1 Standards: General.
§ 60.692-2 Standards: Individual drain systems
§ 60.692-6 Standards: Delay of repair
§ 60.693-1 Alternative standards for individual drain systems.

40 CFR 61 Subpart J -- NESHAPS Benzene Equipment Leaks

40 CFR 61 Subpart J applies to fugitive emissions from equipment "in benzene service." "In Benzene Service," as defined in 40 CFR 61.111, includes equipment that contains or contacts a fluid that is at least 10% benzene by weight. The only potential source of benzene in the Air Products No. 2 Hydrogen Plant is the refinery fuel gas when it is used for a fuel. However, the refinery fuel gas will never contain benzene in quantities of 10% or higher, therefore the requirements of 40 CFR 61 Subpart J are not applicable.

40 CFR 61 Subpart V -- NESHAPS Equipment Leaks

40 CFR 61 Subpart V applies to equipment in "volatile hazardous air pollutant (VHAP) service." "In VHAP service," as defined in 40 CFR 61.241, includes equipment that contains or contacts a fluid that is at least 10% VHAP by weight. VHAP is defined as in 40 CFR 60.241 as any substance regulated by Part 61. The list of pollutants designed as hazardous air pollutants are listed in 40 CFR 61.01. The only potential source of VHAPs in the Air Products No. 2 Hydrogen Plant is the refinery fuel gas when it is used for a fuel. However, the refinery fuel gas will never contain VHAPs in quantities of 10% or higher, therefore the requirements of 40 CFR 61 Subpart V are not applicable.

40 CFR 61 Subpart FF -- NESHAPS Benzene Waste Operations

The Air Products No 2 Hydrogen Plant is potentially subject to 40 CFR 61 Subpart FF because the facility sends wastewater to a petroleum refinery that is subject to 40 CFR 61 Subpart FF. The Marathon petroleum refinery complies with 40 CFR 61 Subpart FF through the "6BQ" option in 40 CFR 61.342(e). This option allows management of the waste streams subject to the 6 Mg/year limit.

However, it is unlikely that the Air Products No. 2 Hydrogen Plant would ever generate waste streams with benzene content. The only potential source of benzene is the refinery fuel gas when it is used for fuel. Fuel is combusted, the flue gas abated with an SCR, and discharged to atmosphere. There is no contact with a waste stream that could generate benzene waste. Refinery fuel gas is not used for feedstock.

Therefore, Air Products is not subject to the requirements of 40 CFR 61 Subpart FF.

40 CFR 63 Subpart CC -- Refinery MACT

The Air Products No 2 Hydrogen Plant is potentially subject to 40 CFR 63 Subpart CC because it is a “petroleum refinery process unit” located at a “plant site” that is a major source per the definitions in Section 63.641 and the applicability provisions in Section 63.640 of Subpart CC:

> **§ 63.640 Applicability and designation of affected source.**
> (a) This subpart applies to petroleum refining process units . . . that are located at a plant site and that meet the criteria in paragraphs (a)(1) and (2) of this section:
>
> > (1) Are located at a plant site that is a major source as defined in section 112(a) of the Clean Air Act; and
> > (2) Emit or have equipment containing or contacting one or more of the hazardous air pollutants listed in table 1 of this subpart.
>
> **§ 63.641 Definitions.**
> *Petroleum refining process unit* means a process unit used in an establishment primarily engaged in petroleum refining as defined in the Standard Industrial Classification code for petroleum refining (2911), and used primarily for the following:
>
> > (4) Examples of such units include, but are not limited to hydrogen production, isomerization, polymerization, thermal processes, and blending, sweetening, and treating processes.
>
> *Plant site* means all contiguous or adjoining property that is under common control including properties that are separated only by a road or other public right-of-way..

The "affected source" comprises the emission points listed in 40 CFR 63.640(c)including the following:

1. All miscellaneous process vents from petroleum refining process units that contain or contact HAPs;
2. All storage vessels associated with petroleum refining process units that contain or contact HAPs;
3. All wastewater streams and treatment operations associated with petroleum refining process units that contain or contact HAPs; and
4. All equipment leaks from petroleum refining process units that are in organic HAP service;
5. All gasoline loading racks classified under Standard Industrial Classification code 2911;
6. All marine vessel loading operations located at a petroleum refinery;
7. All storage vessels and equipment leaks associated with a bulk gasoline terminal or pipeline breakout station; and
8. All heat exchange systems in organic HAP service, as defined in this subpart.

Air Products does not have emission points described in #5, #6 and #7. Therefore, the standards and monitoring requirements that are potentially applicable to Air Products are the following:

§ 63.642 General standards.
§ 63.643 Miscellaneous process vent provisions
§ 63.644 Monitoring provisions for miscellaneous process vents.
§ 63.646 Storage vessel provisions.
§ 63.647 Wastewater provisions.
§ 63.648 Equipment leak standards.
§ 63.654 Heat exchange systems.

The definition of "miscellaneous process vent" in Section 63.641 excludes hydrogen plant deaerator vents as follows:

> *Miscellaneous process vent* means a gas stream containing greater than 20 parts per million by volume organic HAP that is continuously or periodically discharged during normal operation of a petroleum refining process unit meeting the criteria specified in § 63.640(a). Miscellaneous process vents do not include:
>
> > (14) Hydrogen production plant vents through which carbon dioxide is removed from process streams or through which steam condensate produced or treated within the hydrogen plant is degassed or deaerated.

Therefore, the No. 2 Hydrogen Plant is not subject to the Subpart CC requirements for miscellaneous process vents.

The No. 2 Hydrogen Plant does not include vessels used to store organic liquids that contain or contact HAPs (not including pressure vessels and vessels smaller than 40 cubic meters [10,500

gallons]) as defined in Section 63.641. The only storage vessel in the No 2 Hydrogen Plant stores ammonia for the SCR abatement device. Since ammonia is not a material listed in Table 1 of Subpart CC and is not an "organic liquid," the storage vessel is not subject to Subpart CC.

The Air Products No 2 Hydrogen Plant contributes wastewater to the Marathon Petroleum Refinery wastewater system. However, the No.2 Hydrogen Plant does not include wastewater streams and treatment operations that contain or contact HAPs. Furthermore, any Air Products wastewater will not have a benzene concentration of 10 ppm or greater. Thus, any wastewater potentially subject to Subpart CC is therefore a Group 2 Wastewater Stream as defined in 40 CFR 63.641. There are no standards in 40 CFR 63.647 for Group 2 Wastewater Streams.

The requirements of 40 CFR 63.648 Equipment Leak Standards require compliance with the provisions of 40 CFR 60 Subpart VV. However, the Air Products No 2 Hydrogen Plant does not have equipment that is "in organic HAP service" as defined in 40 CFR 63.641 (equipment containing or contacting a fluid that is at least 5% by weight of total organic HAP). Therefore, according to 40 CFR 63.648(a)(1), there are no equipment leak standards applicable. As discussed previously, Air Products is already subject to the requirements of 40 CFR 60 Subpart VV through 40 CFR 60 Subpart GGG.

Air Products operates heat exchangers in cooling water service. However, none of these heat exchangers cool fluids that contain at least 5% by weight of organic HAP. Therefore, none of the Air Products heat exchangers are "in organic HAP service" as defined in 40 CFR 63.641. Thus, the requirements of 40 CFR 63.654 do not apply because the Air Products heat exchangers are not Heat Exchange Systems as defined in 40 CFR 63.641.

In conclusion, the Air Products No 2 Hydrogen Plant is subject to the following standards for 40 CFR 63 Subpart CC:

§ 63.642 General standards.

However, the only applicable general standard in Section 63.642 is the requirement to apply for a part 70 or 771 operating permit from the appropriate permitting authority.

<u>40 CFR 64 -- Compliance Assurance Monitoring (CAM)</u>

The Air Products S-1031 SMR Furnace is potentially subject to 40 CFR 64 Compliance Assurance Monitoring. General applicability is detailed in 40 CFR 64.2(a). S-1031 is subject to CAM because of the following:

(1) The unit is required to obtain a part 70 or 71 permit;
(2) The furnace is subject to a NOx emission limitation of 10 ppm @ 3% O2 in Permit Condition 21087;
(3) The furnace is abated with a SCR control device to achieve compliance with the emissions limit; and
(4) The furnace has pre-control device potential to emit over 100 tons of NOx annually.

Exemptions to 40 CFR 64 that may apply to S-1031 are detailed in 40 CFR 64.2(b). 40 CFR 64.2(b)(1) lists the exempt emission limitations or standards. The NOx emissions limit is not an exempt limitation because:

64.2(b)(1)(i) -- The NOx emissions limitation is not a federal requirement proposed by the [EPA] Administrator after November 15, 1990.
64.2(b)(1)(ii) -- The NOx emissions limitation is not part of the stratospheric ozone protection requirements of Title VI.
64.2(b)(1)(iii) --The NOx emissions limitation is not an Acid Rain Program requirement.
64.2(b)(1)(iv) --The NOx emissions limitation is not part of an emissions trading program.
64.2(b)(1)(v) -- The NOx emissions limitation is not part of an emissions cap that meets the requirements of 40 CFR 70.4(b)(12) or 71.6(a)(13)(iii).
64.2(b)(1)(vi) -- The NOx emissions limitation is not currently contained in a part 70 or 71 permit that specifies a continuous compliance determination method. Permit Condition 21087, Part 6, does impose a District Approved NOx CEM, but this requirement is currently part of the District Permit to Operate, not a part 70 or 71 permit. Air Products will not have a part 70 permit until after this initial Title V permit is issued.

Changes to permit:

- Updated the amended rule revision dates on all tables
- Table IV-A
  - Added BAAQMD Regulation 6 Rule 1 (Particulate Matter-General Requirement),
  - Added BAAQMD Regulation 11-18 (Reduction of Risk form Air Toxic Emissions at Existing Facilities
  - Added Regulation 13 Rule 5 (Climate Pollutants-Industrial Hydrogen Plants)
- Table IV-B
  - Added Regulation 13 Rule 5 (Climate Pollutants-Industrial Hydrogen Plants)
- Table IV-C
  - Revised BAAQMD Regulation 6 Rule 1, 310.2 from Particle Weight Limitation to Total Suspended Particulate (TSP Weight Limits

## V. Schedule of Compliance

Because the Air District has not determined that the facility is out of compliance with an applicable requirement, the schedule of compliance for this permit only contains elements 2-6-409.10.1 and 2-6-409.10.2.

Changes to permit:
None.

## VI. Permit Conditions

During the Title V permit development, the Air District has reviewed the existing permit conditions, deleted the obsolete conditions, and as appropriate, revised the conditions for clarity and enforceability. Some conditions may have been deleted because they reiterate an applicable requirement that is now contained in Section IV, Source-Specific Applicable Requirements. Each permit condition is identified with a unique numerical identifier, up to five digits.

Where necessary to meet Title V requirements, additional monitoring, recordkeeping, or reporting has been added to the permit.

All changes to existing permit conditions are clearly shown in "strike-out/underline" format in the proposed permit. When the permit is issued, all 'strike-out" language will be deleted; all "underline" language will be retained, subject to consideration of comments received.

The existing permit conditions are generally derived from previously issued District Authorities to Construct (A/C) or Permits to Operate (P/O). It is also possible for permit conditions to be imposed or revised as part of the annual review of the facility by the Air District pursuant to California Health and Safety Code (H&SC) § 42301(e), through a variance pursuant to H&SC § 42350 et seq., an order of abatement pursuant to H&SC § 42450 et seq., or as an administrative revision initiated by District staff. After issuance of the Title V permit, permit conditions will be revised using the procedures in Regulation 2, Rule 6, Major Facility Review.

The Air District has reviewed and, where appropriate, revised or added new annual and daily throughput limits on sources so as to help ensure compliance with District rules addressing preconstruction review. The applicability of preconstruction review depends on whether there is a "modified source" as defined in District Rule 2-1-234. Whether there is a modified source depends in part on whether there has been an "increase" in "emission level." 2-1-234 defines what will be considered an emissions level increase and takes a somewhat different approach depending on whether a source has previously permitted by the Air District.

Sources that were modified or constructed since the Air District began issuing new source review permits will have permits that contain throughput limits, and these limits are reflected in the Title V permit. These limits have previously undergone District review and are considered to be the legally binding "emission level" for purposes of 2-234.1 and 2-1-234.2. All sources at this facility were issued permits under the new source review program. By contrast, for older sources that have never been through preconstruction review (commonly referred to as "grandfathered" sources), an "increase" in "emission level" is addressed in 2-1-234.3. A grandfathered source is not subject to preconstruction review unless its emission level increases above the highest of either: 1) the design capacity of the source, 3) the capacity listed in a permit to operate, or 3) highest capacity demonstrated prior to March 2000. However, if the throughput capacity of a grandfathered source is limited by upstream or downstream equipment (i.e., is "bottlenecked"), then the relaxing of that limitation ("debottlenecking") is considered a modification.

Air Products does not have any "grandfathered" sources.

Conditions that are obsolete or that have no regulatory basis have been deleted from this permit.

Conditions have also been deleted due to the following:

- Redundancy in record-keeping requirements.
- Redundancy in other conditions, regulations and rules.
- The condition has been superseded by other regulations and rules.
- The equipment has been taken out of service or is exempt.
- The event has already occurred (i.e. initial or start-up source tests).

The regulatory basis has been referenced following each condition. The regulatory basis may be a rule or regulation. The District is also using the following codes for regulatory basis:

- BACT: This code is used for a condition imposed by the Air Pollution Control Officer (APCO) to ensure compliance with the Best Available Control Technology in Regulation 2-2-301.
- Cumulative Increase: This code is used for a condition imposed by the APCO which limits a source's operation to the operation described in the permit application pursuant to BAAQMD Regulation 2-1-403.
- Offsets: This code is used for a condition imposed by the APCO to ensure compliance with the use of offsets for the permitting of a source or with the banking of emissions from a source pursuant to Regulation 2, Rules 2 and 4.
- PSD: This code is used for a condition imposed by the APCO to ensure compliance with a Prevention of Significant Deterioration permit issued pursuant to Regulation 2, Rule 2.
- TRMP: This code is used for a condition imposed by the APCO to ensure compliance with limits that arise from the District's Toxic Risk Management Policy.

Abatement device operating parameter monitoring has been added for each abatement device.

Additional monitoring has been added, where appropriate, to assure compliance with the applicable requirements.

Changes to permit:
None.

## VII. Applicable Limits and Compliance Monitoring Requirements

This section of the permit is a summary of numerical limits and related monitoring requirements that apply to each source. The summary includes a citation for each monitoring requirement, frequency, and type. The applicable requirements for monitoring are completely contained in Sections IV, Source-Specific Applicable Requirements, and VI, Permit Conditions, of the permit.

The tables below contain only the limits for which there is no monitoring or inadequate monitoring in the applicable requirements. The Air District has examined the monitoring for other limits and has determined that monitoring is adequate to provide a reasonable assurance of compliance. Calculations for potential to emit will be provided when no monitoring is proposed due to the size of a source. In all other cases, the column will have "N/A", meaning "Not applicable".

Monitoring decisions are typically the result of a balancing of several different factors including: 1) the likelihood of a violation given the characteristics of normal operation, 2) degree of variability in the operation and in the control device, if there is one, 3) the potential severity of impact of an undetected violation, 4) the technical feasibility and probative value of indicator monitoring, 5) the economic feasibility of indicator monitoring, and 6) whether there is some other factor, such as a different regulatory restriction applicable to the same operation, that also provides some assurance of compliance with the limit in question.

These factors are the same as those historically applied by the Air District in developing monitoring for applicable requirements**.** It follows that, although Title V calls for a re-examination of all monitoring**,** there is a presumption that these factors have been appropriately balanced and incorporated in the Air District's prior rule development and/or permit issuance. It is possible that, where a rule or permit requirement has historically had no monitoring associated with it, no monitoring may still be appropriate in the Title V permit if, for instance, there is little likelihood of a violation**.** Compliance behavior and associated costs of compliance are determined in part by the frequency and nature of associated monitoring requirements. As a result, the Air District will generally revise the nature or frequency of monitoring only when it can support a conclusion that existing monitoring is inadequate**.**

A summary of all monitoring is contained in Section VII, Applicable Limits and Compliance Monitoring Requirements, of the permit. The summary includes a citation for each monitoring requirement, frequency, and type. The applicable requirements for monitoring are completely contained in Sections IV, Source-Specific Applicable Requirements, and VI, Permit Conditions, of the permit.

| NOX Sources | | | |
|---|---|---|---|
| **S# & Description** | **Federally Enforceable Limit Citation** | **Federally Enforceable Limit** | **Monitoring** |
| none | | | |

NOx Discussion:

The source at the facility that is subject to a NOx limit is also subject to NOx monitoring. This monitoring requirement comes from existing permit conditions. For more detailed information on this matter, see Table VII-C.

| CO Sources | | | |
|---|---|---|---|
| **S# & Description** | **Federally Enforceable Limit Citation** | **Federally Enforceable Limit** | **Monitoring** |
| none | | | |

CO Discussion:

The source at the facility that is subject to a CO limit is also subject to CO monitoring. This monitoring requirement come from existing permit conditions. For more detailed information on this matter, see Table VII-C.

| $SO_2$ Sources | | | |
|---|---|---|---|
| **S# & Description** | **Federally Enforceable Limit Citation** | **Federally Enforceable Limit** | **Monitoring** |
| Facility | BAAQMD 9-1-301 | GLC of 0.5 ppm for 3 min. or 0.25 ppm for 60 min. or 0.05 ppm for 24 hours | Area Monitoring (Note 1) |
| Facility | BAAQMD 9-1-302 | General emission standard: < 300 ppm SO2 (applies only to gas-fired equipment when GLMs are not functioning) | None (Note 2) |

Note 1: All facility combustion sources are subject to the SO2 emission limitations in District Regulation 9, Rule 1 (ground-level concentration and emission point concentration). Area monitoring to demonstrate compliance with the ground level SO2 concentration requirements of Regulation 9-1-301 has been required by the APCO (per BAAQMD Regulation 9-1-501) for the refinery, but not specifically to Air products. The APCO has not required monitoring by Air Products because it is located in the refinery "process block" and has a low likelihood of emitting SO2 since fuel gas is typically natural gas and sulfur free PSA gas.

Note 2: All facility combustion sources are subject to the SO2 emission limitations in District Regulation 9, Rule 1 (ground-level concentration and emission point concentration). In EPA's June 24, 1999 agreement with CAPCOA and ARB, "Periodic Monitoring Recommendations for Generally Applicable Requirements in SIP", EPA has agreed that gaseous-fueled combustion sources do not need additional monitoring to verify compliance with Regulation 9, Rule 1, since violations of the regulation are unlikely. Therefore, no monitoring is necessary for this requirement.

| PM Sources | | | |
|---|---|---|---|
| **S# & Description** | **Federally Enforceable Limit Citation** | **Federally Enforceable Limit** | **Monitoring** |
| S-1031 | BAAQMD 6-1-310.2 SIP 6-310 | 0.0382 grain/dscf @ 6% O2 (Based on Furnace Exhaust Gas rate at 63.840 dcfm) | No monitoring is proposed |

| POC Sources | | | |
|---|---|---|---|
| **S# & Description** | **Federally Enforceable Limit Citation** | **Federally Enforceable Limit** | **Monitoring** |
| S-1030 | BAAQMD 8-2-301 SIP 8-2-301 | 15 lb/day and 300 ppm Total carbon on a dry basis | None |
| S-1030 | BAAQMD 13-5-301 | 15 lb/day and 300 ppm TOC, expressed as methane on a dry basis | Daily TOC Monitor using SCAQMD Method 25.3 or approved by the APCO |

POC Discussion:

S-1030 Hydrogen Plant is subject to the Industrial Hydrogen Plants Regulation 13-5-301. 13-5-501 shall take effect on May 4, 2024. In the interim, the hydrogen plant is still subject to Regulation 8-2-301.

The Air District performed a source test on the Deaerator vents in 1997 and again in 2014 and found the 300 ppm exceeded but the mass emissions were below 15 lb/day. The mass emissions were 4.7 lb/day in 1997 and 4.5 lb/day in 2014. The revised Regulation 13-5-504 required the deaerator vent to be tested on a quarterly basis effective May 4, 2024.

Changes to permit:

- Table VII-B:
  - Added Regulation 13-5-301 requirement effective 5/4/2024

- Table VII-D.1:
  - Added citation of limit change from 8-18-302.3 to 8-18-302, 8-18-303.3 to 8-18-303, and 8-18-304.3 to 8-18-304 to reflect the revised Regulation 8-18-302, 8-18-303, and 8-18-304
  - Revised POC limit change from 0.30% to 0.15% to reflect the revised Regulation 8-18-306.2 and pressure reliefs and pump/compressor from 1% to 0.5%

**VIII. Test Methods**

This section of the permit lists test methods that are associated with standards in District or other rules. It is included only for reference. In most cases, the test methods in the rules are source test methods that can be used to determine compliance but are not required on an ongoing basis. They are not applicable requirements.

If a rule or permit condition requires ongoing testing, the requirement will also appear in Section VI of the permit.

Changes to permit:

- Table VIII:
  - Added Regulation 13-5-601 Test method for TOC

- Added Regulation 13-5-602 Test method for Methane and other Greenhouse Gas

**IX. Permit Shield:**

The District rules allow two types of permit shields. The permit shield types are defined as follows: (1) A provision in a major facility review permit that identifies and justifies specific federally enforceable regulations and standards which the APCO has confirmed are not applicable to a source or group of sources, or (2) A provision in a major facility review permit that identifies and justifies specific federally enforceable applicable requirements for monitoring, recordkeeping and/or reporting which are subsumed because other applicable requirements for monitoring, recordkeeping, and reporting in the permit will assure compliance with all emission limits.

The second type of permit shield is allowed by EPA's White Paper 2 for Improved Implementation of the Part 70 Operating Permits Program. The Air District uses the second type of permit shield for all streamlining of monitoring, recordkeeping, and reporting requirements in Title V permits. The Air District's program does not allow other types of streamlining in Title V permits.

Compliance with the applicable requirement contained in the permit automatically results in compliance with any subsumed (= less stringent) requirement.

No provisions of any rule have been identified or proposed for any source as requirements for which the applicant seeks a permit shield, and no permit shield is included in the proposed permit.

This facility has no permit shields.

**D. Alternate Operating Scenarios:**

No alternate operating scenario has been requested for this facility.

**E. Compliance Status:**

As part of the permit application, the owner certified that all equipment was operating in compliance. The certification was submitted and signed on 09/22/2022 date.

**F. Differences between the Application and the Proposed Permit:**

None

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# APPENDIX A
# GLOSSARY

# Glossary

**ACT**
Federal Clean Air Act

**APCO**
Air Pollution Control Officer

**API**
American Petroleum Institute

**ARB**
Air Resources Board

**BAAQMD**
Bay Area Air Quality Management District

**BACT**
Best Available Control Technology

**BARCT**
Best Available Retrofit Control Technology

**Basis**
The underlying authority that allows the District to impose requirements.

**C5**
An Organic chemical compound with five carbon atoms

**C6**
An Organic chemical compound with six carbon atoms

**CAA**
The federal Clean Air Act

**CAAQS**
California Ambient Air Quality Standards

**CAPCOA**
California Air Pollution Control Officers Association

**CEC**
California Energy Commission

**CEQA**
California Environmental Quality Act

**CEM**
A "continuous emission monitor" is a monitoring device that provides a continuous direct measurement of some pollutant (e.g. NOx concentration) in an exhaust stream.

**CFP**
Clean Fuels Project

**CFR**
The Code of Federal Regulations. 40 CFR contains the implementing regulations for federal environmental statutes such as the Clean Air Act. Parts 50-99 of 40 CFR contain the requirements for air pollution programs.

**CO**
Carbon Monoxide

**CO2**
Carbon Dioxide

**Cumulative Increase**
The sum of permitted emissions from each new or modified source since a specified date pursuant to BAAQMD Rule 2-1-403, Permit Conditions (as amended by the District Board on 7/17/91) and SIP Rule 2-1-403, Permit Conditions (as approved by EPA on 6/23/95). Used to determine whether threshold-based requirements are triggered.

**DAF**
A "dissolved air flotation" unit is a process vessel where air bubbles injected at the bottom of the vessel are used to carry solids in the liquid into a froth on the liquid surface, where it is removed.

**DWT**
Dead Weight Ton

**District**
The Bay Area Air Quality Management District

**DNF**
Dissolved Nitrogen Flotation (See DAF)

**dscf**
Dry Standard Cubic Feet

**dscm**
Dry Standard Cubic Meter

**E 6, E 9, E 12**
Very large or very small number values are commonly expressed in a form called scientific notation, which consists of a decimal part multiplied by 10 raised to some power. For example, 4.53 E 6 equals (4.53) x ($10^6$) = (4.53) x (10 x 10 x 10 x 10 x 10 x 10) = 4,530,000. Scientific notation is used to express large or small numbers without writing out long strings of zeros.

**EFRT**
An "external floating roof tank" minimizes VOC emissions with a roof with floats on the surface of the liquid, thus preventing the formation of a VOC-rich vapor space above the liquid surface as the level in the tank drops. If such a vapor space were allowed to form, it would be expelled when the tank was re-filled. On an EFRT, the floating roof is not enclosed by a second, fixed tank roof, and is thus described as an "external" roof.

**EPA**
The federal Environmental Protection Agency.

**ETP**
Effluent Treatment Plant

**Excluded**
Not subject to any District Regulations.

**FCC**
Fluid Catalytic Cracker

**Federally Enforceable, FE**
All limitations and conditions which are enforceable by the Administrator of the EPA including those requirements developed pursuant to 40 CFR Part 51, subpart I (NSR), Part 52.21 (PSD), Part 60 (NSPS), Part 61 (NESHAPs), Part 63 (HAP), and Part 72 (Permits Regulation, Acid Rain), and also including limitations and conditions contained in operating permits issued under an EPA-approved program that has been incorporated into the SIP.

**FP**
Filterable Particulate as measured by BAAQMD Method ST-15, Particulate.

**FR**
Federal Register

**FRT**
Floating Roof Tank (See EFRT and IFRT)

**GDF**
Gasoline Dispensing Facility

**GLM**
Ground Level Monitor

**grains**
1/7000 of a pound

**Graphitic**
Made of graphite.

**HAP**
Hazardous Air Pollutant. Any pollutant listed pursuant to Section 112(b) of the Act. Also refers to the program mandated by Title I, Section 112, of the Act and implemented by 40 CFR Part 63.

**H2S**
Hydrogen Sulfide

**H2SO4**
Sulfuric Acid

**Hg**
Mercury

**HHV**
Higher Heating Value. The quantity of heat evolved as determined by a calorimeter where the combustion products are cooled to 60F and all water vapor is condensed to liquid.

**IFRT**
An "internal floating roof tank" minimizes VOC emissions with a roof with floats on the surface of the liquid, thus preventing the formation of a VOC-rich vapor space above the liquid surface as the level in the tank drops. If such a vapor space were allowed to form, it would be expelled when the tank was re-filled. On an IFRT, the floating roof is enclosed by a second, fixed tank roof, and thus is described as an "internal" roof.

**ISOM**
Isomerization plant

**LHV**
Lower Heating Value. Similar to the higher heating value (see HHV) except that the water produced by the combustion is not condensed but retained as vapor at 60F.

**Lighter**
"Lightering" is a transfer operation during which liquid is pumped from an ocean-going tanker vessel to a smaller vessel such as a barge. Like any liquid transfer operation, lightering of organic liquids produces organic vapor emissions.

**Long ton**
2200 pounds

**Major Facility**
A facility with potential emissions of: (1) at least 100 tons per year of regulated air pollutants, (2) at least 10 tons per year of any single hazardous air pollutant, and/or (3) at least 25 tons per year of any combination of hazardous air pollutants, or such lesser quantity of hazardous air pollutants as determined by the EPA administrator.

**MDEA**
Methyl Diethanolamine

**MFR**
Major Facility Review. The District's term for the federal operating permit program mandated by Title V of the Act and implemented by District Regulation 2, Rule 6.

**Mo Gas**
Motor gasoline

**MOP**
The District's Manual of Procedures

**MOSC**
Mobil Oil Sludge Conversion (licensed technology)

**MSDS**
Material Safety Data Sheet

**MTBE**
methyl tertiary-butyl ether

**NA**
Not Applicable

**NAAQS**
National Ambient Air Quality Standards

**NESHAPs**
National Emission Standards for Hazardous Air Pollutants. See in 40 CFR Parts 61 and 63.

**NMHC**
Non-methane Hydrocarbons

**NMOC**
Non-methane Organic Compounds (Same as NMHC)

**NOx**
Oxides of nitrogen.

**NSPS**
Standards of Performance for New Stationary Sources. Federal standards for emissions from new stationary sources. Mandated by Title I, Section 111 of the Act, and implemented by 40 CFR Part 60 and District Regulation 10.

**NSR**
New Source Review. A federal program for pre-construction review and permitting of new and modified sources of air pollutants for which the District is classified "non-attainment". Mandated by Title I of the Clean Air Act and implemented by 40 CFR Parts 51 and 52 as well as District Regulation 2, Rule 2. (Note: There are additional NSR requirements mandated by the California Clean Air Act.)

**O2**
The chemical name for naturally-occurring oxygen gas.

**Offset Requirement**
A New Source Review requirement to provide federally enforceable emission offsets at a specified ratio for the emissions from a new or modified source and any pre-existing cumulative increase minus any onsite contemporaneous emission reduction credits. Applies to emissions of POC, NOx, PM10, and SO2.

**Phase II Acid Rain Facility**
A facility that generates electricity for sale through fossil-fuel combustion and is not exempted by 40 CFR 72 from Titles IV and V of the Clean Air Act.

**POC**
Precursor Organic Compounds

**PM**
Total Particulate Matter

**PM10**
Particulate matter with aerodynamic equivalent diameter of less than or equal to 10 microns

**PSD**
Prevention of Significant Deterioration. A federal program for permitting new and modified sources of air pollutants for which the District is classified "attainment" of the National Air Ambient Quality Standards. Mandated by Title I of the Act and implemented by both 40 CFR Part 52 and District Regulation 2, Rule 2.

**Regulated Organic Liquid**
"Regulated organic liquids" are those liquids which require permits, or which are subject to some regulation, when processed at a liquid-handling operation. For example, for refinery marine terminals, regulated organic liquids are defined as "organic liquids" in Regulation 8, Rule 44.

**RFG**
Refinery Fuel Gas

**RMG**
Refinery Make Gas

**SCR**
A "selective catalytic reduction" unit is an abatement device that reduces NOx concentrations in the exhaust stream of a combustion device. SCRs utilize a catalyst, which operates at a specific temperature range, and injected ammonia to promote the conversion of NOx compounds to nitrogen gas.

**SIP**
State Implementation Plan. State and District programs and regulations approved by EPA and developed in order to attain the National Air Ambient Quality Standards. Mandated by Title I of the Act.

**SO2**
Sulfur dioxide

**SO2 Bubble**
An SO2 bubble is an overall cap on the SO2 emissions from a defined group of sources, or from an entire facility. SO2 bubbles are sometimes used at refineries because combustion sources are typically fired entirely or in part by "refinery fuel gas" (RFG), a waste gas product from refining operations. Thus, total SO2 emissions may be conveniently quantified by monitoring the total amount of RFG that is consumed, and the concentration of H2S and other sulfur compounds in the RFG.

**SO3**
Sulfur trioxide

**THC**
Total Hydrocarbons (NMHC + Methane)

**therm**
100,000 British Thermal Unit

**Title V**
Title V of the federal Clean Air Act. Requires a federally enforceable operating permit program for major and certain other facilities.

**TOC**
Total Organic Compounds (NMOC + Methane, Same as THC)

**TPH**
Total Petroleum Hydrocarbons

**TRMP**
Toxic Risk Management Plan

**TRS**
"Total reduced sulfur" is a measure of the amount of sulfur-containing compounds in a gas stream, typically a fuel gas stream, including, but not limited to, hydrogen sulfide. The TRS content of a fuel gas determines the concentration of SO2 that will be present in the combusted fuel gas, since sulfur compounds are converted to SO2 by the combustion process.

**TSP**
Total Suspended Particulate

**TVP**
True Vapor Pressure

**VOC**
Volatile Organic Compounds

**Units of Measure:**

| | | |
|---|---|---|
| bbl | = | barrel of liquid (42 gallons) |
| bhp | = | brake-horsepower |
| btu | = | British Thermal Unit |
| C = | degrees Celcius | |
| F = | degrees Farenheight | |
| $f^3$ = | cubic feet | |
| g | = | grams |
| gal | = | gallon |
| gpm | = | gallons per minute |
| hp | = | horsepower |
| hr | = | hour |
| lb= | pound | |
| in= | inches | |
| max | = | maximum |
| $m^2$ | = | square meter |
| min | = | minute |
| M | = | thousand |
| Mg | = | mega-gram, one thousand grams |
| µg | = | micro-gram, one millionth of a gram |
| MM | = | million |
| mm | = | millimeter |
| MMbtu | = | million btu |
| mm Hg | = | millimeters of Mercury (pressure) |
| MW | = | megawatts |
| ppmv | = | parts per million, by volume |
| ppmw | = | parts per million, by weight |
| psia | = | pounds per square inch, absolute |
| psig | = | pounds per square inch, gauge |
| scfm | = | standard cubic feet per minute |
| yr | = | year |

**Symbols:**

| | | |
|---|---|---|
| < | = | less than |
| > | = | greater than |
| ≤ | = | less than or equal to |
| ≥ | = | greater than or equal to |