SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report

Proposed Amended Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants

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EXECUTIVE SUMMARY

Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Rule 1173) controls volatile organic compound (VOC) leaks from components and releases from atmospheric process pressure relief devices. Rule 1173 applies to refineries, chemical plants, lubricating oil and grease re-refiners, marine terminals, oil and gas production fields, natural gas processing plants, and pipeline transfer stations.

Proposed Amended Rule (PAR) 1173 was developed in response to objectives in the Wilmington, Carson, West Long Beach (WCWLB) Community Emission Reductions Plan (CERP) and to implement the 2022 Air Quality Management Plan Control Measure FUG-01: Improved Leak Detection and Repair, both of which are committed to improved leak detection requirements in South Coast AQMD rules. The objective of PAR 1173 is to further reduce VOC emissions from components by requiring the use of enhanced leak detection technology at greater frequencies and establishing lower leak standards. Additionally, PAR 1173 will introduce contingency measures to partially satisfy Clean Air Act contingency requirements for applicable ozone National Ambient Air Quality Standards in the South Coast AQMD's jurisdiction. PAR 1173 affects approximately 2,350,000 components at approximately 203 facilities.

PAR 1173 achieves VOC emission reductions largely through three proposed requirements: 1) lowering VOC leak standards for fittings, valves, and certain others to reduce baseline VOC emission associated with those components in compliance with the rule; 2) lowering VOC leak standards for pumps (light liquid service) and compressors to reduce baseline VOC emission associated with those components in compliance with the rule; and 3) reducing the persistence of larger VOC leaks by requiring OGI inspections monthly to find and repair those leaks more quickly. Combined, these control strategies are expected to reduce VOC emissions by 680.7 tons per year or 1.86 tons per day. The overall cost-effectiveness of PAR 1173 is $18,300 per ton of VOC reduced.

PAR 1173 also proposes contingency measures as defined by Clean Air Act (CAA) Section 172(c)(9) as "specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date." CAA Section 182(c)(9) further requires that ozone nonattainment areas classified as "serious" or above provide for contingency measures to be implemented if the area fails to meet any applicable milestone. The three proposed contingency measures include: 1) further lowering VOC leak standards for fittings, valves, and certain others to 50 ppm; 2) further lowering VOC leak standards for pumps (light liquid service) and compressors to 300 ppm; and 3) requiring OGI inspections every two weeks. Together, these three contingency measures, if all triggered, are expected to further reduce VOC emissions by 217.9 tons per year or 0.60 tons per day.

Development of PAR 1173 was conducted through a public process. Four Working Group meetings were held on February 28, 2024, April 24, 2024, June 12, 2024, and July 11, 2024. The Working Group is composed of representatives from businesses, environmental groups, public agencies, and consultants. The purpose of the Working Group meetings is to discuss proposed concepts and work through the details of South Coast AQMD's proposal. Additionally, a Public Workshop will be held on July 26, 2024. The purpose of the Public Workshop is to present the proposed amended rule language to the general public and stakeholders and to solicit comments. Staff also conducted multiple site visits as part of this rulemaking process.

CHAPTER 1: BACKGROUND

INTRODUCTION

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INTRODUCTION

Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants applies to refineries, chemical plants, lubricating oil and grease re-refiners, marine terminals, oil and gas production fields, natural gas processing plants and pipeline transfer stations. The purpose of Rule 1173 is to reduce and control volatile organic compound (VOC) from leaks from components and from releases from atmospheric process pressure relief devices (PRDs). Proposed Amended Rule (PAR) 1173 is needed to further reduce VOC from components using new smart leak detection and repair (LDAR) technology and through other practical and innovative strategies.

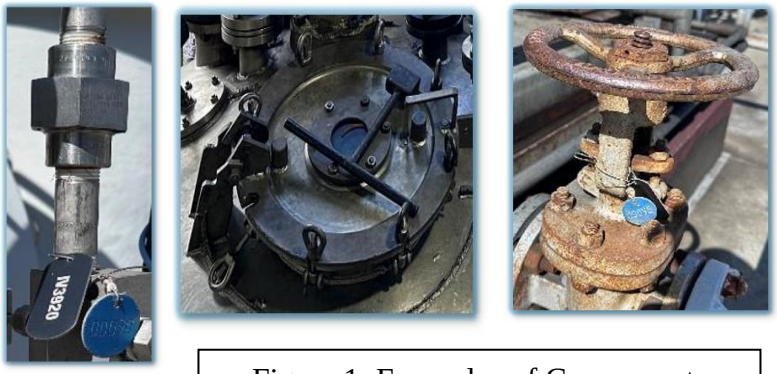


Figure 1: Examples of Components Subject to Rule 1173

BACKGROUND

Contingency Measure SIP Revision

The U.S. Environmental Protection Agency (U.S. EPA) requires areas that do not meet a National Ambient Air Quality Standard (NAAQS or standard) to develop and submit a State Implementation Plan (SIP) for approval. SIPs are used to show how the region will meet the standard. Regions must attain NAAQS by specific dates or face the possibility of sanctions by the federal government and other consequences under the Clean Air Act (CAA). This can result in increased permitting fees, stricter restrictions for permitting new projects, and the loss of federal highway funds. The South Coast AQMD SIPs are developed within the agency's Air Quality Management Plans (AQMPs).

In August 2018, the U.S. EPA designated the Basin as "extreme" nonattainment and the Coachella Valley as "severe-15" nonattainment for the 2015 8-hour ozone standard. The South Coast Air Basin (Basin) includes large areas of Los Angeles, Orange, Riverside, and San Bernardino counties. The Coachella Valley is the desert portion of Riverside County in the Salton Sea Air Basin. "Extreme" nonattainment areas must attain this standard by August 2038 and "severe" nonattainment areas must attain by August 2033.

Control Measures in the 2012, 2016, and 2022 Final AQMPs

On December 2, 2022, the South Coast AQMD Governing Board adopted the 2022 AQMP to achieve attainment for ozone. The 2022 AQMP is focused on attaining the 2015 8-hour ozone standard of 70 parts per billion (ppb) by 2037 for the Basin and 2032 for the Coachella Valley. The 2022 AQMP contains five proposed VOC measures for stationary sources, including FUG-01: Improved Leak Detection and Repair. FUG-01 proposes implementing the use of advanced LDAR technologies including optical gas imaging (OGI) devices, open path detection devices, and gas sensors for earlier detection of VOC emission from leaks.

The 2022 AQMD also made reference to incorporate co-benefits with reductions in greenhouse gas (GHG) emissions, such as methane and ethane, in order provide climate change assistance.

California Assembly Bill 617 and Community Emission Reductions Plans

In addition, Assembly Bill (AB) 617 was signed into California law in July 2017 and focuses on addressing local air pollution in environmental justice (EJ) communities. On September 27, 2018, the California Air Resources Board (CARB) designated 10 communities across the state to implement community plans for the first year of the AB 617 program. One of those communities was the Wilmington, Carson, West Long Beach (WCWLB) community.

In September 2019, the South Coast AQMD Governing Board adopted the Community Emission Reductions Plan (CERP) for the WCWLB community, outlining the actions and commitments by the Community Steering Committee (CSC), the South Coast AQMD, and the CARB, to reduce air pollution in the WCWLB community. Among the objectives of the WCWLB CERP include reducing fugitive VOC emissions as described in Chapter 5b Action 2. The WCWLB CERP proposes reductions be achieved through rule amendments to identify and address VOC leaks and identifies Rule 1173 in particular. Considerations identified include more rapid leak detection and response enabled by advanced air measurements and lowering allowable emissions from on-site equipment, such as emission concentrations.

REGULATORY HISTORY

Rule 1173 was originally adopted on July 7, 1989 and subsequently amended on several occasions:

1989 Rule Adoption

Rule 1173 was developed to reduce fugitive emissions from certain components, specifically valves, pumps, compressors, pressure relief devices (PRDs), diaphragms, fittings, sight-glasses, and meters located at certain facilities, specifically refineries, chemical plants, oil and gas fields, natural gas processing plants, and pipeline transfer stations. Rule 1173 was intended to phase out then-Rules 466, 466.1, and 467, which had been applicable to a more limited number of components at some of the target facilities. Rule 1173 implemented the 1988 AQMP Control Measure #88-B-13.

1990 Amendments

The 1990 amendments to Rule 1173 were primarily administrative in nature. Upon notification by U.S. EPA that certain rules submitted to the State Implementation Plan (SIP), including Rule 1173, controlling emissions of VOC contain provisions that are not consistent with federal policies, the South Coast AQMD initiated rulemaking to correct 34 of the 90 identified deficiencies in 24 different rules. The 1990 amendments modified Rule 1173's VOC definition and deleted outdated compliance dates.

1994 Amendments

The 1994 amendments to Rule 1173 were also administrative changes. U.S. EPA identified three rules submitted to the SIP, including Rule 1173, with deficiencies. South Coast AQMD initiated rulemaking to correct these SIP deficiencies and PAR 1173 (1994) modified the definition for inaccessible components, modified approval of equivalent test methods, revised unsafe component exemption, added definition for exempt compounds, and other minor clarifications.

2002 Amendments

The 2002 amendments to Rule 1173 proposed further reductions of fugitive VOC emissions from components at facilities by requiring an inspection and repair program for heavy liquids, reducing the leak threshold and time to repair components in light liquid service, and requiring capture and control of PRD releases or payment of a mitigation fee. This amendment implemented portions of 1997/99 AQMP Control Measures FUG-04 and FUG-05.

2007 Amendments

The 2007 amendments to Rule 1173 expanded the number of facilities subject to the rule by including lubricating oil and grease re-refiners and marine terminals within the applicability of the rule. The amendment also required the implementation of an enhanced atmospheric PRD monitoring program at refineries. It implemented portions of Control Measure FUG-05 – Emission Reductions from Fugitive VOC Sources, of the 2003 AQMP.

2009 Amendments

The 2009 amendments to Rule 1173 were administrative in nature correcting internal rule references to address the installation schedule for continuous monitors for atmospheric process PRDs and exemptions.

AFFECTED FACILITIES AND EQUIPMENT

PAR 1173 affects approximately 2,350,000 components at approximately 203 facilities operating as refineries, chemical plants, lubricating oil and grease re-refiners, marine terminals, oil and gas production fields, natural gas processing plants and pipeline transfer stations.

PUBLIC PROCESS

Development of PAR 1173 was conducted through a public process. Four Working Group meetings were held on February 28, 2024, April 24, 2024, June 12, 2024, and July 11, 2024. The Working Group is composed of representatives from businesses, environmental groups, public agencies, and consultants. The purpose of the Working Group meetings is to discuss proposed concepts and work through the details of South Coast AQMD's proposal. Additionally, a Public Workshop will be held on July 26, 2024. The purpose of the Public Workshop is to present the proposed amended rule language to the general public and stakeholders and to solicit comments. Staff also conducted multiple site visits as part of this rulemaking process.

COMMERCIAL NATURAL GAS DISCUSSION

As noted earlier in *Background*, staff is tasked with looking for co-benefits with GHG programs. Currently in Rule 1173, commercial natural gas, comprising methane and ethane with trace amounts of odorant gases, is exempted under Rule 1173, despite methane being a known greenhouse gas. Throughout working group meetings, site visits, and other meetings, staff exchanged with a variety of representatives to find common ground and build consensus around best management practices and common sense approaches to reduce emissions of this GHG. After careful consideration and deliberation, staff concluded that requirements for commercial natural gas, comprised almost exclusively as methane and ethane and defined in Rule 102 as not to be considered VOCs, are not within the scope of Rule 1173 regarding VOC leaks and releases and left in place the existing exemption for commercial natural gas.

CHAPTER 2: BARCT ASSESSMENT

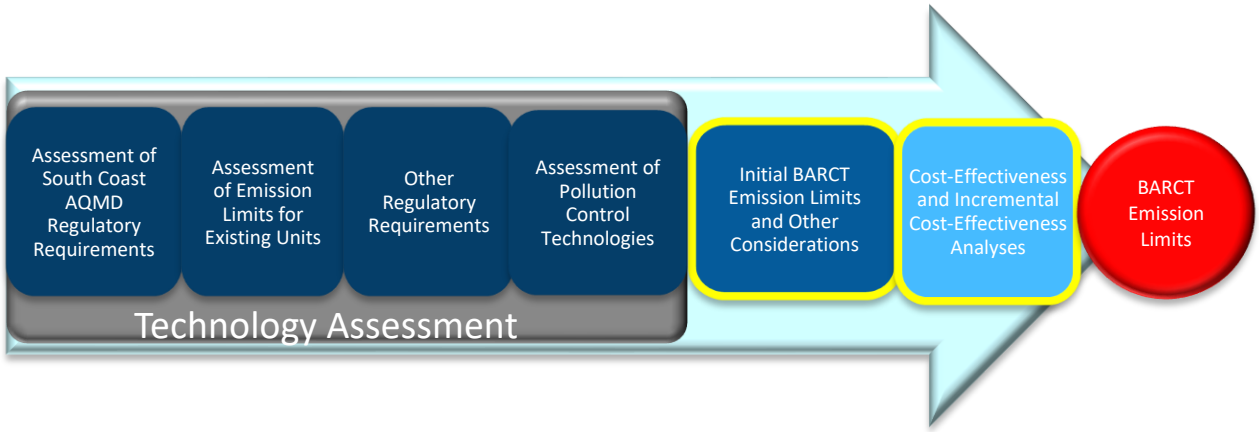
BARCT ANALYSIS APPROACH

PAR 1173 rule development was initiated in response to objectives in the WCWLB CERP for enhanced leak detection and to partially implement Control Measure FUG-01 in the 2022 Final AQMP. Additionally, South Coast AQMD periodically assesses rules to ensure that BARCT (Best Available Retrofit Control Technology) is reflected in rule requirements. To address community member objectives, partially implement Control Measure FUG-01, and ensure that Rule 1173 reflects BARCT, a BARCT assessment was conducted to identify the potential to further reduce emissions from components.

BARCT is defined in the Health & Safety Code Section 40406 as "an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source." Consistent with state law, BARCT emission limits take into consideration environmental impacts, energy impacts, and economic impacts. The BARCT analysis approach follows a series of steps conducted for each equipment category.

The steps for BARCT analysis consist of:

- Assessment of South Coast AQMD Regulatory Requirements
- Assessment of Emissions Limits for Existing Units
- Other Regulatory Requirements
- Assessment of Pollution Control Technologies
- Initial BARCT Emission Limits and Other Considerations
- Cost-Effectiveness and Incremental Cost-Effectiveness Analyses
- BARCT Emission Limit



The BARCT assessment included a review of leak detection technologies and emission reducing strategies. Newer leak detection technologies were reviewed and included OGI devices, gas sensors, and open path detection. Leak detection methods were also analyzed with varying inspection frequencies. Lower leak standards for various types of components were also reviewed. Staff analyzed the potential to reduce emissions from leaks with enhanced leak detection technologies and reduce emissions from facility operations by establishing more stringent requirements for existing components.

As part of the technology assessment, a cost-effectiveness analysis was conducted for technologies with potential to reduce emissions. A cost-effectiveness analysis determines the cost per ton of pollutant reduced. In the 2022 AQMP, a cost-effectiveness threshold of $36,000 per ton of VOC reduced was established. After adjusting for inflation, the cost-effectiveness threshold is $40,170 per ton of VOC reduced (2023 U.S. Dollars). An incremental cost-effectiveness analysis was also conducted for proposed controls and monitoring methods to establish BARCT, if applicable, and is discussed in Chapter 4.

ASSESSMENT OF SOUTH COAST AQMD REGULATORY REQUIREMENTS

Rule 1173 applies to specific types of components at seven categories of facilities. Leaking components emit VOC through openings threaded connections, gaskets, seals, and other points of contact that degrade over time and require periodic monitoring to identify leakage, performance maintenance, and possibly replace components to minimize emissions. Rule 1173 currently requires audio-visual inspections of certain components every 8 hours, quarterly analyzer leak checks for accessible components and annual analyzer leak checks for inaccessible components in accordance with U.S. EPA Method 21. Since the last non-administrative amendments to Rule 1173 in 2007, advancements in the availability of leak monitoring technology have occurred including OGI devices, gas sensors, and open path detection. These more recently developed technologies are included in the BARCT assessment.

ASSESSMENT OF EMISSION LIMITS FOR EXISTING UNITS

Rule 1173 currently has a variety of emission limits based on the type of component and type of service of the component. In addition, South Coast AQMD also completed an evaluation of the federal Lowest Achievable Emission Rate (LAER) requirement for major polluting facilities as well as the Best Available Control Technology (BACT) for new or modified petroleum refineries regarding fugitive VOC emission sources. Known as a LAER/BACT Determination, those emission limits, expressed in ppm, are also summarized in the Table 2-1 below:

Table 2-1 Emission Limits

Regulation	Rule 1173		LAER/BACT
Service Type	Light Liquid or Gas/Vapor	Heavy Liquid	Light Liquid or Gas/Vapor
Valve, Fitting, Other*	500	100	200
PRDs	200	100	200
Pump, Compressor	500	100	N/A
*Other includes diaphragms, hatches, sight-glasses, and meters			

Regarding advanced leak monitoring technologies, Rule 1173 currently does not have an advanced leak monitoring requirement, such as OGI. Other South Coast AQMD rules, specifically Rules 1178 and 463, have advanced monitoring frequencies summarized in the Table 2-2 below:

Table 2-2 Monitoring Requirements in Other South Coast AQMD Rules		
	Rule 1178	Rule 463
OGI Monitoring Requirement	Every two weeks	Monthly

OTHER REGULATORY REQUIREMENTS

Staff reviewed rules and regulations from other air districts including Bay Area AQMD, San Joaquin Valley Air Pollution Control District (APCD), and Santa Barbara County APCD. The inspections are conducted with analyzers and no rule in other air districts requires the use of advanced monitoring equipment like OGI. Those emission limits, expressed in ppm, are summarized in the Table 2-3 below:

Table 2-3 Leak Levels in Other Air Districts						
Air District	Bay Area	San Joaquin Valley APCD			Santa Barbara County	
Regulation	Rule 8-18	Rule 4409	Rule 4455	BACT	Rule 331	BACT
Valve, Fitting	100	500	L: 200 G/V: 400	100	1,000	100
Other	100	500	L: 500 G/V: 1,000	100	1,000	100
Pump, Compressor	500	500	L: 500 G/V: 1,000	100	1,000	100
PRD	500	L: 200 G/V: 400	L: 100 G/V: 200	100	1,000	100
*Other includes diaphragms, hatches, sight-glasses, and meters (L = liquid, G/V = gas/vapor)						

In addition to these finalized emission limits, on November 20, 2023, Bay Area AQMD released a draft with proposed amendments to their Rule 8-18, including lowering some leak standards to

50 ppm. In a more recent draft released May 23, 2024, the proposed amendments to Bay Area AQMD Rule 8-18 do not include a 50 ppm leak standard.

ASSESSMENT OF POLLUTION CONTROL TECHNOLOGIES

Multiple leak detection technologies and methods were considered to reduce the emissions impact from leaks from components. A review of continuous monitoring technologies including fixed gas sensor networks and open path device systems was conducted. Periodic monitoring with handheld optical gas imaging devices was also reviewed.

Continuous monitoring solutions using open path detection and fixed gas sensor networks were assessed in 2023 for PAR 1178 rulemaking and again in 2024 for PAR 463 rulemaking regarding tanks. It was determined that the best solution for monitoring tanks is to require periodic monitoring with handheld OGI devices due to their ability to detect to identify small and large leaks as varying distances. For the situation for components as opposed to tanks, this advantage of handheld OGI devices versus open path and gas sensor methods is accentuated. Continuous monitoring systems are limited in their ability to detect smaller leaks because they are installed at a distance from the source of emissions. Depending on the detection technology of the continuous monitoring system, a leak may need to be significantly large at the source to be detected and has the potential to go undetected. One significant drawback to requiring stationary continuous monitoring system of gas sensors or open path devices, is the chance that a large leak goes undetected because it does not make contact with the fixed sensor or emitted open path beam. Continuous monitoring systems with sensors that must come in contact with the VOC vapor may not be the most effective technologies to reduce the emissions impact from tank leaks. Another drawback to requiring continuous monitoring systems is the delayed implementation timeline due to the plan approval and installation timeframes. Staff assessed that the advanced monitoring technology most suitable to identify sources of leaks at the component level is handheld OGI devices.

Periodic Monitoring with Optical Gas Imaging

An optical gas imaging camera uses infrared technology capable of visualizing vapors. Optical gas imaging cameras have different detectors capable of visualizing a variety of gas wavelengths. VOC wavelengths are in the 3.2-3.4 micrometer waveband. The difference in views is shown in Figure 2-1 below.

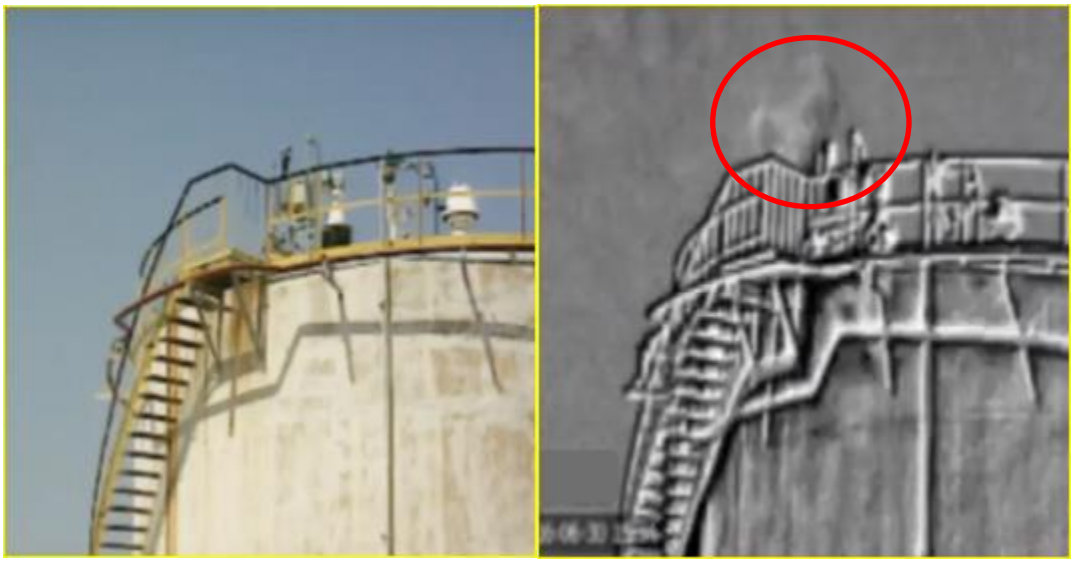


Figure 2-1: View with naked eye compared to view with an OGI camera

OGI cameras with the ability to detect or visualize in this waveband range contain a cryocooler that is integrated into the sensor and increases the sensitivity of the camera to detect smaller leaks. OGI cameras are widely used as a screening tool for leak detection purposes and have continuous monitoring capability. Fixed OGI systems have been implemented at well sites and compression stations for continuous emissions monitoring. Handheld OGI cameras, as seen in Figure 2-2, are used widely by leak detection service providers as well as facilities for periodic monitoring.

Figure 2-2- OGI camera

Fixed OGI cameras may not catch all leaks that can be identified during an inspection where a portable OGI device is manually operated. Fixed OGI cameras are limited in the number of angles viewed and would likely be stationed further away from an emissions source compared to a person conducting an inspection with a portable OGI device. Stationary and portable devices both have the capability to detect large leaks, however, there is greater chance that smaller leaks would be identified with a manual field inspection than with a stationary camera because components can be monitored in close proximity using portable devices such as handheld OGI cameras and toxic vapor analyzers (TVA).

INITIAL BARCT EMISSION LIMIT AND OTHER CONSIDERATIONS

Leak Standards

After review of other pending and finalized leak standards in other air districts, staff considered the following leak standards as initial BARCT emission limits with several other incremental leak standards for determination of cost-effectiveness and incremental cost-effectiveness, summarized in the Table 2-4 below:

Table 2-4 Initial BARCT Limits	
Component Type	Initial BARCT Leak Standard (ppm)
Valve, Fitting, Other*	50
Pump (Light Liquid), Compressor	50
PRD	50
*Other includes diaphragms, hatches, sight-glasses, and meters	

OGI Inspection Frequency

After review of other South Coast AQMD rules requiring OGI device inspection, staff considered weekly OGI inspection as the initial BARCT limit with several other less frequent inspection schedules for determination of cost-effectiveness and incremental cost-effectiveness.

COST-EFFECTIVENESS AND INCREMENTAL COST-EFFECTIVENESS ANALYSES

Leak Standards

Lower leak standards are expected to increase the number of leaks detected above the leak standard, leading to increased maintenance and repair cost. Lower leak standards are also expected to decrease the baseline fugitive VOC emissions from components in compliance with the leak standards. To understand how many more leaks are to be expected and the VOC emission rate of components in compliance, staff studied Rule 1173 leak reports submitted to South Coast AQMD.

Rule 1173 required recordkeeping of component leaks and repairs and Rule 1173 also requires facilities to submit these reports quarterly, as Rule 1173 Component Leak Report (Form C) and Rule 1173 Statistics Summary Sheet (Form D). Staff examined all leak reports submitted for calendar year 2023, 4th quarter. For each grouping of components, the distribution of leak values above the leak standard was counted. The component groups demonstrated certain trends when examined for power trendlines, as demonstrated in the Figures 2-3, 2-4, and 2-5 below:

Figure 2-3 Distribution of Valve, Fitting, Other Leaks

Range: 500 ppm to 11,000 ppm, Grouping: by 100

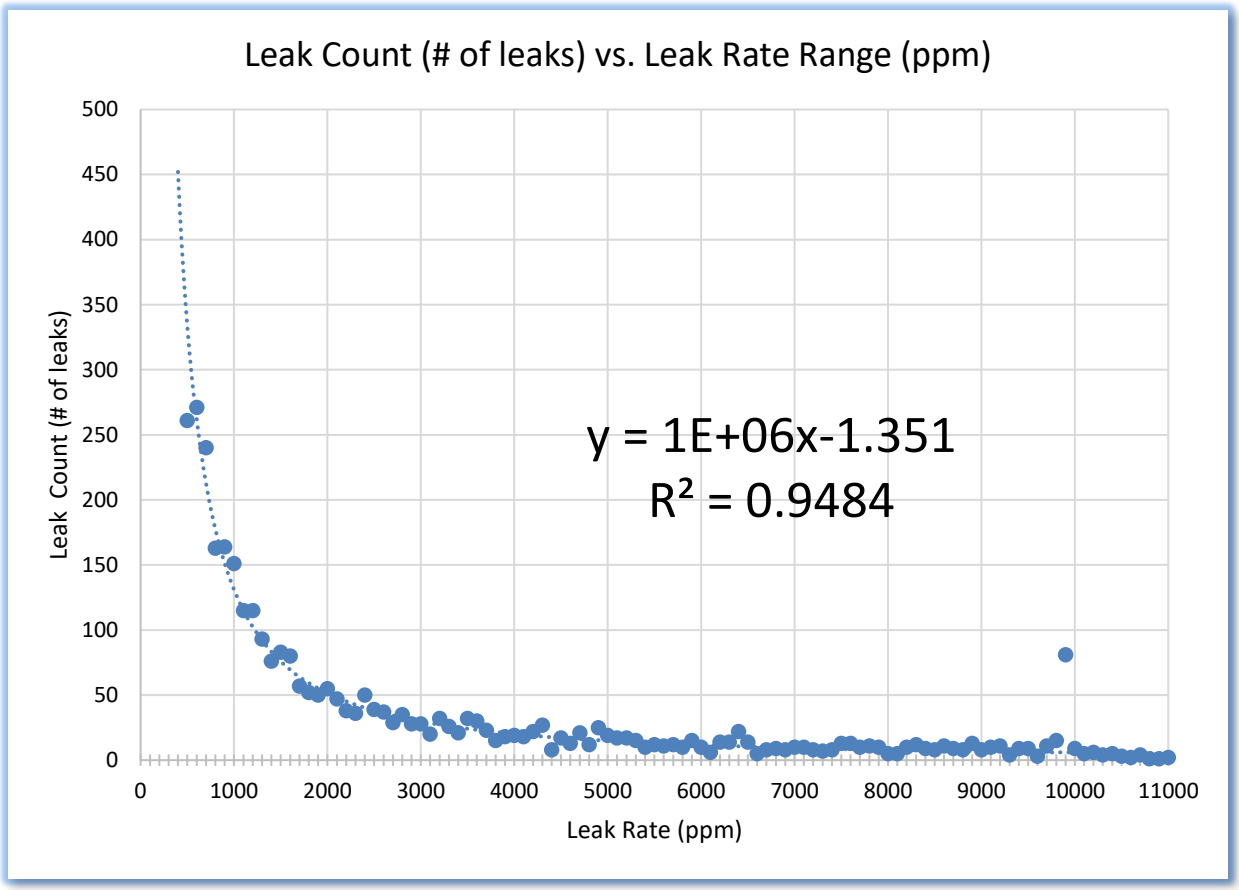


Figure 2-4 Distribution of Pump (Light Liquid), Compressor Leaks

Range: 500 ppm to 11,000 ppm, Grouping: by 250

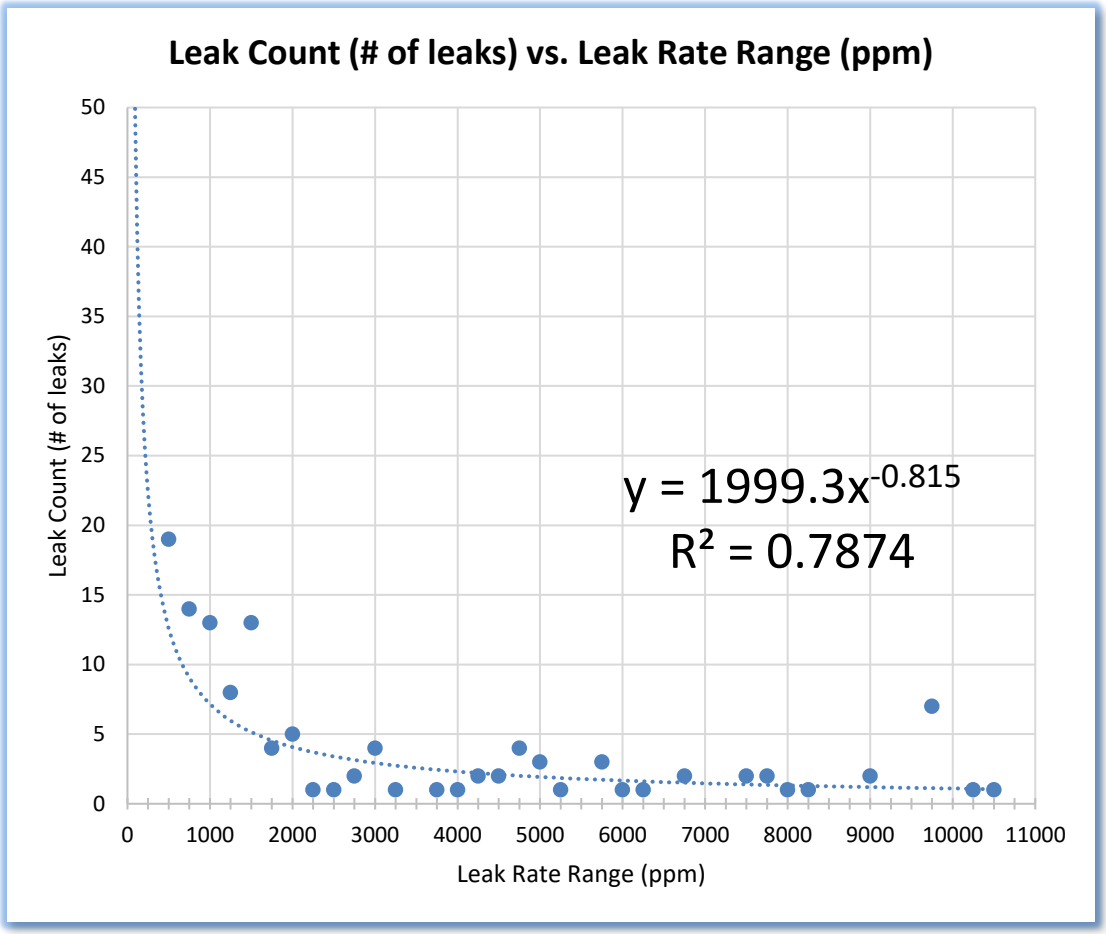
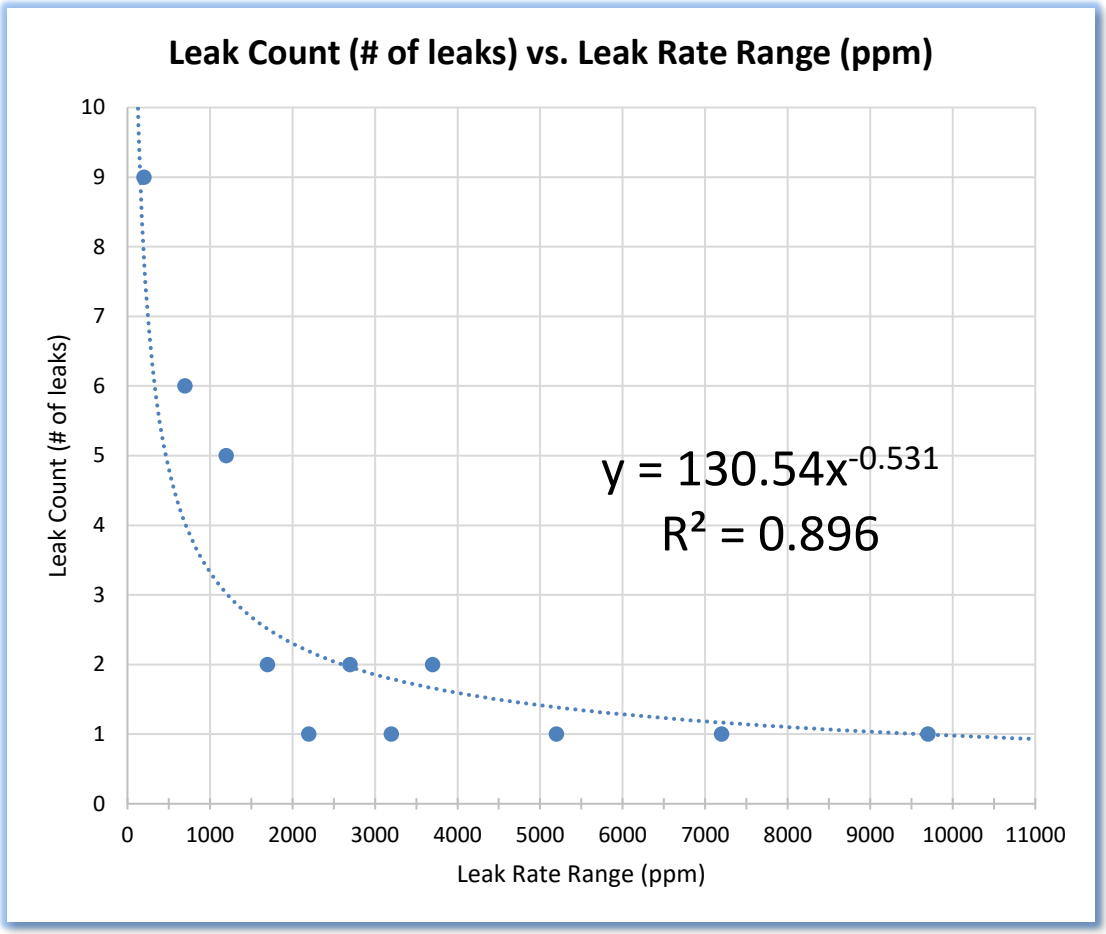


Figure 2-5 Distribution of PRD Leaks

Range: 200 ppm to 11,000 ppm, Grouping: by 500



These curves and power trendlines are able to predict, with relatively high confidence, the number of additional leaks estimated above a leak standard at differing leak values:

Fitting, Valve, Other:

$$Additional\ quarterly\ leaks\ at\ leak\ value = 10^6 \times (leak\ value)^{-1.351}$$

Pump (Light Liquid) and Compressor:

$$Additional\ quarterly\ leaks\ at\ leak\ value = 1999.3 \times (leak\ value)^{-0.815}$$

PRD:

$$Additional\ quarterly\ leaks\ at\ leak\ value = 130.54 \times (leak\ value)^{-0.531}$$

For example, for component type fitting, valve, other, at a leak value of 400 ppm, 305 additional leaks are estimated each quarter at that leak value range. Therefore, 1,220 additional leaks are

estimated each year at a leak standard of 400 ppm. At a leak value of 300 ppm, 455 additional leaks are estimated each quarter at that leak value range. At a leak value of 300 ppm, 305 + 405 = 755 additional leaks are expected in the 300 and 400 leak value range. Thus, 3,020 additional leaks are estimated each year at a leak standard of 300 ppm. Additional leak estimates are listed below in Table 2-5 for various lower leak standards:

Table 2-5 Estimated Additional Leaks Per Year			
Leak Standard (ppm)	Fitting, Valve, Other	Pump (Light Liquid), Compressor	PRD
500	Current leak standard	Current leak standard	
400	1,220	60	
300	3,020	136	
200	6,136	244	Current leak standard
100	14,080	432	44
50	34,344	760	76

Each of these estimated additional leaks has a cost associated with its repair. In 2023, San Joaquin Valley APCD amended their VOC component rules, including Rules 4409 and 4455. The Staff Report[1] for that rulemaking contains Table C-4: *Constant in Quantifying Repairing and Replacing Components* which itemized component replacement costs, percentage needing repair versus replacement, repair labor costs, and average repair or replacement times. Applying the San Joaquin Valley APCD method to the distribution of leaks detected in South Coast AQMD for calendar year 2023, 4th quarter yields a cost for each component type of repair as seen in Table 2-6 below:

Table 2-6 Repair Cost by Component Type		
Fitting, Valve, Other	Pump (Light Liquid), Compressor	PRD
$711.56	$5,486.10	$5,541.40

Multiplying the number of estimated leaks by the cost of repair for each leak yields the annual additional cost of implementing each lower leak standard, summarized in the Table 2-7 below:

[1] https://ww2.valleyair.org/media/vptf4eg2/gb-item.pdf

Table 2-7 Estimated Annual Cost of Lower Leak Standards			
Leak Standard (ppm)	Fitting, Valve, Other	Pump (Light Liquid), Compressor	PRD
500	Current leak standard	Current leak standard	
400	$868,000	$329,000	
300	$2,149,000	$746,000	
200	$4,366,000	$1,339,000	Current leak standard
100	$10,019,000	$2,370,000	$244,000
50	$24,438,000	$4,169,000	$598,000

To determine baseline fugitive VOC emissions from components in compliance with PAR 1173, staff estimated VOC emissions using methods in South Coast AQMD Annual Emission Reporting (AER) document *Guidelines for Reporting VOC Emissions from Component Leaks*, revised February 2015[2], specifically Method 2 – Correlation Equation Method. Based on California Air Pollution Control Officers Association (CAPCOA)-revised 1995 U.S. EPA correlation equations and factors for refineries and marketing terminals, it provides a method to estimate VOC emissions based on component type and screening value in ppm.

Similar to the estimated annual cost at various leak standards, estimate average screening values at various leak standards should be developed. Looking again at the estimated additional leaks at each leak standard, staff developed an estimated average screening value based on a weighted average of estimated leak counts at each leak standard by the formula:

$$Estimated\ Average\ Screening\ Value\ @\ Leak\ Standard\ (ppm) = \frac{\sum(leak\ value \times number\ of\ leaks\ at\ leak\ value)}{\sum number\ of\ leaks\ at\ leak\ value}$$

For example, for component type fitting, valve, other, at a leak value of 500 ppm, there were 261 actual leaks at that leak value range in calendar year 2023, 4th quarter. At a leak value of 400 ppm, 305 additional leaks are estimated each quarter at that leak value range. At 300 ppm, 450 additional leaks are estimated. And at 200, 100, and 50 ppm, 779, 1,986, and 5,066 leaks are estimated, respectively. Thus, the estimated average screening value for a 500 ppm leak standard is 112 ppm as calculated below:

[2] http://www.aqmd.gov/docs/default-source/planning/annual-emission-reporting/guidelreportvocemiscomleaks.pdf

$$Estimated\ Average\ Screening\ Value\ @\ 500\ ppm = \frac{(500 \times 261) + (400 \times 305) + (300 \times 450) + (200 \times 779) + (100 \times 1{,}986) + (50 \times 5{,}066)}{261 + 305 + 450 + 779 + 1{,}986 + 5{,}066}$$

For the lowest leak standard considered, 50 ppm, the leak standard is used at the estimated average screening value. Estimated average screening values associated with each leak standard are listed in Table 2-8 below:

Table 2-8 Estimated Average Screening Value

Leak Standard (ppm)	Fitting, Valve, Other (ppm)	Pump (Light Liquid), Compressor (ppm)	PRD (ppm)
500	112	169	
400	101	136	
300	90	114	
200	78	91	103
100	64	68	70
50	50	50	50

The number of components reported to South Coast AQMD in calendar year 2023, 4th quarter are:

Table 2-9 Number of Components by Type	
Component Type	Components in South Coast AQMD
Valve	498,644
Fitting (Connectors and Flanges)	1,720,410
• Connector (assumed 90% of Fittings)	*1,548,369 (estimated)*
• Flange (assumed 10% of Fittings)	*172,041 (estimated)*
Other (diaphragms, hatches, sight-glasses, and meters)	122,390
Pump (Light Liquid)	7,954
Compressor	644
PRD	6,348

Estimating baseline fugitive VOC emissions from each component category at various leak standards using AER Method 2 yields the following table:

Table 2-10 Baseline Annual VOC emissions (in tons)			
Leak Standard (ppm)	Fitting, Valve, Other	Pump (Light Liquid), Compressor	PRD
500	1,529.2	96.3	
400	1,419.3	84.1	
300	1,306.0	75.4	
200	1,177.0	65.5	10.5
100	1,021.4	54.7	8.2
50	855.0	45.1	6.6

With estimated annual cost for each leak standard and estimated emission reductions derived from the difference between baseline annual VOC emissions, the following tables present cost-effectiveness and incremental cost-effectiveness for each category of component:

Table 2-11 Cost-effectiveness and Incremental Cost-effectiveness for Fitting, Valve, Other					
	400 pm	300 ppm	200 ppm	100 ppm	50 ppm
Estimated cost per year	$868,000	$2,149,000	$4,366,000	$10,019,000	$24,438,000
VOC Emission Reduction (tons)	109.9	223.2	351.2	507.8	674.2
Cost-Effectiveness (per ton VOC)	$7,900	$9,600	$12,400	$19,700	$36,200
Incremental Cost-Effectiveness (per ton VOC)		$11,300	$17,300	$36,100	$86,600

Table 2-12 Cost-effectiveness and Incremental Cost-effectiveness for Pump (Light Liquid), Compressor					
	400 pm	300 ppm	200 ppm	100 ppm	50 ppm
Estimated cost per year	$329,000	$746,000	$1,339,000	$2,370,000	$4,169,000
VOC Emission Reduction (tons)	12.2	20.9	30.8	41.6	51.2
Cost-Effectiveness (per ton VOC)	$27,000	$35,600	$43,500	$56,900	$81,500
Incremental Cost-Effectiveness (per ton VOC)		$47,700	$60,100	$94,900	$189,000

Table 2-13 Cost-effectiveness and Incremental Cost-effectiveness for PRD		
	100 ppm	50 ppm
Estimated cost per year	$244,000	$598,000
VOC Emission Reduction (tons)	2.3	3.9
Cost-Effectiveness (per ton VOC)	$106,500	$154,200
Incremental Cost-Effectiveness (per ton VOC)		$223,100

Based on leak standards that are both cost-effective and incrementally cost-effective, the proposed BARCT limits are as follows in Table 2-14:

Table 2-14 Proposed Component Leak Standards			
Component Type	Leak Standard	Cost-Effectiveness	Incremental Cost-Effectiveness
Fitting, Valve, Other	100 ppmv	$19,700	$36,100
Pump	400 ppmv	$27,000	$0
Pressure Relief Device	200 ppmv	$0	$0

OGI Inspection Frequency

More frequent OGI inspections are expected to increase capital costs as more cameras are expected to be needed and increase recurring costs as more trained operator will be needed and more OGI camera maintenance. However, more frequent OGI inspections are expected to catch more leaks and reduce VOC emissions associated with larger leaks.

To build a model to determine cost-effectiveness and incremental cost-effectiveness, staff used several assumptions regarding OGI cameras. First, manufacturers of OGI cameras claim that they are capable of inspecting 10,000 components per day. While some facilities may approach that efficiency, some may not. Thus, staff conservatively estimated that each OGI camera will be used to inspect 5,000 components per operating day. For South Coast AQMD's 2,358,596 components, the number of OGI cameras needed to implement the inspection schedule is listed in the table 2-15 below:

Table 2-15 OGI Camera Needed for PAR 1173				
	Every 2 Months	Monthly	Every 2 Weeks	Weekly
OGI cameras	11	23	48	95

Regarding capital costs, staff assumed the average cost per camera to be $120,000, consistent with rulemaking for Rule 463, amended in June 2024. OGI cameras have an expected life span of 10 years and maintenance cost and associated shipping cost is documented to be $4,874. Labor costs for implementation are $413.88 per operating day, inflation-adjusted from a $400 figure used in the PAR 1178 rulemaking. In accordance with South Coast AQMD practice to use the Discounted Cash Flow method to account for capital costs, with an interest rate of 4% and life of equipment of 10 years yields $PVF_{(4,10)} = 8.11$. Thus, the Present Value of each OGI camera over 10 years is calculated at $1,005,478, or $100,548 per year. The cost associated with various inspection frequencies is listed in the table 2-16 below:

Table 2-16 OGI Inspection Cost by Frequency				
	Every 2 Months	Monthly	Every 2 Weeks	Weekly
Total Cost over 10 year	$11,282,000	$23,126,000	$49,552,000	$98,071,000
Annual Cost	$1,128,000	$2,313,000	$4,955,000	$9,807,000

To estimate emission associated with leaks detectable with OGI device, staff reviewed again the calendar year 2023, 4th quarter leak reports. Manufacturers of OGI cameras report that their devices are capable of detecting leaks in the 2,000 ppm to 5,000 ppm range. Staff took a conservative approach and determined the number of leaks at or above 5,000 ppm extrapolated per year. To determine the emissions associated with these leaks, staff again referred to the South Coast AQMD AER guidance document and employed the specific leak emission factor based on component type. There are two leak emission factors: one based on a pegged factor at 10,000 ppm and one based on a pegged factor at 100,000 ppm. Staff used the lower, more conservative factor in calculations.

At present, leaks are detecting using U.S. EPA Method 21 equipment at a frequency of once per calendar quarter. Assuming these leaks persist for one-half of the time between inspections, or 45 days, estimates of current annual emissions from larger leaks that could detected by OGI cameras are listed below in Table 2-17:

Table 2-17 Estimated Leaks and Emissions Reductions from Use of OGI							
	Connector	Flange	Valve	Pump Seal	Other	Compressor	PRD
Annual Leaks	2,286	254	928	100	436	44	28
Emission Factor (lb/hr)	0.066	0.209	0.141	0.196	0.181	0.181	0.181
Emissions (tons/year)	81.5	28.7	70.7	10.6	42.6	4.3	2.7

The total amount of VOC emissions associated with leaks greater than 5,000 ppm is estimated at 241.0 tons per year.

VOC emissions associated with these larger leaks can be reduced with more frequent inspections using OGI devices. The emissions and associated reductions with each OGI inspection schedule are listed in the Table 2-18 below:

Table 2-18 OGI Emission Reductions by Inspection Frequency				
	Every 2 Months	Monthly	Every 2 Weeks	Weekly
Leak Emissions (tons/year)	160.7	80.3	37.5	18.8
Emission Reduction (tons/year)	80.3	160.7	203.5	222.3

Combining the costs with the associated emission reduction, Table 2-19 presents cost-effectiveness and incremental cost-effectiveness of each implementation schedule:

Table 2-19 OGI Cost-Effectiveness and Incremental Cost-Effectiveness by Inspection Frequency				
	Every 2 Months	Monthly	Every 2 Weeks	Weekly
Annual Cost	$1,128,000	$2,313,000	$4,955,000	$9,807,000
Emission Reduction	80.3	160.7	203.5	222.3
Cost-Effectiveness	$14,000	$14,400	$24,300	$44,100
Incremental Cost-Effectiveness		$28,800	$115,600	$523,100

OGI component inspection frequency every month was found to be cost-effective and incrementally cost-effective.

BARCT EMISSION LIMIT RECOMMENDATION SUMMARY

Based on the BARCT assessment, staff proposes to lower the leak standard for component category fitting, valve, other to 100 ppm, lower the leak standard for component category pump (light liquid), compressor to 400 ppm, and set an OGI inspection frequency of monthly. Table 2-20 below shows the cost-effectiveness for proposed requirements:

Table 2-10 BARCT Assessment Summary	
Proposed Requirement	Cost-Effectiveness ($/ton)
100 ppm leak standard for component type fitting, valve, other	$19,300
200 ppm leak standard for pressure relief devices	$0 (No change)
400 ppm leak standard for component type pump (light liquid), compressor	$27,000
OGI component inspection frequency every month	$13,000

CHAPTER 3: SUMMARY OF PROPOSALS

INTRODUCTION

PROPOSED AMENDED RULE STRUCTURE

PROPOSED AMENDED RULE 1173

INTRODUCTION

PAR 1173 lowers leak standards for certain types of components and adds OGI inspection requirements on components. PAR 1173 also includes ozone contingencies measures to comply with federal requirements.

The following information describes the structure of PAR 1173 and explains the provisions incorporated from other source-specific rules. New provisions and any modifications to provisions that have been incorporated are also explained. PAR 1173 also includes grammatical and editorial changes for clarity.

PROPOSED AMENDED RULE STRUCTURE

PAR 1173 will contain the following subdivisions:

(a) Purpose
(b) Applicability
(c) Definitions
(d) South Coast AQMD Inspection Procedures
(e) Identification Requirements
(f) Self Inspection Requirements
(g) Leak Standards and Repair Requirements
(h) Atmospheric Process PRD Requirements
(i) Recordkeeping and Reporting Requirements
(j) Test Methods
(k) Ozone Contingency Measures
(l) Exemptions
(m) Interim Procedures and Requirements

PROPOSED AMENDED RULE 1173

Subdivision (a) *Purpose*

The purpose of this rule is expanded to include reference to contingency measures to fulfill federal requirements and partial implementation of the 2022 AQMP.

Subdivision (b) *Applicability*

The types of facilities applicable to this rule are not changed as a result of PAR 1173.

Subdivision (c) *Definitions*

Several definitions were added, deleted, or substantially modified for clarity and consistency. Subdivision-wide, definitions of each applicable facility type have been updated from older Standard Industrial Classification (SIC) code references to newer North American Industry Classification System (NAICS) code references. Note: NAICS codes are included for guidance only and are not meant to be a criterion for determining applicability. Other key definition changes are discussed below:

- *Atmospheric Process PRD* – replaces existing definition for Process PRD for consistency with usage in rule language.

- *Compressor Seal* – added to fully explain the part of a compressor used for sealing purposes.
- *Connector* – added to fully explain a type of fitting connection and part of other components.
- *Contingency Measure* – added to implement federal requirements.
- *Facility* – definition deleted.
- *Field Gas* – definition deleted.
- *Fitting* – modified to increase clarity that, on heat exchangers, fin fan plugs are to be considered fitting components.
- *Flange* – added to fully explain a type of fitting connection and parts of other components or other equipment for connection and access for cleaning, inspection, and modification.
- *Inspection* – modified to trifurcate existing "Operator Inspection" sub-definition into three new sub-definitions:
    - Audio-Visual-Olfactory (AVO) Inspection,
    - Optical Gas Imaging (OGI) Inspection, and
    - Analyzer Inspection.
- *Leak* – modified to remove reference to liquid leaks.
- *Optical Gas Imaging (OGI) Device* – added to implement OGI inspection requirements.
- *Process PRD* – definition replaced by Atmospheric Process PRD.
- *Pump Seal* – added to fully explain the part of a pump used for sealing purposes.
- *Refinery* – modified to ensure refineries that produce refined products but may use non-petroleum-based feedstock be and continue to be considered refineries.
- *Repair* – modified to include newly-defined visible leaks and visible vapors and clarify that Repair may include replacing components and other actions.
- *South Coast Air Basin* – added to implement federal requirements related to contingency measures.
- *Visible Leak* – added by bifurcated from existing leak definition and clarified.
- *Visible Vapors* – added to implement OGI inspection requirements.

Subdivision (d) *South Coast AQMD Inspection Procedures*

Formerly titled *Leak Standards*, PAR 1173 modifies existing South Coast AQMD (formerly referred to as "District" in rule language) inspection procedures. The former provisions have been moved to subdivision (m) – *Interim Procedures and Requirements*. Effective October 1, 2025, PAR 1173 reduces the violation standard for components in light liquid and gas/vapor service from the existing 50,000 ppm violation standard to a new 10,000 ppm violation standard and places this new violation standard and the existing 500 ppm violation standard for heavy liquids in new Table 1 – *Violation Standards*.

PAR 1173 also clearly identifies visible leaks, both light liquid and heavy liquid, as subject to Notice of Violation. Further, PAR 1173 replaces the existing Table 1 – *Leak Thresholds* violation pathway with a new OGI-based violation pathway based on visible vapors from components in VOC service. PAR 1173 provides a pathway to the owner or operator to not be subject to a Notice of Violation for these visible vapors if able to demonstrate using their own Method 21 analyzer that the component is emitting below the violation standard at the time of the visible vapors. However, for exceeding a violation standard in Table 1 – *Violation Standards*, an owner or

operator will still be subject to a Notice of Violation despite the findings from an owner or operator analyzer; the findings of the South Coast AQMD analyzer would prevail.

The provisions in the former paragraph (d)(2), which allowed a facility to adjust a leak measurement to exclude methane and ethane, have been removed. The proposed rule now applies to Total Organic Gases (TOG) instead of just VOC.

Subdivision (e) *Identification Requirements*

PAR 1173 requires all major components be tagged clearly and visibly and minor components to be identified in piping and instrumentation flow diagrams.

Subdivision (f) *Self Inspection Requirements*

Formerly called *Operator Inspection Requirements*, PAR 1173 sets and revises inspection schedules for the owner or operator.

AVO inspections of pumps, compressors, and atmospheric PRDs are required once per operating shift and are to occur no more than 12 hours apart, except for unmanned oil and gas production fields and pipeline transfer stations, those typically without onsite personnel during operations. Those unmanned facilities are now required to perform AVO inspections at least weekly. Previously, audio-visual inspection was required every eight hours and there was no requirement for those unmanned facilities.

Beginning October 1, 2025, OGI inspection of a component in VOC service is required monthly, unless a component will be out of VOC service for more than 14 days of the month due to turnaround. The operator of the OGI device must be trained to use the device and operate and maintain the device in accordance with manufacturer's specifications. Visible vapors detected shall be repaired per subdivision (g) and recorded per subdivision (i).

In lieu of OGI inspection, an alternative inspection method may be used if approved by U.S. EPA and the Executive Officer. Other agencies, such as the state of Colorado Department of Public Health & Environment (CDPHE), have several approved alternative inspection methods. Referred to as an Alternative Approved Instrument Monitoring Method (AIMM)[1], they are for use by oil and gas facilities in that jurisdiction. If one of the methods were also approved by U.S. EPA, they may also be used in South Coast AQMD.

Analyzer inspections by U.S. EPA Method 21 will continue to be conducted quarterly with inaccessible components inspected annually and facilities may continue to seek an alternative annual inspection schedule. However, visible vapors detected with OGI camera are now a criterion for approval or disapproval of an alternative annual inspection schedule.

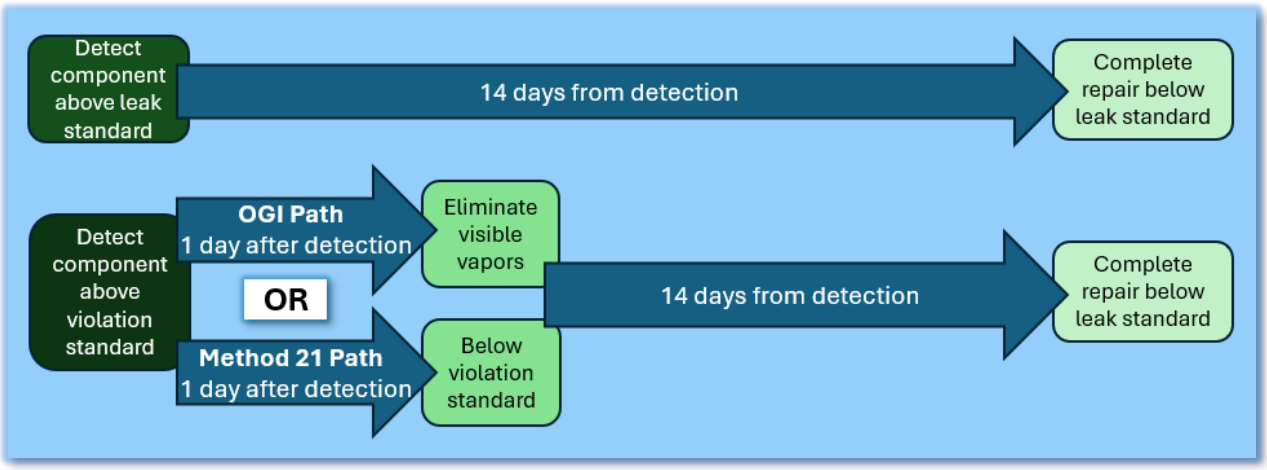
Subdivision (g) *Leaks Standards and Repair Requirements*

Formerly called *Maintenance Requirements*, PAR 1173 revises leak standards at which the owner or operator must repair a component. Effective October 1, 2025, the component category comprising types valve, fitting, and other device (diaphragm, hatch, sight-glass, or meter) must be repaired when above 100 ppm, formerly 500 ppm. Also effective October 1, 2025, pumps in light

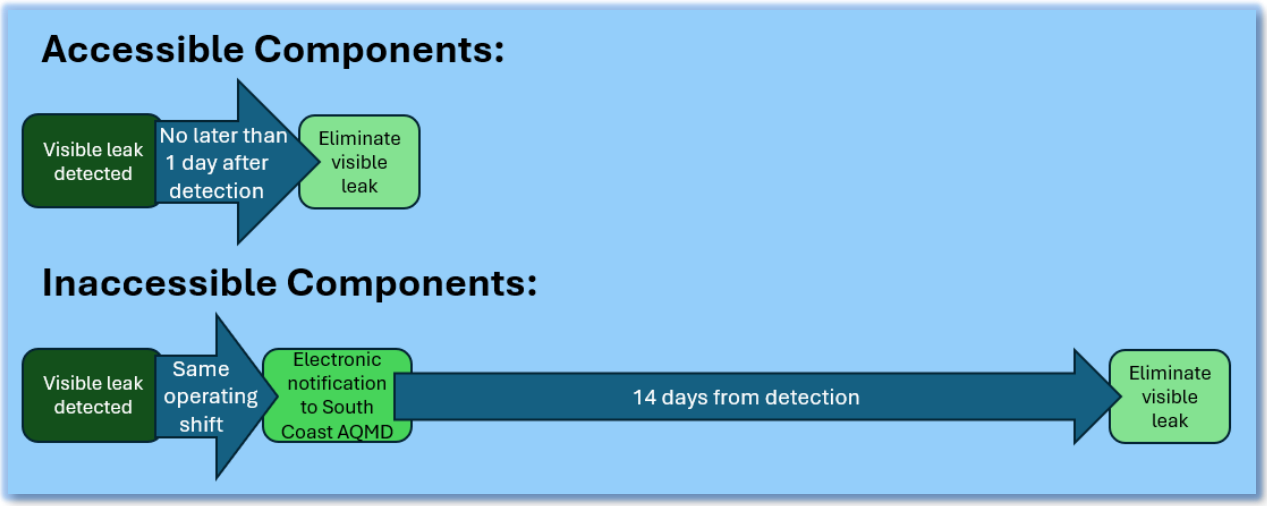
[1] https://cdphe.colorado.gov/oil-and-gas-compliance-and-recordkeeping/approved-instrument-monitoring-method-aimm-for-oil-gas

liquid service and compressors must be repaired when at 400 ppm, also formerly 500 ppm. Two other categories of component, PRD and pump in heavy liquid service, remain at their existing leak standard of 200 ppm and 100 ppm, respectively. Leak standards are listed in Table 2 – *Component Leak Standards*.

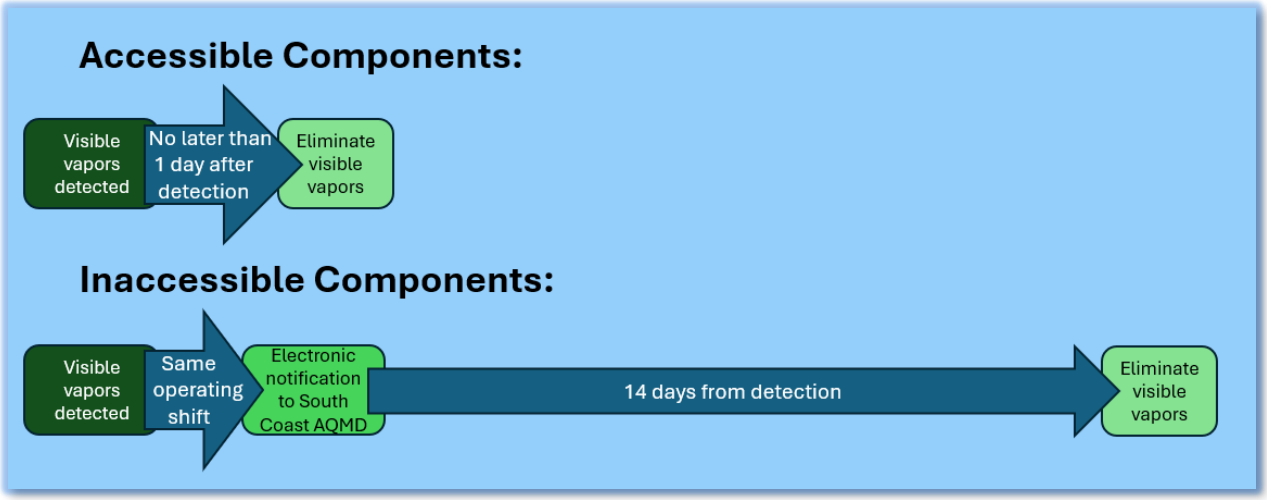
PAR 1173 deletes existing Table 2 – *Repair Periods* and adds repair schedules for leaks above a leak standard, visible leaks, and visible vapors for both VOC service and commercial natural gas service. For components in VOC service above the applicable leak standard, the component must be repaired below the Table 2 – *Component Leak Standard* within 14 days of detection. For components above the applicable violation standard (10,000 ppm for light liquid or gas/vapor service, 500 ppm for heavy liquid service), within 1 calendar day, the leak must be reduced below the violation standard in Table 1 – *Violation Standards* or no longer be visible using an OGI camera. The component must be completely repaired below the applicable leak standard in Table 2 - *Component Leak Standards* within 14 days of detection.



For components in VOC service with visible leaks, the visible leak must be eliminated by the next day. An operator finding a visible leak from an inaccessible component shall notify the South Coast AQMD the same operating shift, no later than 12 hours later, and eliminate the visible leak within 14 days.



For components in VOC service with visible vapors, the visible vapors must be eliminated by the next day. An operator detecting visible vapors from an inaccessible component shall notify the South Coast AQMD the same operating shift, no later than 12 hours later, and eliminate visible vapors within 14 days.



Subdivision (h) ***Atmospheric Process PRD Requirements***

PAR 1173 removes obsolete rule language with achievement dates in the past. PAR 1173 also removes the 500 lbs VOC emission threshold for releases from atmospheric process PRDs to conduct a failure analysis and implement corrective actions, in order to align with federal requirements. PAR 1173 also updates the existing mitigation fee, added in 2002 at $350,000, to account for inflation. The mitigation fee is now set at $625,000.

Subdivision (i) ***Recordkeeping and Reporting Requirements***

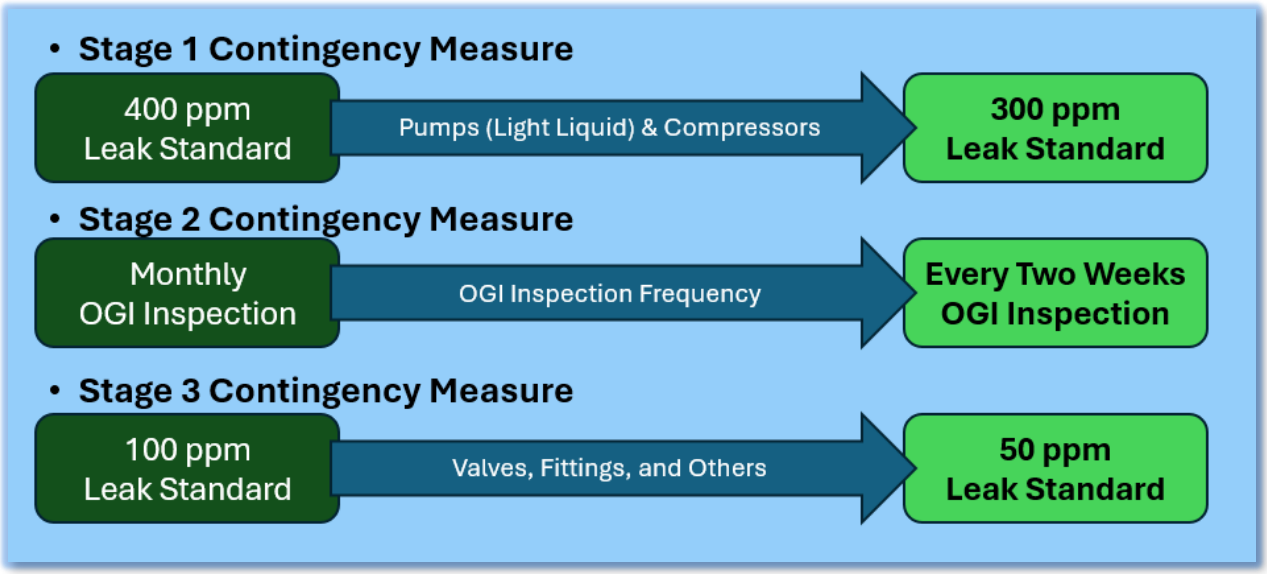
PAR 1173 requires electronic reporting for all reports, including new OGI inspections. PAR 1173 also requires five years of recordkeeping to be maintained to align with federal requirements.

Subdivision (j) *Test Methods*

PAR 1173 makes minor adjustments to this subdivision for clarity.

Subdivision (k) *Ozone Contingency Measures*

PAR 1173 deletes the entirety of the existing obsolete subdivision, formerly titled *Other Rules and Regulation Applicability*, and repurposes it for ozone contingency measures in the South Coast Air Basin to comply with federal requirements.



These contingency measures would only be implemented in the event that the U.S. EPA determines that the South Coast AQMD had failed to meet an RFP milestone or to attain an ozone NAAQS. These contingency control measures are necessary as part of comprehensive efforts to timely attain ozone standards. The contingency measures would be triggered upon the issuance of a final determination by the U.S. EPA that the South Coast AQMD has failed to comply with either of the following requirements:

1. Meet any ozone RFP requirement in an attainment plan approved in accordance with section 51.1012; or
2. Attain the applicable ozone NAAQS by the applicable attainment date.

PAR 1173 includes three contingency measures for the South Coast Air Basin. The measures shall be implemented sequentially, starting with the Stage 1 CM, then layering the Stage 2 CM and then Stage 3 CM if triggered, effective 60 days after issuance of each final determination. The first contingency measure reduces the leak standard of pumps to 300 ppm. Triggering the first contingency measure will result in an estimated additional 8.7 tons per year of VOC reduction. The second contingency measure will increase the frequency of OGI inspections to every two calendar weeks. Triggering the second contingency measure will result in an estimated additional 42.8 tons per year of VOC reduction. The third contingency measure with reduce the leak standard for valves, fittings, and other devices to 50 ppm. Triggering the third contingency measure will result in an estimated additional 166.4 tons per year of VOC reduction.

Contingency measures should provide for emission reductions approximately equivalent to either one year's worth of air quality improvement or one year's worth (OYW) of reductions needed for

RFP in the years following RFP milestone and attainment years. While the proposed amendments in Rule 1173 satisfy a 'triggering mechanism' requirement set by the U.S. EPA, the reductions from the rule alone are not adequate to satisfy the OYW of progress, which is calculated as the percentage of the base year emission inventory (EI) the annual rate of reductions represents of either NOx or VOC (or combined) per year. See the equation below for an example.

$$\frac{(base\ year\ EI - attainment\ year\ EI)}{(attainment\ year - base\ year)} \div base\ year\ EI \times attainment\ year\ EI = OYW\ of\ Progress$$

Contingency measures are required to result in emission reductions within one year of a final action by the U.S. EPA. It would be challenging to implement more stringent requirements, achieving additional NOx or VOC reductions, in rules involving other traditional sources within the mandated one-year time period. Retrofitting or replacement of existing equipment with newer technologies or equipment, or any permitting provisions would likely take more than one year to effectively implement. Conversely, the proposed amendment to Rule 1173 does not require permitting of units, does not require units be retrofitted or replaced, and does not require reformulation or development of new products. Consequently, Rule 1173 is well suited for contingency provisions since implementing lower leak standards or higher frequency OGI monitoring could be implemented in less than 60 days following the triggering of a contingency measure with resulting emission reductions occurring in less than one year.

Based on the above analysis, the South Coast AQMD will satisfy the contingency requirements for set in CAA section 172(c)(9) and the U.S. EPA's Ozone Implementation Rule with these proposed amendments to Rule 1173. PAR 1173 provides contingency measures to be triggered if the South Coast Air Basin fails to meet RFP or attain the applicable ozone standards by the applicable date. The emission reductions anticipated from PAR 1173, in conjunction with reductions from existing rules and regulations, are expected to achieve the reductions equivalent to or more than OYW of progress. PAR 1173 addresses the contingency measures for RFP and attainment for the applicable ozone standards (2008 & 2015 8-hour ozone NAAQS).

Subdivision (l) *Exemptions*

PAR 1173 adds an exemption for safety for OGI inspections. If the owner or operator conducting an OGI inspection at a facility determines that it is unsafe to climb a platform or other area due to safety concerns such as wind or slippery surfaces from rain, the facility is not required to conduct an inspection from the area. An OGI inspection must be conducted the first day the owner or operator conducting the OGI inspection determines it safe to do so. An owner or operator is required to document the date that a required inspection was not completed and the reason.

Subdivision (m) *Interim Procedures and Requirements*

PAR 1173 adds interim procedures and requirements from the date of rule amendment until October 1, 2025 for what is subject to a Notice of Violation and when to repair components, expressed as Table 3 – *Interim Violation Standards* and Table 4 – *Interim Leak Standards*, respectively. These interim procedures and requirements largely reflect existing procedures and requirements in Rule 1173.

CHAPTER 4: IMPACT ASSESSMENTS

INTRODUCTION

Impact assessments were conducted as part of PAR 1173 rule development to assess the environmental and socioeconomic implications. These impact assessments include emission reduction calculations, cost-effectiveness and incremental cost-effectiveness analyses, a socioeconomic impact assessment, and a California Environmental Quality Act (CEQA) analysis. Staff prepared preliminary draft findings and will perform comparative analysis pursuant to Health and Safety Code Sections 40727 and 40727.2, respectively.

EMISSION REDUCTIONS

PAR 1173 achieves VOC emission reductions largely through two strategies: 1) lowering VOC leak standards for components to reduce baseline VOC emission associated with components in compliance with the rule; and 2) reducing the persistence of larger VOC leaks by requiring OGI inspections more frequently than current analyzer inspection to reduce VOC emissions associated with components not in compliance with the rule.

For a detailed analysis of the projected VOC emission reductions, please refer to Chapter 2. Total VOC emission reductions from the proposed rule are 1.86 tons per day. A summary of the expected VOC emission reductions is listed in Table 4-1.

Table 4-1 Emission Reductions from Proposed Rule

Proposed Requirement	VOC Emission Reduction (tons per year)	VOC Emission Reduction (tons per day)
Lower leak standard for component type valve, fitting, other to 100 ppm	507.8	1.39
Lower leak standard for component type pump (light liquid), compressor to 400 ppm	12.2	0.033
Monthly OGI Inspection of all components in VOC service	160.7	0.44
Overall	680.7	1.86

Below is a summary of expected additional VOC emission reductions for contingency measures:

Table 4-2 Emission Reductions from Contingency Measures		
Contingency Measure	Additional VOC Emission Reduction (tons per year)	Additional VOC Emission Reduction (tons per day)
Lower leak standard for component type pump (light liquid), compressor from 400 ppm to 300 ppm	8.7	0.024
OGI Inspection every two weeks of all components in VOC service	42.8	0.12
Lower leak standard for component type valve, fitting, other from 100 ppm to 50 ppm	166.4	0.46
Overall	217.9	0.60

COST-EFFECTIVENESS

Health and Safety Code Section 40920.6 requires a cost-effectiveness analysis when establishing BARCT requirements. The cost-effectiveness of a control is measured in terms of the control cost in dollars per ton of air pollutant reduced. The costs for the control technology include purchasing, installation, operation, maintenance, and permitting. Emission reductions were calculated for each requirement and based on estimated baseline emissions. The 2022 AQMP established a cost-effectiveness threshold of $36,000 per ton of VOC reduced. A cost-effectiveness that is greater than the threshold of $36,000 per ton of VOC reduced requires additional analysis and a hearing before the Governing Board on costs.

The cost-effectiveness is estimated based on the present value of the retrofit cost, which was calculated according to the capital cost (initial one-time equipment and installation costs) plus the annual operating cost (recurring expenses over the useful life of the control equipment multiplied by a present worth factor). Capital costs are one-time costs that cover the components required to assemble a project. Annual costs are any recurring costs required to operate equipment. Costs for this proposal were obtained from available literature, vendors, and facilities.

Details regarding costs and cost-effectiveness determinations are included in Chapter 2. The overall cost-effectiveness of the proposed rule is $18,300 per ton of VOC reduced. The cost-effectiveness for each proposed requirement and the overall cost-effectiveness is summarized in the Table 4-3 below.

Table 4-3 Summary of Cost-Effectiveness			
Proposed Requirement	Annualized Cost	Annual VOC Reductions (tons per year)	Cost-Effectiveness ($/ton)
Lower leak standard for component type valve, fitting, other to 100 ppm	$10,019,000	507.8	$19,700
Lower leak standard for component type pump (light liquid), compressor to 400 ppm	$329,000	12.2	$27,000
Monthly OGI Inspection of all components in VOC service	$2,313,000	160.7	$14,400
Overall	$12,661,000	680.7	$18,600

INCREMENTAL COST-EFFECTIVENESS

Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis for BARCT rules or emission reduction strategies when there is more than one control option which would achieve the emission reduction objective of the proposed amendments, relative to ozone, CO, SOx, NOx, and their precursors. Since volatile organic compounds are precursors to ozone, an incremental cost-effectiveness analysis is required for controls proposed to limit VOC emissions. Incremental cost-effectiveness is the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control options as compared to the next less expensive control option.

Incremental cost-effectiveness is calculated as following:

$$Incremental\ Cost \cdot Effectiveness = \frac{Cost\ of\ Option\ 2 - Cost\ of\ Option\ 1}{Benefit\ of\ Option\ 2 - Benefit\ of\ Option\ 1}$$

Details regarding costs and incremental cost-effectiveness determinations are included in Chapter 2. The incremental cost-effectiveness for each next more stringent proposed requirement is summarized in the Table 4-4 below.

Table 4-4 Summary of Incremental Cost-Effectiveness			
Next More Stringent Proposed Requirement	Incremental Annualized Cost	Incremental Annual VOC Reductions (tons per year)	Incremental Cost-Effectiveness ($/ton)
Further lowering leak standard for component type valve, fitting, other from 100 ppm to 50 ppm	$14,419,000	166.4	$86,600
Further lowering leak standard for component type pump (light liquid), compressor from 400 ppm to 300 ppm	$417,000	8.7	$47,700
More frequent OGI Inspection, from monthly to every two weeks	$2,642,000	42.8	$115,600

SOCIOECONOMIC IMPACT ASSESSMENT

A socioeconomic impact assessment will be conducted and released for public review and comment at least 30 days prior to the South Coast AQMD Governing Board Hearing, which is scheduled for October 4, 2024 (subject to change).

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) and South Coast AQMD's certified regulatory program (Public Resources Code Section 21080.5, CEQA Guidelines Section 15251(l), and South Coast AQMD Rule 110), the South Coast AQMD, as lead agency, is reviewing the proposed project (PAR 1173) to determine if any potential adverse environmental impacts will occur. Appropriate CEQA documentation will be prepared based on the analysis.

DRAFT FINDINGS UNDER HEALTH & SAFETY CODE SECTION 40727

Requirements to Make Findings

Health and Safety Code Section 40727 requires that the Governing Board make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report. In order to determine compliance with Health and Safety Code Section 40727, Health and Safety Code Section 40727.2 requires a written analysis comparing the proposed amended rule with existing regulations, if the rule meets certain requirements.

Necessity

A need exists to amend PAR 1173 to implement best available retrofit control technology, emission reduction strategies recommended in the WCWLB CERPs as part of the AB 617 commitment, and Control Measure FUG-01 in the 2022 Final AQMP, and contingency measures for the 2008 and 2015 ozone NAAQS.

Authority

The South Coast AQMD obtains its authority to adopt, amend, or repeal rules and regulations pursuant to Health and Safety Code Sections 39002, 40000, 40001, 40440, 40702, 40725 through 40728, 40920.6, and 41508.

Clarity

PAR 1173 is written or displayed so that its meaning can be easily understood by the persons directly affected by them.

Consistency

PAR 1173 is in harmony with and not in conflict with or contradictory to existing statutes, court decisions, or state or federal regulations.

Non-Duplication

PAR 1173 will not impose the same requirements as any existing state or federal regulations. The proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the South Coast AQMD.

Reference

In amending this rule, the following statutes which the South Coast AQMD hereby implements, interprets or makes specific are referenced: Health and Safety Code Sections 39002, 40001, 40406, 40702, 40440(a), and 40725 through 40728.5.

COMPARATIVE ANALYSIS

Under Health and Safety Code Section 40727.2, the South Coast AQMD is required to perform a comparative written analysis when adopting, amending, or repealing a rule or regulation. The comparative analysis is relative to existing federal requirements, existing or proposed South Coast AQMD rules and air pollution control requirements and guidelines which are applicable to storage tanks. The comparative analysis will be provided in a future report.