

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Socioeconomic Impact Assessment For: 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

On March 17, 1989, the South Coast Air Quality Management District (South Coast AQMD) Governing Board adopted a resolution which requires an analysis of the economic impacts associated with adopting and amending rules and regulations. In addition, Health and Safety Code Section 40440.8 requires a socioeconomic impact assessment for any proposed rule, rule amendment, or rule repeal which “will significantly affect air quality or emissions limitations.” Lastly, Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis for a proposed rule or amendment which imposes Best Available Retrofit Control Technology (BARCT) or “all feasible measures” requirements relating to emissions of ozone, carbon monoxide (CO), sulfur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOC), and their precursors.

Proposed Amended Rule 1173 (PAR 1173) has been developed to further reduce VOC emissions from components at affected facilities by requiring the use of enhanced leak detection technology at greater frequencies and establishing lower leak standards. Additionally, PAR 1173 will introduce Ozone Contingency Measures to partially satisfy the federal Clean Air Act contingency requirements for applicable ozone National Ambient Air Quality Standards (NAAQS) in the South Coast AQMD’s jurisdiction. A socioeconomic impact assessment has been conducted accordingly, and the following presents a summary of the analysis and findings.

Key Elements of PAR 1173 PAR 1173 would further reduce fugitive VOC emissions by establishing lower VOC leak standards for components at affected facilities and by requiring monthly optical gas imaging (OGI) inspections to find and repair VOC leaks from components more quickly.

Affected Facilities and Industries PAR 1173 is applicable to approximately 2.61 million components at 203 facilities located in the South Coast AQMD jurisdiction, with 164 facilities in Los Angeles County, 34 facilities in Orange County, and five facilities in San Bernardino County. According to the North American Industrial Classification System (NAICS), 150 of the 203 facilities are classified under the Oil and Gas Extraction industry (NAICS 211); 23 facilities are classified under the Pipeline Transportation industry (NAICS 486); 12 facilities are classified as Petroleum and Coal Products Manufacturers (NAICS 324); eight facilities are classified under the Wholesale Trade industry (NAICS 42); seven facilities are classified as Chemical Manufacturers (NAICS 325); and three facilities are classified under the Support Activities for Transportation industry (NAICS 488).

A small business analysis was conducted for the facilities affected by PAR 1173. The following table presents the number of affected facilities that qualify as a small business based on varying definitions:

Definition	Number of Facilities
South Coast AQMD Rule 102	17
South Coast AQMD's Small Business Assistance Office	65
U.S. Small Business Administration	117

Assumptions for the Analysis

The key requirements of PAR 1173 that would have cost impacts for the affected facilities include: 1) lowering VOC leak standards for component categories: a) fittings, valves, and other components; b) pumps (light liquid service) and compressors; and c) fin fans; 2) requiring monthly OGI inspections to detect leaking components; and 3) repairing or replacing detected leaking components.

Approximately 2.61 million components at 203 affected facilities would be subject to the proposed leak standards and OGI inspections required by PAR 1173. The analysis assumed that an additional 61 pump seals or compressor seals and 15,525 fittings, valves, fin fans or other components will require repair or replacement annually to comply with the proposed amendments.

OGI inspections would be required to begin in 2026. Accordingly, the analysis assumed that the annual recurring costs associated with the maintenance of OGI cameras, OGI inspection labor, and the repair or replacement of identified leaking components will also begin in 2026.

Compliance Costs

Over the forecast period from 2026 to 2035, the total present value of the compliance costs is estimated at \$135.73 million and \$112.88 million for a 1 percent and 4 percent discount rate, respectively. The average annual compliance costs of PAR 1173 are estimated to range from \$14.43 million to \$14.47 million for a 1 percent to 4 percent real interest rate, respectively. The following table presents a summary of the average annual compliance costs of PAR 1173 by cost category.

Cost Categories	Average Annual Cost of PAR 1173 (2026 – 2035)	
	1% Real Interest Rate	4% Real Interest Rate
Capital/One-time Costs		
OGI Camera	\$313,610	\$355,647
Recurring Costs		
OGI Camera Maintenance	\$121,850	\$121,850
OGI Inspection Labor	\$2,608,200	\$2,608,200
Fittings, Valves, Fin Fans, and Other Components Replacement Material Cost	\$714,150	\$714,150
Fittings, Valves, Fin Fans, and Other Components Replacement or Repair Labor	\$10,339,650	\$10,339,650
Pump Seals and Compressor Seals Replacement Material Cost	\$10,126	\$10,126
Pump Seals and Compressor Seals Replacement Labor	\$324,520	\$324,520
Total	\$14,432,106	\$14,474,143

Using a 4 percent real interest rate, the analysis indicates that roughly 71% of the annual average compliance cost would result from the labor needed to repair or replace fittings, valves, fin fans, and other components, followed by labor to conduct OGI inspections (18%), replacement material costs of fittings, valves, fin fans, and other components (5%), and OGI camera purchases (3%).

Job Impacts

Direct costs and corresponding revenues of PAR 1173 are used as inputs to the Regional Economic Models, Inc (REMI PI+) model to assess job impacts and secondary/induced impacts for all the industries in the four-county economy on an annual basis from 2026 to 2035.

When the compliance cost is annualized using a 4 percent real interest rate, the REMI analysis forecasts 16 net jobs gained annually in the four-county economy on average over the forecast period, relative to the baseline forecast. The 16 annual jobs gained represent approximately 0.0001 percent of total annual jobs in the four-county area.

The largest job gain is projected to occur in 2026, when OGI cameras are purchased, and component inspections begin. In 2026, PAR 1173 is projected to result in 76 jobs gained relative to the baseline scenario

according to the REMI model simulation.

**Competitiveness
and Price
Impacts**

The overall impact of PAR 1173 on production cost and delivered prices in the region is not expected to be substantial. In the Petroleum and Coal Products Manufacturing Industry (NAICS 324), which bears the majority of the compliance costs associated with PAR 1173, the REMI model projects an average increase of 0.01 percent in relative delivered prices over the forecast period. In addition, the relative cost of production for the Petroleum and Coal Products Manufacturing Industry (NAICS 324) is forecasted to increase by 0.01 percent on average relative to the baseline scenario, suggesting that the impact of the implementation of PAR 1173 on the competitiveness of the Petroleum and Coal Products Manufacturing Industry (NAICS 324) and the rest of the economy is minimal.

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) emissions from leaking components and releases from atmospheric process pressure relief devices (PRDs). Rule 1173 was adopted in August 1989 and last amended in 2009.

The objective of PAR 1173 is to further reduce VOC emissions from components at affected facilities by requiring the use of enhanced leak detection technology at greater frequencies and establishing lower leak standards. Specifically, PAR 1173 seeks to establish the following key proposed requirements: 1) lowering VOC leak standards for fittings, valves, fin fans, and certain other components to reduce baseline VOC emissions associated with those components; 2) lowering VOC leak standards for pumps (light liquid service) and compressors to reduce baseline VOC emissions associated with those components; 3) requiring monthly OGI inspections to detect leaking components; and 4) reducing the repair period for bringing leaking components into compliance. Additionally, PAR 1173 proposes Ozone Contingency Measures as defined by the federal 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 worse provide contingency measures to be implemented if the area fails to meet any applicable milestone.¹

Upon implementation, PAR 1173 would affect approximately 2.61 million components at 203 facilities in the South Coast AQMD jurisdiction. The term component is defined as a valve, fitting, pump, compressor, pressure relief device (PRD), fin fan, or other device (diaphragm, Hatch, sight-glass, meter) in VOC service.

LEGISLATIVE MANDATES

The legal mandates directly related to the socioeconomic impact assessment of PAR 1173 include South Coast AQMD Governing Board resolutions and various sections of the Health and Safety Code.

South Coast AQMD Governing Board Resolution

On March 17, 1989, the South Coast AQMD Governing Board adopted a resolution that requires an analysis of the economic impacts associated with adopting and amending rules and regulations that considers all of the following elements:

- Affected industries;
- Range of probable costs;
- Cost-effectiveness of control alternatives; and
- Public health benefits.

¹ For more information and background on the Ozone Contingency Measures PAR 1173 seeks to establish please see Chapter 3 Proposed Amended Rule 1173 Section of Draft Staff Report for PAR 1173, <https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1173>.

Health and Safety Code Requirements

The state legislature adopted legislation which reinforces and expands the South Coast AQMD Governing Board resolution requiring socioeconomic impact assessments for rule development projects. Health and Safety Code Section 40440.8, which went into effect on January 1, 1991, requires a socioeconomic impact assessment for any proposed rule, rule amendment, or rule repeal which "will significantly affect air quality or emissions limitations."

To satisfy the requirements in Health and Safety Code Section 40440.8, the scope of the socioeconomic impact assessment should include all of the following information:

- Type of affected industries;
- Impact on employment and the regional economy;
- Range of probable costs, including those to industry;
- Availability and cost-effectiveness of alternatives to the rule;
- Emission reduction potential; and
- Necessity of adopting, amending, or repealing the rule in order to attain state and federal ambient air quality standards.

Health and Safety Code Section 40728.5, which went into effect on January 1, 1992, requires the South Coast AQMD Governing Board to: 1) actively consider the socioeconomic impacts of regulations; 2) make a good faith effort to minimize adverse socioeconomic impacts; and 3) include small business impacts. To satisfy the requirements in Health and Safety Code Section 40728.5, the socioeconomic impact assessment should include the following information:

- Type of industries or business affected, including small businesses; and
- Range of probable costs, including costs to industry or business, including small business.

Finally, Health and Safety Code Section 40920.6, which went into effect on January 1, 1996, requires an incremental cost-effectiveness analysis for a proposed rule or amendment which imposes Best Available Retrofit Control Technology (BARCT) or "all feasible measures" requirements relating to emissions of ozone, carbon monoxide (CO), sulfur oxides (SO_x), nitrogen oxides (NO_x), VOC, and their precursors. A cost-effectiveness analysis was conducted for PAR 1173 and can be found in Chapter 2 of the PAR 1173 Draft Staff Report.²

AFFECTED FACILITIES

The implementation of PAR 1173 would affect approximately 2.61 million components at 203 facilities in the South Coast AQMD jurisdiction, with 164 facilities in Los Angeles County, 34 facilities in Orange County, and five facilities in San Bernardino County. There are no affected facilities in Riverside County.

The majority of the affected facilities are in the Oil and Gas Extraction industry (74 percent), followed by the Pipeline Transportation industry (11 percent), and the Petroleum and Coal Products Manufacturing industry (6 percent) as presented in Table 1. While the majority of the affected facilities are in the Oil and Gas Extraction industry, most of the components are located

² South Coast AQMD, Draft Staff Report for Proposed Amended Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants, <https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1173>, accessed September 2024.

at facilities in the Petroleum and Coal Products Manufacturing industry.

Table 1
Affected Facilities by Industry

NAICS	Industry Name	Number of Facilities	Percentage of Facilities
211	Oil and Gas Extraction	150	74%
486	Pipeline Transportation	23	11%
324	Petroleum and Coal Products Manufacturing	12	6%
42	Wholesale Trade	8	4%
325	Chemical Manufacturing	7	3%
488	Support Activities for Transportation	3	1%
Total		203	100%

SMALL BUSINESS

The South Coast AQMD defines a “small business” in Rule 102 for purposes of fees as one which employs 10 or fewer persons and which earns less than \$500,000 in gross annual receipts. The South Coast AQMD also defines “small business” for the purpose of qualifying for access to services from the South Coast AQMD’s Small Business Assistance Office as a business with an annual receipt of \$5 million or less, or with 100 or fewer employees. In addition to the South Coast AQMD’s definition of a small business, the United States (U.S.) Small Business Administration and the federal 1990 Clean Air Act Amendments (1990 CAAA) each have their own definition of a small business.

The 1990 CAAA classifies a business as a “small business stationary source” if it: 1) employs 100 or fewer employees; 2) does not emit more than 10 tons per year of either VOC or NOx; and 3) is a small business as defined by the U.S. Small Business Administration. Based on firm revenue and employee count, the U.S. Small Business Administration definition of a small business varies by six-digit NAICS codes.³ For example, according to the U.S. Small Business Administration definition, a business with less than 1,250 employees in the sector of Crude Petroleum Extraction (NAICS 211120) is classified as a small business, while a business in the Petroleum Refineries (NAICS 324110) sector is considered a small business with less than 1,500 employees.

South Coast AQMD mostly relies on Dun and Bradstreet data to conduct small business analyses for private companies. In cases where the Dun and Bradstreet data are unavailable or unreliable, other external data sources such as Manta, Hoover, LinkedIn, and company website data will be used. The determination of data reliability is based on data quality confidence codes in the Dun and Bradstreet data as well as staff’s discretion. Revenue and employee data for publicly owned companies are gathered from Securities and Exchange Commission (SEC) filings. Since

³ U.S. Small Business Administration, 2023 Small Business Size Standards, <https://www.sba.gov/document/support-table-size-standards>, accessed March 29, 2024.

subsidiaries under the same parent company are interest-dependent, the revenue and employee data of a facility’s parent company will be used for the determination of its small business status. Staff excluded three government-owned facilities from the small business analysis, resulting in a total of 200 commercially owned facilities for consideration. This exclusion allows the analysis to concentrate specifically on private sector entities, as government-owned facilities operate under different funding structures and would not be considered businesses. Employment and revenue estimates from 2024 Dun and Bradstreet data as well as other external sources are available for 169 facilities.⁴ Note that although the employment and revenue data for some facilities are unknown or missing, the current data used for this small business analysis represent the most thorough and accurate information obtainable as of the date of this draft report. The number of affected facilities that are small businesses based on each of the three definitions is presented in Table 2:

Table 2
Number of Affected Small Business Facilities Based on Various Definitions

Definition	Number of Facilities
South Coast AQMD Rule 102	17
South Coast AQMD's Small Business Assistance Office	65
U.S. Small Business Administration	117

Note that staff was unable to conduct a small business analysis based on the 1990 CAAA definition of a small business as most of the facilities are not required to submit annual emission reports pursuant to South Coast AQMD Rule 222, and therefore, a facility’s small business status under this definition cannot be determined.⁵

⁴ Staff utilized Dun and Bradstreet data, as well as cross-referencing with previous small business assessments for other South Coast AQMD rules to find information on affected facilities revenue, employee count, and parent companies; however, for some facilities this information was unavailable as of the date of this draft report.

⁵ South Coast AQMD, Rule 222 – Filing Requirements for Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II, <https://www.aqmd.gov/docs/default-source/rule-book/reg-ii/Rule-222.pdf>, accessed April 11, 2024.

COMPLIANCE COST

The key provisions in PAR 1173 that would have cost impacts for the affected facilities include: 1) lowering VOC leak standards for fittings, valves, fin fans, and other components; 2) lowering VOC leak standards for pumps (light liquid service) and compressors; 3) requiring monthly OGI inspections to detect leaking components; and 4) repairing or replacing detected leaking components.

PAR 1173 would require one-time investments in OGI cameras. In addition, the affected facilities would also incur recurring operating and maintenance (O&M) costs for OGI cameras, labor costs for OGI inspections, material costs associated with replacement of leaking components, and labor costs for the repair or replacement of leaking components. The compliance costs for PAR 1173 are forecasted for a 10-year period from 2026 to 2035 to annualize costs associated with the purchase of OGI cameras over the 10-year useful life of the cameras.

Costs assumptions for PAR 1173 were obtained from a variety of different sources including industry estimates, vendor quotes, the San Joaquin Valley Air Pollution Control District (APCD) rulemaking of their VOC component rules, and the South Coast AQMD Rules 463 and 1178 development.^{6,7,8} All the costs discussed in this Socioeconomic Impact Assessment are presented in 2023 dollars. The estimation procedure and assumptions for each cost category are discussed in the following sections.

Capital or One-Time Costs

OGI Cameras

PAR 1173 requires monthly OGI inspections to detect leaking components. An OGI camera is defined as an infrared camera with a detector capable of visualizing gases in the 3.2-3.4 micrometer waveband.⁹ This assessment assumes that affected facilities will purchase OGI cameras and that existing employees will perform inspections. Approximately 2.61 million components at 203 facilities would be subject to the OGI monitoring requirement. Staff estimated that an OGI camera operator will be able to inspect 5,000 components per operating day. Staff considers this a conservative estimate, as stakeholders have indicated that inspection of 10,000 components per day is feasible at some larger facilities. Approximately 25 OGI cameras would be needed to implement the monthly OGI inspections at all 203 affected facilities, based on the following calculation.

⁶ San Joaquin Valley APCD, June 2023, Governing Board Meeting Agenda No. 12, Adopt Proposed Amendments to District Leak Detection and Repair Rules 4401, 4409, 4455, 4623, and 4624, https://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2023/June/final/12.pdf, accessed August 2024.

⁷ South Coast AQMD, June 2024, Governing Board Meeting Agenda No. 25, Rule 463 – Organic Liquid Storage, <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2024/2024-Jun7-025.pdf>, accessed August 2024.

⁸ South Coast AQMD, September 2023, Governing Board Meeting Agenda No. 34, Rule 1178 - Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities, <http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2023/2023-Sep1-034.pdf> accessed September 2024.

⁹ South Coast AQMD, Draft Rule Language for Proposed Amended Rule 1173 – Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants, <https://www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1173>, accessed September 2024.

$$25 \text{ Cameras} = \frac{2.61 \text{ Million Components}}{(5,000 \text{ components per operating day} * 21 \text{ operating days per month})}$$

The average purchase price per camera is estimated to be \$120,000 with an anticipated equipment lifetime of 10 years, based on manufacturer quotes and consistent with the Rule 463 rulemaking. The total capital cost attributed to OGI cameras is estimated to be \$3,000,000 for 25 OGI cameras.

In practice, many affected facilities already own OGI cameras due to overlapping OGI inspection requirements related to South Coast AQMD Rules 1178, 463, and 1148.1. Additionally, some facilities may choose to contract with third parties for OGI inspections and forego purchasing cameras. Based on feedback from affected facilities, the rate for contracting third-party OGI inspections is approximately \$0.26 per component, making the total price dependent on the number of components at the affected facility.¹⁰ However, due to the uncertainty regarding which facilities already own cameras or will engage third-party services, this analysis assumes that the purchase of 25 additional cameras will satisfy the OGI inspection requirement associated with PAR 1173.

Recurring Costs

OGI Camera Maintenance

OGI cameras would require annual maintenance and calibration to ensure equipment performance. According to feedback from stakeholders, the annual OGI maintenance cost is approximately \$4,874 per camera and is anticipated to begin in 2026 when the OGI cameras are purchased. The total annual cost of OGI camera maintenance is estimated to be \$121,850 for all 25 cameras.

OGI camera maintenance will be performed by affected facilities if they choose to purchase cameras and perform inspections in house. However, affected facilities that choose to contract with third parties will not directly bear this cost.

OGI Inspection Labor

PAR 1173 will require the affected facilities to perform monthly OGI inspections to detect leaks. Following the same methodology as in the Rule 463 rulemaking, this analysis assumes that inspections are conducted by employees of the affected facilities at a wage rate of \$52 per hour. Assuming eight hours per workday, 21 workdays per month, and a total of 25 cameras in operation, this yields a total annual inspection cost of approximately \$2.6 million.

OGI inspection labor will be performed by employees at the affected facilities if they choose to purchase cameras and perform inspections in house. However, affected facilities that choose to contract with third parties will not directly bear this cost.

¹⁰ It is important to note that the number of components at the affected facilities varies significantly, ranging from as few as one component to as many as 342,965 components. On average, the 203 affected facilities have approximately 11,562 components each. This variation can greatly impact the overall cost of contracting third-party OGI inspections, as facilities with more components will incur higher expenses.

Material Cost of Replacing Pump Seals and Compressor Seals

This analysis assumes that all pump seals and compressor seals with detected leaks above the thresholds set by PAR 1173 will need to be replaced. Based on leak data reported pursuant to the existing Rule 1173, approximately 61 additional pump seals and compressor seals would need to be replaced annually to comply with PAR 1173. Consistent with estimates from the San Joaquin Valley APCD rulemaking, pump seals and compressor seals cost approximately \$166 per unit on average, resulting in a total cost of \$10,126 per year.

Material Cost of Replacing Fittings, Valves, Fin Fans, and Other Components

Fittings, valves, fin fans, and other components with detected leaks above the thresholds set by PAR 1173 will need to be either repaired or replaced. Each year, roughly 15,525 of these components will have leak rates greater than the thresholds based on leak data reported under the existing Rule 1173. Consistent with estimates from industry and the San Joaquin Valley APCD rulemaking, fittings, valves, fin fans, and other components are assumed to cost approximately \$46 per unit on average, resulting in a total cost of \$714,150 per year.

Labor for Pump Seals, Compressor Seals, Fittings, Valves, Fin Fans, and Other Components Replacement or Repair

This analysis assumes that the labor for replacing or repairing components will be performed by employees of the affected facilities at a wage rate of \$133 per hour, consistent with the approach used in the San Joaquin Valley APCD rulemaking and comparable to current Los Angeles County prevailing wage rates. The \$133 per hour wage reflects the highly skilled labor force which is required to replace these components. Pump seals and compressor seals are anticipated to require 40 hours of labor per replacement, and 61 replacements are expected, resulting in a total cost of \$324,520 per year. Fittings, valves, fin fans, and other components are expected to require varying amounts of time depending on the type of component and whether it will require repair or replacement. This analysis assumes that it would take five hours on average to repair or replace these components, resulting in a labor cost of \$666 per leak. For the estimated 15,525 annual leaks, this translates to an annual labor cost of \$10.3 million.

Total Compliance Cost

The total compliance cost includes all the estimated costs over a 10-year forecast period, from 2026 to 2035. For the calculation of the present value of total compliance costs, all the annual compliance costs will be discounted to 2024, the anticipated first year PAR 1173 is adopted.¹¹ The total present value of the compliance costs is estimated at \$135.73 million and \$112.88 million for a 1 percent and 4 percent discount rate, respectively. The average annual compliance costs of PAR 1173 are estimated to range from \$14.43 million to \$14.47 million for a 1 percent to 4 percent real interest rate, respectively.¹² Table 3 presents the estimated present value and average annual compliance cost of PAR 1173 by cost categories.

¹¹ To find the present value of a stream of future payments, a discount rate will be used to reflect the idea that costs borne in the future are worth less than the costs incurred in the present period.

¹² Real interest rate is defined as the nominal interest rate adjusted for inflation, reflecting the true cost of borrowing.

**Table 3
Total Present Value and Average Annual Estimated Costs of PAR 1173**

Cost Categories	Present Value Worth (2024)		Annual Average (2026-2035)	
	1% Discount Rate	4% Discount Rate	1% Real Interest Rate	4% Real Interest Rate
Capital Costs				
OGI Camera	\$3,335,090	\$2,773,669	\$313,610	\$355,647
Recurring Costs				
OGI Camera Maintenance	\$1,142,652	\$950,301	\$121,850	\$121,850
OGI Inspection Labor	\$24,458,472	\$20,341,191	\$2,608,200	\$2,608,200
Fittings, Valves, Fin Fans, and Other Components Replacement Material Cost	\$6,696,963	\$5,569,612	\$714,150	\$714,150
Fittings, Valves, Fin Fans, and Other Components Replacement or Repair Labor	\$96,960,370	\$80,638,292	\$10,339,650	\$10,339,650
Pump Seals and Compressor Seals Replacement Material Cost	\$94,956	\$78,972	\$10,126	\$10,126
Pump Seals and Compressor Seals Replacement Labor	\$3,043,195	\$2,530,911	\$324,520	\$324,520
Total	\$135,731,699	\$112,882,947	\$14,432,106	\$14,474,143

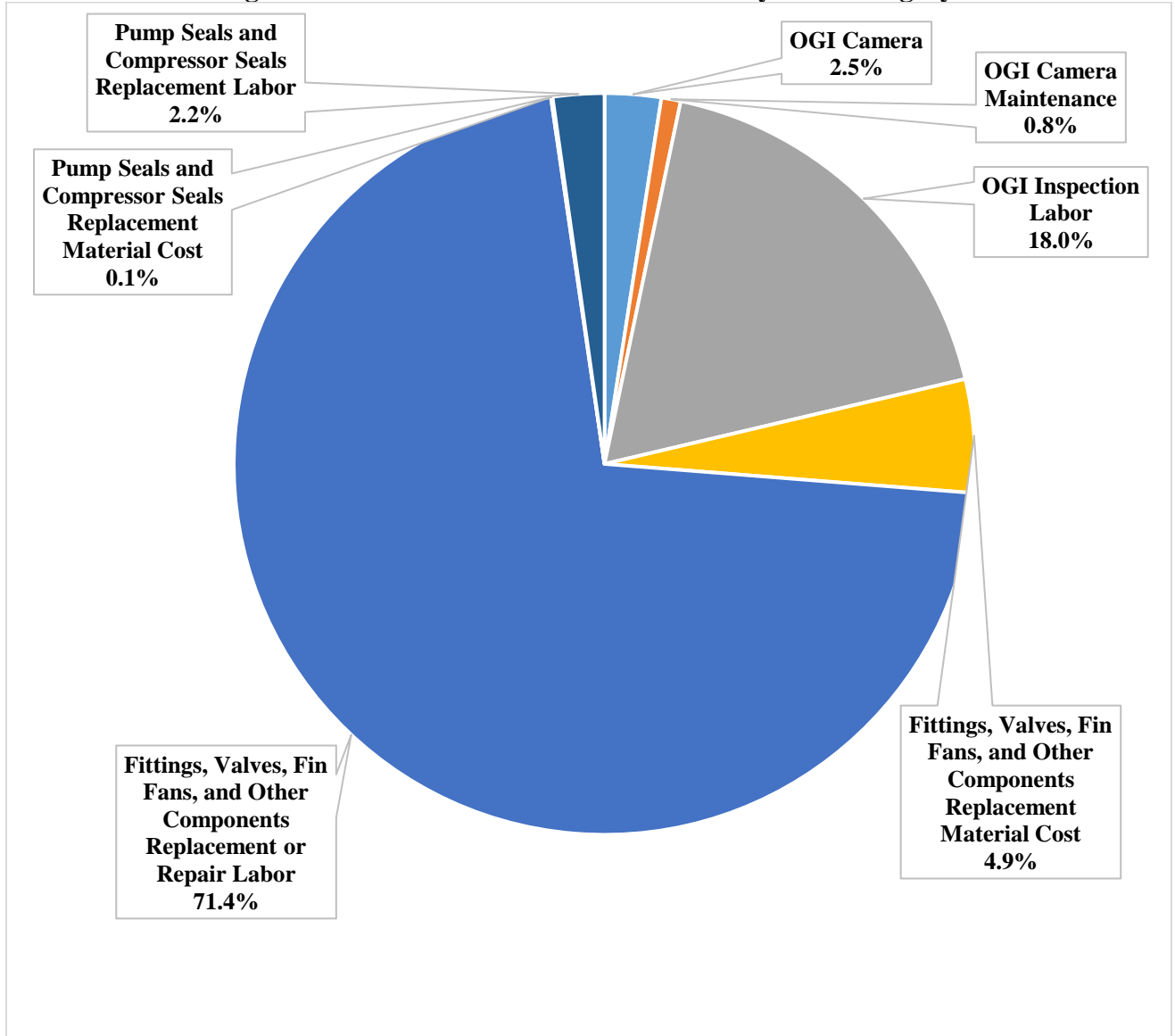
To better assess specific compliance burdens for different industries, Table 4 presents the breakdown of the total average annual compliance costs reported in Table 3 across various industries. The Petroleum and Coal Products Manufacturing sector (NAICS 324) is expected to incur the largest share of the total average annual compliance costs, which is estimated to be \$10.25 million or 71 percent of the total average annual cost. The sectors of Oil and Gas Extraction (NAICS 211) and Pipeline Transportation (NAICS 486) have the second- and third-largest shares of total annual cost, with an estimated total average annual compliance cost of \$2.84 million and \$864 thousand, respectively.

Table 4
Average Annual Compliance Cost by Industry

Industry Name (NAICS)	Annual Average Cost (2026-2035)	Share of Total Annual Average Cost per Industry
Petroleum and Coal Products Manufacturing (324)	\$10,246,193	71%
Oil and Gas Extraction (211)	\$2,836,598	20%
Pipeline Transportation (486)	\$863,657	6%
Wholesale Trade (42)	\$278,413	2%
Chemical Manufacturing (325)	\$167,360	1%
Support Activities for Transportation (488)	\$81,922	1%
Total	\$14,474,143	100%

Figure 1 presents the estimated average annual compliance costs of PAR 1173 by expense categories. The expense for fittings, valves, fin fans, and other components replacement or repair labor accounts for 71% – the largest share of the average annual compliance cost, followed by labor costs for conducting OGI inspections (18%), the material cost of replacing fittings, valves, fin fans, and other components (5%), and OGI camera purchases (3%).

Figure 1
Average Annual Estimated Costs of PAR 1173 by Cost Category



MACROECONOMIC IMPACTS ON THE REGIONAL ECONOMY

The Regional Economic Models, Inc (REMI) PI+ v3 model was used to assess the socioeconomic impacts of PAR 1173.¹³ The model links the economic activities in the counties of Los Angeles, Orange, Riverside, and San Bernardino, and it is comprised of five interrelated blocks: 1) output and demand; 2) labor and capital; 3) population and labor force; 4) wages, prices, and costs; and 5) market shares.¹⁴

It should be noted that the REMI model is not designed to assess impacts on individual operations. The model was used to assess the impacts of the proposed amended rule on various industries that make up the local economy. Cost impacts on individual operations were assessed outside of the REMI model and were aggregated to the 70-sector NAICS code level to be used as inputs into the REMI model.

Impact of PAR 1173

This assessment is performed relative to a baseline “business as usual” forecast where PAR 1173 would not be implemented. The analysis assumes that the affected facilities would finance the capital and one-time costs described above at a 4 percent interest rate, and that these one-time costs are amortized over the useful life of each piece of equipment.

Direct costs of PAR 1173 are used as inputs to the REMI model which uses this information to assess secondary and induced impacts for all the industries in the four-county economy on an annual basis over the 2026-2035 period. Direct effects of PAR 1173 include the purchase of OGI cameras, labor costs for OGI inspections and replacement or repair of leaking components, and the material costs to replace leaking components as discussed in the previous compliance cost section.

Under the existing Rule 1173, facilities report the number of affected components to South Coast AQMD. This analysis uses the number of components reported by facilities in each industry to proportionally allocate the total costs of PAR 1173 across industries. For example, since 1.9 million of the total 2.61 million components are located at facilities in the Petroleum and Coal Products Manufacturing industry, the analysis assumes this industry incurs roughly 71% of the total cost. Similarly, these costs at the industry level are further allocated across four counties within South Coast AQMD region based on the location of affected facilities.

While the compliance expenditures that are incurred by affected facilities would increase their cost of doing business, the purchase of required equipment and services would increase the sales and subsequent spending of businesses in various sectors, some of which may be located in South Coast AQMD’s jurisdiction. Table 5 lists the 70-sector NAICS codes used in REMI model that would either incur a direct cost or directly benefit from the compliance spending.

¹³ Regional Economic Modeling Inc. (REMI). Policy Insight® for the South Coast Area (70-sector model). Version 3. 2023.

¹⁴ Within each county, producers are made up of 156 private non-farm industries and sectors, three government sectors, and a farm sector. Trade flows are captured between sectors as well as across the four counties and the rest of U.S. Market shares of industries are dependent upon their product prices, access to production inputs, and local infrastructure. The demographic/migration component has 160 ages/gender/race/ethnicity cohorts and captures population changes in births, deaths, and migration. (For details, please refer to REMI online documentation at <http://www.remi.com/products/pi>.)

**Table 5
Industries Incurring or Benefitting from Compliance Costs**

Source of Compliance Cost	REMI Industries Incurring Compliance Cost (NAICS)	REMI Industries Benefitting from Compliance Spending (NAICS)
OGI Cameras	Oil and Gas Extraction (211) Pipeline Transportation (486) Petroleum and Coal Products Manufacturing (324) Wholesale Trade (42) Chemical Manufacturing (325) Support Activities for Transportation (488)	Computer and Electronic Products Manufacturing (334)
OGI Camera Maintenance		
OGI Inspection Labor		
Fittings, Valves, Fin Fans, and Other Components Replacement or Repair Labor		N/A*
Pump Seals and Compressor Seals Replacement Labor		
Fittings, Valves, Fin Fans, and Other Components Replacement Material Cost		Fabricated Metal Product Manufacturing (332)
Pump Seals and Compressor Seals Replacement Material Cost		Machinery Manufacturing (333)

*Labor for OGI inspections, Pump Seals and Compressor Seals Replacement, and Fittings, Valves, Fin Fans, and Other Components Replacement or Repair is modeled as additional compensation in each affected industry, reflecting the assumption that this work would be completed by existing employees of affected facilities working more hours.

Regional Job Impacts

When the compliance cost is annualized using a 4 percent real interest rate, the REMI model projects that there would be 16 jobs gained annually on average over the 2026 – 2035 period, relative to the baseline forecast. The net job gains are likely due to the modeled compensation increases for employees in the affected industries, which will have spillover benefits for the market demand of other industries such as food services and retail, while the incremental costs borne by capital-intensive industries like the petroleum and coal products manufacturing sector have relatively smaller impacts on their employment.

The Oil and Gas Extraction, Pipeline Transportation, and Petroleum and Coal Products Manufacturing industries are forecasted to forego three jobs, one job, and one job, respectively, on average over the forecast period. The net job losses are likely due to these sectors incurring the biggest share of PAR 1173 compliance costs, therefore being the most affected sectors. Table 6

presents the forecasted jobs foregone or added for selected years in the sectors with the largest magnitude of average annual job impacts. The “All Other Industries” row in Table 6 shows the sum of job impacts for all the other industries except the 11 selected industries presented in the table.

Table 6
Projected Job Impacts of PAR 1173 for Selected Industries and Years

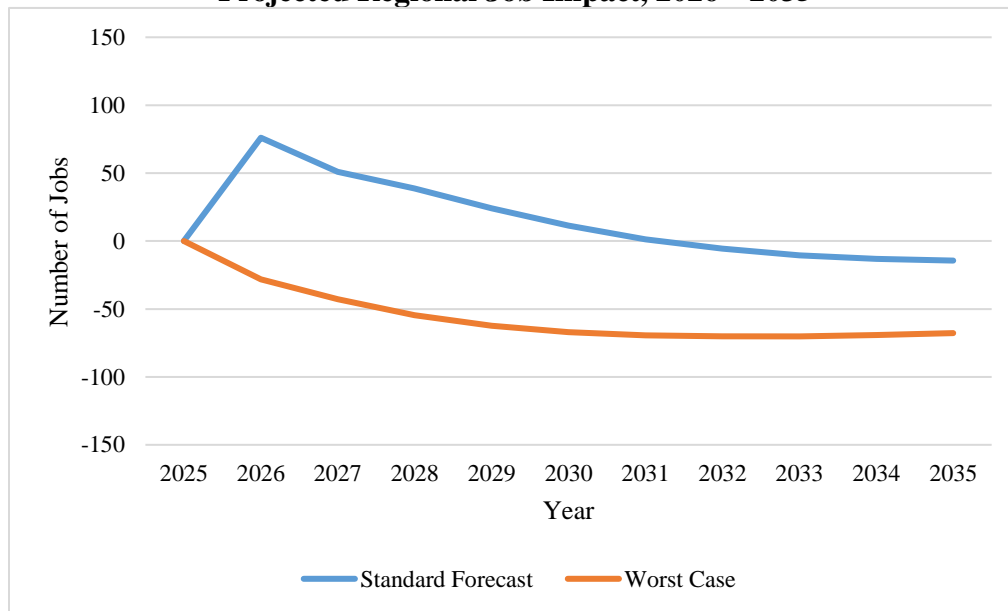
Industry (NAICS)	2026	2030	2035	Annual Average	Baseline Number of Jobs	% of Baseline Jobs
Oil and gas extraction (211)	-1	-4	-4	-3	7,510	-0.043342%
Construction (23)	10	-3	-10	-3	531,695	-0.000474%
Pipeline transportation (486)	0	-1	-2	-1	1,006	-0.133019%
Professional, scientific, and technical services (54)	3	-1	-4	-1	981,069	-0.000108%
Petroleum and coal products manufacturing (324)	0	-1	-1	-1	5,803	-0.012865%
State and Local Government (92)	2	0	-2	0	943,855	-0.000005%
Food services and drinking places (722)	4	2	1	2	727,901	0.000295%
Real estate (531)	6	2	1	2	732,474	0.000332%
Retail trade (44-45)	7	2	1	3	941,011	0.000270%
Personal and laundry services (812)	4	2	2	3	389,013	0.000663%
Ambulatory health care services (621)	9	6	5	6	662,102	0.000921%
All Other Industries	32	7	0	9	6,156,354	0.000146%
All Industries	76	11	-14	16	12,079,792	0.000131%

Note: Totals may not sum due to rounding.

In addition, in 2013, South Coast AQMD contracted with Abt Associates Inc. to review the South Coast AQMD socioeconomic assessments for Air Quality Management Plans and individual rules with the goal of providing recommendations that could enhance South Coast AQMD's socioeconomic analyses. In 2014, Abt Associates Inc. published a report which included a recommendation for South Coast AQMD to enhance socioeconomic analyses by testing major assumptions through conducting a scenario analysis. As such, South Coast AQMD generally includes an alternative worst-case scenario in Socioeconomic Impact Assessments which analyzes a scenario that assumes the affected facilities would purchase all feasible monitoring equipment

and services from providers located outside of the South Coast AQMD’s jurisdiction.¹⁵ This scenario assumes that OGI inspections and replacement/repair labor is done by contractors outside the region, and that all components and OGI cameras are purchased from suppliers outside the region. In simple terms, this alternative worst-case scenario only models the impacts of the costs of compliance with PAR 1173 while excluding the revenues which would benefit equipment and service providers. This hypothetical scenario is designed to test the sensitivity of the embedded assumptions in the REMI model about how compliance costs and revenues would be distributed inside and outside of South Coast AQMD’s jurisdiction. This worst-case scenario would result in an annual average of approximately 60 jobs foregone relative to the baseline scenario. The 60 jobs foregone represent a small portion of the average forecasted baseline jobs in the regional economy at an estimated 0.0005 percent. Figure 2 presents the projected regional job impacts over the 2026 – 2035 period for both the standard and the worst-case forecasts.

Figure 2
Projected Regional Job Impact, 2026 – 2035



Price Impact and Competitiveness

The impact of PAR 1173 on production costs and delivered prices in the region is not expected to be substantial. In the Petroleum and Coal Products Manufacturing Industry, which bears the majority of compliance costs associated with PAR 1173, the REMI model projects an average increase in relative delivered prices of 0.01 percent over the forecast period. The relative cost of production for the Petroleum and Coal Products Manufacturing Industry is also forecasted to increase by 0.01 percent on average relative to the baseline scenario. The small magnitude of the change in production cost and delivered price suggests that the impact of implementing PAR 1173 on consumers and firms in South Coast AQMD region should be minimal.

¹⁵ Abt Associates Inc., August 2014, Review of the SCAQMD Socioeconomic Assessments, Chapter 6, Section 3, <https://www.aqmd.gov/docs/default-source/Agendas/aqmp/scaqmd-report---review-socioeconomic-assessments.pdf>, accessed April 2, 2024.

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