



**SOCIO-ECONOMIC IMPACT ANALYSIS  
PROPOSED AMENDMENTS TO REGULATION 8,  
RULES 33 AND 39 (GASOLINE BULK TERMINALS  
AND GASOLINE BULK PLANTS)**

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**Prepared for  
Bay Area Air Quality Management District**

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# 1. DESCRIPTION OF THE PROPOSED RULE

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The Bay Area Air Quality Management District seeks to reduce emissions of volatile organic compounds at gasoline bulk terminals and gasoline bulk plants through improved facility operations and more stringent standards for gasoline cargo tank loading operations. To this end, the District has promulgated Regulation 8, Rule 33 (Gasoline Bulk Terminals) and Regulation 8, Rule 39 (Gasoline Bulk Plants), which the District now seeks to amend.<sup>1</sup>

Based on District staff's estimate of the emission inventory and review of existing regulations, the District is proposing a set of amendments to Regulation 8-33 and Regulation 8-39 to reduce organic emissions, enhance the safety of gasoline bulk terminal and bulk plant operations, and improve the enforceability of the rules. The proposed amendments include:

- A reduction in the allowable emission limit; and a requirement to monitor vapor recovery system outlet vapor for organic concentrations to ensure the vapor recovery system is operating properly;
- A clarification of vapor leak standards and reduction of liquid leak standards in the rules;
- A requirement that loading arms and cargo tank connectors be compatible prior to gasoline loading, and meet the vapor and reduced liquid leak standards;
- A requirement to install pressure sensors to monitor vapor collection piping backpressure, and activate an alarm or automatic shutdown if backpressure exceeds 18 inches water column;
- A requirement to install block or vapor check valves in each loading rack vapor collection header to minimize emissions when maintenance is required;
- A requirement that vapor hose connectors are stored out of the way of the truck driveway to prevent damage to the connectors, which can be a source of leakage;
- A requirement to monitor vapor storage tank airspace emissions to ensure all leaks are discovered and repaired quickly;
- A requirement to install sample lines on the pressure and vacuum sides of inaccessible pressure/vacuum valves to provide ready access to check for leaks;
- A requirement to further control the release of organic compounds during maintenance and repair operations.
- A requirement for an APCO-approved vapor recovery monitoring, inspection, notification and reporting protocol.
- A requirement that plants and terminals apply to have their equipment recertified by California Air Resources Board (CARB) if substantive changes are made to their existing equipment.
- Revision to definitions and updates to source test requirements to be consistent with federal and state requirements.

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<sup>1</sup> Gasoline bulk terminals and gasoline bulk plants are intermediate facilities that distribute gasoline, gasoline additives and other fuels, such as ethanol, by gasoline cargo tanks to service stations and local businesses. Gasoline bulk terminals also distribute refined fuels to gasoline bulk plants.

## 2. IMPACT OF PROPOSED RULE AMENDMENTS

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This section of the socioeconomic analysis describes demographic and economic trends in the San Francisco Bay Area (Bay Area) region. Following an overview of the socioeconomic analysis methodology, the first part of this section compares the Bay Area against California and provides a context for understanding demographic and economic changes that have occurred within the Bay Area between 1997 and 2007. After an overview of Bay Area industries, we focus on industries impacted by the proposed amendments to Regulation 8, Rules 33/39. For the purposes of this report, the Bay Area region is defined as Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

### METHODOLOGY

The socioeconomic analysis of the proposed amendments to Regulation 8, Rules 33/39 involves the use of information provided directly by BAAQMD, as well as secondary data used to describe the industries affected by the proposed rule amendments.

Based on information provided by BAAQMD staff, ADE determined that the impacts would affect businesses in a narrow set of related industries, namely petroleum bulk terminal facilities and petroleum bulk plants. With this information we profiled impacted businesses and industries, analyzing data on the number of jobs, sales levels, the typical profit ratios, and other economic indicators for Bay Area businesses.

With data from the US Economic Census and other sources such as US IRS, California Employment Development Department, and the District, ADE was able to estimate revenues and profit ratios for industries impacted by the proposed rule amendments, as well as describe trends in the number of petroleum bulk terminals and bulk plants.

In calculating aggregate revenues generated by Bay Area businesses in affected industries, ADE first estimated annual revenue based upon available data, particularly the US Economic Census. ADE calculated ratios of profit per dollar of sales for the businesses and industries on which the analysis focused. The result of the socioeconomic analysis shows what proportion of profit the compliance costs represent. Based on a given threshold of significance, ADE discusses in the report whether the affected businesses and industries are likely to reduce jobs as a means of recouping the cost of compliance or as a result of reducing business operations. Where applicable, ADE also examines whether affected industries can pass costs to consumers. To the extent that such job losses appear likely and significant, the indirect multiplier effects of the job losses area estimated using a regional IMPLAN input-output model.

When analyzing the socioeconomic impacts of proposed new rules and amendments, ADE works closely within the parameters of accepted methodologies discussed in a 1995 California Air Resources Board report called “Development of a Methodology to Assess the

Economic Impact Required by SB513/AB969” (by Peter Berck, PhD, UC Berkeley Department of Agricultural and Resources Economics, Contract No. 93-314, August, 1995). The author of this report reviewed a methodology to assess the impact that California Environmental Protection Agency proposed regulations would have on the ability of California businesses to compete. The California Air Resources Board (ARB) has incorporated the methodologies described in this report in its own assessment of socioeconomic impacts of rules generated by ARB. One methodology relates to determining a level above or below which a rule and its associated costs is deemed to have significant impacts. When analyzing the degree to which its rules are significant or insignificant, ARB employs a threshold of significance that ADE follows. Berck reviewed the threshold in his analysis and wrote, “The Air Resources Board’s (ARB) use of a 10 percent change in [Return on Equity] ROE (i.e. a change in ROE from 10 percent to a ROE of 9 percent) as a threshold for a finding of no significant, adverse impact on either competitiveness or jobs seems reasonable or even conservative.”

## REGIONAL DEMOGRAPHIC TRENDS

The Bay Area experienced moderate population growth from 1997 to 2007. In the five-year period between 1997 and 2002, the nine-county region increased by 1.1 percent annually, from 6.6 million in 1997 to almost 6.9 million in 2002. From 1997 to 2007, the population increase was from 6.6 million to 7.2 million for an increase of slightly less than one percent annually. In other words, the Bay Area grew at a slower pace between 2002 and 2007 relative to 1997 and 2002. Over the ten-year period stretching from 1997 to 2007, California grew at a faster rate of 1.4 percent per year.

Within the Bay Area, the greatest percentage increase occurred in Contra Costa County. From 1997 to 2007 Contra Costa increased its population by 1.6 percent annually. All other Bay Area counties had population increases slower than Contra Costa County and the State. The smallest percentage increase occurred in San Mateo County where population grew annually by 0.4 percent from 1997 to 2007.

**TABLE 1**  
**POPULATION TRENDS: SAN FRANCISCO BAY AREA**

	Population		Annual Percent Change			
	1997	2002	2007	97-02	02-07	97-07
California	32,670,019	35,088,671	37,662,518	1.4%	1.4%	1.4%
Bay Area	6,566,939	6,943,440	7,217,424	1.1%	0.8%	0.9%
Alameda County	1,381,705	1,483,623	1,526,148	1.4%	0.6%	1.0%
Contra Costa County	887,065	983,360	1,042,341	2.1%	1.2%	1.6%
Marin County	241,412	250,090	255,982	0.7%	0.5%	0.6%
Napa County	120,095	128,282	135,969	1.3%	1.2%	1.2%
San Francisco County	772,834	788,971	808,844	0.4%	0.5%	0.5%
San Mateo County	704,834	715,072	733,496	0.3%	0.5%	0.4%
Santa Clara County	1,654,833	1,716,105	1,808,056	0.7%	1.0%	0.9%
Solano County	375,512	408,923	424,823	1.7%	0.8%	1.2%
Sonoma County	428,649	469,014	481,765	1.8%	0.5%	1.2%

Source: ADE, Inc., based California Department of Finance

## REGIONAL ECONOMIC TRENDS

The Bay Area is one of the world's greatest regional economies. It benefits from pre-eminent knowledge-based industries, with competitive strength flowing from an unmatched culture of entrepreneurship, world-leading research institutions, and some of the nation's best educated and most highly skilled workforce. However, in the five year period between 2002 and 2007, the Bay Area economy had not grown significantly with respect to employment, which contrasts with the relatively robust employment growth in the Bay Area between 1997 and 2002.

As Table 2 shows, as of 2007, the professional and business services sector was the largest employer in the region, at 581,742 jobs or 17.5 percent of all private and public sector jobs. In 1997, professional and business services also accounted for 17.5 percent of all Bay Area employment. While professional and business service decreased annually by a slight rate of 0.34 percent between 1997 and 2002, between 2002 and 2007 employment increased in this sector by an annual clip of 1.13 percent. In terms of share of total employment, healthcare\private education and manufacturing sectors are the next largest sector, boasting 11.1 percent and 10.4 percent of total jobs in the Bay Area. In the state as a whole, healthcare\private education and manufacturing comprise 10.4 percent and 9.3 percent of all jobs, meaning the Bay Area has a slightly greater advantage in these sectors that provide a wider breadth of career mobility opportunities relative to many other sectors and industries.

At 10.2 percent, retail is the fourth largest employing sector, followed by leisure and hospitality, all three of which tend to pay less than manufacturing and healthcare. While retail slightly declined by 0.2 percent per year between 2002 and 2007, leisure increased by a robust clip of almost two percent per year in the Bay Area.

Another large industry in the Bay Area is public service, or government, with 446,000 jobs, or 13.2 percent of the total. Within the public sector, employment had risen fastest since 2002 in state government, whereas local government employment actually declined by 0.3 percent annual pace between 2002 and 2007. Employment in federal agencies declined annually by a greater amount, at 1.68 percent annual clip over the five year period between 2002 and 2007.

Overall, since 2002, total public and private employment in the Bay Area changed slightly at 0.12 percent per year between 2002 and 2007, going from 3,312,548 workers in 2002 to 3,332,658 workers in 2007. In comparison, in the five-year period between 1997 and 2002, employment grew in aggregate from 3,182,044 to 3,312,548, for a yearly growth of 0.81 percent.

**TABLE 2**  
**EMPLOYMENT PROFILE OF THE SAN FRANCISCO BAY AREA, 1997-2007**

<b>Industry</b>	<b>1997</b>	<b>2002</b>	<b>2007</b>	<b>% of Total Private and Public Employment in 2007: Bay Area</b>	<b>% of Total Private and Public Employment in 2007: California</b>	<b>Annual Percent Chg, 97-02</b>	<b>Annual Percent Chg, 02-07</b>
<b>Total, all private industries</b>	<b>2,765,671</b>	<b>2,860,813</b>	<b>2,886,583</b>			<b>0.68%</b>	<b>0.18%</b>
Goods-Producing	637,975	612,864	559,837			-0.80%	-1.79%
Natural Resources and Mining	27,991	27,570	22,510	0.7%	2.6%	-0.30%	-3.97%
Construction	142,100	182,399	192,229	5.8%	5.7%	5.12%	1.06%
Manufacturing	467,884	402,895	345,098	10.4%	9.3%	-2.95%	-3.05%
Service-Providing	2,127,696	2,247,949	2,326,746			1.11%	0.69%
Trade, Transportation, and Utilities	580,609	580,925	576,997			0.01%	-0.14%
Retail	326,010	340,881	340,519	10.2%	10.8%	0.90%	-0.02%
Wholesale	131,533	129,192	124,943	3.7%	4.6%	-0.36%	-0.67%
Transportation\Warehouse\Utilities	123,066	110,852	111,535	3.3%	3.1%	-2.07%	0.12%
Information	103,464	124,190	113,082	3.4%	3.0%	3.72%	-1.86%
Financial Activities	188,631	209,626	206,370	6.2%	5.8%	2.13%	-0.31%
Professional and Business Services	559,140	549,827	581,742	17.5%	14.4%	-0.34%	1.13%
Education and Health Services	297,240	348,361	370,398	11.1%	10.4%	3.22%	1.23%
Leisure and Hospitality	278,231	300,502	330,689	9.9%	9.9%	1.55%	1.93%
Other Services	120,381	134,518	147,468	4.4%	4.9%	2.25%	1.86%
Federal Government	57,233	56,887	52,279	1.6%	1.6%	-0.12%	-1.68%
State Government	80,249	84,600	87,550	2.6%	2.9%	1.06%	0.69%
Local Government	278,891	310,248	306,246	9.2%	11.0%	2.15%	-0.26%
<b>Total, all public and private industries</b>	<b>3,182,044</b>	<b>3,312,548</b>	<b>3,332,658</b>	<b>100.00%</b>	<b>100.00%</b>	<b>0.81%</b>	<b>0.12%</b>

Source: ADE, Inc., from data supplied by the Labor Market Information Division of the California Employment Development Department

## DESCRIPTION OF AFFECTED INDUSTRIES

Gasoline bulk terminals and gasoline bulk plants are intermediate facilities that distribute gasoline, gasoline additives, and other fuels, such as ethanol, by gasoline cargo tanks to service stations and local businesses. Gasoline bulk terminals also distribute refined fuels to gasoline bulk plants. Table 3 traces ten-year's worth of data on petroleum bulk plants and bulk terminals. Right now, there are 45 establishments in the nine-county San Francisco Bay Area, down by three since 2002 and by 11 since 1997. In 1997, the average establishment employed 30 workers whereas now, the average employs approximately 20 workers. While the number of establishments and employees has declined over the past ten years, and while bulk plants and terminals have become smaller on average, these industries continue to pay relatively good annual wages, at \$77,100 (average) in 2007.

**TABLE 3  
PETROLEUM BULK STATIONS AND TERMINALS TRENDS: SAN FRANCISCO BAY AREA, 97-07**

<b>Bulk Stations &amp; Terminals</b>	<b>1997</b>	<b>2002</b>	<b>2007</b>	<b>---- Change ----</b>		<b>- Annual Per Chg -</b>	
				<b>97-02</b>	<b>02-07</b>	<b>97-02</b>	<b>02-07</b>
Establishments	56	48	45	-8	-3	-3%	-1%
Employment	1,699	1,305	932	-394	-373	-5%	-7%
Average Wages (\$2007)	\$74,408	\$80,359	\$77,075	5,951	-3,284	2%	-1%

Source: ADE, Inc., based on California EDD, US Economic Census (Geographic Area Series: California: Wholesale Trade), and Bay Area Air Quality Management District

Of the 45 bulk plant and terminal establishments operating in the nine-county region, 28 will be subject to one of the rules. Table 4 below provides additional economic data on the 28 affected bulk terminals and plants in the region. Of the 28, 14 are bulk terminals and 14 are bulk plants. Of the 14 bulk terminals, five are oil refineries, which explain why the aggregate revenue for the 14 establishments is an estimated \$5.7 billion. Combined, the bulk terminals and bulk plants generate an estimated \$5.9 billion in aggregate revenues, off of which are generated \$336 million in after-tax net profits, for an overall net profit rate of approximately 5.7 percent. In large part, this overall net profit rate is attributable to the oil refineries, which generate an estimated 5.8 after-tax net profit rate. In contrast, bulk plants after-tax net profit rate is only one percent.

**TABLE 4  
ECONOMIC PROFILE OF PETROLEUM BULK STATIONS & TERMINAL:  
SAN FRANCISCO BAY AREA**

<b>Petroleum Bulk Stations &amp; Terminals</b>	<b>Establishments</b>	<b>Est. Revenues</b>	<b>Est. Net Profits</b>
Bulk Terminals	14	\$5,737,508,588	\$334,713,799
Bulk Plants	14	\$165,904,346	\$1,651,246
	28	\$5,903,412,935	\$336,365,045

Source: ADE, Inc., based on data from the US Economic Census, 2002 (Geographic Area Series: California: Wholesale Trade)(\$2007) and corporate annual reports (Valero, Tesoro, Chevron, ConnocoPhillips), US Internal Revenue Service, and BAAQMD.

### 3. SOCIOECONOMIC IMPACT ANALYSIS

This section of the report examines the socioeconomic impact analysis of proposed amendments to Regulation 8, Rules 33/39. As indicated above, approximately 28 establishments will fall within the purview of the rule as amended. A number of these establishments are oil refineries, meaning that even as these refineries operate stand-alone bulk terminals and or bulk plant operations, costs associated with the proposed amendments can and will be passed to the refineries that these terminals and plants are a part of.

Table 5 below summarizes costs associated with the proposed amendments to Regulation 8, Rules 33/39. While the District is proposing a more stringent emissions limit for bulk terminal facilities, many are already in compliance with standards established in the proposed amendments, meaning that not all bulk terminal facilities will be subject to \$45,900 to \$64,700 in costs described below. For purposes of a conservative analysis, we assume all 14 bulk terminal facilities will bear \$45,900 to \$64,700 in annual costs stemming from the proposed amendments.<sup>2</sup> For bulk plant facilities, annual costs stemming from the proposed amendments are very small, at an estimated \$2,400 per year per facility.

**TABLE 5  
ANNUAL COSTS: PROPOSED AMENDMENTS TO REGULATION 8, RULES 33 AND 39**

<b>Amendment</b>	<b>Associated Annual Costs</b>	<b>Annual Cost Per Bulk Terminal</b>	<b>Annual Cost Per Bulk Plant</b>
A. Reduce Emission Limits	Parametric monitoring	\$18,000	
B. Clarify Liquid leak Standards			
C. Vapor Recovery Connections	Facility counterweight adjustment	\$200	\$200
D. Pressure Monitors	Back pressure monitor per loading rack, plus	\$10,800	
* assume typical of 4 loading racks at each terminal	Alarm system, <i>OR</i>	\$13,600	
	Automatic shut-off system per loading rack	\$32,400	
	Pressure gauge system		\$700
E. Block Valves or Vapor Check Valves Per Vapor Recovery System		\$800	
* assume typical of 4 loading racks at each terminal			
F. Vapor Recovery Hose Connector Hanger		\$400	
* assume typical of 4 loading racks at each terminal			
G. Monitor Vapor Storage Tank emissions manually		\$200	
H. Install Sampling Lines on Pressure Valves	Install sample lines	\$1,000	\$600
* assume typical of 5 P/V valves at each terminal			
I. Minimize Release of Vapors	Slop tanks or portable containers	\$900	\$900
K. Require APCO-Approved Emissions Monitoring			
L. Require Updated CARB Certification			
M. Editorial Changes			
<b>Total Per Terminal or Per Plant Costs</b>		<b>\$45,900 - \$64,700</b>	<b>\$2,400</b>

Source: Bay Area Air Quality Management District

<sup>2</sup> The reason bulk terminal costs are presented as a range (\$45,900 to \$64,700) is because affected establishments will either pay an estimated \$13,600 in alarm system costs or \$32,400 in automatic shut-off system per loading rack costs, but not both.

As noted above, impacts are evaluated by comparing compliance costs to net profits. At 0.22-to-0.31 percent and 2.03 percent, bulk terminals and bulk plants are not significantly impacted, respectively, by costs stemming from the proposed amendments, when costs are expressed as a percent of estimated net profits. These impacts fall far short of the ten-percent threshold used for the purposes of determining when costs are significant or not.

**TABLE 6**  
**SOCIOECONOMIC IMPACT ANALYSIS: PROPOSED AMENDMENTS TO REGULATION 8, RULES 33 AND 39**

<b>Petroleum Bulk Stations &amp; Terminals</b>	<b>Establish -ments</b>	<b>Est. Revenues</b>	<b>Est. Net Profits</b>	<b>Annual Costs: Maximum Scenario</b>	<b>Cost As Percent of Net Profits</b>	<b>Significance</b>
Bulk Terminals	14	\$5,737,508,588	\$334,713,799	\$734,400 - \$1,035,200	0.22% - 0.31%	< significant
Bulk Plants	14	\$165,904,346	\$1,651,246	\$33,600	2.03%	< significant
	28	\$5,903,412,935	\$336,365,045	\$768,000 - \$1,058,800	0.23% - 0.32%	< significant

Source: ADE, Inc.

## DEFINITION OF A SMALL BUSINESS

For purposes of qualifying small businesses for bid preferences on state contracts and other benefits, the State of California defines small businesses in the following manner<sup>3</sup>. To be eligible for small business certification, a business:

- Must be independently owned and operated;
- Cannot be dominant in its field of operation;
- Must have its principal office located in California
- Must have its owners (or officers in the case of a corporation) domiciled in California; and
- Together with its affiliates, be either:
  - A business with 100 or fewer employees, and an average gross receipts of \$10 million or less over the previous tax years, or
  - A manufacturer with 100 or fewer employees

In analyzing the revenue profiles of the bulk terminals and bulk plants that are not oil refineries, we have determined that none generate less than \$10 million in annual revenues. As a result, none are small businesses. Using data from the United States Economic Census, 2002 (Geographic Area Series: California: Wholesale Trade), we have determined that bulk terminals in the San Francisco Bay Area as a whole generated an estimated \$5.7 billion in revenues. Controlling for revenues generated by oil refineries, bulk terminals that are not

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<sup>3</sup> State of California. Department of General Services. "California Small Business Certification" (<http://www.pd.dgs.ca.gov/smbus/sbcert.htm>)

refineries generated \$1.2 billion (rounded) in aggregate revenues, for an average of \$119 million.

The 14 bulk plant facilities subject to the rule as amended generate, on average, \$12 million in revenues. While this average suggests bulk plants are not small businesses, anecdotal information suggests that a number of the impacted 14 bulk plant facilities are small businesses. Table 7 below distributes the 14 bulk plant establishments by number of workers. For each size category, we include corresponding revenue, net profit and impact estimates. Table 7 shows that establishments employing no more than ten workers are small businesses since, on average, these establishments annually generate less than \$10 million. Thus, of the 14 bulk plant facilities subject to the proposed amendments, ten are small businesses. As the table below shows, these businesses are not impacted by the proposed amendments in a significant manner, meaning that the proposed amendments do not disproportionately impact small businesses.

**Table 7**  
**Socioeconomic Impact Analysis: Proposed Amendments To Regulation 8, Rules 33 and 39: Small Business**  
**Disproportionate Impact Analysis: Bulk Plants Only**

Number of Workers	Establishments By Size	Aggregate Revenue Est.	Average Revenue	Small Business	Aggregate Net Profit Est.	Aggregate Bulk Plant Costs @ \$2,400 Per Facility	Agg Cost as Percent of Agg Net Profits	Significance
All	14	\$165,904,346	\$11,850,310		\$1,651,246	\$33,600	2.0%	less than sig.
1-4 workers	4	\$13,048,656	\$3,262,164	yes	\$129,873	\$9,600	7.4%	less than sig.
5-9	3	\$19,572,985	\$6,524,328	yes	\$194,810	\$7,200	3.7%	less than sig.
10-19	5	\$69,903,517	\$13,980,703	no	\$695,750	\$12,000	1.7%	less than sig.
20-49	2	\$63,379,189	\$31,689,594	no	\$630,813	\$4,800	0.8%	less than sig.
50-99								
100-249								
250-499								
500-999								
>1000								

Source: ADE, Inc., based on US Census Metro Business Patterns (2006), US Economic Census 2002 (\$2007) and BAAQMD