

MESA REFINERY WATCH ISSUE PAPER – 6 SEPTEMBER 2016

REGIONAL ECONOMIC EFFECTS

DATE: September 6, 2016

FROM: Technology Committee, Mesa Refinery Watch Group (MRWG)

TO: Ryan Hostetter, Senior Planner (rhostetter@co.slo.ca.us)
San Luis Obispo County Department of Planning and Building
760 Osos Street, Room 300
San Luis Obispo, California 93408

SUBJECT: Regional Economic Effects of the Phillips 66 Rail Spur Project

1. It is MRWG's position that "economic benefits" cited in the applicant's proposed "Statement of Overriding Considerations [DRAFT]" (8/15/2016) are inadequate for overriding Class 1 project impacts, and too limited in scope to be useful in analyzing county-wide and regional effects.
2. The MRWG Technology Committee has analyzed the economic effects of the Phillips 66 Rail Spur Project in our three-county Central Coast Region – including San Luis Obispo, Santa Barbara, and Monterey Counties. The review was conducted using the U.S. Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System (RIMS II). RIMS II is a tool used by economic development organizations, planners, elected officials and businesses to objectively assess the potential impacts on employment, earnings and output, and effects on Gross Domestic Product (GDP) of various projects. The tool produces multipliers that are used to estimate total direct, indirect, and induced inter-industry and household spending impacts in a specific region.
3. The result of the RIMS II analysis is attached, along with supporting documentation, calculations, and remarks. The results are summarized as follows:

- **Predicted Regional Annual GDP Losses (\$ millions)**
Five Train Alternative: (167.5)
Three Train Alternative: (60.3)
- **Potential Regional Employment Losses (number of jobs)**
Five Train Alternative: - 1,320
Three Train Alternative: - 456
- **Potential Regional Annual Payroll Earnings Losses (\$ millions)**
Five Train Alternative: (142.4)
Three Train Alternatives: (48.5)

MESA REFINERY WATCH ISSUE PAPER – 6 SEPTEMBER 2016

REGIONAL ECONOMIC EFFECTS

These kinds of regional losses can be expected whenever imported raw materials displace and strand locally available raw materials. RIMS II regional multipliers are required to be adjusted downward whenever regional “inputs” are bypassed or not available.^{1, 2}

4. The Final EIR makes two suggestions for how stranded crude oil, displaced by imported crude, may be able to get to market at Los Angeles Basin refineries – (1) reversing the flow in the Sisquoc pipeline and using mid-stream pipelines; and (2) trucking over public roads through multiple counties. Both methods involve significant additional cost and permitting. The methods, permitting challenges, and costs of diverting displaced crude are speculative and not evaluated in the EIR. There are no assurances that diversion is either cost competitive or viable. Important decisions affecting the livelihood of many people in multiple industries, and local government budgets and services, should not be based on speculation. Without supporting evidence to the contrary, local crude oil displaced by the rail project, with no definitive access to market, is considered stranded in this analysis.

5. No one can deny the importance of the oil industry to our three-county Central Coast region. Out of a combined Gross Domestic Product (GDP) of about \$58 billion, the oil industry contribution is almost \$1.6 billion, or almost 3%.³

6. The regional oil industry is roughly composed of three interdependent sectors: an oil and gas extraction industry; a midstream pipeline industry; and a petroleum refining industry.⁴ Regional and local economies are best served when these three sectors work in harmony. Still, each sector often sub-optimizes its own operations to the best advantage of its corporate owners, and to increase market share and income for shareholders.

¹ Inputs to the RIMS II tool were taken directly from data, estimates and evidence contained in the project’s Final Environmental Impact Report (EIR); state production statistics from the California Department of Conservation, Division of Oil, Gas & Geothermal Resources (DOGGR); federal OCS offshore production from U.S. Department of Interior, Bureau of Safety and Environmental Enforcement Data Base; and oil industry employment and earnings from the Western States Petroleum Association (WSPA)/ Los Angeles County Economic Development Corporation (LAEDC) publication “*Oil and Gas Industry in California, Its Economic Contribution and Workforce in 2013*”.

² The only North American Industry Classification System (NAICS) code that shows gains is 32411 Petroleum Refineries, which shows a regional increase of 28 jobs and \$4.03 million in earnings (which includes employer provided benefits.)

³ Oil industry contribution of 2013 GDP by county:

San Luis Obispo County: 4.1% (\$0.5 out of \$12.6 billion GDP – SLO-Paso Robles-Arroyo Grande metropolitan areas)

Santa Barbara County: 3.5% (\$0.8 out of \$23.5 billion GDP – Santa Maria-Santa Barbara metropolitan areas)

Monterey County: 1.1% (\$0.2 out of \$20.4 billion GDP – Salinas-Monterey metropolitan areas)

From U.S. BEA: http://www.bea.gov/newsreleases/regional/gdp_metro/2015/pdf/gdp_metro0915.pdf

and WSPA/LAEDC: http://laedc.org/wp-content/uploads/2015/09/OG_Industry-and-Workforce_20150731.pdf

⁴ This breakdown leaves out non-oil industry transportation services by rail and truck.

MESA REFINERY WATCH ISSUE PAPER – 6 SEPTEMBER 2016
REGIONAL ECONOMIC EFFECTS

7. We only need to look as far as the Refugio State Beach oil spill last year to see downside of sub-optimization by one sector of the local oil industry. Cost savings initiatives by the pipeline owner overrode service to clients. This resulted in offshore oilfield shutdowns, worker layoffs, contract terminations and feedstock reductions to Santa Maria Refinery. However, other industries and local businesses also suffered from reduced demand and lost income. Millions in tax revenue losses impacted county government services for everything from school budgets to road maintenance.

8. The BEA RIMS II model shows Phillips 66 Company’s initiative to import crude oil by rail and optimize its own refinery operations will create the same kind of detrimental impacts as Refugio, by also stranding some local crude oil supplies. Phillips 66’s proposed “Statement of Overriding Considerations [DRAFT]” addresses only the refinery’s side of the economic ledger and overlooks industry-wide, county-wide and regional implications of the project.

We hope the RIMS II analysis is useful to you and the Planning Commission in their deliberations.

Respectfully submitted,

Tom Ryan
Sam Saltoun
Michael Young

CONTACT INFORMATION:

Mesa Refinery Watch Administrator: Eunice King, 408-234-2567, MRWCoord@gmail.com

MRW Technology Committee: Tom Ryan, 661-406-5313, whitneyhiker888@yahoo.com
Sam Saltoun, 805-363-1002, ssaltoun@verizon.net
Michael Young, 623-523-3855, mikero1@mac.com

Importing Crude Oil by Rail Creates Job and Economic Losses Across the Region

NAICS Code	Description	U.S. Bureau of Economic Analysis (BEA) Multipliers P&G WSPA California Data Superseded by BEA RIMS II Type II Data (Table 1.5) for Central Coast. (SEE NOTES 1 & 2)			
		P&G WSPA 2007 Data	BEA RIMS II Type II 2013 Data	P&G WSPA 2007 Data	BEA RIMS II Type II 2013 Data
		Employment		Earnings	
211	Oil and Gas Extraction	5.3998	2.1185	2.4777	1.4933
213111	Drilling Oil and Gas Wells	3.8605	1.8734	2.9549	1.5175
213112	Support Activities, Oil/Gas Operations	2.9867	1.7911	2.4094	1.5102
32411	Petroleum Refineries	9.0343	2.3664	3.4558	1.5171
333132	Oil and Gas Field Machinery and Equipment	3.7576	1.8905	2.8803	1.5737
486	Pipeline Transportation	5.6564	2.4705	2.9781	1.5807

Regional Gross Domestic Product Impact Based on Industry Aggregate Multiplier for Oil and Gas Extraction Industry BEA RIMS II Type II 2013 Data (Table 2.5) Final Demand "Value Added" Multiplier (SEE NOTE 5)	
Predicted Regional GDP Loss (\$ millions) Oil & Gas Extraction Industry Aggregate Multiplier	
Five Trains Per Week	Three Trains Per Week
0.8695	0.8695
(167.5)	(60.3)

NAICS Code	Description	Employment Totals From WSPA 2015 Publication, "Oil and Gas in California: The Industry and Its Contributions in 2013" (SEE NOTE 3)			
		San Luis Obispo County	Santa Barbara County	Monterey County	Total
		Number of Jobs			
211	Oil and Gas Extraction	227	641	190	1,058
213111	Drilling Oil and Gas Wells	53	355	23	431
213112	Support Activities, Oil/Gas Operations	35	431	126	592
32411	Petroleum Refineries (SEE NOTE 4)	200	56	-	256
333132	Oil and Gas Field Machinery and Equipment	126	43	-	169
486	Pipeline Transportation	23	12	-	35
Total Jobs in Central Coast Oilfield Industry		664	1,538	339	2,541

Potential Employment Losses Across Region Includes Direct, Indirect, & Induced Impacts. (SEE NOTES 6 & 7)		
Five Trains Per Week	Three Trains Per Week	
Number of Jobs Lost or Gained		
▼	-669	▼ -240
▼	-241	▼ -87
▼	-317	▼ -114
▲	28	▲ 28
▼	-95	▼ -34
▼	-26	▼ -9
-1,320		-456

NAICS Code	Description	Payroll Totals From WSPA 2015 Publication, "Oil and Gas in California: The Industry and Its Contributions in 2013" (SEE NOTE 3)			
		San Luis Obispo County	Santa Barbara County	Monterey County	Total
		Annual Payroll (\$ millions)			
211	Oil and Gas Extraction	9.8	170.7	18.4	198.9
213111	Drilling Oil and Gas Wells	2.5	50.6	2.2	55.3
213112	Support Activities, Oil/Gas Operations	2.3	42.8	9.7	54.8
32411	Petroleum Refineries (SEE NOTE 4)	44.3	7.6	-	51.9
333132	Oil and Gas Field Machinery and Equipment	11.6	2.4	-	14.0
486	Pipeline Transportation	1.7	1.1	-	2.8
Total Payroll in Central Coast Oilfield Industry		72.2	275.2	30.3	377.7

Potential Earnings Impacts Across Region Includes Direct, Indirect, & Induced Impacts. (SEE NOTES 6 & 7)		
Five Trains Per Week	Three Trains Per Week	
Annual Earnings Loss or Gain (\$ millions)		
▼	(88.7)	▼ (31.8)
▼	(25.1)	▼ (9.0)
▼	(24.7)	▼ (8.9)
▲	4.03	▲ 4.03
▼	(6.6)	▼ (2.4)
▼	(1.3)	▼ (0.5)
\$ (142.4)	\$ (48.5)	

Notes:

1. The employment and earnings multipliers (9.0343 and 3.4558 respectively), used in the Phillips 66 submitted “Statement of Overriding Considerations” (SOC), are outdated, are larger than typical industrial norms, are statewide rather than specific to the Central Coast Region, and are inconsistent with current U.S. Bureau of Economic Analysis (BEA) multipliers for the Central Coast O&G industry.

The multipliers used in the Phillips 66 supplied SOC came from a June 2011 Purvin and Gertz, Inc. study prepared for the Western States Petroleum Association (WSPA), “*Assessment of Petroleum Industry Economic Impact to the State of California*”. The P&G study worked with 2007 data – the latest statewide data available at the time from BEA.

(See: <https://www.wspa.org/sites/default/files/uploads/documents/Industry%20Issues/Purvin%20%26%20Gertz%20Economic%20Impacts%20FINAL.pdf>)

Large multipliers may emphasize a positive contribution to a local economy, but when used to evaluate displacing local raw materials with imported materials, and shutting-in or stranding the local materials, the multipliers act on production losses. In this case, large P&G multipliers show unrealistically large job losses in local oilfields resulting from displacing and stranding local crude oil.

Instead of using decade-old statewide P&G multipliers, we use the most currently available BEA 2013 RIMS II regional multipliers specific to the three-county Central Coast Region – San Luis Obispo, Santa Barbara, and Monterey Counties.¹ The BEA multipliers are much smaller and more in line with industry norms. (See attached: RIMS II Table 1.5 Total Multipliers by Detailed Industry).

Type II multipliers were used. They include both Type I interindustry “direct” and “indirect” impacts, and “induced” impacts from local spending by workers. Type II multipliers are more realistic where potential job losses effect household spending.

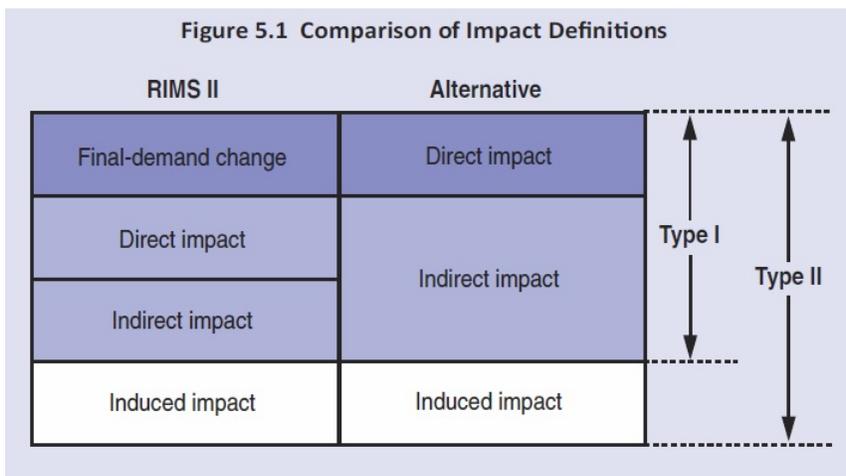


Figure 5.1 from the BEA RIMS II User Guide: https://www.bea.gov/regional/pdf/rims/rimsii_user_guide.pdf

¹ BEA RIMS II regional data used is from 2013 – the most recent currently available. RIMS II national input-output data, which is not used in this analysis, is 2007 data.

2. BEA RIMS II “Direct Effect” multipliers were used rather than “Final Demand” multipliers because the rail project does not change Santa Maria Refinery (SMR) input-output levels, and “Direct Effect” multipliers still include all direct, indirect, and induced impacts.
3. Employment and payroll (labor income) information for the three-county region was taken directly from the April 2015 publication "*Oil and Gas in California: The Industry and Its Contributions in 2013*", Commissioned by WSPA and prepared by the Institute for Applied Economics, Los Angeles County Economic Development Corporation: http://laedc.org/wp-content/uploads/2015/09/OG_Industry-and-Workforce_20150731.pdf

There was one exception to using the WSPA 2013 data explained in Note 4.

4. The WSPA employment and payroll data used for Santa Maria Refinery (SMR) was based on the Phillips 66 submitted draft SOC rather than the WSPA 2013 data as follows:

<u>NAICS</u>	<u>Description</u>	<u>WSPA 2013 Data (Not Used)</u>	<u>Phillips 66 SOC Data (Substituted)</u>
32411	Refineries	Employment: 114 Payroll: \$48.3 million	Employment: 200 Payroll: \$44.3 million

Employment gains calculation: Assumes 12 added employees per Phillips 66 estimate of 10-12
 12×2.3664 (RIMS II multiplier) = 28.4 round to 28

Earnings gains calculation: Average earnings (including benefits) per employee
 = \$44.3 million/200 employees = \$221,500
 $12 \times \$221,500 \times 1.5171$ (RIMS II multiplier) = \$4.03 million

5. BEA RIMS II provides an “Industry Aggregate Multiplier” that is “equivalent to Gross Domestic Product” (GDP) for the “final-demand region” (Central Coast Region in this case). It is called the “final demand value added multiplier”, and includes total value of income generated from production including returns on investment, gross operating surplus or loss, employee compensation, payments to government (taxes and fees on production). (See attached: RIMS II Table 2.5 Total Multipliers by Industry Aggregate).

Calculation of Regional GDP Loss:

Oil and Gas Industry Aggregate Multiplier for value lost (GDP) = 0.8695

Assumed WTI oil price for GDP calculation: \$50 per barrel. (This very conservative assumption is understated by half since the average WTI oil price in 2013 was over \$100 per barrel, and the multipliers are derived base on 2013 economic data.)

Percent of total production potentially stranded: (Ref: Final EIR Section 4.12.5 Page 4.12-37/38)

$28,101,711 \text{ bbl total 2013 production} / 365 = 76,991 \text{ bbl/day total 2013 production}$

Percent stranded: $23,000/76,991 = 0.2987 = 29.87\%$

Five train scenario:

$51,600 \text{ bbl/train} \times 250 \text{ trains/year} \times \$50/\text{bbl} \times 29.87\% \times 0.8695 =$

\$167.5 million loss

Three train scenario:

$51,600 \text{ bbl/train} \times 150 \text{ trains/year} \times \$50/\text{bbl} \times 29.87\% \times 150 \text{ trains}/250 \text{ trains} \times 0.8695 =$

\$60.3 million loss

6. Threatened employment and economic losses were calculated based on the percentage of 2013 local crude oil production for the three-state Central Coast Region, which would be stranded when SMR refining capacity is dominated by imported crude oil by rail.

In order to continue local oilfield production while refinery storage and processing capacity was diverted to train deliveries of imported crude, the Final EIR states:

"It is possible that the Outer Continental Shelf (OCS) oil delivered to the SMR via the All American and Sisquoc Pipelines could be displaced. In this case the OCS oil would continue to use the All American Pipeline system to refinery markets in Los Angeles. If the OCS crude was displaced, then Phillips 66 could reverse the Sisquoc Pipeline allowing local producers to ship their crude oil via pipeline to Los Angeles. Such reversal of the pipeline flow direction would allow production from area producers to be transported to refinery destinations via pipeline instead of by truck if the SMR is not available. If the Sisquoc Pipeline is not reversed, and the local Northern Santa Barbara County crude oil cannot be processed at the SMR, then as much as 23,000 barrels of crude might have to be trucked to refineries in the Los Angeles Basin... This would equate to about 120 truck trips per day (round trips). These truck trips would be spread out over various roads within Santa Barbara County..." (Ref: Final EIR Section 4.12.5 Page 4.12-37/38).

Both the use of mid-stream pipelines and trucking to Los Angeles Basin refineries involve significant additional cost and permitting for either a project to reverse Sisquoc pipeline flows, or trucking through multiple counties. Since neither the method nor the cost of diverting stranded crude is evaluated in the EIR, there are no assurances that diversion is even viable.

Caution requires us to assume 23,000 bbl/day of crude oil would be stranded in the case of five trains per week – or in the case of three trains per week:

(23,000 bbl/day) – (51,600 bbl/train X 2 less trains/week)/7 days per week = 8,257 bbl/day

[Calculation of 51,600 barrels per train: Each 80-tank car High-Hazard Flammable Unit Train (HHFUT) carries between 49,670 and 53,532 barrels – depending on oil density and weight limitations – an average of $(49,670+53,532)/2 = 51,600$ bbl per train. (Ref: Final EIR Pages ES-5/6).]

7. Calculation of job loss associated with stranded regional crude oil production:

BEA RIMS II multipliers are based on region-wide 2013 data, and the users are cautioned to use consistent input and output data to avoid introducing errors. Therefore 2013 employment, earnings, and production output data has been used. (The only exception in this analysis was the use of \$50/bbl WTI in calculating GDP. Oil prices averaged over \$100/bbl in 2013. See note 5.)

2013 total crude production for California O&G District 3 and OCS = 28,101,711 bbl.

See the attached table and chart summarizing all regional production and refinery throughput for the ten-year period 2005-2014. (2015 data is compromised by the Refugio oil spill and pipeline shutdown.) The entire data stream shown is found in the “Mesa Refinery Watch Research Paper” of 20 March 2016. The data also shows overall crude oil supply in the Central Coast Region is stable – not decreasing as claimed in the applicant’s draft SOC, or as is overall in California. The Research Paper is found on SLO County rail project website under “Attachment to Eunice King's email 04_04_2016”:
http://www.slocounty.ca.gov/planning/environmental/EnvironmentalNotices/Phillips_66_Company_Rail_Spur_Extension_Project/Project_Comment_Letters.htm)

$28,101,711/365 = 76,991$ bbl/day total 2013 production

Percent of total production potentially stranded with five trains per week:

$23,000/76,991 = 0.2987 = 29.87\%$

Percent of total production potentially stranded with three trains per week:

$8,257/76,991 = 0.1072 = 10.72\%$

Example calculation for NAICS Code 211 Oil & Gas Extraction employment losses for three trains per week:

(Regional 211 jobs) X (RIMS II 211 employment multiplier) X (% of production stranded) = (job loss)

$1,058 \times 2.1185 \times 10.72\% = 240$ jobs lost

Example calculation for NAICS Code 211 Oil & Gas Extraction economic impact for five trains per week:

(Regional 211 payroll) X (RIMS II 211 earnings multiplier) X (% of production stranded) = (lost earnings)

$\$198.9 \text{ million} \times 1.4933 \times 29.87\% = \$88.7 \text{ million earnings loss}$

**Table 2.5 Total Multipliers for Output, Earnings, Employment, and Value Added by Industry Aggregation
Central Coast Region (Type II)**

INDUSTRY	Multiplier					
	Final Demand				Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Value-added/4/ (dollars)	Earnings/5/ (dollars)	Employment/6/ (jobs)
1. Farms	1.5379	0.4370	9.5864	0.6761	1.5983	1.8056
2. Forestry, fishing, and related activities	1.6630	0.7404	23.7476	1.0136	1.3269	1.2325
3. Oil and gas extraction	1.2837	0.2242	3.0573	0.8695	1.5042	2.1401
4. Mining, except oil and gas	1.4175	0.2463	5.8040	0.7953	1.7855	1.6368
5. Support activities for mining	1.4267	0.3588	6.4011	0.9236	1.5252	1.8192
6. Utilities*	1.4023	0.2515	3.7180	0.7698	1.7436	2.8400
7. Construction	1.6221	0.4970	10.2680	0.8885	1.5227	1.7237
8. Wood product manufacturing	1.4384	0.3143	7.9164	0.5339	1.6547	1.5772
9. Nonmetallic mineral product manufacturing	1.6070	0.3187	6.6322	0.7292	1.8685	1.9862
10. Primary metal manufacturing	1.4581	0.2566	4.9355	0.4855	1.8071	2.0162
11. Fabricated metal product manufacturing	1.4466	0.3445	7.1084	0.6399	1.5478	1.6606
12. Machinery manufacturing	1.4340	0.3319	5.8972	0.6189	1.5766	1.8883
13. Computer and electronic product manufacturing	1.4585	0.3765	5.3949	0.7916	1.5343	2.1821
14. Electrical equipment and appliance manufacturing	1.4240	0.3032	5.7763	0.6302	1.6133	1.7892
15. Motor vehicles, bodies and trailers, and parts manufacturing	1.3909	0.2657	5.2246	0.4596	1.6889	1.8392
16. Other transportation equipment manufacturing	1.5313	0.3782	5.6869	0.7260	1.6332	2.1692
17. Furniture and related product manufacturing	1.4884	0.4052	10.0442	0.6659	1.5126	1.4882
18. Miscellaneous manufacturing	1.4720	0.3500	6.8207	0.7389	1.6179	1.7823
19. Food and beverage and tobacco product manufacturing	1.5391	0.2895	6.3171	0.5558	2.0572	2.0257
20. Textile mills and textile product mills	1.4230	0.3411	8.8654	0.5455	1.5285	1.4472
21. Apparel and leather and allied product manufacturing	1.5630	0.5086	14.9950	0.7687	1.4943	1.3933
22. Paper manufacturing	1.3533	0.2707	5.1742	0.5241	1.5989	1.8208
23. Printing and related support activities	1.5103	0.3918	10.0728	0.7517	1.5904	1.5448
24. Petroleum and coal products manufacturing	1.3257	0.2125	2.6997	0.4538	1.5397	2.3141
25. Chemical manufacturing	1.5481	0.2850	4.3930	0.6657	1.8841	2.6387
26. Plastics and rubber products manufacturing	1.3984	0.2699	5.7543	0.5288	1.6551	1.7067
27. Wholesale trade	1.4660	0.4263	7.5397	0.9573	1.4684	1.7939
28. Motor vehicle and parts dealers	1.4796	0.5302	11.1666	1.0627	1.3411	1.4639
29. Food and beverage stores	1.5399	0.4953	16.5545	0.9905	1.4253	1.2962
30. General merchandise stores	1.5081	0.4432	16.3067	0.9464	1.4835	1.2762
31. Other retail	1.5417	0.4660	15.1299	0.9644	1.4731	1.3358
32. Air transportation	1.4938	0.3032	5.3222	0.7030	1.7409	2.1634
33. Rail transportation	1.4826	0.3370	5.1170	0.7851	1.6163	2.2309
34. Water transportation	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35. Truck transportation	1.6368	0.4532	9.9495	0.7841	1.6281	1.6746
36. Transit and ground passenger transportation*	1.7393	0.6036	18.6383	0.8645	1.4984	1.3309
37. Pipeline transportation	1.5437	0.4226	5.9725	0.8364	1.5790	2.4254
38. Other transportation and support activities*	1.5969	0.5615	11.9314	0.9320	1.4462	1.5669

(Continued)

Region Definition: Monterey, CA; San Luis Obispo, CA; Santa Barbara, CA

*Includes Government enterprises.

1. Each entry in column 1 represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

2. Each entry in column 2 represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

3. Each entry in column 3 represents the total change in number of jobs that occurs in all industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 2013 data, the output delivered to final demand should be in 2013 dollars.

4. Each entry in column 4 represents the total dollar change in value added that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

5. Each entry in column 5 represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the industry corresponding to the entry.

6. Each entry in column 6 represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry.

NOTE.--Multipliers are based on the 2007 Benchmark Input-Output Table for the Nation and 2013 regional data. Industry List B identifies the industries corresponding to the entries.

SOURCE.--Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis.

Table 1.5 Total Multipliers for Output, Earnings, Employment, and Value Added by Detailed Industry
Central Coast Region (Type II)

INDUSTRY	Multiplier					
	Final Demand				Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Value-added/4/ (dollars)	Earnings/5/ (dollars)	Employment/6/ (jobs)
1111C0 Oilseed and grain farming	1.7399	0.3496	7.3297	0.5531	2.5030	3.6968
111200 Vegetable and melon farming	1.4989	0.3934	8.1839	0.9570	1.6027	1.9145
111300 Fruit and tree nut farming	1.5477	0.4705	11.5312	0.9910	1.5764	1.7012
111400 Greenhouse, nursery, and floriculture production	1.7317	0.5858	12.3062	1.0114	1.6137	1.7872
111900 Other crop farming	1.5734	0.4162	8.3589	0.8433	1.6959	2.1712
1121A0 Beef cattle ranching and farming, including feedlots and dual-purpose ranching and farming	1.5307	0.2700	5.0492	0.5846	1.8867	2.3154
112120 Dairy cattle and milk production	1.4928	0.3110	6.2404	0.6364	1.8065	2.1719
112A00 Animal production, except cattle and poultry and eggs	1.3195	0.2776	5.0996	0.8720	1.4706	1.7803
112300 Poultry and egg production	1.3836	0.2658	4.8186	0.4598	1.6363	2.0119
113000 Forestry and logging	1.5689	0.5142	13.2872	0.8865	1.5829	1.6627
114000 Fishing, hunting and trapping	1.4025	0.3840	11.4126	0.9121	1.4093	1.3143
115000 Support activities for agriculture and forestry	1.6841	0.7538	24.4978	1.1030	1.3262	1.2333
211000 Oil and gas extraction	1.2819	0.2226	3.0265	0.8692	1.4933	2.1185
212100 Coal mining	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2122A0 Iron, gold, silver, and other metal ore mining	1.3821	0.2184	4.4778	0.7437	1.7255	1.7232
212230 Copper, nickel, lead, and zinc mining	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
212310 Stone mining and quarrying	1.4131	0.2432	6.6009	0.8587	1.8023	1.5364
2123A0 Other nonmetallic mineral mining and quarrying	1.4543	0.2718	6.4793	0.8298	1.7631	1.6094
213111 Drilling oil and gas wells	1.4115	0.3417	5.8518	0.8958	1.5175	1.8734
21311A Other support activities for mining	1.4323	0.3657	6.6790	0.9349	1.5102	1.7911
2211A0 Electric power generation, transmission, and distribution*	1.3861	0.2445	3.5726	0.7916	1.7274	2.9597
221200 Natural gas distribution	1.4231	0.2456	3.5350	0.6822	1.7351	2.7212
221300 Water, sewage and other systems	1.4847	0.3306	5.8625	0.9506	1.7234	2.1242
23030A Maintenance and repair	1.5791	0.4525	9.5570	0.8911	1.5308	1.7351
2332C0 Nonresidential structures	1.5927	0.5940	11.8853	0.9362	1.3747	1.5151
233293 Highways and streets	1.5587	0.3970	7.4882	0.8232	1.5494	1.7964
2334B0 Residential structures	1.6633	0.4471	9.5746	0.8343	1.6823	1.9609
321100 Sawmills and wood preservation	1.3957	0.2577	5.9699	0.4614	1.7643	1.7493
321200 Veneer, plywood, and engineered wood product manufacturing	1.4222	0.2679	6.7409	0.4959	1.7559	1.6186
321910 Millwork	1.4481	0.3430	8.5349	0.5732	1.5814	1.5328
3219A0 All other wood product manufacturing	1.4474	0.3229	8.6568	0.5783	1.6196	1.5043
327100 Clay product and refractory manufacturing	1.5762	0.4188	10.0129	0.8172	1.5619	1.5247
327200 Glass and glass product manufacturing	1.5308	0.3384	7.0729	0.6844	1.6826	1.7595
327310 Cement manufacturing	1.5094	0.2625	4.5833	0.7820	1.8741	2.3455
327320 Ready-mix concrete manufacturing	1.6968	0.3227	6.4656	0.6575	2.0039	2.2903
327330 Concrete pipe, brick, and block manufacturing	1.5193	0.3189	6.8363	0.7507	1.7235	1.8351

(Continued)

Region Definition: Monterey, CA; San Luis Obispo, CA; Santa Barbara, CA

*Includes Government enterprises.

1. Each entry in column 1 represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

2. Each entry in column 2 represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

3. Each entry in column 3 represents the total change in number of jobs that occurs in all industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 2013 data, the output delivered to final demand should be in 2013 dollars.

4. Each entry in column 4 represents the total dollar change in value added that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

5. Each entry in column 5 represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the industry corresponding to the entry.

6. Each entry in column 6 represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry.

NOTE.--Multipliers are based on the 2007 Benchmark Input-Output Table for the Nation and 2013 regional data. Industry List A identifies the industries corresponding to the entries.

SOURCE.--Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis.

Table 1.5 Total Multipliers for Output, Earnings, Employment, and Value Added by Detailed Industry
Central Coast Region (Type II)

INDUSTRY	Multiplier					
	Final Demand				Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Value-added/4/ (dollars)	Earnings/5/ (dollars)	Employment/6/ (jobs)
33299A Ammunition, arms, ordnance, and accessories manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33299E Fabricated pipe and pipe fitting manufacturing	1.3243	0.2878	6.1802	0.6049	1.4660	1.5541
33299B Other fabricated metal manufacturing	1.4729	0.3332	6.8535	0.6263	1.5798	1.6902
333111 Farm machinery and equipment manufacturing	1.3420	0.2342	4.8564	0.5679	1.6715	1.7849
333112 Lawn and garden equipment manufacturing	1.3208	0.2273	6.2526	0.4434	1.6229	1.4592
333120 Construction machinery manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
333130 Mining and oil and gas field machinery manufacturing	1.4459	0.3494	6.5748	0.6085	1.5737	1.8905
3332A0 Industrial machinery (except semiconductor machinery) manufacturing	1.4843	0.3721	7.0858	0.6539	1.5893	1.8107
333295 Semiconductor machinery manufacturing	1.4932	0.2911	4.2546	0.6182	1.8604	3.1393
33331B All other commercial and service industry machinery manufacturing	1.5379	0.4393	7.9447	0.7181	1.4877	1.7118
333314 Optical instrument and lens manufacturing	1.5642	0.5128	8.5715	0.7850	1.4698	1.8369
333315 Photographic and photocopying equipment manufacturing	1.5416	0.5314	9.4738	0.8957	1.4035	1.6216
33341A Air purification and ventilation equipment manufacturing	1.3513	0.3178	7.0878	0.6535	1.4457	1.4834
333414 Heating equipment (except warm air furnaces) manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
333415 Air conditioning, refrigeration, and warm air heating equipment manufacturing	1.3573	0.2491	5.0547	0.5363	1.6408	1.7511
333511 Industrial mold manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33351A Metal cutting and forming machine tool manufacturing	1.4363	0.4041	8.1667	0.7327	1.4586	1.5864
333514 Special tool, die, jig, and fixture manufacturing	1.4999	0.4660	9.8021	0.7774	1.4428	1.5366
33351B Cutting and machine tool accessory, rolling mill, and other metalworking machinery manufacturing	1.4302	0.3843	8.6819	0.6851	1.4761	1.5015
333611 Turbine and turbine generator set units manufacturing	1.3472	0.2682	4.1911	0.5553	1.5614	2.0946
333612 Speed changer, industrial high-speed drive, and gear manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
333613 Mechanical power transmission equipment manufacturing	1.4072	0.2942	6.6640	0.6643	1.6159	1.6352
333618 Other engine equipment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33391A Pump and pumping equipment manufacturing	1.3336	0.2340	4.1679	0.6341	1.6701	2.0620
333912 Air and gas compressor manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
333920 Material handling equipment manufacturing	1.3466	0.2382	4.9491	0.5778	1.7005	1.8021
333991 Power-driven handtool manufacturing	1.3013	0.2875	6.5208	0.6910	1.4194	1.4503
33399A Other general purpose machinery manufacturing	1.3957	0.2948	5.4001	0.6009	1.6050	1.8794
333993 Packaging machinery manufacturing	1.4215	0.3428	6.7633	0.6680	1.5466	1.6951
333994 Industrial process furnace and oven manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
33399B Fluid power process machinery	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000

(Continued)

Region Definition: Monterey, CA; San Luis Obispo, CA; Santa Barbara, CA

*Includes Government enterprises.

1. Each entry in column 1 represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

2. Each entry in column 2 represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

3. Each entry in column 3 represents the total change in number of jobs that occurs in all industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 2013 data, the output delivered to final demand should be in 2013 dollars.

4. Each entry in column 4 represents the total dollar change in value added that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

5. Each entry in column 5 represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the industry corresponding to the entry.

6. Each entry in column 6 represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry.

NOTE.--Multipliers are based on the 2007 Benchmark Input-Output Table for the Nation and 2013 regional data. Industry List A identifies the industries corresponding to the entries.

SOURCE.--Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis.

Table 1.5 Total Multipliers for Output, Earnings, Employment, and Value Added by Detailed Industry
Central Coast Region (Type II)

INDUSTRY	Multiplier					
	Final Demand				Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Value-added/4/ (dollars)	Earnings/5/ (dollars)	Employment/6/ (jobs)
311920 Coffee and tea manufacturing	1.4120	0.2549	5.2798	0.4665	1.8469	1.9410
311930 Flavoring syrup and concentrate manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
311940 Seasoning and dressing manufacturing	1.4129	0.2505	4.7055	0.4786	1.8155	2.1385
311990 All other food manufacturing	1.5557	0.2890	6.9256	0.5132	2.0942	1.9080
312110 Soft drink and ice manufacturing	1.4845	0.2590	4.9901	0.4673	1.8766	2.1057
312120 Breweries	1.3421	0.2296	4.0592	0.6190	1.6635	1.9435
312130 Wineries	1.5709	0.2999	7.5319	0.6474	2.1731	1.9077
312140 Distilleries	1.2580	0.2078	3.5102	0.8023	1.5059	1.8347
312200 Tobacco product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
313100 Fiber, yarn, and thread mills	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
313200 Fabric mills	1.3996	0.2690	6.4508	0.5476	1.6811	1.5913
313300 Textile and fabric finishing and fabric coating mills	1.4350	0.3241	8.7543	0.5660	1.5818	1.4466
314110 Carpet and rug mills	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
314120 Curtain and linen mills	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
314900 Other textile product mills	1.4196	0.3547	9.0050	0.6197	1.4876	1.4518
315000 Apparel manufacturing	1.5633	0.5083	14.8878	0.8086	1.4891	1.3973
316000 Leather and allied product manufacturing	1.4653	0.3363	10.8825	0.5574	1.6266	1.3710
322110 Pulp mills	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
322120 Paper mills	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
322130 Paperboard mills	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
322210 Paperboard container manufacturing	1.3508	0.2699	5.1748	0.4575	1.5899	1.8225
322220 Paper bag and coated and treated paper manufacturing	1.3655	0.2684	5.2017	0.5198	1.5746	1.7518
322230 Stationery product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
322291 Sanitary paper product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
322299 All other converted paper product manufacturing	1.3869	0.2631	5.2647	0.5538	1.6763	1.8182
323110 Printing	1.5094	0.3894	10.0657	0.7390	1.5925	1.5552
323120 Support activities for printing	1.5296	0.5164	13.3678	0.9093	1.4460	1.4160
324110 Petroleum refineries	1.3137	0.2094	2.5778	0.4374	1.5171	2.3664
324121 Asphalt paving mixture and block manufacturing	1.5628	0.2611	4.1617	0.6784	1.8923	2.4124
324122 Asphalt shingle and coating materials manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
324190 Other petroleum and coal products manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
325110 Petrochemical manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
325120 Industrial gas manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
325130 Synthetic dye and pigment manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
325180 Other basic inorganic chemical manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
325190 Other basic organic chemical manufacturing	1.5858	0.2725	4.9428	0.4059	1.9743	2.2628
325211 Plastics material and resin manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000

(Continued)

Region Definition: Monterey, CA; San Luis Obispo, CA; Santa Barbara, CA

*Includes Government enterprises.

1. Each entry in column 1 represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

2. Each entry in column 2 represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

3. Each entry in column 3 represents the total change in number of jobs that occurs in all industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 2013 data, the output delivered to final demand should be in 2013 dollars.

4. Each entry in column 4 represents the total dollar change in value added that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

5. Each entry in column 5 represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the industry corresponding to the entry.

6. Each entry in column 6 represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry.

NOTE.--Multipliers are based on the 2007 Benchmark Input-Output Table for the Nation and 2013 regional data. Industry List A identifies the industries corresponding to the entries.

SOURCE.--Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis.

Table 1.5 Total Multipliers for Output, Earnings, Employment, and Value Added by Detailed Industry
Central Coast Region (Type II)

INDUSTRY	Multiplier					
	Final Demand				Direct Effect	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (jobs)	Value-added/4/ (dollars)	Earnings/5/ (dollars)	Employment/6/ (jobs)
3252A0 Synthetic rubber and artificial and synthetic fibers and filaments manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
325310 Fertilizer manufacturing	1.7351	0.2957	5.4482	0.6436	2.1429	2.3664
325320 Pesticide and other agricultural chemical manufacturing	1.4399	0.2465	3.8758	0.7236	1.7863	2.3591
325411 Medicinal and botanical manufacturing	1.4880	0.3246	6.2249	0.8070	1.6775	1.8368
325412 Pharmaceutical preparation manufacturing	1.4049	0.3043	4.0720	0.8271	1.6249	2.5915
325413 In-vitro diagnostic substance manufacturing	1.4220	0.3391	5.1512	0.7960	1.5793	2.1370
325414 Biological product (except diagnostic) manufacturing	1.2731	0.2168	3.2582	0.8179	1.5711	2.1478
325510 Paint and coating manufacturing	1.4052	0.2412	4.6013	0.5220	1.7480	1.9009
325520 Adhesive manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
325610 Soap and cleaning compound manufacturing	1.3828	0.2342	3.7268	0.7215	1.6973	2.2771
325620 Toilet preparation manufacturing	1.3608	0.2379	5.0515	0.7225	1.7238	1.7314
325910 Printing ink manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3259A0 All other chemical product and preparation manufacturing	1.4274	0.2512	4.5798	0.5334	1.8200	2.0334
326110 Plastics packaging materials and unlaminated film and sheet manufacturing	1.3457	0.2276	4.8161	0.4925	1.6494	1.7281
326120 Plastics pipe, pipe fitting, and unlaminated profile shape manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
326130 Laminated plastics plate, sheet (except packaging), and shape manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
326140 Polystyrene foam product manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
326150 Urethane and other foam product (except polystyrene) manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
326160 Plastics bottle manufacturing	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
326190 Other plastics product manufacturing	1.4075	0.2529	5.5564	0.5038	1.7468	1.7876
326210 Tire manufacturing	1.4206	0.2904	6.4949	0.5224	1.6080	1.6326
326220 Rubber and plastics hoses and belting manufacturing	1.4475	0.3826	8.0039	0.6287	1.4779	1.5719
326290 Other rubber product manufacturing	1.4089	0.2636	5.8611	0.5585	1.6967	1.7043
420000 Wholesale trade	1.4643	0.4263	7.5794	0.9575	1.4685	1.8034
441000 Motor vehicle and parts dealers	1.4780	0.5298	11.1952	1.0624	1.3399	1.4676
445000 Food and beverage stores	1.5375	0.4946	16.5785	0.9905	1.4232	1.2981
452000 General merchandise stores	1.5065	0.4426	16.3284	0.9463	1.4816	1.2779
4A0000 Other retail	1.5399	0.4654	15.1634	0.9639	1.4712	1.3388
481000 Air transportation	1.4893	0.2959	5.0962	0.6999	1.6993	2.0715
482000 Rail transportation	1.4795	0.3348	5.0627	0.7843	1.6054	2.2072
483000 Water transportation	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
484000 Truck transportation	1.6341	0.4532	9.9810	0.7860	1.6281	1.6799
485A00 Transit and ground passenger transportation*	1.7378	0.6026	18.6892	0.8614	1.4960	1.3345
486000 Pipeline transportation	1.5435	0.4231	6.0836	0.8348	1.5807	2.4705

(Continued)

Region Definition: Monterey, CA; San Luis Obispo, CA; Santa Barbara, CA

*Includes Government enterprises.

1. Each entry in column 1 represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

2. Each entry in column 2 represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

3. Each entry in column 3 represents the total change in number of jobs that occurs in all industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 2013 data, the output delivered to final demand should be in 2013 dollars.

4. Each entry in column 4 represents the total dollar change in value added that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

5. Each entry in column 5 represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the industry corresponding to the entry.

6. Each entry in column 6 represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry.

NOTE.--Multipliers are based on the 2007 Benchmark Input-Output Table for the Nation and 2013 regional data. Industry List A identifies the industries corresponding to the entries.

SOURCE.--Regional Input-Output Modeling System (RIMS II), Regional Product Division, Bureau of Economic Analysis.

RIMS II Assumptions

RIMS II multipliers are based on the average relationships between the inputs and outputs produced in a local economy. The multipliers are a useful tool for studying the potential impacts of changes in economic activity. However, the relative simplicity of input-output multipliers comes at the cost of several limiting assumptions that produce what are likely to be upper bound estimates. Analysts are encouraged to carefully evaluate how closely these assumptions apply to their projects and to consider collecting additional information specific to their project to adjust their results.¹

Assumptions of the model to keep in mind:

- **Firms have no supply constraints—Input-output based multipliers assume that industries can increase their demand for inputs and labor as needed to meet additional demand.** *If local firms are already operating at full capacity, then additional inputs may need to come from outside the region, thereby reducing the local impact.*
- **Firms have fixed patterns of purchases—Input-output based multipliers assume that an industry must double its inputs to double its output.** *If a firm can increase its output without hiring additional employees and without purchasing additional inputs, then the impact of the change on the local economy will be smaller than the impact that is estimated using a full multiplier.*
- **Firms use local inputs when they are available—The method used by RIMS II to develop regional multipliers assumes that firms will purchase inputs from firms in the region before using imports.** *If a clothing manufacturer located in an area that produces textiles, purchases its textiles from outside the region, then the impact of a change in clothing production on the local economy will be smaller than implied by the full multiplier.*

It is also worth keeping in mind that employment changes include both full and part-time jobs—this characteristic applies for all projects, but is especially important for service industries that have large shares of part-time employment.

The example below shows how the employment multiplier for a region can vary when local information is used to improve the accuracy of the multipliers because the model's assumptions do not hold. The example is a construction project for a health care facility.

- **Scenario One:** Suppose that all the assumptions of the multiplier model hold. For example, there is excess capacity in the local economy so that firms can produce an increase of inputs and that additional construction workers can be hired in the same proportion as the regional average for the industry. In this scenario, the final-demand employment multiplier for the construction industry in the hypothetical study region is 18.0, including the impact of new spending by households whose employment is a

result of this new activity. This means that for each million dollars of spending to construct the new health care facility, 18.0 new jobs are expected to be created locally.

- Scenario Two: Suppose that the analyst has carefully studied the details of the construction project, including local work force dynamics, and has determined that 25% of the construction workers come from outside the region. In this case the implied multiplier using local purchases and labor supply estimates is 14.4 new local jobs per \$1 million of new construction.
- Scenario Three: Suppose that the construction activity requires specialized inputs and workers not found in the local area. As a result, local firms cannot supply additional inputs and 75% of the construction workers come from outside the region. In this case the implied multiplier using local purchases and labor supply estimates is 9.8 new local jobs per \$1 million of new construction.

Final-Demand Employment Multiplier for a Hypothetical Region for Three Alternative Scenarios ²		
One	Two	Three
18.0	14.4	9.8

To learn more about how to use local information to refine your analysis, [view an example of the Bill of Goods approach in greater detail here](#).

- ¹BEA recommends a Bill of Goods approach for best results.
- ²These are Type II Multipliers.

San Luis Obispo County

Exhibit 5-54
Direct Activity of Oil and Gas Industry
San Luis Obispo County 2013

		Employment	Labor Income (\$ millions)
211	Oil and gas extraction	227	\$ 9.8
213111	Drilling oil and gas wells	53	2.5
213112	Support activities for oil and gas operations	35	2.3
2212	Natural gas distribution	260	30.9
23712	Oil and gas pipeline construction	354	21.8
32411	Petroleum refineries	114	48.3
324191	Petroleum lubricating oil and grease mfg	-	-
32511	Petrochemical manufacturing	-	-
333132	Oil and gas field machinery and eqmt mfg	126	11.6
4247	Petroleum and petroleum prods wholesalers	86	4.9
447	Gasoline stations	564	44.0
45431	Fuel dealers	65	1.0
486	Pipeline transportation	23	1.7
TOTAL DIRECT ACTIVITY		1,906	\$ 178.7

Exhibit 5-55
Total Economic and Fiscal Contribution of Oil and Gas Industry
San Luis Obispo County 2013

ECONOMIC CONTRIBUTION	Employment	Labor Income (\$ millions)	Value Added (\$ millions)	Output (\$ millions)
Direct	1,906	\$ 178.7	\$ 390.2	\$ 1,556.0
Indirect	806	35.3	58.0	105.9
Induced	992	36.3	69.9	113.4
TOTAL CONTRIBUTION	3,704	\$ 250.2	\$ 518.1	\$ 1,775.3
<i>Percent of Total CA Contribution</i>	<i>1.0%</i>	<i>0.8%</i>	<i>0.8%</i>	<i>0.9%</i>
<i>Percent of County Total</i>	<i>2.3%</i>	<i>3.3%</i>	<i>3.8%</i>	<i>7.6%</i>

FISCAL CONTRIBUTION	State and Local (\$ millions)	Federal (\$ millions)	Total Taxes (\$ millions)
Sales and excise taxes	\$ 112.0	\$ 32.4	\$ 144.4
Property taxes	26.4	-	26.4
Personal income taxes	7.0	18.6	25.6
Corporate profits taxes	3.4	13.7	17.1
Social insurance taxes	1.0	23.3	24.3
Other taxes	5.8	3.0	8.7
Fees, fines and permits	1.7	0.8	2.5
TOTAL TAX REVENUES	\$ 157.4	\$ 91.7	\$ 249.0

Source: Estimates by LAEDC

Santa Barbara County

Exhibit 5-58

**Direct Activity of Oil and Gas Industry
Santa Barbara County 2013**

		Employment	Labor Income (\$ millions)
211	Oil and gas extraction	641	\$ 170.7
213111	Drilling oil and gas wells	355	50.6
213112	Support activities for oil and gas operations	431	42.8
2212	Natural gas distribution	283	31.6
23712	Oil and gas pipeline construction	4	0.3
32411	Petroleum refineries	56	7.6
324191	Petroleum lubricating oil and grease mfg	-	-
32511	Petrochemical manufacturing	-	-
333132	Oil and gas field machinery and eqmt mfg	43	2.4
4247	Petroleum and petroleum prods wholesalers	26	2.0
447	Gasoline stations	868	86.5
45431	Fuel dealers	38	0.6
486	Pipeline transportation	12	1.1
TOTAL DIRECT ACTIVITY		2,756	\$ 396.2

Exhibit 5-59

**Total Economic and Fiscal Contribution of Oil and Gas Industry
Santa Barbara County 2013**

ECONOMIC CONTRIBUTION	Employment	Labor Income (\$ millions)	Value Added (\$ millions)	Output (\$ millions)
Direct	2,756	\$ 396.2	\$ 627.5	\$ 1,333.9
Indirect	582	31.2	49.3	85.4
Induced	1,797	79.2	136.5	220.2
TOTAL CONTRIBUTION	5,135	\$ 506.6	\$ 813.3	\$ 1,639.4
<i>Percent of Total CA Contribution</i>	<i>1.4%</i>	<i>1.5%</i>	<i>1.3%</i>	<i>0.9%</i>
<i>Percent of County Total</i>	<i>1.9%</i>	<i>3.4%</i>	<i>3.5%</i>	<i>4.2%</i>

FISCAL CONTRIBUTION	State and Local (\$ millions)	Federal (\$ millions)	Total Taxes (\$ millions)
Sales and excise taxes	\$ 158.3	\$ 39.7	\$ 198.0
Property taxes	41.2	-	41.2
Personal income taxes	14.7	38.9	53.6
Corporate profits taxes	3.1	12.3	15.4
Social insurance taxes	1.1	43.9	45.0
Other taxes	9.1	2.8	11.9
Fees, fines and permits	3.4	0.7	4.1
TOTAL TAX REVENUES	\$ 230.9	\$ 138.3	\$ 369.2

Source: Estimates by LAEDC

Monterey County

Exhibit 5-34
Direct Activity of Oil and Gas Industry
Monterey County 2013

		Employment	Labor Income (\$ millions)
211	Oil and gas extraction	190	\$ 18.4
213111	Drilling oil and gas wells	23	2.2
213112	Support activities for oil and gas operations	126	9.7
2212	Natural gas distribution	35	4.7
23712	Oil and gas pipeline construction	2	0.1
32411	Petroleum refineries	-	-
324191	Petroleum lubricating oil and grease mfg	-	-
32511	Petrochemical manufacturing	-	-
333132	Oil and gas field machinery and eqmt mfg	-	-
4247	Petroleum and petroleum prods wholesalers	117	13.0
447	Gasoline stations	721	67.6
45431	Fuel dealers	19	0.3
486	Pipeline transportation	0	0.0
TOTAL DIRECT ACTIVITY		1,233	\$ 116.0

Exhibit 5-35
Total Economic and Fiscal Contribution of Oil and Gas Industry
Monterey County 2013

ECONOMIC CONTRIBUTION	Employment	Labor Income (\$ millions)	Value Added (\$ millions)	Output (\$ millions)
Direct	1,233	\$ 116.0	\$ 169.4	\$ 237.3
Indirect	209	9.7	18.8	30.7
Induced	499	21.1	38.4	61.4
TOTAL CONTRIBUTION	1,941	\$ 146.8	\$ 226.6	\$ 329.4
<i>Percent of Total CA Contribution</i>	<i>0.5%</i>	<i>0.4%</i>	<i>0.4%</i>	<i>0.2%</i>
<i>Percent of County Total</i>	<i>0.8%</i>	<i>1.1%</i>	<i>1.1%</i>	<i>1.1%</i>

FISCAL CONTRIBUTION	State and Local (\$ millions)	Federal (\$ millions)	Total Taxes (\$ millions)
Sales and excise taxes	\$ 116.2	\$ 35.1	\$ 151.3
Property taxes	12.7	-	12.7
Personal income taxes	4.6	12.0	16.6
Corporate profits taxes	0.8	3.2	4.0
Social insurance taxes	0.4	12.0	12.4
Other taxes	2.8	1.0	3.8
Fees, fines and permits	1.0	0.3	1.3
TOTAL TAX REVENUES	\$ 138.6	\$ 63.6	\$ 202.2

Source: Estimates by LAEDC

OVERALL CALIFORNIA OIL AND GAS DISTRICT 3 + FEDERAL OCS OIL PRODUCTION (BARRELS PER YEAR)

DATA FROM: <https://secure.conservation.ca.gov/WellSearch/> (BLUE HEADINGS CORRESPOND TO COLORED DATA TABS - GREEN SHADED CELLS INDICATE PRODUCTION IN EXCESS OF SMR CAPACITY)

YEAR	SAN ARDO	DISTRICT 3 OTHER	DISTRICT 3 TOTAL	FED OCS OFFSHORE	TOTAL DISTRICT 3 + OCS	PERCENT CHANGE FROM 2005	TOTAL AVAILABLE CENTRAL COAST CRUDE OIL PRODUCTION EXCEEDS SMR CAPACITY (MAXIMUM PERMITTED THROUGHPUT IS 100%):		
							MAXIMUM PERMITTED THROUGHPUT	HISTORICAL THROUGHPUT (@ SMR UTILIZATION RATE)	HISTORICAL THROUGHPUT EXCLUDING SAN ARDO
2005	3,502,933	3,662,434	7,165,367	21,081,047	28,246,414	0.0%	174.1%	182.4%	159.7%
2006	3,150,545	3,862,159	7,012,704	21,115,838	28,128,542	-0.4%	173.4%	196.8%	174.8%
2007	3,436,801	3,944,944	7,381,745	19,695,008	27,076,753	-4.1%	166.9%	171.3%	149.5%
2008	4,173,214	3,713,068	7,886,282	18,828,190	26,714,472	-5.4%	164.7%	175.2%	147.8%
2009	5,273,250	4,214,496	9,487,746	16,810,240	26,297,986	-6.9%	162.1%	201.0%	160.7%
2010	6,048,571	4,073,870	10,122,441	16,491,647	26,614,088	-5.8%	164.1%	193.9%	149.8%
2011	6,886,541	4,354,112	11,240,653	14,712,566	25,953,219	-8.1%	160.0%	183.7%	135.0%
2012	7,272,511	5,213,207	12,485,718	12,744,365	25,230,083	-10.7%	155.5%	183.8%	130.8%
2013	7,229,422	6,657,038	13,886,460	14,215,251	28,101,711	-0.5%	173.2%	184.9%	137.3%
2014	7,684,307	6,575,052	14,259,359	13,879,310	28,138,669	-0.4%	173.5%	193.8%	140.9%

FEDERAL OUTER CONTINENTAL SHELF (OCS) OIL PRODUCTION AVAILABLE TO DISTRICT 3 (BARRELS PER YEAR) - SEE OCS ANNUAL WORKSHEETS

DATA FROM: http://www.data.bsee.gov/homepg/data_center/production/pacificfreeprod.asp (COLORS CORRESPOND TO HIGHLIGHTING OF OFFSHORE OILFIELDS ON OCS DATA TABS)

YEAR	Santa Inez Unit		Point Pedernales Unit		Point Arguello Unit		FEDERAL OCS YEAR TOTAL (bbl/yr)	
	Hondo	Pescado	Sacate	Point Pedernales	Tranquillon Ridge	Point Arguello		Rocky Point
	HONDO	PESCDO	SACATE	PTPDNS	TRNQ RDG	PTARGL	RCKYPT	
2005	6,125,769	5,000,308	3,766,899	2,540,686	744	2,854,582	792,059	21,081,047
2006	5,626,994	5,076,285	4,115,496	2,972,615	1,321	2,607,872	715,255	21,115,838
2007	5,658,675	4,415,496	3,854,787	2,766,853	1,229	2,681,491	316,477	19,695,008
2008	5,511,525	4,848,376	3,156,213	2,678,265	1,774	2,444,449	187,588	18,828,190
2009	4,739,986	4,513,917	2,991,203	2,280,123	2,100	2,107,765	175,146	16,810,240
2010	5,103,155	3,951,076	3,206,868	2,134,927	968	1,969,836	124,817	16,491,647
2011	5,362,926	2,389,800	3,230,788	1,851,483	706	1,778,365	98,498	14,712,566
2012	4,402,251	2,145,845	2,789,222	1,813,036	993	1,510,212	82,806	12,744,365
2013	5,120,464	2,322,478	3,558,681	1,654,008	830	1,470,673	88,117	14,215,251
2014	5,180,905	2,667,240	2,945,500	1,722,801	456	1,306,278	56,130	13,879,310

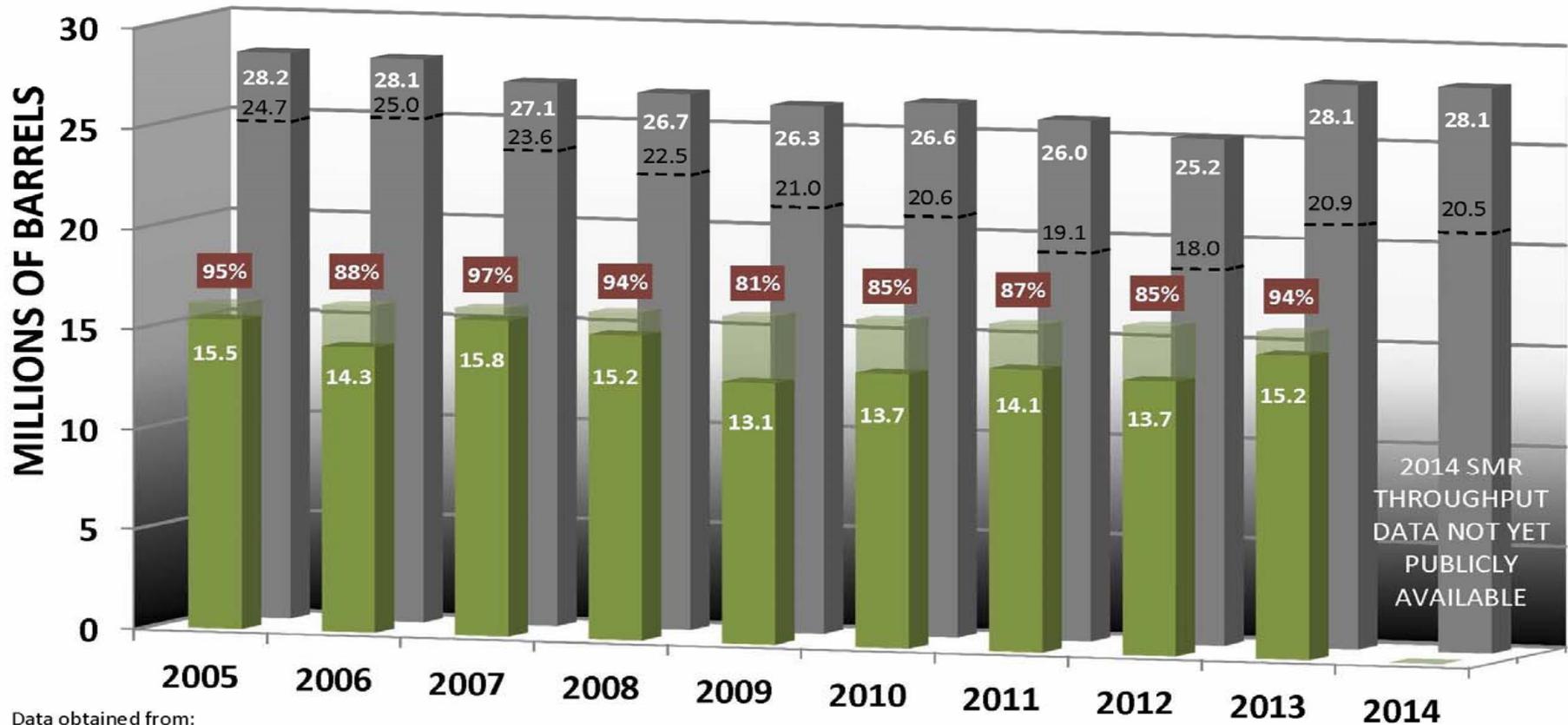
SANTA MARIA REFINERY (SMR) THROUGHPUT STATISTICS

DATA FROM: Phillips 66 Rail Spur Project Final EIR Table 2.8 page 2-27

YEAR	ACTUAL THROUGHPUT (bbl/yr)	ACTUAL THROUGHPUT (millions bbl/yr)	ACTUAL DAILY AVERAGE (bbl/day)	SLOC PLANNING DAILY MAXIMUM (bbl/day)	APCD DAILY MAXIMUM (bbl/day)	APCD ANNUAL ROLLING AVG MAXIMUM (bbl/yr)	REFINERY UTILIZATION RATE (PERCENT OF MAX THROUGHPUT)
2005	15,489,149	15.49	42,442	44,500	48,000	16,220,660	95.49%
2006	14,290,448	14.29	39,157	44,500	48,000	16,220,660	88.10%
2007	15,810,183	15.81	43,321	44,500	48,000	16,220,660	97.47%
2008	15,249,521	15.25	41,665	44,500	48,000	16,220,660	94.01%
2009	13,080,967	13.08	35,838	44,500	48,000	16,220,660	80.64%
2010	13,724,829	13.72	37,785	44,500	48,000	16,220,660	84.61%
2011	14,126,030	14.13	38,701	44,500	48,000	16,220,660	87.09%
2012	13,724,829	13.72	37,602	44,500	48,000	16,220,660	84.61%
2013	15,196,669	15.20	41,635	44,500	48,000	16,220,660	93.69%
2014	INFORMATION NOT PUBLICALLY AVAILABLE			48,000	48,000	16,220,660	N/A
TOTAL	130,692,625	130.69	358,146	400,500	432,000	145,985,940	89.52%
AVERAGE	14,521,403	14.52	39,794	44,500	48,000	16,220,660	89.52%

Regional crude oil production exceeds SMR's capacity

CALIFORNIA OIL AND GAS DISTRICT 3 OIL PRODUCTION - STATE & FEDERAL OCS, ONSHORE + OFFSHORE
 IN COMPARISON WITH 2005 - 2014
 SANTA MARIA REFINERY THROUGHPUT & CAPACITY



2014 SMR THROUGHPUT DATA NOT YET PUBLICLY AVAILABLE

Data obtained from:

1. Annual Reports of the State Oil & Gas Supervisor 2005 - 2014 (http://www.conservation.ca.gov/dog/pubs_stats/annual_reports/Pages/annual_reports.aspx)
2. Federal Bureau of Safety and Environmental Enforcement Pacific Outer Continental Shelf (OCS) Leases for Point Pedernales, Point Arguello, and Santa Ynez Unit (Pescado, Hondo, Sacate) (http://www.data.bsee.gov/homepg/data_center/production/pacificfreeprod.asp)
3. Final Environmental Impact Report SMR Rail Spur Project - Table 2.8

- TOTAL CENTRAL COAST CRUDE OIL PRODUCTION (Lower dashed line excludes San Ardo oilfield)
- TOTAL CRUDE OIL REFINED
- MAXIMUM REFINERY CAPACITY
- % REFINERY UTILIZATION RATE