

*AIR QUALITY RULES IN
THE SOUTH COAST BASIN*

*INDUSTRIAL
AND
GEOGRAPHIC
IMPACTS*

Economic Roundtable
a nonprofit, public policy research organization

Air Quality Rules in the South Coast Basin

INDUSTRIAL AND GEOGRAPHIC IMPACTS

prepared for

ECOSA

The Environmental Compliance Support Association of California,
with funding from by the South Coast Air Quality Management District
under an EPA Section 507 Grant

November 1993

Mark Drayse, Principal Researcher
Daniel Flaming, Project Director

Economic Roundtable
315 West Ninth Street, Suite 310, Los Angeles, California 90015
213-892-8104

TABLE OF CONTENTS

INTRODUCTION	1
INDUSTRY AND EMPLOYMENT COVERAGE OF AIR QUALITY RULES IN THE SOUTH COAST BASIN	4
Introduction	4
Potential coverage of establishments and employment per rule	4
Manufacturing industries	8
Small firms in the manufacturing sector	11
Non-manufacturing industries	18
Summary	18
PRIORITIZING INDUSTRIES AND RULES FOR AREAS IN THE SOUTH COAST BASIN	19
Introduction	19
Los Angeles County	19
Central and Southeast Los Angeles	26
South Bay and Long Beach	28
Westside/Hollywood/Mid-City	28
San Fernando Valley	32
San Gabriel Valley	37
Orange County	37
Riverside County	43
San Bernardino County	48
Summary	54
SUMMARY AND RECOMMENDATIONS	57

LIST OF TABLES

1	AQMD Rules Ranked by Coverage of Total Employment in the South Coast Basin	5
2	AQMD Rules Ranked by Coverage of Manufacturing Employment in the South Coast Basin	9
3	Number of Rules Applying to Each Manufacturing Industry	10
4	Employment and Estimated Emissions, Manufacturing Industries	12
5	Manufacturing Industries, South Coast Basin, Ranked by Employment	13
6	Manufacturing Industries, South Coast Basin, Percentage of Employees in Establishments with less than 100 Employees	15
7	South Coast Basin Manufacturing Industries, Classified by Percent of Manufacturing Employment and Total Annual Emissions	17
8	Manufacturing Establishments and Employment, South Coast Basin Areas	20
9	Manufacturing Industries, Los Angeles County, Ranked by Employment	21
10	Employment in Small Establishments, Manufacturing Industries, Los Angeles County	23
11	Los Angeles County Manufacturing Industries Classified by Percent of Manufacturing Employment and Total Annual Emissions	24
12	AQMD Rules, Ranked by Coverage of Manufacturing Employment in Los Angeles County	25
13	Establishments and Employment, Manufacturing Industries, Central and Southeast Los Angeles	27
14	Central and Southeast Los Angeles Manufacturing Industries Classified by Percent of Manufacturing Employment and Total Annual Emissions	29
15	Establishments and Employment, Manufacturing Industries, South Bay and Long Beach	30
16	South Bay and Long Beach Manufacturing Industries Classified by Percent of Manufacturing Employment and Total Annual Emissions	31
17	Establishments and Employment, Manufacturing Industries, Westside/Hollywood/Mid-City	33
18	Westside/Hollywood/Mid-City Manufacturing Industries Classified by Percent of Manufacturing Employment and Total Annual Emissions	34

LIST OF TABLES (continued)

19	Establishments and Employment, Manufacturing Industries, San Fernando Valley	35
20	San Fernando Valley Manufacturing Industries Classified by Percent of Manufacturing Employment and Total Annual Emissions	36
21	Establishments and Employment, Manufacturing Industries, San Gabriel Valley	38
22	San Gabriel Valley Manufacturing Industries Classified by Percent of Manufacturing Employment and Total Annual Emissions	39
23	Manufacturing Industries, Orange County, Ranked by Employment	40
24	Employment in Small Establishments, Manufacturing Industries, Orange County	41
25	Orange County Manufacturing Industries Classified by Percent of Manufacturing Employment and Total Annual Emissions	42
26	AQMD Rules, Ranked by Coverage of Manufacturing Employment in Orange County	44
27	Manufacturing Industries, Riverside County, Ranked by Employment	45
28	Employment in Small Establishments, Manufacturing Industries, Riverside County	46
29	Riverside County Manufacturing Industries Classified by Percent of Manufacturing Employment and Total Annual Emissions	47
30	AQMD Rules, Ranked by Coverage of Manufacturing Employment in Riverside County	49
31	Manufacturing Industries, San Bernardino County, Ranked by Employment	50
32	Employment in Small Establishments, Manufacturing Industries, San Bernardino County	51
33	San Bernardino County Manufacturing Industries Classified by Percent of Manufacturing Employment and Total Annual Emissions	52
34	AQMD Rules, Ranked by Coverage of Manufacturing Employment in San Bernardino County	53

APPENDIX TABLES

- 1 Establishment Size Distribution, Establishments, Employment, and
Rules, By Industry in the South Coast Basin
- 2 Distribution of Los Angeles County Zip Codes and Communities
by Areas Used in the Report
- 3 Manufacturing Industries, South Coast Basin Areas, Location
Quotients

AIR QUALITY RULES IN THE SOUTH COAST BASIN

Industrial and Geographical Impacts

1. INTRODUCTION

This report identifies the industrial and geographical distribution of jobs and establishments covered by South Coast Air Quality Management District (AQMD) regulations. The purpose of this analysis is to provide information to help communities, public agencies, and businesses achieve goals of improved air quality and economic development in the four-county South Coast Basin (Los Angeles, Orange, Riverside, and San Bernardino counties).

The 121 rules evaluated in this report apply to establishments in one or more designated Standard Industrial Classification (SIC) industries. Variations in location and concentration of different industries throughout the basin result in uneven sub-regional distributions of employment and establishments covered by any one rule. For example, the southeastern areas of Los Angeles County are home to large concentrations of small and medium size establishments responsible for emitting pollutants from furniture manufacturing and metal plating. These communities are faced with a disproportionate share of the responsibility for reducing emissions from these industries while maintaining jobs. The problem is made more complex by the fact that most employees in these low-wage industries are ethnic minorities and/or immigrants who breathe some of the worst air in the basin, but whose livelihoods depend on the success of the same factories contributing to the pollution.

Information in this report can be helpful in evaluating potential community economic impacts of complying with air quality regulations, as well as for identifying businesses in different communities most in need of assistance in complying with regulations.

Two caveats need to be discussed at the outset. First, air quality regulations cover establishments that use a particular process, machine, or piece of equipment resulting in emission of one or more regulated pollutants.¹ At any given time, within an industry covered by a rule, there are three groups of establishments: (a) those that use the process, machine, or equipment in question, and are not in compliance with the emission regulation; (b) those that use the process, machine, or equipment, and are in compliance with the emissions regulation; and (c) those that do not use the process, machine, or equipment in question, and therefore are not affected by the regulation; however, establishments in this group would be covered if they introduced the regulated process, machine, or equipment into their plants.

¹ Regulated pollutants are classified as reactive organic gases (ROG), which accounted for 38% of industry emissions in the South Coast basin in 1990; nitrous oxides (NOX, 35%); carbon monoxide (CO, 14%); sulfur oxides (SOX, 8%), and particulate matter-10 (PM, 7%).

Therefore, although a rule such as 1146.1 (NOX From Small Industrial, Institutional, and Commercial Boilers, etc.) is virtually ubiquitous in its coverage of industries (including almost all manufacturing industries), it only applies to those establishments in these industries that use the boilers, generators, etc. that are regulated by the rule. A subset of these establishments are not in compliance, while the rest are in compliance. The figures included in this report for establishment and employee coverage per rule should be considered in this light, as indicating the potential rather than the actual coverage of establishments and employment. (Detailed survey work is recommended to determine the actual coverage per rule; see the Recommendations section at the end of this report).

The information compiled for this report shows the maximum number of establishments and employees that could be covered by a particular rule -- the *potential coverage* of a rule. The potential coverage of a rule such as Rule 1159 (Nitric Acid Units -- Oxides of Nitrogen), is negligible, as it applies to only 6 establishments employing a total of 235 workers. Attention should be given to those firms that might be affected by Rule 1146.1, and other rules that have a high potential coverage of employment and establishments, rather than the numerous, highly specific rules that apply to only a handful of establishments.

This leads to a second note of caution: the concept of "jobs at risk". The development and application of air quality regulations is a political, economic, as well as environmental process. Some firms are more vulnerable financially than others to costs of complying with air quality regulations. Large corporations are much less vulnerable than small firms, due to greater financial resources and technical capabilities to bring their production processes into compliance. Their political clout is another factor, giving them opportunities to influence the application of air quality regulations that small firms lack. Many firms view air quality regulations as evidence of anti-business regulation, regardless of their ability to come into compliance. In the case of firms that close plants or relocate out of the region, it is tempting to argue that air quality regulations placed jobs "at risk", implying that jobs were lost because of air quality regulation. In fact, any attrition in employment, relocation, or closing of facilities is caused by numerous factors, varying in importance in each case, that are not reducible to the perceived difficulties created by air quality regulations. The potential coverage of establishments and employees by each rule should be viewed in a positive light. For each rule, it is important to ensure that the establishments under actual and potential coverage are aware of the compliance standards, technologies, and other factors associated with the rule, and are able to obtain financial, technical, and related assistance in complying with the rule, thus helping to ensure that goals of job growth and air quality are approached simultaneously. Assistance in complying with air quality rules is especially important for small businesses.

The remainder of the report is divided into three sections. The first section presents information on the relation between rules and impacts on regulated industries in the South Coast Basin. The second section identifies the geographical coverage of rules by analyzing industry composition and rule coverage in each of the four South Coast Basin counties, and five areas within Los Angeles County. The discussion and analysis concentrates on

manufacturing industries, which accounted for 66% of all industry emissions in 1990.² Particular attention is given to manufacturing industries that are major employers, and those that have a high percentage of employees in small establishments. The third and final section includes a summary and recommendations for further research.

² Economic Roundtable, *Jobs and Air Quality*.

2. INDUSTRY AND EMPLOYMENT COVERAGE OF AIR QUALITY RULES IN THE SOUTH COAST BASIN

Introduction

This section presents an overview of the potential coverage of employment and establishments by air quality regulations in the South Coast Basin. The great variation in potential coverage of employees and establishments per rule for the South Coast Basin is discussed. Next, employment and emissions characteristics of manufacturing industries are presented, in order to prioritize industries by total employment, percent of employees in small firms, and total emissions. The assumption here is that industries that are major employers, with a substantial number of employees in small establishments, and relatively high emissions should be given high priority for receiving compliance assistance.

Potential coverage of establishments and employment per rule

The potential employment coverage of rules varies widely among the 121 industry-specific rules. Some rules cover numerous industries, while others apply only to one 4-digit industry (see Table 1). Some manufacturing processes create high emissions of one or more regulated pollutants into the atmosphere, while other manufacturing processes are relatively clean in this respect.

The industry-specific rules may be divided into four groups based on their employment coverage in the basin:

- (1) **High Potential Employment Coverage:** 12 rules that each cover at least 10% of the basin's employment (570,000 workers). The most comprehensive rule is Rule 431.2 (Sulfur Content of Liquid Fuels), which covers 74% of establishments and 78% of employment in the region. Rule 1145 (Plastic, Rubber, and Glass Coatings) covers 38% of establishments and 48% of employment in the region. Rule 1110.2 (Emissions from Gaseous- and Liquid- Fueled Internal Combustion Engines) covers 30% of establishments and 39% of employment in the region.
- (2) **High-Medium Potential Employment Coverage:** 16 rules that each cover between 2% -10% of the basin's employment (between 114,000 and 570,000 workers)
- (3) **Low-Medium Potential Employment Coverage:** 10 rules that each cover between 0.4% -2% of the basin's employment (between 23,000 and 114,000 workers)
- (4) **Low Potential Employment Coverage:** 83 rules that each cover less than 0.4% of the basin's employment (less than 23,000 workers); of these rules, 25 affect fewer than 1,000 workers, and 57 affect fewer than 5,000 workers.

Table 1

AQMD Rules

Ranked by Coverage of Total Employment in the South Coast Basin

Rule	Title	Total Estabs	% of all Estabs	Total Employment	% of all Empl
<i>Rules with High Potential Employment Coverage</i>					
431.2	Sulfur Content of Liquid Fuels	248050	73.3%	4471681	78.4%
1145	Plastic, Rubber, and Glass Coatings	128353	37.9%	2747138	48.2%
1110.2	Emissions from Gaseous— and Liquid—Fueled Internal Combustion	100795	29.8%	2216911	38.9%
1168	Control of Volatile Organic Compound Emissions from Adhesive Ap	112871	33.4%	1805944	31.7%
1146.1	NOx from small Industrial, Instit. & comm boilers, steam generators	73776	21.8%	1671876	29.3%
1402	Control of Toxic Air Contaminants from Existing Sources – PROPO	47789	14.1%	1261380	22.1%
1134	Emissions of Oxides of Nitrogen From Stationary Gas Turbines	43871	13.0%	1166175	20.4%
403.1	Wind Entrainment of Fugitive Dust	75701	22.4%	977209	17.1%
403	Fugitive Dust	74425	22.0%	967120	17.0%
1404	Hexavalent Chromium Emissions from Cooling Towers	13380	4.0%	901788	15.8%
1415	Reduction of chlorofluorocarbon emiss from stationary refrigeration	67335	19.9%	883039	15.5%
1128	Paper, Fabric, and Film Coating Operations	29758	8.8%	736993	12.9%
<i>Rules with High–Medium Potential Employment Coverage</i>					
1171	Solvent Cleaning Operations	9413	2.8%	460430	8.1%
1146	NOx from ind, instit, & commercial boilers, steam generators, & pro	5213	1.5%	427487	7.5%
1122	Solvent Degreasers	20472	6.1%	419506	7.4%
1151	Motor Vehicle and Mobile Equipment Non–Assembly Line Coating	18850	5.6%	391748	6.9%
1130.1	Screen Printing Operations	19662	5.8%	389742	6.8%
1403	Asbestos Emissions From Demolition/Renovation Activities	26865	7.9%	338401	5.9%
1420	Emissions Standard for Lead	5594	1.7%	333329	5.8%
1113	Architectural Coatings	18604	5.5%	269860	4.7%
1405	Control of ethylene oxide & chlorofluorocarbon emissions from steri	2597	0.8%	260081	4.6%
1169	Hexavalent Chromium–Chrome Plating and Chromic Acid Anodizin	5226	1.5%	259744	4.6%
1406	Control of Dioxin Emissions from Medical Waste Incinerators	1241	0.4%	252724	4.4%
1174	Control of Volatile Organic Compound Emissions from the Ignition c	8809	2.6%	239214	4.2%
1129	Aerosol Coatings	13561	4.0%	226563	4.0%
1124	Aerospace Assembly and Component Manufacturing Operations	343	0.1%	189362	3.3%
1175	Control of Emissions from the Manufacture of Polymeric Cellular Prc	4271	1.3%	180100	3.2%
1411	Recovery or Recycling of Refrigerants from Motor Vehicle Air Condil	10852	3.2%	112908	2.0%
<i>Rules with Low–Medium Potential Employment Coverage</i>					
1401	New Source Review of Carcinogenic Air Contaminants	1892	0.6%	88581	1.6%
1149	Storage Tank Degassing	4998	1.5%	59620	1.0%
1136	Wood Products Coatings	1489	0.4%	53047	0.9%
TTT	Industrial Surface Coating Plastic Parts for Business Machines	1071	0.3%	49105	0.9%
1410	Hydrogen Fluoride Storage and Use	965	0.3%	43428	0.8%
1162	Polyester Resin Operations	1012	0.3%	41245	0.7%
1130	Graphic Arts	2234	0.7%	33735	0.6%
461	Gasoline Transfer and Dispensing	3840	1.1%	27900	0.5%
1170	Methanol Compatible Fuel Storage and Transfer	3840	1.1%	27900	0.5%
1115	Motor Vehicle Assembly Line Coating Operations	398	0.1%	25116	0.4%

Rule	Title	Total Estabs	% of all Estabs	Total Employment	% of all Empl
Rules with Low Potential Employment Coverage					
1140	Abrasive Blasting	1432	0.4%	17052	0.3%
1142	Marine Tank Vessel Operations	277	0.1%	16908	0.3%
1125	Metal Container, Closure, and Coil Coating Operations	582	0.2%	16801	0.3%
TT	Standards of Performance for Metal Coil Surface Coating	548	0.2%	14237	0.2%
1107	Coating of Metal Parts and Products	548	0.2%	14237	0.2%
1176	Sumps and Wastewater Separators	265	0.1%	14017	0.2%
1135	Emissions of Oxides of Nitrogen from Electric Power Generating Sy:	173	0.1%	13985	0.2%
431.1	Sulfur content of Gaseous Fuels	260	0.1%	13324	0.2%
1103	Pharmaceuticals and Cosmetics Manufacturing Operations	152	0.0%	12684	0.2%
1153	Commercial Bakery Ovens	141	0.0%	11768	0.2%
1173	Fugitive Emissions of Volatile Organic Compounds	209	0.1%	11062	0.2%
1141.2	Surfactant Manufacturing	236	0.1%	9179	0.2%
X. N.	National Emission Standard for Inorganic Arsenic Emissions from G	168	0.0%	8843	0.2%
1164	Semiconductor Manufacturing	84	0.0%	8463	0.1%
1117	Emissions of Oxides of Nitrogen from Glass Melting Furnaces	168	0.0%	8343	0.1%
1102.1	Perchloroethylene Dry Cleaning Systems	923	0.3%	7307	0.1%
JJJ	Standards of Performance for Petroleum Dry Cleaners	923	0.3%	7307	0.1%
1120	Asphalt Paving Heaters	242	0.1%	6706	0.1%
1158	Storage, Handling, and Transport of Petroleum Coke	25	0.0%	6565	0.1%
1119	Petroleum Coke Calcining Operations – Oxides of Sulfur	17	0.0%	6435	0.1%
1123	Refinery Process Turnarounds	15	0.0%	6375	0.1%
1109	Emissions of NOX from Boilers and Process Heaters in Petroleum R	15	0.0%	6375	0.1%
1105	Fluid Catalytic Cracking Units – Oxides of Sulfur	15	0.0%	6375	0.1%
GGG	Standards of Performance for Equipment Leaks of VOC in Petroleur	15	0.0%	6375	0.1%
J	Standards of Performance for Petroleum Refineries	15	0.0%	6375	0.1%
QQQ	VOC Emissions from Petroleum Refinery Wastewater Systems	15	0.0%	6375	0.1%
1141.1	Coatings and Ink Manufacturing	155	0.0%	4776	0.1%
MM	Automobile and Light-Duty Truck Surface Coating Operations	35	0.0%	4405	0.1%
1126	Magnet Wire Coating Operations	173	0.1%	4392	0.1%
WW	Standards of Performance for the Beverage Can Surface Coating In	173	0.1%	4392	0.1%
SS	Standards of Performance for Industrial Surface Coatings: Large Ar	173	0.1%	4392	0.1%
1102	Petroleum Solvent Dry Cleaners	91	0.0%	4231	0.1%
SSS	Standards of Performance for Magnetic Tape Manufacturing Industr	33	0.0%	3694	0.1%
OOO	Standards of Performance for Nonmetallic Mineral Processing Plant	89	0.0%	3062	0.1%
UUU	Standards of Performance for Calciners and Dryers in Mineral Indus	89	0.0%	3062	0.1%
1108.1	Emulsified Asphalt	205	0.1%	2878	0.1%
1108	Cutback Asphalt	205	0.1%	2878	0.1%
X	Phosphate Fertilizer Industry: Granular triple superphosphate stora	296	0.1%	2762	0.0%
1106	Marine Coating Operations	107	0.0%	2699	0.0%
XX	Standards of Performance for Bulk Gasoline Terminal	125	0.0%	2455	0.0%
LLL	Standards of Performance for Onshore Natural Gas Processing: SC	127	0.0%	2273	0.0%
KKK	Equipment Leaks of VOC from Onshore Natural Gas Processing Pla	127	0.0%	2273	0.0%
1106.1	Pleasure Craft Coating Operations	138	0.0%	2250	0.0%
1148	Thermally Enhanced Oil Recovery Wells	123	0.0%	2213	0.0%
KK	Standards of Performance for Lead-Acid Battery Manufacturing Pla	17	0.0%	2204	0.0%
1141	Control of Reactive Organic Gases From Resin Manufacturing	41	0.0%	1712	0.0%
DDD	Volatile Organic Compound (VOC) Emissions from the polymer mar	41	0.0%	1712	0.0%
477	Coke Ovens	13	0.0%	1527	0.0%
Na	Standards of Performance for Basic Oxygen Process Furnaces	13	0.0%	1527	0.0%
N	Standards of Performance for Iron and Steel Plants	13	0.0%	1527	0.0%
AA	Steel Plants: Electric arc furnaces built after 10/24/74 and on or bef	13	0.0%	1527	0.0%
AAa	Steel Plants: Electric arc furnaces & argon-oxygen decarb vessels	13	0.0%	1527	0.0%
1101	Secondary Lead Smelters/Sulfur Oxides	34	0.0%	1418	0.0%
M	Standards of Performance for Secondary Brass and Bronze Produc	34	0.0%	1418	0.0%

Rule	Title	Total Estabs	% of all Estabs	Total Employment	% of all Empl
L	Standards of Performance For Secondary Lead Smelters	34	0.0%	1418	0.0%
RR	Pressure Sensitive Tape and Label Surface Coating Operations	31	0.0%	1296	0.0%
1112.1	Emissions of Particulate Matter From Cement Kilns	7	0.0%	1284	0.0%
1112	Emissions of Oxides of Nitrogen From Cement Kilns	7	0.0%	1284	0.0%
1104	Wood Flat Stock Coating Operations	22	0.0%	947	0.0%
1121	Control of Nitrogen Oxides from Residential-Type, Natural-Gas-F	9	0.0%	925	0.0%
UU	Standards of Performance for Asphalt Processing and Asphalt Roofi	14	0.0%	884	0.0%
H	Standards of Performance for Sulfuric Acid Plants	29	0.0%	875	0.0%
Cb	Emission Guidelines and Compliance Times for Sulfuric Acid Produ	29	0.0%	875	0.0%
468	Sulfur Recovery Units	29	0.0%	875	0.0%
469	Sulfuric Acid Units	29	0.0%	875	0.0%
CC	Standards of Performance for Glass Manufacturing Plants	31	0.0%	850	0.0%
W	Equipment Leaks of VOC in the Synthetic Organic Chemical Manufc	26	0.0%	810	0.0%
NNN	VOC emissions from syn org chem mfg industry (SOCMI) distillation	26	0.0%	810	0.0%
1163	Control of Vinyl Chloride Emissions	26	0.0%	810	0.0%
III	VOC emiss from the syn organic chem mfg industry (SOCMI) air oxi	26	0.0%	810	0.0%
PPP	Standards of Performance for Wool Fiberglass Insulation Manufactu	13	0.0%	632	0.0%
DD	Standards of Performance for Grain Elevators	21	0.0%	520	0.0%
LL	Standards of Performance for Metallic Mineral Processing Plants	23	0.0%	435	0.0%
I	Standards of Performance for Asphaltic Concrete Plants	36	0.0%	324	0.0%
1116.1	Lightering Vessel Operations - Sulfur Content of Burker Fuel	31	0.0%	250	0.0%
1159	Nitric Acid Units - Oxides of Nitrogen	6	0.0%	235	0.0%
PP	Standards of Performance for Ammonium Sulfate Manufacture	6	0.0%	235	0.0%
BBB	Standards of Performance for Rubber Tire Manufacturing Industry	4	0.0%	235	0.0%
G	Standards of Performance for Nitric Acid Plants	6	0.0%	235	0.0%
FFF	Standards of Performance for Flexible Vinyl and Urethane Coating a	12	0.0%	155	0.0%
QQ	Graphic Arts Industry: Publication Rotogravure Printing	12	0.0%	155	0.0%
Q	Standards of Performance for Primary Zinc Smelters	4	0.0%	60	0.0%
R	Standards of Performance for Primary Lead Smelters	4	0.0%	60	0.0%

Manufacturing industries

Focusing on manufacturing employment, a total of 37 rules covering at least 1% of the basin's manufacturing employment (just over 11,000 workers) are shown in Table 2. Seventeen of these rules cover over 100,000 workers. Three rules are all but comprehensive in their potential coverage of manufacturing employment: Rule 1146.1 (NOX From Small Industrial, Institutional, and Commercial Boilers, etc.); Rule 431.2, and Rule 1145.

Each manufacturing industry group is covered by an average of 13 rules (Table 3). The seven manufacturing industry groups that are covered by an above average number of rules are listed below:

SIC	Industry Group	Number of Rules Applying to Establishments in the Industry Group*
29	Petroleum and Coal Products	36
28	Chemicals	26
34	Fabricated Metal Products	20
33	Primary Metals	17
37	Transportation Equipment	17
32	Stone, Clay, and Glass Products	16
36	Electronics	15

* Note that these rules apply to establishments in the industry that use the process, machine, or equipment regulated by the rule. Some rules apply to any establishment in the industry group, while other rules apply to specific 3- or 4-digit industries within the industry group (see Appendix Table 1).

Altogether, these seven industries include 7,960 establishments, 29% of all South Coast Basin manufacturing establishments, and employ 523,100 workers, 44% of the basin's manufacturing employment.³ The major employers in this group are Transportation Equipment (dominated by aircraft and aerospace manufacturers), which leads all manufacturing industries with 219,800 employees⁴; Fabricated Metal Products (104,600);

³ U.S. Department of Commerce, *County Business Patterns 1990*

⁴ Employment figures in this report are based on the *County Business Patterns 1990*, which is the latest County Business Patterns report issued by the U.S. Department of Commerce. Employment figures do not reflect changes taking place in the last few years, such as the dramatic decline in aerospace employment. The Transportation Equipment industry group remains the major manufacturing employer in the South Coast Basin.

Table 2

AQMD Rules**Ranked by Coverage of Manufacturing Employment in the South Coast Basin**

(Includes rules covering at least 10,000 manufacturing employees)

Rule	Title	Total Estabs	% of all Manufact. Estabs	Total Employment	% of all Manufact. Empl
1146.1	NOx from small industrial, instit, & comm boilers, steam generators	28005	98.2%	1184949	96.6%
431.2	Sulfur Content of Liquid Fuels	28005	98.2%	1184949	96.6%
1145	Plastic, Rubber, and Glass Coatings	26954	94.5%	1114808	90.9%
1402	Control of Toxic Air Contaminants from Existing Sources - PROPO	12852	45.1%	706967	57.7%
1404	Hexavalent Chromium Emissions from Cooling Towers	10399	36.5%	549177	44.8%
1110.2	Emissions from Gaseous - and Liquid - Fueled Internal Combustion	11235	39.4%	515864	42.1%
1171	Solvent Cleaning Operations	9413	33.0%	460430	37.6%
1134	Emissions of Oxides of Nitrogen From Stationary Gas Turbines	7422	26.0%	436286	35.6%
1128	Paper, Fabric, and Film Coating Operations	10551	37.0%	361073	29.4%
1122	Solvent Degreasers	10604	37.2%	352367	28.7%
1420	Emissions Standard for Lead	5594	19.6%	333329	27.2%
1169	Hexavalent Chromium - Chrome Plating and Chromic Acid Anodizin	5226	18.3%	259744	21.2%
1168	Control of Volatile Organic Compound Emissions from Adhesive Ap	8203	28.8%	254810	20.8%
1130.1	Screen Printing Operations	9353	32.8%	232805	19.0%
1151	Motor Vehicle and Mobile Equipment Non - Assembly Line Coating	996	3.5%	219828	17.9%
1124	Aerospace Assembly and Component Manufacturing Operations	343	1.2%	189362	15.4%
1175	Control of Emissions from the Manufacture of Polymeric Cellular Prc	4271	15.0%	180100	14.7%
1401	New Source Review of Carcinogenic Air Contaminants	1365	4.8%	65725	5.4%
1146	NOx from ind, instit, & commercial boilers, steam generators, & proi	950	3.3%	61637	5.0%
1136	Wood Products Coatings	1489	5.2%	53047	4.3%
1113	Architectural Coatings	1403	4.9%	49859	4.1%
1415	Reduction of chlorofluorocarbon emiss from stationary refrigeration	1242	4.4%	49401	4.0%
TTT	Industrial Surface Coating Plastic Parts for Business Machines	971	3.4%	49105	4.0%
1410	Hydrogen Fluoride Storage and Use	965	3.4%	43428	3.5%
1162	Polyester Resin Operations	1012	3.5%	41245	3.4%
403	Fugitive Dust	905	3.2%	37216	3.0%
403.1	Wind Entrainment of Fugitive Dust	905	3.2%	37216	3.0%
1129	Aerosol Coatings	864	3.0%	34924	2.8%
1130	Graphic Arts	2254	7.9%	33735	2.8%
1405	Control of ethylene oxide & chlorofluorocarbon emissions from steri	455	1.6%	29289	2.4%
1115	Motor Vehicle Assembly Line Coating Operations	398	1.4%	25116	2.0%
1149	Storage Tank Degassing	473	1.7%	21384	1.7%
1125	Metal Container, Closure, and Coil Coating Operations	582	2.0%	16801	1.4%
1107	Coating of Metal Parts and Products	548	1.9%	14237	1.2%
TT	Standards of Performance for Metal Coll Surface Coating	548	1.9%	14237	1.2%
1103	Pharmaceuticals and Cosmetics Manufacturing Operations	152	0.5%	12684	1.0%
1153	Commercial Bakery Ovens	141	0.5%	11768	1.0%

Table 3**Number of Rules Applying to Each Manufacturing Industry**

SIC	Industry	Rules Applying to Industry Group	Rules Applying to 3-4 Digit SICs	Total Rules
20	Food and Kindred Products	5	4	9
22	Textile Mill Products	4	1	5
23	Apparel	7	0	7
24	Lumber and Wood Products	4	3	7
25	Furniture and Fixtures	6	1	7
26	Paper and Allied Products	8	3	11
27	Printing and Publishing	6	4	10
28	Chemicals and Allied Products	13	23	36
29	Petroleum and Coal Products	11	15	26
30	Rubber and Plastics Products	6	4	10
31	Leather and Leather Products	3	0	3
32	Stone, Clay, and Glass Products	7	9	16
33	Primary Metal Industries	8	9	17
34	Fabricated Metal Products	9	11	20
35	Industrial Machinery and Equipment	8	1	9
36	Electronics and Electronics Equipment	8	7	15
37	Transportation Equipment	8	9	17
38	Instruments and Related Products	4	2	6
39	Miscellaneous Manufacturing Industries	4	4	8

and Electronics (100,600). These seven industries are responsible for 55% of annual manufacturing emissions.⁵ The ratio between tons of emissions and number of workers is high for most of the industries in this group (see Table 4).

The manufacturing industry groups covered by the fewest number of rules include Textiles (5 rules); Instruments (6 rules); Apparel (7 rules); Lumber and Wood Products (7 rules); and Furniture (7 rules). These industries (excluding Apparel⁶) released 8% of all manufacturing emissions in 1990. For each of these industries, annual tons of emissions are among the lowest in the manufacturing sector (see Table 4).

Table 5 ranks the region's manufacturing industries by total employment. The major employers are Transportation Equipment (220,000 employees), Apparel (110,000), Instruments (106,000), Fabricated Metal Products (105,000), Electronics (101,000), Industrial Machinery (94,000), and Printing and Publishing (88,000). These seven industries account for 70% of the basin's manufacturing employment and 31% of total manufacturing emissions.

Small firms in the manufacturing sector

Small firms typically face greater difficulties in complying with air quality regulations than do large corporations, for straightforward reasons. The costs of refitting or purchasing technology and equipment that allow the manufacturer to come into compliance with appropriate air quality regulations can be prohibitive for small firms, due to limited funds for reinvestment, and/or difficulties in securing financing. Small firms lack the political strength of large corporations, which can influence the development and application of air quality regulations so as to make it easier for them to be in compliance. In some cases the problem may be one of limited information regarding best available compliance technologies.

Therefore, it is important to target small firms for special assistance in complying with air quality regulations. A preliminary step is to determine the importance of small firms in each industry, and take note of the rules that apply to these firms. In this section we provide an overview of small firm employment in the manufacturing sector for the South Coast Basin; small firm employment in each of the four counties is discussed in the following section.

⁵ Based on analysis contained in the Economic Roundtable report, *Jobs and Air Quality*.

⁶ In this report, the Apparel industry is excluded from discussion pertaining to emissions. The Economic Roundtable and AQMD databases which were used to estimate industry emissions contain insufficient numbers of Apparel establishments from which to derive reliable estimates for annual emissions.

Table 4

**Employment and Estimated Emissions
Manufacturing Industries
Ranked by Total Annual Emissions**

SIC	INDUSTRY TITLE	Empl	% of Mfg Empl	Total Annual Emissions (tons)	% of Total Annual Emissions	Tons of Emissions per Worker
29	Petroleum and Coal Products	8504	0.7%	19528	21.6%	2.30
30	Rubber and Plastics	61710	5.2%	11126	12.3%	0.18
34	Fabricated Metal Products	104604	8.9%	9758	10.8%	0.09
26	Paper and Allied Products	23220	2.0%	7870	8.7%	0.34
27	Printing and Publishing	88173	7.5%	6334	7.0%	0.07
37	Transportation Equipment	219828	18.6%	5536	6.1%	0.03
32	Stone, Clay, and Glass Products	28712	2.4%	5045	5.6%	0.18
28	Chemicals and Allied Products	34924	3.0%	3760	4.2%	0.11
25	Furniture and Fixtures	48084	4.1%	3753	4.2%	0.08
35	Industrial Machinery	93747	7.9%	3408	3.8%	0.04
33	Primary Metals	25933	2.2%	3243	3.6%	0.13
36	Electronics	100573	8.5%	3223	3.6%	0.03
20	Food and Kindred Products	61637	5.2%	2486	2.8%	0.04
24	Lumber and Wood Products	24605	2.1%	1703	1.9%	0.07
39	Miscellaneous Manufacturing	27510	2.3%	1557	1.7%	0.06
22	Textile Mill Products	13747	1.2%	1029	1.1%	0.07
38	Instruments	105785	9.0%	840	0.9%	0.01
	MANUFACTURING	1071296		90200		

Source of employment figures: U.S. Department of Commerce, County Business Patterns

Source of emissions figures: Economic Roundtable and SCAQMD

Table 5**Manufacturing Industries
South Coast Basin
Ranked by Employment**

SIC	Industry Group	Estabs.	Employment	% of Mfg Empl
37	Transportation Equipment	996	219828	18.6%
23	Apparel	4361	109708	9.3%
38	Instruments	899	105785	9.0%
34	Fabricated Metal Products	2958	104604	8.9%
36	Electronics	1765	100573	8.5%
35	Industrial Machinery	4054	93747	7.9%
27	Printing and Publishing	4128	88173	7.5%
30	Rubber and Plastics Products	1317	61710	5.2%
20	Food and Kindred Products	950	61637	5.2%
25	Furniture and Fixtures	1210	48084	4.1%
28	Chemicals and Allied Products	864	34924	3.0%
32	Stone, Clay, and Glass Products	804	28712	2.4%
39	Miscellaneous Manufacturing Industries	1351	27510	2.3%
33	Primary Metal Industries	476	25933	2.2%
24	Lumber and Wood Products	948	24605	2.1%
26	Paper and Allied Products	383	23220	2.0%
22	Textile Mill Products	322	13747	1.2%
29	Petroleum and Coal Products	101	8504	0.7%
31	Leather and Leather Products	118	3945	0.3%
		27887	1181004	

Source: U.S. Department of Commerce, County Business Patterns

Ninety-three percent of the South Coast Basin's manufacturing establishments employ fewer than 100 workers; the average number of employees per establishment is 42. In comparing small-firm concentration in manufacturing industries, a useful figure is the percentage of the industry's employment in small establishments (see Table 6). In the Apparel, Miscellaneous Manufacturing, and Lumber and Wood industries, 2 in every 3 workers is employed in a small firm, the highest concentrations among manufacturing industries. Other industries with at least half of their employment in small firms are Industrial Machinery; Fabricated Metal Products; Stone, Clay, and Glass Products; and Printing and Publishing. At the other end of the spectrum, the industries with the lowest concentration of employees in small firms are Transportation Equipment, Instruments, Petroleum and Coal Products, Electronics, and Food and Kindred Products. Fewer than 1 in 10 Transportation Equipment employees work in a small establishment, the smallest concentration in the manufacturing sector. For the manufacturing sector as a whole, 40% of all employees (462,000) work in small establishments.

The table below shows the distribution of the manufacturing industries into three groups: a small-firm group (at least 50% of employment in small firms); an intermediate group (between 40 - 50% of employment in small firms); and a large-firm group (fewer than 40% of employment in small firms). Those industries marked by an asterisk are among the ten largest manufacturing employers in the South Coast Basin.

SMALL-FIRM GROUP	INTERMEDIATE GROUP	LARGE-FIRM GROUP
Apparel*	Rubber and Plastics*	Food*
Fabricated Metal Products*	Furniture*	Electronics*
Printing and Publishing*	Chemicals	Instruments*
Industrial Machinery*	Primary Metals	Transportation Equipment*
Stone, Clay, Glass	Paper	Petroleum
Miscellaneous	Textiles	
Lumber and Wood		

The manufacturing industries with the greatest *number* of employees in small firms are Apparel, Fabricated Metal Products, Printing and Publishing, Industrial Machinery, and Rubber and Plastics. These five industries employ over 261,000 workers in small establishments, 22% of all manufacturing employees in the basin.

Table 6**Manufacturing Industries****South Coast Basin****Percentage of Employees in Establishments with Less than 100 Employees**

SIC	Industry	Number of Employees in Small Estabs	Total Employ- ment	% of Employees in Small Estabs
20	Food and Kindred Products	19472	61637	31.6%
22	Textile Mill Products	5872	13747	42.7%
23	Apparel	73103	109708	66.6%
24	Lumber and Wood Products	15991	24605	65.0%
25	Furniture and Fixtures	22873	48084	47.6%
26	Paper and Allied Products	9468	23220	40.8%
27	Printing and Publishing	46196	88173	52.4%
28	Chemicals and Allied Products	17159	34924	49.1%
29	Petroleum and Coal Products	1574	8504	18.5%
30	Rubber and Plastics Products	29513	61710	47.8%
32	Stone, Clay, Glass Products	15242	28712	53.1%
33	Primary Metals Industries	10560	25933	40.7%
34	Fabricated Metal Products	57971	104604	55.4%
35	Industrial Machinery	54274	93747	57.9%
36	Electronics and Electronic Equipment	28814	100573	28.6%
37	Transportation Equipment	19176	219828	8.7%
38	Instruments and Related Products	16406	105785	15.5%
39	Miscellaneous Manufacturing Industries	18222	27510	66.2%
	MANUFACTURING	461786	1161729	39.7%

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990

Industries to which special attention should be given in the provision of compliance assistance are those that employ significant numbers of workers in small firms, and are major sources of regulated atmospheric emissions. Table 4 shows the total estimated emissions, and the number of workers per ton of emissions, for the manufacturing industry groups. Over 50% of manufacturing emissions are accounted for by four industry groups: Petroleum and Coal Products, Rubber and Plastics, Fabricated Metal Products, and Paper. The industries with the lowest emissions totals include Instruments, Textile Mill Products, and Miscellaneous Manufacturing. To account for differences in industry size, figures were calculated for workers per ton of emissions in each industry. By this measure, the industries with the highest emissions relative to employment were Petroleum and Coal Products, Paper and Allied Products, Rubber and Plastics, and Stone, Clay and Glass Products.

Manufacturing industries are cross-classified by their share of total manufacturing employment and total annual emissions in Table 7. The Fabricated Metal and Printing and Publishing industries emerge as industries that are major employers in the South Coast Basin, with high emissions and a high percentage of employees in small firms. The Industrial Machinery industry is a major employer, with average levels of annual emissions.

On the basis of these comparisons, the following industries bear close attention in the provision of information and assistance regarding compliance with air quality regulations:

Industry	Percent of Employees in Small Firms ¹	Share of Manufacturing Employment ²	Total Emissions ³	Emissions per Worker ⁴
Fabricated Metal	H	H	H	M
Printing/Publishing	H	H	H	M
Industrial Machinery	H	H	M	L
Stone, Clay, Glass	H	M	M	H
Rubber/Plastics	M	M	H	H
Paper	M	M	H	H
Chemicals	M	M	M	H
Primary Metals	M	M	M	H
Furniture	M	M	M	M

¹ H = more than 50%, M = 40 - 50%

² H = 7.5% or more, M = 2.0 - 7.5%

³ H = 7.5% or more, M = 3.0 - 7.5%

⁴ H = more than 1.2 tons per worker annually, M = 0.6 - 1.2

Table 7

**South Coast Basin Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Fabricated Metal* Printing/Publishing*	Transportation Electronics Industrial Machinery*	Instruments
MEDIUM	Rubber and Plastics Paper	Furniture Chemicals Stone, Clay, Glass* Primary Metals	Food Miscellaneous* Lumber and Wood*
LOW	Petroleum		Textiles

* Over 50% of employment in establishments with less than 100 employees

The remaining high-employment manufacturing industries, Transportation Equipment, Electronics, and Instruments, are dominated by large firms and produce average or below-average levels of emissions; these industries are less vulnerable than those in the former group to difficulties of complying with air quality regulations.

Non-manufacturing industries

Non-manufacturing industries accounted for 34% of industry emissions in 1990.⁷ Most of these emissions are attributable to a handful of industries. By far the major contributor is SIC 49, Electric, Gas, and Sanitary Services, which released 22,900 tons into the air in 1990, 17% of total industry emissions. Other major polluters are SIC 1311, Petroleum Extraction; SIC 753, Auto Repair; SIC 7216, Dry Cleaners; and SIC 5171, Petroleum Terminals. The Electric, Gas, and Sanitary Services industry group employs 28,600 workers, and is covered by 19 rules. Auto repair shops likewise employ 28,600 workers, and are covered by 6 rules. Relatively few workers are employed in the other high-emissions non-manufacturing industries.

Summary

There is great variation among AQMD rules in their potential coverage of employment and establishments. For some rules, only a few firms in the South Coast Basin are targeted for compliance, while in the case of other rules, thousands of firms in numerous manufacturing industries are potentially covered. This suggests that, given limited resources, some rules deserve closer scrutiny than others in identifying firms that need assistance in complying with air quality regulations. In addition, industries that are major employers in the region, employ a significant number of workers in small firms, and have average or above average levels of annual emissions should be targeted for compliance assistance, given their importance to the regional employment base. Many establishments in these industries face financial, technical, and other difficulties in bringing their emissions in line with air quality rules.

To provide more targeted assistance, it is important to know the geographic distribution of industries within the region. What is the industry mix for counties and sub-regions in the basin? What industries should be targeted for assistance in compliance in each area? These questions are addressed in the next section.

⁷ Economic Roundtable, *Jobs and Air Quality*

3. PRIORITIZING INDUSTRIES AND RULES FOR AREAS IN THE SOUTH COAST BASIN

Introduction

This section discusses the distribution of manufacturing industries in eight areas within the South Coast Basin. Five areas are within Los Angeles County: Central and Southeast Los Angeles, South Bay and Long Beach, Westside/Hollywood/Mid-City, San Fernando Valley, and San Gabriel Valley (see Appendix Table 2). The remaining areas are the counties of Orange, Riverside, and San Bernardino. For each area, manufacturing industries are described in terms of their total employment, employment concentration⁸, small-establishment employment, and emissions. These categories are used to suggest industries that should be prioritized for compliance assistance in each area. Geographical differences in potential rules coverage are also discussed to point out that some rules are more important in some areas than in others, in terms of their potential coverage of employment and establishments.

Los Angeles County

The Los Angeles County manufacturing sector claims 19,300 establishments and 848,000 employees, respectively 69% and 72% of the South Coast Basin totals (Table 8). The Transportation Equipment industries employ more than 1 in 5 of the county's manufacturing workers. Despite the recent dramatic declines in employment at the county's aircraft and aerospace manufacturers, Transportation Equipment remains by far the largest manufacturing group in the county. In order of employment, the next largest industries are Apparel (99,000), Fabricated Metal Products (71,000), Instruments (64,000), Electronics (61,000), Printing and Publishing (60,000), and Industrial Machinery (59,000). Together these seven industry groups employ almost 600,000 workers, 71% of total county manufacturing employment (Table 9).

The distribution of manufacturing employment in Los Angeles County is similar to that of the South Coast Basin, given the high concentration of the region's manufacturing employment within the county. Industries that have location quotients greater than 1.0 in Los Angeles County are Petroleum, Apparel, Transportation Equipment, Primary Metals, Textile Mills, and Food. The Apparel and Transportation Equipment industries both have high employment, and are more strongly concentrated in Los Angeles County than in the rest of the basin (Appendix Table 3).

⁸ Intra-regional industry concentration is evaluated by calculating location quotients for each industry in each of the eight areas. The location quotients are shown in Appendix Table 3. For a given industry, a location quotient is the ratio of the industry's share of the area's manufacturing employment to the industry's share of South Coast Basin manufacturing employment. Location quotients greater than one show that the industry share of employment in the area is greater than the industry share of employment in the region. Thus, location quotients are helpful in indicating whether or not an industry is over- or underrepresented in a given area, based on employment in the industry relative to employment in the manufacturing sector as a whole.

Table 8**Manufacturing Establishments and Employment
South Coast Basin Areas**

Area	Mfg Estabs	% of Basin	Mfg Empl	% of Basin
Los Angeles County	19312	69.0%	848700	71.6%
<i>Central/Southeast</i>	7387	26.4%	279600	23.6%
<i>South Bay/Long Beach</i>	2898	10.3%	246100	20.8%
<i>San Fernando Valley</i>	3492	12.5%	135400	11.4%
<i>San Gabriel Valley</i>	3600	12.9%	129800	11.0%
<i>Westside/Hollywood/Mid-City</i>	1581	5.6%	44700	3.8%
Orange County	5877	21.0%	238200	20.1%
San Bernardino County	1675	6.0%	59400	5.0%
Riverside County	1141	4.1%	38700	3.3%
SOUTH COAST BASIN	28005		1185000	

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990,
and Database Publishing Service, Southern California Business Directory

Table 9**Manufacturing Industries
Los Angeles County
Ranked by Employment**

SIC	Industry Group	Estabs	Empl	% of Mfg Empl
37	Transportation Equipment	634	185196	21.8%
23	Apparel	3823	99443	11.7%
34	Fabricated Metal Products	1994	70766	8.3%
38	Instruments and Related Products	521	64476	7.6%
36	Electronics and Electronic Equipment	1084	61064	7.2%
27	Printing and Publishing	2745	60151	7.1%
35	Industrial Machinery and Equipment	2574	59062	7.0%
20	Food and Kindred Products	680	47329	5.6%
30	Rubber and Plastics Products	780	34623	4.1%
25	Furniture and Fixtures	883	34404	4.1%
28	Chemicals and Allied Products	595	23608	2.8%
33	Primary Metal Industries	354	19959	2.4%
39	Miscellaneous Manufacturing Industries	937	19936	2.3%
26	Paper and Allied Products	284	16841	2.0%
32	Stone, Clay, and Glass Products	445	16174	1.9%
24	Lumber and Wood Products	541	13518	1.6%
22	Textile Mill Products	268	10958	1.3%
29	Petroleum and Coal Products	70	8004	0.9%
31	Leather and Leather Products	100	3164	0.4%
		19312	848676	

Source: U.S. Department of Commerce, County Business Patterns 1990

Another factor to consider in prioritizing rules is the number of small establishments in an industry. In the county's manufacturing sector, 39% of employees work in establishments with fewer than 100 employees. Nine of the county's manufacturing industry groups have small-establishment employment shares greater than 50%. Of these industries, Apparel, Industrial Machinery, Fabricated Metal Products, and Printing and Publishing are major employers (Table 10).

In Table 11, industries are cross-classified by Percent of Manufacturing Employment and Total Annual Emissions. Industries with a high percentage of employees in small firms are indicated as well. The Fabricated Metal and Printing and Publishing industries are each high employment industries with a high small-establishment employment share, and relatively high annual emissions. Thus, these industries, which are important to the county in terms of employment, are important targets for emissions reduction. They are also more vulnerable than other industries to the costs of implementing air quality rules, given the high concentration of small-establishment employment in each industry. The Industrial Machinery industry has high employment and a high small-establishment employment share, and average annual emissions levels. The Rubber and Plastics industry has average employment, but a high percentage of employment in small firms and high annual emissions. The Chemicals industry has average levels of both emissions and employment, and a high percentage of employees in small firms.

The potential coverage of rules in Los Angeles County is similar to that for the South Coast basin (Table 12). Thirty-six rules cover at least 10,000 employees. In some cases, due to different industry geographies, rules apply to proportionately higher numbers of employees in Los Angeles County than in the South Coast basin. For each rule, a ratio of the potential coverage in the county relative to the basin offers a quick comparison of the relative importance of a particular rule in the county (the Employment Coverage Ratio shown in Table 12). For example, Rule 1124 (Aerospace Assembly and Component Manufacturing Operations) applies to SIC 372, Aircraft and Parts, and SIC 376, Guided Missiles, Space Vehicles, and Parts. Since these industries are concentrated in Los Angeles County, the potential coverage of Rule 1124 as a percentage of county manufacturing employment is greater than its coverage for the basin (the ratio is 1.21). Other rules that have high potential coverage in the county relative to the basin include Rule 1149, Storage Tank Degassing (applying to several chemical and petroleum related industries); Rule 1153, Commercial Bakery Ovens (applying to bakeries); and Rule 1151, Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations (applying to Transportation Equipment as well as auto repair and related services). In each case, the rule covers a higher proportion of employment in the county relative to the basin, due to the greater employment concentration in the county of those industries to which the rule pertains.

Table 10**Employment in Small Establishments
Manufacturing Industries
Los Angeles County**

SIC	Industry	Number of Employees in Small Estabs	Total Employ- ment	% of Employees in Small Estabs
24	Lumber and Wood Products	9678	13518	71.6%
23	Apparel	66599	99443	67.0%
39	Miscellaneous Manufacturing Industries	12956	19936	65.0%
35	Industrial Machinery	35402	59062	59.9%
34	Fabricated Metal Products	39568	70766	55.9%
27	Printing and Publishing	31802	60151	52.9%
28	Chemicals and Allied Products	12240	23608	51.8%
32	Stone, Clay, Glass Products	8380	16174	51.8%
30	Rubber and Plastics Products	17637	34623	50.9%
25	Furniture and Fixtures	17063	34404	49.6%
22	Textile Mill Products	5006	10958	45.7%
26	Paper and Allied Products	6842	16841	40.6%
33	Primary Metals Industries	7995	19959	40.1%
36	Electronics and Electronic Equipment	21739	61064	35.6%
20	Food and Kindred Products	14398	47329	30.4%
29	Petroleum and Coal Products	1232	8004	15.4%
38	Instruments and Related Products	9194	64476	14.3%
37	Transportation Equipment	11969	185196	6.5%
	MANUFACTURING	329700	848676	38.8%

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990

Table 11

**Los Angeles County Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Fabricated Metal* Printing/Publishing*	Transportation Electronics Industrial Machinery*	Instruments
MEDIUM	Rubber and Plastics*	Furniture Chemicals* Primary Metals	Food Miscellaneous*
LOW	Paper Petroleum	Stone, Clay, Glass*	Lumber and Wood* Textiles

* Over 50% of employment in establishments with less than 100 employees

Table 12

AQMD Rules**Ranked by Coverage of Manufacturing Employment in Los Angeles County**

(includes rules covering at least 10,000 manufacturing employees)

Rule	Title	Total Estabs	% of all Manufact. Estabs	Total Employment	% of LA Mfg Empl	Empl Coverage Ratio*
1146.1	NOx from small industrial, instit, & comm boilers, steam generators	19312	98.3%	848676	96.9%	1.00
431.2	Sulfur Content of Liquid Fuels	19312	98.3%	848676	96.9%	1.00
1145	Plastic, Rubber, and Glass Coatings	18562	94.5%	793343	90.6%	1.00
1402	Control of Toxic Air Contaminants from Existing Sources – PROPC	8251	42.0%	498709	56.9%	0.99
1404	Hexavalent Chromium Emissions from Cooling Towers	6901	35.1%	413924	47.3%	1.05
1110.2	Emissions from Gaseous– and Liquid–Fueled Internal Com	8334	42.4%	412113	47.1%	1.12
1171	Solvent Cleaning Operations	6198	31.5%	346472	39.6%	1.05
1134	Emissions of Oxides of Nitrogen From Stationary Gas Turbines	5008	25.5%	341129	38.9%	1.09
1128	Paper, Fabric, and Film Coating Operations	8032	40.9%	267035	30.5%	1.04
1420	Emissions Standard for Lead	3727	19.0%	248963	28.4%	1.05
1122	Solvent Degreasers	6943	35.3%	230787	26.4%	0.92
1169	Hexavalent Chromium–Chrome Plating and Chromic Acid Anodizin	3434	17.5%	201615	23.0%	1.09
1168	Control of Volatile Organic Compound Emissions from Adhesive Ap	6335	32.2%	192032	21.9%	1.05
1151	Motor Vehicle and Mobile Equipment Non–Assembly Line C	634	3.2%	185196	21.1%	1.18
1130.1	Screen Printing Operations	7163	36.5%	183202	20.9%	1.10
1124	Aerospace Assembly and Component Manufacturing Operat	251	1.3%	163802	18.7%	1.21
1175	Control of Emissions from the Manufacture of Polymeric Cellular Prc	2631	13.4%	116266	13.3%	0.90
1146	NOx from ind, instit, & commercial boilers, steam generators, & proi	680	3.5%	47329	5.4%	1.08
1401	New Source Review of Carcinogenic Air Contaminants	946	4.8%	43383	5.0%	0.92
1136	Wood Products Coatings	1026	5.2%	36407	4.2%	0.97
1415	Reduction of chlorofluorocarbon emiss from stationary refrigeration	851	4.3%	35717	4.1%	1.02
1113	Architectural Coatings	1004	5.1%	34128	3.9%	0.95
1410	Hydrogen Fluoride Storage and Use	665	3.4%	31612	3.6%	1.03
TTT	Industrial Surface Coating Plastic Parts for Business Machines	623	3.2%	27312	3.1%	0.78
403.1	Wind Entrainment of Fugitive Dust	515	2.6%	24178	2.8%	0.92
403	Fugitive Dust	515	2.6%	24178	2.8%	0.92
1129	Aerosol Coatings	595	3.0%	23608	2.7%	0.96
1130	Graphic Arts	1479	7.5%	23027	2.6%	0.94
1162	Polyester Resin Operations	571	2.9%	22996	2.6%	0.77
1149	Storage Tank Degassing	321	1.6%	18557	2.1%	1.25
1115	Motor Vehicle Assembly Line Coating Operations	254	1.3%	18281	2.1%	1.04
1405	Control of ethylene oxide & chlorofluorocarbon emissions from steri	266	1.4%	17010	1.9%	0.81
1125	Metal Container, Closure, and Coil Coating Operations	435	2.2%	12436	1.4%	1.01
1107	Coating of Metal Parts and Products	414	2.1%	10559	1.2%	1.00
TT	Standards of Performance for Metal Coil Surface Coating	414	2.1%	10559	1.2%	1.00
1153	Commercial Bakery Ovens	108	0.5%	10545	1.2%	1.20

* For any rule, the Employment Coverage Ratio is the ratio between the potential manufacturing employment coverage of the rule in the county to the potential manufacturing employment coverage of the rule in the South Coast basin.

The manufacturing industry composition was determined for the following areas within Los Angeles County:⁹ (1) Central and Southeast Los Angeles, (2) South Bay and Long Beach, (3) Westside/Hollywood/Mid-City, (4) San Fernando Valley, and (5) San Gabriel Valley. By pointing out differences in industry composition in these area, this section can be used to determine those rules that have the greatest potential coverage in each area.

central and southeast los angeles

This is the manufacturing heartland of the South Coast basin, encompassing the old manufacturing districts in and around downtown Los Angeles, the southeast cities (Vernon, Bell, Bell Gardens, Huntington Park, South Gate), and the south central area (including Compton). While manufacturing employment has dispersed to other parts of Los Angeles County and the other South Coast basin counties in the postwar decades, this area retains 7,200 manufacturing establishments and 279,000 workers, respectively 26% and 24% of the basin totals. In terms of employment, the major industries are Apparel (60,000 employees), Transportation Equipment (35,200), Printing and Publishing (27,000), Food (26,600), Fabricated Metal Products (22,700), Furniture (17,200), and Industrial Machinery (16,100) (Table 13). These industries represent two distinct groups of manufacturers: (1) the aerospace-tied complex of firms in the Transportation Equipment, Fabricated Metal Products, and Industrial Machinery industries, and (2) labor-intensive production in the Apparel, Printing and Publishing, and Furniture industries, which mainly employ immigrant ethnic workers at relatively low wages.

As shown by industry location quotients (Appendix Table 3), the industries that are most highly concentrated in the Central/Southeast area relative to Los Angeles County are Apparel, Textiles, Food, Paper, Petroleum, Primary Metals, and Furniture. While Transportation Equipment is an important employer, its share of the area's manufacturing employment is two-thirds of its share of county manufacturing employment. Other industries with a below-average employment share in the area are Instruments and Electronics.

The Fabricated Metal Products industry combines high employment, high annual emissions, and a high small-establishment employment share, and merits special attention for compliance assistance programs. Industrial Machinery has high employment and small-establishment employment share, and average annual emissions. The Rubber/Plastics and Printing/Publishing industries each have average employment, a high share of employment

⁹ This information was obtained by first tabulating the number of establishments and employees per manufacturing industry for seven sub-regions of Los Angeles County, using the Database Publishing Service (DPS) database. These figures were weighted to conform to county-wide figures published in the County Business Patterns. This was necessary because the DPS database underrepresents small and medium size establishments. The distribution of establishments and employment for each industry in the DPS database was assumed to be representative of the distribution of total industry establishments and employment.

Table 13**Establishments and Employment
Manufacturing Industries
Central and Southeast Los Angeles**

SIC	Industry	Estabs	Employ- ment	% of Manufact. Employ- ment
23	Apparel and Related Products	2279	59900	21.5%
37	Transportation Equipment	141	35200	12.6%
27	Printing and Publishing	758	27000	9.7%
20	Food and Kindred Products	322	26600	9.5%
34	Fabricated Metal Products	753	22700	8.1%
25	Furniture and Fixtures	392	17200	6.2%
35	Industrial Machinery and Equipment	847	16100	5.8%
30	Rubber and Plastics Products	266	10600	3.8%
26	Paper and Allied Products	159	10200	3.7%
33	Primary Metal Industries	194	9400	3.4%
36	Electronics and Electronic Equipment	182	8100	2.9%
28	Chemicals and Allied Products	238	6800	2.4%
32	Stone, Clay, and Glass Products	146	6100	2.2%
39	Miscellaneous Manufacturing Industries	290	5700	2.0%
22	Textile Mill Products	129	5500	2.0%
24	Lumber and Wood Products	182	5300	1.9%
38	Instruments and Related Products	75	3600	1.3%
29	Petroleum and Coal Products	34	3200	1.1%
		7387	279200	

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990, and Database Publishing Service, Southern California Business Directory

in small establishments, and high annual emissions. Other industries with average or above average levels of employment and emissions include Transportation Equipment, Furniture, and Paper (Table 14).

south bay and long beach

The South Bay and Long Beach area stretches from Westchester and LAX in the north to Long Beach in the south. The area's 2,900 manufacturing establishments employ 246,100 workers, 21% of the regional manufacturing workforce. The manufacturing sector is dominated by aerospace manufacturers; the Transportation Equipment industries employ 104,000 workers, 42% of all manufacturing employees in the area. Other important industries include Instruments (27,000 employees), Industrial Machinery (20,000), Electronics (16,000), and Fabricated Metal Products (15,000) (Table 15).

The location quotient for the Transportation Equipment industry is 1.9, representing a high degree of industry concentration (Appendix Table 3). The employment shares of the Instruments and Industrial Machinery industries are also above the regional average. Together these industries incorporate closely-linked production systems, based on large aerospace contractors and including networks of subcontractors that provide machined parts, electronic components, and metal plating services. This entire complex is absorbing defense cutbacks, making the South Bay/Long Beach manufacturing sector one of the most vulnerable in the South Coast Basin to job loss. On the other hand, the area contains some of the largest aerospace corporations in the world, which will remain the pivotal core of the South Bay/Long Beach manufacturing sector. The large average size of manufacturing establishments in the South Bay/Long Beach area (85 workers per establishment) sets it apart from the rest of the basin, in which the average manufacturing establishment employs 42 workers.

The Fabricated Metal Products industry combines high employment, high annual emissions, and a high percentage of employees in small firms (Table 16). Industrial Machinery has the same employment characteristics, with average annual emissions. The Printing/Publishing, and Rubber/Plastics industries have average levels of employment, but high annual emissions and high percentages of employees in small firms. The Transportation Equipment and Electronics industries emit average levels of annual emissions.

westside/hollywood/mid-city

The Westside/Hollywood/Mid-City area is dominated by firms in business services, entertainment, and other non-manufacturing industries. Its relatively small manufacturing sector includes 1,600 establishments that employ close to 45,000 workers, 4% of the regional

Table 14

**Central and Southeast Los Angeles Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Fabricated Metal*	Transportation Furniture Industrial Machinery*	
MEDIUM	Rubber and Plastics* Paper Printing/Publishing*	Primary Metals Electronics	Food
LOW	Petroleum	Chemicals* Stone, Clay, Glass*	Lumber and Wood* Miscellaneous* Textiles Instruments

* Over 50% of employment in establishments with less than 100 employees

Table 15**Establishments and Employment
Manufacturing Industries
South Bay and Long Beach**

SIC	Industry	Estabs	Employ- ment	% of Manufact. Employ- ment
37	Transportation Equipment	121	103500	42.1%
38	Instruments and Related Products	91	26900	10.9%
35	Industrial Machinery and Equipment	534	20400	8.3%
36	Electronics and Electronic Equipment	252	16400	6.7%
34	Fabricated Metal Products	324	15200	6.2%
25	Furniture and Fixtures	133	11200	4.6%
23	Apparel and Related Products	328	9300	3.8%
27	Printing and Publishing	327	8000	3.3%
30	Rubber and Plastics Products	152	7300	3.0%
39	Miscellaneous Manufacturing Industries	155	5400	2.2%
20	Food and Kindred Products	58	5100	2.1%
33	Primary Metal Industries	49	3700	1.5%
28	Chemicals and Allied Products	99	3200	1.3%
24	Lumber and Wood Products	114	3000	1.2%
29	Petroleum and Coal Products	17	2700	1.1%
32	Stone, Clay, and Glass Products	67	2000	0.8%
22	Textile Mill Products	48	1900	0.8%
26	Paper and Allied Products	29	900	0.4%
		2898	246100	

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990, and Database Publishing Service, Southern California Business Directory

Table 16

**South Bay and Long Beach Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Fabricated Metal*	Transportation Industrial Machinery* Electronics	Instruments
MEDIUM	Printing/Publishing* Rubber and Plastics*	Furniture	
LOW	Petroleum Paper	Primary Metals Chemicals* Stone, Clay, Glass*	Miscellaneous* Food Lumber and Wood* Textiles

* Over 50% of employment in establishments with less than 100 employees

manufacturing workforce. Two in every five manufacturing workers in the area is employed in the Electronics and Printing/Publishing industries, which employ 8,700 and 8,500 workers respectively. Other major industries include Apparel (5,600 employees), Transportation Equipment (4,200), and Fabricated Metal Products (Table 17). The employment shares of the Printing/Publishing and Electronics industries are more than double their regional employment shares. Other industries with above average employment shares include Miscellaneous Manufacturing, Chemicals, and Rubber/Plastics (Appendix Table 3).

The Printing and Publishing, Apparel, and Fabricated Metal Products industries have a high percentage of employees in small firms, plus high annual emissions. The Rubber and Plastics industry has an average employment level, a high percentage of employees in small establishments, and high annual emissions. The Electronics and Transportation Equipment industries have average emissions levels (Table 18).

san fernando valley

The San Fernando Valley includes 3,500 manufacturing establishments, employing 135,400 workers (11% of the regional manufacturing workforce). The manufacturing industry structure of the San Fernando Valley is similar to that of the South Bay/Long Beach area. The Transportation Equipment industries are the major manufacturing employer, with 24,200 workers (18% of the area's manufacturing workforce) (Table 19). Like the latter region, the initial development of manufacturing in the San Fernando Valley was based on the establishment of aircraft manufacturing (Lockheed's Burbank complex), with linked suppliers in the machinery, metal products, and electronics industries. In recent decades, a major concentration of electronics and instruments firms, centered around TRW and Rocketdyne, has emerged in the Chatsworth-Canoga Park area. The Instruments industry group employs 17,600 workers, followed by Apparel (16,100), Electronics (14,200), Fabricated Metal Products (13,900), and Industrial Machinery (10,500). Industries with high location quotients include Instruments, Stone/Clay/Glass Products, Chemicals, and Electronics (Appendix Table 3).

The Fabricated Metal Products industry has a high percentage of employees in small firms and high annual emissions (Table 20). The Printing and Publishing industries have average employment levels, but a high small firm employment percentage and high annual emissions. The Industrial Machinery industry also has a high small-firm employment share, with average annual emissions. The Transportation Equipment and Electronics industries have average annual emissions.

Table 17**Establishments and Employment
Manufacturing Industries
Westside, Hollywood, Mid-City**

SIC	Industry	Estabs	Employment	% of Manufact. Employment
36	Electronics and Electronic Equipment	100	8700	19.5%
27	Printing and Publishing	509	8500	19.0%
23	Apparel and Related Products	348	5600	12.5%
37	Transportation Equipment	16	4200	9.4%
34	Fabricated Metal Products	80	3000	6.7%
30	Rubber and Plastics Products	31	2500	5.6%
20	Food and Kindred Products	45	2500	5.6%
28	Chemicals and Allied Products	40	2100	4.7%
39	Miscellaneous Manufacturing Industries	143	2000	4.5%
35	Industrial Machinery and Equipment	112	1900	4.3%
38	Instruments and Related Products	29	1600	3.6%
33	Primary Metal Industries	7	500	1.1%
25	Furniture and Fixtures	50	500	1.1%
24	Lumber and Wood Products	32	500	1.1%
32	Stone, Clay, and Glass Products	23	300	0.7%
22	Textile Mill Products	14	200	0.4%
29	Petroleum and Coal Products	2	100	0.2%
		1581	44700	

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990, and Database Publishing Service, Southern California Business Directory

Table 18

**Westside/Hollywood/Mid-City Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Printing/Publishing* Fabricated Metal*	Electronics Transportation	
MEDIUM	Rubber and Plastics*	Chemicals* Industrial Machinery*	Food Miscellaneous* Instruments
LOW	Petroleum	Primary Metals Furniture Stone, Clay, Glass*	Lumber and Wood* Textiles

* Over 50% of employment in establishments with less than 100 employees

Table 19**Establishments and Employment
Manufacturing Industries
San Fernando Valley**

SIC	Industry	Estabs	Employ- ment	% of Manufact. Employ- ment
37	Transportation Equipment	129	24200	17.9%
38	Instruments and Related Products	169	17600	13.0%
23	Apparel and Related Products	406	16100	11.9%
36	Electronics and Electronic Equipment	340	14200	10.5%
34	Fabricated Metal Products	400	13900	10.3%
35	Industrial Machinery and Equipment	513	10500	7.8%
27	Printing and Publishing	654	7200	5.3%
28	Chemicals and Allied Products	92	5700	4.2%
30	Rubber and Plastics Products	128	5000	3.7%
20	Food and Kindred Products	75	4700	3.5%
39	Miscellaneous Manufacturing Industries	185	4500	3.3%
32	Stone, Clay, and Glass Products	105	4300	3.2%
33	Primary Metal Industries	46	2000	1.5%
25	Furniture and Fixtures	118	1700	1.3%
29	Petroleum and Coal Products	9	1500	1.1%
26	Paper and Allied Products	27	1200	0.9%
24	Lumber and Wood Products	77	800	0.6%
22	Textile Mill Products	19	300	0.2%
		3492	135400	

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990, and Database Publishing Service, Southern California Business Directory

Table 20

**San Fernando Valley Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Fabricated Metal*	Transportation Electronics Industrial Machinery*	Instruments
MEDIUM	Printing/Publishing* Rubber and Plastics*	Chemicals* Stone, Clay, Glass*	Food Miscellaneous*
LOW	Petroleum Paper	Primary Metals Furniture	Lumber and Wood* Textiles

* Over 50% of employment in establishments with less than 100 employees

san gabriel valley

The San Gabriel Valley extends from Pasadena and East Los Angeles in the west to Pomona in the east. This area employs 129,800 workers (11% of the regional manufacturing workforce) in 3,600 manufacturing establishments. The San Gabriel Valley has the most balanced manufacturing sector in the basin, in terms of employment distribution. The four main employers are Fabricated Metal Products (15,500 employees), Transportation Equipment (14,400), Instruments (14,200), and Electronics (12,500) (Table 21). Other important industries include Industrial Machinery (8600 employees), Apparel (8500 employees), Rubber and Plastics (8300 employees), and Printing and Publishing (8300 workers). Several industries have significantly higher employment shares in the San Gabriel Valley than in the basin, including Textiles, Paper, Primary Metals, Chemicals, and Lumber. (Appendix Table 3).

Four industries have high employment shares, a high percentage of employees in small establishments, and high annual emissions: Fabricated Metal Products, Apparel, Rubber and Plastics, and Printing and Publishing (Table 22). Industrial Machinery shares their employment levels, and has average annual emissions. The Paper and Allied Products industry has average employment and high emissions. The Transportation Equipment and Electronics industries have average annual emissions.

Orange County

In the postwar era Orange County has developed into a major center of high technology industries. The county has 5,900 manufacturing establishments employing 238,200 workers, 20% of the regional manufacturing workforce. The main employers are Instruments (38,300), Electronics (33,800), Industrial Machinery (mostly computers) (29,800), Fabricated Metal Products (22,400), Printing and Publishing (19,200), Rubber and Plastics (19,000), and Transportation Equipment (18,400 employees) (Table 23). Industries with high location quotients include Instruments, Electronics, Industrial Machinery, and Rubber and Plastics (Appendix Table 3). Industries that are significantly underrepresented in the region include Apparel, Transportation Equipment, Primary Metal, Stone/Clay/Glass, Food, and Lumber. Note that although the Transportation Equipment industry is an important employer, its manufacturing employment share is well below the regional average. Orange County is distinguished by a well-developed high technology sector not dominated by aircraft and aerospace manufacturers; this may make it more resilient to employment reductions stemming from defense cutbacks.

The Fabricated Metal Products and Printing/Publishing industries have high small-establishment employment shares and high annual emissions (Tables 24 and 25). The Rubber and Plastics industry also has high emissions, but fewer employees in small establishments. Industrial Machinery has average annual emissions and a high percentage of employees in small establishments. The Electronics and Transportation Equipment industries have average emissions levels and relatively low levels of small firm employment.

Table 21**Establishments and Employment
Manufacturing Industries
San Gabriel Valley**

SIC	Industry	Estabs	Employ- ment	% of Manufact. Employ- ment
34	Fabricated Metal Products	422	15500	11.9%
37	Transportation Equipment	90	14400	11.1%
38	Instruments and Related Products	146	14200	10.9%
36	Electronics and Electronic Equipment	187	12500	9.6%
35	Industrial Machinery and Equipment	551	8600	6.6%
23	Apparel and Related Products	463	8500	6.5%
30	Rubber and Plastics Products	194	8300	6.4%
20	Food and Kindred Products	178	8300	6.4%
27	Printing and Publishing	477	8300	6.4%
28	Chemicals and Allied Products	120	5600	4.3%
26	Paper and Allied Products	65	4600	3.5%
33	Primary Metal Industries	56	4300	3.3%
25	Furniture and Fixtures	192	3800	2.9%
24	Lumber and Wood Products	137	3800	2.9%
32	Stone, Clay, and Glass Products	102	3500	2.7%
22	Textile Mill Products	53	2800	2.2%
39	Miscellaneous Manufacturing Industries	160	2300	1.8%
29	Petroleum and Coal Products	7	500	0.4%
		3600	129800	

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990, and Database Publishing Service, Southern California Business Directory

Table 22

**San Gabriel Valley Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Fabricated Metal* Rubber and Plastics* Printing/Publishing*	Transportation Electronics Industrial Machinery*	Instruments Food
MEDIUM	Paper	Chemicals* Primary Metals	
LOW	Petroleum	Furniture Stone, Clay, Glass*	Lumber and Wood* Textiles Miscellaneous*

* Over 50% of employment in establishments with less than 100 employees

Table 23**Manufacturing Industries
Orange County
Ranked by Employment**

SIC	Industry	Estabs	Empl	% of Mfg Empl
38	Instruments and Related Products	303	38326	16.1%
36	Electronics and Electronic Equipment	554	33844	14.2%
35	Industrial Machinery and Equipment	1067	29805	12.5%
34	Fabricated Metal Products	603	22391	9.4%
27	Printing and Publishing	1005	19219	8.1%
30	Rubber and Plastics Products	349	18981	8.0%
37	Transportation Equipment	209	18416	7.7%
25	Furniture and Fixtures	196	9552	4.0%
28	Chemicals and Allied Products	1754	9348	3.9%
20	Food and Kindred Products	151	8703	3.7%
23	Apparel	417	7333	3.1%
26	Paper and Allied Products	64	4651	2.0%
39	Miscellaneous Manufacturing Industries	292	4562	1.9%
32	Stone, Clay, and Glass Products	157	3795	1.6%
24	Lumber and Wood Products	189	3514	1.5%
22	Textile Mill Products	47	2614	1.1%
33	Primary Metal Industries	71	2552	1.1%
31	Leather and Leather Products	14	406	0.2%
29	Petroleum and Coal Products	15	162	0.1%
		7457	238174	

Source: U.S. Department of Commerce, County Business Patterns 1990

Table 24**Employment in Small Establishments
Manufacturing Industries
Orange County**

SIC	Industry	Number of Employees in Small Estabs	Total Employ- ment	% of Employees in Small Estabs
29	Petroleum and Coal Products	149	162	92.0%
39	Miscellaneous Manufacturing Industries	3894	4562	85.4%
24	Lumber and Wood Products	2786	3514	79.3%
32	Stone, Clay, Glass Products	2714	3795	71.5%
23	Apparel	5062	7333	69.0%
33	Primary Metals Industries	1424	2552	55.8%
27	Printing and Publishing	10631	19219	55.3%
34	Fabricated Metal Products	11585	22391	51.7%
35	Industrial Machinery	14361	29805	48.2%
30	Rubber and Plastics Products	7438	18981	39.2%
25	Furniture and Fixtures	3741	9552	39.2%
26	Paper and Allied Products	1702	4651	36.6%
36	Electronics and Electronic Equipment	11955	33844	35.3%
28	Chemicals and Allied Products	3170	9348	33.9%
22	Textile Mill Products	841	2614	32.2%
20	Food and Kindred Products	2648	8703	30.4%
37	Transportation Equipment	3724	18416	20.2%
38	Instruments and Related Products	6184	38326	16.1%
	MANUFACTURING	94009	238174	39.5%

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990

Table 25

**Orange County Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Fabricated Metal* Printing/Publishing* Rubber and Plastics	Electronics Industrial Machinery* Transportation	Instruments
MEDIUM	Paper	Furniture Chemicals	Food Miscellaneous*
LOW	Petroleum*	Stone, Clay, Glass* Primary Metals*	Lumber and Wood* Textiles

* Over 50% of employment in establishments with less than 100 employees

establishments. Industrial Machinery has average annual emissions and a high percentage of employees in small establishments. The Electronics and Transportation Equipment industries have average emissions levels and relatively low levels of small firm employment. The Paper industry has average total employment and high annual emissions, with fewer employees in small establishments.

Table 26 shows the potential establishment and employment coverage of air quality rules in Orange County. A total of 28 rules apply to at least 5,000 employees. A few rules stand out as more important in Orange County than in the region as a whole, as they potentially cover a significantly higher percentage of manufacturing employment. These include Rule 1122 (Solvent Degreasers), which applies to the metal, machinery, and electronics industries; Rule TTT (Industrial Surface Coating of Parts for Business Machines), which affects the Miscellaneous Plastics Products industry (SIC 308); Rule 1162 (Polyester Resin Operations), applying to the plastics, boat building, and sporting goods industries; Rule 1405 (Control of Ethylene Oxide and CFC Emissions), applying to the food and medical instruments industries; and Rule 1129 (Aerosol Coatings), applying to the Chemicals industries.

Riverside County

Riverside County has the smallest manufacturing employment of the eight South Coast Basin areas delineated in this report, with 1,100 establishments and 38,700 employees (3% of regional manufacturing employment). However, manufacturing employment in Riverside County is expected to grow as companies seek lower land rents and access to fast-growing suburban labor forces. The manufacturing sector is relatively balanced, with the major employers being Transportation Equipment (5,800 employees), Printing and Publishing (5,100), Fabricated Metal Products (3,800), Electronics (3,400), Lumber and Wood (3,400), Rubber and Plastics (3,200), and Stone, Clay and Glass Products (3,100) (Table 27). The manufacturing employment shares of the Lumber/Wood and Stone/Clay/Glass industries are well above the regional average, while the employment shares of the Apparel, Industrial Machinery, Chemicals, and Instruments industries are significantly below the regional average (Appendix Table 3).

The Fabricated Metal and Rubber and Plastics industries combine high employment shares, a high percentage of employees in small establishments, and high annual emissions (Tables 28 and 29). The Printing and Publishing industries have fewer employees in small establishments, plus high annual emissions. The Stone, Clay and Glass industry has a high percentage of employees in small establishments, and average annual emissions levels (however, this industry has high emissions per employee). Most workers in the Transportation Equipment and Electronics industries are employed in large establishments.

Table 26

AQMD Rules**Ranked by Coverage of Manufacturing Employment in Orange County**

(includes rules covering at least 5,000 manufacturing employees)

Rule	Title	Total Estabs	% of all Manufact. Estabs	Total Employment	% of Orange Co. Mfg Empl	Coverage Ratio*
1146.1	NOx from small industrial, instit, & comm boilers, steam generators	5877	98.1%	238174	95.3%	0.99
431.2	Sulfur Content of Liquid Fuels	5877	98.1%	238174	95.3%	0.99
1145	Plastic, Rubber, and Glass Coatings	5711	95.3%	229309	91.7%	1.01
1402	Control of Toxic Air Contaminants from Existing Sources – PROPC	3012	50.3%	148427	59.4%	1.03
1122	Solvent Degreasers	2587	43.2%	93154	37.3%	1.30
1404	Hexavalent Chromium Emissions from Cooling Towers	2290	38.2%	91377	36.6%	0.82
1110.2	Emissions from Gaseous– and Liquid–Fueled Internal Combustion	2017	33.7%	72267	28.9%	0.69
1171	Solvent Cleaning Operations	2070	34.6%	68191	27.3%	0.73
1128	Paper, Fabric, and Film Coating Operations	1676	28.0%	65522	26.2%	0.89
1134	Emissions of Oxides of Nitrogen From Stationary Gas Turbines	1618	27.0%	60499	24.2%	0.68
1420	Emissions Standard for Lead	1124	18.8%	50823	20.3%	0.75
1169	Hexavalent Chromium–Chrome Plating and Chromic Acid Anodizing	1295	21.6%	42924	17.2%	0.81
1168	Control of Volatile Organic Compound Emissions from Adhesive Ap	1260	21.0%	42775	17.1%	0.82
1175	Control of Emissions from the Manufacture of Polymeric Cellular Pro	994	16.6%	37908	15.2%	1.03
1130.1	Screen Printing Operations	1596	26.6%	35900	14.4%	0.76
1151	Motor Vehicle and Mobile Equipment Non–Assembly Line Coating	209	3.5%	18416	7.4%	0.41
1401	New Source Review of Carcinogenic Air Contaminants	265	4.4%	16000	6.4%	1.19
TTT	Industrial Surface Coating Plastic Parts for Business Machin	296	4.9%	15016	6.0%	1.50
1124	Aerospace Assembly and Component Manufacturing Operations	68	1.1%	14310	5.7%	0.37
1162	Polyester Resin Operations	305	5.1%	13290	5.3%	1.56
1113	Architectural Coatings	280	4.7%	12232	4.9%	1.19
1415	Reduction of chlorofluorocarbon emissions from stationary refrigeration	249	4.2%	10492	4.2%	1.05
1136	Wood Products Coatings	251	4.2%	10342	4.1%	0.96
1405	Control of ethylene oxide & chlorofluorocarbon emissions fr	141	2.4%	9858	3.9%	1.64
1410	Hydrogen Fluoride Storage and Use	189	3.2%	9510	3.8%	1.09
1129	Aerosol Coatings	174	2.9%	9348	3.7%	1.34
1146	NOx from ind, instit, & commercial boilers, steam generators, & pro	151	2.5%	8703	3.5%	0.70
1130	Graphic Arts	564	9.4%	7897	3.2%	1.13

* For any rule, the Employment Coverage Ratio is the ratio between the potential manufacturing employment coverage of the rule in the county to the potential manufacturing employment coverage of the rule in the South Coast basin.

Table 27**Manufacturing Industries
Riverside County
Ranked by Employment**

SIC	Industry	Estabs	Empl	% of Mfg Empl
37	Transportation Equipment	64	5846	15.1%
27	Printing and Publishing	182	5064	13.1%
34	Fabricated Metal Products	124	3775	9.7%
36	Electronics and Electronic Equipment	59	3449	8.9%
24	Lumber and Wood Products	90	3389	8.8%
30	Rubber and Plastics Products	73	3196	8.3%
32	Stone, Clay, and Glass Products	89	3097	8.0%
38	Instruments	37	2013	5.2%
35	Industrial Machinery and Equipment	163	1663	4.3%
20	Food and Kindred Products	37	1491	3.9%
25	Furniture and Fixtures	49	1339	3.5%
39	Miscellaneous Manufacturing Industries	59	1262	3.3%
33	Primary Metal Industries	20	959	2.5%
23	Apparel	48	773	2.0%
26	Paper and Allied Products	12	731	1.9%
28	Chemicals and Allied Products	35	671	1.7%
31	Leather and Leather Products	0	0	0.0%
22	Textile Mill Products	0	0	0.0%
29	Petroleum and Coal Products	0	0	0.0%
		1141	38718	

Source: U.S. Department of Commerce, County Business Patterns 1990

Table 28

**Employment in Small Establishments
Manufacturing Industries
Riverside County**

SIC	Industry	Number of Employees in Small Estabs	Total Employ- ment	% of Employees in Small Estabs
35	Industrial Machinery	1392	1663	83.7%
23	Apparel	510	773	66.0%
32	Stone, Clay, Glass Products	1818	3097	58.7%
25	Furniture and Fixtures	704	1339	52.6%
34	Fabricated Metal Products	1927	3775	51.0%
30	Rubber and Plastics Products	1579	3196	49.4%
39	Miscellaneous Manufacturing Industries	576	1262	45.6%
20	Food and Kindred Products	677	1491	45.4%
33	Primary Metals Industries	423	959	44.1%
26	Paper and Allied Products	284	731	38.9%
27	Printing and Publishing	1884	5064	37.2%
24	Lumber and Wood Products	1128	3389	33.3%
36	Electronics and Electronic Equipment	907	3449	26.3%
37	Transportation Equipment	1390	5846	23.8%
28	Chemicals and Allied Products	152	671	22.7%
38	Instruments and Related Products	451	2013	22.4%
	MANUFACTURING	15802	38718	40.8%

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990

Table 29

**Riverside County Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Printing/Publishing Fabricated Metal* Rubber and Plastics*	Transportation Electronics Stone, Clay, Glass*	Lumber and Wood
MEDIUM		Industrial Machinery* Furniture*	Instruments Food Miscellaneous
LOW	Paper	Primary Metals Chemicals	

* Over 50% of employment in establishments with less than 100 employees

Twenty-nine air quality rules have a potential coverage of 1,000 workers or more (Table 30). Rules that cover a significantly higher share of manufacturing employees in the county relative to the region include Rule 1171 (Solvent Cleaning Operations), which applies to the Lumber and Wood industries among others; Rule 1175 (Control of Emissions from Polymeric Cellular Products), covering numerous manufacturing industries, of which Concrete, Gypsum, and Plaster Products (SIC 327) is a major employer in the county; and Rules 403 (Fugitive Dust) and 403.1 (Wind Entrainment from Fugitive Dust), which apply to the Stone, Clay and Glass industries.

San Bernardino County

San Bernardino County is home to 1,700 manufacturing establishments, with 59,400 workers (5% of regional manufacturing employment). The major employers are Transportation Equipment (10,400), Fabricated Metal Products (7,700), Stone, Clay and Glass Products (5,700), Rubber and Plastics (4,900), Lumber and Wood (4,200), and Food (4,100) (Table 31). As in Riverside County, the Stone/Clay/Glass and Lumber/Wood industries are overrepresented in the county (Appendix Table 3). Other industries with high employment shares relative to the region include Primary Metals, Paper, Rubber and Plastics, and Fabricated Metal Products. Industries with relatively low employment shares include Instruments, Apparel, Electronics, Industrial Machinery, and Chemicals.

The Fabricated Metal Products and Rubber and Plastics industries have high small-establishment employment shares and high annual emissions (Tables 32 and 33). The Transportation Equipment and Stone/Clay/Glass industries have fewer employees in small establishments, and average annual emissions. The Printing and Publishing and Apparel industries have average employment and high emissions.

Twenty-nine rules have a potential coverage of at least 1,000 employees (Table 34). Rules that are significantly more important in San Bernardino County than in the region, based on percentage of employees covered, include Rules 1420 (Emissions Standards from Lead), 403 (Fugitive Dust) and 403.1 (Wind Entrainment of Fugitive Dust (403.1), covering Stone, Clay, and Glass among other industries; Rule 1175 (Control of Emissions from Polymeric Cellular Products), which applies to the Concrete, Gypsum, and Plaster Products industry among others; Rule 1401 (New Source Review of Carcinogenic Air Contaminants), applying to numerous industries, including various Paper, Chemical, and Stone/Clay/Glass industries; Rule 1136 (Wood Products Coatings), Rule TTT (Industrial Surface Coating of Parts for Business Machines), Rule 1162 (Polyester Resin Operations), applying to plastics industries; and Rule 1115 (Motor Vehicle Assembly Line Coating Operations).

Table 30

AQMD Rules**Ranked by Coverage of Manufacturing Employment in Riverside County**

(includes rules covering at least 1,000 employees)

Rule	Title	Total Estabs	% of all Manufact. Estabs	Total Employment	% of RV County Mfg Empl	Coverage Ratio*
431.2	Sulfur Content of Liquid Fuels	1141	96.9%	38718	95.2%	0.99
1146.1	NOx from small industrial, instit, & comm boilers, steam generators	1141	96.9%	38718	95.2%	0.99
1145	Plastic, Rubber, and Glass Coatings	1104	93.8%	37227	91.5%	1.01
1402	Control of Toxic Air Contaminants from Existing Sources – PROPC	617	52.4%	21951	54.0%	0.94
1171	Solvent Cleaning Operations	452	38.4%	18805	46.2%	1.23
1404	Hexavalent Chromium Emissions from Cooling Towers	443	37.6%	14405	35.4%	0.79
1134	Emissions of Oxides of Nitrogen From Stationary Gas Turbines	330	28.0%	13803	33.9%	0.95
1420	Emissions Standard for Lead	280	23.8%	12326	30.3%	1.11
1122	Solvent Degreasers	425	36.1%	11108	27.3%	0.95
1110.2	Emissions from Gaseous— and Liquid—Fueled Internal Combustion	342	29.1%	10643	26.2%	0.62
1175	Control of Emissions from the Manufacture of Polymeric Cel	252	21.4%	9972	24.5%	1.67
1128	Paper, Fabric, and Film Coating Operations	306	26.0%	9814	24.1%	0.82
1168	Control of Volatile Organic Compound Emissions from Adhesive Ap	235	20.0%	7099	17.5%	0.84
1113	Architectural Coatings	35	3.0%	6761	16.6%	4.06
1130.1	Screen Printing Operations	265	22.5%	6508	16.0%	0.84
1169	Hexavalent Chromium—Chrome Plating and Chromic Acid Anodizin	188	16.0%	6257	15.4%	0.73
1151	Motor Vehicle and Mobile Equipment Non—Assembly Line Coating	64	5.4%	5846	14.4%	0.80
1124	Aerospace Assembly and Component Manufacturing Operations	7	0.6%	3750	9.2%	0.60
403	Fugitive Dust	89	7.6%	3097	7.6%	2.54
403.1	Wind Entrainment of Fugitive Dust	89	7.6%	3097	7.6%	2.54
TTT	Industrial Surface Coating Plastic Parts for Business Machin	59	5.0%	3010	7.4%	1.85
1136	Wood Products Coatings	87	7.4%	2476	6.1%	1.42
1115	Motor Vehicle Assembly Line Coating Operations	27	2.3%	2156	5.3%	2.65
1162	Polyester Resin Operations	61	5.2%	1905	4.7%	1.38
1130	Graphic Arts	88	7.5%	1905	4.7%	1.67
1405	Control of ethylene oxide & chlorofluorocarbon emissions fr	23	2.0%	1849	4.5%	1.89
1401	New Source Review of Carcinogenic Air Contaminants	50	4.2%	1538	3.8%	0.70
1146	NOx from ind, instit, & commercial boilers, steam generators, & proi	37	3.1%	1491	3.7%	0.73
1415	Reduction of chlorofluorocarbon emiss from stationary refrigeration	47	4.0%	1106	2.7%	0.68

* For any rule, the Employment Coverage Ratio is the ratio between the potential manufacturing employment coverage of the rule in the county to the potential manufacturing employment coverage of the rule in the South Coast basin.

Table 31**Manufacturing Industries
San Bernardino County
Ranked by Employment**

SIC	Industry	Estabs	Empl	% of Mfg Empl
37	Transportation Equipment	89	10370	17.5%
34	Fabricated Metal Products	237	7672	12.9%
32	Stone, Clay, and Glass Products	113	5646	9.5%
30	Rubber and Plastics Products	115	4910	8.3%
24	Lumber and Wood Products	128	4184	7.0%
20	Food and Kindred Products	82	4114	6.9%
27	Printing and Publishing	196	3739	6.3%
35	Industrial Machinery and Equipment	250	3217	5.4%
25	Furniture and Fixtures	82	2789	4.7%
33	Primary Metal Industries	31	2463	4.1%
36	Electronics and Electronic Equipment	68	2216	3.7%
23	Apparel	73	2159	3.6%
39	Miscellaneous Manufacturing Industries	63	1750	2.9%
28	Chemicals and Allied Products	60	1297	2.2%
26	Paper and Allied Products	23	997	1.7%
38	Instruments and Related Products	38	970	1.6%
31	Leather and Leather Products	4	375	0.6%
29	Petroleum and Coal Products	16	338	0.6%
22	Textile Mill Products	7	175	0.3%
		1675	59381	

Source: U.S. Department of Commerce, County Business Patterns 1990

Table 32**Employment in Small Establishments
Manufacturing Industries
San Bernardino County**

SIC	Industry	Number of Employees in Small Estabs	Total Employ- ment	% of Employees in Small Estabs
28	Chemicals and Allied Products	1297	1297	100.0%
35	Industrial Machinery	3119	3217	97.0%
26	Paper and Allied Products	640	997	64.2%
34	Fabricated Metal Products	4887	7672	63.7%
38	Instruments and Related Products	577	970	59.5%
30	Rubber and Plastics Products	2859	4910	58.2%
24	Lumber and Wood Products	2399	4184	57.3%
29	Petroleum and Coal Products	193	338	57.1%
36	Electronics and Electronic Equipment	1218	2216	55.0%
27	Printing and Publishing	1879	3739	50.3%
25	Furniture and Fixtures	1365	2789	48.9%
39	Miscellaneous Manufacturing Industries	796	1750	45.5%
23	Apparel	932	2159	43.2%
20	Food and Kindred Products	1749	4114	42.5%
32	Stone, Clay, Glass Products	2330	5646	41.3%
33	Primary Metals Industries	718	2463	29.2%
37	Transportation Equipment	1993	10370	19.2%
22	Textile Mill Products	25	175	14.3%
	MANUFACTURING	28976	59381	48.8%

Source: Derived from U.S. Department of Commerce, County Business Patterns 1990

Table 33

**San Bernardino County Manufacturing Industries
Classified by Percent of Manufacturing Employment and
Total Annual Emissions**

Percent of Manufacturing Employment	Total Annual Emissions		
	HIGH	MEDIUM	LOW
HIGH	Fabricated Metal* Rubber and Plastics*	Transportation Stone, Clay, Glass	Lumber and Wood* Food
MEDIUM	Printing/Publishing	Industrial Machinery* Furniture Primary Metals Electronics*	
LOW	Paper* Petroleum*	Chemicals*	Miscellaneous Instruments* Textiles

* Over 50% of employment in establishments with less than 100 employees

Table 34

AQMD Rules**Ranked by Coverage of Employment in San Bernardino County**

(includes rules covering at least 1,000 employees)

Rule	Title	Total Estabs	% of all Manufact. Estabs	Total Employment	% of SB County Mfg Empl	Coverage Ratio*
1146.1	NOx from small industrial, instit, & comm boilers, steam generators	1675	98.6%	59381	99.5%	1.03
431.2	Sulfur Content of Liquid Fuels	1675	98.6%	59381	99.5%	1.03
1145	Plastic, Rubber, and Glass Coatings	1577	92.9%	54929	92.0%	1.01
1402	Control of Toxic Air Contaminants from Existing Sources -	972	57.2%	37880	63.4%	1.10
1404	Hexavalent Chromium Emissions from Cooling Towers	765	45.1%	29471	49.4%	1.10
1171	Solvent Cleaning Operations	673	39.6%	26962	45.2%	1.20
1420	Emissions Standard for Lead	463	27.3%	21217	35.5%	1.31
1134	Emissions of Oxides of Nitrogen From Stationary Gas Turbines	466	27.4%	20855	34.9%	0.98
1110.2	Emissions from Gaseous- and Liquid-Fueled Internal Combustion	542	31.9%	20841	34.9%	0.83
1128	Paper, Fabric, and Film Coating Operations	537	31.6%	18702	31.3%	1.07
1122	Solvent Degreasers	649	38.2%	17318	29.0%	1.01
1175	Control of Emissions from the Manufacture of Polymeric Cel	394	23.2%	15954	26.7%	1.82
1168	Control of Volatile Organic Compound Emissions from Adhesive Ap	373	22.0%	12904	21.6%	1.04
1151	Motor Vehicle and Mobile Equipment Non-Assembly Line Coating	89	5.2%	10370	17.4%	0.97
1169	Hexavalent Chromium-Chrome Plating and Chromic Acid Anodizin	309	18.2%	8948	15.0%	0.71
1124	Aerospace Assembly and Component Manufacturing Operations	17	1.0%	7500	12.6%	0.82
1130.1	Screen Printing Operations	329	19.4%	7195	12.1%	0.63
403	Fugitive Dust	129	7.6%	5984	10.0%	3.34
403.1	Wind Entrainment of Fugitive Dust	129	7.6%	5984	10.0%	3.34
1401	New Source Review of Carcinogenic Air Contaminants	104	6.1%	4804	8.0%	1.49
1146	NOx from ind, instit, & commercial boilers, steam generators	82	4.8%	4114	6.9%	1.38
1136	Wood Products Coatings	125	7.4%	3822	6.4%	1.49
TTT	Industrial Surface Coating Plastic Parts for Business Machin	93	5.5%	3767	6.3%	1.58
1162	Polyester Resin Operations	75	4.4%	3054	5.1%	1.50
1115	Motor Vehicle Assembly Line Coating Operations	52	3.1%	2782	4.7%	2.33
1415	Reduction of chlorofluorocarbon emiss from stationary refrigeration	95	5.6%	2086	3.5%	0.87
1113	Architectural Coatings	84	4.9%	2028	3.4%	0.83
1410	Hydrogen Fluoride Storage and Use	76	4.5%	1635	2.7%	0.78
1129	Aerosol Coatings	60	3.5%	1297	2.2%	0.78

* For any rule, the Employment Coverage Ratio is the ratio between the potential manufacturing employment coverage of the rule in the county to the potential manufacturing employment coverage of the rule in the South Coast basin.

Summary

Intra-regional differences in industry location are important considerations in developing a compliance assistance plan. For example, two of the most important industries for targeting compliance assistance are Fabricated Metal Products and Printing and Publishing. Both of these industries are major employers in the basin, have a high percentage of employees in small establishments, and account for a significant share of regulated emissions. The geographical distribution of employment and establishments in the Fabricated Metal Products industry is shown below:

FABRICATED METAL PRODUCTS

Area	Estabs.	Empl.	% of Mfg. Empl.	Rank within Area
Central/Southeast LA	753	22,700	8.1%	5
South Bay/Long Beach	324	15,200	6.2	5
Westside	80	3,000	6.7	5
San Gabriel Valley	422	15,500	11.9	1
San Fernando Valley	400	13,900	10.3	5
Orange County	603	22,400	9.4	4
Riverside County	124	3,800	9.7	3
San Bernardino County	237	7,700	12.9	2
SOUTH COAST BASIN	2958	104,600	8.9	4

With respect to the relative share of employment in each area, Fabricated Metal Products establishments are well-distributed throughout the basin, and the industry is one of the top five manufacturing employers in each area. Most of the employment is found in the five major manufacturing areas of the basin: Central/Southeast Los Angeles, South Bay/Long Beach, San Fernando Valley, San Gabriel Valley, and Orange County. At the same time, the industry's manufacturing employment *share* is highest in San Bernardino County and the San Gabriel Valley, and lowest in South Bay/Long Beach and the Westside.

The distribution of employment and establishments in the Printing and Publishing industry shows a greater geographical concentration within the basin:

PRINTING AND PUBLISHING

Area	Estabs.	Empl.	% of Mfg. Empl.	Rank within Area
Central/Southeast LA	758	27,000	9.7%	3
South Bay/Long Beach	327	8,000	3.3	8
Westside	509	8,500	19.0	2
San Gabriel Valley	477	8,300	6.4	9
San Fernando Valley	654	7,200	5.3	7
Orange County	1005	19,200	8.1	5
Riverside County	182	5,100	13.1	2
San Bernardino County	196	3,700	6.3	7
SOUTH COAST BASIN	4128	88,200	7.5	7

Most of the industry's employment is in Central/Southeast Los Angeles and Orange County. In terms of relative employment, the industry is one of the top three manufacturing employers in Central/Southeast Los Angeles, Westside/Hollywood/Mid-City, and Riverside County. Employment shares in the Westside area and Riverside County are well above the regional employment share: nearly 1 in 5 manufacturing workers in the Westside area, and 1 in 8 Riverside County manufacturing workers are employed in Printing and Publishing. On the other hand, Printing and Publishing is a relatively minor employer in the South Bay/Long Beach area. It is important to take into account both absolute and relative employment shares in targeting assistance to establishments. Although Central/Southeast Los Angeles and Orange County are the major employment centers for the industry, the industry is one of the most important manufacturing employers in the Westside area and Riverside County.

Likewise, employment shares vary widely for the Stone, Clay, and Glass industries:

STONE, CLAY, AND GLASS PRODUCTS

Area	Estabs.	Empl.	% of Mfg. Empl.	Rank
Central/Southeast LA	146	6,100	2.2%	13
South Bay/Long Beach	67	2,000	0.8	16
Westside	23	300	0.7	15
San Gabriel Valley	102	3,500	2.7	15
San Fernando Valley	105	4,300	3.2	12
Orange County	157	3,800	1.6	14
Riverside County	89	3,100	8.0	7
San Bernardino County	113	5,600	9.5	3
SOUTH COAST BASIN	804	28,700	2.4	12

While employment in the Stone, Clay, and Glass Products industries is distributed throughout the basin, it represents a much larger share of manufacturing employment in Riverside and San Bernardino counties than in the rest of the basin. Almost 1 in every 10 manufacturing employees in San Bernardino County works in this industry, compared to less than 1 in 100 employees in South Bay/Long Beach. In relative terms, air quality regulations covering this industry are more relevant to San Bernardino and Riverside counties than they are to the rest of the basin.

4. SUMMARY AND RECOMMENDATIONS

The goal of this report is to provide information on the industry composition of the South Coast basin and areas within the basin, and the potential coverage of employment and establishments by AQMD rules, in order to prioritize industries for compliance assistance. Industries were evaluated on the basis of total employment, percentage of employment in small establishments, regional employment concentration, and total emissions. It was assumed that industries ranking high on one or more of these dimensions in a given area are high priorities for receiving assistance in complying with AQMD regulations.

Using these criteria, nine manufacturing industries in the basin combine average or above average employment levels, percentage of employees in small establishments, and annual emissions: Fabricated Metal Products, Printing and Publishing, Industrial Machinery, Stone/Clay/Glass Products, Rubber and Plastics, Paper, Chemicals, Primary Metals, and Furniture. Firms in these industries are important priorities for providing compliance assistance. Assistance should be targeted especially for firms in the Fabricated Metal Products and Printing and Publishing industries, which share high employment, a high percentage of employees in small establishments, and high annual emissions. Industrial Machinery has high employment and a high percentage of employees in small firms, but lower emissions levels than is the case for Fabricated Metals and Printing and Publishing. The Stone, Clay and Glass industries have a high percentage of employees in small establishments, and a high ratio of emissions to employees. Rubber/Plastics and Paper have high annual emissions levels, while Chemicals has a high total of emissions per employee. The Furniture industry is squarely in the middle of each of these categories.

The Transportation Equipment and Electronics industries are major employers; however, their annual emissions are average, and employment is concentrated in large firms, making these industries less vulnerable to the costs of compliance than industries with a high small-establishment employment share. The Petroleum industry is the major source of manufacturing emissions, but employs less than 9,000 workers in the region. The Instruments and Food industries are important employers, with very low annual emissions. (Note that the Apparel industry is a major employer, based on small establishments; however, emissions data for Apparel establishments is insufficient to support conclusions). Based on the employment and emissions criteria, then, these industries are less likely to face difficulties in complying with air quality regulations.

Intra-regional differences in manufacturing employment totals and the industry composition of employment are important factors to consider in targeting firms for compliance assistance. For example, close to two-thirds of the region's manufacturing employment is located in Central/Southeast Los Angeles, South Bay/Long Beach, and Orange County. In Central/Southeast Los Angeles, Apparel is the major manufacturing employer (22% of employment). Of the other industries, the Printing and Publishing, Fabricated Metal Products, Furniture, and Industrial Machinery industries are major employers and "high-priority" industries for providing compliance assistance. The picture is somewhat different in the South Bay/Long Beach area, whose manufacturing sector is dominated by large Transportation Equipment (aerospace) and Instruments manufacturers that are less likely to face compliance problems, due to their size and lower emissions. The main high-priority industries in this area are Industrial Machinery and Fabricated Metal Products. In Orange

County, the Instruments and Electronics industries are the major manufacturing employers, although several high-priority industries are important employers, including Industrial Machinery, Fabricated Metal Products, and Printing and Publishing.

The San Fernando and San Gabriel valleys together employ just over 22% of the region's manufacturing employees. In both areas, the Fabricated Metal Products and Industrial Machinery industries are important employers. In the three areas with low absolute levels of manufacturing employment, Westside/Hollywood/Mid-City, Riverside County, and San Bernardino County, the industry composition of employment is important to consider. Thus the Printing and Publishing industry is important within the Westside area, while the Stone, Clay, and Glass industries are significantly more important in Riverside and San Bernardino counties than they are in any other part of the basin.

This report provides general information that is useful in targeting industries for compliance assistance in the South Coast basin, and constituent areas. However, the quality of compliance assistance could be improved with detailed information regarding the implementation of specific air quality regulations. For example, what firms in an industry are actually covered by a particular rule? Of these firms, how many are in compliance with the rule? How are firms adapting manufacturing processes to comply with the air quality rule? What are the most cost-effective processes and compliance technologies being implemented? What difficulties are firms facing in complying with the rule?

An effective way to obtain this information is through selective industry surveys. For example, the Fabricated Metal Products industries are high priority for compliance assistance, due to their high total and small firm employment, and high annual emissions. An analysis of firms in the Fabricated Metal Products industries could be used to obtain detailed information on production processes, compliance methods, and difficulties faced by firms in complying with a regulation. Investigations could be replicated for other industries through a sample of firms across industries that are potentially covered by a rule.

This kind of information can be invaluable in determining the specific forms of compliance assistance that are required in a particular industry to comply with a rule. When difficulties are found in compliance, the appropriate agencies should work to find solutions to the problem on the basis of detailed knowledge about the ways in which different firms are adapting to the rule. The goal is not to weaken a particular rule, but to provide technical, financial, or other forms of assistance to help firms comply with the rule and continue to provide jobs in the basin.

Appendix Table 1

**ESTABLISHMENT SIZE DISTRIBUTION, ESTABLISHMENTS, EMPLOYMENT, AND RULES
BY INDUSTRY IN THE SOUTH COAST BASIN**

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	SIC	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION						TOTAL EMPL
					1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS		
403.1			07	AGRICULTURAL SERVICES	2756	860	38	10	3664	44791	
1146.1			074	<i>Veterinary Services</i>	515	219	0	1	735	6278	
LL	1405		10	METAL MINING	19	3	1	0	23	435	
1402			13	OIL AND GAS EXTRACTION	184	59	2	4	249	4620	
			KKK 1311	Crude petroleum and natural gas	93	25	2	3	123	2213	
			LLL								
			1148								
			1173								
			1176								
			KKK 1321	Natural gas liquids	2	2	0	0	4	60	
			LLL								
			1173								
000			14	NONMETALLIC MINERALS, EXCEPT FUELS	27	56	4	2	89	3062	
UUU											
403											
403.1											
431.2											
1110.2											
1146.1											
1403			15	GENERAL CONTRACTORS AND BUILDERS	5792	1547	88	23	7450	77820	
403											
403.1											
431.2											
1110.2											
1146.1											
1403			16	HEAVY CONSTRUCTION, EXCEPT BUILDING	605	413	32	18	1068	74905	
403											
403.1											
431.2											
1110.2											
1146.1											
1403			1120 1611	Highway and street construction	122	106	10	4	242	6706	

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION					TOTAL EMPL
				1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS	
431.2			24 LUMBER AND WOOD PRODUCTS	478	420	41	9	948	24605
1145									
1146.1									
1171									
1175			242 Sawmills and Planing Mills	19	38	3	0	60	1681
		1136	2434 Wood kitchen cabinets	186	84	6	3	279	4963
		1104	2435 Hardwood veneer and plywood	7	12	3	0	22	947
431.2			25 FURNITURE AND FIXTURES	499	587	92	32	1210	48084
1128									
1136									
1145									
1146.1									
1168									
1168			251 Household Furniture	214	297	48	19	578	24447
		1169	2514 Metal household furniture	13	34	5	6	58	4088
1168			252 Office Furniture	34	65	18	5	122	7642
1168			253 Public Building and Related Furniture	8	18	4	2	32	2141
1168			259 Miscellaneous Furniture and Fixtures	55	55	9	6	125	6524
431.2			26 PAPER AND ALLIED PRODUCTS	94	210	67	12	383	23220
1110.2									
1128									
1134									
1145									
1146.1									
1171									
1402									
			1401 2621 Paper mills	2	2	2	2	8	1125
			1401 2631 Paperboard mills	0	6	3	0	9	879
		1175	265 Paperboard Containers and Boxes	24	80	37	3	144	10567
		RR	2672 Paper, coated and laminated	4	24	2	1	31	1296
431.2			27 PRINTING AND PUBLISHING	2813	1175	103	37	4128	88173
1130.1									
1134									
1145									
1146.1									
1171									
			1130 2752 Commercial printing, lithographic	1101	442	36	11	1590	26096
		FFF	2754 Commercial printing, gravure	7	5	0	0	12	155
		QQ							
		1130							
		1130.1	2759 Commercial printing, n.e.c.	429	199	3	1	632	7484

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	SIC	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION						TOTAL EMPL
					1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS		
431.2				28 CHEMICALS AND ALLIED PRODUCTS	366	433	46	19	864	34924	
1110.2											
1113											
1129											
1130.1											
1134											
1145											
1146.1											
1402											
1404											
1410											
1415											
1420											
				H 2819 Industrial inorganic chemicals	13	15	0	1	29	873	
				Cb							
				468							
				469							
1149				282 Plastics Materials and Synthetics	22	26	3	1	52	1804	
1173											
1175											
1176											
				DDD 2821 Plastics materials, resins	14	23	3	1	41	1712	
				1141							
				1401							
				1103 2834 Pharmaceutical preparations	19	24	5	6	54	6930	
				1401							
1141.2				284 Soap, Cleaners, and Toilet Goods	110	106	14	6	236	9179	
1149											
				1401 2842 Polishes and sanitation goods	30	26	3	0	59	1536	
				1103 2844 Toilet preparations	42	41	10	5	98	5754	
				1113 2851 Paints and allied products	51	68	11	0	130	4026	
				1141.1							
				1149							
				1401							
				III 2869 Industrial organic chemicals, nec	12	22	1	1	26	810	
				NNN							
				W							
				1163							
				G 2873 Nitrogenous fertilizers	2	4	0	0	6	235	
				PP							
				1159							
				1401 2879 Agricultural chemicals, n.e.c.	3	5	1	0	9	388	
				1113 2891 Adhesives and sealants	20	32	4	0	56	1640	
				1401							
				1401 2892 Explosives	0	2	1	0	3	375	

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION					TOTAL EMPL
				1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS	
403 403.1 431.2 1110.2 1134 1142 1146.1 1402 1404 1410 1415		1141.1	2893 Printing ink	5	20	0	0	25	750
		1401							
		1174	2899 Chemical preparations, n.e.c.	36	44	2	0	82	1799
		1401							
			29 PETROLEUM AND COAL PRODUCTS	47	37	9	8	101	8504
431.2 1128 1145 1146.1 1168 1402		GGG	2911 Petroleum refining	1	2	4	8	15	6375
		J							
		QQQ							
		431.1							
		431.2							
		1105							
		1109							
		1119							
		1123							
		1149							
		1158							
		1173							
		1176							
		1401							
		I	2951 Asphalt paving, mixing	27	9	0	0	36	324
		1401							
		UU	2952 Asphalt felts, coatings	3	7	4	0	14	884
		1401							
		1119	2999 Petroleum and coal products, n.e.c.	0	2	0	0	2	60
431.2 1128 1145 1146.1 1168 1402			30 RUBBER AND PLASTICS PRODUCTS	464	694	121	38	1317	61710

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	SIC	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION						TOTAL EMPL
					1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS		
				BBB 3011 Tires and inner tubes	2	1	1	0	4	235	
				1168 3053 Gaskets, packing, and sealing devices	11	27	6	1	45	2064	
	1175			306 Fabricated Rubber Products, n.e.c.	51	64	14	6	135	7223	
				1168 3061 Mechanical rubber goods	18	23	6	4	51	2944	
				1168 3069 Fabricated rubber products, n.e.c.	30	40	8	2	80	4258	
	TTT			308 Miscellaneous Plastics Products, n.e.c.	370	574	97	30	1071	49105	
	1175			1162 3083 Laminated plastics plate and sheet	9	14	2	3	28	2067	
				1168							
				1162 3088 Plastics plumbing fixtures	4	8	3	1	16	1034	
				1162 3089 Plastics products, n.e.c.	261	379	58	22	720	32032	
431.2				31 LEATHER AND LEATHER PRODUCTS	52	56	8	2	118	3945	
1145											
1146.1											
403				32 STONE, CLAY, AND GLASS PRODUCTS	336	402	44	22	804	28712	
403.1											
431.2											
1145											
1146.1											
1402											
1420											
				321 Flat Glass	2	4	0	0	6	120	
1117											
X. N											
X. N				322 Glass and Glassware, Pressed or Blown	21	12	2	7	42	3997	
1117											
1401											
				CC 3229 Pressed and blown glass	19	11	0	1	31	850	
X. N				323 Glass Products (From Purchased Glass)	65	45	6	4	120	4226	
1117											
F				324 Cement, Hydraulic	1	1	2	3	7	1284	
1112											
1112.1											
1401											
				1401 3264 Porcelain electrical supplies	4	5	1	0	10	295	
1175				327 Concrete, Gypsum, and Plaster Products	106	175	22	3	306	10400	
				1401 3273 Ready-mixed concrete	62	91	5	2	160	4756	
PPP				3296 Mineral wool	3	9	0	1	13	632	

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	SIC	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION					TOTAL EMPL
					1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS	
431.2				33 PRIMARY METAL INDUSTRIES	155	249	55	17	476	25933
1110.2										
1122				AA 3312 Blast furnaces and steel mills	7	4	0	2	13	1527
1145				AAa						
1146.1				N						
1402				Na						
1404				477						
1420				1401						
				1401 3321 Gray and ductile iron foundries	3	10	5	1	19	1698
				1401 3325 Steel foundries, n.e.c.	4	5	0	0	9	435
				L 3341 Secondary nonferrous metals	15	14	5	0	34	1418
				1101						
				M						
				1401						
				1401 3369 Nonferrous foundries, n.e.c.	1	5	1	0	7	356
431.2				34 FABRICATED METAL PRODUCTS	1203	1522	177	56	2958	104604
1122										
1128										
1145										
1146.1										
1171										
1402										
1404										
1420										
				341 Metal Cans and Shipping Containers	9	13	11	1	34	2564
1125				343 Plumbing and Heating. Except Electric	21	35	9	6	71	6160
1175				1169 3432 Plumbing fixture fittings and trim	9	17	5	1	32	3013
1168				344 Fabricated Structural Metal Products	347	450	48	7	852	24779
1175										
1107				347 Metal Services, n.e.c.	204	320	22	2	548	14237
1125										
EE										
TT										
				1169 3471 Plating and polishing	135	213	16	2	366	9743
				1113						
				1401						

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	SIC	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION						TOTAL EMPL
					1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS		
431.2	1173			46 PIPELINES, EXCEPT NATURAL GAS	4	9	2	0	15	610	
	1176			461 Pipelines, Except Natural Gas							
431.2				47 TRANSPORTATION SERVICES	2596	609	29	7	3241	32260	
1145											
431.2				48 COMMUNICATION	498	525	125	74	1222	80889	
1110.2											
403				49 ELECTRIC, GAS, AND SANITARY SERVICES	334	252	61	14	661	28592	
403.1											
431.2											
1110.2											
1134											
1145											
1402											
1404											
1401				491 Electric Services	49	74	28	13	149	7500	
	1135			4911							
1176				492 Gas Production and Distribution	22	38	15	0	75	3625	
1135				493 Combination Utility Services	5	4	0	0	9	235	
1401				494 Water Supply	82	34	2	0	118	2157	
1401				495 Sanitary Services	82	34	2	0	245	6949	
	431.1			4952 Sewerage systems							
	1179										
	431.1			4953 Refuse systems							
	1150										
	1150.1										
	1150.2										
	1406										
	1415										
403				50 WHOLESALE TRADE, DURABLE GOODS	12552	5728	270	86	18636	263862	
403.1											
431.2											
1145											
1168											
1402											
1415											
				1108 5032 Brick, stone, and related materials	118	85	2	0	205	2878	
				1108.1							
				1158 5052 Coal and other minerals and ores	7	3	0	0	10	190	
				1411 5093 Scrap and waste materials	302	170	14	0	486	7175	

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	SIC	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION						TOTAL EMPL
					1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS		
403			51	WHOLESALE TRADE – NONDURABLE GOODS	7078	2966	214	51	10309	156937	
403.1											
431.2											
1129											
1130.1											
1145											
1168											
				DD 5153 Grain and field beans	8	5	0	0	13	145	
				1149 5169 Chemicals and allied products, n.e.c.	286	143	8	0	437	5536	
	1149			517 Petroleum and Petroleum Products	169	111	8	0	288	4800	
				XX 5171 Petroleum Bulk Stations and Terminals	58	63	4	0	125	2455	
				X 5191 Farm supplies	226	70	0	0	296	2355	
403			52	BUILDING MATERIALS AND GARDEN SUPPLIES	1491	846	50	1	2388	34702	
1129											
1145											
1168											
1174											
1415											
1110.2			53	GENERAL MERCHANDISE STORES	284	309	249	134	976	102938	
1145											
1168											
1174											
1415											
1145			54	FOOD STORES	5231	2239	276	5	7751	134477	
1168											
1145			55	AUTOMOTIVE DEALERS AND SERVICE STATIONS	5494	2347	139	6	7986	104781	
1151											
1168											
	1411	5511		New and used car dealers	187	561	125	5	878	48867	
	1411	5521		Used car dealers	303	46	0	0	349	1935	
	461	5541		Gasoline service stations	2882	954	3	1	3840	27900	
	1149										
	1170										
	1411										
1168			56	APPAREL AND ACCESSORY STORES	5888	1790	16	11	7705	65442	
	1168	5699		Miscellaneous apparel and accessory stores	524	92	1	0	617	3541	
1168			57	FURNITURE AND HOME FURNISHINGS STORES	4534	1334	26	2	5896	47482	

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	SIC	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION					TOTAL EMPL
					1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS	
1168				58 EATING AND DRINKING PLACES	11141	9163	310	15	20629	363841
1168				59 MISCELLANEOUS RETAIL	12755	3519	44	7	16325	127667
1415										
431.2				60 DEPOSITORY INSTITUTIONS	1560	2658	105	35	4358	124184
1134										
431.2				61 NONDEPOSITORY INSTITUTIONS	2173	675	46	14	2908	39707
431.2				62 SECURITY AND COMMODITY BROKERS	904	296	28	6	1234	17997
431.2				63 INSURANCE CARRIERS	1210	570	87	57	1924	73409
431.2				64 INSURANCE AGENTS, BROKERS, AND SERVICE	4398	705	40	11	5154	39666
403				65 REAL ESTATE	13384	1939	83	40	15446	108741
403.1										
431.2										
1146.1										
1415										
				1403 6552 Subdividers and developers, n.e.c.	924	181	6	4	1115	9198
431.2				67 HOLDING AND OTHER INVESTMENT OFFICES	1199	267	20	14	1500	21228
431.2				70 HOTELS AND OTHER LODGING PLACES	1346	705	92	64	2207	73005
1110.2				701 Hotels and Motels	1003	619	88	64	1774	69388
	1404			1146 7011						
431.2				72 PERSONAL SERVICES	7325	1408	52	17	8802	64490
1145										
1402										
				1102.1 7216 Drycleaning plants, except rug	722	197	3	1	923	7307
				JJJ						
				1102 7218 Industrial laundrers	30	50	11	0	91	4231
	1168			722 Photographic Studios, Portrait	420	91	3	1	515	3510
431.2				73 BUSINESS SERVICES	13463	5009	524	211	19207	375920
1110.2										
1128										
1145										
				1168 7331 Direct mail advertising services	140	83	16	5	244	7906
				1168 7335 Commercial photography	200	28	0	0	228	1075
				1168 7336 Commercial art and graphic design	589	104	1	1	695	4389
				1168 7384 Photofinishing laboratories	413	114	9	1	537	5932

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	SIC	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION					TOTAL EMPL
					1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS	
431.2	1122			1415 7389 Business services, n.e.c.	2606	811	33	10	3460	36592
1145				75 AUTO REPAIR, SERVICES, AND PARKING	8177	1653	28	10	9868	67139
1151										
				1168 7532 Top & body repair & paint shops	1205	414	2	0	1621	12063
				1411						
				1168 7534 Tire retreading and repair shops	66	15	1	0	82	639
				1411 7538 General automotive repair shops	3344	331	2	1	3678	15859
				76 MISCELLANEOUS REPAIR SERVICES						
431.2	1145			1415 7623 Refrigeration service and repair	2751	596	16	2	3365	25242
				764 <i>Reupholstery and Furniture Repair</i>	98	34	1	0	133	1292
				1168 7699 Repair services, n.e.c.	345	51	0	0	396	2121
					1182	272	8	1	1463	11546
				78 MOTION PICTURES	5014	920	55	39	6028	144257
431.2	1110.2									
1145				781 <i>Motion Picture Production and Services</i>	3280	455	45	33	3813	117772
1402										
431.2				79 AMUSEMENT AND RECREATION SERVICES	3575	1011	75	36	4697	81999
				1415 7999 Amusement and recreation, n.e.c.	450	160	9	10	629	15559
				80 HEALTH SERVICES	24182	3713	324	220	28439	427168
431.2	1110.2									
1134				805 <i>Nursing and Personal Care Facilities</i>	151	380	150	7	688	46086
				806 <i>Hospitals</i>	27	45	64	172	308	199729
				1405 8062 General medical and surgical hospitals						
				809 <i>Health and Allied Services, n.e.c.</i>	453	265	16	1	735	11919
				1405 8099 Health and allied services, n.e.c.						
431.2				81 LEGAL SERVICES	8192	1316	69	15	9592	68917
				82 EDUCATIONAL SERVICES	1066	998	74	43	2181	96733
431.2	1134									
1145										
1146										
1146.1										
				822 <i>Colleges and Universities</i>	48	65	18	35	166	54902

RULE (2D SIC)	RULE (3D SIC)	RULE (4D SIC)	SIC	INDUSTRY	ESTABLISHMENT SIZE DISTRIBUTION						TOTAL EMPL
					1-9 Employees	10-99 Employees	100-249 Employees	250 or more Employees	TOTAL ESTABS		
431.2			83	SOCIAL SERVICES	3112	1610	112	25	4859	75288	
431.2			84	MUSEUMS, BOTANICAL, ZOOLOGICAL GARDENS	56	34	2	0	92	1591	
431.2			86	MEMBERSHIP ORGANIZATIONS	4624	1759	74	24	6481	90530	
431.2			87	ENGINEERING AND MANAGEMENT SERVICES	10976	2734	151	78	13939	194358	
	1405	8731		Commercial physical research	148	81	7	2	238	8772	
	1405	8733		Noncommercial research organizations	83	36	5	2	126	4094	
431.2			89	SERVICES, N.E.C.	1955	284	10	2	2251	13272	

Source:

U.S. Department of Commerce, County Business Patterns, 1990

Appendix Table 2

Distribution of LA County Zip Codes and Communities By Areas used in the Report

Central and Southeast Los Angeles

Los Angeles	90001	90012	90022	90044	90061
	90002	90014	90023	90047	90062
	90003	90015	90026	90057	90071
	90007	90017	90030	90058	90079
	90011	90021	90037	90059	90089

Artesia
Bell
Bell Gardens
Bellflower
Commerce
Compton
Huntington Park
La Mirada
Lynwood
Maywood
Montebello
Norwalk
Paramount
Pico Rivera
Santa Fe Springs
South Gate
Whittier

San Gabriel Valley

Los Angeles	90031
	90032
	90033
	90063

Alhambra
Altadena
Arcadia
Azusa
Claremont
Covina
Diamond Bar
Duarte
El Monte
Glendora
Industry
La Puente
La Verne
Monrovia
Monterey Park
Pasadena
Pomona
Rosemead
San Dimas
San Gabriel
Sierra Madre
South El Monte
South Pasadena
Walnut
West Covina

San Fernando Valley

LA 90041
90042
90065

Burbank
Calabasas
Canoga Park
Chatsworth
Encino
Glendale
Montrose
North Hollywood
Northridge
Pacoima
Reseda
San Fernando
Sun Valley
Sunland
Tarzana
Van Nuys
Woodland Hills

South Bay and Long Beach

Carson
El Segundo
Gardena
Harbor City
Hawthorne
Hermosa Beach
Inglewood
Lakewood
Lawndale
Lomita
Long Beach
Los Alamitos
Palos Verdes
Redondo Beach
San Pedro
Torrance
Westchester
Wilmington

Westside/Hollywood/Mid-City

Los Angeles	90004	90016	90025	90035	90048	90067	90290
	90005	90018	90027	90036	90049	90068	90291
	90006	90019	90028	90038	90056	90069	90292
	90008	90020	90029	90043	90064	90077	
	90010	90024	90034	90046	90066	90272	

Beverly Hills
Culver City
Culver City
Malibu
Santa Monica

Appendix Table 3

**Manufacturing Industries
South Coast Basin Areas
Location Quotients**

SIC	Industry	Los Angeles County	Central/ Southeast LA	South Bay/ Long Beach	Westside/ Hollywood/ Mid-City	San Fernando Valley	San Gabriel Valley	Orange County	Riverside County	San Bernardino County
20	Food and Kindred Products	1.1	1.8	0.4	1.1	0.7	1.2	0.7	0.8	1.3
22	Textile Mill Products	1.1	1.7	0.6	0.3	0.2	1.8	0.9		0.3
23	Apparel	1.3	2.3	0.3	1.3	1.3	0.7	0.3	0.2	0.4
24	Lumber and Wood Products	0.8	0.9	0.8	0.5	0.3	1.4	0.7	4.2	3.3
25	Furniture and Fixtures	1.0	1.5	1.1	0.3	0.3	0.7	1.0	0.9	1.1
26	Paper and Allied Products	1.0	1.9	0.2		0.5	1.8	1.0	1.0	0.9
27	Printing and Publishing	0.9	1.3	0.5	2.5	0.7	0.9	1.1	1.7	0.8
28	Chemicals and Allied Products	0.9	0.8	0.5	1.6	1.4	1.4	1.3	0.6	0.7
29	Petroleum and Coal Products	1.3	1.6	1.2	0.3	1.6	0.6	0.1		0.9
30	Rubber and Plastics Products	0.8	0.7	0.7	1.1	0.7	1.2	1.5	1.6	1.6
32	Stone, Clay, and Glass Products	0.8	0.9	0.4	0.3	1.3	1.1	0.7	3.3	4.0
33	Primary Metal Industries	1.1	1.5	0.6	0.5	0.7	1.5	0.5	1.1	1.9
34	Fabricated Metal Products	0.9	0.9	0.7	0.8	1.2	1.3	1.1	1.1	1.4
35	Industrial Machinery and Equipment	0.9	0.7	1.2	0.5	1.0	0.8	1.6	0.5	0.7
36	Electronics and Electronic Equipment	0.8	0.3	0.9	2.3	1.2	1.1	1.7	1.0	0.4
37	Transportation Equipment	1.2	0.7	1.9	0.5	1.0	0.6	0.4	0.8	0.9
38	Instruments and Related Products	0.8	0.1	1.4	0.4	1.4	1.2	1.8	0.6	0.2
39	Miscellaneous Manufacturing Industries	1.0	0.9	1.0	2.0	1.4	0.8	0.8	1.4	1.3

**Economic Roundtable
315 West 9th St, Suite 310,
Los Angeles, CA 90015
213-892-8104**