

Final Draft Report

# Guidelines and Methodology for Facility-Based Assessment

***Disclaimer***

*The SCAQMD staff is releasing this draft report to stakeholders and the AQMD Advisory Group for review and comment. With input from interested parties, AQMD staff will further develop and refine the facility-based analysis approach for future rule development projects.*

---

**Final Draft Report**

July 17, 2002

**Guidelines and Methodology for  
Facility-Based Assessment**

**Prepared for**

South Coast Air Quality Management District  
21865 E. Copley Drive  
Diamond Bar, California 91765-4182

**Prepared by**

BBC Research & Consulting  
3773 Cherry Creek N. Drive, Suite 850  
Denver, Colorado 80209-3827  
303.321.2547 fax 303.399.0448  
[www.bbcresearch.com](http://www.bbcresearch.com)  
[bbc@bbcresearch.com](mailto:bbc@bbcresearch.com)

# Table of Contents

<b>I.</b>	<b>Introduction</b>	
	Methodology .....	I-1
	What Is Facility-based Assessment and Why Do It?.....	I-3
<b>II.</b>	<b>Advantages &amp; Limitations of Facility-Based Assessment</b>	
	FBA in Relation to AQMD's Existing Socioeconomic Process .....	II-1
	What FBA Can and Cannot Accomplish.....	II-1
	Conclusion .....	II-5
<b>III.</b>	<b>Creating an Industry Profile</b>	
	Identifying Potentially Affected Industries and Firms .....	III-2
	Industry Composition .....	III-3
	Markets and Competition .....	III-6
	Factors and Trends Impacting the Industry.....	III-7
	Prior AQMD Regulations.....	III-9
<b>IV.</b>	<b>Creating Firm Profiles</b>	
	The Concept of "Representative Firms" .....	IV-1
	Defining "Representative Firms" for the Firm Profiles .....	IV-2
	Key Components and Data Sources for Creating Firm Profiles .....	IV-3
	Composing Firm Profiles .....	IV-6
	Describing Potential Variations.....	IV-8
<b>V.</b>	<b>Creating a Regulatory Impact Model</b>	
	Estimating the Costs Firms Would Face .....	V-1
	Cost Impact Relative to Firm Financial Characteristics .....	V-4
	Before and After Rule Cashflows.....	V-5
<b>VI.</b>	<b>Assessing Impacts</b>	
	Affordability .....	VI-2
	Competitiveness.....	VI-3
	Small/Disadvantaged Businesses .....	VI-4
	Cumulative Impacts.....	VI-6

# Table of Contents

**VII. Additional Considerations**

Stakeholder Interaction.....VII-1

Integrating the FBA Process .....VII-3

Presentation of Results .....VII-4

**Appendices**

- A. Conversion of SIC and NAICS Codes
- B. Industry and Firm Data Sources

# SECTION I.

## Introduction

In December 2000, South Coast Air Quality Management District (AQMD or the District) retained BBC Research & Consulting (BBC) to provide potential enhancements to the socioeconomic assessment process by working with AQMD to develop tools for facility-based assessments (FBAs) and post-rule assessments (PRAs). The purpose of this report is to provide the guidelines and methodology for conducting FBAs. This is the “how to” manual or the “cookbook” that is intended to assist AQMD in producing future FBAs on its own.

As a methodology document, most of what follows is somewhat technical and detailed in nature. Policy-oriented or more general audiences may wish to focus on Section I (Introduction) and Section II (Advantages & Limitations of Facility-Based Assessment), in which we present background information and some of the “big picture” issues in conducting FBAs. BBC has also produced a number of other reports that present related material in a less technical manner. These include:

- ***Facility-Based Assessment Case Studies Proposed Rule 1137 and Proposed Amended Rule 1421;***
- ***Criteria and Resources for Facility-Based Assessments*** and
- ***Summary report: Findings and Recommendations for Facility-Based Assessments and Post-Rule Analyses***

The first document listed above, detailing two specific case studies in facility-based assessment, is an essential companion volume to this report. Portions of this report refer specifically to elements of the case study report and describe how those elements were developed.

### Methodology

In Phase I of this effort to develop additional socioeconomic assessment tools, BBC reviewed the existing economic literature as well as the state of the practice within other regulatory entities. We also conducted a set of interviews with regulated businesses and other stakeholders within the LA Basin concerning AQMD’s impact assessment process. This two-pronged approach identified key challenges for BBC and AQMD to confront in the Phase II case studies and guidelines and methodology development.

**Phase I research.** After conducting the literature review and interviews with the regulated community, BBC made the following observations.

- There are few examples of successful FBAs being conducted by other state and regional regulatory authorities, though the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) offer some information for AQMD consideration. There is growing interest in facility-based assessment among both more academic/theoretical economists and other regulatory agencies.

- FBAs can be a very valuable tool to involve stakeholders in the process and to better understand firm-level issues such as affordability and impacts on small businesses.
- The interview process revealed a fundamental challenge. Many businesses interviewed by the study team identified improving communications and mutual understanding as essential to meaningful and comprehensive socioeconomic analysis. However, many of these same businesses expressed concerns about sharing information with a regulatory agency.
- There is no single, ideal data source to address many of AQMD's key questions. It is likely that AQMD will have to rely on a combination of both primary and varied secondary data sources.

Based upon the Phase I research, BBC suggested AQMD consider several preliminary recommendations. (These recommendations comprised Task 3 of our contract and the conclusion of Phase I.) Highlights of those suggestions included the following.

- Use FBAs as a means of increasing stakeholder participation and interaction. This might include focus groups with all stages of the sector to be regulated (from input manufacturers to retailers) to refine cost estimates, assess feasibility and develop a clear understanding of how the sector functions and key issues. Surveys or case studies may also be appropriate tools.
- Develop and present a clear sector, industry and representative firm profile. This would reflect both input from stakeholders and secondary data. This might include data and discussion on how the industry works, industry trends, comparisons of the LA Basin with other areas, structure of the industry and financial and operating characteristics of representative firms within the industry (by size class, product niche, process or other key variables).
- Recognize that the data will be imperfect. It may be useful to separately present data derived from participating stakeholders and from secondary data sources. This may lead to ranges of characteristics and potential impacts.

**Phase II research.** During the second phase of the assignment, BBC used Proposed Rule (PR) 1137 and Proposed Amended Rule (PAR) 1421 to test the ideas and recommendations developed through the interviews and literature review. These rules, reflecting regulatory changes under active consideration by AQMD, were selected by the District. Late changes in some of the specifics of the proposed regulations resulted in rule definitions used in the case studies that were not exactly the same as those ultimately considered by AQMD's board. These differences in rule specification were not, however, particularly relevant to the case study purposes of testing data sources and illustrating approaches to this type of assessment.

The use of case studies proved to be a valuable tool for identifying potential challenges and solutions in conducting FBAs. Section II details many of the lessons learned from the case studies, and the case studies are referred to throughout this guidelines and methodology document as examples. As mentioned above, BBC included the results of each case study in a separate report entitled, ***Facility-Based Assessment Case Studies Proposed Rule 1137 and Proposed Amended Rule 1421***.

Other aspects of Phase II research include the production of this document and the production of a report entitled ***Criteria and Resources for Facility-Based Assessments*** which highlights when it may be most appropriate to conduct an FBA and required resources for such analyses.

### **What Is Facility-based Assessment and Why Do It?**

As a relatively new tool for analyzing the impacts of regulations and other purposes, there is no standardized definition of FBA. However, based upon BBC's review of the state-of-the-art, state-of-the-practice and the purposes of FBA from AQMD's standpoint, it is possible to postulate a simple and workable definition.

**Definition.** FBA is the examination of the direct operational and financial impacts of regulations from the standpoint of the entities in the regulated industry. In particular, FBA typically focuses on such questions as the regulated industry's ability to afford the cost of new rules or regulations, impacts on the competitiveness of the regulated firms and distributional implications. The latter may include assessment of impacts on small or disadvantaged businesses, or other subgroups within the industry.

**Why conduct FBAs.** For many years, AQMD has responded to public demand and statutory requirements by being a leader among regulatory agencies in analyzing the potential social and economic impacts of proposed regulations. In addition to continuously conducting assessments of regional economic impacts of proposed regulations—using the Regional Economic Models, Inc. (REMI) model—AQMD had previously experimented with FBAs for a few proposed rules relating to spray booths and other industries.

In 1999, a workshop convened by AQMD brought together economists and representatives of the regulated community. The workshop built upon previous efforts to improve the socioeconomic assessment process, including the 1997 formation of the Scientific, Technical, and Modeling Peer Review Advisory Group and an audit by a research team from the Massachusetts Institute of Technology. A strong and consistent thread within the workshop and its predecessors was the need to develop information that goes beyond the regional economic impact models in use by AQMD. Whether the concern was industry heterogeneity, small business, or the fate of individual firms, many suggestions were for detailed analysis of the kind associated with FBA.

Beyond the specific context of AQMD's stakeholders, economic and organizational theory researchers are now finding that there is extraordinary diversity among firms within a given industry in terms of size, age, investment, productivity and a host of other measures. It appears that these differences are very important in explaining both how an individual firm and the industry as a whole

respond to economic changes. Recognizing the diversity of firms within any given industry, it is likely that new regulations will have varied effects among those firms. FBA is a potential means of developing insight into distributional effects (e.g., winners and losers) within the regulated industry.

Interviews by the study team with economic analysts at a range of regulatory agencies across the country elicited the following views on how FBAs can improve the regulatory process:

- Facilitates engagement of the regulated industry and the public and can help improve the relationship between the regulator and industry;
- Can give business more forewarning about what to expect and can help the regulator better understand how businesses will adapt to the new regulation;
- Allows examination of how impacts may vary among the firms within the industry, and impacts on small businesses; and
- Can help in understanding the feasibility of the new regulation.

Interviews with industry representatives in the L.A. Basin tend to reinforce these potential benefits from FBA. Businesses perceive two uses for the socioeconomic and other information produced by AQMD when adopting a new rule: 1) informing them about the likely impacts, and 2) helping the Board make an informed decision. The business community appears more concerned with operational and financial impacts as opposed to the aggregate employment and income measures produced by traditional socioeconomic analyses. Businesses indicated they would like to see the following:

- More comprehensive and better information about the cost of rules for businesses;
- More information about the differential impacts of a rule within an industry;
- More information about industry context (e.g., competitiveness, demand, price flexibility);
- More awareness of the other regulations and government mandated costs impacting businesses; and
- More “real world” stories directly from industry or through field visits by staff and Board members.

FBA is a potential mechanism for addressing many of these concerns.

## **SECTION II.**

# **Advantages and Limitations of Facility-Based Assessment**

The following section provides a “big picture” assessment of the challenges and limitations inherent in conducting FBAs and an appraisal of what FBA can and cannot accomplish. This assessment is based on the research conducted in Phase I of this study and, most significantly, on the process of developing the two FBA case studies of PR1137 and PAR 1421. These case studies proved to be an extremely effective tool for understanding the practical aspects, usefulness and limitations of FBA.

### **FBA in Relation to AQMD's Existing Socioeconomic Process**

Currently, AQMD undertakes different types of socioeconomic analysis depending on the potential impact of a proposed rule. In general, the greater the potential impact of a rule, the greater level of detail is provided in the socioeconomic assessment. An assessment for rules or amendments with significant emissions reductions includes discussion of affected facilities/industries; cost impacts; employment impacts by industry and by occupation; impacts on competitiveness; impacts on Consumer Price Index by household income; alternatives, emission reduction potential and necessity of rule; rule adoption relative to cost effectiveness schedule; and incremental cost effectiveness. To estimate job impacts and other secondary impacts that may result, the REMI 172-sector model is used.

FBA can provide an enhancement to AQMD's established, regional socioeconomic impact analysis, but the study team does not believe it should be viewed as a substitute or replacement for such traditional analysis. FBA has a different output and a different focus than many of the tools currently used by AQMD. FBA is intended to provide a view—from the perspective of individual regulated businesses—of the short-run effects of proposed regulations on affordability, competitiveness and other issues. FBA does not provide the comprehensive view of regional economic impacts, including secondary economic impacts, or “multiplier” effects, that traditional regional economic impact analysis can provide. It also does not provide an estimate of job impacts. While REMI provides a standardized tool to compare the magnitude of economic effects across different rules, FBA does not.

In summary, while regional economic assessment provides a macro perspective on overall economic impacts across the District, FBA focuses in narrowly and in greater detail on operational and financial effects on the directly regulated businesses.

### **What FBA Can and Cannot Accomplish**

Both the review of existing practices and the experience of applying the FBA methodology to the two case study rules have produced important insights into the advantages and limitations of FBA. It is important that policy makers understand what is possible with FBA so that they can decide how to interpret the results. There are four main issues that drive what FBA can and cannot practically accomplish: 1) data availability (includes the availability of local data and minority ownership and employment data), 2) data collection methods, 3) reliance on estimates, and 4) assessment.

**Data availability.** In many ways, the focus and detail of an FBA is driven by data availability. In the ideal world, operational and financial information would be available for each potentially impacted firm. In the real world in which AQMD regulations often pertain to small and privately held establishments, this is almost never the case. Section IV, Creating Firm Profiles, provides extensive detail about potential data sources, the types of information they provide and their limitations. There are two major concerns about data: 1) the availability of local information, and 2) the availability of accurate information on minority ownership and employment in affected firms.

**Local versus regional or national data.** AQMD policy makers and industry stakeholders are anxious to use local data as much as possible in developing FBA. BBC has completed an extensive review of available data sources and has found that the desire for local data will often be very difficult or impossible to satisfy from existing sources. Often, regional or national data will be the only secondary information available for a variety of important firm-level financial and operational characteristics.

AQMD could theoretically attempt surveys to collect additional local data. Both the response of industry stakeholders to questions during the Phase I interviews—about their willingness to provide such data—and the past experience of other agencies that have attempted such surveys, suggest such efforts are unlikely to be successful.

As illustrated in the two case studies, BBC believes there are two practical ways of incorporating locally specific information into FBAs. In the PR1137 analysis, we included qualitative and limited quantitative information to indicate in general terms how local firm financial and operational conditions may differ from those found nationally. In the PAR1421 analysis, which focused on a single and fairly homogenous industry (dry cleaning), we led a workshop with industry representatives to design "prototype" firms embodying average local characteristics.

**Data on disadvantaged groups.** The Surveys of Women and Minority Owned Enterprises conducted by the U.S. Census Bureau is the only reliable information on minority ownership of firms. Data are only published at the two-digit Standard Industrial Classification (SIC) code level and at the state level.

The U.S. Census Public Use Micro Sample (PUMS) dataset provides information both on racial/ethnic status and the industry in which individuals work. Thus, it can be used to determine the racial or ethnic make-up of the employment base. However, the most recent data currently available is 1990. Complete data from the 2000 Census will not be made available until sometime in 2003.

State and/or local trade associations may also be able to provide qualitative or quantitative information on the extent of minority ownership and employment in their industries.

Exhibit II-1 below summarizes the differences between the ideal scenario and the practical reality from a data availability perspective. It also describes the type of information in an FBA that can be developed based on available data.

**Exhibit II-1.**  
**Available Data and Implications for FBA**

	<i>Available Data</i>	<i>Information in FBA</i>
<i>The Ideal</i>	Complete, individual firm data	<ul style="list-style-type: none"> <li>▪ Full distribution of impacts across firms</li> </ul>
<i>Practical Reality</i>	Representative firm data <ul style="list-style-type: none"> <li>▪ Local</li> <li>▪ National</li> </ul>	<ul style="list-style-type: none"> <li>▪ Affordability for representative firms</li> <li>▪ Differences by firm size, industry segment</li> <li>▪ Impacts of competitiveness based on representative firms and industry information</li> </ul>

Source: BBC Research & Consulting.

As Exhibit II-1 demonstrates, in the ideal world, AQMD would have complete financial and operational data for all potentially impacted firms. Such data would allow the socioeconomic staff to portray the potential impact of new rules in a very accurate and precise manner and to fully gauge the distributional effects within the regulated industry. However, in the real world, AQMD will likely need to rely on representative firm data built using either local or national sources. With such information, AQMD can still assess affordability for representative firms and differential impacts by comparing alternative representative firm models based on size and/or industry segment. AQMD's existing competitiveness analysis can be expanded to address micro-level competitive impacts within the L.A. Basin.

**Data collection methods.** The type of data collection approach used in conducting an FBA will depend on the type of rule, the variation among potentially impacted firms or industries and industry characteristics. In general, BBC recommends an approach that includes the collection of qualitative and quantitative (when available) data from both primary and secondary sources. Indeed, one of the major identified benefits of FBA is the opportunity it presents to reach out to stakeholders in a meaningful way.

For example, case study PAR 1421, which impacted the dry cleaning industry, involved a single, homogenous industry with a large number of small privately held firms. Dry cleaning is also officially categorized as a service, as opposed to manufacturing, industry. All of these characteristics impacted the data collection strategy.

- Secondary data at the individual firm level were limited or unavailable. This is a typical problem for service sector industries.
- Given the homogeneity of the industry, focus groups or working groups were an effective method of creating firm profiles.

An example at the other extreme, case study PR 1137 involved a number of small, privately held firms. It was different from PAR 1421 because it had the potential to impact firms in a variety of industries (e.g., lumber mills to wood furniture manufacturers) and because almost all potentially impacted firms can be classified as manufacturing establishments.

- Secondary data about individual firms at the local level was unavailable. However, the study team did identify and use national data on financial and operational characteristics specific to the industries analyzed.
- Given that the potentially impacted firms were so different, the use of workgroups or focus groups to create firm profiles would have been difficult. Instead, firm profiles were developed using national data and then input was sought from trade association representatives as to the general accuracy of the profiles.

**Reliance on estimates.** In addition to the need to rely on regional or national data in creating firm profiles, there are other aspects of FBA in which estimates play a role. The identification of potential capital and operations and maintenance costs is one area of uncertainty, and the costs imposed by a new rule are a very important part of the FBA assessment. Though AQMD staff undertake research and use a number of methods to understand potential costs, there is typically no way of knowing for sure what the costs would be for a given business.

Furthermore, some rules may give businesses a choice of compliance technologies. One cannot assume that businesses would simply take the least expensive option, as there may be concerns about quality or compatibility with existing systems. Some AQMD rules include a time horizon that allows impacted businesses to phase in changes over a number of years. Technologies can change during the phase-in period, making the implementation of a new rule more or less expensive and potentially altering the distributional impacts of a given rule.

Along with the need to rely upon representative firm information, the use of estimated data concerning costs, assumptions about available technologies and the implementation choices of businesses all introduce uncertainty into the FBA process. In general, the results of FBAs should be considered indicative of the magnitude of potential effects rather than precise estimates of exact impacts.

**Assessment.** The final caveat, or lesson learned, about FBA underscores the role of decision makers in the rule development process. After all the analyses have been completed, and a range of percentage impacts on profits or cash flow have been presented, what does it all really mean? Of course, this question is easiest to answer at the extremes. For example, a finding that a proposed rule could have a 150 percent impact on the profits of representative firms indicates that there is a good chance the rule would put some firms out of business. On the other hand, a 1 percent change in revenues or cash flow for representative firms probably means that the impact is negligible for most firms in the industry.

Assessing whether or not impacts between these extremes are significant or problematic is much more difficult. There is no absolute standard for making such assessments, though there are precedents in the thresholds set previously by AQMD and other agencies. Ultimately, policy makers will have to weigh the results of an FBA along with the numerous other decision factors (e.g., emission reductions, enforceability, etc.) and decide what level of impact is so large that it logically leads to reconsideration of the rule. This decision is made all the more difficult because the impact assessment is based on composite profiles and cost estimates and cannot reassure policy makers that individual firms will respond in predicted ways. As laid out in this document, an FBA will typically incorporate the “worst case” scenario. Finally, it is important to note that policy makers likely will

also be confronted with a different, and perhaps more negative, perspective on socioeconomic impacts than they are accustomed to seeing from the REMI model. Given the significant differences in the two approaches, this variance is not surprising. As outlined in this document, FBA analysis only takes into account the short-run costs born by potentially impacted firms; it does not measure the benefits to equipment producers or other sectors of the economy or account for longer-term adjustments within the regulated industry

## **Conclusion**

While any attempt to look into the future and predict outcomes involves some level of uncertainty, the challenge of working with available data means that FBAs are as much of an art as a science. The data sources, key issues and specific approaches will likely vary from one proposed rule to the next, and the analysts conducting the assessment will be required to make judgment calls at several points in the process. Despite these challenges and limitations, there are several reasons why FBA may still be a useful tool for AQMD. Unlike any of the analyses currently being conducted by AQMD, FBA allows policymakers to see a rule through the lens of a potentially impacted firm. This shift in perspective is likely to be valuable in and of itself. Representative firm information allows for an assessment of the magnitude of potential impacts on "typical firms" with varied characteristics and can provide important insights about the impacts of a rule on the competitiveness of firms within the LA Basin.

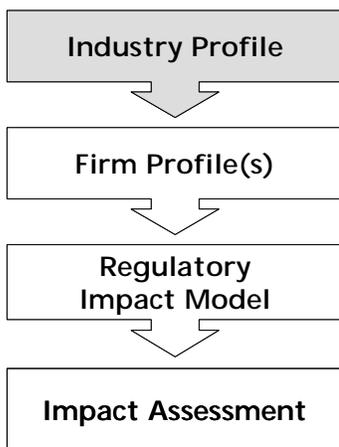
## SECTION III.

### Creating an Industry Profile

During Phase II of BBC's work with AQMD to develop an approach to conduct FBAs, we established an overall methodology consisting of four steps. The industry profile is the first step of the FBA as shown in Exhibit III-1 below. The purpose of an industry profile is to provide the decision makers and the public with information about how the impacted industry works, the structure of the industry and trends that relate to the ability to comply with new regulations. The industry profile information, along with the firm profile information discussed in Section IV, is also used in assessing impacts of the proposed rule. Industry profiles seek to:

- Describe what potentially impacted firms do;
- Describe the customer base for the industry (e.g., end-users, local);
- Illustrate the competitive situation of the industry (e.g., local or national competition, size of industry in the LA Basin versus industry as a whole);
- Discuss factors and trends impacting the industry;
- Indicate whether or not the industry is already affected by existing AQMD regulations; and
- Describe the composition of the industry in terms of number of firms by size and by minority ownership.

**Exhibit III-1.**  
**Four Steps in Completing an FBA**



This report section, as well as the subsequent sections describing the other three steps in the recommended approach to conducting FBAs, identifies the key aspects, challenges and approaches in this type of assessment. We begin each topic area by describing general principles and guidelines.

Recognizing that the "devil is in the details" in performing FBAs, perhaps the most useful guidance to analysts performing future FBAs for AQMD is provided by the examples found in the two case studies performed for AQMD. Therefore, the general discussion is followed by an explanation of the relevant examples provided in the companion report, ***Facility-Based Assessment Case Studies Proposed Rule 1137 and Proposed Amended Rule 1421.***

## **Identifying Potentially Affected Industries and Firms**

There appear to be two ways of narrowing down the types of potentially impacted firms. The first is by industry classification (SIC or North American Industry Classification System (NAICS) codes) and the second is by size of firm. Of course, if a rule is anticipated to affect only a handful of firms, the identification process may be somewhat different. Under such circumstances, AQMD may be able to focus on specific individual facilities and collect and work with data in a different and more specific way.

**Industry codes.** An FBA begins with the identification of the industry or industries that will likely be impacted by a rule by SIC or NAICS codes. SIC and NAICS codes represent an economic classification system produced by the U.S. Census Bureau and designed to categorize business establishments. The NAICS system is newer and is designed to replace the SIC system. However, SIC codes are still in use by many parties, including AQMD in its permit database.

Sometimes rule-making staff identifies potentially impacted industries by SIC code as a part of the rule development process. If the rule-making staff has not identified industries by SIC code, then staff responsible for completing an FBA must clarify and identify the potentially impacted industries by SIC or NAICS codes. Methods for identifying SIC/NAICS codes include:

- An examination of the AQMD permit database (if an industry has been regulated by AQMD in the past);
- EPA sector notebooks which typically begin with a breakdown and analysis of the industry segments by SIC code;<sup>1</sup> and
- Discussions with experts within AQMD or with industry representatives.

Depending on the nature and diversity of the potentially impacted industries, AQMD will probably want to make a decision early on about which industry segments to use in further FBA analysis. If a proposed rule will impact a wide variety of industries at the four-digit SIC code level, it may not be practical to conduct an FBA for each individual industry and so a subset may be chosen. Conversely, the structure of the industry may be such that the vast majority of potentially impacted firms fall within just a few SIC codes. In these cases, it may make sense to include all the SIC codes in the analysis.

---

<sup>1</sup> As of March 2002, the appropriate Internet link is as follows: <http://es.epa.gov/oeca/sector/index.html>.

Much of the data needed to complete an FBA will only be available using the NAICS system. Thus, if the initial industry identification is done using SIC codes, it is still necessary to identify the comparable NAICS codes. Appendix A contains a detailed discussion about how to convert data between SIC and NAICS codes.

**Case study examples.** Exhibit III-2 below provides the staff conducting FBA analysis examples of how to identify potentially impacted firms and industries through the case studies summarized in the industry profile sections of ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421.***

**Exhibit III-2.  
Identifying Industries and Firms**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Industry Profile – PR 1137 Page 3	Identifying potentially impacted industries/firms and describing identification process.	Based on a mail survey, site visits and AQMD staff knowledge, AQMD rule-writing staff determined that PR 1137 would potentially impact firms within SIC code 24 (lumber and wood products) and 25 (furniture and fixtures industry).
Firm Profile – PR 1137 Page 2	Selecting industry segments for further analysis. BBC selected 8 of the approximately 20 four-digit SIC codes.	BBC sorted the industry segments (four-digit SIC codes) by the number of firms believed to be potentially effected in each segment. We then selected the top 8 segments which represented about 70 percent of potentially affected firms.
Industry Profile – PAR 1421 Page 3	Identifying potentially impacted industries/firms and describing identification process.	Potentially impacted firms were defined by examining AQMD's permit database and EPA publications describing the nature of the dry cleaning industry. This information indicated, for example, that coin-operated dry cleaners were a small and diminishing segment of the industry and that industrial cleaners were relatively rare.

**Industry Composition**

An analysis of industry composition involves looking at the firm size structure of the affected industry, identifying ownership patterns by women, minorities or other groups of particular interest, and comparing these industry configurations in the L.A. Basin with those at the national level.

**Industry composition by size.** Typically, economists think about size of firms in terms of revenues, sales or employment. All of these measures serve essentially as proxies of size. For purposes of completing an industry profile, BBC recommends examining size by employment, primarily because this is by far the easiest to obtain, the most reliable and the most consistent of the three measures.

Once AQMD has identified the affected industry(ies) by SIC or NAICS code, it is straightforward to profile the size structure of the industry by employment. The U.S. Census Bureau, through its annual County Business Patterns (CBP), provides the most complete data regarding firm size by number of employees.<sup>2</sup> It is important to note, however, that commonly used CBP data does not include establishments with zero employees (e.g., purely owner operated and family run businesses). This can be an important issue in industries such as dry cleaning. Other data available from the Census Bureau does, however, provide a comparable estimate of the number of these non-employee firms with the same geographic and industry detail as CBP<sup>3</sup>.

On its website, the Bureau provides the following data: total number of employees for the industry;

- Payroll for the industry for the first quarter of the year and the whole year total;
- Total number of firms for the industry; and
- Number of firms using these employment size classes: 1-4 employees, 5-9, 10-19, 20-49, 50-99, 100-249, 250-499, 500-999, and 1000+.

The Bureau currently offers this data on its website for the years 1995 through 1999. Industries defined down to the four-digit SIC code are available for 1995 through 1997; data for 1998 and 1999 are presented for industries down to the six-digit NAICS code level. Data is obtainable at the national, state, county, and zip code levels for all five years. Using NAICS codes, data are available at the Metropolitan Statistical Area level for 1998 and 1999.

Even if an affected industry is defined by multiple industry codes, the CBP website will allow AQMD to easily pull together a complete picture of the industry by size for individual affected sectors and for the aggregate impacted industry.

**Industry composition by disadvantaged groups.** Though AQMD is concerned about disproportionate impacts on disadvantaged groups, it is difficult to obtain current, detailed information. The Surveys of Women and Minority Owned Enterprises conducted by the U.S. Census Bureau is the only reliable information on minority ownership of firms.<sup>4</sup> Data are only available at the two-digit SIC code level and at the state level. The Survey displays the same information as the general Economic Census, including:

- Total number of firms;
- Total number of firms with paid employees;
- Sales receipts for all firms and for firms with paid employees;
- Total number of employees within firms with paid employees; and
- Payroll for firms with paid employees.

---

<sup>2</sup> As of March 2002, the appropriate Internet link is: <http://www.census.gov/epcd/cbp/view/cbpview.html>.

<sup>3</sup> Data on non-employee firms is available at the six-digit NAISC level of detail for the years 1997-1999 at <http://www.census.gov/epcd/nonemployer/idnex.html>

<sup>4</sup> As of March 2002, the appropriate Internet link is: <http://www.census.gov/csd/mwb/>.

The U.S. Census Public Use Micro Sample (PUMS) dataset provides information both on racial/ethnic status and the industry in which individuals work. Thus, it can be used to determine the racial or ethnic make-up of the employment base. However, the most recent data currently available is 1990. Complete data from the 2000 Census will not be made available until sometime in 2003.

Given the lack of data at the local level, AQMD may want to supplement any secondary information with qualitative or quantitative information provided by state or local industry trade associations.

**Industry composition in LA Basin relative to nation.** To give the industry composition elements some context, BBC found it useful to compare the impacted industry's firm size distribution and minority ownership proportion to national data. Both CBPs and the Surveys of Women and Minority Owned Enterprises Both, provide national data. BBC gathered the national data at the same time and from the same websites as the regional data in order to produce the national industry composition profiles.

**Case study examples.** In Exhibit III-3 below, we pull from the report entitled ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421*** to demonstrate how industry composition analyses were conducted in the two case studies.

**Exhibit III-3.  
Industry Composition**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Industry Profile – PR 1137 Page 4	Industry composition by size (number of firms within each size category by county as well as percent of total firms within size category) shown in Exhibit IIA-1. The exhibit also shows the size composition of the local industry relative to national trends.	Data source is U.S. Census Bureau, County Business Patterns. The local to national comparison is read as follows: 44 percent of all woodworking firms in the LA Basin in 1995 had between 1 and 4 employees. Nationally, only 48 percent of firms were in this size range.
Industry Profile – PR 1137 Page 4	Minority ownership and employment.	No reliable, secondary data available at local level. Best estimates are statewide ownership statistics for SIC 24 and 25 and trade industry reports.
Industry Profile – PAR 1421 Page 4	Industry composition by size and location shown in Exhibit IIIA-1. Proportional representation of firms by size in U.S. compared to L.A. Basin.	Data source is U.S. Census Bureau, County Business Patterns. CBP data is not always consistent with other estimates (e.g., AQMD permit database, Dunn and Bradstreet data) of total number of firms in a given industry because CBP does not include firms with no employees.
Industry Profile – PAR 1421 Page 4	Minority ownership and employment.	Again, no reliable, secondary data available at local level. Estimates by local industry representatives indicate that the majority of firms are owned by persons from ethnic or racial minority groups.

## Markets and Competition

A discussion about markets and competition is an important part of the industry profile. Not only does it provide decision makers with a clearer picture of the industry to be regulated, but it also provides information that can be used to assess the impact of proposed rule.

**Markets and competition components.** The type of questions that AQMD should ask and attempt to answer are as follows.

- What is the product that this industry produces?
- For whom is the product produced (other businesses, retail customers)? Does the industry sell directly to end-users?
- Where are customers located (LA Basin, state, region, nation, other countries)?
- Do similar types of firms that sell products into the LA Basin exist in other areas (state, region, nation, other countries)?
- Is there competition from alternative products?

**Data sources.** There are three main sources of information AQMD can use to assess markets and competition:

1. Existing published reports;
2. Interviews with local, regional and national industry experts; and
3. Qualitative data collected through focus groups from local businesses.

All of these sources of information are important because each may provide a slightly different perspective. Published sources of information include Standard and Poors' Industry Surveys; EPA Sector Notebooks; the US Industry and Trade Outlook; Dun & Bradstreet's Industry Financial Profiles; and industry trade journals. (Appendix B provides more information about cost and accessibility for each of these sources.) Industry experts are often found within trade associations, which can be identified either through Internet searches, through the EPA sector notebooks or through association indices such as Gale Research Company's *Associations Unlimited*. Though local trade associations should be consulted, it is also important to contact regional or national associations as they may be able to offer a broader perspective. Structured focus groups with businesses in the LA Basin provide locally-specific and up-to-date information about markets and competition.

**Assessing the implications of market and competitive information.** One of the most important threshold questions is whether or not an industry faces competition from outside the LA Basin. If it does—as was the case with the woodworking firms potentially impacted by PR 1137— it can be difficult to pass cost increases due to localized regulations to customers. If an industry does not face external competition, as was the case with PAR 1421, the end result of a rule in the end may be a partial or complete cost pass-through and correspondingly higher prices for consumers.

Sometimes AQMD rules use phase-in periods or are more applicable to certain firms within an industry than others. If competition is tight within an industry and there are different impacts on different firms, then passage of a proposed rule might provide some firms with a localized competitive advantage.

**Case study examples.** To help staff preparing an FBA, Exhibit III-4 below highlights the sections of ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421*** in which BBC assessed markets and competition for the two proposed rules.

**Exhibit III-4.  
Markets and Competition**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Industry Profile – PR 1137 Page 5	Describes wood product markets, by answering questions about products produced, for whom products are produced and where customers are located.	Information developed by examining EPA publications (sector notebooks) and interviewing regional and national trade associations.
Industry Profile – PR 1137 Page 6	Describes competitive environment for wood products firms. Exhibit IIA-2 compares the relative size of the local industry to the national industry to assess net export or import question.	Based partly on review of literature and trade association input. CBPs are the source for the comparison of LA Basin to national, which allows for some determination of net import or export status. The finding that firms potentially impacted by PR 1137 face competition from firms outside of the LA Basin, implies that, at least for analysis purposes, it must be assumed that it will be difficult to pass cost increases along by increasing customer prices.
Industry Profile – PAR 1421 Page 5	Market and competition analysis.	Analysis based on review of secondary information (EPA and trade association journals) as well as input from local dry cleaners during work group. Though drycleaners do not face competition from outside the L.A. Basin, competition amongst dry cleaners in the L.A. Basin is very strong. Thus, it was important to pay attention to whether or how the proposed rule would have differential impacts on local firms.

**Factors and Trends Impacting the Industry**

Factors and trends impacting the industry give the audience a chance to understand how the industry fares in different economic climates. It is also the appropriate place to provide any other important information that would help to characterize the industry or that relates to the potential regulation.

**Factors and trends components.** The type of questions that AQMD staff should attempt to ask and answer include the following.

- What are the economic trends impacting the industry?
- How does the industry fare in different economic climates?
- How can the economic health of the industry be characterized at this point in time?
- Does the local industry respond to the economic climate in the same way that the regional or national industry does?

**Data sources.** The data sources for answering these questions are the same as those that respond to the market and competition questions.

**Case study examples.** Exhibit III-5 below provides examples of analyzing factors and trends impacting a potentially impacted industry from ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421.***

**Exhibit III-5.  
Industry Factors and Trends**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Industry Profile – PR 1137 Pages 7-8	Factors and Trends Impacting Industry	General market condition information collected from secondary sources and confirmed by local trade associations. Aggregate payroll was chosen for the graphic comparison to take advantage of the long time series of data available from the Bureau of Economic Analysis (BEA) at the two-digit level. The comparison of aggregate payroll growth is not ideal since these growth rates can be affected by changes in wage levels as well as changes in employment. However, the similar BEA time series data on numbers of jobs is not available at the level of industry detail needed. The most accurate comparison could be constructed by using CBP data, but obtaining a time series of this length would be a research challenge and would also involve extensive conversion of NAICS to SIC data.
Industry Profile – PAR 1421 Page 6	Factors and Trends Impacting Industry	Information drawn from local dry cleaners during workgroup process. Though BBC did not undertake a formal analysis to determine accuracy, the secondary literature we reviewed generally confirmed the information provide by local firm owners.

## Prior AQMD Regulations

The cumulative impact of local, state and federal regulations is a major concern for many in the business community. Ideally, AQMD staff could identify all regulations impacting an industry. Practically, this would take a very large amount of effort and it would be almost impossible to ensure comprehensiveness.

It is both reasonable and logical, however, to identify prior AQMD regulations that impact an industry. In some instances, studies of the impact of AQMD regulations have been conducted. Obviously, the findings of these studies should be referenced. Input provided by the industry during structured focus groups can also be presented, though it is appropriate to note instances where such information cannot be confirmed by independent sources.

See page 9 of the Industry Profile section for PR 1137 and page 7 of the Industry Profile section for PAR 1421 in ***Facility-Based Assessment: Case Studies Proposed Rule 1137 and Proposed Amended Rule 1421*** for an example of a listing of prior AQMD regulations relevant in these two situations.

## SECTION IV.

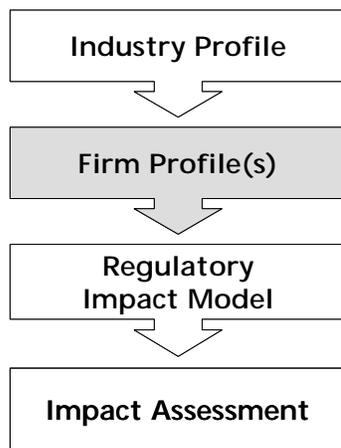
### Creating Firm Profiles

Creating one or more firm profiles is the second step of the FBA as shown in Exhibit IV-1 below. A firm profile is basically a snapshot of existing, pre-rule operational and financial characteristics for representative firms in the regulated industry.

Firm profile(s):

- Describe the operational and financial characteristics of firms such as employment, payroll, materials costs and profit margins in industries potentially affected by the rule;
- Provide a baseline against which the costs or other effects of the proposed rule can be measured; and
- Assist the AQMD decision makers in understanding the nature and economics of firms in the regulated industry.

**Exhibit IV-1.**  
**Four Steps in Completing an FBA**



#### The Concept of “Representative Firms”

Essentially, there are theoretically two alternative approaches to profiling the financial and operational characteristics of firms in the regulated industry. The first approach would be to use the actual characteristics of some or all of the firms in the industry, excluding any information which could be used to identify the individual operations. Though this approach would, if practical, be ideal, it will likely be unobtainable for AQMD in most instances. Many AQMD regulations focus on small, and often privately held, establishments and the nature of the data required for the firm profiles is typically regarded by the businesses as confidential.

In light of these concerns, the second approach is likely to be more practical for AQMD in most instances. This approach involves the creation of "representative firms," intended to portray the average characteristics of firms within the regulated industry, or specific subgroups within that industry.

### **Defining "Representative Firms" for the Firm Profiles**

The type of firm profiles to be developed depends on the nature of the rule. If a rule will impact many different types of industries, then it may make sense to develop firm profiles for each industry or for a subset of the industries. In many cases, it is also appropriate to present different firm profiles based on the size of potentially regulated firms as the impacts may be different for small or large firms.

**Profiling across industries.** The decision about whether or not it is appropriate to create firm profiles for different industries is actually made during the first step of developing an industry profile. Ideally, staff will decide at the very beginning of the FBA process how much variation exists within the potentially regulated community, based upon the identified SIC or NAICS codes and/or stakeholder input through focus groups or other vehicles, and thus the focus for the remainder of the FBA. Again, it is important to remember that decisions about which industries to focus upon are made for analysis purposes only. In many cases, it is simply not feasible or desirable to portray potential impacts on firms from every potentially impacted industry or industry segment.

Even when it is decided that an FBA will focus on several different industries (i.e., several different four-digit SIC codes), it may be useful to develop a composite firm profile that combines data from all the selected impacted industries. This composite firm profile provides a simple, easy and clear method of presenting information to decision makers about the potential impacts of a rule at the firm level. If a composite firm profile, representing several industries or industry segments, is created, AQMD should conduct additional analyses to examine the extent of variation across the industries combined in the composite profile. The case study of PR 1137 provides an example of both the use of a composite firm and the analysis of variations across the industry segments combined in the composite.

**Recognizing firms of different sizes.** AQMD policy makers are concerned about the impacts of proposed rules on different size firms. This concern makes sense, as smaller firms may respond quite differently to a new rule than larger firms. Smaller firms may not have the ability to absorb significant cost increases, while larger firms may be faced with much higher cost control technologies. Thus, for almost every rule, it will be important to develop firm profiles for different sizes of firms. This is true both for the composite firm profile and for firm profiles developed for specific industries.

In general, BBC proposes the use of three size categories: 1) smallest, 2) average, and 3) largest. In the case study for PR 1137, we based the definition of these categories (e.g., what we mean by smallest) on the data developed to describe the composition of the industry in the Industry Profile section of the FBA. In developing cost estimates, AQMD rule-writing staff sometimes also makes size distinctions among firms. One of the most important lessons learned in conducting the case studies was the need to make the size definitions consistent between the FBA (likely led by the socioeconomic staff) and the cost assumptions (likely developed primarily by the AQMD rule writers).

**Case study examples.** Decisions about the most appropriate types of firm profiles were made for each case study. References to the appropriate sections of ***Facility-Based Assessment: Case Studies Proposed Rule 1137 and Proposed Amended Rule 1421*** are presented in Exhibit IV-2 below.

**Exhibit IV-2.  
Identifying Types of Representative Firms for Profiling**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Firm Profile – PR 1137 Page 2	Deciding on types of firm profiles.	BBC only used eight potentially impacted industries to develop firm profiles. Since these eight industries (four-digit SIC codes) represented 70 percent of the affected firms, we believed the additional cost to analyze all 20+ potentially impacted industries would outweigh the benefits to the analysis. Decisions about size categories to use were based on definitions in available secondary data, but caution should be exercised to ensure consistency with other AQMD analyses.
Firm Profile – PAR 1421 Pages 2-4	Deciding on types of firm profiles.	Consistent with the decision made during the Industry Profile section, analyses focused only on SIC code 7216. The decision about which size categories to portray was made largely based on the recommendation of drycleaners who participated in a workshop with BBC.

**Key Components and Data Sources for Creating Firm Profiles**

To prepare for profiling firms in the impacted industries, AQMD will need to determine the necessary components and the best sources of data for the firm profiles.

**Profile components.** As stated above, the purpose of a firm profile is to summarize financial and operational characteristics of the typical impacted firm. To determine the types of financial information available, BBC reviewed typical firm balance sheets and the U.S. Census Bureau’s detailed Economic Census reports for the manufacturing, mining and construction sectors. When available, important information to understand the financial standing of a representative firm includes:

- Revenues;
- Number of employees;
- Operational information specific to the rule (e.g., number of dry cleaning machines)
- Labor costs, incorporating payroll and benefits;

- Costs of materials, purchased services, rent on facilities and rent on land;
- Costs of capital, depreciation and financing; and
- Gross margin and profit before taxes, both as percentage of revenues.

Much of the subsequent assessments of affordability, competitiveness and other issues will focus on a subset of these variables—typically including revenues, profits and cash flow (profits + depreciation). However, BBC believes a more comprehensive portrayal of summarized income statement type items, such as listed above, is useful to allow stakeholders to provide a better review of the reasonableness of the data and to allow decision makers to have a more complete view of the regulated entities.

**Data sources.** BBC has found that there is a variety of data sources upon which AQMD might rely in compiling firm-level financial information. The types of data available for creating firm profiles will vary significantly depending on the industry AQMD regulates. In addition to collecting secondary data, AQMD may want to make use of information collected from the potentially regulated industry during a focus group or targeted work session. While data specific to firms in the LA Basin are clearly preferable, such information often will be unavailable from secondary sources. Stakeholder input is one way of addressing a lack of firm-level information specific to the LA area.

**U.S. Census Bureau.** The U.S. Census Bureau, through its Economic Census and its CBPs, is the most reliable and consistent source for both general and more detailed data at both the national and the local levels. The Bureau collects information about revenues, payroll and number of employees for all sectors at all levels (national through to zip code levels).<sup>1</sup> For the manufacturing, mining and construction sectors, the Bureau collects much more detailed information at the national level through its Economic Census, including labor costs, costs of materials and other inputs, and costs of capital, depreciation and financing.<sup>2</sup> In these three sectors, data are available *only* at the national level on the Bureau's website. For all other sectors, this detailed financial data is not readily available, though special tabulations may be possible at a charge.

**Risk Management Association (RMA).** The RMA's Statement Studies provides typical balance sheet ratios for most four-digit SIC codes at the national and regional levels (the western region would apply most closely to the L.A. Basin). Because RMA reports only provide ratios (as percentages of sales or assets), BBC used RMA only to provide a data point that was missing in the Census Bureau information, namely profit before taxes as a percentage of revenues. AQMD also may use the RMA Studies to compare with the Bureau's numbers. However, the Studies rely on a much smaller sampling pool than the Bureau's, and thus in the case studies, BBC used Census Bureau information supplemented with RMA data to produce representative firm estimates.

---

<sup>1</sup> As of March 2002, the appropriate Internet links are as follows:  
Economic Census at <http://www.census.gov/epcd/www/econ97.html>  
and County Business Patterns at <http://www.census.gov/epcd/cbp/view/cbpview.html>.

<sup>2</sup> As of March 2002, the appropriate Internet links are as follows:  
Manufacturing at <http://www.census.gov/prod/www/abs/97ecmani.html>;  
Construction at <http://www.census.gov/prod/www/abs/cciview1.html>;  
and Mining at <http://www.census.gov/prod/www/abs/97ecmini.html>.

**Publicly traded companies.** If the regulated industry is composed primarily of larger, publicly owned firms, there is a wide variety of sources available for detailed financial data. Corporate websites and company annual reports, Dun & Bradstreet, Standard & Poor's, Moody's, the Gale Research Company, Hoover's Online, and the U.S. Securities and Exchange Commission, among others, all provide detailed firm-level financial information (see Appendix B for details on cost and access for these secondary sources). AQMD could fashion representative firm profiles from these reports, or they can present the firms' information in aggregate as representing the industry.

**Primary information.** BBC has reiterated the benefits of involving stakeholders in the process of creating FBAs many times in this report (see Section VII, Additional Considerations) and other documents. Though input from stakeholders should be an integral part of each FBA, it is more essential and appropriate for some rules than for others. In particular, secondary data may be lacking for industries dominated by small, mostly privately owned firms and service sector industries. In these cases, structured focus groups with industry representatives and firm owners can provide some of the essential information for constructing firm profiles. Such self reported data is potentially subject to strategic responses. Gathering and comparing results from sessions with different participants or with available secondary data can increase confidence in the results.

**Case study examples.** **Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421** describes the data sources used to compile firm profiles. Appropriate references are outlined in Exhibit IV-3 below.

**Exhibit IV-3.  
Data Sources for Firm Profiles**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Firm Profile – PR 1137 Page 2	Identify data sources	Data source for firm profiles is 1997 Economic Census (employees, revenues, and expenses) and Risk Management Association (profit before taxes). Land rental and finance costs were estimated as residuals.
Firm Profile – PAR 1421 Page 2	Identify data sources	Firm profiles are largely based on input from LA Basin area drycleaners during PAR 1421 workgroup. Estimates provided by participants were compared to available national data. As the two sets of numbers generally reinforced one another, the midpoint of ranges provided by workgroup participants were used in developing firm profiles. Given the homogeneity of the dry cleaning industry, qualitative data gathering techniques were easier to implement than for more diversified industries.

## Composing Firm Profiles

Once AQMD has identified the necessary components and data sources, composing firm profiles is primarily a matter of gathering data and transferring them into a spreadsheet for analysis. The most typical course of action is to profile firms in individual industries first, then draw together a composite firm profile. If only one industry is likely to be impacted, of course, the individual industry and composite firm profiles will be one and the same. If there is a dearth of detailed firm-level financial data from secondary sources, the other course of action would be to create a firm profile from primary data. All three strategies are outlined below.

These three strategies apply similarly to the three size categories of firms, as well—average, smallest, and largest. There may be a difference in the level of detail of the information available for the different size categories (i.e., smallest and largest firms typically have less detail available than the average firms), but the overall strategies are the same.

**Individual industry profiles.** If detailed financial information from secondary sources is available, the first step in composing a firm profile is to gather and compile the individual industry data in a spreadsheet for analysis.

**Composite profiles.** Once AQMD has created all the individual impacted industry firm profiles, generating the composite firm profile is straightforward. The composite firm profile is simply a straight or weighted average of the individual industry firm profiles. If AQMD determined the universe of impacted firms while writing the proposed rule, they can create a weighted average firm profile by multiplying each representative firm's financial statistics by the proportion of the regulated community that its industry comprises and then adding up those calculations. If AQMD does not know the universe of regulated firms before performing an FBA, then a straight average of the individual industry firm profile statistics is appropriate.

**Profiles from primary data.** When impacted industries are mostly small, privately owned firms, there may not be enough secondary data available to create a useful firm profile for FBA. This is particularly true of non-manufacturing industries, such as trade and services, where secondary data is the most limited. In those cases, it is vital to include a primary data collection component to the firm profile. Primary data are not typically as consistent or clear-cut as secondary data, but when secondary data are not readily available, they can be an essential input to the firm profile.

In developing the firm profiles of dry cleaners for the PAR1421 case study, BBC worked within AQMD's established workgroup structure. To avoid concerns about disclosing confidential information about their individual businesses, workgroup participants, consisting of individual business owners and trade association representatives were asked to design a typical, prototype firm within each size category. In such a situation, the analyst's role is to both facilitate input and challenge the group if responses seem inconsistent with one another. Workgroup participants may provide ranges of values for financial statistics for the representative firm in their industry. Imputing and presenting those values in the FBA report is important, but it is also key to establish some midpoint value so the reader has a truer idea of the financial characteristics of the "average" firm in each size group or industry segment.

**A note about analyzing different size categories.** As mentioned before, the techniques described here for composing the average firm profile are generally the same for creating firm profiles for size categories different from the average (i.e., smallest or largest). However, there is one important caveat that AQMD must keep in mind. The bulk of detailed financial information available from secondary sources comes from the U.S. Census Bureau's 1997 Economic Census Industry Series reports (for the manufacturing, mining, and construction sectors). As mentioned before, the two important tables in these Census reports for AQMD analysis are Tables 3 and 4, Detailed Statistics by Industry and Industry Statistics by Employment Size. Table 3 provides the detailed information seen in Exhibit IV-2, but it is only for the **average** firm. The information provided in Table 4 for the various size categories is much less detailed, comprising only number of firms, number of employees, payroll, cost of materials, revenues, and capital expenditures. In order to fill in the gaps left by this data source (employee benefits, cost of purchased services, rent on buildings and equipment only, and depreciation), BBC estimated these items based on the proportion of total costs they represented for the average firm.

In this way, AQMD can create complete firm profiles for all size categories that are relevant to their analysis. It should be recognized, however, that this approach does not account for economies and diseconomies of scale and may be less accurate for representative firms substantially different in size from the industry average. To some extent, this issue is mitigated by the use of RMA data to determine profits, since varied profit rates are available by size of establishment (both in terms of annual sales and firm assets).

**Case study examples.** To provide socioeconomic staff with a link to the case study examples of firm profiles, Exhibit IV-4 below summarizes important information from the firm profile sections of ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421.***

**Exhibit IV-4.  
Development of Firm Profiles**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Firm Profile – PR 1137 Page 3	Presents industry composite firm profile for three size categories. (See Exhibit IIB-2.)	Composite firm profile is weighted average of eight industries selected for analysis. Data was drawn from Economic Census and RMA (profitability only) as described earlier in this section. Land rental and finance costs were estimated as residuals (annual revenues minus identified costs minus calculated profits before taxes).
Firm Profile – PR 1137 Pages 6-9	Exhibits IIB-3 through IIB-5 presents firm profiles by size category (average, smallest and largest) and industry segment (4-digit SIC code.)	Economic Census cost data was scaled based upon average revenue levels for different firm sizes. Size specific profit rates (as percentages of revenues) were drawn from RMA national data. Note that the RMA data for the Western region could be used in place of the national data, but given that this regional data encompasses a large number of Western states, it is not clear that is more applicable to conditions in the District, while the sample sizes in the RMA data become considerably smaller.
Firm Profile – PAR 1421 Pages 4-6	Firm profiles by size are shown in Exhibits IIB-2 through IIB-4.	There was no need to create a “composite” firm profile for PAR 1421 because only one four-digit SIC code industry was analyzed. Working group midpoints used as final firm-level estimates.

**Describing Potential Variations**

By definition, firm profiles do not specifically portray the conditions of any actual firm within the LA Basin. Though data limitations mean that firm profiles are representative in nature, they are suitable for assessing the magnitude of compliance impacts. It should be remembered that even if the firm profiles were completely accurate in describing the conditions of the average firm, in reality there is a distribution of relative firm financial performance and roughly one-half of the actual firms may have more profitable financial characteristics, while roughly one-half may have less profitable characteristics. In cases where the best source of data available to create the firm profiles is national or in some other way not based on local firm or economic conditions, then a discussion about potential variations is needed to further qualify the applicability of the profiles.

The nature of the discussion on variations will depend upon the specific limitations of the data used to create the firm profiles. Generally, staff might want to consider variations over time (i.e., are the data representative of current conditions?), variations among industries (i.e., different revenue levels

or profits) and variations between national and local firm characteristics and economic conditions (i.e., are firms locally more profitable than firms nationally, or are economic conditions locally different than the national scene?). Some specific questions to ask and answer include:

- Are firms in the LA Basin the same size as national or regional firms?
- Are firms in the LA Basin facing environmental or other regulations that do not apply to national or regional firms?
- Do firms in the LA Basin face higher costs relative to firms in other parts of the country for some items such as rent, electricity or workers' compensation? Do firms in the LA Basin face lower costs relative to firms in other parts of the country for other items such as labor or transportation?

**Case study examples.** Exhibit IV-5 below references relevant examples of discussing variations on firm profiles from ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421.***

**Exhibit IV-5.  
Variations from Representative Firm Profiles**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
<p>Firm Profile – PR 1137 Pages 4-5</p>	<p>Variations from firm profiles by industry and by year. Also a discussion of how LA Basin firms may differ from national firms.</p>	<p>By its nature the composite firm profile tends to smooth over differences between industries. In discussing PR 1137, BBC noted that average firm revenues and profits were different for different types of woodworking firms. Even when only one year of data is used to compose the firm profiles, analysts should review any existing data on prior years. For example, RMA provides multiple years of profit rates. The year used should not be an anomaly. Given that data from the Economic Census may be several years old (this census is updated every five years) a question arises whether to adjust or inflate the information. Such an adjustment is problematic, since year to year variations in the financial performance of individual industries may not be well proxied by general indices -- such as the Producer Price Index. BBC opted to use the data as reported, without making any temporal adjustment to the figures. Finally, the required financial and operational data to develop firm profiles were available at the national level from reliable secondary sources. However, industry representatives indicated that conditions in LA were different relative to certain costs and prior air quality regulations. The report notes these concerns and, when possible, uses secondary data to confirm.</p>
<p>PAR 1421</p>	<p>N/A</p>	<p>N/A</p> <p>Given that current local data were used to construct the firm profiles, an analysis of potential variations was unnecessary.</p>

## SECTION V.

# Creating a Regulatory Impact Model

The third component of an FBA is the regulatory impact model, as illustrated in Exhibit V-1 below. The regulatory impact model provides a direct look at how the costs of the proposed regulation may affect the financial conditions of typical firms in the regulated industry and provides information used in the subsequent impact assessment.

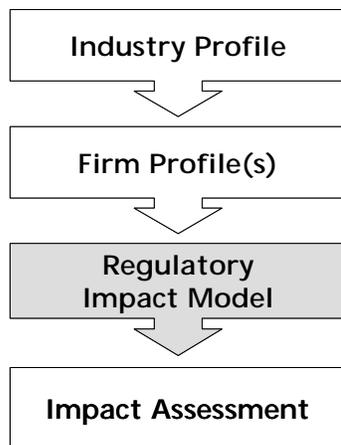
The regulatory impact model combines:

- Firm level financial and operational information (from the firm profiles); with
- Projected firm level capital costs, financing assumptions, annual operations and maintenance (O&M) and other costs potentially imposed by the proposed rule.

Depending on the nature of the proposed compliance requirements (and availability of data), the regulatory impact model can provide "before the rule and after the rule" comparisons of firm level income statement, balance sheet and/or multi-year financial pro-forma information.

These "before and after" comparisons will provide the AQMD decision makers with information about the impact of a proposed rule and will also feed into the fourth step in FBA—impact assessment.

**Exhibit V-1.**  
**Four Steps in Completing an FBA**



### Estimating the Costs Firms Would Face

Typically, there are several types of costs that a proposed rule may impose on regulated firms: capital equipment costs, annual costs such as operations and maintenance costs and financing costs. Depending on the nature of the rule, other costs (such as changes in materials costs or worker productivity) may also be involved.

Costs should be described relative to the status quo, or baseline pre-rule condition. In some cases (such as the PR1137 case study), where the proposed regulation involves an add-on technology which is only for the purpose of emission prevention or control, the full costs should be used in the analysis. In other cases (such as the PAR1421 case study), the regulation may require the adoption of different production equipment or materials at the time of equipment replacement. In such instances, it is the incremental difference between the costs associated with the proposed requirements from the costs associated with the industry's existing technology which is the relevant measure to be used in the analysis.

**Capital equipment costs.** The rule-writing staff within AQMD has the major responsibility for estimating compliance costs. These costs are then provided to the socioeconomic staff. In some instances, compliance costs for a given rule will vary depending on firm or industry characteristics. Additionally, the rule-writing staff may indicate that only a certain proportion of firms will be impacted by the rule. In the two case studies—PR1137 and PAR1421—rule-writing staff used a variety of research techniques to determine equipment costs including collecting information from potentially regulated firms (e.g., surveys, site visits and interviews), collecting information from control equipment manufacturers and vendors and relying on their own expertise from work on previous regulations affecting the industry.

**Annual costs.** The two main categories of annual costs relevant to an FBA are financing costs and O&M costs. In some cases, there may be other costs imposed by a rule that can be categorized as annual costs such as increased labor demands or changes in materials costs.

**Financing costs.** In the case studies, financing costs were developed by BBC. Our understanding is that socioeconomic staff, not the rule-writing staff, is responsible for establishing assumptions about financing terms and costs.

Firms that finance their capital equipment requirements by taking on additional debt will incur annual principal and interest payments on that debt (thus, the capital cost becomes an annual cost). To complete an FBA, staff will have to determine the appropriate financing terms which include interest rate and loan period. Reasonable inferences about financing terms can be made by contacting local lenders and receiving input from the potentially impacted industry. (Note: In the following section, which describes the Impact Assessment part of an FBA, it is also advised to consult local banks about ability to finance—it may be more efficient to combine these inquiries.)

In cases where the capital equipment costs of the regulation are very small relative to the scale of annual financial activities of the representative firms, it is certainly possible that firms may actually chose to pay for the equipment out of their cash flow rather than obtaining a loan from an outside source. However, internal financing also imposes an effective financing cost on the firm, since it means that resources are diverted away from other investments or returns to stockowners. For purposes of assessment, the simplest assumption, which perhaps also portrays the worst-case, is to assume all firms will finance any capital equipment required by the proposed rule.

**Operations & maintenance costs.** O&M costs are provided by the rule-writing staff using the same research methods used to determine capital costs. In some cases, these costs may be provided in terms (such as dollars per gallon of material use or per production cycle) that will require further conversion to represent the annualized costs for the representative firms. For example, in the PAR

1421 case study, costs of cleaning solution were provided on a dollars per gallon basis, etc. The FBA analyst may need to work further with the rule writers, or conduct additional research into the industry, to insure that such unit costs are scaled appropriately to the annual operational activities representative firms.

**Case study examples.** To provide socioeconomic staff with a link to “real-world” examples of the techniques that can be used to estimate capital and annual costs, Exhibit V-2 below summarizes the cost estimation process used in the regulatory impact model sections of ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421.***

**Exhibit V-2.  
Estimating Annual, Firm-Level Costs**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Regulatory Impact Model – PR 1137 Page 2	Describe how cost estimates were developed.	This page reflects information provided by AQMD rule writers and socioeconomic staff.
Regulatory Impact Model – PR 1137 Page 3	Estimating capital costs. Exhibit IIC-1 reflects both range of firm sizes and range of potential costs impacts, depending on technology adopted to comply with rule.	Cost estimates and technologies were provided by AQMD. Worst case assumption that all firms would finance new control equipment, instead of funding out of current cash flow, was used.
Regulatory Impact Model – PR 1137 Pages 4-5	Estimating annual costs. Exhibit IIC-2 provides range of annualized costs (which includes annual financing and O&M costs as well as annual capital cost expressed as loan payment) by firm size.	Capital costs taken from Page 3. Disposal and O&M costs provided by rule writing staff. To obtain loan terms, BBC contacted lenders and described the equipment that would be purchased with the loan and the general financial characteristics of the borrower (based on information in the firm profile section). Annual costs after the loans are repaid would, of course, be lower.
Regulatory Impact Model – PAR 1421 Pages 3 and 10-11	Describe technical aspects of rule and how cost estimates were developed.	BBC analyzed two scenarios for PAR 1421. All cost information was developed and provided by AQMD rule writing staff.
Regulatory Impact Model – PAR 1421 Pages 4-6	Estimating capital costs using a high-end estimate and a low-end estimate. Exhibits IIIC-1 and IIIC-2 reflect capital costs for type of technology and size of firm.	Cost estimates and technologies were provided by AQMD. To analyze the high cost alternative, BBC used the lowest estimates of the cost of perc technology and the highest estimates of cost of alternative technologies. To analyze the low cost alternative, BBC used the highest estimate of the cost of perc technology and the lowest cost estimate of alternative technologies.

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Regulatory Impact Model – PAR 1421 Pages 7-8	Estimating annual costs. Exhibits IIIC-3 and IIIC-4 provides range of annualized costs (which includes annual financing and O&M costs as well as annual capital cost expressed as loan payment) by firm size and type of technology .	Capital costs taken from Pages 5,6 and 12. O&M and added labor costs provided by rule writing staff. To obtain loan terms, BBC contacted lenders and described the equipment that would be purchased with the loan and the general financial characteristics of the borrower (based on information in the firm profile section). Annual costs after the loans are repaid would, of course, be lower.
Regulatory Impact Model – PAR 1421 Page 12	Estimating capital costs, now for perc scenario. Given nature of the rule, only new firms and large existing firms incur any costs as shown in Exhibit IIIC-7. Costs are also shown relative to status quo, not as absolute costs. The detail needed by the reader to compute absolute costs is shown on page 8.	New firms assigned costs developed under non-perc scenario (pages 4-6). Range of costs for large existing firms also based on cost estimates developed for non-perc scenario. It was important to note that though small firms would not incur additional costs in replacing machines (because they could replace existing perc machine with another perc machine), some firms might have to replace their machines sooner than otherwise expected. Firms in such a position forego some of the useful life of their equipment.
Regulatory Impact Model – PAR 1421 Page 13	Estimating annual costs, again for perc scenario. (See Exhibit IIIC-8.) Also shown in relative, not absolute terms.	New firms and large firms assigned costs developed under non-perc scenario (pages 7-8), though costs for large firms are halved because they only have to replace one of two machines.

### **Cost Impact Relative to Firm Financial Characteristics**

Once cost estimates have been developed, the next part of the regulatory impact model involves combining cost information with data from the firm profiles described in Section III. In particular, annual revenues and annual profits before taxes can be compared with the potential costs of a rule. Costs can be expressed both as a percentage of annual revenue (divide costs by annual revenue) and as a percentage of annual profits before taxes (divide costs by annual profits before taxes.) These comparisons can be made for all industries or firm sizes for which firm profiles are developed in the second step of an FBA. In other words, the cost impact can be compared to firm financial characteristics for average sized firms, small firms, large firms and firms within different SIC codes.

**Case study examples.** Exhibit V-3 below summarizes the analysis done to compare costs to firm financial characteristics in the regulatory impact model sections of ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421.***

**Exhibit V-3.**  
**Costs Relative to Firm Financial Characteristics**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Regulatory Impact Model – PR 1137 Page 6	Compare annualized costs to firm financial characteristics by developing costs as a percentage of revenue and as a percentage of profits before taxes. (See Exhibit IIC-3.)	Data are drawn from the preceding page of the regulatory impact model section and from page 3 of the firm profile section. It is worth noting that, just as the firm profiles are intended to represent average financial characteristics of firms of the size and segment(s) profiled, the percentages of annual costs relative to profits or revenues should also represent the average percentage effect (e.g., about one-half of the firms would experience a larger impact and one-half a smaller one, depending on their baseline revenues and profits).
Regulatory Impact Model – PR 1137 Pages 11-13	Comparing annualized costs to firm financial characteristics by industry (4 digit SIC code) and size of firm. Exhibits IIC-7, IIC-8 and IIC-9 contain costs as a percentage of cash flow.	Cost data used same as those used for Exhibit IIC-3. Firm data drawn from firm profile section, pages 7-9. In Exhibits IIC-7 through IIC-9, cash flow is determined by summing profit before taxes and depreciation.
Regulatory Impact Model – PAR 1421 Page 9	Comparing estimated annualized costs with estimated annual revenues and profits before taxes. Exhibit IIIC-5 shows the analysis for different technologies and different establishment sizes for non-perc scenario.	Estimated annualized costs come from tables on page 8. Firm financial characteristics come from firm profiles section, pages 4-6. Instead of showing raw costs, costs are shown relative to the status quo (perc baseline). Therefore, for example, the smallest firms using wet cleaning actually show an improved financial situation relative to the status quo.
Regulatory Impact Model – PAR 1421 Page 14	Same as page 9 except completed for perc scenario. Instead of showing different technologies (because not applicable in this scenario) Exhibit IIIC-9 demonstrates costs as percentage of revenues and as a percentage of profits before taxes for new firms and existing firms.	Estimated costs from tables on previous page (13) and firm financial characteristics from firm profiles section, pages 4-6. Again, costs are shown relative to status quo or perc baseline.

**Before and After Rule Cashflows**

Impact on cash flow has been identified as an important measure of short-term affordability. To demonstrate the impact of a proposed rule on cashflow, staff preparing an FBA must first develop a simplified statement of annual cash flows. This statement is based on the income statement type information provided in the firm profiles. Since the tax burden for the individual firms is not available from secondary data sources and is subject to considerable variation, cash flow is approximated based on the sum of depreciation and profits before taxes. (Depreciation plus profits

**after** taxes would be a better measure if it were available). Cash flow impacts can be assessed either by comparing the absolute change or by looking at the percentage impact (e.g., dividing the annual costs by total cash flow).

**Case study examples.** Exhibit V-4 below describes the analyses BBC performed in looking an impact on cashflows in the regulatory impact model sections of ***Facility-Based Assessment: Case Studies Proposed Rule 1137 and Proposed Amended Rule 1421.***

**Exhibit V-4.  
Before and After Rule Cashflows**

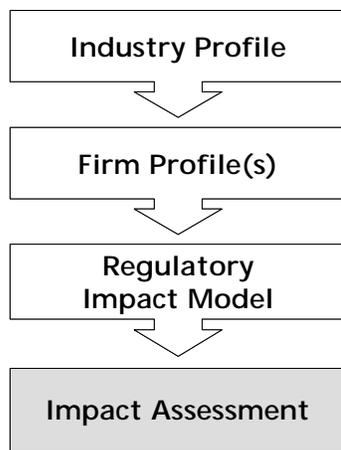
<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Regulatory Impact Model – PR 1137 Pages 7-9	Comparing cash flow before rule to cash flow after rule. Instead of showing costs as a percentage of cash flow (an equivalent way to demonstrate cash flow impacts), Exhibit IIC-4 demonstrates current cash flow and possible change as a result of the rule.	Exhibit IIC-4, IIC-5 and IIC-6 calculate cash flow by subtracting cash requirements from total revenues and adding back in depreciation (not shown). Firm financial data are from the firm profile section, page 3. Cost data are those provided by AQMD and shown on page 5 of the regulatory impact model for PR 1137. Disposal and O&M costs are shown as a purchased service. Principal payment on the loan is shown as a capital cost and interest payments on the loan are shown as other expense.
Regulatory Impact Model – PR 1137 Pages 11-13	Comparing potential rule costs to cash flow for different industries and sizes of firms. Cash flow impacts demonstrated by showing cost as a percentage of cash flow. (See Exhibits IIC-7 through IIC-9.)	Cost data from page 7 of same section. Firm financial characteristics from pages 11-13 of firm profile section for PR 1137.
PAR 1421 N/A	N/A	PAR 1421 could not be assessed in terms of its impact on cash flow because necessary firm financial data were unavailable (e.g., we did not have estimates of depreciation from the workgroup or other sources).

## SECTION VI.

# Assessing Impacts

The impact assessment is the final analytical component of the FBA as shown in Exhibit VI-1 below. The impact assessment combines information from the previous three sections (industry profile, firm profile and regulatory impact model) in order to evaluate the key issues for facility-based analysis: affordability of the proposed regulation; impacts on competitiveness; impacts on small and disadvantaged businesses; and cumulative impacts.

**Exhibit VI-1.**  
**Four Steps in Completing an FBA**



In some ways, the impact assessment section simply highlights key pieces of information developed in other steps of an FBA. However, it is important that all of this information be combined and analyzed in one place to give policy makers a concise and cohesive summary of the findings and implications of the FBA.

When the costs of the proposed rule fall on one end or the other of the continuum (either being relatively modest or relatively large compared to the scale of overall firm operations), judgments about the impact of a rule on affordability or competitiveness may be relatively easy for the AQMD decision makers to reach. When the costs fall in the middle, determining significance will be more difficult and situation dependent.

While there is no single, established standard for determining whether impacts are "significant", there are some precedents which can be considered. For example, EPA and CARB have traditionally used a ten percent change in profitability (e.g., a reduction in profitability from 20 percent to 10 percent)

as their threshold for determining significance. The U.S. Department of Health and Human Services uses a three to five percent reduction in revenues or increase in costs as its threshold for determining significant impacts on small businesses. Others have applied different standards.<sup>1</sup>

While AQMD may find it useful to adopt specific quantitative thresholds in assessing affordability and other issues, it should be recognized that such thresholds may suggest a false sense of precision and certainty with regard to the assessment. It may be more useful to simply report the results of the analysis (e.g., annualized costs represent eight percent of profits before taxes) rather than labeling the outcome.

## **Affordability**

Key affordability issues can include impact on cash flow, impact on profitability and ability to finance pollution control equipment. Whether or not firms have to absorb all of the increased costs, as opposed to being able to pass them on to consumers, depends on the competitive situation of the industry. If the industry profile establishes that firms in the LA Basin face competition from firms outside of the region, then the affordability assessment should incorporate the worst case assumption that no cost increases can be passed along to customers by raising prices.

**Impact on cash flow.** Impact on cash flow is a key measure of short-term affordability. In very simple terms, if facilities cannot maintain positive cash flow after regulations are imposed, they may be forced to borrow funds for operating purposes or cease operations. Further, positive cash flow provides funds for depreciation (to replace capital equipment as it is used up) and profits that reward and encourage investment in the firm.

By dividing the estimates of costs by the estimates of cash flow presented in the regulatory impact section of the FBA, it is possible to estimate the impact on cash flow in percentage terms. Estimated percentage changes in cash flow can be compared across each type of firm profiled earlier in the analysis (e.g., small firms, large firms, varied industry segments).

**Impact on profitability.** Profitability is a key measure of long-term affordability. Profitability rewards business owners and encourages further investment in the facility, which increases productivity over the long term. Dividing profits before taxes by estimated costs (in the regulatory impact model) produces a percentage impact on profits. Again, these analyses can be performed for firms in different size categories and different industries.

**Ability to finance.** Financing pollution control equipment can be challenging for regulated firms, as commercial lenders may consider such investments to not be productivity enhancing, and thus the investment offers no internal payback. The most important condition for obtaining financing is that cash flow must be sufficient to more than cover debt repayment. When lenders are concerned about annual coverage, they will look more closely at balance sheet conditions, such as how leveraged the firm may already be.

---

<sup>1</sup> For example, a study by Environomics Incorporated for the Composites Fabricators Association indicated that costs less than half of profits "although clearly a burden, might be feasible to absorb." While costs from 1 to 2 times profits were described as "unlikely to be affordable, even with some cost pass through to customers." (Environomics, 2000).

To examine the ability of firms in a potentially regulated industry to finance pollution control equipment, AQMD staff should examine the cash flow estimates developed in as part of the regulatory impact model. Telephone calls to local lenders should also be made to discuss and determine the criteria lenders would apply in a given situation. Of course, the ability of an actual firm to finance new equipment is highly dependent on the situation of that firm. The impact assessment can only determine if firms within the impacted industry can generally appear to meet lender's qualifications.

**Case study examples. *Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421*** reports the affordability assessments conducted in the case studies. Relevant citations are provided in Exhibit VI-2 below.

**Exhibit VI-2.  
Affordability**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Impact Assessment – PR 1137 Pages 2-3	Impact on cash flow	Costs and cash flow from regulatory impact model section. Absolute cost numbers straight from Exhibits IIC-4 through IIC-6. Costs as percentage of cash flow calculated by dividing costs by cash flow. Exhibits IIC-7 through IIC-9 in regulatory impact model section demonstrate absolute costs and costs as a percentage of cash flow for individual industries.
Impact Assessment – PR 1137 Page 3	Impact on profitability	Data for discussion of range of impacts all from Section IIC, Regulatory Impact Model for PR 1137. (See Exhibits IIC-3 through IIC-5 and IIC-7 through IIC-9.)
Impact Assessment – PR 1137 Page 4	Ability to finance	BBC conducted interviews with the type of financial institutions that impacted firms would potentially approach to finance costs imposed by new rule.
Impact Assessment – PAR 1421 Page 2	Impact on cash flow	Analysis not performed for PAR 1421 because cash flow estimates unavailable (due to lack of information on depreciation costs.)
Impact Assessment – PAR 1421 Pages 3-4	Impact on profitability	All data drawn from Exhibits IIIC-5 and IIIC-9.

**Competitiveness**

The principal competitiveness concern for new regulations is whether the costs or changes mandated by the requirements will affect the ability of local firms to compete with competitors outside the regulated region. Other potential competitiveness issues can include impacts on the establishment of new businesses in the regulated industry.

One indicator of the magnitude of potential impacts on competitiveness and market share relative to firms outside the District is to examine the annual costs of the regulation relative to the annual revenues of affected firms. In essence, the proportion of annual costs of the regulation relative to the existing annual revenues of the regulated firm is a rough measure of the magnitude of potential price increases, if all costs were passed on to customers. A large potential price increase, in an industry determined in the Industry Profile portion of the FBA to be highly price competitive with firms outside the region, could indicate the potential for substantial competitive impacts. Data for these comparisons comes from the firm profile and regulatory impact assessment sections.

Firms may also compete in terms of quality of product, as well as price. For some prospective AQMD regulations requiring changes in materials or production methods, quality considerations may be as important an issue as potential price increases. Competitive impacts in such cases will be more difficult to assess quantitatively and may have to be addressed primarily in a qualitative manner..

**Case study examples.** Exhibit VI-3 below references examples of competitiveness analysis from the impact assessment sections of ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421.***

**Exhibit VI-3.  
Competitiveness**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Impact Assessment – PR 1137 Page 5	Competitiveness impacts	Important to reiterate whether the industry competes with firms outside the region. Comparing costs to annual firm revenues indicates that any price increases, if possible, are likely to be small.
Impact Assessment – PAR 1421 Page 5-6	Competitiveness impacts	The localized nature of dry cleaning industry means that regional competitiveness is not an issue. Relative competitiveness of firms within LA Basin is also important. The background information for this discussion comes from the PAR 1421 work group as well as an analysis of the nature of the rule (e.g., the non-perc scenario would phase in by allowing dry cleaners to replace equipment at end of life.)

**Small/Disadvantaged Businesses**

AQMD and its stakeholders are concerned about the potential for new air quality regulations to have disproportionate impacts on small businesses and/or minority owned businesses.

**Small businesses.** The development of a small firm profile is a useful tool for addressing impacts on small businesses. Once this profile is created, all of the analyses detailed above, such as the affordability or competitiveness analyses, can be replicated for small businesses. Special attention can be paid to whether or not small businesses incur disproportionately large impacts on cash flow or profits.

**Disadvantaged businesses.** The firm profile section (Section III) of this document discussed the problems in collected good, localized information about the number of firms owned by individuals belonging to racial or ethnic minority groups. These problems are unfortunate because AQMD policymakers are very interested in identifying impacts on disadvantaged businesses. BBC recommends that AQMD continue to review new sources of data and examine new methods of collecting better information about the ownership status of firms.

Even with better information about the percentage of disadvantaged firms within a given industry, the absence of data about the ownership of specific firms combined with uncertainties about exactly how firms will implement new rules means that it is typically not possible to know for certain whether minority or ethnic-owned businesses will be disproportionately affected by the proposed rule.

**Case study examples.** *Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421* handled the issue of impacts on small or disadvantaged businesses as described in Exhibit VI-4 below.

**Exhibit VI-4.  
Small/Disadvantaged Businesses**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Impact Assessment – PR 1137 Page 6	Small business impacts	AQMD excluded firms with fewer than 10 employees from the analysis because research indicated they would not be impacted by the rule. Smallest firm profiles presented in Firm Profile section as well as some of the discussion on affordability in earlier parts of the Impact Assessment section used to assess small business impacts relative to other businesses.
Impact Assessment – PR 1137 Page 6	Disadvantaged business impacts	Lack of localized, firm-specific data combined with limitations in predicting which firms or types of firms will adopt different technologies makes this analysis difficult.
Impact Assessment – PAR 1421 Page 7	Small business impacts	Since, almost all dry cleaners are considered small businesses, analysis focuses on potential disproportionate impacts on smallest (2 employee) firms. Information culled from regulatory impact model Exhibits IIIC-5 and IIIC-9 and affordability discussion at beginning of Impact Assessment section for PAR 1421.
Impact Assessment – PAR 1421 Page 7	Disadvantaged business impacts	Lack of localized, firm-specific data make this analysis difficult, however, important to note that majority of firms in industry are owned by persons from disadvantaged ethnic or racial groups.

**Cumulative Impacts**

The discussion on cumulative impacts should begin by reiterating any prior AQMD regulations identified during the industry profile (Section II). Certain key issues to consider in this assessment are whether previous AQMD regulations affecting the industry are sufficiently recent or pervasive to imply ongoing costs for the firms that will also be affected by the proposed regulation, whether regulated firms were required to make long-term capital investments by preceding AQMD regulations that would now be rendered obsolete, etc. Data on local industry trends, from the Industry Profile section of the analysis, can also provide an indicator of the health of the industry prior to the proposed regulation. Other information relative to cumulative impacts should be collected during the stakeholder interaction process.

Case study examples. ***Facility-Based Assessment: Case Studies, Proposed Rule 1137 and Proposed Amended Rule 1421*** also provides a discussion of cumulative impacts for the two case study rules. See Exhibit VI-5 below.

**Exhibit VI-5.  
Cumulative Impacts**

<i>Page(s) from Case Study Report</i>	<i>Analysis Being Conducted</i>	<i>Explanatory Notes</i>
Impact Assessment – PR 1137 Page 7	Cumulative impacts	In addition to reiterating previous AQMD rules, information comes from analysis of industry performance relative to nation conducted during Industry Profile stage. Qualitative input from trade associations and potentially impacted firms also contribute to analysis.
Impact Assessment – PAR 1421 Page 8	Cumulative impacts	Qualitative input from dry cleaners about impacts of past rules was an important source of information that allowed the assessment to go beyond repeating previous AQMD regulations.

## **SECTION VII.**

### **Additional Considerations**

The previous four sections have focused on the technical “how-to” of completing FBAs for proposed AQMD regulations. The many opportunities BBC has had to interact with stakeholders and AQMD staff throughout both Phase I and Phase II of this study have led us believe that there are a few additional, non-technical considerations that are important. These include:

- Creating meaningful ways for potentially impacted firms to provide information and feedback in the socioeconomic analysis and rule-making process;
- Ensuring that the steps utilized to complete an FBA are integrated into the existing rule-making process in an efficient and sensible manner; and
- Presenting results from the FBA analysis in a simple and yet comprehensive manner.

#### **Stakeholder Interaction**

The first phase of BBC’s work indicated that stakeholder input should be considered an important part of conducting a FBA. The business community that will be affected by a proposed rule will have the best information and insight into the current state of the industry in the LA Basin, though it is important to recognize that this community's views concerning potential regulations may not be completely objective. Involving the business community in FBA will also give AQMD another opportunity to interact with the regulated community in a constructive manner.

One of the reasons to move towards an FBA is to provide the business community with a more concrete picture of potential impacts. Though many business owners interviewed by BBC during Phase I of this project were relatively unfamiliar with the socioeconomic process, they still had ideas about what should be a part of the process or what information should be developed. The business community appears more concerned with operational and financial impacts as opposed to the aggregate employment and income measures produced by traditional socioeconomic analyses.

On the other hand, the interview process revealed a fundamental challenge. Many businesses interviewed by the study team identified improving communications and mutual understanding as one of the keys to a better relationship between AQMD and local business. However, many of these same businesses expressed concerns about sharing information with a regulatory agency. In the context of this study, this apparent conflict may indicate that obtaining information from local businesses to conduct FBAs, and perhaps to conduct PRAs, may be quite challenging.

BBC's recommendations for addressing these challenges include the following types of stakeholder interaction:

- Focus groups or working groups with all stages of the sector to be regulated (from input manufacturers to retailers) to refine cost estimates, assess feasibility and develop a clear understanding of how the sector functions and key issues related to the potential regulation; and
- Surveys, case studies or working groups to develop representative firm profiles or review profiles developed from secondary data sources and provide insight into affordability and competitiveness issues.

The case studies conducted for PR 1137 and PAR 1421 have underscored the need to collect and review data directly from the affected industry and the need to do so early in the rule-writing process. Though AQMD rules often evolve over the course of the rule writing process, the basic industry and firm level information needed to complete an FBA does not appear to typically change substantially.

For a number of reasons, the two case studies did not allow BBC to fully test the recommendations made for stakeholder input. However, the interactions we did have and the input we received both provide ample evidence for the value and importance of making potentially impacted industries an active part of the socioeconomic assessment process.

- For PR 1137, a public workshop was held and public comment was solicited. Focus groups with the affected industry were also conducted. All of these steps occurred prior to the decision that BBC would use PR 1137 as a test case.

A draft of the industry profile and representative firm profiles that BBC developed based on secondary data for industries impacted by PR 1137 was distributed to the trade associations and a few other individuals in the wood industries. BBC received a number of comments on these drafts, which were reflected in this document and the companion report on the case studies.

- With regards to PAR 1421, BBC participated in one of the working sessions hosted by AQMD. At that meeting, we discussed industry background and current trends and representative firm characteristics. After the meeting a summary of findings was sent to workshop participants for comments, though none were received. Given the lack of secondary data on the dry cleaning industry, at either the national or local level, these conversations were crucial to establishing thresholds used in the firm profiles.

In general terms, the data developed through the workshop with the PAR 1421 workgroup was reasonably consistent with the limited data available from secondary sources. It should be noted that though this particular exercise was apparently successful in helping to develop the firm profiles, similar future workshops may not always be as constructive and productive. Nonetheless, we believe the process itself is valuable from both AQMD and the stakeholders' perspective.

## Integrating the FBA Process

It was outside the scope of BBC's assignment to examine the entire rule-making process in detail. Given our recommendations about stakeholder input, however, it seemed worthwhile to consider how an FBA could be integrated with the existing rule making process.

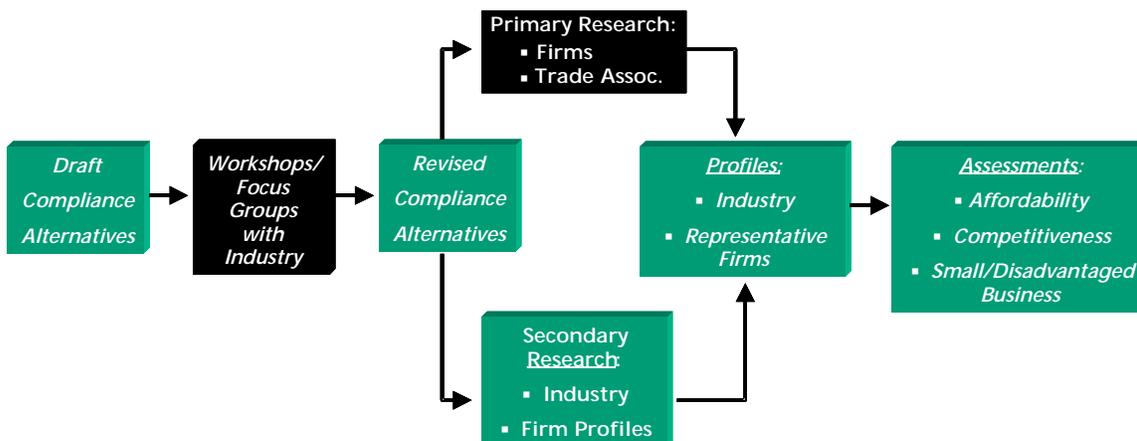
When a rule is being developed, there are typically several opportunities for stakeholder input. Working groups are often formed where industry representatives and AQMD staff can discuss relevant topics. Sometimes focus groups are held. In some cases, mail surveys will be sent to firms or site visits will occur.

BBC's principal recommendation in this area is simply to integrate the socioeconomic staff into each of these settings. Not only should socioeconomic staff be present (as they often are already), but they should have the opportunity to contribute to the design of surveys and focus group guides, facilitate discussions specific to the financial and economic conditions of the industry and potentially regulated firms and collect specific information from industry representatives (e.g., markets and competition, costs of doing business, firm sizes, firm revenues and profit margins). At AQMD, as at many regulatory agencies, the socioeconomic assessment is often traditionally the last step in the development of proposed rules prior to consideration by the decision makers. The case study experience suggests that involving socioeconomic staff and FBA analysis throughout the rule development process can be helpful in identifying potential modifications to proposed regulations to help mitigate affects on the regulated industry.

In some cases, if the rule-writing staff has decided not to conduct working groups or focus groups, then the socioeconomic staff should at least consider hosting one or more sessions to collect industry and firm-level information.

Exhibit VII-1 below provides a graphic depiction of the potential process for integrating FBA into the existing rule making process and providing opportunities for stakeholder input.

**Exhibit VII-1.**  
**Integrating FBA in the Rule-Writing Process**



Source: BBC Research & Consulting.

## Presentation of Results

Throughout BBC's work with AQMD, stakeholders and staff have emphasized the importance of how information is presented. One of the challenges that AQMD faces is the diversity of the audience for this type of work: to obtain meaningful review from the business community, a fair amount of detail will likely be required. Decision makers, however, often have limited time available and need a relatively terse summary of the information developed from the FBA (and other socioeconomic analyses of proposed rules).

The companion report, ***Facility-Based Assessment Case Studies Proposed Rule 1137 and Proposed Amended Rule 1421***, provides an example of detailed and comprehensive reporting on FBAs. As shown in this report, while the two proposed regulations and the affected industries differ, BBC believes the basic four-step structure can be consistently maintained, assisting readers in reviewing this type of information. Although the case study report is somewhat lengthy, the landscape format and emphasis on relatively terse text and graphics is intended to make it relatively easy to review and digest.

Given resource and time constraints, AQMD may not wish or be able to prepare such detailed FBA reports in every instance. Much of the audience for an FBA on a proposed regulation may also prefer to examine a much briefer summary. Essentially BBC sees two likely options in this regard:

1. AQMD could prepare shorter and more summary versions of FBA reports that would still stand alone. Again, we would suggest maintaining the four step structure, but each key findings from each step can likely be abbreviated to a one or two page summary, emphasizing bullets and graphics. The summary of each case study contained in ***Summary report: Findings and Recommendations for Facility-Based Assessments and Post-Rule Analyses*** provides an example of such reporting.
2. AQMD can integrate the key findings from FBAs into their existing Rule Staff Report structure. This approach has the advantage of combining the range of relevant information (in both socioeconomic and other dimensions) into a single document. AQMD staff has already experimented with such integration with the FBAs conducted for the two case study regulations and is continuing to refine the format of the Rule Staff Report in response to comments from stakeholders throughout the study process.

# APPENDIX A.

## Conversion of SIC and NAICS Codes

Much of the data needed to complete an FBA will only be available using the NAICS system. Thus, if AQMD initially identifies impacted industries using SIC codes, it is still necessary to identify the comparable NAICS codes. The following, rather complicated, discussion of conversion from NAICS to SIC codes is applicable only if AQMD will be gathering data from sources that are mixed between SIC and NAICS codes.

Throughout this appendix, we will refer to the case study conducted for PR 1137 as an example of how to complete the necessary conversions. AQMD initially identified the industries potentially impacted by PR 1137 by SIC code. Data BBC needed to develop both the industry and firm profiles were available only by NAICS code. Our explanation focuses on how to convert NAICS data to the SIC level, as that conversion is most likely to be the issue of concern facing AQMD staff.<sup>1</sup>

### Data Source

The data source for converting SIC to NAICS codes is on the U.S. Census Bureau website, and the current link is <http://www.census.gov/epcd/ec97brdg/>. Please keep in mind that this bridge is at the national level **only**. There is no bridge of which BBC is aware that will convert SIC to NAICS at state or local levels. BBC used this national bridge between SIC and NAICS in all its analyses.

**Identifying Codes.** The first step in converting SIC codes to NAICS codes is to identify the relevant NAICS codes. Using the bridge provided on the Census Bureau website, BBC identified the NAICS codes for each of the eight industries selected for analysis for PR 1137, demonstrated in Exhibit A-1 below.

**Exhibit A-1.  
Identifying NAICS Codes  
for PR 1137**

Source:  
BBC Research & Consulting and U.S. Census  
Bureau.

<i>Industry</i>	<i>SIC Code</i>	<i>NAICS Codes</i>
Sawmills and planing mills, general	2421	321113, 321912, 321918, 321999
Hardwood dimension and flooring mills	2426	321912, 321918, 337215
Millwork	2431	321911, 321918
Wood pallets and skids	2448	321920
Wood products not otherwise classified	2499	321912, 321920, 321999, 339999
Wood household furniture	2511	337122
Mattresses and bedsprings	2515	337121, 337910
Drapery hardware, blinds and shades	2591	337920

<sup>1</sup> If AQMD needs to convert SIC data to NAICS, take these equations provided in this appendix and perform them oppositely from the way in which they are shown here.

## Establishing the Relationship between SIC and NAICS Codes

Once AQMD identifies the relevant NAICS codes, it may seem as if the process can stop. If a perfect one-to-one relationship exists between each NAICS and SIC code, then one could stop.

Unfortunately, it is unlikely that all relationships will be one-to-one given that the NAICS system was created to be more specific and detailed than the SIC system.

To convert data from NAICS codes to SIC codes and to make sure that the conversion is accurate and provides outcomes comparable to other analyses within an FBA, AQMD must establish the proportional relationship between SIC and NAICS codes. In the case study for PR 1137, BBC needed to specify these relationships so that we could use Economic Census and CBP data at the SIC code level.

Exhibit A-2 below is a partial table from BBC's conversion of PR 1137 industries from SIC to NAICS codes. The numbers above the diagonal lines represent the percentage of each SIC code contained within the relevant NAICS code. For example, 84 percent of SIC Code 2421 is contained within NAICS code 321113. The numbers below the diagonal lines, on the other hand, represent the percentage of each NAICS code contained within the relevant SIC code. For example, 100 percent of NAICS code 321113 is contained in SIC code 2421. These percentages are taken from the U.S. Census Bureau's *1997 Economic Census: Bridge Between NAICS and SIC*.

### Exhibit A-2.

#### Sample of Proportional Relationships Between SIC-NAICS Codes for PR 1137

		SIC Code		
		2421	2431	2448
NAICS Code	321113	84 100	0 0	0 0
	321911	0 0	74 100	0 0
	321912	15 74	0 0	0 0
	321918	0 0	26 69	0 0
	321920	0 0	0 0	100 77
	321999	1 5	0 0	0 0

84% of firms in SIC 2421 are also in NAICS 321113

100% of firms in NAICS 321113 are also in SIC 2421

Source: BBC Research & Consulting.

## Converting Data from NAICS to SIC Codes

The method of converting data presented by NAICS codes into SIC codes depends upon the type of data being converted: counts or numbers than can be added are treated in one manner while average or per firm figures (e.g., number of employees per firm) are treated in another. The reason there are two different calculations is that in the first instance, all that is required is to sum the appropriate number of observations. In the second instance, data must be weighted by the correct proportion.

Examples of data elements considered “counts” are total revenues or wages for the industry, number of firms, and number of employees. Examples of data elements considered averages or per firm figures are revenues, wages, and employees per firm, or materials, purchased services and capital costs per firm.

**Converting counts.** To convert additive types of data from NAICS to SIC code, AQMD must focus on the percentages below the diagonal lines in Exhibit A-2. In other words, AQMD needs to use the percentage of each NAICS code contained within the relevant SIC code. Using number of firms and the relationships from Exhibit A-2 as an example, the equation reads as follows.

$$\begin{aligned} \text{The total number of firms in SIC 2421} = & ((\text{the percentage of NAICS 321113} \\ & \text{contained within SIC 2421, or 100\%}) * (\text{the number of firms in NAICS 32113})) + \\ & ((\text{the percentage of NAICS 321912 contained within SIC 2421, or 74\%}) * (\text{the} \\ & \text{number of firms in NAICS 321912})) + ((\text{the percentage of NAICS 321999} \\ & \text{contained within SIC 2421, or 5\%}) * (\text{the number of firms in NAICS 321999})) \end{aligned}$$

**Converting averages or per firm figures.** To convert this type of data from NAICS to SIC code, AQMD must focus on the percentages above the diagonal lines in Exhibit A-2. In other words, AQMD needs to use the percentage of each SIC code that is comprised by the relevant NAICS code. Using employees per firm and the relationships from Exhibit A-2 as an example, the equation reads as follows.

$$\begin{aligned} \text{The average number of employees per firm in SIC 2421} = & ((\text{the percentage of SIC} \\ & \text{code 2421 comprised by NAICS 321113, or 84\%}) * (\text{the average number of} \\ & \text{employees per firm in NAICS 32113})) + ((\text{the percentage of SIC 2421 comprised by} \\ & \text{NAICS 321912, or 15\%}) * (\text{the average number of employees per firm in NAICS} \\ & \text{321912})) + ((\text{the percentage of SIC 2421 comprised by NAICS 321999, or 1\%}) * \\ & (\text{the average number of employees per firm in NAICS 321999})) \end{aligned}$$

## **APPENDIX B.**

### **Industry and Firm Data Sources**

Data sources for FBA are many and varied. They run the gamut of cost, detail, and applicability to the L.A. Basin. Some data sources are free, detailed and specific to the L.A. Basin. Others are expensive and contain generalized data that is available only at the national level. This appendix describes all the data sources BBC researched, plus several others of which BBC is aware but was unable to learn much about. This appendix is not authoritative—there may be other data sources available for FBA that BBC did not discover.

As a general rule, more detailed data from a wider variety of sources is available for industries dominated by large, publicly owned, manufacturing firms. Other sectors, such as services, and those industries dominated by small, privately owned firms, have significantly fewer data sources available, and those that exist are generally less detailed and more industry-focused. Exhibit B-1 on the following page summarizes the data sources profiled in this appendix. Detailed descriptions of each source follow.

**Exhibit B-2.**  
**Data Source Summary**

<i>Data Source</i>	<i>Individual Firm Data</i>	<i>Aggregate Firm Data</i>	<i>Size of Firm</i>	<i>Data Specific to LA Basin</i>	<i>Financial Information Useful for Firm Profile</i>	<i>Industry Information Useful for Industry Profile</i>	<i>Cost</i>
EPA Sector Notebooks		✓	N/A	No		✓	Free
Fed Survey of Small Business Finances		✓	Less than 500 employees	Maybe	✓		Free
1997 Economic Census		✓	All	Yes	✓		Free
Center for Economic Studies Databases	✓	✓	All	Maybe	✓		Unknown
County Business Patterns		✓	All	Yes	✓		Free
U.S. Industry and Trade Outlook		✓	N/A	No		✓	\$75
SEC's EDGAR Database	✓		Large, publicly owned firms	Probably	✓		Free
American Business Disc	✓		All	Probably	✓		\$2,495
California Manufacturers Register	✓		All	Yes	✓		\$199-995
Directory of Corporate Affiliations	✓		Large, publicly owned firms	Probably	✓		\$1,133
D&B's Comprehensive Reports	✓		Any firm with adequate info	Probably	✓		\$112/firm
D&B's Industry Financial Profiles		✓	N/A	No		✓	\$196/industry
D&B's Million Dollar Database	✓		Firms with > \$1million in sales	Probably	✓		\$2,425
Gale's InfoTrac OneFile	✓	✓	Industries and variable firm sizes	Probably	✓	✓	\$4,900
Gale's Ward's Business Directory	✓		Large firms	Probably	✓		\$2,515
RMA's Annual Statement Studies		✓	N/A	No	✓		\$139
S&P's Net Advantage Industry Surveys		✓	N/A	No		✓	\$2,800
S&P's Net Advantage Register of Corp.	✓		All	Probably	✓		\$2,800
Thomas Publishing Company	✓	✓	Variable	Probably	✓	✓	Variable
ValueLine DataFile	✓		Large, publicly owned firms	Probably	✓		\$10,000
Corporate Websites	✓		All sizes, potentially	Probably	✓		Free to variable
Trade Associations	✓	✓	All sizes, potentially	Probably	✓	✓	Free to variable
Occupation Health & Safety Admin.		✓	N/A	No		✓	Free
Lexis-Nexis	✓	✓	All sizes, potentially, and industry	Probably	✓	✓	Expensive
Moody's Manuals	✓		All sizes, potentially	Probably	✓		Expensive

## Environmental Protection Agency Sector Notebooks

In 1995 and 1997, the USEPA completed an ambitious project to profile many of the major polluting industries in the United States. Though the statistical information included in the notebooks may be dated, the notebooks do provide a comprehensive and extensive look at each industry's characteristics—financially, environmentally and procedurally. Information provided includes:

- Comprehensive environmental profile;
- Industrial process information, as well as basic financial data;
- Pollution prevention techniques;
- Pollutant release data;
- Regulatory requirements;
- Compliance and enforcement history;
- Government and industry partnerships and innovative programs; and
- Industry and government contacts.

***Firm threshold.*** EPA profiled 32 industries, ranging from manufacturers to services like drycleaning. Data is in aggregate, industry specific form.

***Geography.*** National.

***Cost.*** Free.

***Form of access.*** Online at <http://es.epa.gov/oeca/sector/index.html>.

## Federal Reserve Survey of Small Business Finances

The Federal Reserve performed a thorough survey of small businesses in 1998, 1993, and 1987, and they have provided the raw data on their website. The survey explored information including:

- Number of employees and demographics of firms and owners;
- Use of deposit, credit, and financing services; and
- Income and expenses, assets, liabilities and equity.

***Firm threshold.*** Only firms with less than 500 employees were surveyed, and data is in aggregate form.

***Geography.*** National.

***Cost.*** Free of charge.

***Form of access.*** Online at <http://www.federalreserve.gov/pubs/oss/oss3/nssbftoc.htm>.

## U.S. Census Bureau's 1997 Economic Census

The U.S. Census Bureau also produced the 1997 Economic Census in which they present comprehensive and authoritative information about firms across all industries and geographical locations. The data covers only one year, 1997, and contains:

- NAICS code and description;
- Number of establishments;
- Sales, receipts, or shipments; and
- Number of employees and annual payroll.

***Firm threshold:*** All firms of all sizes are included in the Economic Census, but data is aggregate (no individual firm information). Data can be selected by geographic location and industry classification.

***Geography:*** National.

***Cost:*** Free of charge.

***Form of access:*** Online at <http://www.census.gov/epcd/www/econ97.html>.

## U.S. Census Bureau's Center for Economic Studies Databases

The U.S. Census Bureau's Center for Economic Studies maintains several databases that would greatly aid AQMD in its socioeconomic impact analyses. However, the Center has strict requirements for access to the data in order to maintain the integrity of agreements the Center has with firms that provide information for the databases. For more details about accessing these databases, please see <http://www.ces.census.gov>. For detailed descriptions of these databases, please refer to BBC's ***Task 1 Working Paper – Literature and Methodology Review***, pages 7 and 8. The Center's databases are:

- Longitudinal Research Database (LRD)
- Longitudinal Business Database (LBD)
- Quarterly Financial Reports (QFR)
- Survey of Manufacturing Technology (SMT)
- Pollution Abatement Cost and Expenditures Database (PACE)
- Manufacturing Energy Consumption Survey (MECS)
- Research and Development (R&D)
- Large company Survey and Auxiliary Establishment Database
- Characteristics of Business Owners (CBO)
- Worker-Establishment Characteristic Database (WECD)

## U.S. Census Bureau's County Business Patterns

The U.S. Census Bureau provides comprehensive and authoritative information about firms across all industries and regions in the United States. The data covers years 1993 to 1999 and can be filtered by SIC code, NAICS code, and geographic location down to the county and zipcode level. The data one can find in this database comprise:

- NAICS or SIC code and description;
- Number of employees and payroll for both the first quarter and the full year;
- Total number of establishments; and
- Number of establishments by size (number of employees), including sizes 1-4 employees, 5-9, 10-19, 20-49, 50-99, 100-249, 250-499, 500-999, and 1,000 and more.

**Firm threshold:** All firms of all sizes are included in County Business Patterns, but data is aggregate (no individual firm information). Data can be selected by geographic location and industry classification

**Geography:** National.

**Cost:** Free of charge.

**Form of access:** Online at <http://www.census.gov/epcd/cbp/view/cbpview.html>.

## U.S. Industry and Trade Outlook

Each year, the Department of Commerce and International Trade Administration produce the U.S. Industry and Trade Outlook, a book profiling 54 industries across natural resources, energy, construction, industrial materials, manufacturing, communications, consumer goods, transportation, healthcare, and financial, business, and education services. Information profiled in this book includes:

- Economic and trade trends, forecasts, and patterns;
- Industry and product data, including sales and production levels; and
- Analyses of industry trends and predictions for the near future.

**Firm threshold:** 54 industries, with more emphasis on production-oriented industries and less on services. Data is aggregate, industry specific.

**Geography:** National.

**Cost:** \$75 for the book, \$130 for a CDROM for one user, or \$10-25 each for downloadable chapters.

**Form of access:** Book, CDROM, or downloadable chapters. Order at <http://www.ntis.gov/product/industry-trade.htm>.

## U.S. Securities Exchange Commission (SEC) and the EDGAR Database

The SEC provides a database that contains thousands of reports from both large, often publicly owned companies, as well as some smaller businesses. The reports of particular interest are: annual reports, SEC registration documents, and 10-K/10-KSB/10-Q/10-QSB reports. Annual reports are the same ones distributed to stockowners; companies also file them with SEC. SEC requires registration documents in order to become a filing member of the Commission. 10-K and 10-Q reports are SEC's required update reports for companies with over \$10 million in sales, and 10-KSB and 10-QSB are the same reports, but for small businesses. Small businesses have somewhat less comprehensive reporting requirements. All these reports generally provide the following information about companies:

- Contact information;
- Financial information, such as sales, profits, and costs;
- Company trends and production, market details, areas of growth and decline; and
- Details of the operating structure of the company.

***Firm threshold.*** Generally \$10 million in sales, but there are some small business that report. Data is firm specific.

***Geography.*** National.

***Cost.*** Free.

***Form of access*** Online at <http://www.sec.gov>.

## American Business Disc

InfoUSA's American Business Disc is a powerful tool for researching over 12 million companies across the nation. Compiled from a variety of sources, the Disc provides:

- Business contact information, location, and industry classification;
- Ownership status and contacts;
- Corporate organizational structure and credit ratings;
- Sales and employment figures; and
- Ownership, affiliations, subsidiaries, and date of establishment.

***Firm threshold.*** The Disc comprises 12 million companies of all sizes, and data is firm specific.

***Geography.*** National.

***Cost.*** \$2,495 per year with a semi-annual update.

***Form of access*** Order online at <http://www.infousagov.com>.

## California Manufacturers Register

Harris InfoSource publishes this registry of more than 34,000 manufacturing firms in California. The Register supplies details for each company with regard to:

- Company names, addresses, and fax numbers;
- Employment figures and sales estimates; and
- Brief descriptions of what the company manufactures.

***Firm threshold*** Any firm that Harris InfoSource has in its database with one or more employees will have a profile. Data is firm specific.

***Geography*** State.

***Cost*** Harris InfoSource's Register comes in four forms and is produced annually. The printed volume costs \$199, the CD-ROM simple directory \$199, the CD-ROM interactive/selective directory \$995, and the online interactive/selective directory \$846.

***Form of access*** All forms of the California Manufacturers Register are available for ordering online at <http://www.harrisinfo.com>. Click on "Products and Services."

## Directory of Corporate Affiliations

This directory of more than 20,000 publicly owned, private, and international companies and their more than 100,000 subsidiaries, divisions, and affiliates, provides information on:

- Company names, contact information, personnel, divisions, and subsidiaries; and
- Basic financial data, such as assets, earnings and sales.

***Firm threshold*** \$10 million in sales for publicly traded and private companies, and \$50 million in sales for international firms. Data is firm specific.

***Geography*** National.

***Cost*** \$1,133 for the first five-volume set, \$1,259 for each subsequent set. A one-year subscription to quarterly updates with the set is \$1,995.

***Form of access*** Printed books in five volumes, revised annually.

## Dun and Bradstreet's (D&B) Comprehensive Reports

D&B's Comprehensive Reports profile companies in an in-depth manner, allowing the reader to assess the company's financial situation. Data profiled includes:

- Key business ratios, such as profitability and efficiency;
- Financial information, such as sales and assets; and
- Credit information, such as payment schedules and financial stresses.

**Firm threshold** For any firm for which D&B has enough information, they will produce a Comprehensive Report. Most eligible firms are larger companies, but there are many smaller firms included, as well. There is no strict threshold for inclusion, and data is firm specific.

**Geography** National.

**Cost** \$112 per company record.

**Form of access** Order online at <http://www.dnb.com>.

### D&B's Industry Financial Profiles

D&B's Industry Financial Profiles may help to understand the typical financial structure of companies within an industry. These profiles provide a list of the top ten companies in the industry, as well as a litany of industrywide financial statistics, including:

- Profitability and asset ratios;
- Cashflows, sales, and liabilities; and
- Other key business ratios, such as solvency and efficiency.

**Firm threshold** Most industries at the four-digit SIC code level. Some individual company data for the top ten companies is included, but all other data is aggregate, industry specific.

**Geography** National.

**Cost** \$196 per industry.

**Form of access** Order online at <http://www.dnb.com>.

### D&B's Million Dollar Database

D&B's Million Dollar Database provides thousands of records for companies that have more than \$1 million in sales annually, including 1.6 million firms. Data one can find in the database comprise:

- Contact information, location, and SIC industry codes;
- Sales and employment figures; and
- Ownership, affiliations, subsidiaries, and date of establishment.

**Firm threshold** Firms with \$1 million in annual sales, and data is firm specific.

**Geography** National.

**Cost** For the State of California, one user costs \$2,425 per year, with an additional \$200 per additional user.

**Form of access** Order online at <http://www.dnb.com>.

## Gale Research Company's InfoTrac OneFile

The Gale Research Company has produced a wide array of searchable databases that cover journals, magazines, and newspapers. One of their databases, InfoTrac OneFile, combines many of their systems into one and includes over 6,000 titles. Some 25 percent of the titles are academic journals, and another 25 percent are business and technology publications, with the rest composed of law and

healthcare journals, newspapers, and general interest magazines. Database titles included in the InfoTrac OneFile with which one may be familiar include: Business ASAP, Expanded Academic ASAP, and General Business File ASAP. This database may help to research:

- Industry trends and technologies;
- Latest news in the industry, including environmental issues;
- Current events at specific companies; and
- Market size and conditions and the general economic situation.

**Firm threshold** Most industries with variable amounts of information across firm sizes. Data is both aggregate and firm specific.

**Geography** National. Maybe some regional or citywide information.

**Cost** \$4,900 per year for one user, \$8,820 per year for two users.

**Form of access** Online at <http://www.galegroup.com>.

## Gale Research Company's Ward's Business Directory of U.S. Private and Public Companies

The Gale Research Company also produces this paperbound directory of businesses in the United States. The information available in this book includes:

- Name of the company and location;
- Ownership status; and
- Sales figures for the previous year.

For larger companies, the directory provides more detailed information in similar categories.

**Firm threshold** The directory covers 100,000 public and private companies, with 90 percent private and most of them larger entities. The company does not mention a specific firm threshold, and data is firm specific.

**Geography** National.

**Cost** \$2,515.

**Form of access** Book only, available at <http://www.galegroup.com>.

## Risk Management Association's Annual Statement Studies

RMA has created a database covering financial aspects of more than 600 industries. Manipulable by SIC or NAICS industry classifications, the database reports information comprising:

- Sixteen classic financial statement ratios, such as sales to receivables and profitability;
- Balance sheet and income statement line items, such as sales and operating expenses; and
- Trend data for the past four years.

**Firm threshold** Firms of all sizes across the nation, but data is aggregate (individual firms are unidentifiable).

**Geography** National and regional.

**Cost** The book costs \$139. The CDROM with only national data costs \$139. Regional data costs \$139 per region (there are six regions). The national data CDROM plus one region costs \$253. One can also download individual 4-digit SIC industry classifications for \$60 each.

**Form of access** Book, CDROM, online downloads. Order online at [http://www.rmahq.org/Ann\\_Studies/asstudies.html](http://www.rmahq.org/Ann_Studies/asstudies.html).

## Standard and Poor's (S&P's) Net Advantage – Industry Surveys

Net Advantage is S&P's platform to access its eleven most valuable research databases, including the Bond Guide, Corporation Records, Dividend Record, Earnings Guide, Industry Surveys, Investment Reviews, Mutual Funds, Register of Corporations, Security Dealers, Stock Guide, Stock Reports, and Current Outlook. The two most applicable databases for SCAQMD are the Industry Surveys and the Register of Companies. The Industry Surveys cover 52 major industries and over 100 subindustries and include data such as:

- Current market environment analysis;
- Industry trends and operational details;
- Key industry ratios and statistics, including interest rates and GDP; and
- Comparative company analyses, looking at revenues, income, returns, and financial ratios.

**Firm threshold** A wide variety of industries, with major companies profiled in the comparative company analyses. A heavy focus on production-oriented industries and major services, such as technology and transportation. Data is mostly aggregate, industry specific, with some individual firm data for top companies.

**Geography** National.

**Cost** \$2,800 per year for one user for just Industry Surveys. For all 11 databases, \$14,000 per year for one user.

**Form of access** Online at <http://www.netadvantage.standardandpoors.com>.

### **S&P's Net Advantage – Register of Corporations**

S&P's Register of Corporations has thousands of records for companies from all sectors of the economy. The larger the company, the more detailed the record the Register provides. Information comprises:

- Name, location, and ownership of the firm;
- Sales figures and NAICS industry classifications; and
- Number of employees.

**Firm threshold:** There was no identifiable firm threshold, but information is more detailed for larger firms than for smaller firms. Data is firm specific.

**Geography:** National.

**Cost:** Please see the cost for Industry Surveys.

**Form of access** Online at <http://www.netadvantage.standardandpoors.com>.

### **Thomas Publishing Company**

The Thomas Publishing Company produces several directories and buying guides that may be of use to South Coast. Publications include: the Southern California Regional Industrial Buying Guide, the Thomas Register of American Manufacturers, and Thomas Business Lists.

**Firm threshold:** Variable depending on directory. Data is likely firm specific.

**Geography:** National.

**Cost:** Variable by directory.

**Form of access** Variable by directory. See <http://www.thomaspublishing.com> for further information.

### **ValueLine DataFile**

The ValueLine DataFile contains records for more than 6,000 publicly traded companies. The records contain timeseries data from 1955 to the current year, including:

- Balance and income sheets;
- Risk measures and rates of return; and
- Analytic ratios.

**Firm threshold:** Only large, publicly traded companies are included in the DataFile, and data is firm specific.

**Geography:** National.

**Cost:** DataFile annual subscription, \$10,000.

**Form of access:** Order online at <http://www.valueline.com>.

### Corporate Websites

Corporate websites may offer a wealth of information for the researcher, including annual reports, contacts, and company profiles. It is most often larger companies that have extensive websites, though smaller companies may have at least basic information available online. Facts about firms available on corporate websites could include:

- Contact information;
- Financial information, such as cost and income statements; and
- Company profiles that reveal production and market trends and environmental practices.

**Firm threshold:** Many companies, large and small, have websites, but for research purposes, larger companies' websites are often most useful. Data will be firm specific.

**Geography:** National.

**Cost:** Free, though reports or other information may come at a charge.

**Form of access:** Online at [http://www.\[name of company\].com](http://www.[name of company].com) or use a searchengine, such as <http://www.yahoo.com> or <http://www.google.com>.

### Trade Associations

Trade associations offer a potential source of both primary and secondary data. It is worthwhile to consult firsthand with association representatives to learn what level of information from members they have found available. Associations sometimes keep databases of contact information and may have reports that will help reveal typical financial layouts for the industry's firms. The associations may also lead AQMD to other sources of information that they may not have onsite, such as databases, trade journals, or firms with whom one could confer.

**Firm threshold:** Any firm within the industry may be a member of a trade association. Data may be aggregate, industry specific, or there may be information available at the individual firm level.

**Geography:** There are industry associations at the national, regional, state, and city level for many industries.

**Cost:** Variable, but very often free of charge.

***Form of access*** Many associations may be found online, but reports, databases, or other forms of information may be available only in hardcopy for a charge. Two online directories of associations are Concept Marketing Group's Directory of Associations, at <http://www.marketingsource.com/associations/index.html>, and AssociationCentral.com.

### **Other Sources**

Occupational Safety and Health Administration (OSHA) has a variety of papers and databases available for several industries (see <http://www.osha-slc.gov>). Lexis-Nexis is an extensive database that brings together several databases and allows for in-depth research on industries and firm; however, it is prohibitively expensive to use unless accessed through a university library. Finally, Moody's Manuals are books that may be available at local L.A. Basin libraries and contain information about companies; however, they, too, are very expensive.