
Socioeconomic Impacts of Nuclear Generating Stations

Diablo Canyon Case Study

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Mountain West Research, Inc.
with
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Prepared for
U.S. Nuclear Regulatory
Commission

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ABSTRACT

This report documents a case study of the socioeconomic impacts of the construction and operation of the Diablo Canyon nuclear power station. It is part of a major post-licensing study of the socioeconomic impacts at twelve nuclear power stations. The case study covers the period beginning with the announcement of plans to construct the reactor and ending in the period, 1980-81. The case study deals with changes in the economy, population, settlement patterns and housing, local government and public services, social structure, and public response in the study area during the construction/operation of the reactor.

A regional modeling approach is used to trace the impact of construction/operation on the local economy, labor market, and housing market. Emphasis in the study is on the attribution of socioeconomic impacts to the reactor or other causal factors. As part of the study of local public response to the construction/operation of the reactor, the effects of the Three Mile Island accident are examined.

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CHAPTER 1: INTRODUCTION

1.1 The NRC Post-Licensing Studies

This report—the case study of the Diablo Canyon Nuclear Plant, located in San Luis Obispo County, California—is one of a series of reports that are being prepared as part of the NRC Post-Licensing Studies. The purpose of this chapter is to describe the objectives of the NRC Post-Licensing Studies, the major components of the studies, and the relationship of research concerning Three Mile Island to the overall study plan, and the organization of this case study report.

1.1.1 Objectives of the Post-Licensing Studies

The Post-Licensing Studies have four main objectives: to determine the socio-economic effects of nuclear power stations; to ascertain the significance of these effects to individuals and groups affected; to identify the determinants of the effects and their significance; and to determine whether currently available assessment methodology could have been used to anticipate the most significant of these effects.

Each of the latter three objectives depends upon clear identification of the effects of the nuclear station—the difference in the socioeconomic conditions as they occurred with the station and those that would have prevailed had the station not been built. Once the effects have been identified and their incidence among groups established, they must be placed in the context of the values of the individuals affected by them to determine their significance. The explication of the effects, the evaluation of those effects, and their significance to local residents permits an analytic consideration of the overall evaluation and the response of local residents to the presence of the nuclear facility in or near their communities.

After determining the patterns of effects caused by the facilities and the meaning of the effects to local residents across sites, the Post-Licensing Studies will turn to an examination of the causes of the documented effects. It is necessary to know what combination of site, project, or other circumstantial determinants appears to be responsible for the effects that ensued and for the levels of significance attached to them by local residents. In short, some plausible explanation for the consequences of constructing and operating the stations must be developed.

The final objective of the Post-Licensing Studies is somewhat different from the preceding three in that it is directly concerned with the methodology of the socioeconomic-assessment process. The central question is whether there are assessment methods currently available that could have been used to foresee the most significant of the socioeconomic effects associated with the nuclear plant. Based on the answer to this question, recommendations will be developed with respect to the assessment methods that can most appropriately be applied to anticipate the effects of the construction and operation of nuclear generating stations.

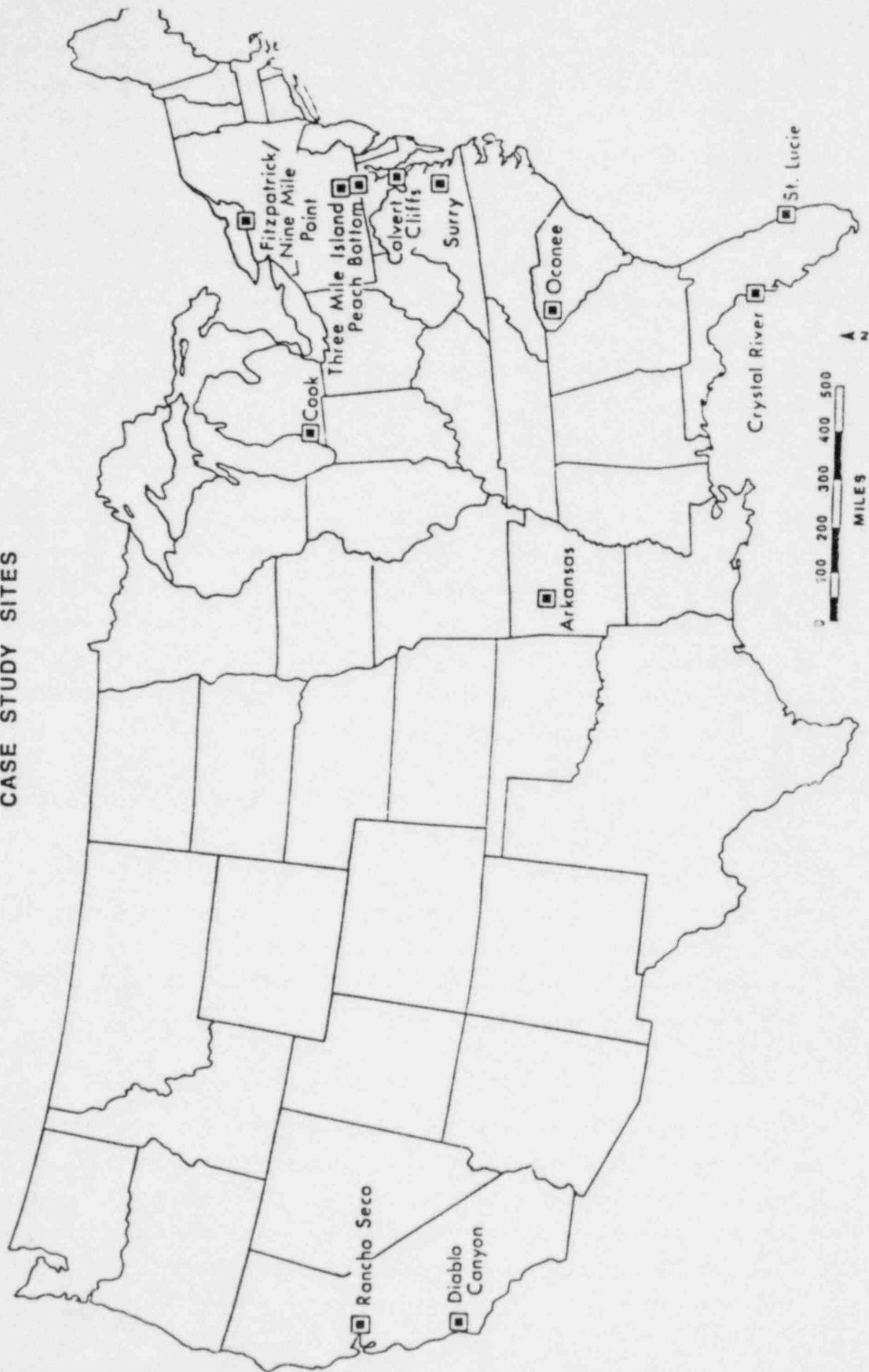
1.1.2 Components of the Post-Licensing Studies

The Post-Licensing Studies have three distinct components: the individual case studies, the cross-site analysis, and the methodological recommendations. The individual case studies are being conducted at twelve sites, as listed in Figure 1-1. The twelve case study reports will meet the first two objectives of the study. They will establish the social and economic effects of the nuclear station, and they will determine the significance of the effects for those persons affected by them.

Once the twelve case studies have been completed, work will begin on the part of the study referred to as the cross-site analysis. The results from all twelve case studies will be utilized to identify more specifically the causal mechanisms responsible for the effects that occurred. Of particular importance will be the establishment of the relative roles of site characteristics, project characteristics, and external forces in determining the consequences of constructing and operating a nuclear plant. The objective is to understand why effects occurred as they did and what was responsible for the significance they assumed. It must be remembered that twelve case studies is a very small sample and will not support rigorous statistical analysis of postulated causal relationships. At the same time, twelve comparable observations are more than have heretofore been available, and it is anticipated that the cross-site analysis will contribute substantially toward an understanding of why the socioeconomic effects occurred as they did and what determined the significance of the effects for the individuals affected by them.

The final component of the study will develop recommendations for methods to be applied in assessing the social and economic effects of proposed projects. The recommendations will be based on an evaluation of the relative success that various assessment methods would have had in anticipating the most significant effects of the twelve

FIGURE 1-1. UNITED STATES NUCLEAR REGULATORY COMMISSION
POST-LICENSING STUDY
CASE STUDY SITES



nuclear stations. Based on these results, methodological recommendations will be made, with an attempt to indicate the relative strengths and weaknesses of the alternatives.

1.1.3 Three Mile Island

Since Three Mile Island was one of the case-study sites, the scope of the Post-Licensing Studies was expanded to include an analysis of the social and economic effects of the accident on the residents of south-central Pennsylvania. Because a reliable data base was necessary to support this effort, the NRC Telephone Survey of 1,500 households was conducted in late July (Flynn, 1979). Since that time, an additional report was prepared. This report described the social and economic consequences of the accident during the six-month period from the end of March through September (Flynn and Chalmers, 1980).

Because of the unique circumstances surrounding the accident, the research at Three Mile Island will culminate in an individual report with two major parts. Part I will describe the pre-construction, construction, and operating experience of the station from late 1966 through 27 March 1979. This part will be based on the same methodology being used at the other eleven nuclear station sites and will be directly comparable to those case study reports. Part II will describe the emergency and the post-emergency periods covering the period from 28 March through the summer of 1981.

In addition to the expanded effort at the Three Mile Island site itself, the accident will affect the Post-Licensing Studies in one other way. Each of the case study sites will be examined for consequences of the Three Mile Island accident. There are two possibilities: the accident may have directly affected social or economic conditions at other sites, or the accident may have caused recognized effects to be evaluated in a different way and, therefore, to assume increased significance in the eyes of local residents. Both possibilities will be investigated.

1.2 Overview of the Case Study Organization

As was explained above, the purposes of the individual case study reports are to describe the socioeconomic effects of the construction and operation of the nuclear station that were experienced by residents of the area being studied and to indicate the significance of those effects to the individuals and groups affected. Each report contains ten chapters, the contents of which are summarized in Figure 1-2.

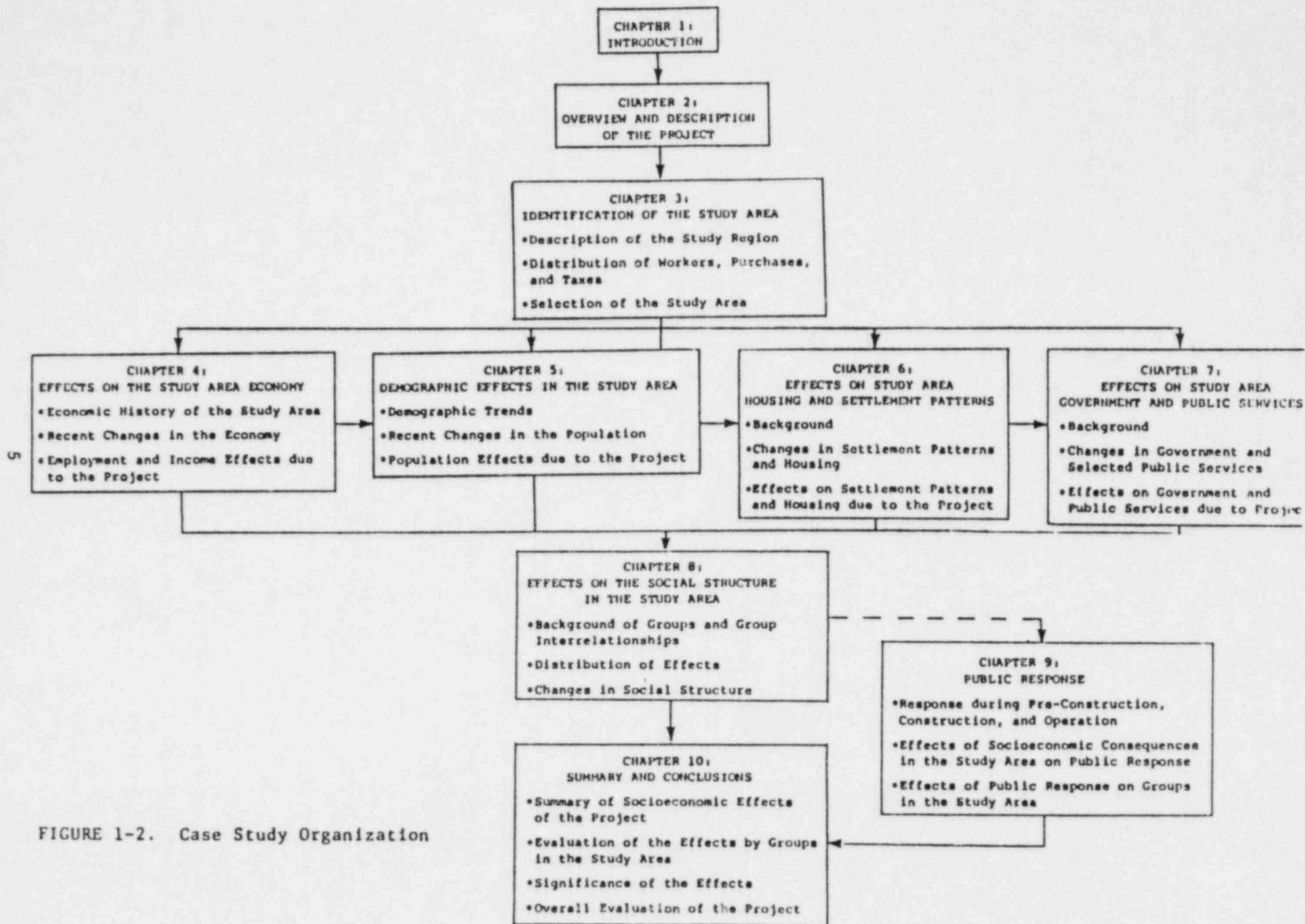


FIGURE 1-2. Case Study Organization

Following this introduction, Chapter 2 describes the project with emphasis on those project characteristics that are important determinants of socioeconomic effects. Chapter 3 then provides a general description of the region in which the project is located, both as an orientation and as a prelude to selecting the smaller study area that will be intensively analyzed in the remainder of the case study. Actual selection of the study area relies on the spatial distribution of project consequences and on the geographic extent of the major social, economic, and political systems that function in the vicinity of the plant. The consequences of the project that are examined in this context are the spatial distribution of the persons directly employed in constructing or operating the nuclear station, the distribution of direct purchases of goods or services made by the utility in order to build or operate the facility, and the spatial distribution, by jurisdiction, of the tax payments from the utility due to the nuclear station. The study area is then defined with reference both to the spatial distributions of these major consequences of the project and to the spatial distribution of the functional, social, economic, and political systems that operate in the vicinity of the station.

The next four chapters trace the effects of the plant on the study area economy, on the size and composition of the area's population, on housing and settlement patterns in the study area, and on government and the provision of public services in the study area. There are several organizing principles used to present this information. First, an attempt is made to describe conditions as they existed in the study area prior to the start of construction and as they changed from that time to the present. An explicit attempt is then made to identify that part of the change, or lack of change, due to construction and operation of the nuclear station. The temporal focus of the attribution of changes to the nuclear facility is on two points in time: the peak year of construction and a recent year during which the station was in full operation.

The second major organizing principle concerns the way in which effects are attributed to the nuclear station. There are two basic approaches to this problem. The first is to identify and control the effects of all other exogenous forces acting on the study area and, after their effects have been isolated, to attribute remaining effects to the nuclear station. The second approach is to make explicit causal arguments that directly tie postulated effects back to some known aspect of the construction or operation of the station. Both approaches require use and acceptance of the same kinds of behavioral hypotheses. Using the first approach, it is necessary to define the direct and indirect effects of other exogenous forces acting on the study area so that the effects

due to the station can be determined as a residual. Using the second approach, the same kinds of hypotheses and behavioral relationships are used to directly argue the nature and extent of socioeconomic effects stemming from the construction and operation of the station. The most convincing case for attributing effects to the nuclear station results from use of both approaches—control of other exogenous influences and identification of direct causal links to the plant. Where possible, both approaches are pursued in the case studies. In general, however, the social and economic changes that have taken place in the areas examined in this study over the ten- to fifteen-year period of investigation are so complex that the second general approach is relied upon more heavily than the first.

Chapter 4 begins with a description of the jobs and income directly associated with the station and then establishes other employment, income, and labor force effects experienced in the study area. Chapter 5 works directly from these estimates of employment change to examine effects on the size and composition of the study area's population, both from the in-migration of workers and their families and from reduced out-migration of local persons induced to remain in the area due to opportunities offered by the construction or operation of the station. Once population change due to the station has been established in Chapter 5, Chapter 6 examines the effects of the combined economic and demographic changes on housing and settlement patterns in the study area. The emphasis is principally on changes in the number, type, and spatial distribution of residences, although, where relevant, effects on patterns of commercial and industrial activity are also described.

Chapter 7 summarizes the major consequences of the station and of its economic, demographic, and housing effects on the local government in the study area. It begins by examining the major local jurisdictions in the study area for evidence of change in organization or structure due to the station. The effects on the revenues of local jurisdictions are then described. Finally, there is a discussion of the combined influence of changed revenues and changed levels of demand for public services on the provision of services in the study area. It was decided that these effects could be shown most clearly by focusing on a smaller number of important services rather than by trying to examine the provision of all public services in the study area. The services chosen are education, transportation, public safety, and social services.

Chapters 4, 5, 6, and 7 proceed in sequence, therefore, to trace the economic, demographic, housing, and governmental implications of constructing and operating a

nuclear station. The geographic focus is the study area defined in Chapter 3. The temporal focus is on the change from pre-construction to the construction peak and on the change from pre-construction to a recent year of full operation. Finally, the attribution of the effects to the nuclear station is achieved primarily through the establishment of direct causal relationships that are linked to effects directly associated with the station.

Chapter 8 examines the social structure of the study area and the ways in which it has been affected by the construction and operation of the nuclear station. The social structure is defined by the groups that exist in the area, their principal characteristics, and their social, political, and economic interrelationships. The chapter begins by identifying a set of functional groups into which the study area population is divided. A profile of each group is then developed. Each group is characterized in terms of livelihood, size, outstanding demographic characteristics, location, property ownership, values and attitudes, and patterns of intragroup interaction. The economic, political, and social interrelationships of the groups are then identified and described. An appreciation of these group characteristics and interrelationships helps to understand the way in which the effects of the project were evaluated and to explain group response to these effects. In addition, the characterization of groups and their interrelationships prior to the project serves as the basis for assessing the degree to which groups and social structure were altered as a consequence of the project.

The final step in the analysis of social structure is to determine the distribution of the economic, demographic, housing, and governmental effects of the station. The distribution of effects across groups provides explanatory information concerning the changes in group structure and characteristics and provides data for interpreting and understanding the group evaluations of the project.

Chapter 8 is designed, therefore, to accomplish two very important objectives. First, it makes operational the concept of social structure so that its constituent parts can be described and so that the effects of the construction and operation of the plant on social structure can be assessed. Second, the approach permits the examination of the effects of the plant on each group. The information on group characteristics and on the project effects accruing to each group provides the basis for determining the project's impact on the groups, discussed in Chapter 10.

Chapter 9 provides another perspective on the socioeconomic effects of constructing and operating the nuclear station by examining the public response to the project. The emergence and expression of public concerns and the issues that arose over the plant during the three study periods—pre-construction, construction, and operations, including post-Three Mile Island—are described and assessed. The issues are described in terms of topic, time of occurrence, actors, positions, and resolution. Unlike the previous five chapters of the case study, which focused on the effects of the nuclear station within the study area defined in Chapter 3, the analysis of public response is regional in scope. The principal sources of information concerning public response are the local and regional press, transcripts of hearings, and key informants.

The analysis of public response focuses on three questions: the extent to which the socioeconomic effects of the station on individuals and groups in the study area played a causal role in the public response to the project; the level of the direct participation of study area residents in publicly responding to the project; and the effects of the public response itself on the residents of the study area. The latter question involves the degree to which issues and confrontations that arose in the course of building and operating the nuclear station were responsible for changes in social or economic conditions within the study area. The strategy of Chapter 9, therefore, is to identify public response to the nuclear project and then sort out the reciprocal causal links from local socioeconomic effects to public response and from public response to local socioeconomic effects.

The overall objectives of the individual case studies are to establish the socioeconomic consequences of constructing and operating a nuclear power station on the residents of the local area in which a station is located and to provide a perspective on the significance of these effects to the people who experienced them. Chapter 10 will focus on the evaluation of the major socioeconomic consequences of the project by each group in the study area. The next step in Chapter 10 is to combine the information on group characteristics, effects, and group-specific evaluations to reach conclusions about the impacts and significance of the effects of the project. Absolutely large effects combined with strong positive or negative evaluations would imply strong significance. Similarly, absolutely small effects would tend to offset strong positive or negative evaluations, or indifferent evaluations could offset large effects and produce low levels

of significance. This process leads to a summary of the significance of the effects of the project.

CHAPTER 2: OVERVIEW AND DESCRIPTION OF THE PROJECT

2.1 Introduction

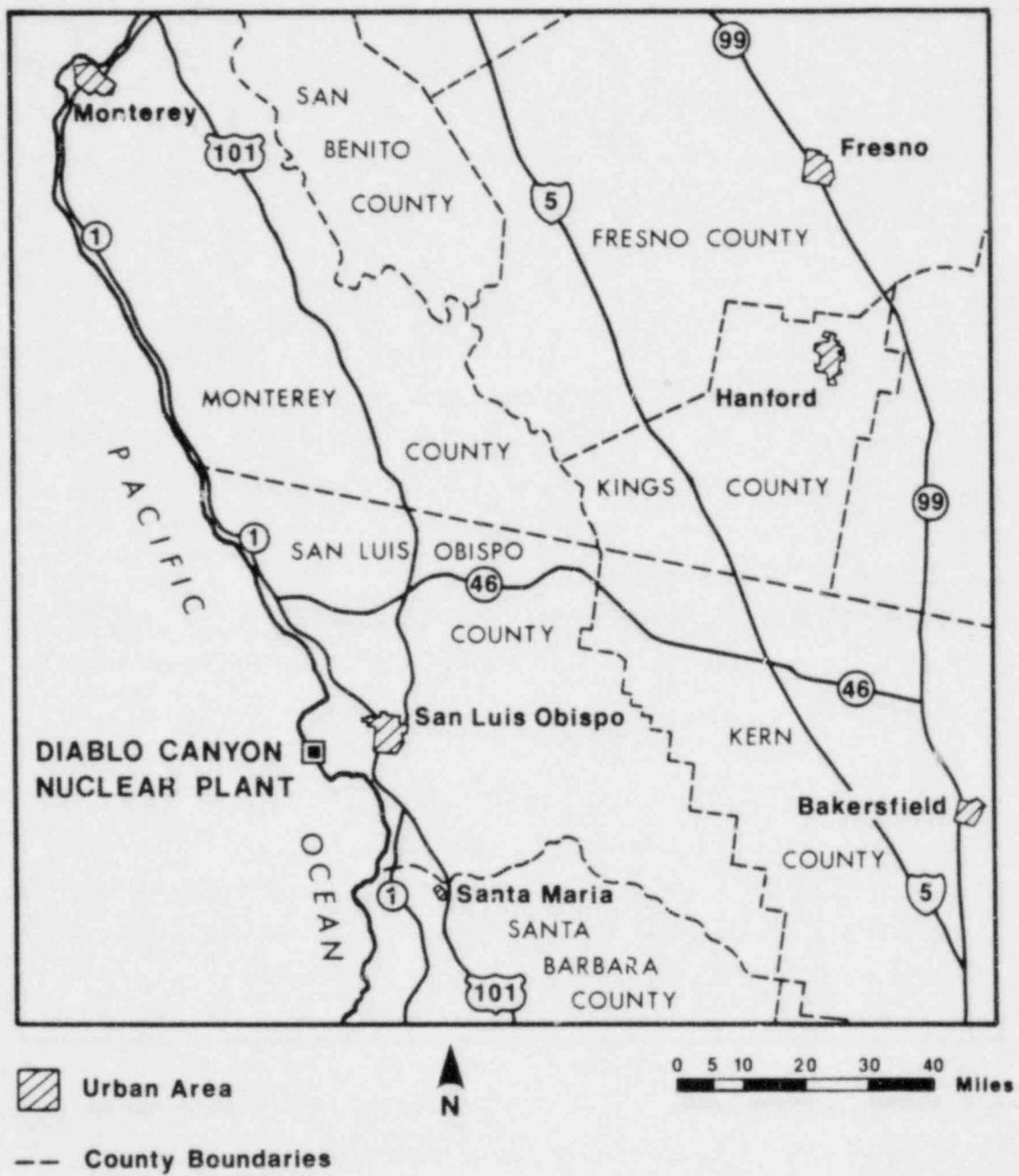
An essential element in every impact assessment is a description of the impacting agent. The purpose of Chapter 2 is to provide an overview of the Diablo Canyon Nuclear Power Station and a sufficient description of the utility, the project site, and the project characteristics to support and orient the more detailed discussions and analyses of the subsequent chapters and to facilitate comparisons among the twelve case studies. Consequently, this chapter presents information on the project's location, size, type, and site characteristics; the utility and other major factors involved with the project; the magnitude and duration of the construction effort; and the project's operating characteristics.

2.2 Location

The Diablo Canyon Nuclear Power Station, owned by the Pacific Gas and Electric Company (PG&E), is located approximately midway between San Francisco and Los Angeles along the California coast in San Luis Obispo County. San Francisco is 228 miles north of the plant site and Los Angeles is 207 miles southeast. The City of San Luis Obispo, the county seat, has nearly 30,000 people and is located 12 miles northeast of Diablo Canyon. There are also a number of smaller coastal communities located close to the plant. These include Avila Beach (10 miles), Morro Bay (32 miles), and Pismo Beach (17 miles). Arroyo Grande, located southeast of Pismo Beach, is about 20 miles from the plant site.

As shown in Figure 2-1, the major transportation routes in the area run north and south, the principal route being United States Highway 101 (US-101), which is east of the nuclear station and runs from Los Angeles to the northern border of the state. State Highway 1 (CA-1), the other major north-south route, follows the coastline along much of its length and is utilized more as a scenic route than as a major transportation link. However, CA-1 does not traverse the coastal area near the plant site and, as a result, the Diablo Canyon station is relatively isolated and remote. There are few county roads west of US-101 to connect the area near the plant to the rest of the county. The Los Osos Valley Road is an east-west route, north of the plant, connecting US-101 with Los Osos, a small community on the coast. A county road runs from Los Osos south through the Montana De Oro State Park, but terminates at Point Buchow, approximately five miles north of the Diablo Canyon station.

FIGURE 2-1. LOCATION OF DIABLO CANYON NUCLEAR GENERATING STATION



2.3 The Utility

2.3.1 Corporate Background

The Pacific Gas and Electric Company (PG&E), which owns the Diablo Canyon nuclear station, is one of the oldest and largest utilities in the country. The utility, which was incorporated in 1905, grew rapidly due to the merging of several electric and gas companies and because of the extraordinary growth of industry and population taking place in California. Today, PG&E provides electric power service to 48 counties in northern and central California, including 201 incorporated cities and towns, 650 unincorporated communities, and an extensive rural area. (U.S. AEC, 1973; Pacific Gas and Electric, personal communication, 1980.)

The electric generating system includes a large number of diverse generating facilities: 64 hydroelectric generating plants with a capacity of 2,350.9 megawatts; 12 fossil-fueled thermal stations; a 15-unit geothermal facility with a capacity of 502 megawatts; and a nuclear facility at Humboldt Bay with a generating capacity of 63 megawatts. The two nuclear units at Diablo Canyon are awaiting their operating license, and a 1.1 million kilowatt pumped storage plant is under construction. In addition to the extensive and important investments in energy projects in the region, the utility's visibility as an important regional industry is underscored by the fact that it employs over 25,000 people.

Pacific Gas and Electric has a long history of experience with nuclear technology. The Atomic Energy Commission (AEC) gave its first developmental license jointly to PG&E and the General Electric Company to construct the 5,000 kilowatt experimental atomic plant in the early 1950s. The Vallicetos station, the first privately financed atomic power plant, began to produce electricity commercially in 1957 but was decommissioned in 1967. Pacific Gas and Electric also participated with several other utilities in the Nuclear Power Group, an effort which resulted in construction of the Dresden Unit 1, as part of the Commonwealth Edison system in Illinois. PG&E's Humboldt Bay nuclear station (63,000 kilowatts), also one of the earlier efforts in the country to generate nuclear energy, began commercial operation in 1963. Mendocino and Bodega Bay were proposed for construction during the 1960s and 1970s, but were not built primarily because of difficulties in obtaining approval of site seismic criteria.

2.3.2 Service Area

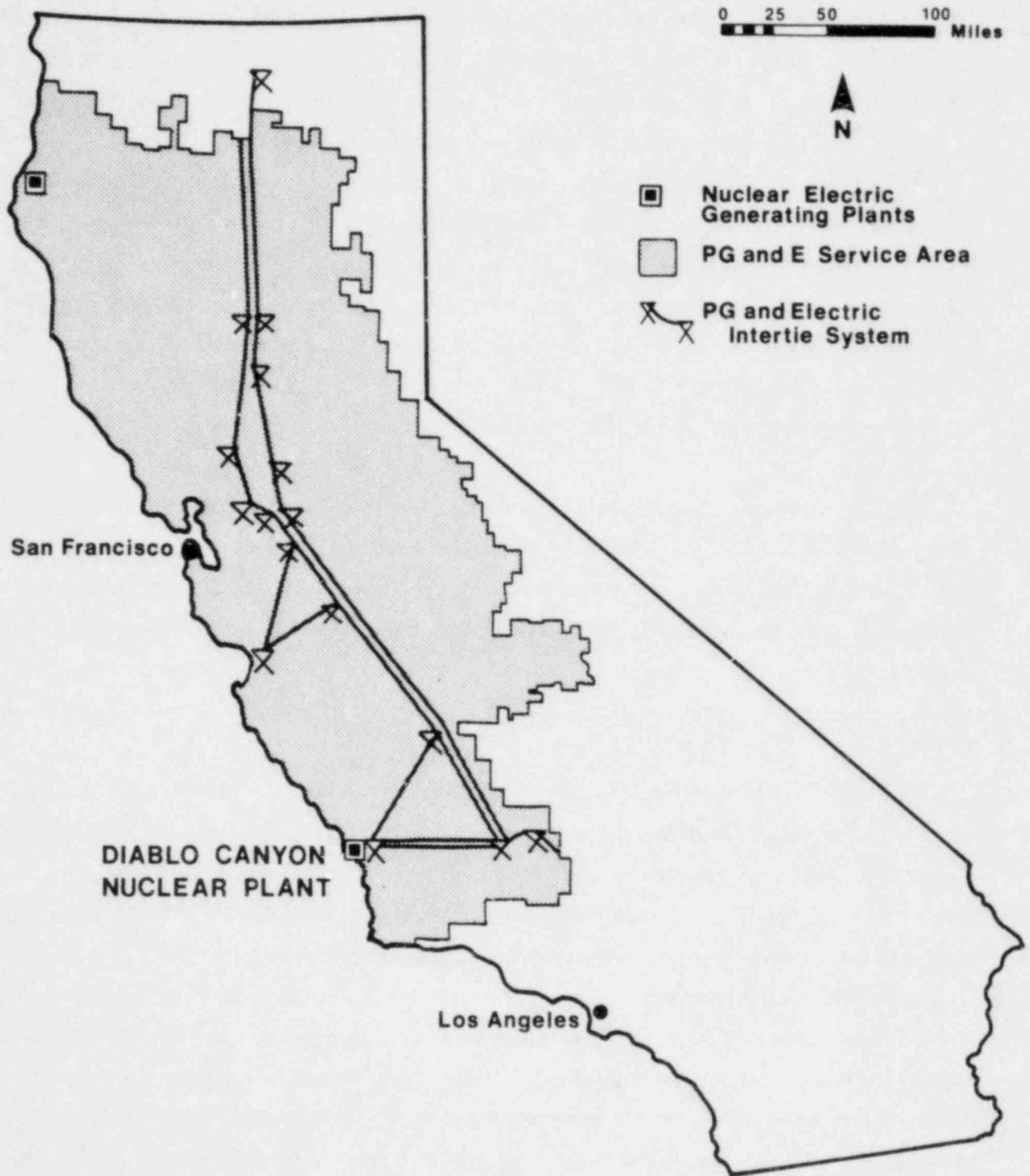
As shown in Figure 2-2, Pacific Gas and Electric Company's present service area includes nearly two-thirds of northern and central California (94,000 square miles) and covers 48 counties. In 1979 PG&E provided gas and electric service to more than six million customers—3.4 million electric customers and 2.8 million gas customers. The Diablo Canyon station is located in the southernmost section of the utility's service area, primarily to meet that area's estimated load requirements. (Pacific Gas and Electric, 1978 and 1979.)

2.3.3 Generating Capacity and Production

As of July 1979, PG&E's total system capability was 15,766.4 megawatts (Mw), which included 2,502.5 Mw output from PG&E's hydroelectric plants, 8,636 Mw from its thermal-electric plants, and 4,627.9 Mw that were available from other sources, including 1,240 Mwawatts purchased from utilities outside the PG&E's system. It is expected, however, that Diablo Canyon's two units, with a total generating capacity of 2,190 Mw, will provide 10 percent of PG&E's electrical generating capacity. (Pacific Gas and Electric Company, 1979a.)

To meet the system's future peak load requirements, the need for the Diablo Canyon project has been articulated several times, beginning in the mid-1960s when the station was first proposed, and continuing to the present. The original justification for Diablo Canyon was to mitigate the forecasted shortages in the system's capacity during the early and mid-1970s, and the plant was projected to be constructed and operational by that time. Although reserve margins were declining in the early 1970s, the adjustments by PG&E to increase capacity without the support of Diablo Canyon were only moderately successful. These adjustments included developments to augment the system's resource capacity through expansion of PG&E's geothermal and hydroelectric facilities, and through the purchases of power from outside sources. Moreover, the forecasts that had been established in the 1960s to estimate peak annual demands were significantly higher than the actual demands. A combination of internal system adjustments, capacity demands lower than were anticipated, and the purchasing of power, enabled PG&E to meet its requirements without the additional output from the Diablo Canyon plant. By the late 1970s, however, PG&E argued that there were serious problems developing in the system's capability to generate sufficient levels of power at

FIGURE 2-2. PACIFIC GAS AND ELECTRIC COMPANY SERVICE AREA



peak demand and that the Diablo Canyon's capacity was required. (U.S. AEC, 1973; Pacific Gas and Electric, personal communication, 1980.)

2.4 The Project

2.4.1 The Project Site

The Diablo Canyon Nuclear Power Station is located on a coastal marine terrace (1,000 feet wide) in San Luis Obispo County, in a section of undeveloped coastline bypassed by the major transportation routes. The station site is at the foot of the western slopes of the San Luis Mountain Range. The site is in a relatively isolated part of the county coastal area: prior to the construction of the plant, the site was part of a privately owned ranch (originally a Mexican land grant), and the land was either idle or used for cattle grazing. In 1962, the site was rezoned for commercial and recreational uses, but no residential, commercial, or recreational capital investments materialized. Prior to construction of the plant, the area was characterized by low scrub growth, sparse vegetation, cattle grazing, a lack of access roads, and some cultivated agriculture along the relatively small mesa areas directly adjacent to the ocean.

The nuclear plant is located on a 750 acre site which is cut through by the Diablo Canyon Creek. South of the creek, 585 acres were leased to PG&E for a period of 99 years, and the remaining acreage, north of the creek, was directly owned by the utility. Rather than purchasing the lease, the utility and the owner of the property agreed on a long-term financial loan arrangement. An eight-mile road constructed by PG&E connects Avila Beach to the plant site.

Pacific Gas and Electric began planning for a nuclear plant as early as 1962. By July 1963, three possible locations were identified in the southern part of San Luis Obispo County. A coastal location in the southern portion of the PG&E service area was preferred for generating additional electric capacity because it was in that particular part of the service area that power deficits were anticipated for the early 1970s. It was reasoned that construction of a nuclear plant near the load center would minimize transmission costs. Plant construction was originally proposed at the Nipomo Dunes site, south of the present Diablo Canyon location; however, the proposal did not succeed because of opposition from an environmental group (Sierra Club) and the State Resources Agency. Subsequently, in 1966, eleven potential sites in the region were examined for a

nuclear power plant and, with the cooperation of the Sierra Club and the County Planning Commission, the present site at Diablo Canyon was chosen.¹

2.4.2 The Plant

The Diablo Canyon Nuclear Generating Station has two pressurized water reactors: Unit 1 is rated with a capacity of 1,084 MWe and Unit 2 with 1,106 MWe, a total capacity of 2,190 MWe. Both the reactors and the turbine generators were supplied by Westinghouse Corporation. The plant will be cooled by water from the Pacific Ocean using once-through cooling. (U.S. AEC, 1973.)

Construction of transmission lines to connect the Diablo Canyon station to PG&E's system included two 230kV and three 500kV transmission lines. The two single circuit 500kV lines would carry electricity from the plant to a substation (Midway) in Kern County, a distance of 84 miles directly east of the plant. The single circuit 500kV line was connected to the Gates Substation in Fresno County, 79 miles northeast of the nuclear plant. The third transmission line, a double circuit 230kV line, would be linked to the existing Morro Bay-Mesa 230kV line, a distance of about 10 miles. (Pacific Gas and Electric, personal communication, 1980.)

The design, engineering, and construction supervision of the Diablo Canyon plant were performed by PG&E itself. The prime contractor was G. F. Atkinson, Inc.

2.5 Construction

2.5.1 Announcement

In April 1966, the Pacific Gas and Electric Company decided to construct a nuclear plant at the Diablo Canyon site and announced that decision in November 1966. At that time, the utility had already leased a large portion of the site property, but it was not until February 1968 that negotiations were completed for purchasing all the necessary land for site development. The Diablo Canyon site was approved by the Sierra

¹The Sierra Club argued that the dunes site was important as a science and recreational area. Moreover, the environmentalists took the position that if a plant was to be built near the dunes, it should be set 4,000-5,000 feet back from the beach area, a proposal the utility could not accept. The eleven potential sites were compared on seven parameters: availability of water, degree of isolation, land availability (PG&E owned 1,121 acres of the Nipomo sand dunes), routes for transmission lines, seismology, community acceptability, and access to transportation.

Club and by the State Resources Agency, which had originally opposed siting the plant at the Nipomo Dunes area. The construction costs were estimated to be \$162.3 million for Unit 1 and \$154.4 million for Unit 2, a total of \$316.7 million. The projected completion date for Unit 1 was May 1972, followed by Unit 2 in June 1974. (Pacific Gas and Electric Company, 1979b.)

2.5.2 Schedule and Cost

The total cost of constructing the two units to date has been approximately \$1.6 billion, five times the original estimate. To date, the total cost of Unit 1 is \$1,034.9 million (through November 1980), and the cost of Unit 2 is \$740.7 million. The construction of the two units, which began in 1969, was still in progress at the time of this research, a period of eleven years. This lengthy construction period, and the fact that an operating license had not been issued, require a brief explanation.

Following the selection of the Diablo Canyon site, Pacific Gas and Electric Company filed an application with the California Public Utilities Commission (CPUC) for a Certificate of Public Convenience and Necessity, a requirement for constructing a power generating facility in California. In November 1967, the CPUC approved the application for construction of Unit 1, and in March 1969 it approved the construction of Unit 2. The utility subsequently filed with AEC the application to construct the plant. The public hearings for the construction permit were held in February 1968. In April 1968, a construction permit for Unit 1 was issued by the Atomic Safety Licensing Board (ASLB). In June 1968, PG&E filed an application for a construction permit for Unit 2; hearings for the construction permit were held in January 1970, and a construction permit was issued in December of that year.

Construction for Unit 1 began in 1968, and the first year of construction activity included building an access road to the site and excavating the plant structure. It was not until June 1969, 14 months after the issuance of the construction permit, that contracted construction work began. In September 1973, the ASLB held hearings regarding environmental impacts (NEPA) for Unit 2, but construction activity continued, unabated. In September 1973, the utility also filed an application for an operating license for Units 1 and 2. At that time, a safety issue emerged regarding a seismic risk that had not been anticipated. By June 1976, Unit 1 was essentially constructed and ready for nuclear fuel loading, but the assessments and hearings over seismic risks and other environmental concerns pre-empted the issuance of an operating license. In early 1977, PG&E unsuccessfully attempted to obtain a temporary operating license for

Unit 1. In December 1978, the ASLB reopened public hearings on the seismic safety of Diablo Canyon. As of September 1980, the Diablo Canyon project had not been issued a permit to operate. For the past four years, construction activity largely has been focused on retrofitting the units to meet the additional standards imposed on the design to insure increased safety from seismic risk. This process has been significant in terms of costs and delay.

According to the Pacific Gas and Electric Company, four factors have been identified as causing significant increases in the cost of constructing the Diablo Canyon project: inflation, modifications to satisfy government regulations, construction labor productivity, and plant optimization changes. In 1969, when construction began, the escalation rates to determine projected costs were very low (2.5 percent per year for construction material, 5 percent for labor) compared to the rates that actually materialized. The nuclear plant construction index rose by 146 percent between January 1967 and July 1978, a much more rapid rate of inflation than had been originally estimated. In addition to changes to the original design because of the development of more stringent NRC standards, major retrofitting efforts were required. It was these efforts, according to the utility, that resulted in an "extreme adverse cost impact." Further, labor productivity and its availability were recognized as much lower than was originally expected. The size of the experienced labor pool in central California was much smaller than that found in the larger California urban centers. Competing regional sources for skilled labor during Diablo Canyon's construction period resulted in labor shortages during critical stages in the construction of the plant. Finally, the cost has been increased substantially by rising interest rates. The proportion of total costs accounted for by interest charges increased from about 11 percent in 1966 to more than 30 percent by 1979.

2.5.3 Work Force

Site preparation for the two units began in 1968, but construction did not seriously begin on the site until June 1969. As shown in Table 2-1, the size of the construction work force increased from an average annual work force of 158 in 1968 to a peak of 2,116 persons in 1975. The size of the 1974 annual work force fell slightly from that of 1973 due to major work stoppages; nonetheless, the peak construction month (more than 2,400 workers) occurred in 1974. The size of the work force decreased by 598 workers in 1976, and fell an additional 625 workers in 1977. In 1977, there were an estimated 893 workers on site on an average annual basis, 1,223 less than in 1975. However, in 1978 and

1979 the number of workers markedly increased over 1977, primarily because of retrofitting activity. Table 2-1 shows the average annual construction work force for Diablo Canyon during the period 1968 to 1979, and Figure 2-3 graphically displays this data.

TABLE 2-1
AVERAGE ANNUAL CONSTRUCTION WORK FORCE
DIABLO CANYON NUCLEAR GENERATING STATION
1968-1979

Year	Average Annual Employment
1968	158
1969	295
1970	705
1971	921
1972	1,441
1973	1,866
1974	1,510
1975	2,116
1976	1,518
1977	893
1978	1,317
1979	1,472

Source: Pacific Gas and Electric Company, personal communication, 1980.

Because of the construction delays that have plagued Diablo Canyon, double shifting has been used at various stages in the construction of the plant, especially in early 1974 when accelerated construction work on Unit 1 commenced. Diablo Canyon was an entirely union job. The utility, which served as its own construction manager, hired primarily through union halls.

2.5.4 Construction Experience

Construction of the plant seriously began in June 1969 and, by June 1976, Unit 1 was about 97 percent complete. If the operating license had been issued, the nuclear fuel would have been loaded in the summer of 1976 and commercial operation would have begun soon after. The construction period, discounting the retrofitting work subsequent to 1976, lasted for a period of 86 months. This construction period was marked by work stoppages and strikes, shortages of skilled labor at critical junctures in the construction process, and materials procurement problems. These problems resulted in protracted and

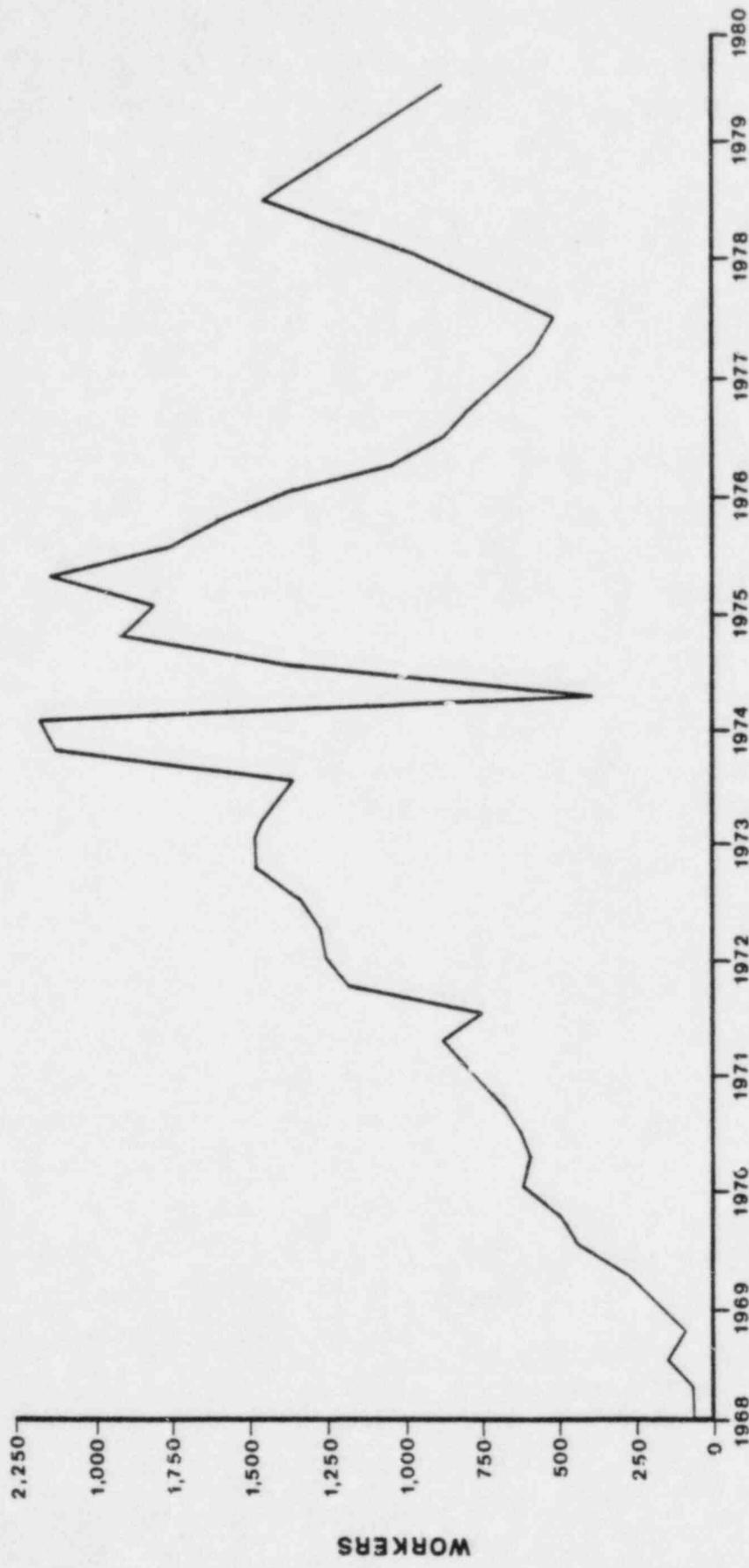


FIGURE 2-3. Average Daily Construction Work Force, Diablo Canyon Nuclear Plant.

delayed construction progress and significantly affected the cost schedule of the project. As of June 1972, four years after site preparation began, Unit 1 was only 45.6 percent complete and Unit 2 was 12.8 percent complete. (Pacific Gas and Electric, 1980; Davin, personal communication, 1980; Etzler, personal communication, 1980.)

The first major problem in the construction of the plant occurred in February 1969 when operating engineers (construction) went on strike for two months. In 1970, strikes by both the Carpenters Union and the Teamsters Union delayed the construction schedule for more than three months. In addition, the building of the breakwaters was delayed for four months because of problems in obtaining suitable materials for their construction. The problem of procurement of materials was not an isolated event: between 1971 and 1975, there were serious equipment delays and, according to PG&E, this situation was the result of national demands for technical equipment made at that time by the nuclear industry, which had exceeded the manufacturers' production capabilities. (Etzler, personal communication, 1980.)

Shortages in skilled craftsmen were endemic to the project. The lack of qualified welders was a chronic problem; in response to this situation, the Pacific Gas and Electric Company established fifteen welder training stations and provided opportunities for welder upgrading on the job. (Etzler, personal communication, 1980.)

2.6 Operations

An operating license for Diablo Canyon had not been issued by the NRC as of September 1980. This aspect of the Diablo Canyon project (ongoing since September 1973 when PG&E applied for an operating license for both units) will be fully described in Chapter 9. The major issue causing the delay has been the risk posed by an offshore geological fault, which necessitated changes in the plant design to assure greater reliability. Presently, the nuclear fuel is stored on site, and the utility is awaiting the granting of the operating license. However, although the plant is not commercially operating, there is a sizeable operating work force of 220 people on site. The work force size, according to PG&E, will increase to approximately 300 workers if and when commercial operation commences.

2.7 Taxes

In California, the State Board of Equalization, rather than the local county assessor, assesses public utility property. A unit value approach is used in placing a

market value on the utility's entire system. Market value is determined through three assessment methods: income approach, cost approach, and stock and debt approach. An assessment ratio of 25 percent is applied to market value to obtain assessed value, upon which ad valorem taxes are levied. The State Board of Equalization allocates the utility system's assessed value among county tax code areas using a reproduction cost net less depreciation allocation procedure. The local tax rate is then applied to the utility's assessed value within each tax code area to determine tax liability.

Prior to the passage of Proposition 13 in June 1978, each local taxing authority levied a separate tax on property located within its jurisdiction. The one percent of full cash value tax rate limitation imposed by Proposition 13 resulted in the levy of a single tax rate of \$4 per one hundred dollars of assessed valuation on all property. The tax revenues generated by the \$4 tax rate are allocated by the county among local jurisdictions based upon legislative formula.

Proposition 13 also requires that assessed valuations be rolled back to 1975 levels unless the property is newly constructed or a change in ownership has occurred. However, the state has held that the rollback provision does not apply to "centrally assessed" properties such as a public utility and, therefore, continues to assess these properties at current market value. PG&E has pursued judicial interpretation of this issue. The California Supreme Court has decided that the company must seek tax refund actions before bringing suit for overpayment of taxes.

Total tax payments by the utility for Diablo Canyon Units 1 and 2 are shown in Table 2-2. Property taxes account for the major part of total taxes paid by the Diablo Canyon facility. In 1975-76, Diablo Canyon paid \$7.6 million. In 1977-78, the facility paid \$12.4 million. However, because of the passage of Proposition 13, the 1978 California initiative to lower property taxes, the facility paid only \$8 million in the 1978-79 tax year. (Violich, personal communication, 1980; Birch, personal communication, 1980.)

2.8 Corporate/Community Programs

2.8.1 Emergency Planning

Safety and the arrangements for emergency evacuation have been major issues at Diablo Canyon. As early as 1969, opponents of the plant were calling attention to the inadequacy of emergency procedures. In 1969, there was public discontent over the fact

TABLE 2-2

TOTAL ASSESSED VALUATION AND TAX PAYMENTS^a
 FOR THE DIABLO CANYON NUCLEAR GENERATING STATION
 UNITS 1 AND 2
 1967-1980

Tax Year	Assessed Valuation	Tax Payment
1967-1968	\$ 669,290	\$ 55,242
1968-1969	1,616,140	134,979
1969-1970	2,327,740	211,107
1970-1971	10,471,430	1,053,533
1971-1972	23,362,260	2,254,885
1972-1973	36,171,790	3,400,266
1973-1974	56,918,370	5,297,004
1974-1975	74,345,460	6,378,514
1975-1976	88,999,681	7,645,501
1976-1977	111,471,470	9,695,559
1977-1978	151,966,210	12,413,495
1978-1979	174,017,410	7,981,241 ^b
1979-1980	175,722,980	7,977,212

^aTotal tax payments include taxes on the plant, site, information center, transmission corridor, and transmission lines.

^bEffect of Proposition 13.

Source: Pacific Gas and Electric Company, personal communication, 1980.

that existing emergency plans were not made public. In 1975, Mothers for Peace, a major anti-Diablo group in the area, called for a master plan for school evacuation in the event of a nuclear accident. Later in 1975, members of the County Board of Supervisors attending an NRC hearing questioned the county's ability to deal with a nuclear disaster at the plant. Moreover, although a private medical facility (Sierra Vista Hospital) originally made an agreement with the utility to deal with radiological accidents, this hospital later chose not to participate in the agreement. The arrangement of emergency planning and security procedures has been the subject of substantial legal maneuvers between the utility and the intervenors in the Diablo Canyon case. Throughout this period of controversy, however, the County Board of Supervisors consistently supported the construction and operation of the Diablo Canyon plant. Consequently, although doubts have been expressed by both the Board of Supervisors and the members of the county's professional staff who are charged with carrying out the emergency planning procedures, the utility has been able to obtain the agreements with local governments necessary to its FSAR submittal to the NRC. (Blankenburg, personal communication, 1980; Davin, personal communication, 1980; Farnsworth, personal communication, 1980; Hoch, personal communication, 1980; Silver, personal communication, 1980.)

Since the Three Mile Island plant accident, the county has worked with PG&E to develop an emergency plan based on new standards imposed by the state. The utility has also recently submitted to the NRC a detailed and refurbished contingency plan.

2.8.2 Visitors' Center and Other Community Programs

The Nuclear Energy Information Center was opened on 12 December 1972 and has been successful in providing public information through speakers, displays, and a multi-media program. Located on the main regional highway, the center has served as a major tourist attraction and, since its opening, has attracted approximately 500,000 visitors.

The utility has also donated a substantial tract of land (the Nipomo Dunes area) to the state and has established important research facilities at the California Polytechnical University.

2.9 Major Events Chronology

The chronology of the major events for the Diablo Canyon project is shown in Table 2-3.

TABLE 2-3
CHRONOLOGY OF MAJOR EVENTS

Date	Event
January 1967	Construction permit application, Unit 1.
February 1968	Public hearings on construction permit, Unit 1.
April 1968	Issuance of construction permit, Unit 1.
June 1968	Construction permit application, Unit 2.
June 1969	Construction on Unit 1 begins.
January 1970	Issuance of Construction permit, Unit 2.
December 1970	Public hearings on construction permit, Unit 2.
May 1972	Public hearings regarding whether construction permits should be suspended pending NEPA review.
September 1973	NEPA hearing, Unit 2.
September 1973	Operating license application for Units 1 and 2 filed.
December 1975	Public hearing on receipt of nuclear fuel for Unit 1 and order permitting receipt of nuclear fuel for Unit 1.
June 1976	Unit 1 ready for fuel loading.
December 1976	Further NEPA hearings, Units 1 and 2.
December 1978	Operating license hearings.
June 1978	ASLB decision regarding NEPA issues.
April 1980	Initial partial decision by ASLB.

CHAPTER 3: IDENTIFICATION OF THE STUDY AREA

3.1 Introduction

This chapter serves as a transition between the focus on the Diablo Canyon Nuclear Generating Station itself and the focus on the socioeconomic effects caused by the project presented in the remaining chapters. As such, it has two principal purposes. The first is to describe the region near the Diablo Canyon nuclear plant and the distribution of direct project effects—jobs, workers, purchases, and tax payments—within that region. The second is to identify the area in which the consequences of the direct project effects will be studied in detail—the Study Area.

The identification and selection of the study area are important in the overall case study methodology. The urban areas and counties in the region that received appreciable direct project effects were identified. Based on a consideration of the relationships between these units, aggregates were formed, and the distribution of jobs, workers, purchases, and tax payments among those aggregate units was determined. The pattern of distribution of direct project effects was then examined to identify those where the greatest intensity of direct project effects had occurred.

Based on the intensity of direct project effects and the relationships among the aggregate units, alternative study areas were considered. One was then selected to serve as the unit for analysis of the economic, demographic, housing, governmental, and social structure effects of the Diablo Canyon nuclear station.

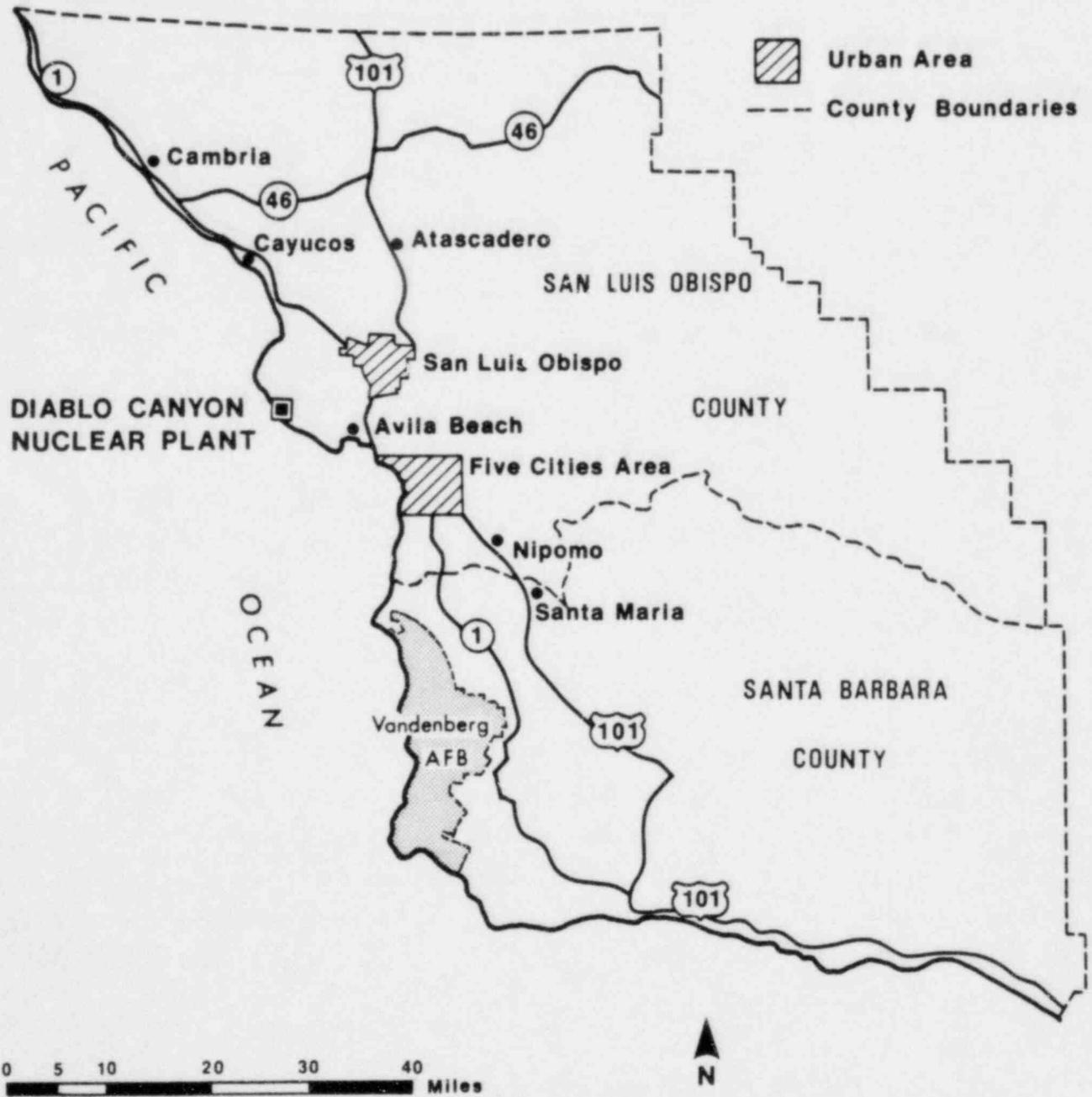
3.2 The Region

3.2.1 Description of the Region

The preliminary site visit examined a two-county region as shown in Figure 3-1 (York, 12 February 1979). The region includes San Luis Obispo County, where the plant is located, and adjacent Santa Barbara County. The two-county region is located along the central California coast, approximately midway between Los Angeles and San Francisco. The Diablo Canyon site is located in San Luis Obispo County on high bluffs overlooking the Pacific Ocean (York, 12 February 1979).

In 1960, the populations of San Luis Obispo County and Santa Barbara County were 81,044 and 168,962, respectively. Between 1960 and 1970, the population in each county increased faster than the state's annual average population growth of 4.4 percent. In

FIGURE 3-1. STUDY REGION: SAN LUIS OBISPO COUNTY AND SANTA BARBARA COUNTY, CALIFORNIA



1970, the population of San Luis Obispo County had risen to 105,690, while the population of Santa Barbara totaled 264,324 (Bureau of the Census, 1970). Although the average population density of the region is below the state average (31.9 persons per square mile in San Luis Obispo County and 96.5 persons per square mile in Santa Barbara County versus 124 persons per square mile for the state), it is concentrated within 15 miles of the coast, making the population density of the coastal area much higher.

Historically, the economic base of the region has been linked to resource-based activities, particularly agriculture, fishing, mining, and tourism. In more recent years, government, construction, and manufacturing have become increasingly important in the regional economy. The increases in government employment were chiefly the result of expansion at California Polytechnic State University (Cal Poly) in San Luis Obispo and the University of California at Santa Barbara, as well as construction and staffing of Vandenberg Air Force Base in Santa Barbara County. The construction industry expanded significantly as a result of the building of Vandenberg between 1957 and 1961. The manufacturing sector has grown in Santa Barbara County, reflecting increased activity in the aerospace industry. The region's rapid population growth has resulted primarily from the sizeable in-migration of persons taking advantage of expanding job opportunities and the growth of the tourist industry.

Early transportation networks focused on ocean transport. Steamers and sailing vessels were the chief means of transporting people and supplies to the region as well as transporting the region's agricultural products to the principal market in San Francisco. Overland passage was also possible along the El Camino Real which linked the coastal mission communities and facilitated local trade. By 1861, stage coaches were making regular runs along that route between Los Angeles and San Francisco. The Southern Pacific Railroad reached the region in the early 1900s, providing another link to major markets along the coast.

More recently, highways have met the area's major transportation needs and, with the rapid growth of the Los Angeles area, the economic orientation of the region has shifted from San Francisco to Los Angeles. The major route connecting the region with other trade areas is Highway 101, the former route of the El Camino Real. The region's major manufacturing establishments are located in communities serviced by this corridor.

3.2.2 Identification of Places within the Region

Based on preliminary information regarding area characteristics of direct project effects, three subcounty areas were identified in San Luis Obispo County for allocation of direct project effects. In addition, examination of the project's impacts in Santa Barbara County was focused on the city of Santa Maria, where the majority of the project's impacts in Santa Barbara County occurred.

The San Luis Obispo County areas are: (1) the City of San Luis Obispo, which is the county seat and largest city in San Luis Obispo County; (2) the contiguous urban area along the coast, south of the City of San Luis Obispo, known as the Five Cities Area; and (3) the remainder of San Luis Obispo County, which consists of the urban areas north of the City of San Luis Obispo and the county hinterland.

3.2.2.1 City of San Luis Obispo

The City of San Luis Obispo is the county seat of San Luis Obispo County. Located along Highway 101, it is 228 miles south of San Francisco and 207 miles north of Los Angeles. The city is located approximately twelve road-miles northwest of the Diablo Canyon plant site. San Luis Obispo serves as a regional center for trade, employment, and cultural activities for the county and is the location of California Polytechnical State University, which had a 1978 enrollment of 15,565. The university and the California State Men's Colony, a penal institution established in 1954, are two of the largest employers in the county. San Luis Obispo is also the local headquarters for several nuclear power interest groups including Mothers for Peace, ECO-SLO, Downwind, and the Abalone Alliance. The 1970 population of San Luis Obispo was 28,036 persons, a 98 percent increase over the 1950 population of 14,180 persons.

3.2.2.2 Five Cities Area

The Five Cities Area is an approximately five-mile stretch of urban area located along the Pacific coast directly west of Highway 101. The Five Cities Area consists of the incorporated cities of Pismo Beach, Grover City, and Arroyo Grande, and the unincorporated Oceano. Shell Beach, the fifth city, was annexed by the city of Pismo Beach in 1967. Pismo Beach, the northernmost city, is located approximately 11 miles south of the City of San Luis Obispo. With a 1970 population of 4,050 persons, it has a larger proportion of elderly residents than does the county, the state, or the rest of the Five Cities Area as a result of its primarily resort character. From 1950 through 1970, the Five Cities Area experienced rapid population and residential growth as elderly

retired people in-migrated to the area. Grover, Arroyo Grande, and Oceano also experienced rapid population increases between 1950 and 1970, in part because of their proximity to major employment centers (including those in northern Santa Barbara County) as well as the resort amenities of the area. Another result of the proximity to employment centers concerns age structure: in 1970, there was a lower proportion of elderly than that for the rest of the county, although still a higher proportion than that for the state as a whole, and a larger proportion of child-rearing families than that for the county or the state. By 1970, the population of Grover was 5,939; the population of Arroyo Grande, the largest in the Five Cities Area, was 7,454; and Oceano, the smallest, was 2,564. Residents of the Five Cities Area generally consider the area a well-integrated community. The predominant economic activity of the area is tourism, although agriculture plays an important role in Arroyo Grande. Due to the availability of temporary and permanent housing in the Five Cities Area, it was a primary area for the location of Diablo Canyon workers. The 1970 population of the Five Cities Area was 17,245. (City of Arroyo Grande, 1976; City of San Luis Obispo, 1975; Lane, personal communication, 1979.)

3.2.2.3 Remainder of San Luis Obispo County

The remainder of San Luis Obispo County consists of the northern cities of Atascadero (unincorporated), Paso Robles, and Morro Bay, and the county hinterland. The primary economic activity of this region is agriculture, with fishing and tourism also important in Morro Bay. The Atascadero State Hospital is one of the major employers in the county. The 1970 population of Atascadero was 10,290, while that of Paso Robles was 6,677 and Morro Bay was 7,109. This area has also served to attract a large elderly population, especially around Morro Bay.

3.2.2.4 City of Santa Maria

The City of Santa Maria is located 31 miles south of the City of San Luis Obispo on Highway 101, in Santa Barbara County, a short distance south of the San Luis Obispo County-Santa Barbara County border. Primary economic activities include agriculture, retail trade, and manufacturing. Construction (in the early 1960s) of Vandenberg Air Force Base, located southwest of Santa Maria, led to the establishment of a large construction work force in Santa Maria and the subsequent rapid expansion of the city's economic base and population. Because of the large construction work force residing in Santa Maria, many of the workers employed at the Diablo Canyon project commuted from this area. The 1970 population of Santa Maria was 32,749.

3.3 Distribution of Direct Project Effects within the Region

In this section, the distribution of the direct project effects among the four aggregate units—direct basic employment,¹ direct basic workers,² utility purchases, and tax payments for the Diablo Canyon project—is described for the year of peak construction (1975) and a later year (1978), which includes operations workers. The aggregate incidence of direct project effects and the pattern over time were principal components in the determination of the intensity of direct project effects and the identification of the study area. The principal purpose of allocating workers to the areas within the region is to determine the size of the effects relative to the size of the areas in which they occurred.

3.3.1 Distribution of Direct Basic Employment by Place of Work

Since the project site and all direct project work was located in San Luis Obispo County, all direct basic employment occurred within the jurisdictional boundaries of San Luis Obispo County in both 1975 and 1978. In 1975, the annual average daily employment at the project was 2,116; in 1978 it was 1,317 (PG&E, personal communication, 1980).

3.3.2 Distribution of Workers by Place of Residence

The principal purpose of allocating workers to the local areas is to determine the size of the effects relative to the size of the areas in which they occurred. Employment and income associated with the project are considered to be both important effects in themselves and the cause of further, secondary effects.

Although there was no survey of the work force at the Diablo Canyon site to document the spatial distribution of the workers, utility records and interviews with the business agents of the union locals, real estate agents, and apartment and motel managers enabled allocation of the workers to each of the subareas for 1975 and 1978.

Table 3-1 shows the number of direct basic workers residing in each of the places in San Luis Obispo and in Santa Maria.³ As shown in Table 3-1, the largest number of

¹Direct basic employment is the employment on the project itself. In this discussion, the focus is on the location of the job employment by place of work.

²Direct basic workers are workers employed on the project itself.

³Includes operations personnel.

workers (43 percent) was in the Five Cities Area, with smaller concentrations in the remaining areas of San Luis Obispo County and Santa Barbara County. (Adams, personal communication, 1980; Anderson, personal communication, 1980; Atkinson, personal communication, 1980; Baldwin, personal communication, 1980; Etzler, personal communication, 1980; Garth, personal communication, 1980; Holloway, personal communication, 1980; Mallory, personal communication, 1980; Rich, personal communication, 1980; Ryan, personal communication, 1980; Swearinger, personal communication, 1980.)

TABLE 3-1
DIABLO CANYON
DIRECT BASIC WORKERS BY PLACE OF RESIDENCE
1975 AND 1978

	1975 ^a	1978 ^b
San Luis Obispo City	212	158
Five Cities Area	1,016	619
Remainder San Luis Obispo County	571	342
TOTAL San Luis Obispo County	1,799	1,119
Santa Maria	317	198
TOTAL Santa Barbara County	317	198
TOTAL Two-County Region	2,116	1,317

^aIncludes 2,007 construction and 109 operations personnel.

^bIncludes 1,133 construction and 184 operations personnel.

Source: Mountain West Research Inc. (based on PG&E records, records of construction contractors, personal communications with business managers of union locals, apartment managers, realtors, and other key informants).

Several factors were particularly influential in the distribution of workers. Although several union locals¹ were located in San Luis Obispo at the time of

¹These included Carpenters Local 1623; Plasterers and Current Masons Local 775; Electrical Workers Local 639; Laborers Local 1464; Painters District Council 52; and Plumbers and Steamfitters Local 403.

construction, the manpower requirements of the plant far exceeded the local unions' memberships; thus, they were unable to supply a sufficient number of workers. It was therefore necessary for union locals to go outside the San Luis Obispo primary labor market in order to meet the manpower requirements of the plant. Subsequently, many workers moved into the county from other areas of California to work on the project. Many of the workers who moved into the area were affiliated with unions in the secondary labor market, which included Santa Barbara, Kern, and Monterey counties. The residential patterns of these workers were determined in large measure by the availability of housing. In general, housing was less available and more expensive in the City of San Luis Obispo than it was in the Five Cities Area, Santa Maria, or the northern cities in San Luis Obispo County that were within commuting distance of the plant. Because the Five Cities Area had an abundance of apartments, motels, and recreation vehicle parks, which serviced the tourist trade, many of the workers were able to secure acceptable living quarters in the Five Cities Area.

The residential distribution of the work force in 1978 was similar to that in 1975, although there was a slightly higher concentration of workers residing in the City of San Luis Obispo. This was due to the larger proportion of operations personnel at the plant in 1978 than in 1975. In general, the housing preferences of the operations work force tended more toward location in San Luis Obispo than did those of the construction work force. The operations personnel were more willing to "shop" the San Luis Obispo housing market for a permanent residence and to pay the generally higher prices for housing that existed there.

3.3.3 Distribution of Utility Purchases, 1975 and 1978

Both the largest purchases and the greater proportion of all purchases for the construction and eventual operation of the Diablo Canyon plant were made outside San Luis Obispo and Santa Barbara counties. Table 3-2 shows the distribution of utility purchases for the Diablo Canyon project within the region in 1975 and 1978 as estimated by PG&E. (PG&E, personal communication, 1980.)

As shown in Table 3-2, the local purchases by the utility occurred almost exclusively within the cities of San Luis Obispo and Santa Maria. However, the value of these transactions was insignificant compared to the total trading activities in either place and was too small to have resulted in an observable increase in employment or income in the local economies. Local purchases in the region totaled about \$240,000 in

1975 and \$63,000 in 1978, compared to total purchases of \$11,093,000 in 1975 and \$3,051,074 in 1978 (PG&E, personal communication, 1980).

TABLE 3-2

DIABLO CANYON
UTILITY PURCHASES FOR PLANT CONSTRUCTION AND
OPERATION BY PLACE OF TRANSACTION IN
STUDY REGION
(Constant 1972 Dollars)

Place	Value of Purchases	
	1975	1978
City of San Luis Obispo	\$ 59,380	\$20,927
Five Cities Area	—	—
Remainder of San Luis Obispo County	3,825	—
TOTAL SAN LUIS OBISPO COUNTY	63,205	20,927
Santa Maria	176,746	41,856
Remainder of Santa Barbara County	—	—
TOTAL SANTA BARBARA COUNTY	176,746	41,256
TOTAL	\$239,951	\$62,783

Source: PG&E, personal communication, 1980.

Since the purchase of materials was not of consequence to the economy of any of the selected places (although it was important to some of the individual establishments which received the business), the purchase of materials receded as a criterion for study area selection.¹

¹In fact, the evidence that is available is not altogether consistent. One major subcontractor indicated average annual purchases in San Luis Obispo and Santa Maria Counties may have run as high as \$200,000 and \$400,000 (in current dollars), respectively. (Farnsworth, personal communication, 9 September 1980). Even so, purchases are typically from the trade sector, and \$100,000 of purchases translates into only \$10,000 of income, or about one job. Because of the small size of the effect, combined with uncertainty concerning its actual magnitude, it is ignored in the subsequent qualitative analysis of project effects. The appropriateness of this decision is reinforced by conversations with the more important local suppliers who reported that the purchases were noticeable but not large and did not affect employment or the overall scale of the operation.

3.3.4 Distribution of Taxes, 1975 and 1978

PG&E paid taxes to several taxing authorities within San Luis Obispo County and to the State of California on the Diablo Canyon facilities and purchases of equipment and materials. Table 3-3 shows the distribution of taxes to jurisdictions in 1975 and 1978.

TABLE 3-3

DIABLO CANYON
DISTRIBUTION OF TAX PAYMENTS
1975 AND 1978
(Current Dollars)

Taxes	1974-75	1977-78
<u>Property Tax</u>		
San Luis Obispo County	\$2,357,254	\$4,309,248
Port San Luis Harbor District	103,531	211,166
City of Pismo Beach	11,323	3,206
Special Districts	—	3,479
County Schools Department	309,731	591,780
Atascadero Unified School District	33,348	70,615
Lucia Mar Unified School District	69,225	80,915
Paso Robles	20,584	37,884
San Luis Coastal Unified School District	2,532,841	5,866,220
Shandon Unified School District	690	1,001
Templeton Unified School District	4,902	7,800
Community College District	870,197	1,229,082
TOTAL PROPERTY TAXES	6,313,626	12,412,396
<u>Sales and Use Taxes</u>		
State of California	288,862	70,835
<u>Franchise Taxes</u>	36,000	120,000
TOTAL	\$6,638,488	\$12,603,231

Source: PG&E. personal communication, 1980.

In FY 1974-75, taxes on the Diablo Canyon facility totaled \$6.6 million. The largest tax, by far, was the property tax, which accounted for \$6.3 million. In addition, sales and use taxes paid to the state on purchases of materials and equipment amounted to almost \$290,000, and franchise tax payments to the county for use of rights-of-way were \$36,000. The recipients of the largest tax payments were the San Luis Obispo Coastal Unified School District and San Luis Obispo County. In FY 1974-75, those

jurisdictions received \$2.5 million and \$2.4 million, respectively, from taxes levied on the plant.

In FY 1977-78, taxes levied on the Diablo Canyon project totaled \$12.6 million. Property taxes accounted for \$12.4 million while sales and use taxes added about \$70,000 and franchise taxes contributed \$120,000. Again, San Luis Obispo Coastal Unified School District and the county were the major recipients of the revenue, collecting \$5.9 million and \$4.3 million, respectively, from levies on the project. (Birch, personal communication, 1980; Lyoma, personal communication, 1980; Newman, personal communication, 1980.)

3.4 Selection of the Study Area

3.4.1 The Study Area

The Study Area selected for the Diablo Canyon case study was San Luis Obispo County, California. A detailed map of the Study Area is provided in Figure 3-2.

3.4.2 Rationale

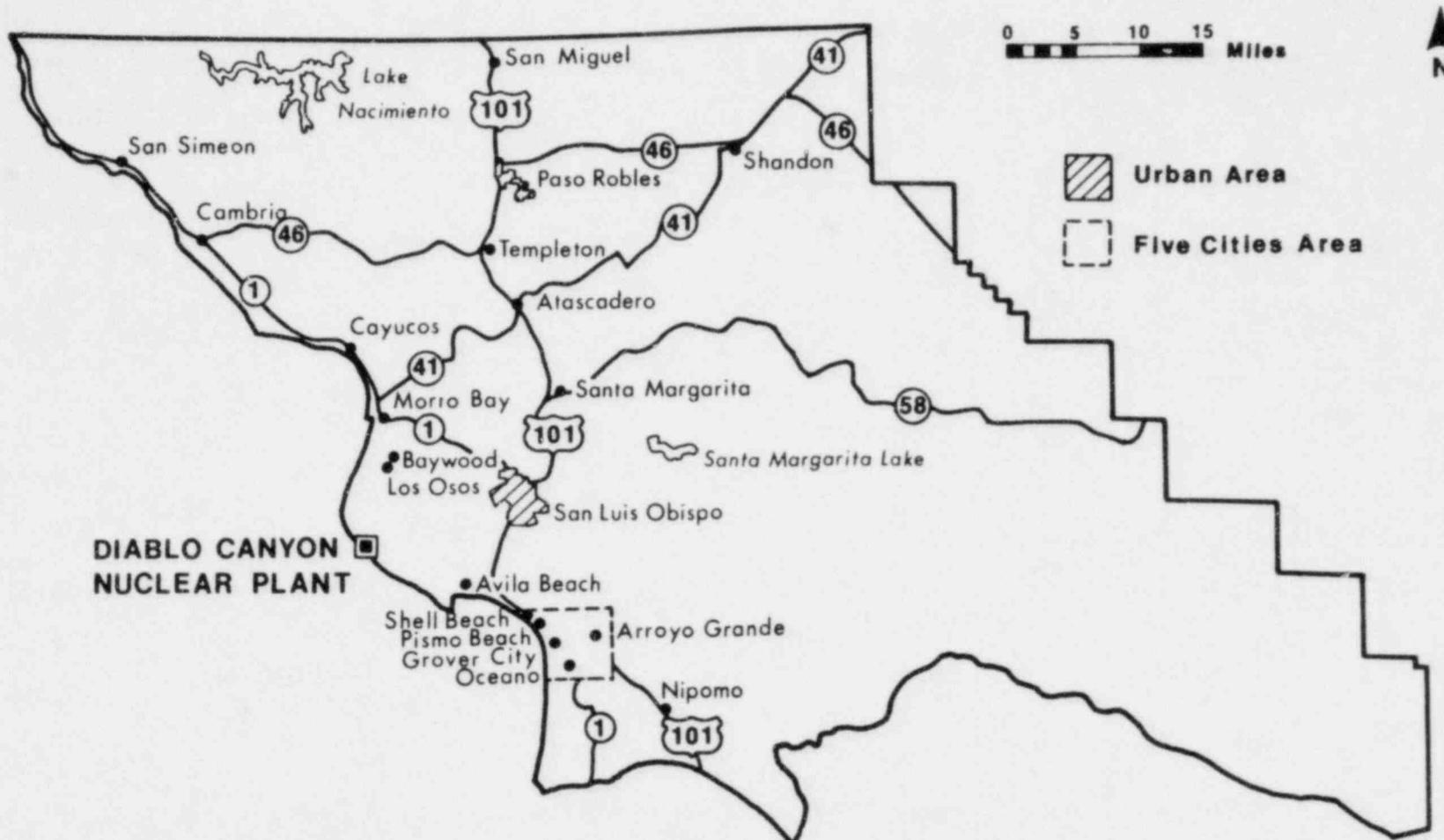
The distribution of the work force in 1975 and 1978 showed that about 85 percent of the workers resided in San Luis Obispo County.

Since the quantity of materials purchased within the two-county area was very small and did not result in observable impacts on local employment or income, local materials purchases were not a factor in distinguishing the Study Area.

However, a clear distinction does result from considering the distribution of taxes. All property taxes paid by PG&E on the Diablo Canyon project went to taxing jurisdictions within San Luis Obispo County.

In FY 1974-75, total property taxes paid on the Diablo Canyon plant to taxing jurisdictions in San Luis Obispo County were approximately \$6.3 million: 40.1 percent went to the San Luis Coastal Unified School District, while 37.3 percent went to the San Luis Obispo County government. In FY 1977-78, total property taxes paid on the Diablo Canyon facility to taxing authorities in San Luis Obispo County amounted to \$12.4 million. Of this amount, 47.2 percent was paid to the San Luis Coastal Unified School District and 34.7 percent was paid to San Luis Obispo County for county operations. In 1978, the Diablo Canyon nuclear plant (not yet operational) accounted for about 21 percent of the assessable tax base of San Luis Obispo County.

**FIGURE 3-2. DIABLO CANYON NUCLEAR PLANT STUDY AREA:
SAN LUIS OBISPO COUNTY, CALIFORNIA.**



Source: San Luis Obispo, California, Planning Department, n.d., "County Planning Divisions".

3.4.3 Summary

San Luis Obispo County was clearly a potential Study Area. Since the work force distribution was concentrated in the Five Cities Area in the southern section of the county, the definition of a subcounty area as the Study Area was considered. However, the entire county was chosen as the Study Area for several reasons. Not only were work force effects discernible in other areas of the county, but also induced employment and income effects were expected to take place within the established county trade and service patterns. In addition, the fiscal effects were large enough to have definite county-wide impacts. Finally, the potential public response to the project was highly visible in the county-wide community and was an important consideration in defining the county as the Study Area.

Furthermore, since the discovery of the Hosgri fault which is located about 2 1/2 miles offshore from the Diablo Canyon facility, the nuclear project has come under increasing scrutiny by numerous environmental and other nuclear power interest groups. While several of these groups maintain strong national and statewide presence, their political response to the Diablo Canyon plant was highly visible in San Luis Obispo County. During the course of construction of the plant, several anti-nuclear demonstrations were staged near the plant site and in the City of San Luis Obispo. However, it should be noted that the Five Cities Area is the most likely place for identifying social structure effects.

CHAPTER 4: ECONOMY OF THE STUDY AREA

4.1 Introduction

The purpose of this chapter is to identify and discuss the effects of the construction of Diablo Canyon Nuclear Power Plant on the economy of the Study Area. Emphasis is placed on changes in the employment, income, and labor force status of the population. An attempt is also made to assess the impacts of the station on the standard of living of the Study Area residents.

The analysis begins by providing an overview of the economic history of the Study Area. The historical discussion is oriented to the major components of the economic base of the Study Area—agriculture, tourism, and government. A more detailed examination of changes that occurred in the economy of the Study Area from 1967 (the year preceding commencement of construction of the project) through 1978 is then made. In this section, the purpose is to quantify the total change that occurred in: (1) the number of jobs and income generated in the Study Area, (2) the labor force in the Study Area and the employment characteristics of Study Area residents and, (3) the standard of living in the Study Area. No attempt will be made to identify the role of the Diablo Canyon project in these changes.

The next sections of the chapter trace the effects of plant construction on these same variables—the income earned in the Study Area; the labor force in the Study Area and the income characteristics of Study Area residents; and the standard-of-living of Study Area residents. The analysis of the effects of plant construction is centered on 1975 (the peak construction period was 1974-75), and 1978 (the most recent year for which data are available). An economic base approach is utilized to identify and analyze three different effects of the project on the Study Area: basic employment and income; nonbasic employment and income; and total employment and income. A summary of the employment and income effects due to the nuclear power plant, followed by a summary of labor force effects and standard-of-living effects, ends the chapter.

4.2 Economic History of the Study Area

The first permanent white settlers came to San Luis Obispo County shortly after the Spanish occupation of upper California began in 1769. On 1 September 1772, Father Junipero Serra, on an expedition from Monterrey to San Diego, founded Mission San Luis Obispo de Tolosa. The mission (named for Saint Louis, Bishop of Toulouse, France) was

the fifth Franciscan mission founded in a chain of twenty-one missions stretching from San Diego to San Francisco. The missions served as outposts for Spain in California and extended Spanish influence in the region in the face of growing English and Russian incursion. The original goals of the mission system were to turn Indians into citizens of the Spanish Empire and mission communities into self-governing bodies.

The mission communities were supported by agriculture; the settled Chumash Indian converts at San Luis Obispo tended crops of wheat and herds of cattle. As a result of the fertile soil surrounding the mission, San Luis Obispo de Tolosa was one of the wealthiest missions in California.

After Mexico won its independence from Spain in 1822, the California missions were secularized, and the vast acreages of lands under control of the missions were transferred into the hands of private individuals through sales and grants. Mission San Luis Obispo de Tolosa was sold for about \$500. Following California's admission to the union in 1850, patents were issued to the rancheros, or owners of land grants, thereby granting legal title to the landholders. The ranches at this time were relatively self-sufficient, although some trading did occur. Until the 1860s, there was virtually no money in circulation, and hides and tallow were traded for rations, silks, laces, and broadcloth (Bonetti, 1968).

A prolonged drought between 1862 and 1864 resulted in the destruction of cattle and the subsequent break-up of the ranches. Economic activity of the area transferred to dairying and crop farming. The principal market for the country's products was San Francisco, with a population in 1870 of 299,000. Other agricultural activities during this period included the production of wheat, barley, beans, beets, and squash.

By the turn of the century, the Southern Pacific Railroad had reached San Luis Obispo, bringing more people into the area. Tourism became important in the area for the first time as the mud baths at Paso Robles received national attention. California Polytechnic State University (Cal Poly) was established by the state legislature in 1901 and opened its doors to students on 1 October 1903. In 1910, the population of San Luis Obispo County was still less than 20,000.

Growth in the county's population and employment remained fairly steady until the end of World War II and accelerated thereafter. In 1940, the population of San Luis Obispo County was 33,246. Between 1940 and 1950, the population increased by 54.7 percent to 51,417, and total employment increased by 59 percent.

Between 1940 and 1970, the composition of the economic base changed significantly while total employment more than doubled. Although agriculture continued to play an important role in the economy of the county, it was no longer the single largest employer, having given way to the services, government, and trade sectors. Tourism had increased in relative importance, particularly in the beach communities in the southern part of the county. Employment in government jobs also increased dramatically during this period with expansions at California Polytechnic State University, the California Men's Colony, and Atascadero State Hospital.

Table 4-1 shows how the composition of employment in San Luis Obispo County changed between 1940 and 1970. Agriculture, which accounted for 34 percent of total employment in 1940, had declined to 8.7 percent by 1970. The mining sector, a relatively small sector in the county's economy, declined slightly in its share of total employment in the thirty-year period. Contract construction increased in its share of total employment between 1940 and 1960, but declined between 1960 and 1970. Manufacturing, although a much smaller proportion of total employment than is the case for California as a whole, did increase its relative share of employment during the period. Transportation, communications, and public utilities grew faster than total employment between 1940 and 1950, but decreased in relative terms between 1950 and 1970. Wholesale and retail trade increased in relative importance between 1940 and 1970, as did finance, insurance, and real estate. Employment in the services sector increased in absolute amount by over 400 percent between 1940 and 1970, and its relative share of employment increased from 20.7 percent in 1940 to 35.5 percent in 1970. Because of the manner in which the U.S. Census Bureau defines employment (i.e., distributing government employment across all industrial sectors by function), the very rapid increase in services employment shown in Table 4-1 reflects both the growth of educational services employment, principally at Cal Poly, and tourist-related service employment. Government employment, shown in Table 4-1, also increased in relative importance during the period.

TABLE 4-1

EMPLOYMENT BY PLACE OF RESIDENCE
 SAN LUIS OBISPO COUNTY, CALIFORNIA
 1940, 1950, 1960, 1970

	1940	Percent of Total 1940	1950	Percent of Total 1950	Percent of Change 1940-1950	1960	Percent of Total 1960	Percent of Change 1950-1960	1970	Percent of Total 1970	Percent of Change 1960-1970
Total Employment	11,424	100.0	18,163	100.0	59.0	27,568	100.0	51.8	36,493	100.0	32.4
Agriculture	3,889	34.0	3,702	20.4	-4.8	3,157	11.5	-14.7	3,187	8.7	1.0
Mining	218	1.9	259	1.4	18.8	205	0.7	-20.8	373	1.0	82.0
Construction	633	5.5	1,686	9.3	166.4	3,526	12.8	109.1	2,758	7.6	-21.8
Manufacturing	484	4.2	844	4.6	74.4	2,019	7.3	139.2	2,153	5.9	6.6
TCPU	948	8.3	1,708	9.4	80.2	2,059	7.5	20.6	2,540	7.0	23.4
Trade	2,228	19.5	4,177	23.0	87.5	5,840	21.2	39.8	7,886	21.6	35.0
FIRE	244	2.1	424	2.3	73.8	986	3.6	132.5	1,370	3.8	38.9
Services	2,364	20.7	4,317	23.8	82.6	7,289	26.4	68.8	12,963	35.5	77.8
Government	416	3.6	1,046	5.8	151.4	2,487	9.0	137.8	3,263	8.9	31.2

Sources: U.S. Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, Regional Employment by Industry 1940-1970, U.S. Government Printing Office, 1975.

4.3 Economic Changes during the Study Period

Three perspectives are taken in this section on changes in the economy of the San Luis Obispo County over the 1967 to 1978 period. The first perspective focuses on the level of economic activity occurring within the boundaries of the areas being studied and is measured by the number of jobs and amount of income generated at places of work within the county. The second perspective focuses on the people residing in these areas and deals with the labor force status of area residents and with the income they earn. Thus, employment is a key indicator in both cases, but the distinction in the employment concepts must be kept clearly in mind. The first perspective deals with employment in terms of number of jobs measured at the place of work, while the second perspective measures number of employed persons at their place of residence. The third perspective taken in this section describes the standard-of-living of Study Area residents.

4.3.1 Employment and Income in the Local Economy

The principal components of the economic base of San Luis Obispo County were agriculture, tourism, and government. During the study period, 1967 to 1978, the major sources of employment were the government, services, and trade sectors. Government was by far the single most important employment sector. Agriculture, although far less important as an employer than government, services, or trade, played a disproportionately important role in the local residents' perception. Tourism also had a significant influence upon the structure and development of the local economy, especially in the trade and services sectors.

Table 4-2 shows employment by place of work in San Luis Obispo County for the 1967-1978 period. During this period, total employment increased from 30,829 to 53,946—an annual average rate of increase of 5.2 percent. The number of proprietors increased more slowly during the period than did the number of wage and salary employees. Farm proprietors increased at an annual average rate of less than one percent, while nonfarm proprietors grew by an average of 4.6 percent per year. Wage and salary employment increased by 5.5 percent per year during the period.

TABLE 4-2
EMPLOYMENT BY PLACE OF WORK BY INDUSTRIAL SECTOR
SAN LUIS OBISPO COUNTY, CALIFORNIA
1967-1978
(Full- and Part-Time)

	1967 ^a	1968 ^a	1969 ^a	1970 ^a	1971 ^a	1972 ^a	1973 ^a	1974 ^a	1975 ^b	1976 ^b	1977 ^b	1978 ^b
Total Employment ^c	30,829	32,527	34,109	36,100	37,848	39,838	41,886	44,282	45,918	48,249	50,096	53,946
Number of Proprietors	4,574	4,500	4,591	4,730	4,874	5,237	5,436	5,811	5,909	6,084	6,454	6,771
Farm Proprietors	1,334	1,300	1,279	1,266	1,271	1,314	1,359	1,406	1,444	1,450	1,468	1,466
Nonfarm Proprietors	3,240	3,200	3,312	3,464	3,603	3,923	4,077	4,405	4,465	4,634	4,986	5,305
Total Wage and Salary Employment	26,255	28,027	29,518	31,370	32,974	34,601	36,450	38,471	40,009	42,165	43,642	47,175
Farm	1,659	2,083	2,203	2,255	2,275	2,319	2,322	2,486	2,640	2,641	2,447	2,106
Nonfarm	24,596	25,944	27,315	29,115	30,699	32,282	34,128	35,985	37,369	39,524	41,195	45,069
Private	15,077	16,073	16,997	18,485	19,849	21,236	22,427	23,491	24,371	26,456	28,657	32,330
Agricultural Services, Forestry, Fishing, and Other ^d	398	(D)	(D)	(D)	(D)	388	406	(D)	551	670	613	710
Mining	121	(D)	(D)	(D)	(D)	110	105	(D)	90	99	117	142
Construction	981	1,066	1,215	1,587	1,986	2,418	2,664	2,276	2,483	2,593	2,789	3,947
Manufacturing	1,118	1,186	1,255	1,277	1,386	1,514	1,811	1,973	1,782	1,989	2,379	2,875
Nondurable Goods	599	602	599	637	643	641	707	(D)	(D)	1,060	1,248	1,215
Durable Goods	519	584	656	640	743	873	1,104	(D)	(D)	929	1,131	1,660
Transportation and Public Utilities	1,515	1,537	1,489	1,694	2,068	2,189	2,236	2,440	2,193	2,392	2,637	2,904
Wholesale Trade	593	588	612	605	675	772	803	876	1,194	1,211	1,322	1,270
Retail Trade	4,843	5,219	5,567	5,888	6,115	6,423	6,921	7,343	7,846	8,601	9,013	9,657
Finance, Insurance, and Real Estate Services	721	759	804	840	920	965	1,012	1,035	1,097	1,286	1,450	1,613
Government and Government Enterprises	4,787	5,150	5,477	6,012	6,253	6,457	6,469	7,048	7,135	7,615	8,337	9,212
Federal, Civilian	9,519	9,871	10,318	10,630	10,850	11,046	11,701	12,494	12,998	13,068	12,538	12,739
Federal, Military	496	480	603	611	615	598	618	677	626	647	603	596
State and Local	949	947	993	974	967	973	1,003	1,000	972	943	842	848
State and Local	8,074	8,444	8,722	9,045	9,268	9,475	10,080	10,817	11,400	11,478	11,093	11,295

^aEstimates based on 67 SIC.

^bEstimates based on 72 SIC.

^cConsists of wage and salary jobs plus number of proprietors.

^dIncludes number of jobs held by U.S. residents working for international organizations in the U.S. Primary source for private nonfarm employment: ES-202 covered wages—California Department of Human Resources Development.

(D) Not shown to avoid disclosure of confidential data. Data are included in totals.

Source: Bureau of Economic Analysis, Regional Economic Information System, April 1980, unpublished data.

All sectors except farming, mining, and government experienced gains in their share of total wage and salary employment. The relative share of government employment to total employment declined from over 30 percent of total employment in 1967 to 23.6 percent in 1978.

The largest absolute gains in employment during the study period were in construction (13.5 percent annual average increase); manufacturing (9.0 percent annual average increase); and finance, insurance, and real estate (7.6 percent annual average increase).

Most employment sectors exhibited steady growth during the period, although there were minor downturns during the 1974-75 recession in construction; manufacturing; and transportation, communications, and public utilities.

As shown in Table 4-3, total labor and proprietors' income by place of work increased steadily during the study period. During this period, total income by place of work increased at an annual average rate of 6.7 percent after adjusting for inflation. The composition of total income changed in a slightly different manner than did employment. While agricultural employment became relatively less important during the period, its share of total income increased at an average annual rate of 8.5 percent. Although employment in the trade sector grew faster than total employment, total income in the sector declined slightly in relative terms. Nevertheless, after adjusting for inflation, income in the trade sector increased in absolute terms an average of 5.0 percent between 1967 and 1978.

4.3.2 Employment and Income of Local Residents

The labor force status of the residents of San Luis Obispo County as a whole reflects the general economic forces operating on the local economy that were described in the previous section. San Luis Obispo County had a resident work force of 31,850 in 1967, the year prior to commencement of construction on the Diablo Canyon plant. The labor force increased steadily throughout the study period, reaching 59,808 in 1978, as shown in Table 4-4. The average annual increase in the labor force during the period was 5.9 percent.

TABLE 4-3

LABOR AND PROPRIETORS' INCOME BY PLACE OF WORK BY INDUSTRIAL SECTOR
 SAN LUIS OBISPO COUNTY, CALIFORNIA
 1967-1978
 (Thousands of Constant 1972 Dollars)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Total Income	211,369	228,450	238,581	252,192	273,630	298,618	321,450	329,136	334,864	361,261	381,774	429,529
Agriculture ^a	19,514	(D)	(D)	(D)	(D)	28,531	34,187	(D)	36,082	38,499	34,346	47,738
Mining	1,413	(D)	(D)	(D)	(D)	1,411	1,317	(D)	1,324	1,693	1,722	2,264
Construction	14,071	33,843	18,162	22,588	26,716	34,659	37,173	30,855	36,179	37,776	37,997	54,351
Manufacturing	9,448	9,845	10,356	10,724	11,442	13,065	14,914	15,577	15,168	17,581	20,717	24,249
TCPU	14,488	15,539	16,693	18,142	23,507	26,141	27,720	29,080	26,224	30,344	33,910	37,804
Trade ^b	37,849	40,654	40,889	43,112	44,939	47,350	50,936	52,084	55,915	59,886	63,522	64,997
FIRE	7,185	7,978	7,792	7,582	8,296	8,809	8,389	7,412	7,479	10,739	14,701	16,834
Services	34,924	36,467	38,878	40,532	43,230	46,093	47,307	48,368	49,370	55,525	63,931	71,292
Government	72,477	76,091	79,504	84,348	87,425	92,559	99,507	102,390	107,123	109,218	110,927	110,001

^aIncludes Farm, Agricultural Services, Forestries, Fisheries, and Other Income.

^bIncludes wholesale and retail trade income.

(D) Not shown to avoid disclosure of confidential data, included in totals.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, April 1980, unpublished data.

TABLE 4-4

POPULATION, LABOR FORCE, EMPLOYMENT, AND UNEMPLOYMENT
 BY PLACE OF RESIDENCE
 SAN LUIS OBISPO COUNTY
 STATE OF CALIFORNIA AND UNITED STATES
 1967-1978

	1967	1978	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
<u>San Luis Obispo County</u>												
Labor Force	31,850	33,250	35,400					46,082	47,749	51,033	54,715	59,808
Employment	30,300	31,800	33,700					43,143	44,297	47,495	51,040	56,261
Unemployment	1,550	1,450	1,700					2,939	3,452	3,538	3,675	3,547
Unemployment Rate	4.9	4.4	4.8					6.4	7.2	6.9	6.7	5.9
<u>California</u>												
Labor Force (000)	7,831	8,094	8,366	8,157	8,359	8,581	8,814	9,195	9,386	9,709	10,141	10,646
Employment (000)	7,442	7,728	7,994	7,566	7,624	7,930	8,197	8,525	8,460	8,820	9,307	9,890
Unemployment (000)	389	366	372	591	735	651	617	670	926	889	834	756
Unemployment (000)	5.0	4.5	4.4	7.2	8.8	7.6	7.0	7.3	9.9	9.2	8.2	7.1
<u>United States</u>												
Population (000)	197,374	199,312	201,306	203,810	206,206	208,322	209,846	211,371	213,203	214,675	216,383	218,059
Labor Force (000)	77,347	78,737	80,734	82,715	84,113	86,542	88,713	91,011	92,613	94,773	97,401	100,420
Employment (000)	74,372	75,920	77,902	78,627	79,120	81,702	84,409	85,935	84,783	87,485	90,546	94,373
Unemployment (000)	2,975	2,817	2,832	4,088	4,993	4,840	4,304	5,076	7,830	7,288	6,855	6,047
Unemployment Rate	3.8	3.6	3.5	4.9	5.9	5.6	4.9	5.6	8.5	7.7	7.0	6.0

Sources: Sue Rota, California Employment Data and Research, personal communication, 1980; California, 1967-1969 California Statistical Abstract 1970; San Luis Obispo County, 1967-1978 California Statistical Abstract 1970; San Luis Obispo County, 1974-1978 Annual Planning Information, San Luis Obispo County, 1980-81.

The number of unemployed persons rose sharply between 1974 and 1975 (17.5 percent to a total of 3,452) as shown in Table 4-4. During that period of recession, the unemployment rate climbed by an eighth of a percentage point to 7.2 percent, the largest increase in the county in recent years.

Labor force participation rates for both males and females in San Luis Obispo County were significantly below both California and national levels in 1960 and 1970, as shown in Table 4-5. This is attributable in part to the large retired and student populations that reside within the county. In 1960, the labor force participation rate among males was 64.5 percent, 18.9 percent below that of the state and 16.6 percent below that of the nation. By 1970, the male participation rate had declined by 10.9 percent to 57.5 percent. This was significantly lower than both the California labor force participation rate of 77.6 percent and the national rate of 72.9 percent. In contrast, the female labor force participation rate in the Study Area increased between 1960 and 1970 at a much faster rate than did that of California or the United States. In 1960, the female labor force participation rate was 30.3 percent, compared to 38.3 percent in 1970. By 1970, the female participation rate had almost reached that of the nation as a whole.

TABLE 4-5
LABOR FORCE PARTICIPATION RATES BY SEX
SAN LUIS OBISPO COUNTY, STATE OF CALIFORNIA
AND UNITED STATES
1960 AND 1970

	1960 ^a		1970 ^b	
	Male	Female	Male	Female
San Luis Obispo County	64.5	30.3	57.5	38.3
California	79.5	36.1	77.6	42.2
United States	77.4	34.5	72.9	39.6

^aPercent aged fourteen years and older.

^bPercent aged sixteen years and older.

Sources: U.S. Department of Commerce, Bureau of Census, Census of Population, Characteristics of the Population 1960, U.S. Government Printing Office, Tables 52,83,84; U.S. Department of Commerce, Bureau of the Census, Census of Population, General Social and Economic Characteristics: 1970, U.S. Government Printing Office, Tables 4-6 and 5-3.

Income by place of residence, as shown in Table 4-6, showed the same trend as income by place of work, increasing each year between 1967 and 1978. In constant 1972 dollars, the personal income of county residents increased by an annual average rate of about 7.0 percent compared to an average annual increase in labor and proprietors' income by place of residence of 6.0 percent per year. The slightly more rapid increase in transfer payments (8.3 percent per year) and dividends, interest, and rent (7.6 percent per year) is largely responsible for the difference between personal income and labor and proprietors' income by place of residence.

San Luis Obispo County residents exhibit a diverse range of occupational skills and educational attainments which contributes to a standard-of-living that is traditionally higher than the national average. In 1969, San Luis Obispo County had an incidence of family poverty of 10.9 percent, below the national average of 13.7 percent, but above the California rate of 8.4 percent. The median family income in San Luis Obispo County in 1969 was \$8,738, which was 90.2 percent of the California figure of \$9,690 and 113.5 percent of the national median family income of \$7,699 (Bureau of the Census, 1970).

One measure of the standard of living is per capita income, which is shown in Table 4-6 in constant 1972 dollars for the 1967 to 1978 period. As shown in Table 4-6, the real per capita income of San Luis Obispo County residents increased at an annual average rate of 3.7 percent over the eleven-year period. Real per capita income increased every year except 1973-74.

4.4 Economic Changes in the Study Area due to the Project

The purpose of this section is to describe the effect of constructing the Diablo Canyon nuclear station on the economic conditions in San Luis Obispo County. As was the case in the previous section, three perspectives will be taken: (1) the effect of the project on economic activity in the Study Area (i.e., on jobs and income on a place-of-work basis); (2) the effect of the project on the labor force status of the residents of the Study Area; and (3) the effect of the project on the standard-of-living of Study Area residents.

TABLE 4-6
DERIVATION OF PERSONAL INCOME BY PLACE OF RESIDENCE
SAN LUIS OBISPO COUNTY, CALIFORNIA
1967-1978
(Thousands of Constant Dollars)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Total Labor and Proprietors Income by Place of Work	211,369	228,450	238,581	252,192	273,630	298,618	321,450	329,136	334,864	361,261	381,774	429,529
Less: Personal Contributions for Social Insurance by Place of Work	11,502	12,026	12,797	13,571	14,331	16,793	19,258	18,337	18,754	20,339	21,316	23,369
Plus: Residence Adjustment	15,319	14,943	14,755	13,324	11,834	11,143	11,842	12,104	11,384	12,131	21,582	25,156
Net Labor and Proprietors Income by Place of Residence	215,186	231,368	240,539	251,946	271,134	292,968	314,034	322,903	327,494	353,053	382,041	431,317
Plus: Dividends, Interest, and Rent	55,568	57,954	59,667	66,639	70,904	71,672	77,836	84,149	95,814	104,629	115,252	124,685
Plus: Transfer Payments	50,846	55,433	59,070	67,318	71,800	75,954	82,797	92,063	104,535	112,874	118,729	122,742
Personal Income by Place of Residence	321,600	344,754	359,276	385,903	413,837	440,594	474,667	499,115	527,843	570,556	616,021	678,743
Per Capita Personal Income (Constant 1972 Dollars)	3,209	3,410	3,501	3,631	3,801	3,852	4,051	4,033	4,172	4,336	4,519	4,795

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, April 1980, unpublished data.

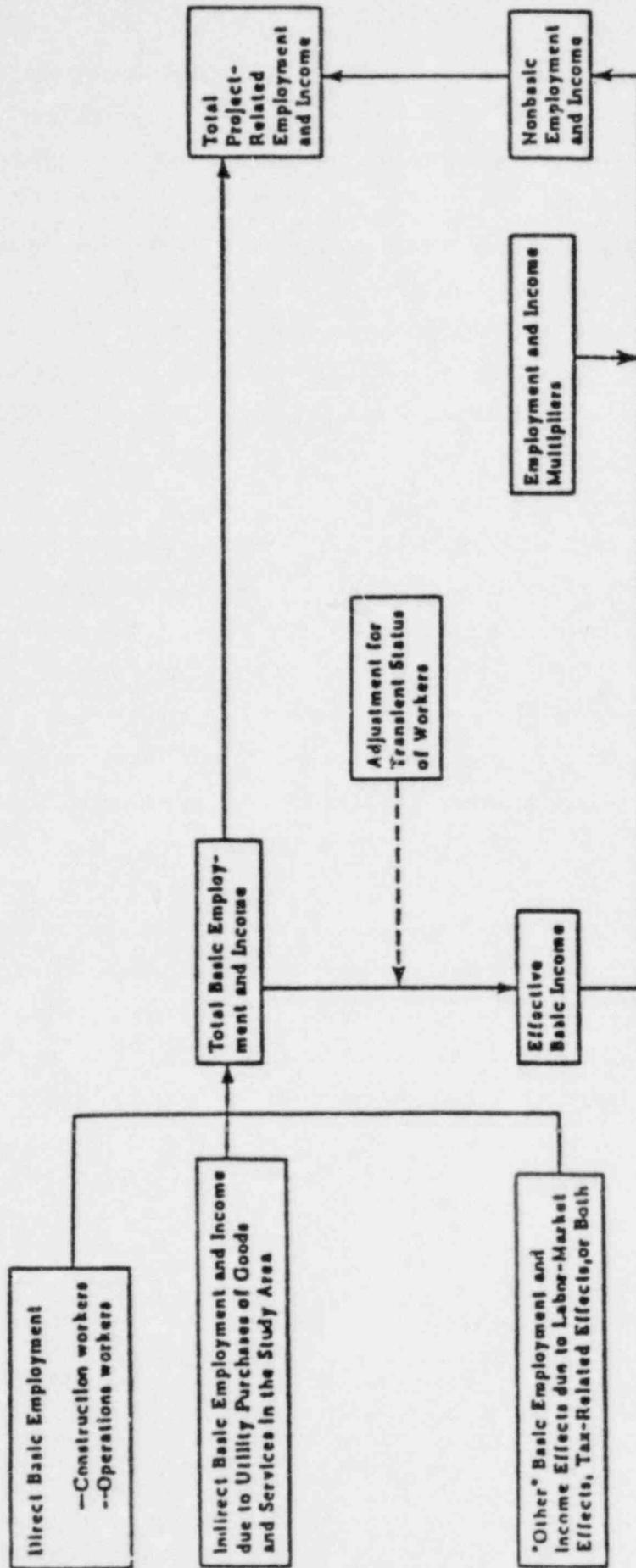
To accomplish these objectives, an economic base analysis (supplemented with an input-output analysis) is utilized. The premise of this analysis is that the economic activities of the project—the employment at the Diablo Canyon project, the purchases of materials for the project, and other market effects of the project (for example, the consequences of the massive taxes paid by the project)—caused additional economic activity in the Study Area. Determination of the total project effects on employment and income in the Study Area requires quantification of both the direct project activity and the additional nonproject activity it induced. Once these income and employment consequences of the project have been estimated, their impacts on the area's economy, on the area's labor force, and on the area's residents' standard-of-living will be summarized.

4.4.1 Estimation of Project-Related Employment and Income Effects

This analysis begins by describing the work force and the purchases of goods and services required to construct and operate the generating station. Persons directly employed in the construction or operation of the plant are called "direct" basic employees, and the income they earn is counted as "direct" basic income. In addition to direct employment and income, local income and employment may have resulted from the purchase of goods and services for the construction and operation of the plant. If, for example, \$1,000 of materials was purchased locally, some fraction of the purchase would accrue as income to labor. For materials produced locally, the ratio of locally-generated-income-to-total-purchases could be quite high. Materials produced elsewhere and only distributed locally would result in a lower ratio of income-to-purchases, which would reflect only the distributor's margin. Income and employment generated in this way in response to the purchases of goods and services by the utility are referred to as "indirect" basic income and employment.

A third group of income and employment effects is referred to as "other" basic income and employment. This category includes labor-market effects due to labor shortages, higher wages, or changes in activity that are a response to the favorable fiscal impacts of the station. To the extent that such responses changed the income or employment of local residents, the change would be categorized as "other" basic income and employment. Figure 4-1 summarizes the three major sources of change in basic income and employment: direct basic, indirect basic, and "other" basic.

FIGURE 4-1
ESTIMATION OF PROJECT-RELATED EMPLOYMENT AND INCOME EFFECTS



A significant portion of the project-related basic income earned in the Study Area was earned by workers who lived outside the Study Area or who resided in the Study Area only during the work-week. As a result, less of this income was spent in the Study Area than would have been if the income had been earned by area residents. To account for this, the total project-related basic income was adjusted to make each dollar equivalent in terms of its effect on the local economy. The resulting adjusted income total is referred to as "effective" basic income. For example, if one group of workers spent only 25 percent as much in the Study Area as local residents earning comparable incomes, only 25 percent of the total income of the group would be included in effective basic income.

"Nonbasic" income and employment is that which results when effective basic income is spent and respent in the local economy. In general, the larger the economy, the smaller the income leakages due to imports and the larger the multiplier. Once a multiplier appropriate to the size of the local economy has been estimated, the change that basic income produces in nonbasic employment and income can be calculated. Nonbasic employment and income can then be added to the three categories of basic employment and income to arrive at an estimate of the total employment and income effects of construction and operation of the nuclear station.

The method for estimating the nonbasic employment and income response to an increase in effective basic income is based on the Regional Interindustry Multiplier System (RIMS) developed for the Regional Economic Analysis Division of the U.S. Department of Commerce, Bureau of Economic Analysis. The RIMS approach is well documented elsewhere (U.S. Water Resources Council, 1977; Anderson, 1980) and, therefore, is not described in detail here.¹

¹In general, the RIMS technique develops industry-specific input-output types of multipliers based on national interindustry relationships at the 496-sector level of disaggregation, adjusted to reflect the availability of required inputs from suppliers in the county. In the simplest case, if an industry does not exist in the county economy, any requirements from that industry are assumed to be supplied by imports from outside the county economy. If an industry does exist in the county at the same, or greater, proportion to the county economy as the industry is to the national economy, the county demands from that industry are assumed to be met within the county economy. If an industry represents a smaller proportion of the county economy than it did of the national economy, some of the county demand is assumed to be supplied from within the county and some is assumed to be imported.

4.4.1.1 Employment and Income Effects of the Project in 1975

Direct basic employment and income effects of the project in 1975.

The first of the three components of total project-related basic income and employment is direct basic income and employment. The direct basic employment in the Study Area due to the project is represented by those jobs and workers involved directly in the construction or operation of the plant. The wages earned by direct basic employees constitute the direct basic income due to the project. Direct basic income and employment can be counted in one of two ways: (1) at the place of work, to show the number of jobs and amount of income generated by the project and their effect on the economy of the Study Area, or (2) at the place of residence of the workers, to show the number of residents of the area employed at the project, their income, and the effect on the labor force of the area. In this study, the determination of direct basic income and direct basic employment at place of work is straightforward and is derived from project employment and wage data.

The Diablo Canyon plant is located in San Luis Obispo County. Consequently, in terms of employment and income by place of work, all direct basic employment and income from the project accrued to the San Luis Obispo County economy. This amounted to 2,116 jobs and \$53.9 million of direct basic income.

Determination of direct basic income and employment at place of residence in the Study Area requires information about the residential location of the direct basic employees. The income of direct basic employees contributes to the generation of nonbasic employment and income in the Study Area, as discussed below.

Not all of the direct basic employees resided in San Luis Obispo County. In 1975, in terms of employment and income by place of residence, it is estimated that 1,799 direct basic employees, earning \$45.9 million in income from the project, were residents of San Luis Obispo County.

Indirect basic employment and income effects of the project in 1975.

The second component of total project-related basic income and employment is the indirect basic, here designated as the profits, earnings, and employment that result from the purchase of goods and additional services by the utility for plant construction and operation. As explained above in Section 3.3.3, the value of goods and services purchased by the utility in the Study Area was very small. The insignificant size of the

effect (relative to the size of the county economy), combined with the uncertainty of its exact magnitude, led to the conclusion to ignore it in the quantitative analysis of this chapter.

"Other" basic employment and income effects of the project in 1975.

The construction of a facility such as a nuclear generating station may result in some wage-induced effects that are classified as "other" basic income and employment. Wage-induced effects might occur in agricultural areas or areas experiencing underemployment. In such areas, the higher wages paid at the construction site might attract workers from lower-paying jobs. During periods of shortages in the skilled crafts, the establishment of apprenticeship programs at the construction site, on-the-job training, and acceptance of craftsmen with less than first-rate credentials may attract workers from competing employers. Theoretically, this could result in a marked increase in wage rates throughout the local economy. In a rural area, farmers who depend upon large numbers of seasonal laborers might be expected to be especially hard hit.

The Diablo Canyon project was an entirely union job and the utility served as its own construction manager. Contractors hired workers primarily through the union halls. During the course of the project, however, there were several instances when the unions were unable to fill the manpower requirements of the project for welders and pipefitters. In these instances, PG&E contractors had to recruit directly for workers. The nonunion workers who were hired by the company were given temporary working permits by the union and were trained by the contractors. If this practice occurred on a sufficiently large scale, it could be expected that workers in the local area would be drawn from lower paying occupations into the higher wage occupations associated with constructing the plant. In order to compete for labor, the lower-wage occupations would be forced to increase wages. Evidence suggests, however, that "open" hiring practices were of such a limited nature so as not to have caused noticeable wage-induced effects in the Study Area. The vast majority of the major manpower needs of the project were met by union members residing in other areas of California who moved into San Luis Obispo County to work on the project.

As indicated in Chapter 3, the property taxes paid by PG&E on the Diablo Canyon plant were sizeable, totaling \$7.7 million in FY 1975-76. The largest share of tax payments went to the county, which received \$2.9 million, and the San Luis Coastal Unified School District, which received \$3.4 million. The additional revenues received by

local governments could have resulted in "other" basic employment in the Study Area by inducing expansion of local government employment. Because of the multiplier effect of basic income, it is necessary to identify and distinguish this "other" basic employment from the nonbasic government employment and income caused by the project. The employment and income change in the government sector which was directly a function of the economic and demographic growth in the Study Area caused by the project (for example, school personnel, sanitation workers, public safety personnel, and so forth) would be nonbasic; only that caused directly by the increased revenues from the project would be basic.

Although employment in government in San Luis Obispo County grew rapidly between 1967 and 1975, analysis indicates the magnitude of the growth in San Luis Obispo County was commensurate with the growth in government employment in similar sized counties experiencing similar growth in personal income. Evidence further suggests that a substantial portion of the increase in government employment in San Luis Obispo County can be attributed to expansion of California Polytechnic State University during this period. Therefore, the large tax revenues associated with the Diablo Canyon plant do not appear to have resulted in substantial "other" basic employment or income in the government of the Study Area.

Total "other" basic employment and income in 1975 was therefore assumed to be zero in the Study Area.

Total basic employment and income effects of the project in 1975.

Total basic employment and income is the sum of the three basic components—direct basic, indirect basic, and "other" basic. As shown in Table 4-7, the total number of basic jobs added to the Study Area economy in the Diablo Canyon project—basic employment by place of work—in 1975 was 2,116. These jobs generated basic income of \$53.9 million. A portion of these jobs, however, were filled by workers who lived outside the San Luis Obispo County Study Area. In 1975, 1,799 project-related basic employees earning \$45.9 million were residents in the Study Area.

Nonbasic employment and income due to the project in 1975.

Nonbasic employment and income, the final component of project-related employment and income effects, results from the expenditure (and re-expenditure) of basic income in the local economy. The amount of nonbasic employment and income

caused by the project in the local economy is determined primarily by the interaction of two factors: (1) the amount of "effective" basic income created by the project, and (2) the size of the nonbasic-to-basic employment and income multipliers in the local economy.

TABLE 4-7
DIABLO CANYON
TOTAL PROJECT-RELATED BASIC EMPLOYMENT
AND INCOME IN STUDY AREA

Employment/Income	Direct	Indirect	Other	TOTAL
Employment				
By Place of Work	2,116	0	0	2,116
By Place of Residence	1,799	0	0	1,796
Income ^a				
By Place of Work	\$53,920	0	0	\$53,920
By Place of Residence	\$45,855	0	0	\$45,855

^aThousands of constant 1972 dollars.

Sources: PG&E, personal communication, 1980; Ronald Drake, personal communication, 1980.

Effective basic income. A proportion of the project-related basic income in the Study Area was earned by workers who were transient residents or who lived outside San Luis Obispo County and who, therefore, spent a smaller proportion of their income in the county economy than did workers living in the Study Area who earned the same income. This reduced the effect of the project-related basic income on the local economy by diminishing the amount available for multiplication. To account for this, the total project-related basic income earned in the county was adjusted to make each dollar of project-related basic income equivalent in effect on the economy of the county to an average-dollar-of-basic-income earned there. Two principal factors affected the amount of effective basic income resulting from the project: (1) the residential location of the workers earning the basic income and, (2) the incidence of outside financial commitments such as the maintenance of a household. The effects of these factors were analyzed by dividing the project-related basic workers into four groups:

1. Nonmovers—employees who were residents in the Study Area prior to their employment on the project, and who did not move because of this employment;
2. Movers accompanied by families—employees who moved into the Study Area because of their employment on the project and were accompanied by families;
3. Movers unaccompanied by families—employees who moved into the Study Area because of their employment on the project and were not accompanied by families (including single employees); and,
4. Daily long-distance commuters—employees living outside the Study Area but commuting daily into the Study Area to work at the project.

An adjustment for the basic income earned by each group was then made individually to determine the effective basic income.

Table 4-8 shows the distribution of project-related employees and basic income among those four groups for the Study Area. As the figures indicate, about 23 percent of the project-related basic jobs were held by San Luis Obispo County residents; 38 percent were held by workers who moved to the Study Area with their families; 24 percent were held by workers who moved to the Study Area unaccompanied by their families; and almost 15 percent were held by persons commuting to the work site from outside the Study Area.

Based on information about residential location and outside financial commitments of the work force, and an examination of the availability of goods and services in the local economy, the basic income of each of the four groups was weighted so that its significance, in terms of generating induced effects within the Study Area, would be commensurate across groups. The resulting weighted income estimate is referred to as "effective" basic income. Because the county-specific multipliers are based on the consumption patterns of average county residents, nonmovers serve as the standard for defining effective basic income. All of their income is treated as effective (i.e., their income is weighted by a factor of 1.0). For each of the remaining categories of workers, a formula was used to estimate the proportion of income spent in the local area compared to that spent by nonmovers. In this formula, the annual expenditures for major items (such as homes, clothing, health care, and recreation) for a family of four in the income bracket within which the average annual income of Diablo Canyon construction workers falls (around \$25,000), from the Consumer Expenditure Survey,

1972-73 (U.S. Department of Labor, Bureau of Labor Statistics), was used as a baseline. Discussions with workers and local planners then led to assumptions about the percentage of expenditures made locally for each category of expenditures. For example, it was assumed that for nonmovers and movers accompanied by their families, 100 percent of their expenditures for shelter would be spent in the Study Area; for movers without their families, only 50 percent of their housing needs would be met in the Study Area; and none of the daily commuters would have housing in the area.

TABLE 4-8
DIABLO CANYON
DISTRIBUTION OF PROJECT-RELATED BASIC
WORKERS AND INCOME
1975

Workers	Total Basic Employment			Total Basic Income ^a		
	Direct Basic	Indirect Basic	TOTAL	Direct Basic	Indirect Basic	TOTAL
Nonmovers	495	—	495	\$12,613.8	—	\$12,613.8
Movers, Accompanied by Families	804	—	804	20,487.9	—	20,487.9
Movers, Unaccompanied by Families	500	—	500	12,741.2	—	12,741.2
Outside Daily Commuters	<u>317</u>	<u>—</u>	<u>317</u>	<u>8,077.9</u>	<u>—</u>	<u>8,077.9</u>
TOTAL^b	2,116	—	2,116	\$53,920.9	—	\$53,920.9

^aThousands of constant 1972 dollars.

^bTotals may not add exactly due to rounding.

Source: Mountain West Research, Inc., 1980.

Once the average yearly expenditures in each category were totaled for each group, it was assumed that nonmovers and movers with family present would have the same consumption patterns and that \$11,369 would be spent locally out of total consumption of \$15,306 (i.e., 74.3 percent of consumption would be within the county).

For movers without their families and long distance daily commuters, the amounts spent locally were estimated to be substantially less. For movers without their families, the percentage spent locally was estimated to be 26.7 percent, while for long distance commuters it was just 4.0 percent.

Based on these estimates, the effect on the local economy of income paid to movers without their families, and long distance commuters, will be less than that paid to nonmovers or movers accompanied by their families. For movers without their families, the appropriate weight is .359 based on their local expenditure (26.7 percent) relative to that of the reference group (74.3 percent). For the long distance commuters, the appropriate weight is .054 based on their local expenditures (4.0 percent) relative to that of the nonmovers (74.3 percent).

As shown in Table 4-9, these weights gave an estimated effective basic income in San Luis Obispo County in 1975 of about \$38 million, or 71 percent of the total project-related basic income by place of work.

TABLE 4-9
DIABLO CANYON
ESTIMATED EFFECTIVE BASIC INCOME
1975

	Basic Income ^a	Adjustment Factor	Total Effective Income ^b
Nonmovers	\$12,613.8	1.0	\$12,613.8
Movers Accompanied by Families	20,487.9	1.0	20,487.9
Movers Unaccompanied by Families	12,741.2	0.359	4,574.1
Commuters Residing Outside San Luis Obispo County	<u>8,077.9</u>	0.054	<u>436.2</u>
TOTAL	\$53,920.9		\$38,112.0

^aThousands of constant 1972 dollars.

^bThousands of constant dollars.

Source: Mountain West Research, Inc., 1980.

Nonbasic-to-basic multipliers. The second factor determining the nonbasic employment and income effects of the project in the Study Area is the nonbasic-to-basic employment and income multipliers. The size of the multiplier is determined by the size and characteristics of the economy being analyzed—the larger and more diversified the economy, the larger the multiplier. The nonbasic income and employment to effective basic income multipliers employed for the analysis in San Luis Obispo County was derived from the county specific input-output analysis of the Regional Interindustry Multiplier System (RIMS). The general RIMS technique was described in Section 4.4.1.3. Here, RIMS multipliers are used to estimate the employment and income effects of an increase in final demand in the household sector caused by the basic income from the project, and they employ both county specific industrial sector and national household data (Drake, personal communication, 1980).

Based on the RIMS analysis, the appropriate multipliers for San Luis Obispo County were for \$1,000 of effective basic income to result in 0.0374 nonbasic jobs and \$209 in nonbasic income in the county (by place of work). When applied to the estimated project-related effective basic income (38,112 thousand), these multipliers indicate that the project caused 1,425 nonbasic jobs and \$8.0 million in nonbasic income in San Luis Obispo County in 1975, as shown in Table 4-10.

TABLE 4-10
DIABLO CANYON
NONBASIC EMPLOYMENT AND INCOME BY PLACE OF WORK
1975

Employment/Income Components	Amount
Effective Basic Income (Thousands 1972 Dollars)	\$38,112
Employment Multiplier (Per Thousand Effective Basic Income)	0.0374
Income Multiplier (Per Thousand Effective Basic Income)	209
Total Nonbasic Employment	1,425
Total Nonbasic Income (thousands)	\$7,965.4

Source: Mountain West Research, Inc., 1980.

Based on a consideration of labor force availability and commuting patterns, it is estimated that 90 percent of the nonbasic jobs created by the project in San Luis Obispo County were filled by nonmovers; 5 percent were filled by movers with family present; and 5 percent were filled by outside daily commuters. As a result, by place of residence, the project provided nonbasic employment for 1,354 county residents who earned \$7,568.6 thousand in income as shown in Table 4-11.

TABLE 4-11
DIABLO CANYON
NONBASIC INCOME BY PLACE OF RESIDENCE
1975

Workers	Nonbasic Employment	Nonbasic Income ^a
Nonmovers	1,283	\$7,171.7
Movers Accompanied by Families	71	396.9
Movers Unaccompanied by Families	0	0
Long Distance Commuters (Outside Study Area)	<u>71</u>	<u>396.9</u>
TOTAL WORKERS^b	1,425	\$7,965.4
TOTAL WORKERS IN STUDY AREA	1,354	\$7,568.5

^aThousands of constant 1972 dollars.

^bTotals may not add exactly due to rounding.

Source: Mountain West Research, Inc., 1980.

Total employment and income due to the project in 1975.

The sum of the four components of employment and income generated by the Diablo Canyon project--direct basic, indirect basic, "other" basic, and nonbasic--is the total employment and income created in San Luis Obispo County by the project. As shown in Table 4-12, the total number of new jobs created in the county in 1975 by place

of work was estimated at 3,541. Total income from this employment generated \$61,886.3 thousand.

TABLE 4-12
DIABLO CANYON
TOTAL PROJECT-RELATED EMPLOYMENT
AND INCOME BY PLACE OF WORK
1975

Employment Type	Employment Number	Income ^a
Direct Basic	2,116	\$53,920.9
Indirect Basic	0	0
"Other" Basic	0	0
Nonbasic	1,425	7,965.4
TOTAL	3,541	\$61,886.3

^aThousands of dollars.

Source: Mountain West Research, Inc., 1980.

As shown in Table 4-13, the employment and income effects on the Study Area by place of residence were somewhat smaller due to income leakages attributable to the outside of county daily commuters. In the Study Area, the project provided employment for 3,153 residents who earned 53.4 million in project-related jobs.

4.4.1.2 Employment and Income Effects of the Project in 1978

Direct basic employment and income effects of the project in 1978.

As in 1975, all employment and income earned at the project is direct basic employment and income at the place of work in the Study Area. In these terms, in 1978, the total annual average daily direct basic employment in the Study Area was 1,317, and the total direct basic income was \$36.1 million (in constant 1972 dollars). As in 1975, not all of the direct basic employees were residents of the Study Area. In 1978, in terms of employment and income effects by place of residence, it is estimated that 1,121 direct basic employees, earning \$30.7 million (constant 1972 dollars) were residents of the Study Area.

TABLE 4-13

DIABLO CANYON
TOTAL PROJECT-RELATED EMPLOYMENT AND
INCOME BY PLACE OF RESIDENCE
1975

Employment Type	Employment Number	Income ^a
Direct Basic	1,799	\$45,842.9
Indirect Basic	0	0
Other Basic	0	0
Nonbasic	<u>1,354</u>	<u>7,568.5</u>
TOTAL	3,153	\$53,411.4

^aThousands of 1972 dollars.

Source: Mountain West Research, Inc., 1980.

Indirect basic employment and income effects of the project in 1978.

For the reasons explained above, the very small amount of purchases made by the utility in the Study Area is ignored in the quantitative analysis that follows.

"Other" basic employment and income effects of the project in 1978.

As in 1975, no "other" basic employment or income was evident in the Study Area due to the Diablo Canyon project.

Total basic employment and income effects of the project in 1978.

The total basic employment and income due to the project in the Study Area in 1978 is shown in Table 4-14. These figures are substantially smaller than the comparable figures for 1975 when construction activity was at peak level, due primarily to the great reduction in work force between these two years. Estimated total basic employment by place of work was 1,317, and total basic income was \$36.1 million (constant 1972 dollars). In terms of employment by place of residence, a total of 1,121 basic employees, earning \$30.7 million (1972 dollars), were residents of the Study Area in 1978.

TABLE 4-14

DISTRIBUTION OF PROJECT-RELATED BASIC EMPLOYMENT AND INCOME
1978

Workers	Total Basic Employment			Total Basic Income ^a		
	Direct Basic	Indirect Basic	TOTAL	Direct Basic	Indirect Basic	TOTAL
Nonmovers	316	—	316	\$ 8,656.5	—	\$ 8,656.5
Movers Accompanied by Families	514	—	514	14,080.5	—	14,080.5
Movers Unaccompanied by Families	291	—	291	7,971.6	—	7,971.6
Daily Outside Commuters	<u>196</u>	—	<u>196</u>	<u>5,369.2</u>	—	<u>5,369.2</u>
TOTAL	1,317	—	1,317	\$36,077.8	—	\$36,077.8

^aBased on average of \$21,222 for all workers. Thousands of constant 1972 dollars.

Source: Mountain West Research, Inc., 1980.

Nonbasic employment and income effects of the project in 1978

Following the analysis discussed for 1975, the basic income earned in the Study Area by each of the four categories of workers—nonmovers, movers accompanied by families, movers unaccompanied by families, and outside commuters—was weighted to determine the total effective basic income in the Study Area. Table 4-15 shows the distribution of basic workers and basic income among these four categories, the weights applied to the income of each group, and the total effective basic income effects of the project in the Study Area.

TABLE 4-15
ESTIMATED EFFECTIVE BASIC INCOME
SAN LUIS OBISPO COUNTY
1978
(Thousands of Constant 1972 Dollars)

Project-Related Income Category	Basic Income	Factor	Effective Basic Income
Nonmovers	\$8,656.5	1.0	\$8,656.5
Movers Accompanied by Families	14,080.5	1.0	14,080.5
Movers Unaccompanied by Families	7,971.6	0.359	2,861.8
Daily Outside Commuters	<u>5,369.2</u>	0.054	<u>289.9</u>
TOTAL	\$36,077.8		\$25,888.7

Source: Mountain West Research, Inc., 1980.

After adjusting for income leakages due to the workers who commuted on a daily basis from outside the county and for workers with outside financial commitments, the "effective" basic income of the Study Area was \$25.9 million(see Table 4-15).

Conversion of the effective basic income to nonbasic employment and income was done as it was for 1975. Use of the RIMS multipliers¹ resulted in the estimation of 968

¹The nonbasic-to-basic employment multiplier for San Luis Obispo County per \$1,000 income is .0374. The nonbasic-to-basic income multiplier per \$100 income is \$209. (Ronald Drake, personal communication, 1980.)

nonbasic jobs and \$5.4 million of nonbasic income within the Study Area in 1978 as a result of the Diablo Canyon project, as shown in Table 4-16.

TABLE 4-16
DIABLO CANYON
NONBASIC EMPLOYMENT AND INCOME
SAN LUIS OBISPO COUNTY
1978

Employment/Income	Income
Effective Basic Income ^a	\$25,888.7
Nonbasic to Basic Employment Multiplier (Per Thousand Dollars Basic Income)	0.0374
Nonbasic to Basic Income Multipliers (Per Thousand Dollars Basic Income)	209.0
Estimated Nonbasic Employment	968.0
Estimated Nonbasic Income ^a	\$5,410.7

^aThousands of 1972 dollars.

Sources: Ronald Drake, personal communication, 1980; Mountain West Research, Inc., 1980.

The distribution of the nonbasic employment among the categories of workers as in 1975 gave an estimate that 872 of the nonbasic jobs were filled by residents of the Study Area, while 48 were filled by movers accompanied by families and 48 were filled by outside daily commuters. Accordingly, over \$5,140 thousand was earned by the 920 nonbasic workers who were residents of the Study Area.

Total employment and income effects of the project in 1978

Table 4-17 shows the total employment and income due to the project in San Luis Obispo County by place of work for 1978. The total number of new jobs created by the project in the Study Area was 2,285, including 1,317 direct basic and 968 nonbasic jobs. Total income on a place of work basis generated by the project in the Study Area was about \$41.5 million (constant 1972 dollars).

TABLE 4-17
TOTAL EMPLOYMENT AND INCOME DUE TO THE PROJECT
BY PLACE OF WORK
SAN LUIS OBISPO CO'JNTY
1978

Employment/Income Type	Employment	Income ^a
Direct Basic	1,317	\$36,077.8
Indirect Basic	0	.0
Other Basic	0	.0
Nonbasic	<u>968</u>	<u>5,410.7</u>
TOTAL	2,285	\$41,488.5

^aThousands of constant 1972 dollars.

Source: Mountain West Research, Inc., 1980.

Table 4-18 shows the total number of project-related jobs in 1978 filled by residents of the Study Area and total project-related income earned by these residents. An estimated 2,041 residents of the Study Area earned approximately \$35,848.8 thousand as a result of the Diablo Canyon project in 1978.

TABLE 4-18
TOTAL EMPLOYMENT AND INCOME EFFECTS OF THE PROJECT
BY PLACE OF RESIDENCE
SAN LUIS OBISPO COUNTY
1978

Employment/Income Type	Employment	Income ^a
Direct Basic	1,121	\$30,708.6
Indirect Basic	0	.0
Other Basic	0	.0
Nonbasic	<u>920</u>	<u>5,140.2</u>
TOTAL	2,041	\$35,848.8

^aThousands of constant 1972 dollars.

Source: Mountain West Research, Inc., 1980.

4.4.2 Effects of the Project on the Study Area Economy, 1967-1978

To give some sense of the magnitude and duration of the employment and income effects of the project on the economy of the Study Area, the annual employment and income due to the project has been estimated for the 1967-1977 period by assuming that the ratio of direct basic employment and income to total project-related employment and income remained constant at the 1975 level from 1967 to 1975, then changed at a constant annual rate between 1975 and 1978 to reach the 1978 level. Table 4-19 shows the total by employment and income for this period. The technique used in estimating annual total employment and income due to the project probably overestimates the employment effects in the early years and underestimates them in the later years because the direct basic workers' salaries were slightly lower in 1978 than in 1975 and would have caused a lower nonbasic response per worker. The higher real salary in 1975 was the result of the increased amount of overtime paid to workers in an attempt to speed production to compensate for time lost due to a strike in 1974.

As shown in Figure 4-2 and Figure 4-3, employment created by the Diablo Canyon project in 1975 was estimated to be 3,541 jobs, which was about 8 percent of the approximately 46,000 jobs located in San Luis Obispo County. The \$61.8 million of income generated within the county by these jobs was about 18 percent of the total income earned in the county (\$334.9 million). The percentage of total income was greater than the percentage of jobs because of the relatively high average annual wages earned in the project-related jobs.

In 1978, as shown in Table 4-19, there were 2,285 jobs and \$41.5 million of income created by the Diablo Canyon project which accounted for 4.2 percent of the jobs in the county and 9.6 percent of total income earned in the county (\$429.5 million).

4.4.3 Effects of the Project on the Residents of the Study Area

The employment and income effects of the project on the residents of San Luis Obispo County for each year of the study period are shown in Table 4-20. These estimates were derived utilizing the same assumptions about constant direct basic to total ratios as in the previous analysis. As shown in Table 4-20, over 2,000 residents of the Study Area were employed in project-related jobs for six years during the study period.

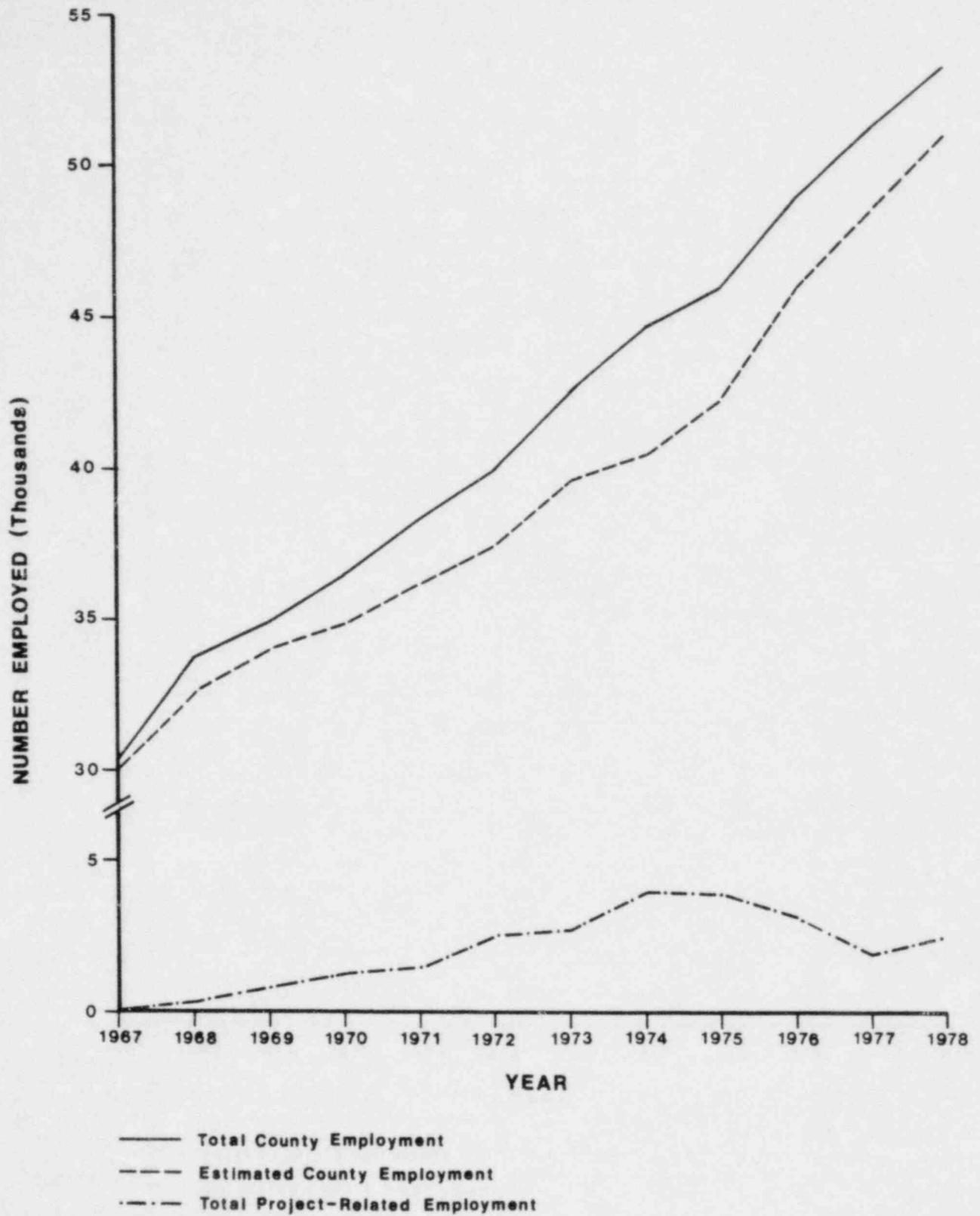


FIGURE 4-2. Project-Related Employment by Place of Work in San Luis Obispo County, 1967-1978.

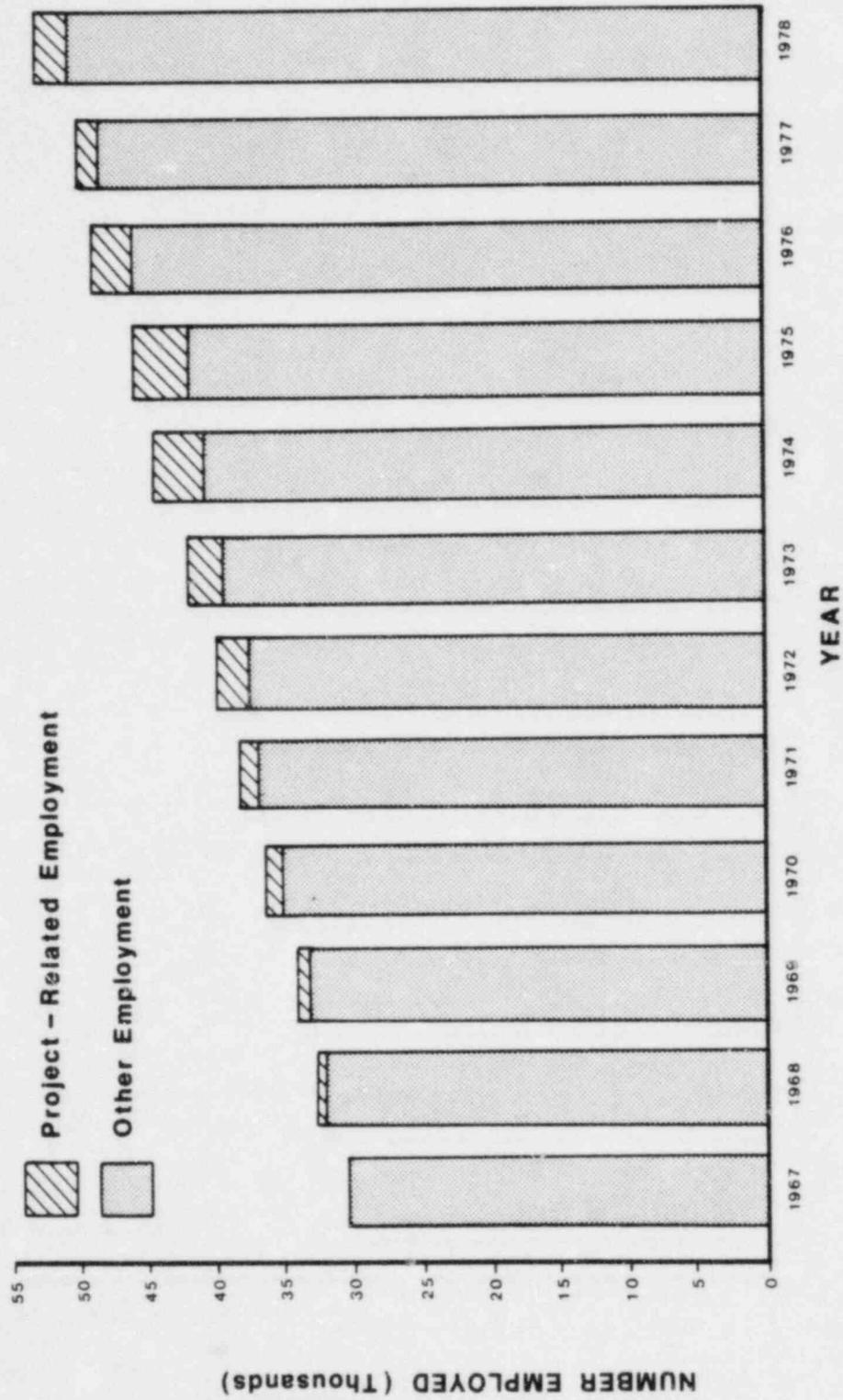


FIGURE 4-3. Project-Related and Total Employment by Place of Work in Study Area, 1967-1978.

TABLE 4-19

ESTIMATED ANNUAL EMPLOYMENT AND INCOME EFFECTS
BY PLACE OF WORK
SAN LUIS OBISPO COUNTY
1967-1978

Year	Direct Basic Employment	Total Employment ^a	Total Income ^b
1967	0	0	0
1968	158	264	\$ 4,621.0
1969	295	494	8,627.8
1970	705	1,179	20,619.0
1971	921	1,541	26,936.3
1972	1,441	2,411	47,144.6
1973	1,866	3,122	54,574.5
1974	1,510	2,526	44,162.7
1975	2,116	3,541	61,886.3
1976	1,518	2,570	45,509.8
1977	893	1,531	27,443.5
1978	1,317	2,285	41,488.5

^aBased on the ratio of 1975 total employment to direct basic employment times the annual average direct basic employment.

^bBased on the 1975 total income to direct basic employment ratio times annual average direct basic employment for 1968-1975, decreased at constant annual rate (to reach the 1978 income to employment ratio) between 1975 and 1978 to reflect changes in average worker salaries between 1975 and 1978. (Thousands of 1972 dollars.)

Source: Mountain West Research, Inc., 1980.

TABLE 4-20

ESTIMATED ANNUAL EMPLOYMENT AND INCOME EFFECTS
 BY PLACE OF RESIDENCE
 SAN LUIS OBISPO COUNTY
 1967-1978

Year	Direct Basic Employment	Total Employment ^a	Total Income ^b
1967	0	0	0
1968	158	235	\$ 3,988
1969	295	440	7,446
1970	705	1,051	17,795
1971	921	1,372	23,247
1972	1,441	2,147	36,373
1973	1,866	2,781	47,101
1974	1,510	2,250	38,115
1975	2,116	3,153	53,411
1976	1,518	2,292	39,292
1977	893	1,366	23,703
1978	1,317	2,041	35,848

^aBased on the 1975 ratio of direct basic employment to total employment and income for the years 1968-1974; for the years 1975-1978, the ratio was adjusted to the 1978 ratio at a constant average annual rate.

^bThousands of 1972 dollars.

Source: Mountain West Research, Inc., 1980.

In 1975, 3,153 county residents held project-related jobs, about 7 percent of the total labor force in the county. Based on estimates of movers and accompanying families, in 1975 the project had caused an increase in the labor force by in-migration of 1,375 workers (71 nonbasic and 1,304 basic), or 2.9 percent of the total county work force. Similar analyses for 1978 indicate that up to 853 additional workers (48 nonbasic plus 805 basic) may have been added to the labor force due to in-migration, or 1.3 percent of the total county labor force.

Interviews with key informants suggest that, although the Diablo Canyon project produced beneficial economic effects in the Study Area, the magnitude and temporary nature of these effects were not critical to the employment opportunities of county residents. The employment rate in San Luis Obispo County was below the state level in 1967, prior to the start of construction of the project, and it was below the state rate in 1978.

Although the wages paid to the project-related workers were typically higher than the average wage in the Study Area, the project work force did not comprise a sufficiently large portion of the total labor force to have had a significant impact on median or per capita income in the Study Area.

CHAPTER 5: POPULATION

5.1 Introduction

The purpose of Chapter 5 is to determine and explicate the population effects of the Diablo Canyon project on the Study Area (San Luis Obispo County). The first step in this chapter is to examine the demographic trends in the Study Area. The second step is to determine the demographic implications of the basic and nonbasic employment created by the project. Two sources of population increase are considered: increases due to the in-migration of workers and their household members for project-related employment, and increases from diminished out-migration of local residents and their household members due to project-related employment. The third step is to take these estimates formulated into annual series and to examine the population impacts of the project in terms of the percentage of the Study Area population due to the project. Further demographic effects are addressed in Chapter 8, where the impacts on groups in the Study Area are considered.

5.2 Demographic Trends

The population of San Luis Obispo County was examined from 1910 to 1978. The county population growth rates fluctuated over time. A relatively slow but steady growth characterized the county until 1940. Between 1910 and 1940, the population increased from 19,383 to 33,246 persons, representing a growth rate of 71.5 percent. By 1950, the population had grown to 51,417 persons, and by 1960 another 29,627 persons had been added. Between 1950 and 1960, the annual average rate of growth was 4.7 percent. The growth rate after 1960 was significantly smaller than during the 1950s. The annual average growth rate in the 1960s was 2.7 percent and increased only slightly during the 1970s. (State of California, 1977; U.S. Department of Agriculture, 1975; U.S. Department of Commerce, 1972.)

The major contribution to population growth has been net in-migration. The importance of net in-migration as a source of growth is shown during the 1960-1970 period when net in-migration accounted for 69.8 percent of the total population change. Net in-migration during this decade was substantially higher than that for California as a whole, where net in-migration accounted for 52.2 percent of total population change in the 1960-1970 period. Natural increase, in contrast, accounted for less than 1.0 percent each year during the 1960s. Of the total population change in the county (24,500) in the

1970 to 1975 period, net migration accounted for 92.2 percent of the total population change.

The population composition of the in-migration was especially unique and helps explain why the county as a whole deviated from the state on two demographic components—age and sex distribution. Three major factors account for in-migration during the 1960 to 1970 period: the growth of educational facilities at the California State Polytechnic University; the influx of a substantial number of retired people; and the growth of institutions in the county, particularly the California State Men's Colony. Each significantly contributed to population growth, but did not contribute in any major way to the size of the labor force. Approximately 13,620 persons (79 percent) of the net in-migration of 17,258 between 1960 and 1970, were not part of the county's labor force. (City of San Luis Obispo, 1975; Draze, personal communication, 1980; MacDonald, personal communication, 1980; Rosenthal, personal communication, 1980.)

The composition of the in-migration to the county during the 1960 to 1970 period was assessed by the County Planning Department in 1975. The study found that 40 percent of the 1960-1970 population increase was related to the expansion of the university (both students and employees) located in the community of San Luis Obispo: increased enrollment, alone, accounted for about 32 percent of the county's population growth. The California State Men's Colony housed over 3,000 inmates and contributed 4 percent to the growth of the county's population between 1960 and 1970. The population structure of the county has been affected by these institutions, primarily in the male-female distribution. In 1970, 52.6 percent of the population was male and 47.4 percent was female. This distribution departs from the state and national breakdown of the population by sex. In 1970, 49.2 percent of the California population was male, while 49.0 percent of the United State's population was male. (City of San Luis Obispo, 1975; San Luis Obispo County, 1975.)

The in-migration of retired people has also influenced the population structure of the county. In 1970, the elderly age group (64 years of age and older) comprised a proportionately large share of the total population. This group accounted for 12.3 percent of San Luis Obispo County's total population compared to 9.0 percent in California as a whole. Between 1960 and 1970, the county experienced a net increase of 3,900 persons over 64 years of age, and of this increase, 70 percent (2,730 persons) were in-migrants. The percentage of total population in this age bracket grew from

11.6 percent to 12.3 percent in this decade. Between 1960 and 1975, the elderly age group increased slightly as a proportion of the San Luis Obispo County population and was the fastest growing age group during this period.

The percentage of the nonwhite population in the county was smaller than the percentage in the state and the nation. In 1960, the nonwhite population of the county was estimated to be 3.7 percent of the total population. Of the nonwhite population, 47.5 percent were black, and the remainder consisted of a combination of Native American, Japanese, Chinese, and Filipino peoples. By 1970, the nonwhite population had increased to 5.6 percent of the county's population. The percentage of blacks in the nonwhite population declined from 47.5 percent to 38.5 percent in 1970, despite absolute gains made in the black population. (San Luis Obispo County, 1975; State of California, 1977 and 1980; U.S. Department of Commerce, Bureau of the Census, 1972.)

The population growth and distribution of the county also has a strong spatial component; to more clearly understand the area's demography, it would be helpful to examine the growth and population structure in the county's six planning divisions. This would also enable us to more clearly understand the effects of the plant in particular areas of the county, especially those areas to which construction workers and their dependents relocated and from which the nonbasic employment was drawn.

Arroyo Grande Division

The Arroyo Grande division is located in the southwestern part of the county, and its largest urban center is the community of Arroyo Grande. The division has also experienced rapid population growth. Between 1950 and 1960, the Arroyo Grande division increased in population from 9,670 to 17,734, (83 percent). Between 1960 and 1970, the growth rate declined, but overall growth increased by 34.2 percent during the decade—making it the second fastest growing division. The San Luis Obispo division was the fastest growing division, probably because of the expansion of the university. Of the total county population in 1970, 22.5 percent resided in the Arroyo Grande division. (City of Arroyo Grande, 1976; Lane and Moore, 1979; San Luis Obispo County, 1975.)

The Arroyo Grande division is characterized by an age structure that does not parallel the county as a whole. The number of families with children residing in this area has resulted in a large percentage of the population being under 20 years of age. In 1970, 40.7 percent of the division's population was under 20 years of age, compared to

33.2 percent of the county, and 36.8 percent of the state as a whole. The percentage of the population in the 20-44 year bracket was small (28.2 percent) compared to the overall county figure (33.6 percent) in that age bracket. For the percentage of population aged 64 years and older, there was no significant difference between the division and the county: more than 10 percent of the population was aged 64 and older.

San Luis Obispo Bay Division

It is within this division that the Diablo Canyon nuclear plant is located. In 1970, the population was 5,711, the smallest of all the divisions, with the population concentrated in two centers, Avila Beach and Pismo Beach. During the past fifteen years, the area has been losing population. The most distinguishing feature of the population is the large proportion of elderly: in 1970, 15.4 percent of this division's population was aged 64 and older compared to 12.3 percent in the county as a whole.

North Coast Division

This division is located north of the San Luis Obispo Bay division. Between 1950 and 1960, the area experienced the largest proportional increase in population relative to the other divisions; the 1970 population of 15,152 represented an increase of 41.2 percent over the 1960 population. With respect to the spatial distribution of population within the division, over 90 percent of the population resided in the four urban communities of Baywood Park, Los Oso, Cayucos, and Morro Bay. These communities, which are oriented toward the resort economic activities on the coast, have grown very rapidly since 1960. For example, Morro Bay's 1970 population of 7,109 represented a 92.5 percent increase over the 1960 population of 3,692 people.

The population of the North Coast division also consists of a very large proportion of elderly persons: in 1970, 21.9 percent of the division's population was aged 64 and older. When the age category is expanded to include those aged 45 and over, we find that nearly 50 percent of the area's population falls into that group; the county had 33 percent and the state only 30 percent in the 45 years and older bracket.

Atascadero Division

This area incorporates the central section of the Study Area and, in 1970, accounted for 13.4 percent of the county's total population. While the age and sex structure in this division was similar to that of the county, the most discernible feature was the concentration of the population (73 percent) in the community of Atascadero.

Paso Robles Division

This area dominates the northern section of the county and is characterized by an agricultural economic base. For its relatively large geographical area, it has a low population. Population growth in this division has generally been slow, due partially to its agricultural base as well as the out-migration of military personnel in the 1950s. During the 1960 to 1970 period, the population grew from 11,636 to 12,194, an increase of only 4.8 percent. This was the lowest growth rate experienced in the county.

San Luis Obispo Division

This division has consistently been the most populated area of the county and has been characterized by both rapid population growth rates and rural suburbanization. In 1960, the area's population was 24,713; in 1970, it reached 34,682, an increase of 40.3 percent (one of the highest growth rates in the county). The county seat, the City of San Luis Obispo, is the major population center for both the area and the county. It is the county's center for employment, commercial activity, and administration. In 1960, the city's population (20,437) accounted for about 83 percent of the division population and 25 percent of the county population. In 1970, the population of the City of San Luis Obispo was estimated to be about 27 percent of the county population. The student population of the city was a significant element in the population composition of the area: in 1970, the university accounted for 35.5 percent of the division's population. (City of San Luis Obispo, 1975; San Luis Obispo County, 1975.)

By the time construction began on the Diablo Canyon project in 1969, the population trend included the following features: net in-migration accounted for a high percentage of population growth, principally students and the elderly; the three divisions—Arroyo Grande, San Luis Obispo, and the North Coast—were receptor areas for most of the in-migration; the City of San Luis Obispo continued to expand as the major regional trade and residential center; and the Avila Beach area, where the plant is located, did not grow in any meaningful way.

5.3 Changes in the Population during the Study Period

Table 5-1 shows the population estimates for San Luis Obispo County and its constituent divisions for 1970, 1976, and 1979. The study period encompasses the 1970-1979 time frame and includes the period of initial construction activity as well as the period of retrofitting construction activity when operations workers were preparing for a

TABLE 5-1

POPULATION OF SAN LUIS OBISPO COUNTY AND ITS MAJOR SUB-UNITS
1960, 1970, 1979

	1960	1970	Percent Change 1960-1970	Special Census 1976	Estimate 1979	Percent Change 1970-1979
San Luis Obispo County	81,040	105,690	30.4	132,529	144,744	36.9
Arroyo Grande Division	17,734	23,793	34.2	30,833	34,450	44.8
Arroyo Grande City	3,291	7,454	126.5	9,550	10,343	38.7
Grover City	4,210	5,939	41.0	7,500	8,350	40.6
Nipomo	—	3,642	—	4,300	5,296	45.4
Oceano	1,317	2,564	94.7	3,434	3,967	54.7
Atascadero Division	11,581	14,158	22.3	18,586	21,732	53.5
Atascadero	5,983	10,290	72.0	12,244	14,681	42.7
North Coast Division	10,733	15,152	41.2	22,562	24,955	64.7
Baywood-Los Osos	—	3,487	—	8,075	9,593	175.0
Cambria	—	1,716	—	2,667	3,087	79.9
Cayucos	—	1,772	—	2,081	2,223	25.5
Morro Bay City	—	7,109	—	8,392	8,685	22.2
Paso Robles Division	11,636	12,194	4.8	13,052	15,320	25.6
El Paso de Robles City	6,677	7,168	7.4	7,932	8,838	23.3
San Luis Obispo Bay Division	4,647	5,711	22.9	6,941	7,206	26.2
Pismo Beach City	1,762	4,043	129.5	4,870	5,116	26.5
Avila Beach	—	400	—	343	386	-3.5
San Luis Obispo Division	24,713	34,682	40.3	40,555	41,081	18.5
San Luis Obispo City	20,437	28,036	37.2	34,300	34,445	22.9

Sources: U.S. Department of Commerce, Bureau of the Census, 1970; San Luis Obispo County Planning Department, July 1979.

possible start-up. The county population during this period increased from 105,690 to 144,744 (36.9 percent). This increase was more rapid than that of the 1960s, but not as rapid as the growth that had taken place in the 1950s. The annual average rate of growth during the 1970-1979 period was estimated at 3.6 percent. This compares with annual growth rates of 2.7 percent during the 1960s and 4.6 percent in the 1950s, respectively. In-migration to the county accounted for most of the growth; between 1960 and 1970, net migration accounted for 69.8 percent of the total population change, and during the period 1970-1975, net migration as a percent of total population change was estimated at 92.2 percent.

During the 1970-1979 period, there were slight shifts in the spatial distribution of the population. As shown in Table 5-2, during the study period, the population of all of the county's divisions (except San Luis Obispo) increased at a much faster rate than they did during the previous decade. During the 1960s, San Luis Obispo experienced a large average annual rate of growth (3.4 percent) but, during the study period, this rate declined to 1.9 percent, the lowest growth rate in the county. This was largely due to a "no-growth" policy in the City of San Luis Obispo, which will be discussed in Chapter 6.

Significant changes in growth rates during the study period were seen in two areas—Paso Robles and the North Coast. Paso Robles, the most northerly district, experienced very little growth during the 1960s—an average annual rate of 0.5 percent. But, during the study period, the growth rate increased significantly to 2.6 percent. The North Coast, which was experiencing the fastest growth during the 1960s, continued to expand in the 1970s at an even faster pace, 5.7 percent annually. Thus, in 1979, we find that Arroyo Grande, Atascadero, and the North Coast increased their proportional share of the total county population. The San Luis Obispo division, in contrast, experienced a decline in its proportional share of population.

5.4 Population Effects due to the Project

5.4.1 Introduction

Population effects directly attributable to the construction and operation of the Diablo Canyon project have been considered in two categories: population change due to in-migration and population change due to diminished out-migration. For both categories, employment due to the project was the force assumed to be driving the population change.

TABLE 5-2
POPULATION BY COUNTY DIVISION
SAN LUIS OBISPO COUNTY
1960-1979

Division	Percent of Total		Average Annual Rate of Change (Percent)	
	1970	1979	1960-1970	1970-1979
Arroyo Grande	22.5	23.8	3.0	4.2
Atascadero	13.4	15.0	2.0	4.9
North Coast	14.3	17.2	3.5	5.7
Paso Robles	11.5	10.6	0.5	2.6
San Luis Obispo Bay	5.4	5.0	2.1	2.6
San Luis Obispo	32.8	28.4	3.4	1.9

Source: San Luis Obispo Planning Department, Population of San Luis Obispo County, 1979.

In Chapter 4, the number of plant-related workers in the Study Area was determined for both basic and nonbasic employment. The number of workers who moved into the county and the number of workers who were already residents of the county were determined for this plant-related employment. The following sections present estimates of the two categories of population effects due to the construction of the Diablo Canyon plant.

5.4.2 Population Effects in 1975

The principal demographic effects attributable to the Diablo Canyon project are those resulting from the in-migration to the Study Area of project-related workers accompanied by families. In 1975, as shown in Chapter 4, the project created an estimated 3,153 jobs in the Study Area. Table 5-3 shows the distribution of these jobs in the Study Area among the three categories of workers--nonmovers, movers accompanied by families, and movers unaccompanied by families. It is estimated that 495 of the 1,799 basic jobs in the Study Area were held by nonmovers, 804 were held by movers accompanied by their families, and 500 were held by movers who were single or unaccompanied by their families. In 1975, the project is estimated to have introduced an additional 1,354 nonbasic jobs in the Study Area, 1,283 of which were estimated to have been held by nonmovers and 71 by movers.

TABLE 5-3

PROJECT-RELATED EMPLOYMENT BY WORKER CATEGORY
STUDY AREA
1975

Workers	Basic	Nonbasic ^a	TOTAL
Nonmovers	495	1,283	1,778
Movers Accompanied by Families	804	50	854
Movers Unaccompanied by Families	<u>500</u>	<u>21</u>	<u>521</u>
TOTAL	1,799	1,354	3,153

^aBased on 70 percent of movers accompanied by families (Verway, 1979).

Source: Mountain West Research, Inc., 1980.

The population change caused by in-migration to the Study Area was assumed to be due to the movers and their accompanying household members. The distribution of the basic and nonbasic jobs among the four categories of workers has been discussed in Chapter 4, where the number of movers unaccompanied by families and the number of movers accompanied by families were estimated. An average family size of 3.25 was used for accompanied basic workers, based on figures obtained by Malhotra for construction workers moving to work on large-scale construction projects. (Malhotra, 1979.) The average 1970 household size in California (3.48) was used to estimate the number of additional household members in-migrating to the Study Area with nonbasic workers (U.S. Department of Commerce, Bureau of the Census, 1970). The resulting estimate of the number of in-migrants to the Study Area in 1975 is shown in Table 5-4.

Population Change due to Diminished Out-Migration

Population increases due to the construction of the Diablo Canyon plant could also have resulted from diminished out-migration. Workers who would normally have left to obtain employment elsewhere may have stayed because they found work on project-related jobs, thus increasing the population over what it would have been without those jobs. The maximum population effect from reduced out-migration would have occurred if all locally-hired residents had been mobile, had perceived other job opportunities, and

would have out-migrated if not employed. The minimum population effect would have occurred if the best alternative for these locally-hired residents was to remain unemployed in the Study Area, in which case no population increase from diminished out-migration would have been caused by the project.

TABLE 5-4
POPULATION IN-MIGRATION DUE TO THE PROJECT
SAN LUIS OBISPO COUNTY
1975

In-Migrant Employment Category	Study Area		TOTAL
	Workers	Additional Household Members	
Basic Workers			
Movers Accompanied by Families ^a	804	1,809	2,613
Movers Unaccompanied by Families	500	0	500
Nonbasic Workers			
Movers Accompanied by Families ^b	50	124	174
Movers Unaccompanied by Families	<u>21</u>	<u>0</u>	<u>21</u>
TOTAL	1,375	1,933	3,308

^aBased on average family size of 3.25 (Malhotra).

^bBased on 1970 average household size in California of 3.48 (U.S. Department of Commerce, Bureau of the Census, 1970).

Source: Mountain West Research, Inc., 1980.

The appropriate position between these extremes was estimated by examining the out-migration trends and other employment opportunities in the Study Area over the study period. Between 1967 and 1978, the Study Area experienced steady growth in the size of the labor force and in the level of population. Moreover, the period was marked by rapid growth in employment opportunities in the trade, services, construction, and government sectors of the economy. The employment created by the project,

particularly that filled by local residents, was only a small fraction of the total employment opportunities in the county labor market. The fact that the unemployment rate was low (5.9 percent) when compared to the unemployment rate of the state (7.1 percent) reinforces the finding that the plant did not significantly diminish out-migration. Examination of the economic trends and opportunities for employment in the Study Area indicates that the percentage of nonmovers who obtained jobs at the project who would otherwise have out-migrated was probably small. Consequently, for the purpose of estimating total population effects, no diminished out-migration is attributed to the project.

Total Project Effects in 1975

The total population effect of the project in 1975 is the sum of the increase due to in-migration and the increase due to diminished out-migration. No diminished out-migration has been attributed to the project, so the total estimated population effects remain those shown in Table 5-4: an increase of 3,308 persons in the Study Area.

5.4.3 Population Effects in 1978

Population Change Due to In-Migration

In 1978, as in 1975, the project caused a population increase as a result of the employment of in-migrants in project-related jobs. In 1978, as shown in Table 5-5, 853 workers had moved into the Study Area for employment on project-related jobs.¹ An average household size of 3.48 was used for estimating the total population increase due to the project. As shown in Table 5-6, the total estimated population increase in the Study Area in 1978 due to project-related in-migration was 2,212 persons, 853 workers and 1,359 additional household members.

Population Change due to Diminished Out-Migration

As in 1975, consideration of the availability of alternative employment in the area resulted in the attribution of no significant population effects due to out-migration of the Study Area.

¹Even though many construction workers were at the site in 1978, the composition of the construction workers had changed since 1975; more positions (such as engineers and clerical workers) were held by people with characteristics similar to other state residents. Moreover, one-third of the project workers in the Study Area were operations workers.

TABLE 5-5
DIABLO CANYON NUCLEAR GENERATING PLANT
PROJECT-RELATED EMPLOYMENT BY WORKER CATEGORY
SAN LUIS OBISPO COUNTY
1978

Worker Category	Study Area		TOTAL
	Basic	Nonbasic	
Nonmovers	316	872	1,188
Movers Accompanied by Families	514	34	548
Movers Unaccompanied by Families	<u>291</u>	<u>14</u>	<u>305</u>
TOTAL	1,121	920	2,041

Source: Mountain West Research, Inc., 1980.

TABLE 5-6
DIABLO CANYON NUCLEAR GENERATING STATION
POPULATION IN-MIGRATION DUE TO THE PROJECT
1978

Employment Category	Study Area		TOTAL
	Workers	Additional Household Members	
Basic Workers			
Movers Accompanied by Families	514	1,275	1,789
Movers Unaccompanied by Families	291	0	291
Nonbasic Workers			
Movers Accompanied by Families	34	84	118
Movers Unaccompanied by Families	<u>14</u>	<u>0</u>	<u>14</u>
TOTAL	853	1,359	2,212

Source: Mountain West Research, Inc., 1980.

Total Population Effects in 1978

The total population effects of the project are, therefore, those resulting from immigration of workers and their accompanying families. In 1978, the Study Area population is estimated to have increased by 2,212 persons due to the project.

5.4.4 Summary

Based on the calculations for population increases in 1975 and 1978, the annual population effects of the project shown in Table 5-7 were estimated, assuming a constant relationship between population size and total work force. As seen in this table, the population due to the project reached its highest level in 1975 when it accounted for about 2.6 percent of the Study Area population.

Based on this analysis, it appears that the population effects of the project on the Study Area were relatively small, considering the magnitude of the project and the size of the construction work force. The population change due to the project does not appear to have been a dominant element of the overall population changes in the Study Area. The population effects of the project were moderated by the availability of labor within commuting distance and the transient character of the Pismo Beach area where the construction workers largely relocated.

TABLE 5-7

DIABLO CANYON NUCLEAR GENERATING STATION
POPULATION INCREASE DUE TO IN-MIGRATION
OF PROJECT-RELATED WORKERS AND HOUSEHOLD MEMBERS
SAN LUIS OBISPO COUNTY
1967-1978

Year	Direct Basic	Project-Related Population Increase	Study Area Population	Percent of Study Area Population
1967	0	0	NA	NA
1968	158	247	NA	NA
1969	295	461	NA	NA
1970	705	1,102	105,690	1.0
1971	921	1,440	110,100	1.3
1972	1,441	2,252	112,800	2.0
1973	1,866	2,917	118,000	2.5
1974	1,510	2,360	124,000	1.9
1975	2,116	3,308	126,500	2.6
1976	1,518	2,430	131,600 ^a	1.8
1977	893	1,465	NA	NA
1978	1,317	2,212	140,000	1.6

^aDiffers by 929 fewer persons from the figure obtained in the 1976 Special Census by the San Luis Obispo County Planning Department.

NA: Not available.

Sources: Mountain West Research, Inc., 1980; California Statistical Abstract, 1977.

CHAPTER 6: SETTLEMENT PATTERNS AND HOUSING

6.1 Introduction

The purpose of Chapter 6 is to identify the effects of the Diablo Canyon project on settlement patterns and housing in the Study Area. In this chapter, the historical trends are examined, with particular attention paid to the changes that took place during the study period (1967-1979). Based on the analysis of the preceding chapters, estimates are made of the effects of the project on new housing construction, upgrading of existing houses, and conversions of seasonal housing. The effects on cost and availability of housing units, based on key informant interviews and information describing the numbers and specific locations of project-related people, are then discussed. The chapter concludes with a summary of the effects of the Diablo Canyon project on settlement patterns and housing in the Study Area.

6.2 Settlement Patterns

The settlement pattern can first be described by the prevailing land use pattern in the county. About 2 percent of the total county land is in urban development, approximately 60 percent of the land is devoted to agriculture (largely grazing), and another 36 percent is open space, of which more than half is unused. Approximately 85 percent of the population is urban, residing in sixteen urban settlements primarily located in the western part of the county near the coast. In fact, the coastal communities comprise about 80 percent of the total urban area of the county. The urban communities contain four well-defined urban areas: the regional capital City of San Luis Obispo, the most populated; the incorporated cities of Pismo Beach, Arroyo Grande, and Grover City, which, combined with the unincorporated communities of Shell Beach and Oceano, form the Five Cities Area; the urban area adjacent to the coast consisting of three centers, Morro Bay, Baywood Park, and Los Osos; and the two north central communities of Paso Robles and Atascadero, which serve the northern agricultural hinterland.

Approximately 85 percent of the population resides in the county's urban centers. The rural non-farm population is scattered throughout the western and northern parts of the county as well, but with concentrations near State Highway 101 and along the edge of the Salinas River flood plain in the northeast. Excepting the population concentrations near the ocean and in the western section, the county is sparsely settled: in 1975, the population density was estimated at 41 persons per square mile.

The settlement patterns in San Luis Obispo County were strongly influenced by a number of factors: the topography of the county, the land resource potential, and the historical economic and demographic trends. The physical geography of the county was largely responsible for much of the settlement configuration. The county occupies a central position in the south coast mountain range complex and, consequently, parts of five mountain ranges are within its boundaries, oriented along a northwest-southeast geographic axis. Of particular importance as a barrier to the development of transportation routes and development of the area is the Santa Lucia Range, which meanders from the northern and to the southern end of the county. In the north, this range prevents accessibility between the coast and the interior, and in the south it merges with other ranges to form a large regional complex of rugged terrain toward the interior. The prevalence of such terrain has resulted in a landscape of very steep slopes that has prevented both development and intensive agricultural activity. Over 60 percent of the county land has slopes of 30 percent or more; only 17 percent of the area has land suitable for development of intensive cultivation. This has resulted in a sharp competition between agriculture and urban expansion, with agriculture rapidly declining in importance. (San Luis Obispo County, 1975.)

Approximately 5 percent of the county's population is devoted to farming, and the farms are scattered in the less rugged parts of the county. The farm community has a widely diffused settlement pattern. However, a more cohesive and less diffused pattern of farm location and activity is found in the southwestern sector of the county, in the vicinity of Arroyo Grande. There, the Arroyo Grande Valley and Santa Maria River Valley provide a small but fertile area for intensive land cultivation. Thus, the topography has greatly influenced the settlement pattern: large scale agriculture and open space dominate the landscape, while urbanization has developed in the coastal plain. The location of urban growth has also been reinforced by the major north-south transportation routes that were established early in the history of central California.

The settlement pattern can also be understood by examining the historic economic and demographic trends operating in the area. The first stage of the history of San Luis Obispo was defined by the influence of Spanish settlement. Between 1770 and 1850, the infrastructure for agricultural growth and for movement of goods between Los Angeles and San Francisco was established. The missions, one of which was located on the present site of the City of San Luis Obispo, had organized a viable ranching industry which, through land grants, has persisted to the present. (San Luis Obispo County, 1975.)

In the second stage of the area's history, 1850 to 1900, the economic base of the area diversified and an urban regional system evolved. A number of major developments during this period collectively resulted in today's settlement pattern. It was not until the latter half of the 19th century that any appreciable growth in population or in agriculture developed. In the 1860s, agriculture diversified and expanded; in response to this growth, small agricultural services centers were founded. In addition, agriculture-related industries were established in such places as Arroyo Grande, which served the agricultural hinterlands. The growth along the coastal plain was reinforced by transportation development. In the late 1800s, Morro Bay was an established fishing/commercial port, and the railroad ran along the Pacific coast, linking San Francisco and Los Angeles. The port at San Luis Bay was also established during this period.

Between 1920 and 1935, widespread county land speculation resulted in the expansion of such places as Atascadero and Morro Bay and in the establishment of residential-resort areas such as Oceano, Shell Beach, Pismo Beach, and Cambria. The growth increased sharply by the establishment of military bases in the county during the 1940s and 1950s and by the growth of the coastal area as a tourist and retirement center. The expansion of residential developments was determined by their access to water and recreational amenities, and such places (for example, Baywood Park-Los Osos, south of Morro Bay) have grown rapidly as residential centers in the past few years. (Cummings, personal communication, 1980; Dowdy, personal communication, 1980; MacDonald, personal communication, 1980; Mankius, personal communication, 1980; Rogoway, personal communication, 1980.)

6.3 Housing

Since 1960, the housing pattern and conditions in the Study Area have been influenced by a number of factors. The expansion of educational facilities and the growth of employment opportunities in the City of San Luis Obispo, especially professional and government employment, have resulted in an unprecedented growth of the city's residential sector and a trend toward multi-family housing structures. The expansion of employment opportunities in the city has also resulted in the creation of new residential areas in the county and substantial commutation to the city. For example, 20 percent of the heads of household in Arroyo Grande work in the City of San Luis Obispo, 24 percent in Atascadero, and 52 percent in Baywood-Los Osos (an area that has only developed during the past decade). The growth of the student population in the

city during the past fifteen years has added to the housing pressures, and the vacancy rate has consistently been very low (about 2 percent). Moreover, in the City of San Luis Obispo, approximately 50 percent of the housing stock consists of rental units, a reflection of the needs of the student population. By 1974, the in-migration of both students and public sector workers into the city resulted in housing shortages that have persisted. The city housing shortage was further aggravated by the decision made by the city in 1976 to restrict the building of mobile home parks within the city limits. (San Luis Obispo County, 1975 and 1979.)

The county has grown rapidly as a tourist and retirement area, and the housing market has responded to the demands of these forces. This response has three dimensions. First, during the last fifteen years, there has been a shift toward multiple-family units. In 1970, for example, 75 percent of all housing units in the county were single-family units while multi-family structures represented only 15 percent of the housing stock. In 1978, single-family units had declined to 68 percent of the county's total housing stock while the percent of multi-family units had increased to 20 percent. Although there has been a shift toward multiple-family units during the study period, single-family units remain the dominant housing type. (San Luis Obispo County, 1975 and 1979.)

The second dimension of the housing market response to population growth is the increase in the number of apartments and small houses (both seasonal and year-round structures) to meet the demands of tourists and elderly in-migrants. The area has grown rapidly as a tourist area: communities such as Cambria and Cayocos, which cater to the tourist market, have a large number of vacation or seasonal homes. These communities have consistently experienced large vacancy rates. The Five Cities Area, a growing tourist zone since 1965, has also experienced a substantial increase in apartments constructed in response to the tourist market. The dominant type of housing unit to meet the needs of the elderly and the seasonal in-migrant varies considerably among communities. For example, while the Five Cities Area contains small houses and apartment buildings, the Nipomo area and the rural areas in the Paso Robles division have, since 1970, experienced a sharp upswing in the number of mobile homes. In fact, the percentage of mobile homes compared to the total housing stock in the county increased from about 6 percent in 1970 to 18 percent in 1978. This was largely a reflection of the high proportion of older and retired residents in the county. (San Luis Obispo County, 1975 and 1979.)

Although the housing stock expanded during the 1960s and 1970s, the data show that the housing stock did not keep up with population growth. The third dimension of the housing sector between 1960 and 1975 has been the increase in unit density and the noticeable decline in the percentage of vacancies. Between 1960 and 1970, the number of housing units increased rapidly, from 29,399 to 37,546 units, an increase of about 28 percent, or an average annual increase of 2.5 percent. Between 1970 and 1978, the number of housing units had increased by an additional 20,364 units, representing an increase of about 54 percent, or an average annual increase of 5.6 percent. The data suggest rapid changes in the housing stock during the 1960s and an accelerated rate of change in the 1970s. (San Luis Obispo County Planning Department, n.d.)

Table 6-1 shows the number of new residential units constructed between 1967 and 1976. The growth rate of new residential units in the county increased sharply between 1967 and 1970, with an increase of 76.4 percent in new residential units in 1970 over the previous year. Between 1970 and 1974, the annual growth rate in new residential units declined. In 1973, the rate of increase in the number of units declined 27 percent from the 1972 rate. This occurred as the number of workers at the plant site increased. There was also a decline of 24.4 percent in the growth rate of new residential units in 1974 over the number in 1973. The most significant increase took place in 1976, with 5,610 new residential units, representing an increased growth rate of 171.5 percent over 1975. A large proportion of these housing units were multi-family housing units and mobile homes. The 1960s trend toward multi-family structures and mobile homes continued into the 1970s at an even faster rate of growth.

Growth in the county housing stock during the 1970-1978 period is shown, by area, in Table 6-2. The areas with the largest increase during this time were in the North Coast division; the communities of Baywood/Los Osos experienced the largest rate of growth—167.6 percent. Arroyo Grande and Nipomo experienced high growth rates—64.8 percent and 74.4 percent, respectively. Of import is the growth of housing in the rural areas of the Arroyo Grande division. Between 1970 and 1978, the housing stock in these areas expanded from 1,304 to 2,167 units, representing an increase of 66.2 percent. This trend reflects the increase in mobile homes in the Arroyo Grande division.

Although the housing stock in the San Luis Obispo division experienced a much smaller percentage increase during the 1970-1976 period than did the three county divisions, the absolute increase in the number of housing units (4,183) was as large as the increase in the three rapidly growing areas. The housing sector data shown in Table 6-3

TABLE 6-1

NEW RESIDENTIAL UNITS
SAN LUIS OBISPO COUNTY
1967-1976

Year	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
Units	547	566	708	1,249	1,961	2,675	1,947	1,472	2,066	5,610
Percent of Increase	—	3.5	25.0	76.4	57.0	36.4	-27.2	-24.4	40.4	171.5

Source: San Luis Obispo County Planning Department, n.d.

TABLE 6-2

GROWTH IN HOUSING UNITS
BY MAJOR AREAS
SAN LUIS OBISPO COUNTY
1970-1978

Major Areas	1970	1978	Change 1970- 1978	Percent of Increase
San Luis Obispo County	37,612	57,976	20,364	54.1
North Coast Division	7,644	13,045	5,401	70.7
Morro Bay	3,451	5,046	1,595	46.2
Baywood/Los Osos	1,517	4,060	2,543	167.6
Atascadero Division	4,619	7,657	3,038	65.8
Arroyo Grande Division	7,953	12,883	4,930	70.0
Arroyo Grande	2,450	4,037	1,587	64.8
Grover City	2,269	3,319	1,050	46.3
Nipomo	974	1,699	725	74.4
Paso Robles Division	4,475	6,348	1,873	41.9
San Luis Bay Division	2,599	3,538	939	36.1
Pismo Beach	2,008	2,666	658	32.8
San Luis Obispo Division	10,322	14,505	4,183	40.5

Source: San Luis Obispo County Planning Department, n.d.

TABLE 6-3

CONSTRUCTION ACTIVITY OF NEW HOUSING IN THE HOUSING SECTOR
CITY OF SAN LUIS OBISPO
1964-1978

Housing Type	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Single-Family	91	57	43	76	69	50	51	181	66	62	119	99	167	149	72
Multiple-Family	265	376	38	42	83	246	419	461	484	284	222	228	171	123	223
Mobile Homes (additions)	NA	NA	NA	NA	NA	NA	411	9	302	236	3	79	1	0	0
TOTAL	356	433	81	118	152	296	881	651	852	582	344	406	339	272	295

Source: City of San Luis Obispo, General Plan Housing Element, 1979.

for the City of San Luis Obispo from 1964 to 1977 shows that construction activity in the residential sector of the economy increased sharply between 1970 and 1973. Between 1970 and 1973, significant increases were evident in the number of multiple units and mobile homes. The importance of these two housing components as a share of total housing stock is seen in the 1979 housing statistics, where single-family units accounted for 51.2 percent of the housing stock, multiple family units for 38.7 percent, and mobile homes for 10.3 percent. (City of San Luis Obispo, 1979.)

The Arroyo Grande division, consisting of the Five Cities Area and the rural hinterland, grew rapidly in population during the study period. Between 1970 and 1975, for example, the Five Cities Area accounted for 25 percent of all the county's growth. Comparing the percentage of population growth to the percentage of growth in housing, we find that the housing stock did not keep up with the population growth. This is evidenced by the decline in the number of housing vacancies in the division, from 4.4 percent in 1970 to 3.2 percent in 1974, as shown in Table 6-4.

TABLE 6-4
HOUSING SECTOR CHANGE, FIVE CITIES AREA
SAN LUIS OBISPO COUNTY
1960-1974

Housing	1960	1970	1974
Dwelling Units	6,475	8,655	10,661
Population	17,502	23,672	29,076
Average Number of Persons per Dwelling Unit	2.70	2.74	2.73
Vacant Units	406	377	341
Vacancy Rate	6.2	4.4	3.2

Source: San Luis Obispo County, Planning Department, personal communication, 1980.

6.4 Effects of the Diablo Canyon Station on Housing in the Study Area

6.4.1 Introduction

The effects of the Diablo Canyon nuclear facility on housing have been divided into three categories: (1) effects on the size of the housing stock through project-related

demand; (2) effects on the characteristics of the housing stock; and (3) effects on the housing market in terms of cost and availability of housing units.

6.4.2 Effects on the Size of the Housing Stock due to Project-Related Demand

Based on the characteristics of the workers and the numbers of accompanying household members described in Chapters 4 and 5, the project-related demand for housing is estimated as shown in Table 6-5. These estimates assume that each married worker required a housing unit and that the number of "doubled-up" movers and two-worker households resulted in a housing demand of 0.85 per unaccompanied worker during the peak construction period (Mountain West Research, Inc., unpublished data, 1980). The estimated project-related housing demand in the Study Area peaked at 1,297 units in 1975 but declined to 807 units in 1978. Figure 6-1 shows both the project-related demand for housing and the size of the housing sector in the county.

TABLE 6-5
HOUSING DEMANDS OF PROJECT INDUCED POPULATION
SAN LUIS OBISPO COUNTY
1967-1978

Year	Movers ^a Accompanied by Families	Housing Demand	Movers ^a Unaccompanied by Families	Housing ^b Demand	Total Housing Demand
1967	0	0	0	0	0
1968	64	64	39	33	97
1969	119	119	73	62	181
1970	285	285	174	148	433
1971	372	372	227	193	565
1972	581	581	355	302	883
1973	753	753	459	390	1,143
1974	609	609	372	316	925
1975	854	854	521	443	1,297
1976	619	619	366	311	930
1977	368	368	211	179	547
1978	548	548	305	259	807

^aAnnual series derived by assuming a constant ratio of total population increase to movers accompanied by families and to movers unaccompanied by families between 1968-1975 and a constant rate of change between 1976-1978.

^bBased on a housing demand of 0.85 per mover unaccompanied by family.

Source: Mountain West Research, Inc., 1980.

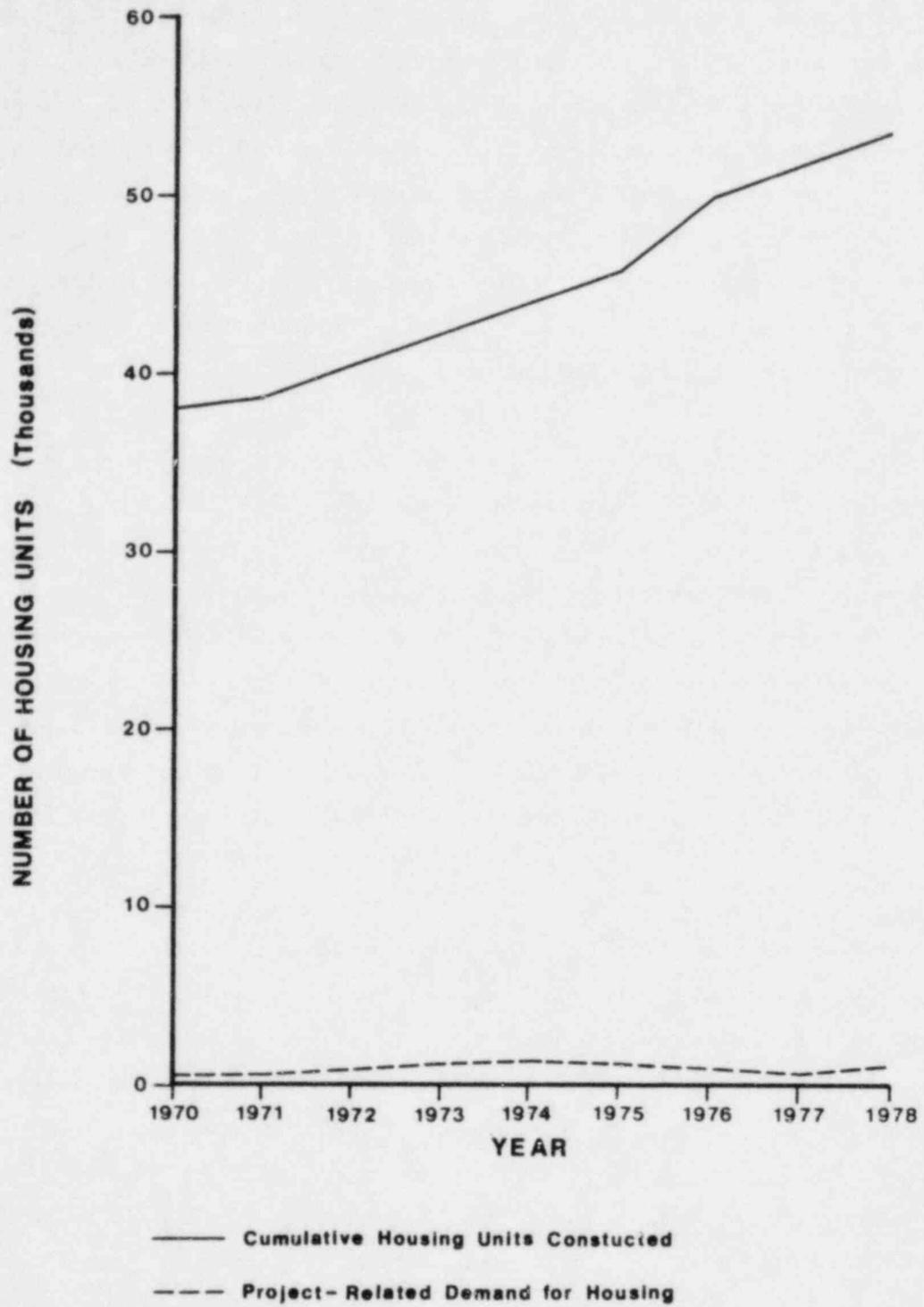


FIGURE 6-1. Project-Related Demand for Housing and Cumulative Housing Units in Study Area, 1970-1978.

As indicated in Chapter 3, a small proportion of the movers in-migrated to the City of San Luis Obispo, which was experiencing an extraordinarily tight housing market during the 1970s. The allocation of residences of the movers was strongly skewed toward the Five Cities Area. Thus, a separate analysis was undertaken for this section of the county. Figure 6-2 shows the change in housing stock for the five communities during the 1970-1978 period, and the demand placed on the housing market by workers at the Diablo Canyon project. Worker-related demands on the housing sector is overestimated in this case as many workers rented units on a long-term basis in tourist apartments and hotels which were not part of the housing sector.

In 1974, the peak construction year, the housing demands made by construction workers in the Five Cities Area amounted to about one-third of the growth in the total housing stock in the five communities. Housing studies at that time showed that population pressures were being exerted in the housing market, that the vacancy to housing stock ratio was declining, and that occupancy density was increasing. However, the pressure on the housing market in the Five Cities Area was not attributed to the in-migration of construction workers but to the general in-migration to the area, especially the influx of elderly. By 1978, the demands for housing by project-related in-migration had declined concomitant with an increased rate of expansion of the housing sector since 1974.

The growing number of multiple units and mobile homes in the Five Cities Area during the 1960s and 1970s, coupled with the large segment of the housing market devoted to seasonal habitation, diffused the pressures on housing demands exerted by the movers. The movers and their families were part of a rapidly growing area and were not considered to be a conspicuous element in the housing market.

6.4.3 Effects on the Housing Stock through Project-Related Upgrading or Conversion

The Study Area had a sizeable stock of seasonal "tourist" housing before construction began at Diablo Canyon, which also served to accommodate the movers. Since high vacancy rates characterized these areas, no conversions or upgrading resulted. There is also no evidence that the quality of housing increased due to effects of project income on home improvements.

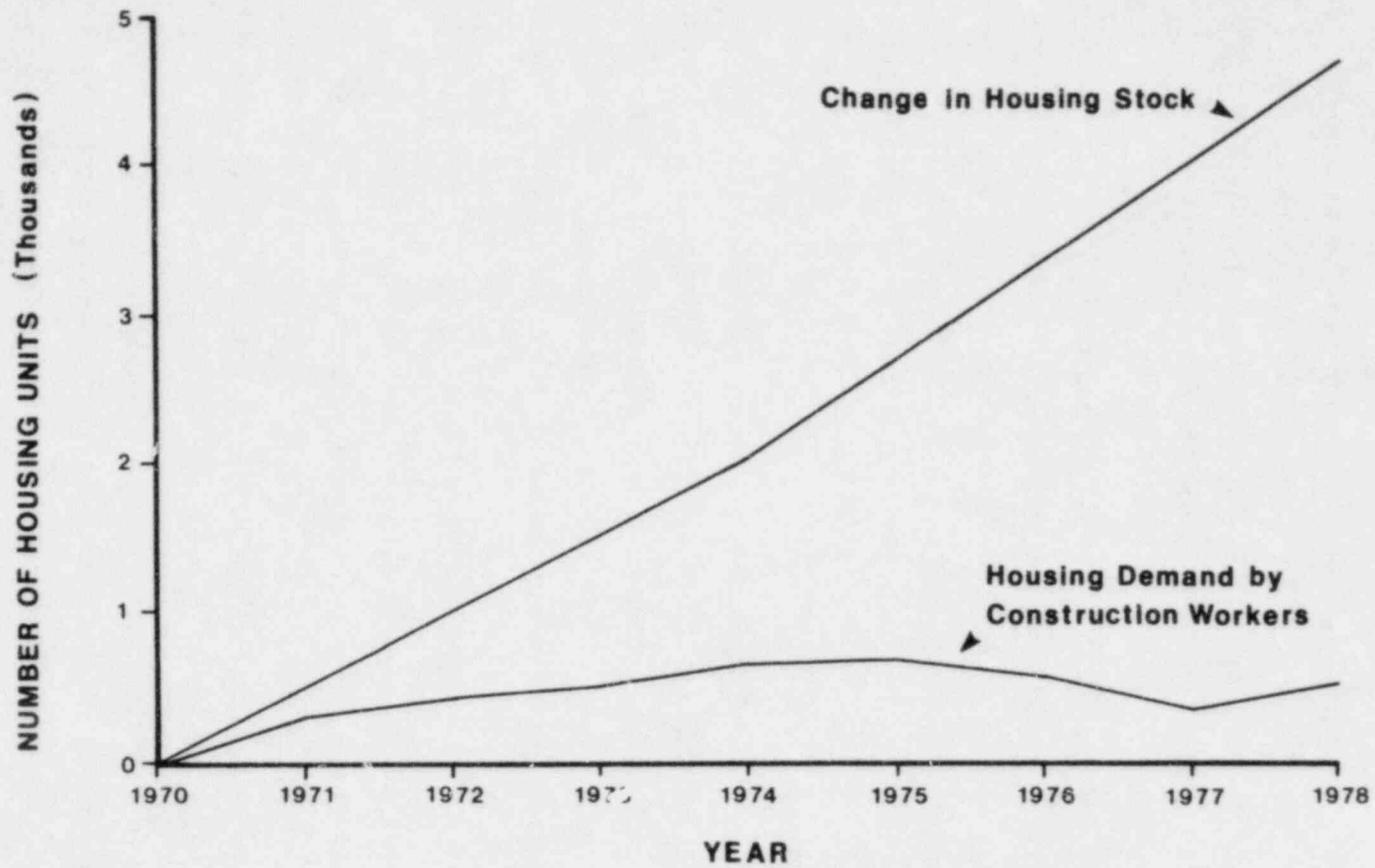


FIGURE 6-2. Project-Related Demand for Housing and Change in Housing Stock in the "Five Cities", 1970 - 1978.

CHAPTER 7: LOCAL GOVERNMENT AND PUBLIC SERVICES

7.1 Introduction

The purpose of Chapter 7 is to describe the basic structural components of the local government in the Study Area, indicate the level of services, and detail specific areas of services during the study period. The objective is to focus on changes in public services that resulted from the construction of the Diablo Canyon plant. These discussions highlight changes associated with significant social or political consequences rather than provide a detailed fiscal analysis of the Study Area government.

Once the background description of the local government is outlined, a summary of the budgets for the study period will be presented. An analysis of revenues and expenditures concentrates on the local area's response to the increased revenues resulting from plant construction. These analyses include consideration of the effects on the assessed tax base of the county, reduced tax rates, increased expenditures, and other results.

The discussion of public services focuses on employment and service trends in four areas: education, transportation, and public safety. These services have been chosen because: (1) they are thought to be responsive to socioeconomic change in the county; (2) they are often cited as impacted services in the literature; and, (3) they would be indicative of other public services' effects experienced in the Study Area.

7.2 Government Structure

The Study Area includes six incorporated communities¹ including the City of San Luis Obispo (the county seat) and eleven unincorporated communities. The governments of the incorporated municipalities were mostly of the city council/administrative officer type. Each incorporated town had the decision-making authority to provide public services such as water, waste disposal, and transportation, and to assess city taxes to provide revenues for these services. The towns of Pismo Beach, San Luis Obispo, and Morro Bay employed a city administrator. The city councils largely consisted of members of the business community. However, during the study period, a number of

¹The incorporated cities include Morro Bay, Arroyo Grande, Grover City, Pismo Beach, Paso Robles, and San Luis Obispo.

council people were not leaders in the business community, and their election to office reflected the growth of the environmental public-interest constituency in the county. Nevertheless, political power, as measured by the occupational status of locally-elected officials, was generally controlled by business interests.

While the incorporated cities of the Study Area are responsible for the administration and planning within their boundaries, the unincorporated and rural areas are under the jurisdiction of the county. The county is governed by a five-member Board of Supervisors elected to serve four-year terms and to represent the five districts of the county. The Board of Supervisors has the mandate to establish programs, levy taxes, adopt land use ordinances, and establish and appoint planning commissions. The district boundaries were last changed in 1972, and this marked the beginning of a major and persistent split within the Board between those favoring growth and development in the county and those opposing strong growth and development who had strong feelings concerning environmental preservation. The three-to-two split favored those holding pro-growth attitudes. The study period was characterized by political conflict, not only over the nuclear plant, per se, but also over allocation of the increased revenues from the plant. In addition, emphasis was placed on minimizing the property tax rate and expanding the tax base of the Study Area by supporting plans for economic growth.

During the study period, as population grew rapidly and the level of public services expanded, county planning evolved as a critical governmental function. The County Planning Commission during the 1970s was very active, and the County Planning Department, which was expanded, investigated many of the population, land use, and economic problem areas of the county. In 1975, a number of detailed planning studies were undertaken, followed soon after by a comprehensive land use plan. The Study Area was divided into six planning units based on the 1970 census divisions (Chapter 5). Each of these units were further divided into public service districts. Thus, in the San Luis Bay Planning Area, which includes the cities of Pismo Beach, Grover City, and Arroyo Grande, there are 12 special districts that provide services (sanitation, water) to both the incorporated cities and the unincorporated areas.

7.3 The County Budget during the Study Period, 1967-1978

7.3.1 The County Budget

Available county budget data for 1967 to 1978 are discussed by major function in Section 7.3.3. The budgets for four incorporated cities within the Study Area (San Luis

Obispo, Arroyo Grande, Grover City, and Pismo Beach) have also been selected for discussion. A budget analysis for these cities will reveal much about the resource base and governmental priorities, in addition to the costs of plant-related public services demands. Revenues to the general fund for each jurisdiction are analyzed to identify major shifts in resource availability—either in magnitude or in source—with special attention paid to the implication of the presence of the Diablo Canyon nuclear plant. Expenditures are then examined for the three municipal jurisdictions to identify major shifts in expenditures for public services.

7.3.2 Revenues

The major revenue effects of the Diablo Canyon plant resulted from property taxes levied on the project and were most evident in the budgets of San Luis Obispo County and the San Luis Coastal Unified School District. These revenue effects were also translated into tax savings to the property taxpayers in San Luis Obispo County. Although municipalities within the Study Area collected various tax revenues from the Diablo Canyon project workers, these revenues were not significant when compared to the total revenues of these jurisdictions.

During the study period, the major source of revenue for San Luis Obispo County was the property tax. As shown in Table 7-1, the property tax accounted for between 34.6 percent and 40.4 percent of total county general revenues during the 1968-1978 study period. During the study period, county basic property tax levies increased at an average annual rate of 10.2 percent.

One reason for the rapid increase in property tax levies during the period was the large increases to the assessed valuation base made by the Diablo Canyon project. As shown in Table 7-2, the net assessed tax valuation of the Diablo Canyon facility increased by a factor of over 200 during the study period. In FY 1967-68, the Diablo Canyon plant accounted for only about 0.3 percent of total county assessed valuation. In FY 1977-78, the facility accounted for almost 22 percent of total net assessed valuation in the county.

A similar situation existed for the San Luis Coastal Unified School District where the Diablo Canyon station was sited. Table 7-3 shows the school district's local property tax income as a percentage of total income. Between 1969 and 1977, the San Luis Coastal Unified School District received in excess of 75 percent of its total income

TABLE 7-1

COUNTY BASIC TAX RATES, PROPERTY TAX LEVIES,
AND TOTAL COUNTY REVENUES
SAN LUIS OBISPO COUNTY
1968-1978

Fiscal Year	County Basic Tax Rate ^a	Estimated County Basic Property Tax Levy ^{b,c}	Total County General Revenues ^c	Percent Property Tax Levy of Total
1967-68	\$2.69	\$6,721.9	\$18,190.9	37.0
1968-69	2.72	6,996.5	19,252.3	36.3
1969-70	2.96	7,683.7	22,066.1	34.8
1970-71	3.33	9,609.9	24,612.7	39.0
1971-72	3.33	10,511.7	26,010.8	40.4
1972-73	3.17	10,953.2	31,078.0	35.2
1973-74	3.16	11,408.7	30,168.5	37.8
1974-75	2.86	11,886.8	31,079.7	38.2
1975-76	2.86	14,218.7	35,968.5	39.5
1976-77	2.81	15,473.5	40,632.5	38.1
1977-78	2.55	17,697.7	51,152.1	34.6

^aRate per \$100 net assessed valuation from State Board of Equalization, personal communication.

^bLevy estimated by multiplying tax rate by net assessed valuation of county from State Board of Equalization, personal communication.

^cThousands of dollars.

Source: Financial Transactions of California Municipalities. n.d.

TABLE 7-2

DIABLO CANYON ASSESSED VALUATION
AND TOTAL COUNTY ASSESSED VALUATION
1967-1978

Fiscal Year	Net Assessed Value Diablo Canyon ^a	Net Assessed Value of PG&E Property ^a	Total County Net Assessed Value	Percent Diablo Canyon Total County
1967-68	\$669.3	\$42,397.4	\$249,885.0	0.3
1968-69	1,616.1	41,350.3	257,233.0	0.6
1969-70	2,327.7	39,150.8	259,584.0	0.9
1970-71	10,471.4	44,651.8	288,586.0	3.6
1971-72	23,362.3	55,326.7	315,668.0	7.4
1972-73	36,171.8	71,251.9	345,528.0	10.5
1973-74	56,918.4	90,759.4	361,035.0	15.8
1974-75	74,345.5	102,574.7	415,621.0	17.9
1975-76	88,999.7	122,531.6	497,156.0	17.9
1976-77	111,471.5	150,128.4	550,658.0	20.2
1977-78	151,966.2	194,523.0	694,026.0	21.9

^aThousands of dollars.

Sources: State Board of Equalization, personal communication, 1980; PC&E, personal communication, 1980.

from local property taxes. In FY 1977-78, the proportion was 82.1 percent. In terms of district assessed valuation, it was estimated that the Diablo Canyon plant accounted for over 35 percent of the total assessed valuation of the San Luis Coastal Unified School District in FY 1977-78.

TABLE 7-3
SAN LUIS COASTAL UNIFIED SCHOOL DISTRICT
TAX RATE, TAX INCOME
1969-1978

Fiscal Year	Tax Rate	Local Property Tax Income ^a	Total School District Income ^a	Percent Property Tax Income Total
1969-70	4.47	\$5,409.9	\$7,124.1	75.9
1970-71	4.58	5,792.7	7,798.1	74.3
1971-72	4.75	6,496.2	8,425.9	77.1
1972-73	4.68	7,500.3	9,560.8	78.4
1973-74	4.37	7,935.8	10,520.2	75.4
1974-75	0.00	8,055.9	10,725.4	75.1
1975-76	4.03	10,655.3	13,583.0	78.4
1976-77	4.04	12,432.6	15,895.0	78.2
1977-78	3.95	15,456.7	18,836.5	82.1

^aThousands of dollars.

^bSources: Financial Transactions of California Schools. n.d.; California Department of Education, California Public Schools, Selected Statistics.

Because the Diablo Canyon facility constituted such a large proportion of the tax base of the county and San Luis Coastal Unified School District, and subsequently paid a similarly large proportion of the total taxes of these districts, other taxpayers in these districts paid fewer taxes. The amount of tax savings can be estimated by calculating what the tax rate would have been without the facility to raise the required amount of revenue.

As mentioned in Chapter 3, PG&E paid \$12.4 million in property taxes to all jurisdictions in FY 1977-78. Of this total, the county received 34.7 percent and the San Luis Unified School District received 47.3 percent. The county basic tax rate in

1977-1978 was \$2.55 per \$100 of net assessed value, while the total district tax rate of San Luis Coastal Unified School District was \$4.00¹. Without the Diablo Canyon plant, the county basic tax rate would have had to be increased to \$3.26 (an additional \$0.71) in order to meet the FY 1977-78 monetary requirements for county operations. For a homeowner with a home valued at \$50,000 (\$12,500 assessed value due to 25 percent assessment ratio), the additional taxes would have been \$89 for FY 1977-78.

Similarly, for the San Luis Coastal Unified School District to raise equivalent revenues without the Diablo Canyon plant, the school district tax rate would have had to increase to \$6.15 (up \$2.15). On a \$50,000 house, the additional school district taxes would have been \$269. Since the homeowner residing within the San Luis Coastal Unified School District also paid taxes to the county, the combined additional county and school taxes on the \$50,000 house would have amounted to \$358 annually.

7.3.3 Expenditures

Table 7-4 shows county expenditures by major function for selected years during the study period. Table 7-5 shows similar information for the same years for municipalities. The data displayed in Tables 7-4 and 7-5 include expenditures for operations and capital outlay.

Total county expenditures increased (in current dollars) from about \$17.1 million in FY 1967-68 to \$47.3 million in FY 1977-78; an average annual rate of increase of 10.7 percent (see Table 7-4). After adjusting for inflation, the overall annual rate of increase was 4.8 percent. During the study period, the major areas of county expenditure were public assistance, public protection, and general government. In FY 1977-78, these three areas of county government accounted for 38.7 percent, 23.1 percent, and 18.5 percent of the county budget, respectively. A major portion of county expenditures for public assistance was for the operation of aid programs such as contributions to the Medi-Cal program. Funding of CETA programs also represented a significant proportion of public assistance expenditures. A sizeable share of expenditures for public protection went to the sheriff's office, with smaller shares allocated to the district attorney's office and the probation department. Within the general government category, the county

¹Maximum tax rate according to San Luis Obispo County, San Luis Obispo County 1979-1980 Tax Rates.

assessor's office and property management divisions received the largest shares. During the study period, the areas of county expenditure experiencing the greatest growth were public ways and facilities (40.7 percent average annual rate of increase), public protection (16.7 percent), general government (15.2 percent), health and sanitation (15.1 percent), and education (14.0 percent).

TABLE 7-4

EXPENDITURES BY MAJOR FUNCTION FOR
SAN LUIS OBISPO COUNTY
Selected Fiscal Years
(Thousands of dollars)

Function	1967-68	1969-70	1972-73	1974-75	1977-78
General Govern- ment	\$2,130.4	\$2,755.8	\$5,060.3	\$5,815.6	\$8,766.0
Public Pro- tection	2,325.7	2,998.3	4,436.7	7,169.1	10,936.0
Public Ways and Facilities	1,392.7	2,195.7	2,253.3	4,497.7	4,261.5
Health and Sanitation	622.5	754.3	915.7	1,433.7	2,544.6
Public Assis- tance	9,639.8	11,612.6	11,874.0	10,415.9	18,319.0
Education	320.6	367.9	536.0	804.0	1,187.9
Recreation and Cultural Ser- vices	549.6	737.7	917.0	1,055.4	1,264.8
Other/Miscellan- eous	<u>145.7</u>	<u>223.2</u>	<u>143.3</u>	<u>—</u>	<u>—</u>
TOTAL	\$17,127.0	\$21,645.5	\$26,136.3	\$31,191.4	\$47,279.8
TOTAL IN CONSTANT 1972 DOLLARS	\$21,066.4	\$24,458.2	\$26,136.3	\$26,682.1	\$33,603.3

Source: Financial Transactions of California Counties. n.d.

TABLE 7-5
EXPENDITURES BY MAJOR FUNCTIONS FOR MAJOR MUNICIPALITIES IN STUDY AREA
 (Thousands of Dollars)

Function	Arroyo Grande					Grover City				
	1967-68	1969-70	1972-73	1974-75	1977-78	1967-68	1969-70	1972-73	1974-75	1977-78
General Government-Departmental	\$72.6	\$80.5	\$124.1	\$153.8	\$289.6	\$35.2	\$30.1	\$54.8	\$112.9	\$241.3
General Government-Nondepartmental	44.5	48.6	67.7	124.9	257.9	60.9	81.6	97.5	137.5	220.3
Public Safety	112.6	136.2	247.4	281.9	457.8	90.3	115.7	217.0	242.6	329.9
Public Works	194.2	227.0	237.3	629.4	500.1	128.3	90.5	260.2	337.4	603.0
Health	0	0.1	0	0	0	0	0	0	0	0
Libraries	0	0	0	0	0	0	0	0	0	0
Parks and Recreation	31.4	32.4	41.9	72.8	174.3	0	0	5.8	40.7	121.5
Contribution to Other Government Funds	0	0	0	0	0	0	88.8	0	0	0
TOTAL	\$455.3	\$524.8	\$718.4	\$1,262.8	\$1,679.7	\$314.7	\$406.7	\$635.3	\$871.1	\$1,516.0
TOTALS IN CONSTANT 1972 DOLLARS	\$560.0	\$593.0	\$718.4	\$1,080.2	\$1,193.8	\$387.1	\$459.5	\$635.3	\$745.2	\$1,077.5

Function	Pismo Beach					San Luis Obispo				
	1967-68	1969-70	1972-73	1974-75	1977-78	1967-68	1969-70	1972-73	1974-75	1977-78
General Government-Departmental	\$33.5	\$47.7	\$144.3	\$235.1	\$200.4	\$133.0	\$169.0	\$235.6	\$959.9	\$887.4
General Government-Nondepartmental	75.8	50.0	130.3	212.7	418.8	543.2	534.4	587.5	435.4	776.7
Public Safety	123.0	135.8	239.7	308.2	471.1	681.5	1,096.0	1,224.1	1,713.3	3,288.2
Public Works	102.2	81.8	822.2 ^a	316.5	367.4	635.0	774.8	1,080.0 ^b	1,237.6	1,419.5
Health	0.1	0.2	0.1	0.1	0.1	0.6	0.6	0.6	0.3	2.0
Libraries	0	0	0	0	0	85.0	107.2	0	0	0
Parks and Recreation	30.9	66.6	37.0	49.1	100.9	92.5	282.8	382.4 ^c	848.8	1,446.9
Contribution to Other Government Funds	0	0	0	0	0	0	0	0	0	0
TOTAL	\$365.5	\$382.1	\$1,373.6	\$1,121.7	\$1,558.7	\$2,170.8	\$2,964.8	\$3,510.2	\$5,195.3	\$7,820.7
TOTALS IN CONSTANT 1972 DOLLARS	\$449.6	\$431.8	\$1,373.6	\$959.5	\$1,107.8	\$2,670.1	\$3,350.1	\$3,510.2	\$4,444.2	\$5,558.4

^aIncludes capital outlay of \$605,091.

^bIncludes capital outlay of \$457,375.

^cIncludes capital outlay of \$189,268.

Source: Municipal Budgets for Arroyo Grande, Grover City, Pismo Beach, and San Luis Obispo, 1980.

Expenditures for four cities within the study area—Arroyo Grande, Grover City, Pismo Beach, and San Luis Obispo—increased during the study period between 13 and 17 percent per year in current dollars (see Table 7-5). Grover City experienced the greatest growth as total expenditures increased from about \$315,000 in FY 1967-68 to \$1.5 million in FY 1977-78. Similar in size and growth was Pismo Beach, which experienced an increase of total expenditures from \$365,000 in FY 1967-68 to \$1.56 million in FY 1977-78. Total expenditures in Arroyo Grande grew from \$455,000 to \$1.7 million during the study period while San Luis Obispo expenditures increased from \$2.1 million to \$7.8 million. The largest area of expenditure for Arroyo Grande and Grover City was public works. In Pismo Beach and San Luis Obispo, the largest area of expenditure was for public safety.

7.4 Selected Public Services

The public services described here are those that are most responsive to public demand and most often cited in the literature as being affected by large scale projects. To discuss these services, it has been necessary to present an overview that condenses extensive data for an extended period. The objectives are to identify responses to project impacts made by the public services and to record structural changes that had important consequences for county residents.

7.4.1 Education

Public education in San Luis Obispo County was provided by nine elementary districts, three high school districts, and five unified school districts under the direction of the county superintendent of schools. Funding for public education came from federal, state, and local sources, with the local property tax providing the largest source of educational funding.

Post-high school education within the county is provided by two institutions: Cuesta College, a two-year community college located west of the City of San Luis Obispo and serving all of San Luis Obispo County; and, California Polytechnic State University, a four-year state university with major academic emphasis on agriculture, engineering, and architecture. The estimated 1980 enrollment at Cuesta College was

over 6,000 full- and part-time students, while enrollment at California Polytechnical was in excess of the equivalent of 15,000 full-time students.¹

During the study period, the major educational impacts of the Diablo Canyon project were concentrated on two public school districts—San Luis Coastal Unified School District and Lucia Mar Unified School District. The San Luis Coastal Unified School District served the City of San Luis Obispo, and its boundaries extended north along the coast to Morro Bay and south to Shell Beach. The Diablo Canyon generating station was situated in the San Luis Coastal Unified School District. The boundaries of the Lucia Mar Unified School District extended south from Shell Beach to the Santa Barbara county border, encompassing all of the south-county area, including the Five Cities Area. Impacts of the Diablo Canyon plant on the San Luis Coastal Unified School District were primarily related to the large tax revenues generated by the facility, while the impacts on the Lucia Mar Unified School District were related to the influx of school-age children of the Diablo Canyon workers.

Changes in each of these two public school districts since 1969 are summarized in the budget, enrollment, and funding data that follow. Table 7-6 shows the school enrollments for 1968 to 1978 for both school districts. In 1968, the beginning of the study period, there were 7,231 students enrolled in the San Luis Coastal Unified School District. The enrollment rate increased slowly until 1975, when it reached a total of 7,467 students; in 1978, enrollment had declined by approximately 5 percent. Student enrollment in the Lucia Mar Unified School District in 1968 was 6,768. Between 1968 and 1969, enrollment increased by 2 percent, to a total of 6,906, which is partly attributable to construction worker (and accompanying family) in-migration. (During this same period, enrollment had declined by more than 2 percent in the San Luis district.) However, between 1970 and 1973, as the numbers of construction workers at the site substantially increased in number, there was a concomittant decline in enrollment of almost 3 percent. The school enrollment figures did not strongly correlate with the size of the work force. In 1978, with a peak work force of 1,700 persons, there were 6,556 students enrolled in the Lucia Mar Unified School District, a smaller student population than in 1968.

¹Equivalent of 15,000 full-time students refers to the total number of students registered for classes, but not differentiated between part- and full-time students.

TABLE 7-6

SCHOOL DISTRICT ENROLLMENTS: SAN LUIS COASTAL UNIFIED AND
LUCIA MAR UNIFIED
1968-1978

Year	San Luis Coastal Unified		Lucia Mar Unified	
	Total Enrollment ^a	Percent Changes from Previous Year	Total Enrollment ^a	Percent Changes from Previous Year
1968	7,231	—	6,768	—
1969	7,082	-2.1	6,906	2.0
1970	7,238	2.2	6,991	1.2
1971	7,224	-0.2	6,884	-1.5
1972	7,304	1.1	6,819	-0.9
1973	7,369	0.9	6,804	-0.2
1974	7,360	-0.1	6,996	2.8
1975	7,467	1.5	7,121	1.8
1976	7,511	0.6	7,085	-0.5
1977	7,358	-2.0	6,784	-4.2
1978	7,142	-2.9	6,556	-3.4

^aIncludes high school and elementary school enrollments.

Source: California State Department of Education, personal communication, 1980.

In estimating the project's impact on school enrollments, school district administrators claimed that the impact from additional students on the San Luis Coastal Unified School District was negligible, while the impact on the Lucia Mar Unified School District was noticeable. According to a key administrator of the Lucia Mar district, during peak construction the district was at over-capacity as a result of the additional children of the Diablo workers, and the district was forced to add portable classrooms to accommodate the student population. Although the enrollment data do not indicate a large increase of students during construction of the Diablo Canyon plant, school administrators stated that a substantial number of project-related students were placed in the Lucia Mar educational system.

Another of the project's significant impacts on the educational system was related to funding. Prior to PG&E's final decision to locate the nuclear plant at the Diablo Canyon location, Nipomo Dunes, a site along the coast in the south-county area, was also

being considered. For environmental reasons, this site was eventually abandoned in favor of the Diablo Canyon location. Before the siting decision was made, however, the county's school districts were reorganized to establish the approximate boundaries that exist today. In establishing the new school district boundaries, several factors were considered. One of the factors was the wealth, or assessed valuation of each district, on a per pupil basis. The estimates of assessed valuation, moreover, were based on projections of a nuclear generating station being located at Nipomo Dunes, within the Lucia Mar school district. The decision to move the project to the Diablo Canyon site resulted in a substantial loss of potential tax base for the Lucia Mar district and a significant gain in tax base for the San Luis Coastal district (Hoagland, personal communication, 1980).

Table 7-7 compares the revenue per student of the Lucia Mar Unified School District (LMUSD) to the San Luis Coastal Unified School District and to the state average during the period 1973 to 1980. Between 1973 and 1980, the average annual differences in revenue per pupil (based on average daily attendance) between the school districts was \$312 per pupil. In dollar terms, for the 1979-80 school year, the LMUSD had a revenue per pupil of \$1,472 compared to \$1,859 for the San Luis Coastal school district and \$1,579 for the state average. Thus, not only did the LMUSD gain additional students because of the construction worker in-migration to the Five Cities Area, but the district did not gain additional revenues from the construction of the station as did the San Luis Coastal school district.

The inequities between the relative wealth of the two districts was further exacerbated by the state legislature's passage of Senate Bill 90, which placed revenue limits on all school districts. Rather than equalize the revenue capacities of districts, the limits were based on the prior wealth of each district and, to an extent, froze the disparities among districts at existing levels. Similarly, the June 1978 passage of Proposition 13 by California voters also tended to freeze existing financial inequalities among districts. Proposition 13 severely reduced the level of property taxes and completely altered the concept of district taxation within the state. As a result, the legislature was forced to enact a bail-out program to recoup the revenue losses of local districts. The state allocations to school districts were based on expenditure levels that existed in 1977-78, thereby perpetuating the differences between relatively wealthy and poor districts. (Hoagland, personal communication, 1980.) According to a key school administrator, because PG&E made its siting decision (Diablo Canyon rather than Nipomo

Dunes) after the school district reorganization, the Lucia Mar Unified school district was adversely affected. This ultimately resulted in the district's present valuation-poor status as well as its inability to finance programs on par with other school districts in the state.

TABLE 7-7

BASE REVENUE LIMIT PER PUPIL (AVERAGE DAILY ATTENDANCE)
 LUCIA MAR UNIFIED SCHOOL DISTRICT (LMUSD),
 SAN LUIS COASTAL SCHOOL DISTRICT (SLCSD),
 AND STATE OF CALIFORNIA AVERAGES
 1973-1980

School Year	LMUSD	SLCSD	Difference between LMUSD and SLCSD	STATE AVERAGE	Difference between LMUSD and STATE AVERAGE
1973-1974	\$848	\$1,164	\$+316	\$918	\$+70
1974-1975	909	1,203	+294	962	+53
1975-1976	993	1,266	+273	1,051	+58
1976-1977	1,110	1,454	+344	1,170	+60
1977-1978	1,184	1,511	+327	1,244	+60
1978-1979	1,336	1,580	+244	1,459	+123
1979-1980	1,472	1,859	+387	1,579	+107
Six Year Gain	+\$624	+\$695		+\$661	

Source: Lucia Mar Unified School District, Dr. Robert Hoagland, 1980.

A third effect of the plant, according to key informants, was that construction of the plant, and associated school enrollment fluctuations, masked the long-term trend in school enrollments of the district. The decline in construction-related enrollment over the past couple of years has hidden an increase in enrollment attributable to long-term, permanent residents. This phenomenon has made it difficult for the district to get approval from the voters for additional capital facilities.

7.4.2 Transportation

During the study period, transportation within the Study Area was provided primarily by highway, air, and rail systems. The major roads providing access to the Diablo Canyon facility were State Highway 101, Avila Road, and San Luis Bay Drive,

with the latter two maintained by the county. The county also owned and operated the San Luis Obispo airport. The airport, located south of the City of San Luis Obispo, was classified as a type IC airport, which accommodates short-haul and scheduled air taxi or commuter service. The Southern Pacific Railroad provided freight services within the Study Area. Amtrak provided passenger service, connecting the Study Area with other areas in the San Francisco/Los Angeles corridor (County Land Use Plan, 1980).

During the study period, the major impacts of the project on transportation were on traffic density on Highway 101, Avila Road, and San Luis Bay Drive due to workers driving to the site. During peak construction, over 2,000 workers were employed at the site. To accommodate the additional traffic, the county made several improvements to Avila Road and San Luis Bay Drive. The major improvements involved a new by-pass on Avila Road to route the plant traffic around the community of Avila Beach, a new bridge across San Luis Obispo Creek at Avila Beach, and a new road from Avila Beach to Port San Luis. The construction took place between 1967-1969, and PG&E aided in the funding of the improvements. The county, through federal aid and secondary funds, constructed the bridge over San Luis Obispo Creek and paid for the grading of the road from the bridge to Port San Luis. PG&E paid for the construction of the by-pass, for purchase of the right-of-way for the by-pass, and for paving of the road from the bridge to the port. (George Propopapas, personal communication, 1980.)

In addition to the road work required at Avila Beach to provide access to the plant, extensive repairs were made by the county to Avila Road between Avila Beach and Highway 101. The repairs were necessary to accommodate the additional wheel loads associated with travel to and from the Diablo Canyon plant. PG&E also participated in funding these improvements (Propopapas, personal communication, 1980). There were no indications that county highway decisions were affected by the Diablo project.

7.4.3 Public Safety

The major elements of public safety were the police, fire, and civil defense preparedness and communication. The incorporated cities within the Study Area all provided police protection within each of their corporate limits. Police protection in the rural areas of the county, including Avila Beach near the Diablo Canyon plant, was provided by the county sheriff and California Highway Patrol. The incorporated cities also provided fire protection services within their corporate limits. The rural portions of the Study Area relied on fire protection from the California Division of Forestry stations

located in both San Luis Obispo and Pismo Beach. Fire protection services were provided in a portion of Avila Beach by the Avila Beach County Water District through a volunteer force. A recently established volunteer fire company in Avila Valley provided fire protection service to several rural areas near Avila Valley, including the Diablo Canyon power plant (County Land Use Element, 1980).

Interviews with key informants suggest that there was no evidence of increased crime related to the project's work force. A large number of the Diablo Canyon work force were residents of the Study Area, and the increased crime typically associated with transient work forces (e.g., gambling, illegal drug use, prostitution) at large projects was not evident (Whiting, personal communication, 1980). No noticeable demand changes were attributed to the Diablo Canyon project. Over all, the Diablo Canyon project's tax contributions enabled the expansion of public safety services. The county sheriff was required on several occasions, however, to intervene in demonstrations at the plant site. In 1977, 47 persons were arrested for trespassing on PG&E's Diablo Canyon property and, in 1978, 487 persons were arrested at the plant site. About 95 percent of those arrested were from outside the Study Area. According to informed sources, the arrests and court processing of the arrested amounted to a significant burden on the county's legal services. These costs were estimated to range from \$300 to \$500 thousand.

Due to the increased traffic of workers travelling to the plant site during peak construction, the California Highway Patrol stationed a patrolman in the Avila Beach area during each shift. As the project neared completion and the work force was reduced, patrol of the area returned to a spot-check basis. The Diablo Canyon project did not necessitate the hiring of additional highway patrol officers in the Study Area (Howser, personal communication, 1980).

CHAPTER 8: SOCIAL STRUCTURE

8.1 Introduction

The purpose of this chapter is to identify and examine the effects of the project on social structure and process. The approach followed in this chapter is to identify the major functional social groups at the beginning of the study period, to develop a profile of each group, and to describe the major features of the relationships among the groups. A premise of this study is that relationships among people in a community are structured, and that people in a community form functional and interacting groups that can be identified and described.¹ It is important, therefore, to define an area in which the major social units and social processes can be identified and the changes in the system observed.

For the purposes of assessing the impact of the Diablo Canyon Nuclear Generating Station on the social structure, the Five Cities Area was selected as the area for study. Aside from increased tax revenues, the economic and demographic changes due to the construction of the plant took place primarily in the Five Cities Area and effects on social structure would be expected to be most visible in that section of the county. Because San Luis Obispo County covers a complex and extensive area, it would be impossible to document the social structure and the impact of the plant on the whole county. For that reason, only that part of the county known as the Five Cities Area was selected for examination regarding the plant's effects on social structure. This is not to say that such impacts were necessarily more important in the Five Cities Area, but that the area, as a microcosm of the county, is representative of the maximum impacts on the county because most workers located there. In addition, the social groupings comprising the Five Cities Area largely reflect the major social groups found in the county. However, the Five Cities Area can be viewed as the largest single area within the county that can be characterized as a functional social system and considered as a "community" for study. The distinct urban centers and agricultural areas located outside of the Five Cities Area are separated from it by both distance and social function. In addition, those

¹Using Warren's (1978) definition of community—that combination of social units and systems that perform the major social functions having locality relevance. (Functions include: production, distribution, consumption; socialization; social control; social participation; and mutual support).

areas did not sustain the same economic and demographic impacts from the Diablo station as did the Five Cities Area.

Once the groups within the Study Area are identified and characterized and the relationships among the groups defined, the next step is to distribute the economic, demographic, housing, and local government effects of the project (identified in Chapters 4 through 7) among the groups in the study. Changes in the profile of the groups and in the relationships among groups during the study period are then identified, and the role of the project in those changes is determined. Much of the information is based on interviews with key informants who either represented the groups in the area or were in positions in the community to provide knowledge and awareness of particular groups. Secondary data were also used to substantiate the information provided by the key informants and to further define the groups.

8.2 Social Structure at the Beginning of the Study Period (1970)

8.2.1 Identification of the Social Groups

The selection of the social groups is based primarily on an examination of the historical development of the area and on interviews with key informants regarding the organization and structure of the Study Area community; it is supplemented by personal observations and secondary data. In the Five Cities Area, five groups were identified as the important functioning social units of the area: the agricultural community, the elderly residents, the business group, the Hispanic community, and the urbanites. It should be noted that the boundaries between these five groups overlap; the groups are not altogether internally homogenous. (For example, there are elderly members of the Hispanic community.) However, as the group profiles will demonstrate, the groups were defined on the basis of distinctiveness of the group in relation to the effects of the plant. This chapter will profile the five groups and will explore the changes in these groups and in their interrelationships. The role of the plant in these changes will then be examined.

8.2.2 Group Profiles

Based on a review of the literature on community organization, social structure, and large-scale project effects, seven attributes were identified that seemed most critical to the specification and description of the groups and the social structure, and to the analysis of the effects of the nuclear project on them. These seven attributes were:

- (1) Size of the group;
- (2) Livelihood of group members;

- (3) Demographic characteristics;
- (4) Geographic location (residential and occupational);
- (5) Property ownership characteristics;
- (6) Dominant attitudes and values toward growth, environment, community participation, and planning; and
- (7) Patterns of interaction among group members (cohesion).

A profile of each group on the basis of these seven attributes at the beginning of the study period was then developed by synthesizing secondary data, information from key informants, and records of public occurrences. Because the purpose of these profiles is to explicate the social structure and provide a basis for analyses of project effects, the approach has been to describe the modal characteristics of the group and to give some indication of the diversity within the group.

The patterns of interaction among group members will be examined for three spheres of activity—economic, political, and social. The focus of the discussions regarding the interactions among group members in these three spheres will be as follows: economics—employment and income; political—political control, representation, and participation; and social—participation or control of formal social organizations and the degree of informal social contact.

8.2.2.1 The Agricultural Community

Primarily because of their livelihood, the agricultural community is a distinct social group in the Five Cities Area. The fact that an intensive agricultural region exists in close proximity to expanding urban residential areas provides a sharper definition to the agricultural community. In the Five Cities Area, two zones of agricultural activity are found: The first is northeast of the Arroyo Grande community, in a narrow belt following the Arroyo Grande Valley; the second is directly south of the Five Cities Area. In general, areas of intensive agricultural use are highly localized in the western part of the county, especially in the coastal valleys, where the long growing season, heavier rains, and fertile soils have resulted in production of truck crops and intensive fruit and vegetable farming. These pockets of agricultural activity look to the coastal urban areas as markets and processors for their products. Arroyo Grande, for example, has grown primarily as an agribusiness community. However, the geographical separation between the areas used for farming, the proximity to coastal cities, the expansion of residential development into the rural areas, and the relatively high turnover rate among farmers has resulted in an environment where traditional rural values and culture have not emerged as a strong social force.

According to estimates made by the San Luis Obispo County Farm Bureau, there were approximately 150 operating commercial farms in the Five Cities Area, ranging in size from 40 to 100 acres and valued at approximately \$2,500 per acre. In addition, there were a few large farms owned by industrial corporations and sometimes leased to individual farmers for operation. There were also a great many small, family-owned farms averaging ten acres in size. Most of these small farms were devoted to strawberry cultivation and were owned by Filipino and Japanese families. These families, in general, were urbanized, resided in Arroyo Grande or Grover City, and commuted to their fields. Agriculture, to them, was considered an important supplemental income.

In contrast, the commercial farms in the Five Cities Area hired full-time farm labor and management; it was not unusual for a 50-100 acre farm to employ one full-time manager and up to five farm laborers. Moreover, a large agricultural labor pool was available in the area, especially at harvest time. The size of the agricultural community was estimated to be 2,500 persons (excluding the seasonal migrant workers), and accounted for approximately 13 percent of the Five Cities Area population. The County Farm Bureau estimated that the farm owners and managers earned high middle incomes, while farm laborers were generally in a lower income bracket. While farmland in the Five Cities Area accounted for only 5 percent of total farmland in the county, it produced 36 percent of total farm income.

Intensive agriculture in the Five Cities Area began in the 1930s, but few farms have remained family owned for long periods of time; farming in this area has not been considered as a "way of life", but more as an operating business. Where urban encroachment has resulted in high land values, farms or portions of farmland have been sold. The turnover rate of productive farms has also been unusually high for an agricultural area, as children from farm families have left both farming and the area for professional careers in the larger urban centers. Because farms are often considered as businesses, marginal farms, that would otherwise have supported the elderly, are sold for profit; consequently, the number of elderly supported by farm activity is much lower than would be expected.

The agricultural community consists of a mix of longtime residents and recent immigrants. Commercial farm owners are generally white, but Japanese farmers and farm managers are a large component of the agricultural population and are considered longtime residents of the area. Farm laborers tend to be Hispanic and are residentially

concentrated in Oceano and Nipomo. The Filipino community in-migrated during the 1940s as farm laborers. By 1970, the Filipinos had become a middle-income group, residing in Arroyo Grande and Grover City as business owners, professionals, craftsmen, and owners of small agricultural pieces of land which they would attend daily. The predominant religious affiliations were the Presbyterian Church, the Methodist Church, and the Roman Catholic Church.

Before 1970, a major concern of the County Planning Department and some farmers was the rapid pace of urban expansion. Marginal farms located near expanding urban areas were particularly vulnerable to urban pressures. Under the state legislature's Williams Act, a few of the farms in the Five Cities Area joined the agricultural preserve, an agreement to farm the land for 20 years in return for a reduction in property tax rates. Under the agreement, property taxes would be based on agricultural capability rather than the appraised value of the property. Interviews with farmers indicated that such agreements were made to protect marginal farms and not to preserve open space. The agricultural preserve agreements favored farms with large areas of pasture rather than smaller farms with intensive vegetable agriculture; therefore, the preserve program was not totally successful in the Five Cities Area.

In general, the agricultural community was not opposed to growth, including nearby urban expansion, and spoke favorably about the recent residential developments occurring in the Five Cities Area. Growth was accepted as a positive societal value. The environmental activists in the county were viewed as obstructionists. The agricultural community held conservative political ideas, and viewed their economic welfare as intricately linked to urban population growth and energy facilities expansion.

The farmers in the Five Cities Area rejected environmentalism as a political philosophy and placed importance on "managed" growth. The major issues identified by farmers have been the environmentalists' positions on development and environmental quality. To illustrate, environmentalists acted to establish an ordinance to retain undeveloped parcels of land as open space within urban areas. The farmers (the group who owned these parcels of urban land) wanted to sell these lands because these parcels were usually under five acres and not feasible for high technology farming. The siting of the Diablo Canyon nuclear plant near the Five Cities Area was also viewed with favor by most of the farmers who were interviewed as well as the County Farm Bureau. Technological advancement and energy independence were viewed as important societal

goals by the farming community and the nuclear plant symbolized these objectives. The farming community, in general, supported pro-growth county policies and opposed stringent land use controls.

Interviews with members of the farming group indicated that community participation as a group was minimal and that political action was responsive rather than preventive. Little initiative was taken on community-wide issues that did not directly involve the interests of the farming community. Because the agricultural group was diffuse in membership, it did not evolve as a unified political unit with definite political aims or policies. Rather, the group tended to work within the existing political process and to rely on traditional political allies such as the County Farm Bureau and the County Board of Supervisors. The farming community itself did not represent a political power in the Five Cities Area, but a few individual farmers were politically influential in the political decision-making process.

On the basis of property ownership patterns, four major subgroups can be identified within the agricultural community. These include: (1) ownership of land by industrial corporations; (2) family-owned commercial farms; (3) land owned and cultivated by Filipino and Japanese families; and (4) farm managers and laborers. The diversity of property ownership and the variety of ethnic groups comprising the agricultural community prior to the construction of the plant have made the economic interrelationships among group members complex. The large absentee-owned farms are economically less dependent on regional services than the small, family-owned farms where labor, machinery, and expertise are often shared. Moreover, the network of such economic exchanges are greater within the Japanese and Filipino groups than they are across the groups. As long-time resident groups in the area, they have established an intricate and complex mutual support and communication system. Managers of family-owned farms, many of whom were Japanese or Filipino, were also accepted into this informal mutual support system through kinship and community ties as long-time residents of the area. Family ties among members of the two ethnic agricultural groups tended to be strong.

Given the relatively small population size of the farming community and the concentration of farms in a small geographical area, most people within the community either knew each other personally or knew of each other. However, the social ties between the major agricultural subgroups and the agricultural community in general were

not strong. In fact, the only community center for the farmers and their families closed in the 1960s due to lack of participation and interest. Answers to questions concerning social visitation patterns revealed that, outside of the two ethnic agricultural subgroups, visits among neighbors were minimal. The proximity of urban centers and the urban orientation of the farming community resulted in social networks between the members of the agricultural group and urban residents of the Five Cities Area. These networks were widely diffused and no dominant or consistent pattern was recognized.

8.2.2.2 The Elderly Residents

Because of the climatic, recreational, and geographical amenities provided by the Five Cities Area, elderly retired persons constituted a large proportion of the population. The in-migration of the elderly began at a slow pace in the late 1950s, accelerated during the 1960s and, by 1970, approximately 13 percent of the population of the Five Cities Area was 64 years of age and older.

The elderly group resided primarily in three communities: Shell Beach, Pismo Beach, and Arroyo Grande, the most recent residential magnets for retirees. Many of the elderly who were interviewed indicated that they had out-migrated from the greater Los Angeles area; some originally had owned their retirement homes as family vacation homes. Others had moved to the Five Cities Area while still employed and had decided to retire in the area, particularly in Shell Beach.

The elderly group represented a wide range of incomes and previous occupations. These differences expressed themselves in property ownership patterns and residential location. Fixed income retirees located in the old section of Pismo Beach—in mobile home parks, in apartment buildings, or in homes of a generally low quality. In 1970, newer residential developments were established on the hill slopes just east of Pismo Beach and this area attracted the more well-to-do retired people, principally from middle to upper income professional jobs or owners of successful businesses. Unlike the concentration of elderly residents in the older Pismo Beach area, the newer residential projects had a high level of heterogeneity regarding ages, professions, and places of work. Shell Beach was primarily a residential area in 1970, characterized by a mix of small housing units (many converted from vacation homes), and large, newly built single-family structures. Demographically, most elderly residents were white, middle income people of various religious persuasions. A large proportion of the elderly of Shell Beach were considered to be long-time residents of the area, having resided there for 20 years

or more. Perhaps more than any other place within the Five Cities Area, there is a sense of community among the elderly of Shell Beach. Approximately 60 percent of the Shell Beach population is retired. The feeling of "community" among the elderly in Shell Beach, according to those interviewed, was a function of social interaction and contact that evolved over time. This evolution was aided by the relative geographic isolation of Shell Beach, the relatively high participation rate of Shell Beach residents in community, social, and political activities, and the shared feeling of threat to their quality of life. The intense bitterness expressed by elderly Shell Beach residents to the loss of political autonomy through the 1967 annexation of Shell Beach to Pismo Beach attests to the value placed on this sense of community. Those residents who were interviewed argued that the uniqueness and the special quality of life in Shell Beach would be altered by political decision-making being centered in Pismo Beach and that the level of public services would decline.

In general, the elderly supported economic growth for the Five Cities Area, especially growth that would result in an expanded tax base for the county and more centralized and closer shopping centers. However, they opposed industrialization and the establishment of manufacturing firms. To the elderly, environmental quality was just as important a consideration as economic growth and community development. From the perspective of the elderly residents, the expansion of the economy, if planned correctly, would improve the level of public services—their major concern. Only in Shell Beach was there evidence that environmental quality/anti-growth predispositions among the elderly were especially strong, and only in Shell Beach did the elderly organize as a community and participate in political activities. Of prime concern to this group was the preservation of the small town, coastal resort environment. According to key informant interviews, annexation to Pismo Beach was opposed not only because of the impending loss of community autonomy, but also because the political leadership in Pismo Beach was perceived as "pro-development at any cost." Elderly residents felt this would ultimately result in the loss of the special environmental amenities and the small town quality that characterized Shell Beach.

In 1970, the interaction among members of the elderly group in the Five Cities Area was highly restricted because of the geographic distance between them and by the differences in socioeconomic status. As a retired population, economic interaction between group members was minimal. Interaction among members of this group was limited to social memberships in organizations which, by 1970, had become centralized in

the Five Cities Area. Visitation took place within their respective neighborhoods, and was especially prevalent among Shell Beach residents.

8.2.2.3 The Hispanic Community

In 1970, there were approximately 1,500 members in this group, residing primarily in Oceano, a small unincorporated municipality south of Arroyo Grande and Grover City. Oceano's principal characteristic was that it was an Hispanic community. Historically, the community served as the residential center for agricultural field workers. In 1970, there were no employment opportunities in Oceano itself, and the Hispanic labor force commuted to agricultural areas and resort towns within the Five Cities Area or to the City of San Luis Obispo.

The houses in Oceano were small, family owned dwellings in need of upgrading. The high level of unemployment endemic to the area had resulted in houses being shared by members of individual extended families. Employment opportunities in the Five Cities Area were better for Hispanic females than for males and, as a result, there has been a long-term tendency for young Hispanic males to out-migrate to areas where manufacturing employment exists. Census statistics and interviews with families in Oceano show that those eighteen years of age and younger comprise the largest population group. The Hispanic community in Oceano has the lowest socioeconomic status of any group in the Five Cities Area, with high levels of chronic unemployment and juvenile delinquency.

Information gathered through interviews indicated that, although there is generally a high level of awareness and knowledge of neighbors, social interaction in the sense of a tightly knit community does not exist. The exception to this is the high level of interaction among the younger members of the group. Information from interviews with Hispanic families suggested that the reasons for the lack of community social interaction and participation were four-fold: the high transient rate among Hispanic families in the area; the commutation to work outside of Oceano; the lack of a political or social organization within Oceano; and the lack of support by the Church (Roman Catholic) for such functions.

The members of the Hispanic community who were interviewed indicated that expansion of economic activity in the area was important to them. Little value was placed on environmental quality considerations, and in general they perceived the

anti-growth/environmental political forces in the county as detrimental to their economic well-being. Many of those interviewed were unaware of or uninterested in the major political issues in the county. Rather, their concerns focused on issues in their own community—improved housing, day-care centers, occupational training programs, and the expansion of public transit to improve mobility between Oceano and places of employment. The level of participation in political or social organizations was generally low, and no informal community support system had emerged. As an ethnic community with shared membership in the Church and shared values and aspirations, the Hispanics are defined as a group, but the group does not function as a well-defined, operating community. Leadership, for example, was not readily identifiable in the group, and both formal and informal social institutions had not fully developed.

8.2.2.4 The Business Community

The business community in the Study Area included those families that owned retail and wholesale establishments; those who influenced or directed economic policy through key financial or managerial positions; and those who represented or managed absentee-owned commercial establishments. In the Five Cities Area, economic activity was largely concentrated in the communities of Arroyo Grande and Pismo Beach, and this activity was primarily in the tourist/services trade. There were approximately 570 persons in the Five Cities Area who constituted the business community, including proprietors, managers, or officials. When their family members were included, the population was closer to 1,700 persons.

Historically, the business community consisted of owners of small to medium-sized hotels, restaurants and other retail outlets. Prior to 1970, no large shopping centers had been built in the area, and no particular establishments had grown in size to monopolize the regional market. Rather, the area was characterized by small, independent businesses run by people who resided in the area. Prior to the construction of the plant, business ownership fluctuated and, historically, there had been a relatively high transient rate among members of the business community. The members of the business community were exclusively white, middle to upper income families; in these, as in other demographic characteristics, the group approximated the general profile of area residents with no conspicuous concentrations of age or sex. Most members of the group owned their own homes as well as their businesses or offices, and tended to live near their business establishments.

Because Arroyo Grande serviced the needs of the agricultural community and the growing number of permanent urban in-migrants, it was less vulnerable to changes in tourist inclinations. The Pismo Beach area, in contrast, was highly susceptible to fluctuations in the tourist trade. The years prior to the construction of the Diablo Canyon plant were characterized by wide fluctuations in economic activity. On the whole, businesses depended economically on a seasonal tourist trade in the coastal area. These seasonal periods of high business activity were followed by long periods of inactivity. This resulted in a substantial movement of business people into and out of the tourist areas. Consequently, the business community was not as cohesive as it might have been: it included merchants who were both long-term residents of the area and those who were more recent arrivals.

The principal motivation of the business community was to promote economic growth and to provide a basis for residential and commercial expansion. Of particular importance, especially to many Pismo Beach businesses, was the need to upgrade the commercial center of the area which was viewed as declining and thus attracting tourists of lower socioeconomic status. The business people in the community, while recognizing the importance of protecting the coastal environmental amenities, consistently fostered pro-growth development plans in the coastal areas. From their perspective, residential and commercial growth could be compatible with the objectives promulgated by the environmentalists and others who did not want their community to change. Particularly important was the overwhelming support given by the area's merchants to the proposed Diablo Canyon plant. Interviews with representatives of the business community showed a highly favorable attitude towards the plant. It was felt that the construction of the plant would improve the economic base of the Five Cities Area through increased expenditures of construction workers; through increased revenues; and by reduced energy costs after the plant became operational.

The major community issues in the Five Cities Area arose over development plans. By 1970, the two major controversies—annexation, and rezoning from agriculture to residential land use—had been resolved successfully in favor of the business community. The business community at this time held political power in the Five Cities Area and received political support from their traditional allies, the agricultural community. In both the county political structure and the local city councils, long-time businessmen were prominent in membership. The business group as a whole was conspicuous in its very high participation in civic organizations, political and social leadership roles, and community involvement.

Economic interrelationships among members of the business community were limited to communication over large-scale community development plans. The fact that most of the establishments were in the retail services/trades sector further reduced the economic interrelationships that would have occurred in a more diversified local economy which depended on internal regional flow or exchange of goods. Moreover, factors such as the large turnover in businesses, the geographic separations of business centers, and differences in the business orientations (agriculture and the tourist trade) further minimized development of a higher level of economic interdependency.

8.2.2.5 Urbanites

The largest social grouping in the Five Cities Area is the urbanites. This name is given to those members of the Study Area population who do not readily (according to our definition of functional groups) form identifiable social units. The urbanites (population 10,000) are those families living in Oceano, Pismo Beach, Arroyo Grande, and Grover City. The suburbanization process, especially in this region of California, has resulted in a diffuse residential pattern of diverse occupations and socioeconomic groups without locational specificity. A large number of professional people and skilled craftsmen have located throughout the Five Cities Area, with diverse value systems and various levels of participation. No particular urbanite subgroup surfaced as a functional unit. Generally, the urbanites were politically conservative and pro-growth on environmental issues. However, among some of the professionals, greater concerns were voiced over environmental quality considerations. In 1970, the urbanites generally supported the Diablo Canyon plant, although a significant number felt that additional controls or safeguards for the plant should be investigated.

As in many suburban growth areas in California, attachment to place of residence was not viewed as an important value; interviews with many urbanites indicated that they did not feel a "sense of community" in their areas of residence. The group is highly mobile: professionals residing in Arroyo Grande commuted either to the City of San Luis Obispo or to Santa Barbara County. Long distance commutation to work or recreation was prevalent. In addition, social interaction patterns were not community oriented; visitation patterns were geographically widespread and frequently outside of the Five Cities Area. To many of the urbanites interviewed, the perception of community was regional in scope rather than restricted to the immediate locale of their home or their work. In 1970, most urbanites were home owners with middle incomes, representative of their professional or skilled crafts employment. Group political participation in local

issues was historically low, but individual members did become actively involved in particular issues of concern to themselves. Because of the group's diversity, it is difficult to provide a valid description of the prevailing attitudes and values of this group. Public opinion polls, nevertheless, indicated that this group, particularly the skilled craftsmen, tended to favor controlled and planned growth and development. They generally did not participate in community government unless confronted with an issue of direct importance to themselves.

8.2.3 Interaction among the Groups

The following discussion is intended to outline the dominant interactions among the five groups in the Study Area. The interaction among groups, as measured by the economic, political, and social dimensions of the interactions, is an important component in the description of the social structure.

8.2.3.1 Economic

In 1970, the majority of employed area residents did not work in businesses controlled or owned by the area's business community. Most of the urbanites were employed either as white collar professionals or as skilled craftsmen who commuted to work outside the Five Cities Area to the City of San Luis Obispo or to Santa Barbara County. Professionally employed people, such as physicians or nurses working in clinics or hospitals within the Five Cities Area, were not considered to be economically interactive with the business community. The employment structure, then, was such that intensive interaction between the largest social group and the business group was weak. Nevertheless, some economic activity involving Study Area groups in employer-employee relationships did occur among the urbanites, Hispanic, and business groups.

The commercial establishments were generally not large enough to employ a great number of workers. They were oriented to meeting peak seasonal demands, and a number of them were family operated. In addition, because the economic base was strongly associated with the tourist industry, purchases of goods by area residents were often made outside the Five Cities Area, further reducing the economic links among social groups in the Five Cities Area. The high business turnover rate, coupled with the fact that the business sector historically catered to a large transient and/or tourist population, resulted in a relatively formal relationship between the area merchants and long-time resident shoppers who would ordinarily have been more intimate in a community of this size.

The economic activity of the Arroyo Grande community was traditionally based on service to its agricultural hinterland and, in 1970, the interrelationship between the agricultural and business groups continued to be a viable one. Moreover, a strong interdependence between the Hispanic agricultural field workers and the farm owners or managers was also apparent.

8.2.3.2 Political

Although linked (to some degree) economically and socially, there were distinct political entities within the Five Cities Area. Both Arroyo Grande and Pismo Beach had city council type governments, and political leadership was largely represented by members of the established business community. At the county level, the area was also represented by the business interests.

The agricultural community expressed little interest in local politics, and its participation level was generally low. In matters relating to agricultural interests, especially over land use questions, their participation was indirect; they exerted their influence through county and state agricultural lobbies and agencies, and through business leaders, with whom they were generally in agreement on land use and tax issues. The agricultural community did not establish any explicit long-range strategy or policy to protect their interests; rather, the agricultural group responded to specific problems as they surfaced. This pattern of response often resulted in heightened controversy in the local political sphere, especially over differences of positions between environmental and agriculture interests.

Participation rates among the elderly were generally high, and many were active in community, church, and environmental organizations. The Hispanics, in contrast, were excluded from the mainstream of political involvement. Yet, it was the Hispanic group in particular that most needed strong political representation. In an area with a largely diverse population, no significant public interest group emerged. However, by 1970, a strong but latent environmental interest lobby was emerging from a coalition consisting of members of the Shell Beach elderly group (who had originally opposed both the Shell Beach annexation and the Pismo Beach strategy for coastal development), members of the urbanite group (especially white collar professionals), and existing environmental/community interest organizations. In 1970, this coalition of political interests had not yet merged; the Diablo Canyon plant served as the catalyst for the emergence of this political force.

8.2.3.3 Social

There is little evidence to indicate that the individual groups behaved (by definition) as a group where social interaction was concerned. The agricultural community, according to interviews with key informants, had not developed a strong sense of community. The Filipino agricultural subgroup, for example, had established both formal and informal social interactions primarily within its own subgroup rather than across the entire agricultural group. The Japanese community, to a lesser extent, developed a strong social network among members of its particular ethnic group which did not readily include non-Japanese. Members of the agriculture group, in general, tended toward urban institutions and, as such, interacted with both the business community urbanites and the elderly in fraternal and social clubs and in church activities. As the proportion of elderly residents increased in the Five Cities Area during the 1960s, their interaction with the elderly members of the other groups increased markedly, especially in regional social clubs and church-related activities. Social interaction among families of affluent businessmen, farmers, and retired citizens was exemplified by membership in private clubs. Overall, there was a high level of participation in civic and community activities in the Five Cities Area but this involvement was not group-specific. The Hispanic community was conspicuous by its absence in regional social organizations and community affairs.

8.2.3.4 Study Area Cohesion

As indicated by the profiles of the five major social groups and the patterns of group interaction, the business group dominated the economic and political activities of the Five Cities Area. The agricultural community was not removed from social and economic activities occurring in the urban centers, and was allied to the business group on political issues. There was not a strong attachment to the community except among residents of Shell Beach. Although the Five Cities Area was increasingly viewed as the "place of residence" or community by 1970, there was evidence of strong counteracting forces that worked against the integration of political, social, and economic interaction among the major social groups. The development of a community of interest and social links outside the Five Cities Area, especially by more recent in-migrants, tended to reduce the cohesion of the area. The large turnover rate of businesses and the emerging polarization of positions regarding pro-growth versus environmental quality were two other mitigating factors that should be considered.

8.3 New Groups in the Study Area during the Study Period

The purpose of this section is to ascertain whether any new functional group(s) can be identified in the Study Area during the study period. Investigation reveals that, apparently, no new group emerged in the area, despite the project-related activity. The construction workers and their families were studied for potential inclusion as a functional social group. However, the project-related workers and their families were not included as a separate functional group in the Five Cities Area because, as a component of the population, few construction worker families became permanent residents or functioned as a social unit with distinct economic, political, and social patterns of behavior. Moreover, in terms of social behavior, the workers and their families who in-migrated during the 1970 to 1978 period were incorporated into the urbanite social group by reason of their residential location, mobility and shopping patterns, and overall attitudes.

8.4 Distribution of the Project Effects to the Groups

The effects of the Diablo Canyon project on the economy, labor force, population, settlement patterns, and public services of the Study Area were identified and described in Chapters 4 through 7. This section describes the distribution of those effects among the five groups in the Five Cities Area for two key years, 1975 and 1978. Most of the construction workers and their accompanying families in-migrated to the Five Cities Area. Additionally, the income/expenditure flows and shopping behavior patterns indicated that most of the nonbasic employment occurred in the Five Cities Area. The distribution of effects to the groups in the Five Cities Area was derived from available empirical evidence, key informant information, and adjustments of the county-wide aggregate effects to the Five Cities Area, based on the area's socioeconomic significance to the county as a whole.

8.4.1 Economic Effects

The economic impacts of the Diablo Canyon Nuclear Generating Station on the Study Area were assessed for the 1975 and 1978 construction years and are recapitulated in Table 8-1. Table 8-2 contains estimates of employment and income effects in the Five Cities Area and the distribution of these effects to the social groups in the area. In 1975, as shown in Table 8-2, an estimated 1,727 residents of the Five Cities Area worked in project-related jobs, including basic and nonbasic employment. These 1,727 jobs (and workers) were distributed among the five groups as follows: the agricultural community--125; the business group--none; the elderly group--none; the Hispanic

community—110; and the urbanites—1,492. The construction workers who moved into the area were categorized as part of the urbanite social unit (urbanites-movers). Approximately 7 percent of those employed on plant-related jobs were agricultural workers who left the agricultural sector for work at the site. Interviews with farm owners and managers revealed that the number of workers who left agricultural jobs in order to obtain construction employment at the plant did not adversely affect the agricultural sector because a large pool of underemployed and unemployed agricultural workers were available in the area as replacements. The Hispanic community gained in nonbasic jobs, mainly in the hotel/restaurant services. Interviews with key informants indicated that these jobs went primarily to women who, traditionally, were either underemployed or only seasonally employed; there were not as many "new" jobs created as the figures tend to indicate. The project-related estimates of income earned by Five Cities Area residents are also shown in Table 8-2. The total project-related income earned by area residents in 1975 was estimated to be \$30,149.4 thousand.

TABLE 8-1

DIABLO CANYON NUCLEAR GENERATING STATION
TOTAL PROJECT EMPLOYMENT EFFECTS
STUDY AREA
1975 AND 1978

Employment by Place of Residence (Study Area)	1975			1978		
	Direct Basic	Non- basic	TOTAL	Direct Basic	Non- basic	TOTAL
Nonmovers	495	1,283	1,778	316	872	1,188
Movers Accompanied by Family	804	50	854	514	34	548
Movers Unaccompanied by Family	500	21	521	291	14	305
TOTAL	1,799	1,354	3,153	1,121	920	2,041

Source: Mountain West Research, Inc., 1980.

TABLE 8-2

ESTIMATED EMPLOYMENT AND INCOME EFFECTS
FIVE CITIES AREA RESIDENTS
1975 AND 1978

Social Groups	Employment						Income ^a		
	Basic	1975		TOTAL	Basic	1978		1975	1978
		Nonbasic				Nonbasic			
Farmers	100	25	125	60	20	80	\$ 3,110	\$ 110	
Business	0	0	0	0	0	0	— ^b	— ^b	
Elderly	0	0	0	0	0	0	0	0	
Hispanic	10	100	110	5	70	75	804	521	
Urbanites ^c	906	586	1,492	551	403	954	26,235	17,258	
Nonmovers ^c	(165)	(550)	(715)	(83)	(379)	(462)	(7,216)	(3,343)	
Movers ^c	(741)	(36)	(777)	(468)	(24)	(492)	(19,019)	(13,914)	
TOTAL ^d	1,016	711	1,727	616	493	1,109	\$30,149	\$17,889	

^aThousands of constant 1972 dollars.

^bNonbasic income also accrues to the business community in addition to the amount paid out to nonbasic workers. However, because it is difficult to determine the amount that remains in the business community, the nonbasic income that accrued to the Five Cities Area is distributed totally among the nonbasic employees. For a discussion of the magnitude of the plant-related income effects on the business community, refer to Chapter 4.

^cUrbanites total is the sum of combined nonmovers and movers which are noted in parentheses under urbanites' figures.

^dTotals may not add exactly due to rounding.

Source: Mountain West Research, Inc., 1980.

By 1978, a large construction work force continued to reside in the Five Cities Area with an estimated 1,109 basic and nonbasic workers. Again, the urbanites, with 86 percent of the total Five Cities Area employment, constituted the group with the largest plant-related employment. Of the urbanites, approximately 492 workers in-migrated to the area for basic and nonbasic plant-induced work. About 42 percent of project-related jobs were held by urbanites who were already residents of the area.

8.4.2 Demographic Effects

The demographic effects of the project on the Study Area were estimated in Chapter 5 with the total 1967-1978 population increases summarized in Table 5-7. For the Five Cities Area, the 1975 in-migration of workers (basic and nonbasic) was estimated at 777 persons (543 accompanied by their families and 234 unaccompanied by their families); in 1978, in-migrant workers numbered 492 persons (344 accompanied by their families and 148 unaccompanied by their families). Of the two possible components of increased population--in-migration and diminished out-migration--only in-migration was found to have had a measurable effect on the area population. When the appropriate family size factors were applied, the total project-induced population was estimated to be 1,998 persons in 1975, and 1,345 persons in 1978. This additional population was unevenly distributed among the social groups; the urbanite group received all the increased population due to the project. The in-migrant workers were largely construction workers, and relatively few in-migrants were associated with project-induced nonbasic employment.

8.4.3 Settlement Patterns and Housing Effects

The settlement pattern of the Five Cities Area was not greatly affected by the project. As indicated in Chapter 6, existing mobile home parks in the area were able either to meet the increased demand for mobile home space or to expand their capacity. There was no evidence that any new park was established directly because of project-related population in-migration. In addition, the community of Pismo Beach, given its large concentration of hotels and apartments catering to seasonal tourist trade, was able to absorb the housing demands of the workers and their families. Moreover, key informants indicated that a number of construction workers had rented rooms in the homes of elderly residents on fixed incomes. The research, however, was not able to verify this information. However, considering that the number of tourist accommodations and apartments was more than sufficient, that the deterioration of elderly-owned residences in downtown Pismo Beach continued unabated during the study

period, and that interviews with elderly/retired key informants did not identify benefits from room rentals, it may be concluded that such benefits to the elderly were minimal and not extensive.

Because of project-related housing demands, rental costs, particularly those for hotels and apartments, accelerated during the peak construction period. In spite of this, the evidence suggests that project-related housing demands did not adversely affect the tourist industry or compete with nonproject-related families who rented housing in the area. Interviews with key community people indicated that demands for tourist accommodations were met through existing vacancies, expansion of the tourist facilities, and growth of the tourist industry outside the Five Cities Area. A few key informants alleged that the expanded resort/tourist facilities may have resulted from pressures exerted by the construction workers who were successful in competing with the more transient, short-term housing demands of tourists. The research findings do not substantiate this claim. Rather, in the early 1970s, the tourist industry was dependent on high volume, weekend/holiday vacationers; even with the addition of construction work force in-migration, vacancies were still available, particularly on weekends and holidays, as many construction workers returned to their home communities. Since the 1973 energy crisis, regional recreational patterns have changed to include substantially greater numbers of tourists from the greater Los Angeles area who tend to stay for longer periods of time. The expansion of tourist facilities in the area was largely a reflection of significant increased demand rather than the result of competition for space from the construction workers.

The study found that housing availability and costs were not problematic in the Five Cities Area between 1968 to 1980. The expansion of large housing developments north of Pismo Beach and in Arroyo Grande, in addition to the increased capacity of mobile home parks, assured that no particular group in the Five Cities Area would be adversely affected by housing and rent competition from construction workers. Interviews with proprietors of hotels and apartments in the Study Area indicated that the location of construction workers in the tourist area had an important beneficial impact on the tourist industry. It provided year-round occupancy and thereby stabilized the industry and reduced the business ownership turnover rate. Those who benefitted economically from the increased housing rental activity were exclusively those local business people who were owners of local hotels and apartments, and real estate investors. At a time of economic fluctuation in the tourist trade sectors, the housing

business people who were owners of local hotels and apartments, and real estate investors. At a time of economic fluctuation in the tourist trade sectors, the housing demand by construction workers was an important stabilizing economic factor. Also, the fact that the construction workers were concentrated in Pismo Beach raised a question regarding the impacts to social groups and interactions directly attributable to the residential concentration of the construction work force. The concentration of Diablo Canyon workers was not considered to have been disruptive to the Five Cities Area social patterns, interactions, and behavioral norms. They were an unobtrusive subgroup. As a population working in the area, the construction work force was considered part of the urbanite group, but in terms of residential location, level of transience and turnover, and lack of social interaction with traditional formal and informal social institutions in the Five Cities Area, the construction work force was separated from the permanent social groupings of the area. Interviews with members of the business community, particularly those in the retail and services trade sectors, indicated that the construction work force was not a conspicuous group, but exhibited the transient characteristics of the area. Interviews with a number of construction workers presently working on-site and residing in Pismo Beach indicated their strong disinclination for involvement in community affairs.

8.5 Changes in the Social Structure and the Role of the Effects of the Project

8.5.1 Changes in the Profiles of the Groups

This section describes the major changes in the profiles of each of the groups during the study period and examines the role the project's effects played in those changes.

8.5.1.1 The Agricultural Community

During the construction period of the Diablo Canyon plant (1970 to 1980), three changes in the agricultural community were discerned. First, there was a trend toward smaller acreages as less productive land was sold for residential development. However, this did not result in a noticeable decline in the population size of the group as there was, concomitantly, a trend toward cultivation of higher-return crops which necessitated greater managerial and field work efforts. Second, as a few of the larger (and politically important) farms changed hands, and as residential growth and encroachment onto farmland resulted in greater social interaction across groups, the cohesion of the agricultural community continued to deteriorate from its already relatively low level. The fragmentation of the agricultural community was further reinforced by increased

not attributable to direct or induced plant effects. The in-migration of population in the Arroyo Grande area (the area closest to the agricultural community) was not a function of the plant's construction nor did the farming community perceive it to be. Rather, the farmers tended to favor residential growth and expansion. The social networks of the agricultural group which existed prior to the construction of the plant were not altered in any appreciable way. The construction work force, generally centered in the Pismo Beach area, did not interfere or obstruct social interaction and processes between the agricultural community and other groups. None of the members of the farming community who were interviewed had known any construction workers.

The economic situation of the farmers continued to be as viable as it was prior to the plant's construction. Overall, the agricultural community was economically and socially far removed from any plant-related impacts. Although a number of farm laborers left their place of employment to work on the Diablo Canyon plant, their departure did not result in any labor shortages because a large pool of underemployed and unemployed farm laborers was available in the area.

8.5.1.2 The Business Community

The size of the business community in the Five Cities Area increased substantially during the study period as the area grew in population (approximately 20,000 in 1970; about 26,500 in 1976; and 30,000 in 1980). The consensus of the key community informants who were interviewed was that the business community of Pismo Beach was the recipient of most of the economic benefits from the Diablo Canyon project, principally through income expenditures of the construction work force. Places with strong and traditionally stable economic bases, such as Arroyo Grande and Grover City, experienced growth in the retail sectors of the local economy as a response to significant in-migration, particularly the elderly in-migrants. Unlike Pismo Beach, the Arroyo Grande area had not been a tourist center with a large transient population and did not, therefore, attract construction workers. The few that did locate there were not a visible element and did not contribute to the local economy in any significant way.

The influx of construction workers into Pismo Beach in the late 1960s and early 1970s was an important economic event for the community. It resulted in year-round occupancies, particularly for the smaller hotels and apartments and, in turn, business activity generally increased. Moreover, the indirect effects of construction worker expenditures stabilized the local economic base until the mid-1970s when the business

community could depend largely on the tourist industry for its livelihood. The area economically improved, some places expanded or modernized, and the economic upturn reversed the high turnover rate which had been prevalent prior to the Diablo Canyon's plant construction. The construction of the plant accelerated the stability and cohesion of the business community, a process that would have begun five years later in response to changing regional recreational patterns.

Although the business community remained diverse, business improvement and reduced turnover resulted in improved cohesion, communication, vitality, and community spirit among members of the business group. As the economic base expanded, however, the business community polarized. This polarization surfaced in the late 1970s in a major political and community conflict over redevelopment of downtown Pismo Beach. The large businesses, represented by the Chamber of Commerce and some elected officials, wanted to develop a plan to revitalize the downtown area into a more attractive tourist center. The small and more marginal businesses in the downtown area, represented by the Small Business Organization, argued that redevelopment would result not only in the ultimate disappearance of the small business establishments, but would also mean the expropriation of the small homes and apartments owned or rented by elderly people on fixed incomes. The opposition to the redevelopment plan was headed by a Pismo Beach City Council member who was also adamantly opposed to the Diablo Canyon project and who received broad-based support from the area's environmental constituency, the downtown businessmen, and elderly residents.

It is difficult to attribute the development of political expressions of group interest to the construction of the nuclear station. However, a number of key informants speculated that the controversy over the nuclear plant (in an already relatively volatile political climate where environmental/no-growth interests generally were in conflict with development/pro-growth interests) may have heightened differences in the expression of political positions. These differences could have enhanced the conflict over community issues by reducing negotiation and compromise within the political decision-making process. There is some evidence available from social science research on nuclear technology to lend support to such claims (Sharaf 1978, 1980). Opponents of nuclear plants are often sensitive to other societal questions over community growth, local control, social equity, technological decentralization, and alternative energy technologies. Confronted with such issues, in the context of community disagreement

over a nuclear generating plant, it is not unreasonable to expect the expression of strong and perhaps ideological positions on other social and community issues.¹

8.5.1.3 The Elderly

The elderly population of the Five Cities Area continued to grow in size, both in absolute and proportional numbers relative to the rest of the area's population. Those receptor areas for elderly in-migration prior to the study period--Pismo Heights, Lower Pismo Beach (mobile home parks), and Arroyo Grande--continued to support and attract the elderly. The major growth center for the elderly/retired, however, had shifted from the Shell Beach area to the residential and institutional areas of Arroyo Grande that had expanded in the 1970s and provided apartment units for the elderly and specialized health clinics. The elderly persons residing in Arroyo Grande and Pismo Heights, although very active in social organizations, did not generally participate in community political affairs and issues. The nuclear plant was perceptually far removed from them; there is no evidence of plant-related impacts to this group.

For those elderly residing in Pismo Beach and Shell Beach, the old social organizations persisted; except for increased involvement in civic affairs among Shell Beach residents, there was little change in social organization, economic position, or group interaction. A number of key informants indicated that over the past ten years there has been a noticeable turnover of elderly residents in the Shell Beach area, as homes were sold to younger and more affluent residents. To these informants, this reflected the phenomenal escalation in property values in San Luis Obispo County, especially in the coastal communities.

The elderly residents of Pismo Beach were not generally affected by the influx of construction workers to their community because social contact and integration between the plant's work force and the elderly residents were limited. In terms of social cohesion, the existence of the plant did not alter the social and economic patterns of the elderly community.

¹The discussion of the public response to the Diablo Canyon plant (Chapter 9) points to major political conflicts within the political structure of the county. The nuclear issue had a major role in the growth and continuation of the polarization of political positions.

8.5.1.4 The Hispanic Community

The economic, social, and housing conditions of the Hispanic community have not changed to any significant degree since 1970. Overall, in spite of job opportunities made available through the plant-related expansion of nonbasic employment, by the late 1970s, the competition from other groups for these jobs resulted in continued high levels of unemployment and underemployment for the Hispanic community. The fact that middle income residential housing developments began to encroach into the Hispanic community resulted in the further decline of the Hispanic community as a functional unit. These changes were not influenced or affected by the construction of the Diablo Canyon plant.

8.5.1.5 The Urbanites

The size of the urbanite group increased substantially during the study period, particularly in the Arroyo Grande/Grover City area. There was some evidence to support the view that the level of social interaction among members of the group had increased, as indicated by the growth in the number of informal social organizations, such as athletic leagues. However, differences between the large professional class (physicians, teachers, public service officials) and the skilled blue-collar class seemed as sharp as it had been prior to the period of study, especially in regards to values toward growth. Although the urbanites generally were politically conservative and held pro-growth sentiments, there were indications that concerns over environmental quality, including the nuclear plant, were sensitive issues among some of the professionals. Despite these concerns, professionals in the Five Cities Area had only limited involvement in environmental issues. This was in sharp contrast to professionals in the community of San Luis Obispo who showed a high level of involvement. This difference may be accounted for by the role of the university in the City of San Luis Obispo, the sense of community among the city's residents, the more lengthy residence status, and the previous public interest group involvement of that city's professionals in the political process. The professional urbanites in the Five Cities Area were more recent immigrants and their attachment to a particular community was not as developed.

The employment effects of the plant's construction were important primarily for the skilled craftsmen of the area. The Five Cities Area had a relatively large labor pool of construction workers. This was reflected by construction work opportunities in Santa Barbara County (Vandenberg Air Force Base), construction work force residuals from the Morro Bay power plant, and public facilities and housing expansion in the Study Area. Employment problems in the building trades industry surfaced in the late 1960s as work

on Vandenberg was phased out, and in the mid-1970s with the national slow-down in housing construction. The employment impacts to the urbanites helped diffuse the generally high unemployment levels in the construction industry during these two periods.

Aside from employment at the project site and some project-related nonbasic employment, the Diablo Canyon plant was not an important factor in the changes that occurred to the urbanite group. The increased organization and social activity were largely a function of population increases in the group and a growing recognition and identification of the Five Cities Area as their community. To the urbanites, the nuclear plant was not considered a major social/political issue, and minimal overall political participation evolved as a result of the plant.

8.5.2 Changes in the Relationships among the Groups

The effects of the Diablo Canyon project on the Five Cities Area as a whole, and on the internal organization of the groups, resulted in relatively small changes in group interrelationships. In some cases, the effects of the project were only part of larger trends that were underway, such as the growth of the tourist industry and housing construction expansion as a response to high rates of in-migration. Prior to the project, the social and economic links among groups in the Five Cities Area were not especially strong. The level and type of interaction between groups did not change much during the study period.

8.5.2.1 Economic

Although the business community benefited directly from the income generated by the project throughout the study period, the business owners did not consider the relationship between the construction work force and themselves to be different from their relationship with the tourists. The fact that the economy of Pismo Beach was primarily geared to the tourist trade ensured that economic interaction among groups would be limited: the tourist industry was not a large employer in the area. In general, the business community in the Five Cities Area was diverse and the business centers spatially separated. The agricultural-Arroyo Grande economic linkage, for example, remained the same during the study period and was not affected by the plant's construction. No new business establishments emerged as a direct or indirect effect of the plant; thus, the existing economic pattern of exchange was not altered.

Aside from the additional jobs created by the Diablo Canyon project, the structure of the local economy remained relatively unchanged during the study period. In terms of employment, the Five Cities Area was an integral part of the larger regional economic system, and the places of employment for large segments of the Five Cities Area were outside the area, usually in the City of San Luis Obispo or in Santa Barbara County. This further diluted the level of economic interaction among the groups. This pattern of economic interrelationships was not altered by the plant to any significant extent. The impact of the project in terms of employment and income was not particularly large relative to the area as a whole. Examination of the major economic relationships among the groups in the Five Cities Area reveals that the employer-employee linkages existing over the study period were not affected by the construction of the plant.

8.5.2.2 Political

The public response and political ramifications of the nuclear plant are described in Chapter 9. Aside from addressing a number of issues over the potential hazards of the nuclear plant within the context of community resolutions, in the Five Cities Area the level of public involvement over the plant was, in general, low. For instance, no important public interest group emerged in the Five Cities Area. Moreover, during the study period, the business community lost some of its political leadership as professionals from the urbanite group became elected officials. Although such individuals were, generally, more politically sensitive about environmental quality concerns and on occasion may have expressed opposition to the Diablo Canyon project, there is no evidence to indicate that they were elected primarily on the basis of their position on the nuclear facility. However, the research findings suggest that the community disputes between the business/agricultural groups and the environmentalists (elderly and some urbanites) increased during the study period. This was, in part, a result of the political climate generated by the controversy over the nuclear plant in the county. In sum, the political relationships among the groups in the Five Cities Area do not appear to have been substantially altered since 1970 as measured by the nature of the issues, political participation, and leadership structure.

8.5.2.3 Social

Overall, the social relationships among the groups at the time of the study remained much as they were profiled for 1970. This was not unexpected, given the natural propensity of the area toward a low level of social cohesion. There are a number of factors that may explain this. The area had developed very rapidly during the last two

decades as a tourist/retirement center and as a residential area for families in-migrating to the area from Los Angeles. The lack of a traditional sense of community, high levels of transience and population turnover, and the development of "community of interests" and social ties outside the area of study, were factors that inhibited the development of stronger social interaction.

CHAPTER 9: PUBLIC RESPONSE TO THE DIABLO CANYON NUCLEAR POWER STATION

9.1 Introduction

The purpose of this chapter is to identify and describe the public response that arose in connection with the project. The response to the Diablo Canyon facility began in the early 1960s as a local issue over the siting of the plant, and it has persisted to the present as a major local and regional political question. In this chapter, the issues over the nuclear plant will be identified; the institutions, constituencies and political activities will be described; and the impact on the Study Area will be assessed. It is also important to ascertain the degree to which residents of the Study Area participated in public activity, to gauge their level of concern over the facility, and to measure the salience of issues provoked by the construction and probable operation of the nuclear station.

The history of public response to the Diablo Canyon project comprises both formal and informal public responses. Formal public responses consist of two major elements: (1) responses by groups through normal governmental channels, such as the contentions raised by interveners during permit hearings; and (2) local governmental responses, as illustrated by resolutions passed by communities to reduce potential hazards. Informal public responses refer to events or activities that take place outside existing political channels and are directed at issue resolution. The emergence of public interest and environmental organizations as well as organized public protests are examples of such activities. In addition, changes in the attitudes, concerns, and behaviors of residents are considered important components in measuring the public response to the Diablo Canyon plant.

9.2 The Pre-Construction Period, 1964-1970

The initial public response to the siting and proposed construction of a nuclear station in San Luis Obispo County began during the pre-construction period with the general planning efforts undertaken in the early 1960s; it continued until after construction permits for Units 1 and 2 were issued in 1968 and 1970, respectively. This period is characterized by a shift in responses--from a generally favorable climate in the early 1960s, when the public was accepting of nuclear facilities, to a less favorable climate where public concern over environmental questions have engendered local opposition to the nuclear plant siting. This period in Diablo Canyon's history is indicative

of the changing attitudes of many Americans regarding the impact of nuclear power plants on the natural environment (Kasperson, et al, 1980). The nature of the public response to the Diablo Canyon plant during this period was most observable during the early siting controversy, by the contentions expressed in the California Public Utilities Commission hearings, and in the Atomic Energy Commission's Construction Permit hearings.

9.2.1 Site Selection Issue

The site initially selected for the plant was a 1,121 acre plot near the coastal sand dunes at Nipomo in San Luis Obispo County, approximately 20 miles south of the present Diablo Canyon site. The selection of that site was favored by the county supervisors, and no evidence was found to indicate that there was any significant public opposition at that time. Rather, information from interviews with key informants suggests that the tax revenues from constructing the facility were expected to be large and relatively important to the county economy. The anticipated increased taxes and the expected increased sales in the business community were factors identified by key informants as enhancing local acceptance of the proposed site. (Blankenburg, personal communication, 1980; Brand, personal communication, 1980; Crook, personal communication, 1980; Drazee, personal communication, 1980; Mankins, personal communication, 1980; Rogoway, personal communication, 1980.)

Early concerns about the plant centered on the environmental effect regarding the Nipomo Dunes location. Both the Sierra Club and the California State Resources Agency (parks and recreation) took the position that this part of the coast should be developed as a scientific and recreational area rather than an industrial area with a power generating facility. The opposition to locating the plant at Nipomo Dunes was not directed at preventing the establishment of a nuclear power station per se—at that time the Sierra Club had not as yet taken a position against the development of nuclear power—but was motivated to preserve what they considered a unique coastal environment. In fact, the Sierra Club's position was that, if the Nipomo Dunes site was selected for the plant, it should be set 4,000 to 5,000 feet inland from the beach area. According to the utility, constructing the plant so far inland would entail a significant loss of economic advantages, especially regarding the cooling design system. Because of the additional costs, the utility rejected the inland siting proposal. (Pacific Gas and Electric, 1978a; Dixon, personal communication, 1980; McChesney, personal communication, 1980; Reents, personal communication, 1980; Rogoway, personal communication, 1980.)

The outcome of the siting issue was a decision made by the Pacific Gas and Electric Company to work in concert with the state agencies, the County Planning Commission, and the conservation groups in an effort to find a suitable alternative site. The Diablo Canyon site was selected with the assistance of local conservation groups and the County Planning Department.

The site selection process took place over a period of two years, 1964 to 1966. Comparisons were made of eleven potential southern coastal sites using seven siting criteria: availability of circulating water, isolation for the exclusion area, land availability, suitable routes for transmission lines rights-of-way, community acceptance, access to transportation, and a seismologically adequate foundation. Three of the sites were rejected because of their location within the Vandenburg Air Force Base exclusion area in Santa Barbara County. The other sites, except for the Avila Beach site, were also rejected on the basis of "unfavorable community acceptance," as these locations were near existing or proposed state parks or residential areas. The Avila Beach site was withdrawn from consideration because of privately planned development of the area. In 1966, the Diablo Canyon site was selected, following agreement by the State Resources Agency, the Sierra Club, San Luis Obispo County, and the County Conservation Association. (U.S. Atomic Energy Commission, 1973.)

9.2.2 The California Public Utilities Commission Hearings (CPUC), 1967 - 1969

Prior to issuance of a construction permit by the AEC/NRC, a utility in the State of California must obtain a Certificate of Public Convenience and Necessity. The utility is required to furnish information on cost of power, safety factors, and environmental effects in an effort to support its claim that the nuclear power plant is needed and can operate safely. As part of the CPUC evaluation process, public hearings were held in 1967 for Unit 1, and in 1968 for Unit 2. Unit 1 was approved in November 1968 and Unit 2 in March 1969. The hearings afforded an opportunity to ascertain the areas of public concern over the Diablo Canyon plant.

At the CPUC hearings, public opposition to the Diablo Canyon nuclear plant was principally limited to the environmental effects of the plant because of its coastal location. The major issues, in fact, focused on the protection of the California coastline. This emphasis on the coastline is demonstrated by the list of the political factors, their location, and their motivations shown in Table 9-1. Contentions were made that the construction and operation of a nuclear power plant would adversely affect the

TABLE 9-1

DIMENSIONS OF COASTLINE ISSUE
CALIFORNIA PUBLIC UTILITIES COMMISSION HEARINGS
1967 AND 1968

Typology of Group or Individual(s)	Organization or Individual(s)	Location of Organization or Individual(s)	Motivation
Environmental	Scenic Shoreline Preservation Conference	Santa Barbara County and San Luis Obispo County	Specifically opposed the siting of the plant because of environmental effects to coastal region.
	State Park Planning and Development	State Agency	Desired open space and no industrial development along California coast.
	Two academicians from State Universities	San Jose, San Francisco	Wanted to protect the coastline.
Civic	San Luis Obispo County Planning Commission and County Board of Supervisors	San Luis Obispo County	Favored plant because of increased assessed valuation.
Special Interest	Abalone Fisherman	San Luis Obispo County	Contended that thermal emissions would adversely effect the abalone population and the individual's economic welfare.
Special Interest	Property Owner	San Luis Obispo County	Opposed to plant because of transmission line routing.
Single Purpose— Anti—Nuclear	Individual	San Luis Obispo County	Opposed to nuclear plant on the basis of seismic risk.

Source: Mountain West Research, Inc., 1980.

natural coastline, the recreational potential, and the coastal wildlife and fish. The expression of the need for preserving the natural state of the coastal area was spearheaded by the Scenic Shoreline Preservation Conference (SSPC), an environmental interest group formed specifically to oppose the siting of the Diablo Canyon plant. (San Luis Obispo County Telegram-Tribune, 1967-1969; California PUC hearing documents.)

The formation of the SSPC is particularly important to understand the emergence and the duration of nuclear plant-related issues. When the Sierra Club originally approved the plant site at Diablo Canyon, its membership had not reached a consensus regarding the site. In fact, a number of Sierra Club members had taken a position opposing the building of a nuclear plant in any part of the coastal region. The internal conflict within the Sierra Club resulted in some members withdrawing from the organization and subsequently forming the SSPC to oppose the Diablo Canyon project. The SSPC presented its views on environmental effects at the CPUC hearing and participated as interveners in the AEC/NRC licensing permit hearings. The group is centered in Santa Barbara County, but some of its members reside in San Luis Obispo County. (Silver, personal communication, 1980.)

9.2.3 Construction Permit Hearings, 1968-1970

Pacific Gas and Electric submitted an application to the AEC for a construction permit for Unit 1 in January 1967, and a public hearing was held in San Luis Obispo on 20-21 February 1968. The permit was issued in April 1968, following a brief public hearing at which a number of environmental concerns were expressed. These concerns did not differ from those expressed during the CPUC hearings. The construction permit application for Unit 2 was filed in June 1968, and a short public hearing was held on 13-14 January 1970. The main contentions of the interveners included potential environmental effects of plant operation and the instability of the geological foundation on which the plant would be built. In August 1970, seven months after the January hearing, the hearing was reopened on the basis of additional geological evidence to be presented by interveners. However, the Atomic Safety Licensing Board did not find the evidence persuasive, and in December 1970 the construction permit for Unit 2 was issued by the AEC.

9.3 Attitudes toward the Diablo Canyon Project during the Pre-Construction Period, 1964-1970

9.3.1 The Utility

Planning for the nuclear generating facility that resulted in the construction of the Diablo Canyon plant began in the the early 1960s. At that time, Pacific Gas and Electric had made decisions to invest heavily in nuclear power development, and the Diablo Canyon plant was one of five existing or proposed facilities. According to the Pacific Gas and Electric Company, the decision to build nuclear plants in their service area was based on the idea that the development of nuclear power would have economic and environmental benefits over fossil-fueled facilities. The utility was also cognizant of the importance that state and local agencies placed on preserving the environmental quality of the coastal area, and stated that nuclear power would be environmentally advantageous and would not discharge combustion products into the atmosphere. The development of a large fossil-fueled facility in nearby Morro Bay reinforced the utility's argument for an environmentally cleaner and alternative power source for the region. (PG&E, 1978a,b; Davin, personal communication, 1980; Draeger, personal communication, 1980; Hoch, personal communication, 1980.) Moreover, in the 1960s, the national scientific consensus and political climate favored the development of nuclear power, and this public predisposition was apparent in the Study Area. Nuclear power for generating electricity was generally viewed as economically and environmentally preferable to conventional generating stations.

9.3.2 Community and Political Leaders

Between 1962 and 1970, residents of the Study Area had a generally favorable attitude toward the Diablo Canyon plant, and local politicians and the business community had a highly favorable attitude toward its location in the county. Interviews with business leaders indicated that, in general, there was support for the plant when it was announced because large increases in economic activity and tax revenues were anticipated. All of the area business leaders interviewed agreed that, during the 1960s, unemployment was generally high, the tourist industry was experiencing large seasonal fluctuations, and industrial employment was needed to increase the tax base and to reduce unemployment. The nuclear plant, it was perceived, would aid in meeting these objectives. (Adams, personal communication, 1980; Armstrong, personal communication, 1980; Blankenburg, personal communication, 1980; Garth, personal communication, 1980; Holloway, personal communication, 1980; Layne, personal communication, 1980; Mankins, personal communication, 1980.)

The San Luis Obispo County Board of Supervisors unanimously endorsed the Diablo Canyon plant. Interviews with the county administrators, supervisors, and planners who held positions at that time suggest that the location of the plant was acceptable to the county because it was relatively isolated and without public access. The Board of Supervisors publicly endorsed the nuclear plant, largely motivated by the increased tax base the plant would generate. In fact, the members of the board fought among themselves, each wanting the plant to be located in his own district. In addition, efforts were made to redraw school district boundaries at that time to equalize the tax benefits from the plant. (Brand, personal communication, 1980; Mankins, personal communication, 1980; San Luis Obispo County Telegram-Tribune.)

The planning department, while generally favoring the plant, was originally interested in issuing a conditional use permit for Diablo Canyon until a number of zoning studies had been completed. However, the California District Attorney ruled that the state (CPUC) superceded the county in zoning for utilities. Despite this setback in local authority, the planning department continued to monitor the project's development. In addition to helping locate the plant, the planning department actively participated in challenging the utility over a number of transmission line issues. The department criticized the routing of transmission lines over valued scenic landscapes and the method by which towers were built (which resulted in erosion problems); in two cases, it was successful in changing the routing. (Rogoway, personal communication, 1980.)

9.3.3 The Public

Pacific Gas and Electric Company sponsored a public opinion poll in 1967 that questioned attitudes toward nuclear power (ORC West, 1967). The poll found that 75 percent of the residents of the City of San Luis Obispo favored the construction of nuclear power plants near their community, while only 7 percent opposed such facilities. The percentage of respondents in the City of San Luis Obispo favoring nuclear power plants was higher than the percentages in the other two cities covered in the survey, Sacramento and Santa Monica. However, only 40 percent of the residents in the City of San Luis Obispo were aware of a proposed plant site in their own area. Of the respondents in the City of San Luis Obispo 61 percent did not see any disadvantages in having an atomic plant nearby and 19 percent indicated that there were disadvantages to having an atomic power plant in or near their community. However, of those respondents who indicated there were disadvantages, less than one-third were concerned about exposure to radiation and about one-fifth expressed fear of a plant accident. Only

5 percent of those who were concerned about the nuclear power plant identified its potential for changing the nature of their community as the basis of their concern.

The poll indicated that 63 percent of the City of San Luis Obispo sample perceived that a nearby atomic power plant would have advantages. The principal advantage—that nuclear plants would produce "more economical electricity"—was followed by the view that a nuclear power plant in the area would attract industry or create jobs. In addition, a large number of respondents indicated that nuclear power plants would have air quality advantages over fossil-fueled plants. Almost 10 percent of these respondents indicated that one advantage of having a nuclear power plant near their community was that it would reduce property taxes.

9.3.4 Summary

In general, it can be said that the plant originally was strongly favored by the major political, business, and agricultural interests in the county and also by most residents, as the City of San Luis Obispo survey suggests. This acceptance may have been related to economic considerations: new job opportunities were identified as the major concern of San Luis Obispo city residents, as shown in the 1967 survey. Despite this predilection, public concerns over environmental quality should not be downplayed: with a large elderly (retired) population, to whom environmental conditions were important, and a large, politically active professional population in the City of San Luis Obispo, the preconditions for intervention in the siting process existed.

9.4 The Environmental Hearings, 1973 - 1978

The environmental hearing over the Diablo Canyon plant, Unit 2, took place in 1973, but a number of unresolved questions resulted in periodic reopenings of this hearing until 1978 when final decisions were made on the environmental impacts. The 1973 hearing was necessitated because the NEPA required that the construction license renewal be accompanied by an environmental assessment.¹ (Unit 1 was approved before NEPA.) The NEPA hearings took place while construction of the plant was underway. Consequently, a number of specific environmental effects from plant construction became contentions at the hearing in addition to the more generic environmental issues.

¹The passage of the National Environmental Protection Act and its application to nuclear power plants (Calvert Cliffs decision) required an environmental impact statement for plants that had not yet been issued an operating license.

The results of a pre-hearing in June 1973 ruled out any discussion of the danger posed by earthquakes to plant safety as part of the environmental hearing. The interveners charged that it was irresponsible not to consider seismic matters at this hearing because of the 1971 San Fernando quake, which may have altered the geophysical nature of the area.¹ However, contentions over thermal discharges and their impacts, power requirements, transmission lines, and cooling techniques were approved for inclusion in the hearings. (San Luis Obispo County Telegram-Tribune, 1973.)

§.4.1 Concern Over Environmental Quality: Regional Background

The historical evidence suggests that during the pre-construction period the principal concern expressed by the public over Diablo Canyon was related to the potential damage to the coastal environment. Public expressions of concern, as measured by participation in the hearings, was generally limited to environmental interest groups and a few individuals expressing self-interest contentions. A number of key informants, including interveners, suggested that the relatively limited opposition to the plant during the pre-construction period may have been the outcome of the Sierra Club's endorsement of the Diablo Canyon site, the County Planning Department's efforts in monitoring the plant's development, and the general public attitude that nuclear power posed fewer air quality problems than fossil fuel plants. However, these individuals also pointed out that the protection of the coastal environment had been a long-time concern of residents in the region and that, by the early 1970s, environmental/conservation issues were of principal interest to residents of the area. (DiCarli, personal communication, 1980; Draeger, personal communication, 1980; Mankins, personal communication, 1980; Reents, personal communication, 1980; Rogoway, personal communication, 1980.)

The importance and growth of environmental quality as a major public issue in the region can be illustrated by the following examples. In 1964, the proposal to site a nuclear power plant at Bodega Head, California, was not successful due to public opposition based on seismic and environmental concerns. In the mid-1960s, while San

¹The interveners argued that the information gained from the 1971 earthquake demonstrated that the geologic data used for the plant's construction in 1966 was invalid: according to the interveners, accelegraphy records showed that ground movement in geologic areas similar to the Diablo Canyon site could be higher than the maximum values that were used to design the Diablo Canyon plant. (San Luis Obispo County Telegram-Tribune, 1973.)

Luis Obispo County experienced substantial growth in its population and in its economic base as the tourist industry expanded, the planning philosophy established the county as one based on preserving agriculture, preserving the coast for tourism, and protecting natural resources. To this end, the planning department monitored the construction activity of the Diablo Canyon plant and criticized a number of the utility's decisions. In addition, the planning commission defined limits for the growth of urbanization in the county. The agricultural preserve program was a concept instituted to restrict urban growth in the northern and southern parts of the county by reducing certain taxes on farmland under the condition that the land not be sold for development for a set period of time. By the late 1960s, northern coastal communities in the Study Area, such as Cambria and Morro Bay, had a strong environmental philosophy. Because of water supply problems in this part of the county, limited growth was planned. Morro Bay passed a moratorium on further development, and the coastal commission passed regulations to prevent growth in communities with water supply problems. The City of San Luis Obispo had also taken strong planning measures to restrict growth by discouraging industrial growth and by passing a law that would refuse annexation without public approval. (Rogoway, personal communication, 1980; Mankins, personal communication, 1980; Evans, personal communication, 1980.)

Strong support for preserving and protecting the environment manifested itself in the late 1960s and early 1970s in a number of public issues. The proposal to construct the Lopez Dam for county flood control resulted in a clash between government officials and environmentalists who claimed that the project would destroy important and unique natural habitats. Similarly, the proposal to develop the Port San Luis Harbor as a recreational-boating marina was objected to as growth-inducing, and the Hearst Ranch project to develop 28 thousand acres in the northern part of the county was opposed by a number of the county's conservation groups. Finally, the Lomex project to explore for uranium near Santa Margarita emerged as a countywide issue as groups expressed concern with the adverse effects uranium mining could have on the groundwater. (Silver, personal communication, 1980; Mankins, personal communication, 1980; Smith, personal communication, 1980.)

The trend toward conflicts over growth issues resulted in a change in the structure of the County Board of Supervisors. This change resulted in the election of two environmentalists to the five-member board. Since 1972, the board has been split between pro-growth advocates (three supervisors) and environmentalists (two

supervisors). Although the evidence indicates that this change did not occur directly as a result of the Diablo Canyon plant, the long controversy over the safety of the plant reinforced the split among the county supervisors. For example, there was a vote to have the board be part of the interveners during the licensing hearings. This vote was defeated. The split was also apparent on most growth issues. For example, with respect to the Lomex uranium project, a resolution to ask the Bureau of Land Management to place a moratorium on mining failed to pass. (Mankins, personal communication, 1980; Silver, personal communication, 1980.)

In the early 1970s, the need for environmental protection received strong support statewide, especially with respect to the coastal areas. The level of environmental activity and concern over growth questions were particularly intense in the Study Area. This concern was not initiated by the proposal to build the Diablo Canyon plant; rather, environmentalists viewed the decision to construct and operate a nuclear plant in San Luis Obispo County as another example of encroachment on limited natural space, in addition to its posing a number of serious environmental impacts. When the nuclear plant was an issue at the CPUC hearing, the County Board of Supervisors unanimously endorsed the utility's plans for its construction. By 1972, the political climate in the county had changed: environmental protection had become a respectable cause, the coastline initiative to limit coastal development had passed, and a "go-slow" development attitude was reflected in the election of two environmentalists representing, in part, the City of San Luis Obispo. (Mankins, personal communication, 1980; San Luis Obispo County Telegram-Tribune.)

9.4.2 Transmission Line Issue

Long-term effects of access road construction (necessary for building transmission lines) were identified by the AEC staff prior to the environmental hearings. The AEC concluded in the Final Environmental Statement (FES) that the utility's construction and replanting practices were inadequate to prevent serious and extensive erosion problems in steep terrain; consequently, they required that corrective measures be taken. Construction of access roads has been a consistent source of contention since there were construction problems with approximately five percent of total access road miles. As of June 1972, the AEC staff recommended a program of in-sloping of roads, installation of culverts, and reseeding and planting in areas with potential erosion problems. Other transmission line-related problems such as erosion, aesthetics, and land use incompatibilities continued to be contentions expressed at the 1973 environmental

hearings. (Hoch, personal communication, 1980; U.S. Atomic Energy Commission, 1973; San Luis Obispo County Telegram-Tribune.)

9.4.3 Thermal Emissions Impact Dispute

The major issue during the environmental hearings centered on the impact of thermal emissions on the abalone population in the Diablo Cove. The interveners argued that the AEC's final environmental report on Unit 2 did not include complete studies of the thermal effects on marine life and that it did not provide sufficient information on the thermal plume. At issue was the intervener's objection to the size and shape of the thermal plume, based on studies provided by the utility and generally accepted by the AEC. (San Luis Obispo County Telegram-Tribune; Silver, personal communication, 1980; Hoch, personal communication, 1980.)

In the Final Environmental Statement (1973), the AEC expressed concern that the thermal discharge at Diablo Cove could reduce the abundance of kelp, which in turn would adversely affect the abalone population. The catch of abalone in the area was estimated to be substantial (365,817 pounds in 1968 alone), and amounting to 53 percent of commercial fish caught between 1965 and 1970. The AEC staff also argued that additional reductions in algae might occur and that this, in turn, might further reduce the black abalone population in the area. On the assumption that the algae is reduced in an area equal to one-half the cove area, the AEC estimated a total loss of 110,000 abalone. (U.S. Atomic Energy Commission, 1973.)

Utility consultants disputed this number and argued that only a small population near the plant was in danger; most of the abalone, it was concluded, were able to tolerate warmer water. The utility also argued that the area of loss (35 acres) was comparatively smaller than the AEC estimate and, additionally, other species of kelp would take over in warmer water while, at the same time, the abalone would adjust to the thermal changes. (San Luis Obispo County Telegram-Tribune.)

The method by which the utility predicted the areal extent and nature of the thermal plume was based on comparative information from other ocean discharges, such as the nonnuclear Morro Bay plant. The AEC concluded that the analytical data used to predict discharge impacts was not sufficient and that the "utility should continue construction while studies are carried out." In addition, the AEC stated that "any unacceptable degree of damage could result in construction shutdown." The interveners

criticized this ruling because a standard to define "unacceptable" was not determined. (San Luis Obispo County Telegram-Tribune; U.S. Atomic Energy Commission, 1973.)

9.4.4 Environmental Problems due to Construction

A number of environmental problems surfaced during the construction period. In 1972, construction activity resulted in siltation, which killed almost all the abalone and algae in an area near the plant. Although the utility dredged the cove, the problem recurred in 1975. It was difficult to measure the economic cost of this loss since fishermen could fish elsewhere and since the abalone population at that time was being substantially reduced by its natural predators, which had migrated into the Diablo Cove area.

In 1975, Pacific Gas and Electric was cited by the Environmental Protection Agency (EPA) for releasing toxic copper into the ocean following tests on the cooling system. Following the EPA citation and the expectation that a second test was to be conducted, the State Regional Water Quality Control Board conducted a hearing and ordered that the utility not discharge toxic material into the ocean. As a result of this order, PG&E decided during the environmental hearing to replace the copper tubing with titanium tubing at a cost of \$5 million. The interveners, in response to this problem, again voiced criticism that the previous studies by the NRC and the utility regarding the impact to the abalone population were not adequate; they argued that there was a need for an alternative plant design to compensate for the environmental change—a few thousand abalone were estimated to have been killed as a consequence of the copper discharge. The utility, in the form of compensation to the environmental damage, paid the state \$375 thousand for an abalone planting program. (Environmental Hearings Docket; San Luis Obispo County Telegram-Tribune.)

Thus, the issues expressed at the hearings were centered on three major contentions: the destruction of the natural coastline; interference with abalone fishing; and erosion from transmission line construction. The interveners ultimately failed to halt construction of Unit 2 on the basis of environmental issues and, on 6 June 1978, the Atomic Safety Licensing Board reached its decision that Diablo Canyon had met the federal environmental requirements. It should be noted, however, that the opposition to the plant conformed to the constraints imposed by the rules and regulations of the AEC. Only environmental issues were discussed; concerns over health effects and seismic risk were not addressed.

9.5 Operating License Hearings: The Seismic Risk Issue

The application for an operating license and the Final Safety Analysis Report (FSAR) were filed in September 1973. According to utility personnel, key county informants, interveners, and media coverage, the seismic risk was the principal issue during the operating license hearing.¹ In a 1978 chronology of the Diablo Canyon plant, written and published by the Pacific Gas and Electric Company, the questions relating to seismology and geology were identified as the critical variables in delaying the commencement of the plant operation.

From 1973, right up to the present time, the NRC staff and its consultants and the ACRS and their consultants, have reviewed, analyzed, and examined the Diablo Canyon design. The extent and depth of the review in the areas of seismology and geology was without precedent. Sixty-nine amendments have been made to the FSAR, over 70 meetings were held between NRC staff and PG&E, countless information requests were made and answered.

The final step in the licensing of Diablo Canyon is the ASLB hearing now scheduled for December in San Luis Obispo. Assuming the board recommends a license, the process will be concluded, having taken over five years. (PG&E, 1978.)

The salient issue in the debate over the issuance of the operating license was centered around the risk posed by siting the Diablo Canyon nuclear plant near an existing offshore earthquake fault. In order for the construction permits to be granted, the utility was required to furnish supporting data that the design criteria would meet postulated levels of seismic risk. The utility's assessments were approved by the AEC based on investigations of the site in 1965-1966. However, the discovery of an offshore fault (Hosgri Fault) in 1972, at a distance of three to five miles from the plant site, altered the accepted assumptions of the seismic risk in the area and initiated a process of risk assessment and regulatory decision-making over a period of several years (1972 to 1979), when an Initial Partial Decision was made by the NRC following a series of public

¹According to the interveners, they are under the legal constraints imposed by the NRC. Although seismic risk is considered a critical area of concern, one intervener group argued that the main contention has been, and continues to be, that the routine and nonroutine radioactive emissions from an operating nuclear power plant can cause adverse health effects. The group profoundly disagrees with the assumptions made by the NRC and the nuclear industry in regard to "allowable" exposures to radioactivity. (Silver, personal communication, 1980.)

hearings in 1978.¹ The period was characterized by high levels of uncertainty and conflicting assessments of the risks posed by the offshore fault.² For the regulatory agency, it was a particularly difficult period because decisions had to be made under conditions of scientific uncertainty and in a context of growing public opposition and concern over a broad array of generic safety questions over nuclear power, especially following the Three Mile Island accident. For the utility, the seismic risk issue engendered increased local and regional public concern and opposition to the plant and resulted in costly delay and design retrofitting. For the interveners, the seismic risk issue was considered to be the most critical area of concern: the principal interveners who were interviewed held the view that the operation of the plant in itself posed unacceptable risks to the public, and that the location near a fault substantially increased the probability of a major accident.

9.5.1 Issues in the Risk Assessment Process

The risk assessment process may be considered to consist of three major components of risk: identification, estimation, and evaluation (Kates, 1980). Risk assessment efforts over the Hosgri Fault have been characterized by contentions over scientific fact and interpretation inherent within each major component of the assessment process. Components of risk assessment are outlined as follows: identification—the definition of the fault, its extent and physical characteristics, and the

¹A few individuals have noted that the fault was discovered in 1969 and that the knowledge of that fault discovery was withheld as proprietary information until 1971 when an article was published in a trade journal.

²It is important to note that, except for a pre-hearing conference held in 1974, a five-year delay occurred in the public hearing over the operating permit in order to conduct investigations and to determine the nature of the seismic hazard.

The interveners—Scenic Shoreline Preservation Conference, Mothers for Peace, and California Polytechnic Ecology Group—presented a position to ban further construction of the plant until the available data on recent offshore seismic studies were completed. Earlier, the Atomic Safety Licensing Board (ASLB) made the decision to not consider the seismic issue during the environmental hearings. In April 1974, the ASLB delayed the decision to terminate construction activity at the Diablo Canyon site: the issue was to be taken up at the Operating License Hearings after an assessment and evaluation of the fault and the risk posed to the nuclear facility. The interveners perceived this decision to be highly detrimental to their case. It meant that construction would continue to proceed, making it more difficult for the interveners to later argue for the plant's termination, especially once its construction was completed. Second, the plant's opponents argued that the further construction advanced, retrofitting would become less acceptable and less suitable in reducing the potential seismic hazard.

nature of the geological structure at the site in order to assess the magnitude of the seismic disturbance; risk estimation--measurements of the postulated earthquake magnitude and ground acceleration and probability of earthquake occurrence; risk evaluation--the judgment of the level of risk that is acceptable, the balancing of benefits and risks, and the acceptability of design criteria to withstand the postulated seismic hazards.

Contentions in Risk Identification

The utility consistently argued that its 1966 assessment of the seismic hazard was valid in light of the Hosgri Fault discovery and that the plant was designed to withstand a probable Hosgri earthquake. The original plant design was based on two determinations of seismicity. First, according to the utility, extensive site exploration demonstrated that the site was not affected by significant fault movements and, additionally, that there was an absence of seismic activity on land such as might result from an extension of an offshore fault. Second, and more important, the design of the plant was based on what was evaluated to be conservative assumptions of a large quake occurring in the region or near the site: a 6.75 magnitude earthquake was the maximum ever expected to occur at the site and the plant was designed to be able to safely withstand a force of that magnitude.¹ The Hosgri Fault, as evidenced by the utility's 1972 FSAR, was assessed to present a low level of seismic activity which could be accommodated by the plant's

¹According to the utility, a 6.75 magnitude event directly beneath the plant would result in a plant shutdown following a 0.4g surface acceleration. Prior to the discovery of the Hosgri Fault, interveners criticized the plant's design because ground acceleration during the San Fernando 1971 earthquake was substantially higher: the design based on 1966 data was considered invalid by the interveners. The interveners argued that the plant originally was designed to withstand a force of 0.2g. The AEC, to be sure of conservatism in the design, required the plant to use figures expressing a "double design earthquake (DDE)." Thus, Diablo Canyon was built to withstand 2 x 0.2g or 0.4g. After the Hosgri was discovered, the NRC used the "Safe Shutdown Earthquake (SSE)" design criteria. The staff's position called for the plant to withstand a 0.75g force. The earlier DDE requirement would have called for a seismic design to protect against a 1.5g force. Moreover, the interveners argued that the 0.75g figure underestimated the risk by removing the peak acceleration forces which may reach 2.0g. (Silver, personal communication, 1980.)

original design.¹ (Hoch, personal communication, 1980; U.S. Atomic Energy Commission, 1974; U.S. Nuclear Regulatory Commission, Initial Partial Decision, 1979.)

The interveners' contention was that the utility failed to adequately determine the length of the offshore fault, its relationship to the regional tectonic structure, and the nature of the displacement along the fault, all of which are considered to be critical factors in determining the magnitude of a possible earthquake and the probability of its occurrence.² Supported by a number of scientists, the interveners' position was that the Hosgri Fault was connected or linked to other offshore faults, resulting in a much lengthier fault with a potentially much larger magnitude.³ The utility, with support from the United States Geological Survey (USGS) and the NRC staff, criticized these views and argued that the Hosgri Fault was not linked, but rather part of a regional fault system characterized by individual, discontinuous faults. Further, the utility characterized the fault as a "capable" fault (as defined by NRC regulations) with a small to moderate magnitude, based on its relatively short length (50-100 miles) and minor surface displacement--a second or third order fault. The NRC Atomic Safety Licensing Board supported the utility's position that the Hosgri Fault was a "distinct unconnected break." The NRC used this finding to deny the request of the interveners to halt construction work until the seismic risk issue was resolved.

Contentions in Risk Estimation

In 1975, the NRC requested the USGS to evaluate the Hosgri Fault based on a contention that the ground motion value of 0.5g used by the NRC (the re-evaluated

¹This conclusion was based on knowledge of the seismic activity of three regional faults: San Andreas, 48 miles from the site; the Santa Yuez, 50 miles; and the Nacimiento, 20 miles.

²Some seismologists, for example, have theorized that the length of a fault is directly related to the magnitude of the earthquake, but this concept is subject to much question.

³One theory postulated by a scientist who testified for the interveners was that the Hosgri Fault joined with the San Gregorio offshore fault north of Hosgri and further connected with the San Andreas, forming a continuous fault of about 200 miles. This position was discounted by the NRC safety evaluation. One theory presented on the interveners' behalf was discredited by the NRC staff because of errors in the data and the use of extremely high input numbers used in the formula to calculate earthquake magnitude.

value) was inadequate and the contention that the 7.3 magnitude earthquake in 1927, thought to have originated in the Lompoc Fault further offshore, could be reassigned to the Hosgri Fault. The USGS studies based on 1975 and 1976 assessments resulted in the following findings:

1. The criterion for the design to withstand an earthquake was recommended to be a 7.5 magnitude event based on the fact that the 1927 earthquake with a possible magnitude of 7.3 may have occurred at the Hosgri site. Moreover, the large magnitude of the 1927 earthquake would preclude attribution to the Lompoc Fault because of the fault's relatively short length of 8 miles.
2. A possible 7.5 magnitude earthquake exceeded the plant's seismic design criteria, and the 7.5 value was recommended to be used to determine the safety of the plant in the event of an earthquake.¹

The utility argued against the USGS findings and recommendations. According to the utility consultants, the Hosgri Fault was not the source of the 1927 quake because there was no evidence of any significant offset of the sea floor. The utility consistently argued that the plant's design to meet a 6.5 magnitude earthquake was reasonable. (Hoch, personal communication, 1980; U.S. Nuclear Regulatory Commission, Partial Initial Decision, 1979.)

In 1976, based on the USGS findings, the NRC requested PG&E to reevaluate the seismic structure on the basis of a 7.5 magnitude earthquake and to retrofit the plant to meet the 7.5 design criteria. Of critical importance was whether the Diablo Canyon plant could adequately cope with ground motion generated by a 7.5 magnitude earthquake.

The estimation of ground motion acceleration was an area of substantial contention. Based on the NRC staff's estimates, the utility took the position that an unlikely Hosgri event would result in a 0.75g (effective acceleration), which could be met by some modifications to the plant. (The original design was based on a 0.4g peak ground

¹The magnitude of the earthquake is related to vibratory ground motion, which is the basis of earthquake-resistant design. The magnitude is a measurement of total energy released, while the ground acceleration is a measurement of the rate at which the ground movement increases and decreases during the earthquake.

acceleration.) The interveners, however, argued that, based on information gained in the 1971 San Fernando quake, a 1.15g (peak acceleration) for a 7.5 magnitude earthquake was probable.¹ In contrast to this position, PG&E held the view that a 6.5 magnitude earthquake and a 0.5g surface acceleration were adequate for seismic retrofitting; a 7.5 magnitude earthquake and a 0.75g surface acceleration were extremely conservative values, they contended. Despite this contention, the 0.75g acceleration was accepted by the NRC as a basis for the plant's retrofitting.

Contentions in Risk Evaluation

Based on the assumption of a 0.75g effective ground acceleration, the utility reanalyzed the plant structures and equipment, which resulted in a need to modify the structure of the turbine building at the plant to withstand greater ground movement. The interveners criticized NRC's apparent acceptance of what they considered an unacceptable risk situation. Interviews with interveners indicated that the seismic issue was not resolved to their satisfaction: (1) they believed that the assumption of a 0.75g acceleration for retrofitting the plant was inadequate to assure safety. Moreover, retrofitting was limited to noncritical areas of the plant; the integrity of the reactor and coolant system was not assured in the case of an earthquake of large magnitude; and (2) retrofitting at the relatively late stage of the plant's construction was perceived as problematic: construction activity should have been terminated much earlier, until the seismic issues had been resolved. The fact that two of the ACRS consultants dissented from the ACRS's recommendation to license Diablo Canyon reinforced the interveners'

¹The 1.15g value was derived by the USGS in Circular 672, which estimated near field ground motions to be used for design of the Alaska Pipeline, and was based largely on data estimated from the San Fernando magnitude 6.4 earthquake in which peak ground motion was recorded at 1.25g on a rock ridge adjacent to Pacoima Dam. The utility criticized this interpretation by arguing that the estimate of the acceleration was an anomaly because of the unique geologic structure at the dam site, which amplified the seismic movements. According to PG&E personnel, the USGS later modified its position and made it clear the the PGA (peak ground acceleration) values contained in Circular 672 were not necessarily intended to be used for design purposes, but could be reduced, based on engineering rationale. (Pacific Gas and Electric, personal communication, 1981.)

concern.¹ (Silvers, personal communication, 1980; San Luis Obispo County Telegram-Tribune, 1975-1980; U.S. Nuclear Regulatory Commission, Initial Partial Decision, 1979.)

9.5.2 Seismic-Related Nuclear Fuel Hazard

As construction of Unit 1 neared completion and fuel loading was impending, the interveners (Mothers for Peace) requested that the Nuclear Regulatory Commission prevent the Diablo Canyon plant from receiving the nuclear fuel. The group's position consisted of three arguments: (1) it was not justifiable to receive and store the nuclear fuel on-site prior to the issuance of the operating license; (2) the utility had not demonstrated that the storage facilities at Diablo Canyon would prevent the fuel from being activated during an earthquake; and (3) the utility had not established an on-site security system that would ensure against fuel sabotage.

The outcome of the request was that the nuclear fuel shipment for storage on-site was delayed. The NRC did not have sufficient or timely information to resolve the fuel safety storage issue, and no policy ruling had hitherto been made on the standard for safety with respect to the relationship between earthquake activity and its effect on stored fuel. In August 1975, four months following the request for a delay in the fuel shipment, the NRC ruled that it would presume that the stored fuel at the Diablo Canyon site would be unsafe until the utility could prove that there was no danger posed by the storage.

The public hearing (9-12 December 1975) on the receipt of nuclear fuel for Unit 1 resulted in four additional safeguards, including storage of the fuel in the spent fuel pool and storage in aborated water solution with a concentration of twice the acceptable standard. On 23 December 1975, the ASLB approved the storage of fuel at Diablo Canyon. The Mothers for Peace appealed the decision on the basis that an earthquake could cause the fuel to go critical. Both the NRC and the utility discounted the risk (probability of occurrence and the magnitude of the consequences) as being of an almost negligible probability. In June 1976, the decision to store the fuel on site was reaffirmed.

¹One of the dissenters agreed with PG&E's contention that a 6.5 magnitude earthquake was the largest that the Hosgri would be capable of, with an associated PGA of 0.75g. (PG&E, personal communication, 1981.)

9.6 The Nature of Public Intervention

9.6.1 Stages of Intervention

The complexion and nature of public intervention by both individuals and groups regarding the construction of the Diablo Canyon plant has changed markedly over time. Four distinct phases of public involvement were discerned. The earliest expression of public concern (1964-1966) was related to the site selection and the need to protect a unique coastal dune area. The selection of the present Diablo Canyon site ameliorated this concern.

The protection of the coastline continued to be a critical issue during the CPUC hearings (1968-1970) as environmentalists became the key participants. However, concerns were also expressed in this second phase by individuals motivated by self-interest, the potential reduction of the abalone population for fishermen and opposition to the routing of transmission lines.

In the early 1970s, the requirement of assessing the environmental impacts of nuclear generating plants had become legitimized through the passage of the 1970 National Environmental Protection Act (NEPA), and the Federal Water Pollution Control Act (enacted in 1972). Subsequently, the environmental (NEPA) hearings, the third phase of public intervention (1973 for the most part), were characterized by a shift away from concerns over the general encroachment of the coastal area to issues over thermal and radiological effects. Moreover, this third phase of public response was marked by growth in the number of committed interveners and in their public support; the interveners had also become more broad-based, representing environmentalists' interests (Scenic Shoreline Preservation Conference), parochial/private interests (limited appearances over such issues as transmission lines, erosion, and urban growth), and ideological/nuclear safety concerns (Mothers for Peace).

The fourth phase of public intervention (1975-1980) concerned issues over Diablo Canyon's safety, principally with respect to seismic risk. Other issues, mostly generic safety questions, such as the need for emergency planning, plant security, and waste shipment, were long-standing concerns but became salient following the Three Mile Island accident in Pennsylvania.

9.6.2 The Interveners

Four petitions were filed in 1973 to intervene in the environmental hearings. The Scenic Shoreline Preservation Conference was recognized as an intervener. The group was based in Santa Barbara County and had members in San Luis Obispo County. This group was formed in 1966 to oppose the siting of the plant following the Sierra Club's acquiescence, and participated in the AEC construction permit hearings. The Luigi Marre Land and Cattle Company, a ranching concern in San Luis Obispo County, also appeared as an intervener, and primarily opposed the routing of transmission lines on the ranch land. The company withdrew as an intervener following the environmental hearings. The third intervener, California Polytechnic Ecology Action Club, consisted primarily of a small group of individuals from the state university in the City of San Luis Obispo.

The fourth intervener, Mothers for Peace, was perhaps the most significant public organization opposing the project, as measured by the size of its membership, its long-term commitment to nuclear safety issues, and its visibility as the most active local opponent. The organization has a long history of political activism: in the early 1960s, individuals who later formed or joined the Mothers for Peace had been involved in opposing nuclear weapons-testing because of the radioactive fallout (Stontium 90) effects on children. Because of group members' strong ideological position against weapons-testing and war, the group was formed in 1969 to actively oppose the war in Vietnam. Its concern over the effects of radiation persisted and, with the termination of the Vietnam war, the group turned its attention to stopping the construction and operation of the Diablo Canyon plant during the operating license hearings.

The active membership of the group stands at about 40 members, but the inactive membership is substantially larger. Nearly all of the active group members are female and college educated, representing a wide range of ages. Although primarily residents of the City of San Luis Obispo, there are also members from Atascadero and Pismo Beach. Although the nuclear plant issue is of major importance to the group, the group is not a single-issue group, and it has been very active in a broader scale, especially over antiwar issues, the plight of Cambodian refugees, and the mining of uranium in the county. The group's major concern with respect to nuclear facilities included uranium mining as a health issue (just as they had opposed nuclear weapons-testing because of adverse health consequences); the group has therefore opposed such mining in the county. Group spokespersons indicated that the group has been instrumental in broadening the safety issues by introducing questions of risk that were not previously dealt with at hearings.

Such questions include the level of retrofitting and the level of risk inherent in stored fuel under conditions of geological instability. On these issues, the group feels it has been successful in delaying construction, in pressing for more stringent standards for storing fuel, in initiating local efforts to develop emergency evacuation plans, and in educating the public on the hazards of nuclear technology. However, the interveners have taken the position that "no amount of retrofitting or added band-aid adjustments will make Diablo safe." (Silver, personal communication, 1980.)

The concerns of the interveners and their supporters over the nuclear power plant were rooted in the environmental movement and in the disarmament/antiwar movement. Furthermore, the Diablo Canyon plant was located in an area where environmental quality was already held as an important community value. Of particular and consistent importance to the area residents was the preservation of the coast and its planned growth. With respect to the siting impact of the plant on the coastal environment, the early involvements of the Sierra Club, the planning department, and the SSPC were forerunners to the broader environmental issue of the State Coastal Initiative. Analyses of newspaper reports, interviews with key elected officials, and examination of voting records demonstrate that environmental quality concerns were important community issues in the county in general, and in the City of San Luis Obispo in particular. Moreover, individuals who consider themselves environmentalists are a powerful political force in the Study Area. A 1978 San Luis Obispo newspaper review of local elections concluded that 28 percent of the voting population were environmentalists and that questions over coastal planning were salient issues.

The interveners have been gaining local and regional public support since the mid-1970s. The interveners are, at present, closely linked with regional and local anti-nuclear organizations, which have proliferated during the past few years. The accident at Three Mile Island (TMI) was considered by the interveners as the critical point in the history of opposition to nuclear power, as the risks of nuclear technology and the probability of a seismic-related accident became a perceived possibility to them. The interveners who were interviewed criticized the NRC for its policy of promoting nuclear plants and not taking more stringent actions to assure safety. For example, a particularly disturbing fact, according to the interveners, was that the NRC did not terminate construction work until the seismic assessment was complete, which resulted, according to the interveners, in less stringent seismic retrofitting efforts.

9.7 Local Governmental Response

The purpose of this section is to ascertain the level to which local government officials in the Study Area responded to the construction of the Diablo Canyon plant. The consensus of those who were interviewed, including elected officials and chief administrators, was that the nuclear plant as a political issue was limited and had not affected local political processes in any significant way. Table 9-2 outlines the local governmental response in San Luis Obispo County.

At the San Luis Obispo County Supervisor level, a number of attempts have been made to prevent the opening of Diablo Canyon, but these have not been successful. Since 1972, two of the five supervisors (representing areas which include the City of San Luis Obispo and the university) have acted on behalf of environmental interests, while the remaining three supervisors have generally supported development in the county and have supported the Diablo Canyon facility. Elected governmental officials of local municipalities have generally supported the nuclear plant. As Table 9-2 illustrates, concerns over evacuation plans and transport of waste and fuel have been expressed by a few municipalities. However, outright opposition to the plant by elected local officials has been rare.

9.8 Informal Response

The nature of the public response to the Diablo Canyon nuclear generating facility has been described in terms of its two major dimensions: participation in legally constituted political arenas (the hearings process) and local governmental response. The third component, the level of public response outside of normal governmental channels, is more difficult to ascertain. For the Diablo Canyon case, two social phenomena were observed: a proliferation of broad-based organizations in the Study Area between 1975 and 1980, and a change in the levels of acceptability and attitudes toward Diablo Canyon by the general population of the Study Area.

9.8.1 Public Attitudes toward Diablo Canyon

Available public opinion polls were scrutinized in order to ascertain the degree to which residents of the Study Area favored or disapproved of the plant and the reasons for their predispositions. It should be noted that the survey instruments were not consistent in approach or in specific questions, and one in particular has been publicly criticized as biased. However, on the whole, they can be used as crude indicators of perceptual and attitudinal change.

TABLE 9-2

LOCAL GOVERNMENTAL RESPONSE TO
THE DIABLO CANYON NUCLEAR POWER PLANT

County/Municipal Governmental Body	Action(s)	Result
Planning Commission, San Luis Obispo County	Wanted to evaluate zoning implications of site, 1966.	CPUC overruled local authority.
	Worked with utility to select site, 1964-1966.	
	Criticized utility on access roads and routing of transmission lines.	Utility re-routed lines.
Board of Supervisors, San Luis Obispo County	Hired consultants to develop emergency evacuation plan.	
	Considered support for proposing a study to convert Diablo Canyon to a fossil-fueled plant.	Did not pass.
	Resolution that plant should not operate until the seismic issue resolved.	Did not pass.
	Resolution to halt license until county developed evacuation plan.	Passed.
	Vote to have board be an intervener.	Did not pass.
City Council, City of San Luis Obispo	Resolution against transport of wastes through the city.	Passed.
	Study for nuclear power conversion to fossil fuel was filed with CPUC.	The CPUC did not address the issue.
City Council, Pismo Beach	Resolution against transport of waste or fuel through the city.	Passed.
	Support for conversion study.	Passed.
	Went on record that council opposed the plant operation until evacuation plan was developed.	Passed.
City Council, Arroyo Grande	Resolution against transport of waste through city.	Did not pass.
City Council, Morro Bay	Resolution to halt license of plant until full investigation of TMI, April 1979.	Passed.
	Resolution to halt license of plant until city had an evacuation plan.	Passed.
	Resolution prohibiting waste transport through the city.	Passed.

The 1967 poll demonstrated a highly favorable attitude toward the siting of the Diablo Canyon Plant, with only 7 percent of the residents opposing the plant. Moreover, 61 percent of those interviewed found no disadvantages relating to the nuclear plant. These findings seem to be consistent with the relatively low participation rate of active interveners at that time. (ORC West, Inc., 1967.)

Although Study Area residents generally favored the plant in 1975, there were some indications that there were misgivings and concerns, even among those who generally favored the plant, and the size of the population opposed to the plant had grown. The poll (criticized by many as biased toward the utility) showed that 75 percent of San Luis Obispo County residents favored the plant—but 30 percent of them favored it only "somewhat." Approximately 20 percent definitely opposed Diablo Canyon; 5 percent were undecided. Of those favoring the plant, the "need for power" was by far the number one reason for the positive response. In 1967, radiation and accidents were the two primary concerns regarding nuclear power. By 1975, residents' concerns had expanded and were more focused; they varied from generic safety issues to concerns that were specific to the Diablo Canyon site. Of those opposing Diablo Canyon, the chief expressions of concern were that they generally considered the plant not to be safe and that the issue of waste disposal had not been resolved. In addition, the problem of radiation leaks, seismic risks, and thermal emissions were also important reasons for a negative predisposition. The analysis of the poll results also indicated that favorability toward the plant was directly related to: length of residence (support increased with lengthier residence); age (those 18-30 opposed the plant in greater numbers than other age groups); and student status (full-time students were not as likely to favor the plant as were part-time students or non-students). (Field Research Corporation, 1975.)

The analysis of polling results demonstrated that, in terms of approval by residents, the response to the Diablo Canyon Nuclear Generating Station varied geographically within the Study Area. If the Study Area is broken down into its five political districts, residents of District 5 were least supportive of the plant. District 5 includes the northeast section of the City of San Luis Obispo in which the university is located, the lower part of Atascadero, and the rural area east of the City of San Luis Obispo. The social groups in this district—university faculty and students (a younger population relative to the rest of the county), and a large professionally employed population—would have a stronger predisposition to oppose nuclear power, according to sociological surveys of public response to nuclear power plants (Kasperson, et al., 1980).

In fact, most of the public interest anti-nuclear organizations which emerged in the Study Area had memberships largely concentrated in this district, particularly in the City of San Luis Obispo.

Residents of Districts 1 and 4 were most favorable toward the Diablo Canyon facility: 89 percent of the respondents in District 4 and 79 percent of those in District 1 supported the plant. District 4 is located in the southern part of the county and includes the Five Cities Area. In terms of economic gain generated by the construction of the plant, District 4 was affected to a larger degree than the other districts.

Residents of District 2, which includes the northern and western parts of the City of San Luis Obispo, Morro Bay, and the coastal communities of Cambria and Cayucas--an area where residents placed a particularly high value on environmental quality--expressed concerns over the plant to a degree almost equal to those in District 5.

Information on public attitudes subsequent to 1975 was derived from the California Nuclear Initiative (Proposition 19) voting statistics and from a partially released 1980 utility-sponsored survey. The California initiative to restrict nuclear power development in the state was supported by about one-third of the county residents and reflected the state-wide voting pattern. The 1980 survey, according to newspaper accounts, showed that the size of local support for Diablo Canyon plant was dwindling: 60 percent of San Luis Obispo County residents favored the plant "if licensed by the NRC", but only one-third of these unconditionally favored the operation of the plant. Moreover, a majority of Study Area residents in 1980 expressed concern over whether the Diablo Canyon plant was safe: 55 percent indicated that it was not safe, 47 percent said that it was safe, and 8 percent were undecided. The uncertainties in the seismic risk assessments, the inconsistencies of scientific positions, and the claims made regarding insufficient retrofitting, have elevated the seismic risk question as a major local concern. In fact, 60 percent of the respondents indicated a preference for reopening the operating license hearings because of the seismic hazard. The fact that the local newspaper shifted positions and attacked the Diablo Canyon plant may have been an important factor in public attitudes.

The dramatic decline in local support for Diablo Canyon, as evidenced by these surveys, may be hypothesized to be: (1) a function of the media's wide coverage of the seismic controversy, (2) the activities of anti-nuclear organizations in the Study Area

and, (3) the slippage in support for nuclear power development in the state as a whole since 1976. With respect to the latter, the California Opinion Index on energy issues were examined. In May 1976, the index found that 69 percent of state residents favored having a greater number of nuclear power plants, while 19 percent opposed such a proposal. In May 1979 (two months after the Three Mile Island accident), the index noted that only 37 percent (a decrease of 32 percent) of California residents responded in favor of nuclear plants and 55 percent were opposed. This was a significant shift and may be partly explained on the basis of Three Mile Island; a direct relationship cannot be made at this time, however, because of incomplete data to interpolate during the 1976 to 1979 period. In April 1980, the percentage favoring more nuclear facilities in the state increased slightly to 45 percent.

9.8.2 The Anti-Nuclear Movement in San Luis Obispo County

Between 1975 and 1980, a relatively large number of anti-nuclear organizations and anti-nuclear activities surfaced in the Study Area. The opposition to Diablo Canyon reached its height in 1978 with a mass demonstration in which 500 persons (5 percent of them from the Study Area) were arrested. This growth in opposition is a function of four factors: the historical and present commitment of Study Area residents to environmental quality, including environmental activism; the growth of the national anti-nuclear movement, which is centered in California; concerns of San Luis Obispo County residents over the safety of the Diablo Canyon plant, particularly concerning the seismic hazard; and the social structure of the area. Most of the Study Area organizations and their memberships were centered in the City of San Luis Obispo. The preconditions for a viable public response to the Diablo Canyon plant had been firmly established: in terms of social structure, the city consisted of a large professional population (physicians, architects, university professors), a large student population, and an affluent retirement group which did not want to see the coastal environment changed. Moreover, a significant number of residents in the City of San Luis Obispo were historically politically active and, on the whole, supported environmental causes. Opposition to the Diablo Canyon plant was firmly rooted in the City of San Luis Obispo.

9.9 Summary of Public Response

9.9.1 The Extent of Public Concern

The data support the conclusions that, in general, residents of the Study Area have become more concerned about the Diablo Canyon plant, public acceptability has noticeably declined, and a committed, politically active opposition has grown. Although

the opposition is centered in the City of San Luis Obispo, it has become well integrated into the larger regional anti-nuclear movement, for which the Diablo Canyon plant has become a symbol. Following national trends in public attitudes toward nuclear technology, public concerns have shifted from a highly localized interest in preserving environmental quality to a very broad array of generic safety issues. The findings also suggest that the controversy over the seismic risks and the Three Mile Island accident heightened public concern and awareness of the hazards posed by nuclear technology. As the opposition became more regionalized, intense, and broad-based, the nuclear plant also became representative of such things as loss of local control, industrial monopolization, and nuclear proliferation. Regional opposition to the nuclear station has subsequently grown, both in membership and in intensity.

The level of public concern varied geographically within the Study Area. Opposition to the plant was centered in the City of San Luis Obispo and in some of the small coastal communities; elsewhere, active opposition to the plant was less observable. Communities having high levels of public opposition or concern were, concomitantly, those communities most sensitive to questions of environmental quality. By and large, these were the coastal communities with large retired and affluent populations (i.e., Shell Beach, Cayucos, Morro Bay and Cambria).

The San Luis Obispo County business communities as well as the agricultural areas have strongly supported the nuclear plant. The business community in the City of San Luis Obispo as represented by the Chamber of Commerce has consistently favored the plant. This attitude is underscored in an interview with the assistant director of the city's Chamber of Commerce, David E. Garth.

The majority of businessmen in San Luis Obispo feel that the plant should operate. The benefits to businesses from the plant have not been clear in the county, but have had a minimal impact on this community, in regards both to benefits and adverse consequences... The time of construction were good years, but there have been bad years when the construction workers were leaving...In 1977 the chamber took a pro-nuclear stand, and only a small group, less than ten, decided to leave the chamber because of this position...Since the TMI accident, a lot of people in the city have become anti-nuclear. Many pro-people are not undecided...The business people are concerned about the environment, even though they have supported the plant. Tourism is an important industry, and they consequently do have some fears about Diablo. But, the energy situation is also serious...The city has a coastal

mentality with a strong environmental ethic. Santa Maria, which is inland and is as affluent as San Luis Obispo, is pro-growth and pro-nuclear, unlike San Luis Obispo, where the major issues are over growth.

The support given by farmers is illustrated by an interview with the director of the San Luis Obispo Farm Bureau, J. McClosky.

The farmers feel that Diablo Canyon should operate. It makes good business sense...The farmers in the county are not "no-growthers" and do not feel the plant will create any problems for them. We think in terms of progress and are not obstructionists in terms of normal development...The situation is similar to the pesticide problem: we lost DDT—cheap, beneficial, and without problems when properly used—because of emotion. Like nuclear power, there were a lot of unknowns, but farmers deal with uncertainties, unknowns...At the state level, the Farm Bureau endorsed nuclear power. The Board of Directors in San Luis Obispo took a position favoring the Diablo Canyon plant. (San Luis Obispo County Farm Bureau Resolution, 17 December 1978.)

9.9.2 Impacts of the Three Mile Island Accident

Interviews with key informants and data gathered from opinion surveys suggest that the accident at the Three Mile Island nuclear power plant heightened public concerns over the Diablo Canyon plant, particularly over seismic issues and evacuation plans. There is some evidence that opposition to the Diablo Canyon plant grew in the Study Area following TMI, but a direct causal link could not be established. However, since TMI, a great number of Study Area residents have indicated that further testing on seismic matters should be continued. Again, this expression of concern may be a direct function of recent earthquake events in the larger region (Imperial Valley). The TMI accident, according to the key informants who have taken a position against the plant, has made a seismic-related nuclear accident more plausible and realistic.

9.9.3 Effect of Regional Response in the Study Area

As a local political problem, the Diablo Canyon plant has not been a major and consistent issue except for the active opponents. In a 1975 opinion survey of the problems facing residents of the City of San Luis Obispo, the two most important problem areas cited were: (1) economic needs (unemployment, housing, inflation) and community needs (street repairs, transportation, etc.) and, (2) community/government problems and concerns over growth and residential development. While 48 percent of all

responses identified the economy as the number one problem area, only 5 percent of the responses mentioned the nuclear power plant as a problem.

For some of the local political jurisdictions, environmental concerns have been important issues and the pattern of elected officials has long reflected the split between the growth versus no-growth constituencies. The controversy over the Diablo Canyon plant has reinforced this dichotomy in the political structure. In addition, there is some evidence that the growth in political activism over the nuclear plant has had some "trickling down" effects, as members of anti-nuclear groups have taken strong positions and actions regarding other matters of environmental quality and health in the county.

CHAPTER 10: EVALUATION AND SIGNIFICANCE OF THE SOCIOECONOMIC EFFECTS OF THE DIABLO CANYON NUCLEAR POWER STATION

10.1 Introduction

The purpose of this chapter is to provide a summary of the evaluation of the effects of construction and operation of the Diablo Canyon plant by the major groups comprising the Study Area. The discussion focuses on both individual and cumulative effects of the project on the group and on the community. The evaluation of the effects considers four dimensions: (1) the magnitude and salience of the economic, fiscal, demographic, and housing effects of the plant; (2) the impacts of the plant over time; (3) the relative importance of the plant effects compared to other changes experienced by the groups and the community; and (4) the overall evaluation of the plant in terms of the balance between risks and benefits. For each group, the research attempted to ascertain the perception of the magnitude of the effects, the evaluation of the positive/negative dimension of the effects, the duration (short-term/permanent) of the changes, and the level of importance of the particular effects to the group and to the Study Area as a whole. These evaluations of the plant's effects are seen as a function of the norms, goals, and historical experience of the groups, and the consequences of the plant's effects (both real and perceived) to each group.

The significance attributed to the nuclear plant represents our overall evaluation of the plant and its effects. The criteria to determine significance include: (1) the magnitude of the effects; (2) the duration of the effects; (3) the distribution of the effects among social groups; (4) the evaluation of the effects by social groups; and (5) the relationship of the nuclear power plant and its effects to the other changes and issues occurring in the Study Area.

10.2 Evaluation of the Effects by Social Group

Overall, the economic effects were considered by most groups to be less important than the other economic changes occurring in the area. The plant's effects were thought to be highly concentrated, both geographically and by social group. Important economic gains were felt by the business community, particularly proprietors of apartments, hotels, and restaurants. However, this was considered as a "shot in the arm" and not permanent. In contrast, the Hispanic community, which had the most to gain from direct employment at the site, did not directly benefit from employment. The business community placed importance on the economic effects because these helped

stabilize the motel/tourist industry. However, the impact was a short-term one; the tourist economy during the construction period became viable due to increased recreational demand from within the larger region. There is some evidence that nonbasic jobs for the Hispanic group increased because of the plant, but members of the group who were interviewed did not attribute employment to the plant, nor did their economic well-being improve. To the Hispanic community, the effects of the plant on their group was assessed as unimportant. The workers (urbanites) and business community indicated that plant-related employment and income was moderately important, but in the context of rapid economic and population growth in the Study Area, the effects of the plant were downplayed. The agricultural group indicated that the group did not directly benefit but a consensus was reached that the plant was generally important to the area as a whole. As a group, they were removed from the economic effects.

Demographic effects, as evaluated by the Study Area groups, were either small in magnitude or nonexistent. Overall, the in-migration of construction workers and their families was evaluated as unimportant to the groups or to the area. This was also true of the housing effects on the groups; the construction workers primarily rented apartments or motel rooms in the Pismo Beach area and consequently did not exert any pressure on housing availability or rental prices. The fact that this area was oriented to transients and catered to the tourist market was a factor mentioned that mitigated any adverse social impacts that may have resulted from accommodating such a large construction force.

With one exception (the Hispanics), all groups in the area evaluated the tax revenues from the Diablo Canyon plant as important to their group and to the Study Area. However, the tax revenues were not conspicuous. It is important to note that no adverse impacts were identified. The analysis of public response found that within the Study Area the political and public response to questions of environmental impact and safety varied by geographical area. The antinuclear constituency had grown in the region, and because the economic and fiscal benefits were considered either small or short-term, concerns over risk had become paramount. Businessmen tended to emphasize the benefits of the plant over the risks as did farmers.

10.3 Significance of the Project

10.3.1 Magnitude, Relative Importance, and Duration of the Impacts

Economic Effects

The major economic effects of the Diablo Canyon project on the Study Area were the employment and income effects shown in Chapter 4 and Chapter 8. Construction of the plant began in 1969 and continues to date due to retrofitting construction activity. At peak construction, the project created over 3,000 jobs (by place of residence), generated \$53.4 million of income in the Study Area economy, and created over 1,700 jobs in the Five Cities Area.

To answer the question of how significant these gains in employment and income were to the area, the economic changes are summarized based on the following information. The construction of the plant took place over a ten year period. Construction activity, from its inception in 1969 to its construction peak in 1975, was characterized by a steady increase in employment; as a consequence, there was no evidence of an economic "boom" in the Study Area. In addition, during the past decade, employment opportunities in the Study Area expanded, in-migration increased, and the construction sector grew to meet the increased housing and commercial building demands. These factors reduced the economic significance of the Diablo Canyon plant. Further, the steady decline in the size of the construction work force following the 1975 peak did not have a noticeable, adverse economic result.

The steady rate of growth and the growing diversification of the economic base of the area reduced the relative importance of the plant. In 1975, total plant-related employment was estimated to be approximately 3,500 persons, or 8 percent of the county's 46,000 jobs. In 1978, plant-related employment accounted for only 4.2 percent of the number of jobs in the county. The increase in the size of the labor force through in-migration of plant-related workers in 1978 amounted to only 1.3 percent of the Study Area's labor force.

The economic effects in the area were not critical to employment opportunities for the Study Area residents. Further, over the entire study period, plant construction did not have a significant impact on either the median or per capita income in the Study Area or on the employment rate. The employment rate continued to remain below that of

the state as a whole. Moreover, no new business establishments were permanently created because of the nuclear facility.

The construction of a large facility may have regionally specific secondary or special economic effects. This can be illustrated by the improvement in the skills of the indigenous labor pool; the stabilization of a particular economic sector; the decline of a particular sector of the economy due to manpower competition from the project; and the change in the spatial configuration of industrial location. The construction of the Diablo Canyon plant was responsible for two secondary economic effects. First, it provided employment for construction workers when the local construction industry was particularly impaired (in the late 1960s and in 1974-1975). Second, it stabilized and expanded the tourist services sector in the Pismo Beach area in the early 1970s. Both effects were temporary, and their overall importance to the economy of the area is questionable.

Because few purchases of construction material were made by the utility within the Study Area, the economic effects were largely those resulting from the expenditure of plant-created income. Given that the construction work force primarily resided in the Five Cities Area, the economic gains were also concentrated in that locale. This fact was corroborated by all of the key informants who were interviewed. Outside the Five Cities Area, the economic effects were diffused and, therefore, were not considered to be significant.

With respect to social groups, important economic gains were felt by the business community, particularly proprietors of apartments, hotels, and restaurants. In contrast, the Hispanic community, which had the most to gain from direct employment at the site, did not directly benefit from employment; no effort was made to enlist, train, or upgrade their skills for construction-related work.

Overall, the economic effects were generally small in relative importance and were highly concentrated, both geographically and by social groupings. None of the economic changes had a prolonged effect.

The Demographic Effects

Changes in the Study Area population were based on the changes in the levels of employment due to job opportunities created by the project. Two principal aspects

considered in the determination of population change were in-migration and reduced out-migration. However, no population effects were attributed to diminished out-migration. The total population increase in 1975 due to the project was estimated to be 3,308 persons. By 1978, the estimated population increase in the Study Area due to project-related employment was 2,212 persons.

The impact of the demographic changes caused by the plant was determined by considering the magnitude of the population increase relative to both the pre-project population and the total population in-migration during the study period, and the nature of the secondary population effects, particularly the effects on social cohesion.

In 1975 in San Luis Obispo County, the total plant-related population increase was approximately 2.5 percent of the total population; in 1978 it was 1.5 percent. These increases were not considered important. Moreover, it should be noted that these population changes represented but a small fraction of the substantial in-migration of population during the study period. According to key informants, the project-related population was not conspicuous; rather it successfully assimilated into the larger regional demographic picture. The nonbasic in-migrants, for example, did not differ in demographic characteristics from the non-elderly, urbanite in-migrants. Further, according to key informants, the construction workers who largely relocated to the Pismo Beach tourist area conformed to the general transient nature of the place. Overall, the population of the host community was not affected to any noticeable degree in terms of social structure and interaction, nor did any social problems or conflicts surface between the host population and the construction worker population.

Effects on Settlement Patterns and Housing

Existing urban centers, especially Atascadero, the City of San Luis Obispo, and Arroyo Grande, experienced substantial population growth during the study period; residential expansion into agricultural or rural areas increased as well. The impact of the Diablo Canyon plant on settlement patterns and land use changes was minimal. The actual station site was isolated in an undeveloped section of the coast and no additional changes in land use (except for a private access road) resulted from locating the plant at the Diablo Canyon site. The location of the plant reflected both the county residents' goal and the local governmental policy to preserve the natural coastal environment. Because the project-related demand for housing accounted for only a fraction of the new residential units built during the study period, no attribution is made to the plant to new

housing growth. Interviews with key informants suggested that a few construction workers bought homes in the Study Area and permanently relocated to work or retire in the area. The evidence suggests, however, that the purchasing of homes by plant construction workers did not result in a housing impact.

Overall, the housing effects attributed to the project were small. The housing demand created by in-migrants peaked in 1975 at an estimated 1,297 residential units. By 1978, the project-related housing demands had fallen to 807 units. The housing stock in the Study Area in 1975 was estimated at about 50,000 units; thus the demand of 2.6 percent of the housing stock could be met easily. Moreover, during the first half of the decade, Pismo Beach, the area where the construction workers primarily concentrated, had many hotels and apartments with high vacancy rates. In addition, existing mobile home parks expanded to meet the project-related demands. Before construction, the Study Area had a sizeable stock of seasonal "tourist" housing that served to accommodate the construction workers and their families. In terms of the relative magnitude of project-related housing growth in the Study Area, the geographical extent of housing demands, and the secondary economic effects on the housing sector (vacancies, property values, and price of rental units), the overall housing effects attributed to the plant were minimal.

Government and Public Service Effects

In Chapters 7 and 8, the operation of the county and local governments and the provision of key services were examined to determine the effects of the project, particularly the balance between project-caused changes in demand for services and project-caused changes in governmental revenues to meet these demands.

San Luis Obispo County and the San Luis Coastal Unified School District (SLCUSD) were the recipients of large tax revenues because of the plant. The county received \$2.4 million in taxes from the plant in 1975 and \$4.3 million in 1978. The net assessed value of the Diablo Canyon plant represented 17.9 percent and 21.9 percent of the total county's net assessed value of property in 1975 and 1978, respectively. The SLCUSD received \$2.5 million in 1975 and \$5.9 million (current dollars) in 1978 in property taxes on the Diablo Canyon plant. By 1978, the Diablo Canyon plant constituted over 35 percent of the total assessed valuation of the school district. As indicated by these figures, the project-related increase in resources available to the county and school district were large, while the project-related increase in demand for services was small.

This was especially true because the communities in which the majority of the school-aged children of the construction workers resided were outside the SLCUSD. The uneven distribution of revenues and expenditures had an acknowledged impact to the south where the construction workers relocated. The underlying theme that the facility siting adversely affected school district equalization was discussed in detail in Chapter 8. The extent to which the southern school district, Lucia Mar, was impaired as a direct result of increased enrollment and loss of expected revenues, was not clear. The available enrollment data do not support a finding that plant-related population increases alone exerted extraordinary pressures on the system's capacity. However, qualitative statements made by key informants attributed the overcrowding in the district schools to plant-related in-migration of construction workers and their families.

Although the nuclear plant generated a sizeable share of revenues, no major improvement in public facilities or social programs and no reductions in the tax rate can be attributed to the construction of the plant. However, the SLCUSD expanded the scope and improved the quality of a number of educational programs as a result of the additional revenues provided by the project. It should be noted that, because of the larger tax base of the Lucia Mar district, the total educational expenditures per student in each of the two districts do not differ significantly; the larger tax base in the Lucia Mar school district has had the effect of discounting the differential impact of the plant.

Effects on Groups and Group Interaction

Overall, the project had relatively little effect on the size or characteristics of the social groups identified in Chapter 8. The farming community, the elderly, and the Hispanics were not affected by plant construction effects and changes in these groups during the study period could not be attributed to the plant. The business community in the Five Cities Area was most directly affected by the construction of the plant. The research found that the turnover rate among business people declined, the community stabilized, and participation/leadership activities were revitalized. The findings also suggest that the economic gains to the community accelerated a process that would have taken place without the nuclear project. As such, the study has concluded that the plant had only a temporary and partial impact on the business community.

For the most part, construction workers and their families tended either to live apart from the existing communities, with minimal formal or informal involvement in community affairs, or to reside in the highly transient tourist centers of the Five Cities

Area where they were inconspicuous as a new social element. The impact on existing social groups was further minimized by the transitory nature of the construction work force itself. During the study period, the changes that took place in the characteristics of the functional social groups and in the major interaction patterns were the results of regional, economic, and historical processes in which the construction of the nuclear plant had a minimal role.

The level of political participation and conflict among groups in the Five Cities Area and in the county escalated during the study period, particularly over issues of growth versus environmental quality. Given the historical nature of this conflict in the Study Area, it was not surprising that the level of interest concerning environmental problems resulting from the project was greatly expanded, more frequent, and very intense. In-migration of the professionals and the affluent elderly during the 1970s, combined with the unplanned urban encroachment of rural areas, expanded the conflicts to include broad-based constituencies and groups which were traditionally outside the locus of political conflict over environmental issues. The research findings contend that the controversy over the Diablo Canyon nuclear plant reinforced and amplified the polarity of value positions in the Study Area; the plant was an indirect but contributing factor for expanded group participation regarding environmental conflicts.

10.3.2 Evaluation Summary

The effects of the Diablo Canyon plant were most important to the members of the business community in the Study Area. This group unequivocally favored the Diablo Canyon project because it believed the plant would be growth-promoting for the county as a whole. Business people in the City of San Luis Obispo, however, did not view the plant as particularly important to themselves since they did not benefit from its construction. Given that the business community is highly dependent on tourism, a few business people indicated that the Three Mile Island accident caused growing concern about the economic costs that could result from a possible plant problem once the Diablo Canyon plant began operations.

In contrast to the City of San Luis Obispo, the business people interviewed in the Five Cities Area expressed the view that, because of the additional revenues and income, the construction of the plant resulted in positive gains for the area as a whole and the business community in particular. However, these income gains were considered to be only temporarily important, specifically during the early 1970s when the tourist industry

was experiencing significant instability. Moreover, the plant primarily aided the small and marginal hotel and apartment building owners; the larger motels and restaurants continued to depend exclusively on the tourist trade. Thus, the direct effects of the plant are generally viewed as having only past importance, affecting primarily members of the business community. The general perception of key informants was that, outside of additional tax revenues, the benefits of the plant were highly concentrated in Pismo Beach, and even those impacts were seen as having been diminished because of the substantial and steady economic and population growth of the area during the study period.

The other social groups in the Study Area, while recognizing that additional tax revenues accrued to the county, did not perceive that individual families may have benefited directly through tax savings or through improved and expanded public services. Moreover, among those individuals who held anti-nuclear predispositions, there was a general tendency to discount all positive effects of the plant.

10.3.3 Perceived Risks Posed by the Plant

Chapter 9 contained a detailed analysis of the public response to the construction and potential operation of the Diablo Canyon plant. The expressions of concern over risks posed by the nuclear facility may have resulted in the only significant sociopolitical effect. The research found that support for the plant within the Study Area declined over time, and that the controversy engendered concern and political participation regarding other environmental matters. In addition, there is evidence to support a finding that the intensity and extent of the opposition to Diablo Canyon markedly increased as a function of the Three Mile Island accident, the lengthy dispute over seismic risk assessments, and the growth of the anti-nuclear movement in California. Moreover, the area's opposition to the nuclear plant was rooted in the area's traditional attitudes and political activism concerning environmental quality and natural resource preservation.

Examination of attitudinal surveys, analyses of anti-nuclear organizations, and interviews with key informants show that the public response to the nuclear station was geographically skewed toward the City of San Luis Obispo. In general, the residents of the Five Cities Area held a more favorable attitude toward the plant; the City of San Luis Obispo was the de facto center of opposition. The study points to major differences

in the social structure and in the historical level of political participation between the two places as explanatory factors for the differential response.

According to key informants, the nuclear plant is not a major political issue in terms of requiring local level decisions; rather, the consensus is that the controversy over the plant has fluctuated over time. Key informants, except for those who actively oppose the plant or are strongly concerned about its safety, when asked about the problems facing San Luis Obispo County residents, indicated that the Diablo Canyon plant often was not identified as the major problem and, in a few cases, was not mentioned at all. However, a recent partially released poll suggests that most residents may harbor deep-seated concerns about the safety of the plant, particularly over the seismic hazard.

Each of the key informants indicated a high level of satisfaction with their residence in the county. Mention was made of the small town quality of the urban centers, the invigorating yet mild climate, the importance of the coastal environment, and the favorable social milieu. The special environmental qualities of the Study Area attracted and are continuing to attract a substantial in-migration of affluent elderly and professional people despite proximity to the Diablo Canyon plant. The existence of a nuclear plant and the possibility of its operation have not detracted from the general benefits of living in the area: the value of homes and property has escalated sharply during the study period. On the other hand, an active opponent of the Diablo Canyon plant stated that what was especially painful was the superimposition of a nuclear plant in "one of the most attractive and livable parts of the country."

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