
Socioeconomic Impacts of Nuclear Generating Stations

Peach Bottom Case Study

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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 Peach Bottom 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.

TABLE OF CONTENTS

	PAGE
CHAPTER 1: INTRODUCTION	1
1.1 The NRC Post-Licensing Studies	1
1.1.1 Objectives of the Post-Licensing Studies	1
1.1.2 Components of the Post-Licensing Studies	2
1.1.3 Three Mile Island	4
1.2 Overview of the Case Study Organization	4
CHAPTER 2: OVERVIEW AND DESCRIPTION OF THE PROJECT	11
2.1 Introduction	11
2.2 Location	11
2.3 The Utility	13
2.3.1 Corporate Background	13
2.3.2 Service Area	15
2.3.3 Generating Capacity and Production	15
2.4 The Project	15
2.4.1 Project Site	15
2.4.2 The Plant	17
2.5 Construction	17
2.5.1 Announcement	17
2.5.2 Schedule and Cost	18
2.5.3 Construction Phase Work Force	18
2.5.4 Construction Experience	20
2.6 Operations	22
2.6.1 Schedule and Cost	22
2.6.2 Work Force	22
2.6.3 Operating Experience	22
2.6.4 Refueling and Major Repairs	24
2.7 Taxes	25
2.8 Corporate/Community Programs	26
2.8.1 Emergency Planning	26
2.8.2 Visitors' Center	28
2.8.3 Other	28
2.9 Major Events Chronology	29

TABLE OF CONTENTS (Continued)

	PAGE
CHAPTER 3: IDENTIFICATION OF THE STUDY AREA	31
3.1 Introduction	31
3.2 The Study Region	32
3.2.1 Description of the Region	32
3.2.2 Identification of Places within the Region	34
3.3 Distribution of Direct Project Effects within the Region	35
3.3.1 Distribution of Direct Basic Employment by Place of Work	36
3.3.2 Distribution of Direct Basic Workers by Place of Residence	36
3.4 Distribution of Purchases	40
3.5 Distribution of Taxes	40
3.6 Selection of Study Area	41
3.6.1 Area Selected	41
3.6.2 Rationale	41
CHAPTER 4: ECONOMY OF THE STUDY AREA	44
4.1 Introduction	44
4.2 Economic History of the Study Area	44
4.3 Changes in the Economy during the Study Period	46
4.3.1 Employment	46
4.3.2 Labor Force	49
4.3.3 Standard of Living	50
4.4 Economic Changes in the Study Area due to the Project	51
4.4.1 Employment and Income Effects due to Construction of the Plant, 1973	55
4.4.2 Employment and Income Effects due to Operation of the Plant, 1978	64
4.4.3 Summary of the Economic Effects on the Study Area, 1973 and 1978	67
4.5 Effects of the Project on the Study Area Economy, 1967-1978	68

TABLE OF CONTENTS (Continued)

	PAGE
CHAPTER 5: POPULATION	72
5.1 Introduction	72
5.2 Demographic Trends	72
5.3 Changes in the Population during the Study Period	75
5.4 Population Effects due to the Project	77
5.4.1 Introduction	77
5.4.2 Population Effects during the Construction Period	77
5.4.3 Population Effects during the Operation Period	83
5.4.4 Summary	86
CHAPTER 6: SETTLEMENT PATTERNS AND HOUSING	90
6.1 Introduction	90
6.2 Settlement Patterns	90
6.2.1 Factors Influencing the Settlement of the Study Area	90
6.2.2 Population Distribution	93
6.3 Housing	94
CHAPTER 7: LOCAL GOVERNMENT AND PUBLIC SERVICES	101
7.1 Introduction	101
7.2 Government Structure	101
7.3 The Budget during the Study Period (1967 - 1979)	104
7.3.1 The Budget	104
7.3.2 Revenues	106
7.3.3 Expenditures	112
7.4 Selected Public Services	113
7.4.1 Education	113
7.4.2 Transportation	117
7.4.3 Public Safety	122
7.4.4 Social Services	124
7.5 Summary	125

TABLE OF CONTENTS (Continued)

	PAGE
CHAPTER 8: SOCIAL STRUCTURE	126
8.1 Introduction	126
8.2 Social Structure at the Beginning of the Study Period (1969)	126
8.2.1 Identification of Groups	126
8.2.2 Group Profiles	127
8.2.3 Interrelationships among the Groups	135
8.3 Distribution of Project Effects to Groups	138
8.3.1 New Groups: The Construction Workers	138
8.3.2 Distribution of Economic, Demographic, Housing and Settlement Patterns, and Public Service Effects to Groups	140
8.4 Summary of the Effects of the Project on Groups	148
8.5 Changes in the Interrelationships among the Groups	152
8.5.1 Introduction	152
8.5.2 Economic	152
8.5.3 Political	154
8.5.4 Social	156
CHAPTER 9: PUBLIC RESPONSE TO THE PEACH BOTTOM ATOMIC POWER STATION	158
9.1 Introduction	158
9.2 Response during the Pre-Construction Period	158
9.2.1 Announcement	158
9.2.2 Siting	159
9.2.3 Hearings	159
9.2.4 The AEC Construction Permit	160
9.3 Response during the Construction Period	160
9.3.1 Operating License Hearings: The Regional Context	160
9.3.2 The Operation License Hearings	162
9.3.3 Concern over the Fulton Nuclear Plant	165
9.3.4 The Tax Issue	165

TABLE OF CONTENTS (Continued)

	PAGE
9.4 Response during the Operation Period	166
9.4.1 The Waste Transportation Issue	166
9.4.2 Response to the Accident at Three Mile Island	167
9.5 Summary	170
9.5.1 Measuring Public Concern over the Peach Bottom Plant	170
9.5.2 Effect of Regional Response on Groups in the Study Area	175
CHAPTER 10: EVALUATION AND SIGNIFICANCE OF THE SOCIOECONOMIC EFFECTS OF THE PEACH BOTTOM NUCLEAR STATION	176
10.1 Introduction	176
10.2 Evaluation of Projects Effects by Groups in the Study Area	176
10.3 Significance of the Plant	185
10.3.1 Magnitude and Relative Importance of Effects	185
10.3.2 The Impact of the Three Mile Island (TMI) Accident on the Peach Bottom Area	190
10.3.3 Community Well-Being	192
BIBLIOGRAPHY	193
PERSONAL COMMUNICATIONS	198

LIST OF FIGURES

FIGURE NUMBER	TITLE	PAGE NUMBER
1-1	United States Nuclear Regulatory Commission Post-Licensing Study, Case Study Sites	3
1-2	Case Study Organization	5
2-1	Location of Peach Bottom Atomic Power Station	12
2-2	Philadelphia Electric Company Service Area	16
2-3	Average Daily Construction Work Force, Peach Bottom Atomic Power Station	19
3-1	Study Region: Four Counties in Pennsylvania and Maryland	33
3-2	Peach Bottom Atomic Power Station Study Area: Delta and Peach Bottom Township	42
4-1	Estimation of Project-Related Economic and Demographic Impacts	54
5-1	Population of Delta Borough and Peach Bottom Township, 1900-1979	73
7-1	Revenues and Expenditures, Peach Bottom Township, 1968-1978	107
9-1	Measurement of Public Concern over the Peach Bottom Nuclear Plant: Reports in the Communi- cations Media, York Dispatch, 1958-1979	171

LIST OF TABLES

TABLE NUMBER	TITLE	PAGE NUMBER
2-1	Average Annual Construction Work Force, Peach Bottom Atomic Generating Plant, 1967-1974	21
2-2	Average Annual Operations Work Force, Peach Bottom Atomic Generating Plant, 1974-1979	23
2-3	Total Tax Payments for the Peach Bottom Atomic Plant, Units 2 and 3, 1974-1978	27
2-4	Chronology of Major Events	30
3-1	Peach Bottom Atomic Generating Plant, Payroll Operations Work Force, by Place of Residence, 1973	37
3-2	Peach Bottom Atomic Generating Plant, Payroll Operations Work Force, by Place of Residence, 1978	39
4-1	Employment by Major Sector, Delta Borough and Peach Bottom Township, 1960	48
4-2	Direct Basic Employment and Income in the Study Area, 1973	56
4-3	Total Project-Related Employment and Income, Peach Bottom Township and Delta Borough, 1973	65
5-1	Population and Population Change, Delta Borough and Peach Bottom Township, 1960, 1970, 1975, and 1979	76
5-2	Project-Related Employment by Type of Worker, Peach Bottom Township and Delta Borough, 1973	78
5-3	Employment and Population Increase due to In-Migration, Delta Borough and Peach Bottom Township, 1973	80
5-4	Population Increase due to In-Migration of Basic Workers and Household Members, Delta Borough and Peach Bottom Township, 1967 to 1974	81

LIST OF TABLES (Continued)

TABLE NUMBER	TITLE	PAGE NUMBER
5-5	Population Increase due to Diminished Out-Migration, Delta Borough and Peach Bottom Township, 1967-1974	84
5-6	Total Population Increase due to the Construction of Peach Bottom Atomic Generating Station, Delta Borough and Peach Bottom Township, 1967-1974	85
5-7	Population Increase due to the Operation of the Peach Bottom Atomic Power Plant, Delta Borough and Peach Bottom Township, 1974 to 1979	87
5-8	Population Change due to Construction and Operation of the Peach Bottom Atomic Power Plant, Delta Borough and Peach Bottom Township, 1967-1979	88
6-1	Land Use, Peach Bottom Township, 1971 and 1976	96
6-2	Number of Housing Units, Peach Bottom Township, 1970-1979	97
7-1	Revenues Receipts, Delta Borough, 1965, 1970, 1973, 1975	105
7-2	Study Area Budget, Delta Borough and Peach Bottom Township, 1969-1975	108
7-3	Revenue Contribution of Peach Bottom Atomic Generating Plant to the Peach Bottom Township, 1969-1978	109
7-4	Peach Bottom Township, Actual and Potential Property Tax Revenues Based on 1969 Tax Rate, 1970-1976	111
7-5	Revenues and Expenditures, Southeastern School District, 1968-1979	114
7-6	Share of Total Revenue by Source, Southeastern School District, 1973-1978	115
7-7	Total School Enrollment and Impact of the Nuclear Facility, Southeastern School District, 1968-1978	118

LIST OF TABLES (Continued)

TABLE NUMBER	TITLE	PAGE NUMBER
7-8	Highway and Street Expenditures, Delta Borough and Peach Bottom Township, 1969-1975	120
7-9	Delta Borough and Peach Bottom Township, Average Daily Traffic Volume at Three Selected Points, 1966, 1972, and 1975	121
7-10	Expenditures for Public Safety in the Study Area 1969-1975	123
8-1	Employment and Income Effects, Delta Borough and Peach Bottom Township, 1972 and 1978	141
8-2	Employment and Income Effects Distributed to Five Social Groups, Peach Bottom Township and Delta Borough, 1973 and 1978	142
8-3	Approximate Distribution of Population Effects by Group, Peach Bottom Township and Delta Borough, 1973	145
9-1	Summary of Major Issues over the Peach Bottom Nuclear Plant, by Time, Issue, Participants, Local Involvement, and Resolution	172

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CHAPTER 1: INTRODUCTION

1.1 The NRC Post-Licensing Studies

This report—the case study of the Peach Bottom Nuclear Generating Station located in York County, Pennsylvania—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.

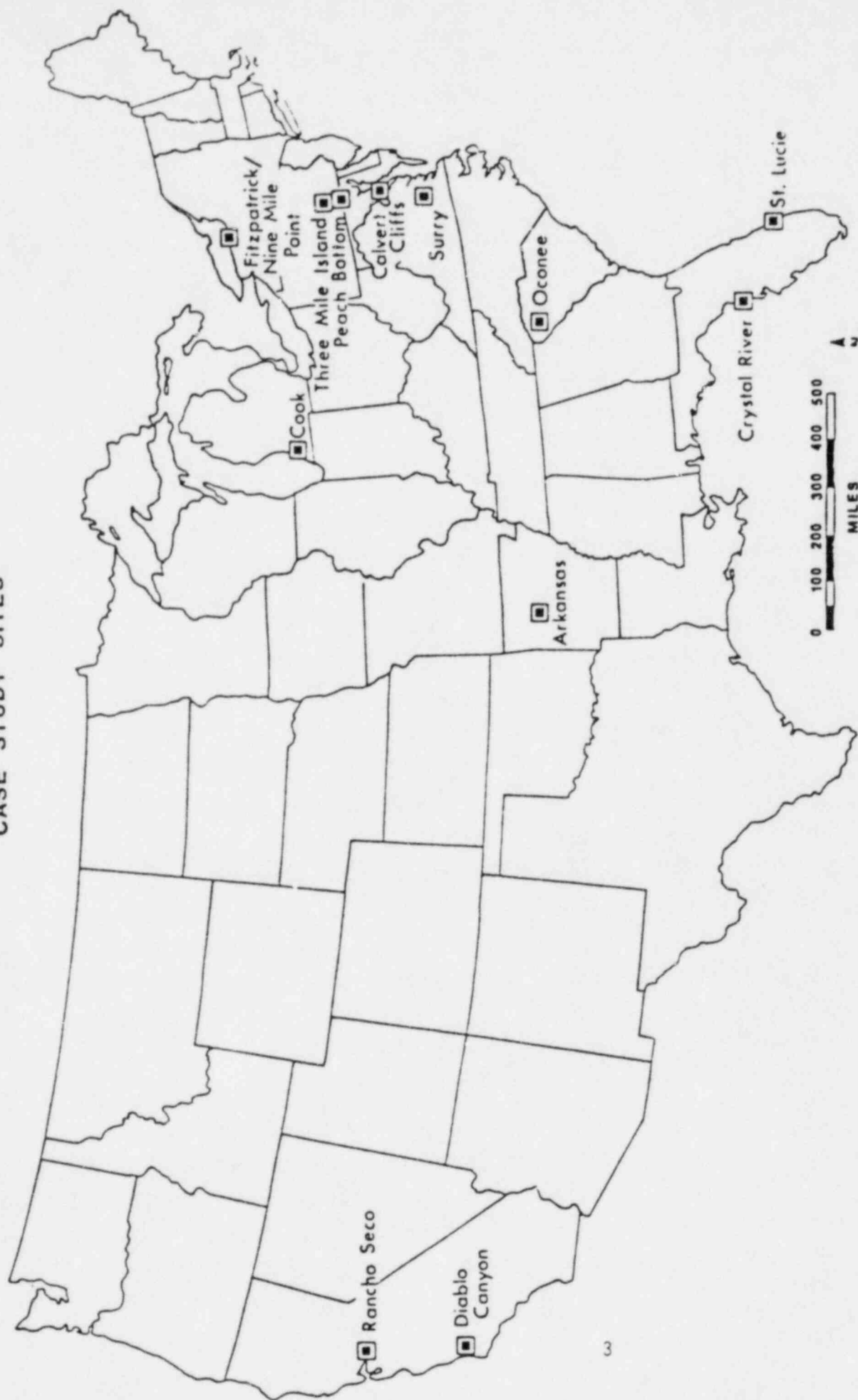
1.1.2 Components of the Post-Licensing Studies

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.

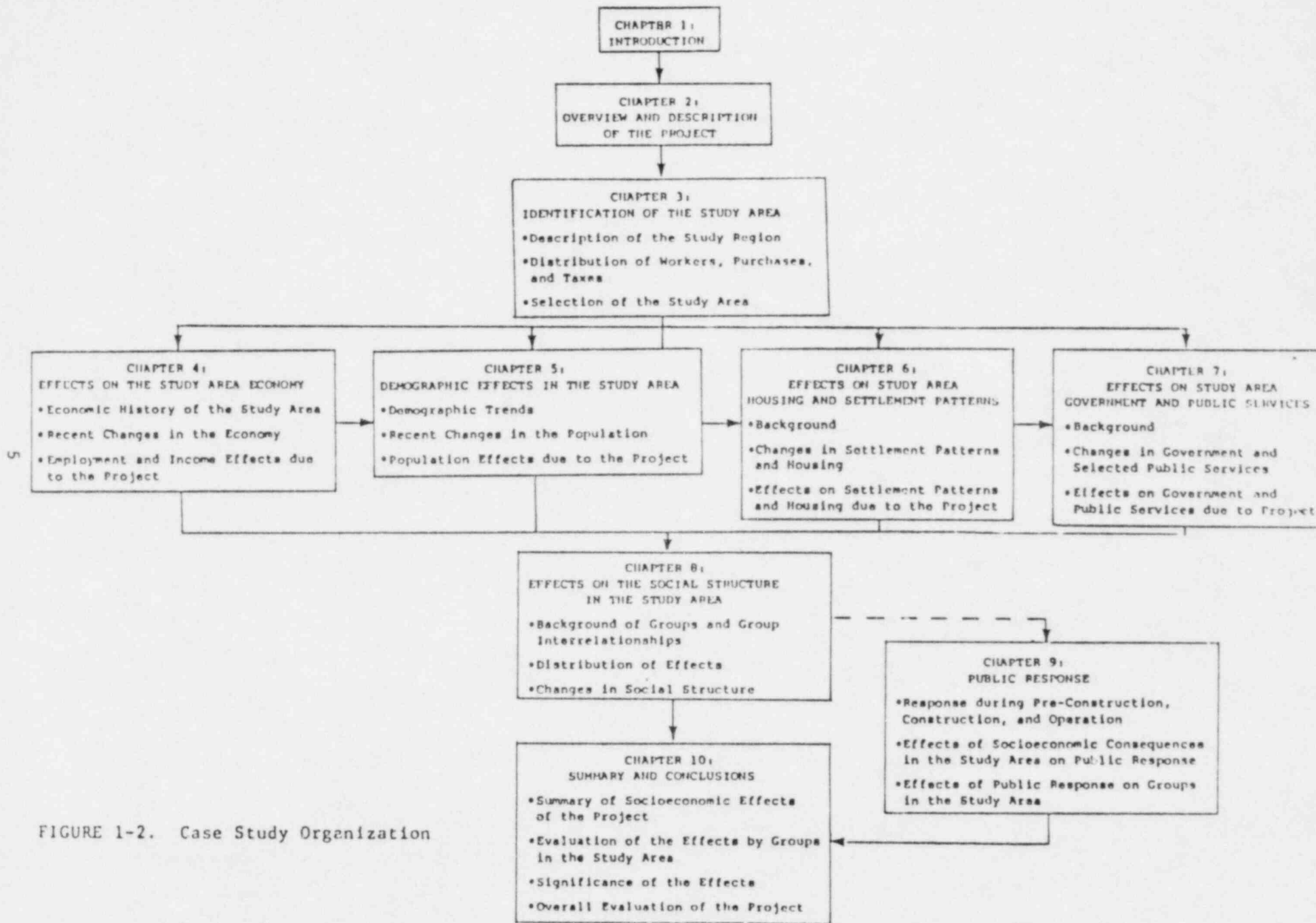


FIGURE 1-2. Case Study Organization

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

The purpose of Chapter 2 is to provide an overview of the Peach Bottom project, whose socioeconomic effects are the topic of study in this report. The emphasis in this chapter is on a description of the major characteristics and elements of the project. This information will be provided in sufficient detail to support and orient the discussions and analyses of the subsequent chapters and to facilitate the cross-site comparison.

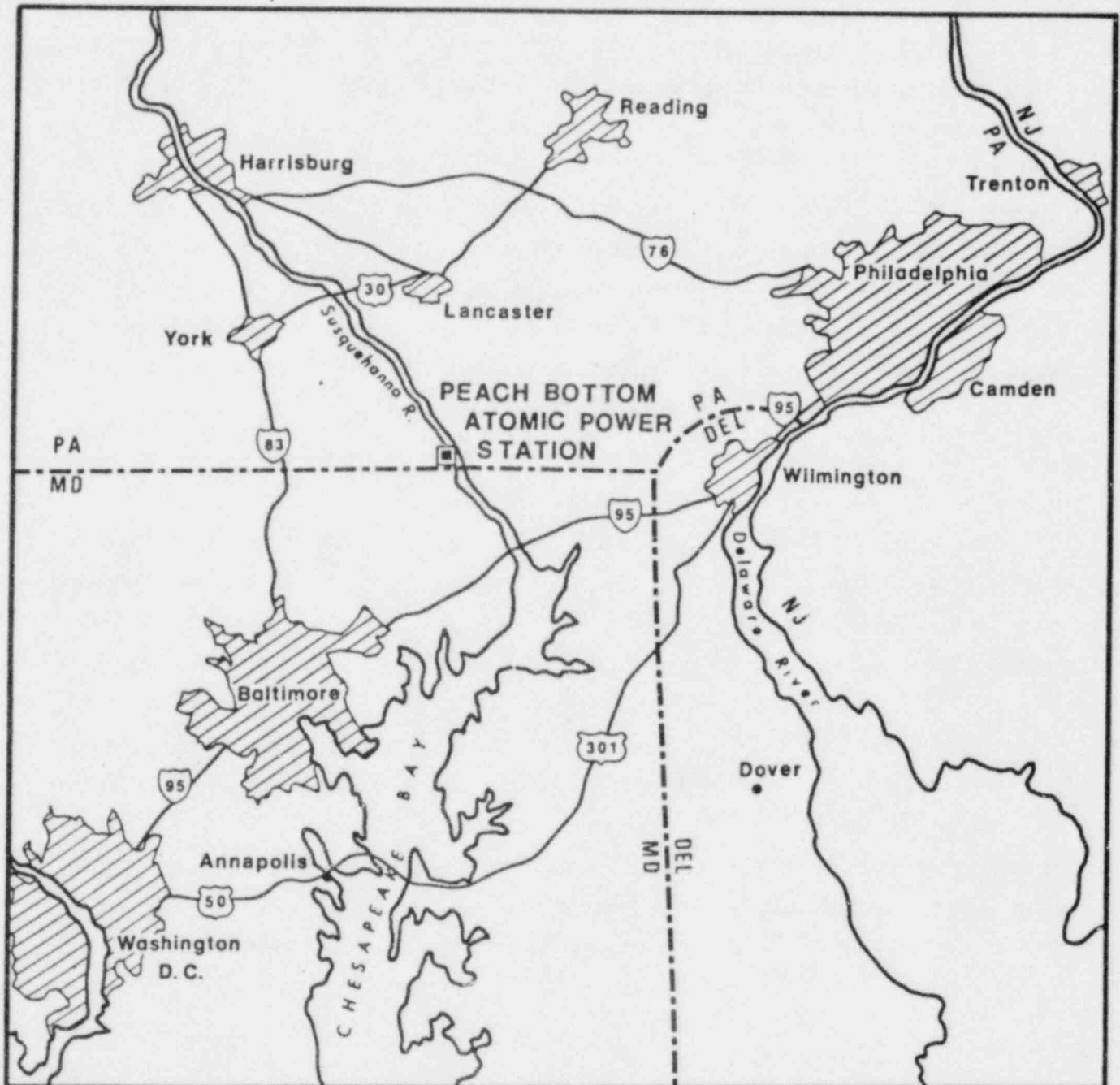
Information is provided on the project's location, size, type, and site characteristics; on the utility and other major actors involved with the project; on the magnitude and duration of the construction effort; and on the project's operating characteristics. This chapter is principally descriptive and is based on information provided by the utility, contractors, newspaper files, NRC docket materials, other reports, and interviews with a variety of informed people.

2.2 Location


The Peach Bottom Atomic Power Station Units 2 and 3, operated by the Philadelphia Electric Company, is located in southernmost York County, Pennsylvania, two miles north of the Pennsylvania-Maryland border. The station is adjacent to the Susquehanna River. Ownership of the facility is shared by four utilities. Atlantic Electric Company and Delmarva Power and Light Company each own eight percent, and the remainder is divided equally between the Philadelphia Electric Company and the Public Service and Gas Company. As seen in Figure 2-1, three metropolitan areas—Baltimore, Maryland; Wilmington, Delaware; and Philadelphia, Pennsylvania—are within 75 miles of the plant site. Two important regional centers, York and Lancaster, are each approximately 30 miles from the nuclear plant. Harrisburg, the state capital, is approximately 60 miles from the station.

As shown in Figure 2-1, the major transportation routes within the regional area are Interstate 95, which links Baltimore and Philadelphia; Interstate 83, which runs north from Baltimore through York; and Interstate 76, which connects Harrisburg and Philadelphia.

FIGURE 2-1. LOCATION OF PEACH BOTTOM
ATOMIC POWER STATION



0 5 10 15 20
Miles

 Urban Area


N

2.3 The Utility

2.3.1 Corporate Background

In 1902, the Philadelphia Electric Company of Pennsylvania was incorporated through mergers of several smaller electricity and gas companies. Growth of Philadelphia and the surrounding suburban areas, along with rising per capita consumption of electricity, resulted in rapid expansion of the utility.

The Philadelphia Electric Company has actively invested in the development of generating facilities. The Conowingo hydroelectric project, started in 1926 in northeastern Maryland near the Peach Bottom site, was one major generating facility built to meet the increasing demands for electricity. The project originally included seven generating units and involved the construction of the Conowingo Dam and a 13 square mile storage reservoir. In 1964, four additional hydroelectric units were added to the Conowingo project, increasing its total generating capacity to 512 Mw. Fourteen miles north of the Conowingo Dam, in Pennsylvania, the Philadelphia Electric Company built an additional dam and a small reservoir for the Muddy Run pumped storage project. (Wainwright, 1961, 1968; Philadelphia Electric Company, n. d.) The heavy involvement of the utility in the region, the general acceptability of the utility's projects, and the Philadelphia Electric Company's policy to provide and encourage use of the reservoirs for recreation undoubtedly influenced the positive public response to the Peach Bottom nuclear facility.

The Philadelphia Electric Company actively participated in the early development of nuclear technology as a member of one of the original groups of electric utilities formed to research the possibilities for commercial application of the technology. In 1952, the Philadelphia Electric Company participated in the development of the Enrico Fermi Atomic Plant in Michigan (Philadelphia Electric Company, 1967). In 1954, the laws governing atomic energy were changed to permit private industry to invest in the development of nuclear power, and the Atomic Energy Commission (AEC) invited utilities to develop a demonstration plant with the AEC's help. The Philadelphia Electric Company submitted a proposal for such an investment, but the contract was awarded to the Shippingport Light Company, which developed the first nuclear plant in the U.S. (Wainwright, 1961).

In 1955, the AEC initiated the Power Demonstration Reactor Program, which provided industry with governmental research and development assistance. Soon

after, when knowledge and experience were needed with a high-temperature gas-cooling experimental nuclear reactor, the Philadelphia Electric Company proposed the construction of a helium-cooled reactor on the Peach Bottom site. In 1959, congressional approval to build the demonstration plant was given. (Philadelphia Electric Company, 1975.)

Although the Peach Bottom project was principally an undertaking of the Philadelphia Electric Company, fifty-two other utilities were involved. The fifty-two companies contributed \$16.5 million toward the research and development costs of Unit 1, while the Philadelphia Electric Company contributed \$1.3 million toward this effort. In addition, the Philadelphia Electric Company furnished the site and an additional \$8 million toward the station's construction. The Atomic Energy Commission spent \$14.5 million for research on the reactor and waived \$2 million of carrying charges on nuclear fuel. (York Dispatch, 1967.)

The plant was designed as a small experimental station with a maximum capacity of 40 Mw. The site in Peach Bottom Township was chosen for a number of reasons: the land was already owned by the utility, the site satisfied all the locational requirements (low population density, adequate water supply, and geological stability), and proximity to a 220kV transmission line ensured low transmission costs. (U.S. Atomic Energy Commission, 1973.) In April 1960, the site was approved by the AEC, and in February 1962, the construction permit was issued. In March 1966, criticality was reached, and in January 1967, electricity was generated. The unit operated for seven years and was decommissioned in October 1974.

By the time Peach Bottom Unit 1 became operational, additional generating capacity was needed in Philadelphia Electric Company's system to meet the estimated demands for the middle 1970s. By 1967, a decision was made to construct the Limerick nuclear plant about 20 miles northwest of Philadelphia to add 2,000 Mw of additional electric capacity by 1977.¹ Earlier, it was decided to expand the Peach Bottom site with two additional units, each with a capacity of 1,098 Mw. (U.S.

¹The original schedule for the operation of the proposed Limerick plant was 1977, but after numerous delays and construction cutbacks because of public resistance to the project and cash flow problems, the operating schedule was changed to 1985.

Atomic Energy Commission, 1973.) The original proposal was to construct one unit in Peach Bottom Township and the other unit in New Jersey. The need for additional generating capacity, however, resulted in a decision to construct four additional nuclear-fueled units--two at the Peach Bottom site (Peach Bottom Units 2 and 3) and two in New Jersey (the Salem Nuclear Generating Station). Of the four utilities who collaborated in this effort--Philadelphia Electric Company, Public Service and Gas Company, Atlantic Electric Company, and Delmarva Power and Light Company--Philadelphia Electric owns 42.6 percent of the additional Peach Bottom plant and 42.6 percent of the Salem facilities. (McHugh, 1980.)

2.3.2 Service Area

The Philadelphia Electric Company's present service area is restricted to southeastern Pennsylvania, as shown in Figure 2-2, and a subsidiary provides electric services in two counties in northeastern Maryland. Together with its subsidiaries, the Philadelphia Electric Company service area encompasses 2,475 square miles. In 1978, the utility provided electricity to 1.3 million customers and gas to 0.3 million. (U.S. Atomic Energy Commission, 1973; Philadelphia Electric Company, 1978.) The Peach Bottom nuclear facility is located in the easternmost portion of the utility's service area.

2.3.3 Generating Capacity and Production

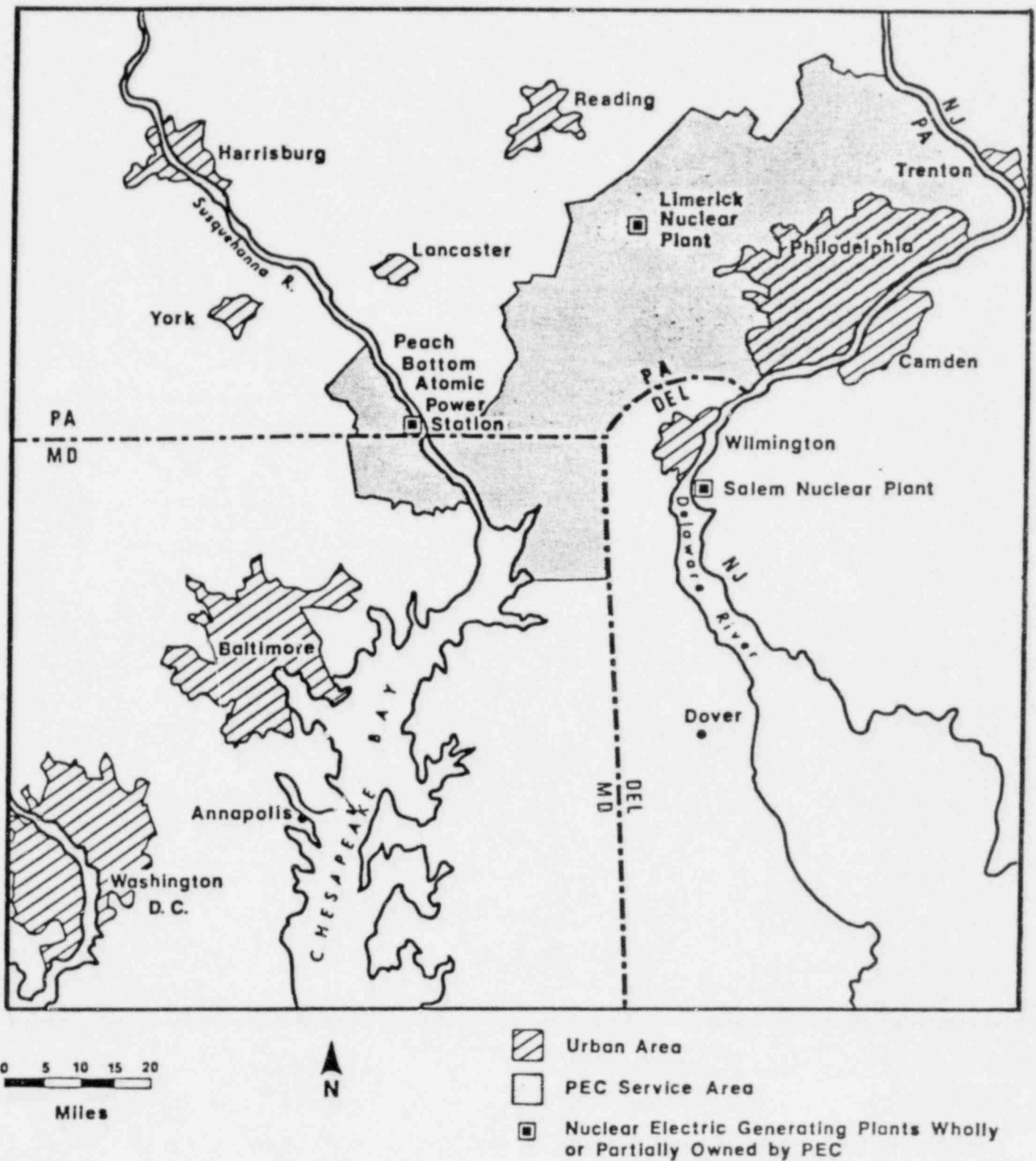
In 1978, the total generating capacity of the Philadelphia Electric Company's system was 7,727 Mw. Of this, Peach Bottom Units 2 and 3 provided 2,196 Mw, or 28.4 percent of the total generating capacity. In 1975, 39.7 percent of the electrical production (Mwh) of the Philadelphia Electric Company was provided by the Peach Bottom plant. In 1978, the Peach Bottom facility provided 48.1 percent of the company's electrical output. (Philadelphia Electric Company, 1978.)

2.4 The Project

2.4.1 Project Site

The Peach Bottom Atomic Power Station is located in the southeastern corner of York County, Pennsylvania. The site is adjacent to Conowingo Pond in the Susquehanna River, approximately eighteen miles northwest of its mouth in Chesapeake Bay, and consists of 620 acres, 100 of which are covered with roads and structures. (U.S. Atomic Energy Commission, 1973.) The remaining 520 acres are woodland.

FIGURE 2-2. PHILADELPHIA ELECTRIC COMPANY SERVICE AREA



The transmission system at the site made the location valuable for additional power generation. However, the transmission lines and existing rights-of-way were not the only advantages of the site. Cooling water was available from Conowingo Pond; the geological strata were stable; the population density in the surrounding area was low (79 persons per square mile, 6,145 persons within 5 miles); the danger of flooding was minimal; and road and rail transportation was nearby. In addition, the site had previously been determined acceptable for a nuclear facility in the siting of Peach Bottom Unit 1. (U.S. Atomic Energy Commission, 1973; Philadelphia Electric Company, personal communication, 1979.)

An outstanding feature of the Peach Bottom site is its location on the shore of Conowingo Pond. The pond, actually a small lake formed by two dams on the Susquehanna River, is about 9 miles long and about 1.5 miles wide at the station site.

2.4.2 The Plant

Peach Bottom Units 2 and 3 are boiling-water reactors, each having a capacity of 1,098 Mw. The reactor and the turbine generator were both furnished by the General Electric Corporation. The general contractor was Bechtel. The plant utilizes a once-through open-looped cooling technique with five mechanical draft cooling towers. A total of 3,350 cubic feet per second of Conowingo Pond water is used when both units are in full operation.

Utilizing much of the transmission line rights-of-way obtained for Peach Bottom Unit 1, three 500kV transmission lines were constructed: a 3.8 mile line, a 24.5 mile line due east, and a 10.5 mile line to the south linked Units 2 and 3 into the system. (Philadelphia Electric Company, personal communication, 1980.)

2.5 Construction

2.5.1 Announcement

In 1966, the Philadelphia Electric Company announced that two additional reactors would be built at Peach Bottom; construction began in 1967. At that time the cost of these reactors was estimated at \$250 million. The projected completion dates were October 1970^f for Unit 2 and October 1972 for Unit 3. (Philadelphia Electric Company, personal communication, 1979.)

The need for the increased system capacity to be provided by Peach Bottom Units 2 and 3 was presented in the Final Environmental Statement by the U.S. Atomic Energy Commission. The generating capacity required by the utility in 1974 was projected to be 20,856 Mw. At the time of this estimate, the utility's generating capacity was 14,144 Mw, with an additional 4,914 Mw anticipated from newly constructed units. With the loss of output from Unit 1 due to its decommissioning, the available capacity would thus be short of the 1974 requirements. The AEC concluded that the two Peach Bottom units would be needed to meet utility load requirements.

2.5.2 Schedule and Cost

The construction of Peach Bottom Units 2 and 3 took place over a period of eight years, from 1967 to 1974. The actual cost of constructing the two units, excluding the costs of the transmission lines and the visitors' center, (which was built as part of Unit 1), was \$760 million, about three times more than the original \$250 million estimate. The construction of ancillary facilities such as the 3.5 mile spur line and an access road to the plant was included in the total costs. Since 1974, plant modifications to improve plant reliability and to satisfy NRC requirements (particularly those related to plant security and additional design modifications) have increased the cost of the plant.

2.5.3 Construction Phase Work Force

Site preparation for the two units began in late 1966, but construction did not seriously commence until 1967. By late 1967, 300 people were working at the site. By the end of 1968, the work force had increased to over 900 persons. As shown in Figure 2-3, the size of the work force increased sharply until the middle of 1970 when the number of workers was estimated to be almost 3,500. By the end of 1970, the size of the work force had declined to 2,663. Of these, 254 persons were Bechtel's nonmanual personnel, while the remainder consisted of manual employees. In mid-1971, the construction work force declined dramatically for a period as a consequence of work stoppages over labor disputes. (York Dispatch, 1971; Philadelphia Electric Company, personal communication, 1979.)

In 1972, the peak construction year, the size of the work force remained consistently large, reaching over 3,000 workers. In early 1973, the work force began to decline as construction of the plant was completed. At the end of 1973, the total

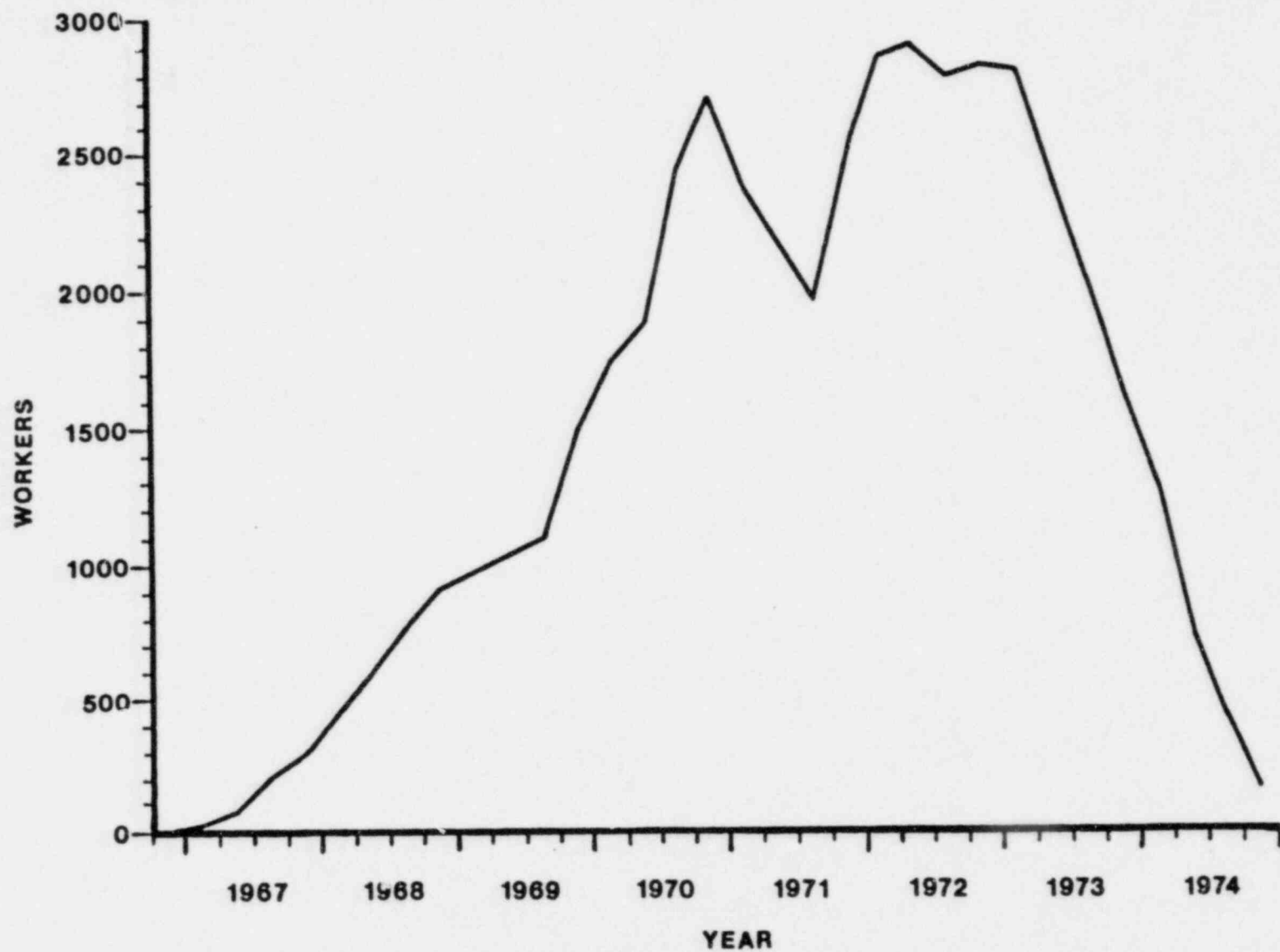


FIGURE 2-3. Average Daily Construction Work Force, Peach Bottom Atomic Power Station.

work force numbered 1,615 persons.¹ Table 2-1 shows the average annual work force during the construction period.

The shift structure was such that a significant amount of work was done at night. In March 1971, for example, 1,700 individuals were working on the project during the day, and 700 were working during the night. A large "night shift" work force continued throughout the remainder of the construction period. The construction work was a union job, and the wage scale was the highest in the region. In addition, overtime guarantees were provided.

2.5.4 Construction Experience

The construction permit for both units was issued on 31 January 1968, but the construction progress of the two units differed from the beginning. This was primarily a result of shortages of critical crafts and problems in procuring building materials. (Philadelphia Electric Company, personal communication, 1979.) Although the plant is bounded by industrial centers—Harrisburg to the north, Baltimore to the south, and Philadelphia to the east—the progressive expansion of industrial employment in the region and competing construction projects closer to the residential location of the skilled work force resulted in shortages of pipefitters, welders, and electricians throughout the project's construction. By February 1968, for example, the concrete for the reactor building for Unit 2 had been poured, but not until seven months later was concrete poured for Unit 3 (Philadelphia Electric Company, n.d.).

There were a number of labor disputes, mostly jurisdictional in nature, that resulted in construction delays. The Peach Bottom plant was one of the earlier large nuclear projects, and the jurisdictional problems experienced in its construction were similar to those of other large projects constructed at the same time. (Philadelphia Electric Company, personal communication, 1979.) In March 1971, for example, a labor dispute halted construction for over four months. The Philadelphia Electric Company acknowledged at that time that the plant's construction was two years behind schedule because of labor shortages, work stoppages, problems with timely deliveries of construction materials, and design changes required because of new AEC

¹ A survey of the construction work force was carried out for the Philadelphia Electric Company in August 1973 by Renova International, Ltd.

TABLE 2-1

AVERAGE ANNUAL CONSTRUCTION WORK FORCE
PEACH BOTTOM ATOMIC GENERATING PLANT
1967-1974

Year	Average Annual Employment
1967	150
1968	688
1969	1,064
1970	2,186
1971	2,119
1972	2,844
1973	2,230
1974	639

Source: Bechtel, n.d., Actual Field Manpower Distribution 1967-1974; Philadelphia Electric Company, n.d., Peach Bottom Units 2 and 3, Cumulative Commitments and Costs.

specifications (York Dispatch, 20 March 1971). In August 1972, another jurisdictional dispute disrupted construction schedules for the Peach Bottom plant. The Philadelphia Electric Company estimated that labor problems alone contributed to a one-year delay in building the plant. (Philadelphia Electric Company, personal communication, 1979.)

2.6 Operations

2.6.1 Schedule and Cost

Commercial operation of Unit 2 began in July 1974. In December 1974, Unit 3 began commercial operation. The total Peach Bottom operating expenses steadily increased since 1975. In 1975, power-production expenses amounted to approximately \$17 million¹; in 1976, the total expense was estimated at about \$26 million. Of this total, fuel costs were estimated at about \$14 million, and maintenance costs, at \$6.5 million. In 1977, total power production expenses were \$30.7 million, and in 1978, \$36.4 million. The operating costs (¢/kwh) in 1975 were estimated at 0.392; by 1978, costs had increased to 0.622. (Philadelphia Electric Company, 1978; Federal Energy Regulatory Commission, 1978.)

2.6.2 Work Force

The size of the operations work force from 1974 to 1979 is shown in Table 2-2. During this six-year period, the size of the work force increased from 295 to 469 persons, in part due to increases in the security force resulting from changes in the guidelines of the Nuclear Regulatory Commission.

2.6.3 Operating Experience

Unit 2 has been in commercial operation since July 1974; Unit 3 has been operating since December 1974. In 1974, the generating capacity factor was 78.8 percent for Unit 2 and 76.5 percent for Unit 3. The capacity factor declined in 1975 to 55.1 percent for Unit 2 and 58.3 for Unit 3 and increased to 60.3 percent and 66.5 percent in 1976. In 1977, the capacity factor of both units dropped, to 43.7 percent for Unit 2 and to 52.7 percent for Unit 3. In 1978 and 1979, the capacity factors improved. In 1978, the capacity factor was 73.8 percent for Unit 2 and 76.8 percent for Unit 3. The capacity factors increased in 1979 to 91.2 percent and 81.1 percent for Units 2 and 3, respectively.

¹Power-production expenses include costs for refueling, maintenance, operations personnel, repair work, and design modifications.

TABLE 2-2

AVERAGE ANNUAL OPERATIONS WORK FORCE^a
PEACH BOTTOM ATOMIC GENERATING PLANT
1974-1979

Year	Average Annual Employment
1974	295
1975	300
1976	308
1977	342
1978	414
1979	469

^aThe operations work force consists of plant managers, operators, engineers, clerical workers, the security work force, and maintenance workers. The security and maintenance employees are not employed by the utility but are subcontracted.

Source: Philadelphia Electric Company, personal communication, 1979.

In comparison with the generating capacity factors for Peach Bottom Units 2 and 3 provided in this section, the average capacity factors for all nuclear-fueled units in the United States was 52.7 percent in 1975, 52.2 percent in 1976, 62 percent in 1977, 61.7 percent in 1978, and 52.4 percent in 1979. Peach Bottom's capacity factors were well above the average for all plants in the United States.

Delays in the commercial startup and shutdowns due to equipment failures in both units may partially explain the problems in achieving higher capacity factors. Although the 100-percent-power permit was issued for Unit 2 in October 1973, an electrical failure in the generator delayed startup for approximately six months. In December 1974, Unit 3 was declared commercial, but soon after, an electrical failure resulted in a three-week shutdown of the unit. (Philadelphia Electric Company, personal communication, 1979.)

On 23 September 1974, both units were shut down for AEC inspection after cracks were discovered in the cooling system of other plants. At that time, Unit 2 was operating at 83 percent capacity. On 18 October 1974, Unit 2 shut down for over one month when a relief valve on the primary coolant system opened, although no excessive release of radiation was apparent and no equipment was damaged.

In April 1975, the Peach Bottom plant was among eleven boiling-water facilities ordered to check for possible vibrations within the reactor; and on 3 June 1975, Unit 3 reduced its operating power by one-half due to vibrations found in the monitoring devices installed in the reactor core. As a result of the concern over the vibration problems, the capacity of both units was restricted to 55 percent for a five-month period. The instrument vibration problem was repaired by early December of that year, and the plants resumed normal operation. In October 1977, excessive levels of radioactive gases were emitted from the plant at 2.3 times the permissible rate. The emission levels were monitored, and studies were conducted; the problem was of a temporary nature. (York Dispatch, October 1977.) A valve in Unit 3 malfunctioned in June 1979, and this too resulted in the shutdown of the Peach Bottom reactor. By the end of the month, the Peach Bottom plant was again at full power. (York Dispatch, June 1979.)

2.6.4 Refueling and Major Repairs

Each unit has been refueled three times, with each refueling lasting approximately seven weeks. Because maintenance and repair work always accompany

refueling, the process has large labor requirements. In 1978, for example, 640 workers were needed for maintenance and refueling of the two units. Although the utility had a large pool of skilled craftsmen who were utilized during refueling, a substantial number were employees contracted for maintenance and decontamination work. In both 1976 and 1977, about 400 workers were required for refueling.

Major repair and maintenance are frequently undertaken during a refueling outage. The first refueling outage for Unit 2 was extended for twenty-five days to repair cracks in the core-spray piping. The second refueling outage for Unit 2 was also extended to repair cracks in the control rod cladding, isolate the drive-return line, and remove damaged reactor parts. (Philadelphia Electric Company, personal communication, 1979.)

Peach Bottom Unit 3 was removed from service in April 1978 to accommodate a refueling and maintenance outage. The unit had been kept in service on a lower power-generating rate for approximately three weeks beyond the original shutdown date to provide power to adjoining utilities during a Pennsylvania coal strike.

2.7 Taxes

In contrast to other states where local jurisdictions receive substantial revenue from taxes on the assessed value of utility facilities, the Pennsylvania tax structure is such that local areas do not benefit directly from property taxes on generating facilities. The Public Utility Realty Tax of 1970 (PURTA) is a tax imposed annually on the depreciated cost of utility real estate (including structures under construction) at a rate of 30 mills. The state distributes to localities throughout the state an amount equal to the total of all real estate taxes that would have been collected that year if the public utility's realty had been subject to local assessment and taxation. The basis for the distribution is the ratio of total taxes collected by the local area to the total taxing effort of all localities in the state. (Philadelphia Electric Company, personal communication, 1979.)

Local real estate taxes are paid annually on nonutility real estate associated with the Peach Bottom plant such as the visitors' center, built in 1963. This tax is

relatively small, approximately \$6,000 annually.¹ (Solecki, personal communication, 1979.) In addition, an Occupational Privilege Tax of \$10 per worker is levied on individuals who work within the boundaries of the Southeast School District,² and a one percent earned-income tax is levied on earnings. The revenues from these taxes are shared with local municipalities within the school district.

Total tax payments by the utility for Peach Bottom Units 1 and 2 are shown in Table 2-3. A detailed analysis of the tax payments to municipal jurisdictions is found in Chapter 7.

2.8 Corporate/Community Programs

2.8.1 Emergency Planning

As part of the application for an operating license, the utility submitted a plan for coping with emergencies at the plant. The emergency plan incorporated agreements and communication with local, state, and federal agencies as well as arrangements for medical support in the event of a radiological emergency.

In August 1975, the Environmental Coalition on Nuclear Power, a federation of state ecology groups, petitioned the State Public Utilities Commission. Both the Peach Bottom plant and the Three Mile Island plant were cited for not having adequate contingency plans. By July 1976, state officials were preparing updated emergency plans.

In May 1978, an evacuation plan was drafted for the areas around the Three Mile Island and Peach Bottom nuclear plants. Prompted by the accident at the Three Mile Island nuclear plant in March 1979 and the subsequent development of emergency requirements, the York County Evacuation Plan was developed in April 1979.

On 12 April 1979, the Peach Bottom Nuclear Power Station Evacuation Plan was issued. Peach Bottom Township supervisors, some residents, and a local activist group expressed concerns over the completeness and adequacy of the plan, and a

¹Based on the 1978 tax liability.

²The townships of Peach Bottom, Faun, East Hopewell, and Hopewell, and boroughs within these townships are within the Southeast School District.

TABLE 2-3

TOTAL TAX PAYMENTS FOR THE PEACH BOTTOM ATOMIC PLANT
UNITS 2 AND 3
1974-1978

Year	Total Tax Payments
1974	\$1,386,196
1975	1,640,177
1976	1,762,549
1977	1,733,098
1978	1,707,071

Source: Renova International Ltd., 1974, Community Impact Study; A.J. Solecki, memorandum to W.J. Cloves, Philadelphia Electric Company, 22 February 1979.

number of townships in the vicinity of the Peach Bottom plant decided to develop their own emergency plan. To this end, the Peach Bottom Township emergency coordinator met with representatives of the townships in the region. The utility has also been actively involved in the deliberations over the development of the plan.

2.8.2 Visitors' Center

The Peach Bottom Information Center is located on the site adjacent to the nuclear facility and was built during construction of Unit 1. The center was originally designed to provide information on nuclear energy in general and on the Peach Bottom plant specifically with educational displays and models at the center and programs for various audiences. Approximately one-half of the visitors to the center are school children, mostly from Maryland schools. Annual attendance at the information center has averaged around 60,000 people. (McHugh, 1980).

The information center is considered an important asset by residents of nearby communities, as the facility has been made available for community events and meetings. Moreover, the utility has sponsored an annual Peach Bottom historical night when slides are collected from local residents and presented to the community. The information center has sponsored historical research in the area and has an extensive library of historic photographs of the Peach Bottom area.

The construction of the information center was part of a much larger, continuous, and active public relations effort. Speakers from Philadelphia Electric Company have often appeared at community meetings and functions in response to requests for information about the operation of the Peach Bottom plant. Special efforts have been made to develop good relationships between utility personnel and local civic and business leaders. Following the TMI accident, personnel from the utility held meetings with local government leaders and the public to discuss the accident and the Peach Bottom plant (Alden, Fleishman, and Hughes, personal communication, 1980).

2.8.3 Other

Philadelphia Electric Company has actively participated in the development of recreational facilities in the region, especially in the Conowingo Pond area where the utility owns much land. As part of the utility's earlier hydroelectric projects on the lower Susquehanna River, recreational parks were integrated into the overall

development plans. The Muddy Run recreational parks were directly sponsored by the Philadelphia Electric Company. Moreover, much of the land around Conowingo Pond is leased to individuals for private cottages. Philadelphia Electric Company's contribution to the development of these areas is highly visible.

2.9 Major Events Chronology

The chronology of the major events for the construction and operation periods is shown in Table 2-4.

TABLE 2-4
CHRONOLOGY OF MAJOR EVENTS

Year	Month	Day	Event
1966	August	22	Units 2 and 3 are announced.
1967	February	10	Philadelphia Electric Company files license application with the AEC.
1968	January	31	Construction permits are issued by the AEC following a brief public hearing.
1972	June	—	Peak construction work force is reached with 2,800 workers.
1973	May	30	Operating license hearing is held.
1973	August	8	Operating license is issued for Unit 2. The operating license for Unit 3 will be delayed.
1974	July	—	Commercial operation of Unit 2 begins.
1974	July	2	Operating license is issued for Unit 2.
1974	November	—	Decommissioning of Unit 1 begins.
1974	December	30	Commercial operation of Unit 3 begins.

Source: U.S. Atomic Energy Commission, Directorate of Licensing, 1973, Final Environmental Statement; Philadelphia Electric Company, personal communication, 1979; York Dispatch, 29 September 1966, 2 June 1967, 2 March 1971.

CHAPTER 3: IDENTIFICATION OF THE STUDY AREA

3.1 Introduction

This chapter serves as a transition between the focus on the Peach Bottom Atomic Power Station, presented in Chapter 2, and the focus on the socioeconomic effects resulting from the construction and operation of the plant, presented in the remaining chapters. As such, this chapter has two principal purposes. The first is to describe a multi-county region near the Peach Bottom nuclear plant and the distribution of direct project effects—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 identification and selection of a study area is an important element in the overall case study methodology. An analysis of the secondary socioeconomic effects (social and fiscal changes, for example) requires identifying an area that has two characteristics: (1) a concentration of primary project effects (workers, purchases, and tax payments), and (2) overlapping and integrated economic, political/governmental, and social systems.

Initially, the counties contiguous to the project site that received appreciable direct project effects were identified as the study region. Within the counties, minor civil divisions (or municipal units) that received direct project effects were identified. Based on the magnitude of direct project effects in relationship to the size of the minor civil divisions' populations and economy and the proximity to the project site, aggregate units were formed. The distribution of jobs, workers, purchases, and tax payments relating directly to the construction and operation of the Peach Bottom plant were identified for the aggregate units of the study region. The pattern of the distribution of direct project effects and the population size of the aggregate units were 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, alternate study areas were considered. A study area was then selected that would serve as the unit for analysis of the economic, demographic, housing, governmental, and social structure effects of the Peach Bottom nuclear generating station.

A preliminary examination of the Peach Bottom project conducted in 1978 identified and described a four county region as the area for the regional study. This region is identified in Section 3.2. The county descriptions were used in conjunction with information from utility and union officials and from key informants concerning the distribution of project workers, purchases, and tax payments for a construction year, 1973, and the latest complete year of plant operation, 1978.

A systematic consideration of the distribution of project workers, purchases, and tax payments in these particular areas throughout the four-county region for each of the two years, presented in the following sections presents the scope, magnitude, and pattern of their individual and combined occurrence. As discussed in Section 3.6, this analysis provides a basis for identification and selection of a study area and for interpretation of the socioeconomic effects found to occur in the study area.

3.2 The Study Region

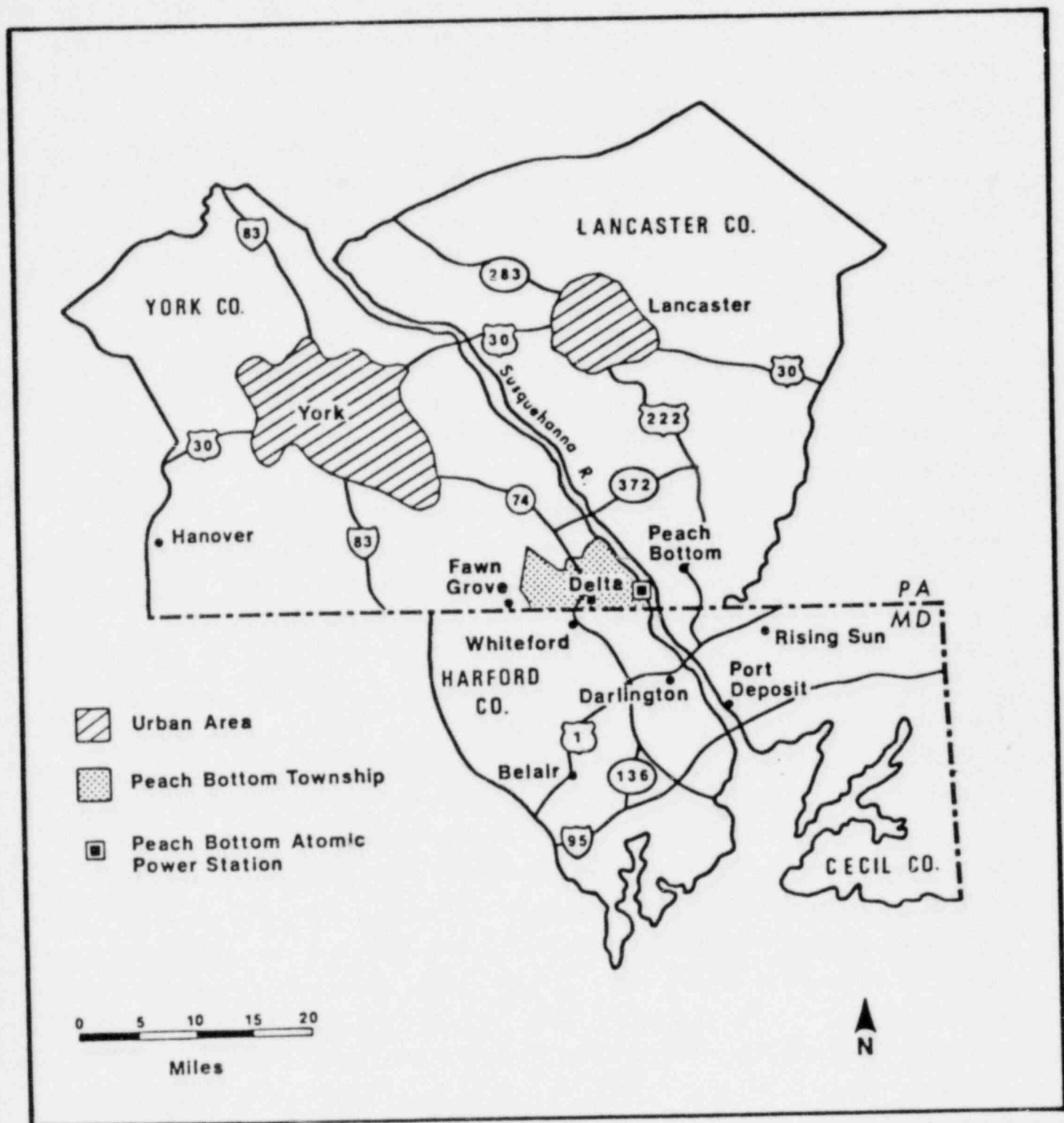
3.2.1 Description of the Region

The four counties of York, Pennsylvania; Lancaster, Pennsylvania; Harford, Maryland; and Cecil, Maryland constitute the region examined in the chapter and are shown in Figure 3-1. These four counties were identified and described in Peach Bottom Units 1, 2, and 3: Preliminary Site Visit Report (Mountain West Research, Inc., 1979).

The four-county region straddles the Pennsylvania-Maryland border and both sides of the Susquehanna River. The Peach Bottom nuclear plant is located approximately in the center of the region, in the southeastern corner of York County. In general, the four-county region exhibits a rural/urban dichotomy, with the central, rural portion of the region surrounded by and somewhat isolated within a more densely populated and industrialized area formed by the urban centers of York, Lancaster, Wilmington, and Baltimore. The total population of the four-county region was about 761,000 persons in 1970. The two counties in Maryland—Harford and Cecil—are smaller in area and population than are the two counties in Pennsylvania—York and Lancaster.

Despite the influence of the urban, industrialized centers of York and Lancaster counties on the overall economic statistics of the region, agriculture remains an important sector of the economy, particularly in the central portion of the region—the area nearest the Peach Bottom site.

FIGURE 3-1. STUDY REGION: FOUR COUNTIES
IN PENNSYLVANIA AND MARYLAND



The northernmost portions of both York and Lancaster counties are semi-rural, oriented primarily toward the Harrisburg, York, or Lancaster urban areas. The Lancaster, York, and Hanover urban areas, with a combined population in 1970 of about 180,000 persons and a highly integrated manufacturing sector, dominate the central and southwestern portions of the York-Lancaster county area. The remainder of the two counties, particularly the southwestern portion of Lancaster County and the southeastern portion of York county where the Peach Bottom project is located, is more sparsely populated with small, widely scattered towns functioning primarily as agriculture service centers. During the 1960s and 1970s, the population of the urban and semi-rural areas in the northern portion of York and Lancaster counties increased rapidly in contrast to the more rural southern portion where little population growth occurred.

The eastern part of Cecil County and the southern half of Harford County are within commuting distance of Wilmington, Delaware and Baltimore, Maryland, and experienced rapid population growth and suburbanization during the 1960s and 1970s. The largest community in these two counties, Belair, which had a 1970 population of about 6,300 people, is located near the center of Harford County. As suburban development extended northward during the 1970s, the north-central rural areas of these two counties experienced a moderate rate of population growth and suburbanization.

3.2.2 Identification of Places within the Region

The geographic areas delineated in this section function as the geographic framework within which the distribution of the direct effects of the project are identified in the study region. Figure 3-1 shows the four-county region and the places located within the region. All population figures are for 1970. Five places are shown in York County: the York urban area, Hanover, Fawn Grove, Peach Bottom Township, and Delta Borough. Of these, the York urban area was the most conspicuous area at the time of the study, with a large urban population (195,492 persons) and a diversified manufacturing economic base. The area included several incorporated centers that formed an urban-industrial continuum with York City. Hanover, in the southwestern section of the county, was an important retail and manufacturing center in the county, with extensive residential development and a population of over 15,600 persons. Fawn Grove, a small and prosperous town of about 485 persons, continued to serve its agricultural environs, although it became a "bedroom" community for commuters to the Baltimore area during the 1970s. The Peach Bottom plant is located in Peach Bottom Township, with Delta Borough as its nearest town. The township, primarily rural, and

Delta, which traditionally functioned as the township's service center, had populations of 1,424, and 778 persons, respectively.

In Lancaster County, the principal area of attention was the Lancaster urban area, which had a population of 218,812 in Lancaster City and the adjacent suburban areas, along with the smaller town of Peach Bottom, which had a population of only 200. In Harford County, the principal areas of attention were Belair, a residential and retail center in a rapidly growing urban area of 30,803 persons; Whiteford, a small town of 600 persons; and Darlington, which had a population of 950. In Cecil (the other Maryland county), the towns of Rising Sun and Port Deposit, with populations of 956 and 906, respectively, were similarly considered.

3.3 Distribution of Direct Project Effects within the Region

Construction and operations workers at the Peach Bottom plant will be spatially allocated to determine the areas in which socioeconomic effects may have occurred. The places where workers resided are most likely to have experienced demographic and income effects because of the plant, and these effects may have resulted in secondary economic and social changes. In this section, the distribution of direct project effects resulting from the construction and operation of the Peach Bottom plant—direct basic employment, utility purchases, and tax payments—are allocated to places within the region.

Because they reflect the magnitude of the difference in work force size, demographic composition, residential patterns, income, and interaction with host communities, a construction year (1973)¹ and a recent operations year (1978) are the periods for which worker distribution will be examined.

¹Although 1972 was the peak construction year (the average work force was 2,844), a survey conducted in 1973 (when the work force was 2,230) provided accurate data on worker residence. The objective of the survey was to ascertain information about the size and distribution of the work force for assessing the projected impacts of the Philadelphia Electric Company's proposed Fulton Atomic Plant. The study was undertaken for the utility by Renova International Ltd. and was published in July 1974 as the Community Impact Study of the Peach Bottom Atomic Power Station.

The 1973 construction work force is spatially allocated on the basis of a detailed survey of the work force taken by the company, which recorded the place of residence of the workers. The information was validated by key informants, including union managers and individuals from communities located in the four-county area. Detailed information on the origin and residential distribution of the 1978 operations work force was provided by the Philadelphia Electric Company.

3.3.1 Distribution of Direct Basic Employment by Place of Work

The Peach Bottom plant is located in Peach Bottom Township. Therefore, all project work and all direct basic employment occurred within the boundaries of the township in both 1973 and 1978. In 1973, the annual average daily employment at the project site was 2,230 persons; in 1978 it was 414 persons.

3.3.2 Distribution of Direct Basic Workers by Place of Residence

Table 3-1 shows the 1973 construction work force as it was spatially allocated within the four-county region. The construction work force was divided into three categories: nonmovers--workers who were residents of the study area before construction began and did not relocate; movers--workers who relocated into the area to work at the site; and long-distance commuters--workers who commuted daily from outside the study area to the site.

In 1973, as shown in Table 3-1, 1,240 workers at the plant site resided in York County. This represented almost 50 percent of total employment. About 400 workers resided in Lancaster County, 60 workers in Cecil County and about 275 workers in Harford County. Almost 50 percent of the workers residing in York County were found in the York urban area.

The distribution of the construction work force can be explained by several factors. All of the union locals from which construction workers for the Peach Bottom plant were obtained were located in York City. In addition, the York urban area had the largest pool of skilled labor in the four-county area. During the construction phase, many movers, especially those with families, were also attracted to the York urban area and to other large urban centers. (York City was located within easy commuting distance to the Peach Bottom site.) This was a result of both shortages of family housing units in the immediate area of the plant (Peach Bottom Township) and the preferences of the professional nonmanual personnel for a more urban area. The immediate area of the

TABLE 3-1

PEACH BOTTOM ATOMIC GENERATING PLANT
CONSTRUCTION WORK FORCE BY PLACE OF RESIDENCE
1973

Place	Nonmovers	Movers	TOTAL
York County			
Hanover	46	0	46
York Urban Area	291	248	539
Fawn Grove	24	3	27
Delta	148	111	259
Peach Bottom Township	98	58	156
Residual	193	20	213
County Total	800	440	1,240
Lancaster County			
Lancaster Urban Area	94	164	258
Peach Bottom	12	6	18
Residual	126	0	126
County Total	232	170	402
Cecil County			
Rising Sun	18	0	18
Port Deposit	9	11	20
Residual	22	0	23
County Total	49	11	60
Harford County			
Whitford	14	4	18
Darlington	15	16	31
Belair	34	63	97
Residual	113	17	130
County Total	176	100	276
Outside Four-County Area			252
Total Construction Work Force			2,230

Sources: Renova International Ltd., 1974, Community Impact Study of the Peach Bottom Atomic Power Station; Philadelphia Electric Company, personal communication, 1979; Bechtel Corporation, n.d., Actual Field Manpower Distribution.

plant lacked housing for workers with families, and the rental space that was available in the homes of Delta and Peach Bottom residents primarily accommodated workers who were either single or without their families. The demand for housing far exceeded the available housing close to the project. This fact, in addition to the available housing elsewhere but within commuting distance, resulted in a generally dispersed residential pattern for workers' location.

The 1978 data on the residential location of the operations work force for Peach Bottom Units 2 and 3 were provided by the Philadelphia Electric Company. These data are shown in Table 3-2. The total operations work force, including the operations of the regular maintenance and contracted personnel, consisted of 414 workers in 1978. Of these, 220 were directly employed by the utility. Precise residential information was available for these 220 workers, but not for the remaining 94 workers, although their general distribution was known.

During the 1978 operation year, the operations work force was concentrated in York County, primarily in the York urban area and Peach Bottom Township. The remainder was distributed throughout the four-county area.

The annual refueling work force, which includes maintenance and repair workers, consisted of three groups of crafts workers: workers who were hired from the union halls in York City, workers employed by the utility, and workers who were employed by a maintenance-labor-pool organization and resided primarily in the area near the plant. (Philadelphia Electric Company, personal communication, 1979.) The size of the refueling work force in 1978 was estimated to be over 600 workers. It is estimated that the residential distribution of these workers was similar to that of the construction work force although somewhat skewed toward the area near the plant. According to interviews from key informants, the 1978 refueling period resulted in the temporary relocation of a number of workers into the region.

Table 3-1 also characterizes the workers as nonmovers and movers. Movers are those workers who in-migrated into the community as a direct result of employment at the plant site. About 25 percent of the total work force were movers. About 30 percent of the work force were nonmovers and resided in York County. There were approximately 290 workers at the site who were from the York urban area and who resided there prior to plant construction. About 250 workers and their families

TABLE 3-2

PEACH BOTTOM ATOMIC GENERATING PLANT
PAYROLL OPERATIONS WORK FORCE
BY PLACE OF RESIDENCE
1978

Place	TOTAL
York County	
York Urban Area	57
Fawn Grove	2
Delta/Peach Bottom Township	32
Residual	10
Lancaster County	
Lancaster Urban Area	51
Residual	8
Cecil County	
Rising Sun	1
Port Deposit	1
Residual	2
Harford County	
Whitford	4
Darlington	1
Belair	8
Residual	2
Four-County Area	172
Unallocated ^a	194
Outside Four-County Area	48
Total Operations Work Force	414

^aSince it was not possible to obtain precise residential information for the 194 maintenance and contracted personnel who were not employed directly by the utility, they have not been allocated to particular places.

Source: Philadelphia Electric Company, personal communication, 1979.

in-migrated to the York urban area. York City was the largest city in the county with a high vacancy rate in the housing sector. A smaller, but sizeable number of workers in-migrated to the Lancaster urban area. Both Lancaster and York City were within commuting range of the plant site.

3.4 Distribution of Purchases

The major purchases associated with the construction and operation of the Peach Bottom plant were made outside of the four-county region, mostly in Harrisburg, Baltimore, and Philadelphia. A deliberate effort was made to purchase construction items in Philadelphia. Purchases that were made within the four-county region were primarily bulk construction materials (such as lumber, sand, and cement) purchased from wholesalers, and these were relatively small purchases. The Philadelphia Electric Company suggested that up to 2 percent of the materials and services purchased for construction may have been made in York County, mostly in the York urban area. The \$3.7 million in purchases would not have had discernible economic effects in this heavily urbanized manufacturing region. In fact, interviews with key informants from York City indicated that no economic effects as a result of the plant were observable in that area. (Alden, Barnhart, and McHugh, personal communication, 1979 and 1980.)

3.5 Distribution of Taxes

The Philadelphia Electric Company pays taxes on the Peach Bottom nuclear station to three public jurisdictions: Peach Bottom Township, the State of Pennsylvania, and the Southeastern School District. The implementation of the 1970 Pennsylvania Public Utility Tax Act resulted in the payment of utility real estate taxes to the state. Since 1975, Pennsylvania has received an average of more than \$1.6 million annually from the utility's realty tax payments on the plant. Real estate taxes paid on nonutility real estate have been paid to Peach Bottom Township, but this tax has remained small, approximately \$6,000 annually.

The Occupational Privilege Tax, levied on workers who work within the Southeastern School District,¹ combined with the 1 percent earned-income tax that was

¹The Southeastern School District covers an area that includes four townships in Southeastern York County.

imposed on construction workers, added substantial revenues to Peach Bottom Township. Between 1969 and 1973, a cumulative sum of \$991,581 in earned-income taxes was collected from construction workers. In addition, by 1978, \$303,662 in earned-income taxes had been withheld from operations personnel.

3.6 Selection of Study Area

3.6.1 Area Selected

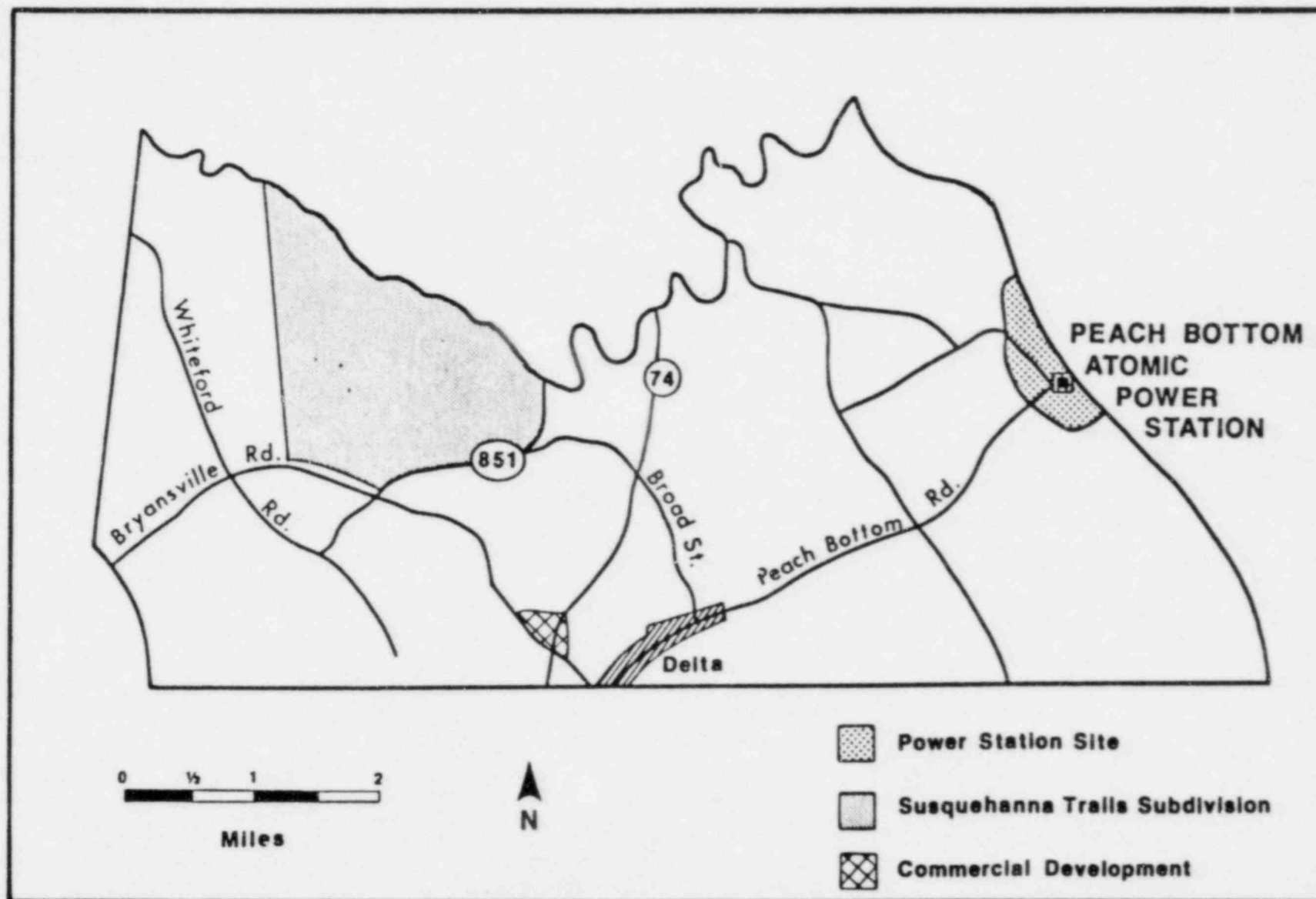
The Study Area selected for the Peach Bottom case study, as shown in Figure 3-2, was Delta Borough and Peach Bottom Township. Peach Bottom Township is a small agricultural township in York County as shown in Figure 3-1. The town of Delta Borough is located within Peach Bottom Township but is a separate and distinct municipality from the township. The two municipalities will serve as the basis for the analysis of the economic, demographic, housing, governmental and social structure effects of the construction and operation of the Peach Bottom plant.

3.6.2 Rationale

The distribution of the construction work force shows that 415 workers resided in the Study Area. In 1973, the construction work force was estimated to constitute approximately 20 percent of the Study Area population. In no other place within the four-county region was the construction work force such a large proportion of the host population. Moreover, about one-third of the operations workers who relocated to work at the plant moved into the Study Area. The direct basic employment by place of residence was distributed throughout the four-county region. This section examined the concentration of the project's direct effects by place of residence for each place identified in the study region and each area's portion of total direct basic employment to each area's portion of the total 1970 population. In 1973 and 1978, Peach Bottom Township/Delta Borough had the highest percentage-of-workers-to-percentage-of-population ratio.

Even though there were an estimated 539 workers in the York urban area during the 1973 construction period, it was not selected as a Study Area because the number of workers was small in proportion to the population and the population was distributed throughout the large urban area. The effects of the Peach Bottom plant were further diffused by the rapid expansion of the York urban area during the construction period. The conclusion that discernible demographic and economic changes did not occur in the York urban area is supported by the Renova study, which did not find any noticeable

FIGURE 3-2. PEACH BOTTOM ATOMIC POWER STATION STUDY AREA:
DELTA AND PEACH BOTTOM TOWNSHIP



economic impacts in the York urban area as a direct result of the plant's construction (Renova International, 1974). This conclusion is further reinforced by information provided by key informants.

There were relatively few purchases of construction materials within the four-county area, and these did not result in any significant economic or income effects relative to the total costs of construction goods and services. Nevertheless, from the perspective of the residents in the Study Area, where some establishments were able to supply construction materials to the plant, the increases in the volume of sales were considered to be rather significant.

The taxes paid by the utility to the state are distributed state-wide to local jurisdictions, and the revenues are thereby diffused. The earned-income tax payments to Peach Bottom Township, on the other hand, were large and important, given the pre-construction level of revenues. In 1972, earned-income tax payments amounted to \$332,764, and in 1973, they were \$447,212. In 1972, the year of peak construction, taxes from the plant contributed 67.2 percent of the township's total revenues. No other places received comparable tax payments from the plant.

Investigations regarding the spatial distribution of the work force, taxes, and purchases have led to the conclusion that further study should be limited to Delta Borough and Peach Bottom Township. The employment and income effects are expected to be highly observable given that the work force was a relatively large proportion of the population and that the area had been in economic decline for some time before the project began. Peach Bottom Township and Delta Borough also possess the characteristics necessary for a satisfactory examination of socioeconomic effects, each having a functioning political system and sharing a sense of community and social cohesion.

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 and operation of Peach Bottom Units 2 and 3 on the economy of Delta Borough and Peach Bottom Township. Emphasis is placed on changes in the local economy and on changes in the employment, income, and labor force status of the area population. An assessment is also made of the impacts of the station on the standard of living of the Study Area's residents.

The analysis begins by providing an overview of the economic history of the Study Area. The historical discussion is oriented to the components which constitute the economic base of Delta Borough and Peach Bottom Township--agriculture, agricultural services, and mining. A more detailed examination is then made of changes that occurred in the economy of the Study Area over the 1967-1978 period. The study period begins in 1967, the year prior to the start of construction on Peach Bottom Units 2 and 3 and continues through 1978. The discussion is organized around three topics: employment and income changes, labor-force changes, and standard of living changes.

The next sections of the chapter trace the employment and income effects associated with both the construction and the operation of the station. The analysis of the construction effects is centered on 1973 (a peak construction year), and the analysis of the operation effects focuses on 1978. An economic base approach is utilized to identify and analyze the three elements of basic employment and income as well as the nonbasic employment and income that together constitute the total employment and income effects of the project. A summary of the employment and income effects due to the station, followed by a summary of labor force effects and standard of living effects, completes the chapter.

4.2 Economic History of the Study Area

The Study Area has historically been somewhat isolated. In the rural part of Pennsylvania, not traversed by any major east-west routes, the Study Area is located in a larger region that has been characterized as "one of the three colonial hearths" that contributed to the formation of the United States' cultural landscape. By the middle of the 18th century, the larger region had achieved what was to be the prototype of United States' development: a population mix of various national and religious origins and an

evolving urban system. Philadelphia and Baltimore, as major ports of entry, dominated the region, and such cities as Lancaster, York, and Harrisburg, with smaller populations, were emerging as county centers. Smaller farm service villages, such as Delta Borough, were scattered throughout the area. Urbanization began early in southeastern Pennsylvania, and by 1800, the region had acquired a markedly urban character with agriculturally rich hinterlands, a pattern that continued to the time of the study. (Gibson, 1886; Prowell, 1907.)

The earliest settlers in the Study Area were Irish and Scottish farmers who arrived between 1718 and 1740. The farm settlements were precarious at first, and failure was not uncommon in the area then known as the "Barrens." By the early 1800s, the socioeconomic base of the area had stabilized. Slate quarrying in Delta Borough by Welsh immigrants began in the late 1700s, and by 1820 the quarrying and distribution of slate ensured the viability of Delta Borough as a regional commercial center. The opening of a canal on the west side of the Susquehanna in 1836 encouraged the development of large-scale farming in the region. The widespread adoption of fertilizers in the region coincided with the construction of the canal and resulted in an upsurge of agricultural activity. (Renova International Ltd., 1974; Prowell, 1907.)

By the turn of the century, Delta Borough had a mature economic base centered on mining and agriculture. The development of the slate industry was critical to Delta Borough's early prosperity. During the early 1900s, however, the export of slate declined. Delta Borough's slate could not effectively compete with either the lower-priced slate that had become available or the construction materials that could be substituted for slate by 1930. Labor problems also affected the industry. During World War I, the location and establishment of arsenals in Maryland and shipyards in Philadelphia and Wilmington resulted in a substantial out-migration of experienced miners. (Renova International Ltd., 1974; Philadelphia Electric Company, historical documents, n.d.)

The economic decline and out-migration from Delta Borough continued into the 1960s; small retail outlets moved to larger urban centers, and the lack of employment opportunities resulted in the out-migration of the younger population. By the early 1960s, the economic base of Delta Borough was experiencing problems: there had been a long period of out-migration of young people, and the limited activity related to the mining industry—slate granulation—came to an end. Delta Borough's role as an

agricultural service center declined as equipment dealers and other service firms relocated to larger regional cities. The largest employer in the Study Area was a garment factory located in Delta Borough, but employment levels at the factory fluctuated widely. (Cooper, Gailbraith, Hughes, Hunt, Poff, Sommer, personal communications, 1979 and 1980.)

The economic decline of Delta Borough was reinforced by its isolated geographic position: the Susquehanna River blocked movement between York County and Lancaster County; the railroad between York County and Baltimore ceased operation; and the important routes between the major regional cities continued to by-pass York County's southeastern townships.

4.3 Changes in the Economy during the Study Period

Two perspectives are taken in this section on changes in the economy of the Study Area from 1967 to 1978. The first perspective focuses on the level of economic activity occurring within the boundaries of the area being studied. The primary measure of this activity is the number of jobs at places of work within the Study Area. The second perspective focuses not on economic activity occurring within the Study Area, but on the people residing in the area. The discussion centers on the labor force status of area residents and on the income they earn. Therefore, while employment is a key indicator in both cases, the distinction in the employment concepts must be maintained. The first perspective deals with employment in terms of the number of jobs measured at the place of work, while the second perspective measures the number of employed persons at their place of residence.

4.3.1 Employment

The study period begins in 1967, when construction on Units 2 and 3 commenced, and ends in 1978, an operating year. The best available economic data for the period prior to construction is the 1960 U.S. Census data. In describing this baseline year, 1960 data are utilized. Whenever sufficient data are available to reasonably extrapolate to 1967, it will be done and will be so indicated.

Peach Bottom Township has traditionally had a significant number of people engaged in agriculture, the leading industry. In 1960, an average of 4.6 percent of York County's employment was in agriculture, while almost 34 percent of the labor force in Peach Bottom Township was employed in the agricultural sector. At this same time,

19.5 percent of the people employed in Peach Bottom Township were farmers and farm managers, and 14.4 percent were farm laborers and farm foremen (the large percentage of people employed as farm laborers indicates a high level of seasonal employment). Prior to construction, there were 129 farm units in the township, but by the time construction on Units 2 and 3 had peaked in 1972, the number of farms had declined to 104. (York County Planning Commission, 1971.) This decline was accompanied by a loss in acreage devoted to farmland, from 17,651 to 14,480 acres, a loss resulting from idle marginal farms and competing urban uses for farmland. There was little industrial activity in the Study Area except for the garment factory: one of the last important industries--granulated slate for roofing materials--was shut down in 1964. (Renova International Ltd., 1974; Hunt, personal communication, 1980.) An examination of the industrial employment pattern of York County shows that the urbanized areas of the county, York and Hanover, contained over 85 percent of the county's total industrial employment. In contrast, the southeastern townships and boroughs, including Chanceford, East Hopewell, Fawn, Lower Chanceford, and Peach Bottom Township, contained a mere 1 percent of the county's industrial employment. (York County Planning Commission, 1971 and 1975.)

Table 4-1 shows employment (including proprietors) by sector for Peach Bottom Township and Delta Borough in 1960. The problem in interpreting these data is that they show the employment of the residents of the area, not the employment actually occurring in the area.

Outside of agriculture, most Study Area residents worked outside the Study Area in Baltimore or York City, making the figures in Table 4-1 substantially higher than the employment actually located in the Study Area itself. The commuters were employed principally in the construction, manufacturing, and public administration sectors. (York County Planning Commission, 1971.)

Prior to the construction of the Peach Bottom plant, more than 25 percent of the Study Area residents were employed in manufacturing, and over 20 percent were employed in agriculture. Many of those employed in manufacturing commuted to work outside of the Study Area. Interviews with key informants suggest that the employment pattern of the area's residents had not changed substantially between 1960 and 1967, the time of the construction of the nuclear facility. Employment data for Peach Bottom Township and Delta Borough for 1970 were not available due to boundary changes. The

TABLE 4-1

EMPLOYMENT BY MAJOR SECTOR
DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
1960

Sector	Delta Borough		Peach Bottom Township		Study Area	
	Number	Percent of Total Employment	Number	Percent of Total Employment	Number	Percent of Total Employment
Agriculture	4	1.3	139	33.8	143	20.7
Construction	29	9.6	59	14.4	88	12.7
Manufacturing	73	24.3	107	26.0	180	26.0
Transportation	17	5.6	—	—	17	2.5
Communications/ Utilities	16	5.3	8	2.0	24	3.5
Wholesale Trade	8	2.7	—	—	8	1.2
Retail Trade	60	20.0	8	2.0	68	9.8
Education	12	4.0	20	4.8	32	4.6
Public Administration	49	16.3	50	12.1	99	14.3
Other Industry	20	6.7	12	2.9	32	4.6
Total Employment	288		403		691	

Source: U.S. Department of Commerce, Bureau of the Census, 1963, Character Files of the Population, Part 40, Pennsylvania.

boundaries of the enumeration district for the Peach Bottom area were changed in 1970 to Peach Bottom Township, Delta Borough, Fawn Grove Borough, and Fawn Township (Census Tract 240). Since the economic structure and historical demographic processes taking place in Fawn Township and Fawn Grove Borough were in many respects similar to those in Peach Bottom Township and Delta Borough, the 1970 employment data by major industry group for Census Tract 240 are used as a proxy for the Study Area. (Fawn Grove Borough Planning Commission, 1977.)

Between 1960 and 1970, no appreciable increases occurred in the importance of the manufacturing or agricultural sectors in the Study Area. However, in 1970, both the construction and communications-utilities sectors had grown substantially. In 1960, 88 persons in the Study Area (12.7 percent of total employment) were employed in construction. By 1970, 212 residents of Census Tract 240 were employed in construction (17.7 percent of total employment).

In Delta Borough itself, employment of residents in the communications-utilities sector increased from 16 workers (5.3 percent of those employed) to 96 workers (8 percent of those employed) between 1960 and 1970.

Information provided by governmental officials, local businessmen, and farmers indicated that several changes occurred in the economy of the local area during the study period. Increased employment in the utility industry resulted directly from the Peach Bottom facility, and some shortages of labor in the agricultural sector developed due to workers shifting from jobs as agricultural laborers to employment at the Peach Bottom facility. There were two consequences of these changes. First, unemployment in the Study Area decreased. Second, the combination of office jobs at the Peach Bottom facility and employment opportunities at recently developed commercial shopping centers within commuting distance of the Study Area significantly improved employment opportunities for women in the Study Area.

4.3.2 Labor Force

By 1967, Delta Borough was a small community: the slate-related industries were dead and, although some of the agricultural services industry remained, most of the retail firms were relocating. The construction of Peach Bottom Unit 1 helped the economy to a very limited extent but did not prevent the continued out-migration of firms and population, with the result that Delta Borough had a large retired population

and a large proportion of workers who were commuters. When construction began on Units 2 and 3, the labor force in Delta Borough was about 300 persons, of whom less than 10 percent were usually unemployed. The female labor force participation rate in Delta Borough was unusually high for a rural town, and women made up approximately one-third of the total labor force. However, unemployment among women was also high: the unemployment rate for women was about 15.7 percent, compared to an unemployment rate of 5.3 percent for men. The high participation of women in the labor force was attributable to the availability of clerical, agricultural, and garment work in the area. The high female unemployment rate was partly the result of seasonal fluctuations in local agricultural industries and partly the result of layoffs at the garment factory in Delta Borough, the largest single industry in the area prior to the siting of the Peach Bottom plant. The employment and labor force characteristics in Peach Bottom Township contrasted sharply with those of Delta Borough. The female labor force participation rates in Peach Bottom Township were considerably lower. The township's overall unemployment rate was also lower, only about 5 percent.

During the first half of the 1970's the size of the labor force increased in both Delta Borough and Peach Bottom Township, and low rates of unemployment were experienced by residents of the Study Area from 1968 to 1974. However, in 1975, the size of the labor force started to decline, especially in Delta Borough, and significant out-migration began to take place.

4.3.3 Standard of Living

Information on the standard of living was obtained from census data and planning reports prepared by the York County Planning Commission. The median family income in the Study Area remained stable during the 1960s at a level consistently below that of York County and the State of Pennsylvania. Factors contributing to this included the rural nature of the Study Area, with characteristically lower average salaries than those found in urban/industrialized areas, and the large proportion of retired people, many of whom derived their income largely from social security payments. Both York County, with a median family income of \$5,678, and Pennsylvania, with a median family income of \$5,719, exceeded the U.S. national average of \$5,666. Peach Bottom Township, however, had a median family income of \$4,455, and Delta Borough's median family income was estimated at \$5,338. These data illustrate that median family incomes of the residents of the Study Area were comparatively low.

In 1969, 4.1 percent of the population of Peach Bottom Township had incomes below the poverty level, compared to 7.9 percent in York County, 10.6 percent in the State of Pennsylvania, and 13.7 percent in the United States. The median income of families and unrelated individuals in the Peach Bottom area (Census Tract 240) for 1969 was \$7,834, markedly lower than that of York County of the State of Pennsylvania, where the median incomes were \$10,022 and \$8,066, respectively. Thus, although the median income was lower in the Study Area than in the county, the incidence of poverty was also substantially less. Interviews with key informants indicated that during the 1967 to 1974 period, the standard of living for residents of the Study Area improved with a noticeable increase in their disposable income.

During the 1970s, the Study Area experienced in-migration from the Baltimore urban area. As these families were either professionals or skilled craftsmen, the median family income in the Study Area increased.

4.4 Economic Changes in the Study Area due to the Project

The purpose of this section is to describe the effects of the construction and operation of the Peach Bottom Nuclear Generating Station on the economic conditions in the Study Area. As was the case in the previous section, the analysis focuses on three perspectives: the effects of the project on economic activity in the Study Area; the effects of the project on the Study Area labor force; and the effects of the project on the standard of living of Study Area residents.

To accomplish these objectives, an economic base analysis, supplemented with an input-output analysis, was utilized. The premise of this analysis was that the economic activities of the nuclear project (the employment at the project, the purchases of materials and services for the project, and other market effects of the project) caused additional economic activity in the Study Area. The determination of the total project effects on employment and income in the Study Area required the quantification of both the direct project activity and the additional induced nonproject activity. Once these income and employment consequences of the project had been estimated, their impacts on the area's economy, on the area's labor force, and on the area residents' standard of living were summarized.

The analysis of the employment and income effects due to Peach Bottom Units 2 and 3 begins by describing the work force and the purchases of goods and services used to construct and operate the generating station. In this analysis, persons directly employed at the plant will be referred to as "direct" basic employees, and the incomes they earn will be counted as "direct" basic income at their place of residence. The direct basic employment and income is the first of three components of total project-related basic income and employment. Direct basic employment and income are analyzed in two ways: (1) the number of jobs and income earned at the place of work and their effects on the economy of the Study Area, and (2) the number of Study Area residents employed at the project and their project-related income and the subsequent effects on the labor force and the standard of living in the Study Area.

In addition to direct employment and income, local income and employment may result from the purchase of goods and services for the construction and operation of the plant. If, for example, \$1,000 of building materials were purchased locally for plant construction, some fraction of the total value of the purchase would accrue as income to local residents. For materials produced locally, the ratio of locally-generated-income-to-total-purchases is quite high. Materials produced elsewhere and only distributed locally result in a lower ratio of local-income-to-purchases because only the distributors' margins would become local income. Income and employment generated in response to the purchases of goods and services by the utility is referred to as "indirect" basic income and employment, and is the second component of total project-related basic employment and income. The amount of indirect basic income produced by a given purchase is determined by the ratio of indirect basic income to product value, which varies according to the type of goods and the type of establishments involved in the transactions. The indirect basic income and employment in the Study Area due to the project was calculated by applying an income-and-employment-to-value-of-purchases ratio derived from the Regional Industrial Multiplier System (RIMS) developed for the Regional Economic Analysis Division of the Bureau of Economic Analysis (United States Department of Commerce, 1977; Anderson, 1980.)

A third component of the project's income and employment effects is referred to as "other" basic income and employment, which include changes due to labor market effects (e.g., labor shortages or higher wages) and changes due to the favorable fiscal impacts of the station. The changes in income or employment of area residents resulting

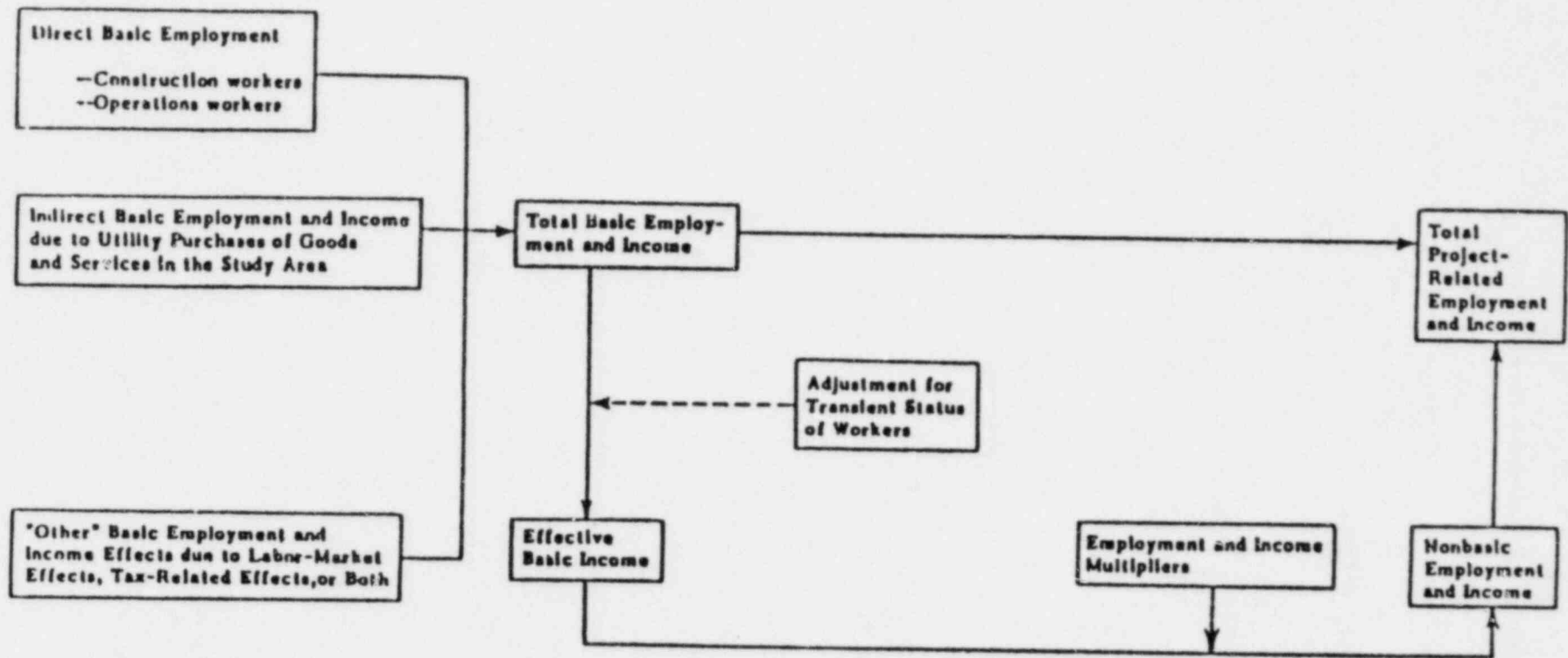
from these effects are the "other" basic income and employment. The construction of a nuclear plant could result in labor market effects due to labor shortages, higher wages, or changes in economic activity in response to fiscal impacts due to the plant. For example, wage-induced effects might occur in agricultural areas or in areas experiencing underemployment if higher wages paid at the site attracted workers from lower paying jobs. Theoretically, this could result in an increase in wage rates and in labor shortages throughout the local economy. 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. The three major sources of change in basic income and employment—direct basic, indirect basic, and other basic—are summarized in Figure 4-1.

A high proportion of the project-related basic income in the Study Area was earned by workers who lived outside Peach Bottom or Delta Borough or who resided in the Study Area only during the work week. As a result, these workers spent a smaller proportion of their income in the Study Area than did workers who lived in the Study Area and earned the same income. Therefore, the total project-related basic income earned in the Study Area was adjusted to make each dollar of project-related basic income equivalent in its effect on the Study Area to an average dollar of basic income earned there. The resulting adjusted income total is referred to as "effective" basic income.

"Nonbasic" income and employment, the final component of project-related employment effects, is that which results when basic income generated as a direct consequence of employment at the plant leads to purchases of goods and services and thereby increases employment and incomes in those sectors in which these purchases are made—the expenditure and re-expenditure of effective basic income. The ratio of nonbasic to basic income, known as the multiplier, varies according to the size and characteristics of the economic system. In general, the larger the local economy, the smaller the income leakages due to purchases of goods and services produced outside the local economy, and the larger the multiplier. Once a multiplier has been estimated that is appropriate to the size of the local economy, the nonbasic income and employment resulting from the basic income due to the project is calculated. The method for estimating the nonbasic employment and income response to an increase in effective

FIGURE 4-1

ESTIMATION OF PROJECT-RELATED EMPLOYMENT AND INCOME EFFECTS



basic income is based on RIMS.¹ Nonbasic employment and income can then be added to the three categories of basic employment and income to estimate the total employment and income effects of the construction and operation of the nuclear plant.

4.4.1 Employment and Income Effects due to Construction of the Plant, 1973

Direct Basic Employment and Income Effects, 1973

Table 4-2 shows the number of construction workers residing in the Study Area in 1973. Of the 415 workers in the Study Area, 259 were located in Delta Borough, and 156 workers were located in Peach Bottom Township. Of these 415 workers, some had lived in the Study Area prior to the plant's construction (the nonmovers), and some had relocated to the Study Area (the movers). The nonmovers working on the project were mostly clerical workers and unskilled or semi-skilled laborers, although a few were skilled craftsmen. In addition, a few young, unskilled nonmovers joined the apprenticeship program offered by the construction contractor during periods of manpower shortages and became skilled craftsmen.

Of the 246 nonmovers, 148 lived in Delta Borough, and 98 lived in Peach Bottom Township. Of the 169 movers, 111 moved into Delta Borough, and 58 moved into Peach Bottom Township. In constant 1972 dollars, the construction work force living in the Study Area had a total income of about \$6.9 million in 1973. In addition to those workers living in the Study Area, 1,814 workers commuted to the site from outside the Study Area, mostly from York and Lancaster counties. These commuters earned \$32.5 million in 1973.

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.

TABLE 4-2

DIRECT BASIC EMPLOYMENT AND INCOME
IN THE STUDY AREA
1973
(Constant 1972 Dollars)

Place	<u>Nonmovers</u>		Family Present	<u>Movers</u>		Income (\$000)	Total Direct Basic Employees	Total Income (\$000)
	Number	Income (\$000)		Income (\$000)	Family Absent			
Delta	148	\$2,470	22	\$367	89	\$1,485	259	\$4,322
Peach Bottom Township	<u>98</u>	<u>1,636</u>	<u>12</u>	<u>200</u>	<u>46</u>	<u>768</u>	<u>156</u>	<u>2,603</u>
Study Area	246	\$4,106	34	\$567	135	\$2,253	415	\$6,925

Source: Renova International, Ltd., 1974; Mountain West Research, Inc., 1980.

Recent information on construction worker characteristics shows that approximately 60 percent of the construction workers who move into an area to work on a nuclear power plant are accompanied by their families. In 21 out of 28 construction worker surveys at thirteen nuclear plant sites, the proportions of movers with family present were between 51 and 72 percent. (Malhotra, 1979.) However, in the Study Area, the percentage of movers accompanied by their families was estimated at only 20 percent. The construction workers who moved into the Study Area were primarily single or unaccompanied by their families, a result of the lack of housing availability in the Study Area. Prior to the construction of the Peach Bottom nuclear plant, the housing in Delta Borough was primarily single-family residential structures; few rental units were available (less than 2 percent of the housing stock). When construction began on the Peach Bottom facility, every attempt was made to accommodate the construction workers, usually by converting single-family homes to multi-unit apartments. These converted units were generally more suitable for single workers than for families; consequently, few families relocated to the Study Area. Only 34 movers to the Study Area were estimated to have been accompanied by their families, while 135 movers were estimated to have been single or unaccompanied by their families (see Table 4-2).

Indirect Basic Employment and Income Effects, 1973

Indirect basic employment and income in the Study Area result from local purchases of materials or equipment. During the construction of Peach Bottom Units 2 and 3, the major purchases for construction were made outside the local area--mostly in Baltimore and Philadelphia. Some electrical and hardware supplies and bulk construction materials such as lumber were obtained locally, but total purchases in the Study Area for 1973 were estimated to be only \$150 thousand (constant 1972 dollars).

Although a detailed quantitative analysis of indirect basic income and employment effects was not possible given the approximate nature of purchase estimates, an order-of-magnitude estimate of the purchases made in the Study Area and the resulting indirect basic income and employment was made.

It is estimated that in 1973 the value of purchases made in the Study Area for the construction of the project was about \$150,000 (constant 1972 dollars). Since little is known about the specific sectors from which purchases were made, it is assumed that they were in the wholesale trade sector. This assumption is undoubtedly appropriate for the majority of local purchases, although some materials (e.g., sand and gravel) were

produced locally. For the majority of goods, however, local wholesalers simply served as distributors for materials and supplies produced elsewhere. It is estimated that for each dollar of sales by the wholesale trade sector, about \$0.09 of indirect basic income is created.¹ Thus, the \$150,000 of purchases in the Study Area would produce about \$13,500 of indirect basic income; the indirect income and employment generated in the Study Area would have been insignificant to the overall economy.

For the owners of the few businesses in the Study Area that supplied the materials, however, the perspective was different. Interviews with these people suggested that increases in their volume of sales due to purchases for plant construction were important and enabled them to upgrade and expand their firms. Both the lumber and printing firms in the local area, for example, increased sales by nearly 25 percent over the pre-project period and, although demands declined as construction was completed, purchases of lumber products by the utility continued through the study period. Later purchases of lumber were used as crates to transport low level radioactive wastes from the plant site. In spite of the increased sales, employment effects were minimal because the increased demands for products were met by internal adjustments with existing labor. (Bueker, personal communication, 1980; Cooper, personal communication, 1980; Gailbraith, personal communication, 1980; Hunt, personal communication, 1980; Sommer, personal communication, 1980.)

Other Basic Employment and Income Effects, 1973

The construction of a large facility such as a nuclear generating plant may result in some wage-induced effects that are classified as "other" basic employment and income. 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,

¹This figure is based on a trade margin of .21 multiplied by a change in gross output of 1.0 plus direct purchases by the trade sector of 0.5613. The earnings-to-gross-output ratio for the wholesale trade sector in York County is 0.276; thus, it is estimated that for each \$1.00 of purchases from the wholesale trade sector, \$0.09 (the product of the three factors, .21, 1.5613, and 0.276) of indirect basic income will be generated. These estimates are based on the Regional Interindustry Multiplier System (RIMS) calculations prepared for each of the counties under study. (Drake, personal communication, 1980.)

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 market increase in wage rates and manpower shortages throughout the local economy. The agricultural sector is especially vulnerable to these effects. In the Peach Bottom area, farmers complained that because of the competition with the Peach Bottom plant for laborers, many were not able to rely on their traditional sources of seasonal help.

A common perception in the Study Area was that shortages of farm workers adversely affected the agricultural sector and that the absolute number of farms declined during the construction period. In support of this allegation, some informants claimed that after construction was completed, manpower was no longer in short supply. However, there is no evidence to support these arguments that agriculture declined. Rather, the agricultural sector continued to be a viable and important contributor to the regional economy. Interviews with key informants suggested that adjustments were made to offset labor shortages: longer hours for workers and higher levels of family labor made it possible for employment and income to remain at much the same level as they would have been without the nuclear station. No long-term or permanent shortages in seasonal manpower were observed during the construction of the plant according to key informants. In sum, no noticeable loss in agricultural income or employment can be attributed to the construction of the Peach Bottom station.

It was also alleged that the plant's construction resulted in the demise of a few traditional retail establishments in the Study Area. However, the evidence suggests that this decline was consistent with the economic trend of such establishments in the area. These establishments consisted of two general stores and an agricultural machinery service firm.

Similar arguments were also made regarding the wage-induced effects on the construction industry. A number of key informants who were interviewed suggested that because of the high construction wages paid to workers on the Peach Bottom and Three Mile Island projects, which were being constructed at the same time, there were shortages of manpower for commercial and residential construction work; these shortages, they stated, were responsible for increased construction wage rates. Renova International, Ltd., in its study of the impacts of the Peach Bottom plant, confirmed that the high wage scale for construction on the atomic station was felt throughout York

County because the wage scale inflated private and public construction costs (Renova International, Ltd., 1974).

The Nuclear Regulatory Commission reviewed regional labor data in its evaluation of the potential impacts of the proposed Fulton plant and concluded that during the construction of the Peach Bottom plant, above-average wage increases in construction work occurred in York County. The increase in average earnings for construction work between 1968 and 1972 was 68 percent. This increase was substantially higher than increases during the same period for the state as a whole and for three neighboring counties. Dauphin County, however, experienced wage increases similar to York County's; this was attributed to the construction of the Three Mile Island plant.

The increase in the York County construction wage scale was attributed to the construction work force at the Peach Bottom plant being included in the calculations—a work force that represented about 30 percent of the total employment in the county's construction industry and that received higher wages than the average York County construction wage. When the Peach Bottom wage was factored out, the rate of growth of construction wages in York County fell below that of the state. (U.S. Nuclear Regulatory Commission, 1975.)

In conclusion, wage-induced effects were alleged in both the agriculture and the construction sectors. However, such effects were apparently not responsible for any significant changes in aggregate levels of employment or income within the Study Area.

Nonbasic Employment and Income Effects, 1973

The construction of Peach Bottom Units 2 and 3 resulted in significant increases in basic employment and income in the Study Area. The purpose of this section is to estimate the induced or nonbasic employment and income effects in the Study Area. These induced effects result from expenditure of the basic income earned in the Study Area due to the project.

The technique for estimating the nonbasic income and employment effects is based on a county-specific adaptation of the Regional Interindustry Multiplier System (RIMS) developed by the Regional Economic Analysis Division of the Bureau of Economic Analysis, U.S. Department of Commerce. The technique is well documented elsewhere (U.S. Water Resources Council, 1977) and is therefore not described in detail here. In

general, the 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 local suppliers.

In general, variation in the size of the multipliers reflects variation in the size and diversity of the local economy rather than differential propensities to consume. The larger the local economy, the more able it is to meet its own needs; therefore, imports are smaller, and the induced response to an increase in basic income is larger. Income and employment multipliers have been estimated for York County and are based on the national 1976 input-output table, adjusted to constant 1972 dollars. For York County, the income multiplier was estimated to be \$229.4 (per \$1,000 of income), and the employment multiplier was estimated at 0.036 (per \$1,000 of income).¹

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 York 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 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 employment on the project and who were accompanied by families;

¹Drake, personal communication, 1980.

3. Movers unaccompanied by families (or single)—employees who moved into the Study Area because of employment on the project and who were not accompanied by families; and
4. Daily long-distance commuters—employees living outside the Study Area who commuted daily into the Study Area to work at the project.

Based on information concerning residential location, commuting patterns, and outside financial commitments, as well as 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 effect, in terms of generating induced economic activity 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 who are principally nonmovers, nonmovers serve as the standard for defining effective basic income, and 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, data outlined by the Consumer Expenditure Survey (U.S. Bureau of Labor Statistics, 1972-1973) were utilized to determine the proportion of income spent by these workers in the local area compared to that spent by nonmovers. Examination of the local economy and discussions with workers, local planners, and area residents then led to assumptions about the percentage of expenditures made locally for each category of expenditures. Regarding housing, for example, it was assumed that nonmovers and movers accompanied by their families would spend 100 percent of their housing expenditures in the Study Area, movers without their families would spend only 50 percent of their housing expenditures in the Study Area, and daily commuters would spend nothing for housing in the area.

To calculate the proportion of direct basic income (see Table 4-2) that should be included for estimating the nonbasic employment and income, several factors were considered. An adjustment is made for the income of movers who are single or unaccompanied by their families since these workers spend considerably more of their income outside the Study Area than do the nonmovers or the movers accompanied by families. Interviews with union officials, workers, and local businessmen indicated that local spending by movers who are single or unaccompanied by families was about half that of nonmovers and movers accompanied by families. Therefore, only 50 percent of the basic income of this group is assigned to the base for calculating nonbasic income and employment.

Commuters from residences outside the Study Area spent money locally on such goods and services as gas, meals, and incidental items. The amount spent on such purchases was considerably less than that spent locally by nonmovers or movers with families. Key informants, especially local businessmen, estimated that a typical daily commuter spent about twenty dollars a month in the county. This was only about 7 percent of the local spending by nonmovers and movers with families.¹

The total effective income calculated as the base for deriving the nonbasic employment and income was \$5.9 million. This includes all the income from the nonmovers and movers with families (\$4.7 million), 50 percent of the income of movers who were single or with family absent (\$1.1 million), and 7 percent of the income of daily long-distance commuters from outside the Study Area (\$0.06 million). The application of the RIMS multipliers indicates that direct basic income produced an estimated \$1.3 million in nonbasic income and an estimated 211 nonbasic jobs. It must be understood, however, that the multipliers applied to the income base of the Study Area were those applicable to York County. If it were possible to use similar techniques to derive multipliers for the Study Area, the resulting multipliers would be much smaller. Therefore, although the 211 nonbasic jobs may be a reasonable estimate of regional nonbasic employment due to the basic income in the Study Area, only a very small proportion of these jobs would be expected to occur within the Study Area of Delta Borough and Peach Bottom Township. In fact, interviews with key informants in the Study Area suggested that approximately 20 additional nonbasic jobs were created in the Study Area during the 1973 construction year, only about 10 percent of the total nonbasic jobs estimated above.

The degree to which the increase in nonbasic jobs occurred outside of the Study Area was not surprising given the small and declining commercial sector in Delta Borough relative to nearby shopping centers that were growing rapidly. It appears, therefore, that only a small percentage of the direct basic income was actually spent in the Study Area.

¹If more goods and services had been available locally, including liquor, for example, local spending by movers and nonmovers would have been greater, as would have local spending by long-distance commuters.

The nonbasic employment generated by the project was primarily in the service sector. The average 1974 salary in the service sector in York County was \$5,276 (Bureau of Labor Statistics, 1976). At this salary, the 20 nonbasic jobs generated by the construction of Units 2 and 3 would have added an annual income of approximately \$106 thousand (1972 constant dollars) to the Study Area.

A particularly visible consequence in nonbasic employment and income was the development of a large regional supermarket in the area, which stemmed from the increase in disposable income in the Study Area during the construction period. The expansion of this particular establishment accelerated the decline and ultimate demise of the few traditional general stores in Delta Borough, which could not compete with respect to location, range of goods and services, or price. The trend toward centralization of the retail food trade in the Study Area, which was accelerated by construction-related spending, was sustained by the other recent newcomers to the local area. The establishment of the large supermarket in which a number of Study Area residents were employed increased wage and salary employment in the Study Area, partly in substitution for proprietors' employment in family-operated stores.

Total Employment and Income due to Construction of the Project, 1973

The sum of the four components of employment and income generated by the Peach Bottom station—direct basic, indirect basic, "other" basic, and nonbasic—is the total employment and income created in the Study Area by the project. Table 4-3 shows the number of new jobs created in the Study Area by place of work and by place of residence in 1973. The total number of new jobs created in the county in 1973 by place of work was estimated to be 2,441, and total income from this employment was \$40.5 million. In 1973, 435 jobs were project-related by place of residence and income from this employment was estimated to be \$7.07 million.

4.4.2 Employment and Income Effects due to Operation of the Plant, 1978

Direct Basic Employment and Income Effects, 1978

Commerical operation of Units 2 and 3 began in 1975. Detailed information on the origins and residential distribution of the 1978 operations work force and on earnings was provided by the Philadelphia Electric Company. The average wage per operations worker in 1978 was \$13,200 (constant 1972 dollars). This figure may be slightly high, as the cost data on operations did not separate the salaries paid to utility employees from

TABLE 4-3

TOTAL PROJECT-RELATED EMPLOYMENT AND INCOME
PEACH BOTTOM TOWNSHIP AND DELTA BOROUGH
1973

Employment and Income Type	Place of Work	Place of Residence
Employment		
Basic	2,230	415
Nonbasic	<u>211</u>	<u>20</u>
TOTAL	2,441	435
Income ^a		
Basic	39.2	6.93
Nonbasic	<u>1.3</u>	<u>0.11</u>
TOTAL	40.5	7.04

^aIncome is reported in thousands of 1972 constant dollars.

Source: Mountain West Research, Inc., 1980.

the cost of contracted workers and therefore included some overhead and other indirect costs. The total operations work force—regular operations staff and security and maintenance personnel—was 414 workers in 1978. Of these, 48 (12 percent) were Study Area residents; 22 were movers, mostly regular operations staff, and 26 were nonmovers, mostly the security and maintenance workers. In 1978, the basic income of the operations work force living in the Study Area was about \$633,600, of which \$290,400 was earned by the movers. The remaining 366 operations workers who resided outside the Study Area did not spend a sufficient amount of money in the Study Area to warrant inclusion as additional direct basic income. In addition, indirect and "other" basic employment and income effects in the Study Area during 1978 were negligible.

In 1978, a temporary work force of 640 refueling, maintenance, and repair personnel was required for a short period. These workers were either hired from the union halls in York City, employed by the utility, or employed by a maintenance/labor-pool organization whose members resided primarily in the area near the plant. (Philadelphia Electric Company, personal communication, 1979.) The distribution of these workers by place of residence during the refueling periods was similar to that of the construction work force, with a slightly higher percentage located in the Study Area; about 87 of these workers stayed in the Study Area. (Philadelphia Electric Company, personal communication, 1979.)

These workers are equivalent to 21 full-time workers in terms of average annual employment. Their pay rates were approximately the same as those of the regular operating workers, and they received a per diem subsistence allowance of \$35. The effective income spent by these workers for local purchases is estimated to have been about 50 percent of that of the operations employees who were full-time residents of the Study Area, giving a total increase in basic income from these workers of approximately \$138,600. The 553 long-distance commuters, representing 136 full-time workers in terms of average annual employment, were estimated to have spent about 3.5 percent of their income, or about \$36,000, in a pattern similar to that of the mover and nonmover refueling workers. Total basic income from these workers was therefore approximately \$200 thousand. Together with the direct basic income of the operations work force, this gives a total effective basic income in the Study Area of approximately \$0.8 million in 1978.

Nonbasic Employment and Income Effects, 1978

Nonbasic employment and income effects generated by the basic operations work force residing in the Study Area were estimated for 1978 applying the same procedure used to derive the nonbasic increases during construction. Nonbasic income was estimated to be \$191,228, and nonbasic employment was estimated to be 30 persons. Although a large proportion of the income earned by the operations workers was spent in York County, it was spent outside the Study Area: the nonbasic employment, then, is assumed to be a fraction of the total nonbasic jobs generated by earned income in the Study Area. As in the case of the induced nonbasic jobs during the construction period, the number of nonbasic jobs in the Study Area in 1978 was estimated to be 10 percent of the total nonbasic jobs—or a total of only 3 jobs.

4.4.3 Summary of the Economic Effects on the Study Area, 1973 and 1978

The following subsections summarize the employment and income effects of the plant during a peak construction year and a recent year of operation.

Direct Income and Employment Effects, 1973 and 1978

Construction, 1973

The average annual on-site construction work force in 1973 was 2,230 workers, divided into movers, nonmovers, and long-distance commuters. In 1973, there were 415 direct basic workers residing in the Study Area. They had a total income of \$6.9 million.

In 1973, about 169 direct basic workers moved into the Study Area (see Table 4-2). Of these movers, 34 were accompanied by families, and 135 were single or with family absent. Most of the 246 nonmovers were employed as laborers, clerical workers, and craft trainees, although some were skilled crafts people. Nonmovers earned about \$4.1 million in 1973.

Operations, 1978

Basic employment for 1978 during the operations phase was estimated to be 414 workers, 48 of whom resided in the Study Area. About 22 of these were movers. In addition, there was an average annual employment of 158 maintenance, repair, and refueling workers, 21 of whom stayed in the Study Area. The basic income of the operations workers living in the Study Area in 1978 was estimated to be \$633 thousand. The basic income contributed to the Study Area by these workers was estimated to be about \$200 thousand.

Other Income and Employment Effects, 1973 and 1978

Indirect income and employment results from the utility's purchase of goods and services in the Study Area. Some electrical and hardware supplies and bulk construction materials such as lumber were purchased, but total purchases in the Study Area were estimated to be only about \$150 thousand. The indirect basic income generated by these purchases was estimated at about \$13 thousand, not enough to produce measurable employment effects in the Study Area.

Interviews with owners of establishments that provided goods and services to the utility indicated that the increases in their volume of sales due to these purchases were relatively substantial and enabled some of these firms to modernize.

Nonbasic Employment and Income Effects, 1973 and 1978

Basic employment due to the plant resulted in income for the workers, which they, in turn, spent. A portion of those expenditures were made in the Study Area and resulted in nonbasic employment and income. In 1973, nonbasic employment due to the project was estimated to be about 20 jobs, and nonbasic income was estimated to be about \$106 thousand. In 1978, during the operations period, only three nonbasic jobs were created by the project.

Summary of Employment and Income Effects, 1973 and 1978

The total basic and nonbasic employment effects in the Study Area for 1973 included workers on the site and in the local economy. These were about 435 project-related basic and nonbasic workers residing in the Study Area in 1973. Their total income was about \$7 million. For the operations year, 1978, there were about 51 project-related basic and nonbasic workers living in the Study Area, whose income was about \$650 thousand.

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

The Peach Bottom project had important effects on the labor force in the Study Area during construction. One of the most significant of these was the effect on the number of unemployed. Prior to the construction of the nuclear station, the unemployment rate in the Study Area was 8.5 percent in Delta Borough and 5.6 percent in the townships (U.S. Bureau of the Census, 1960). The total labor force in the local impact area was estimated to be about 765 persons (U.S. Bureau of the Census, 1960). In 1970, the fourth year of construction, the unemployment rate for the area fell to

2.1 percent (U.S. Bureau of the Census, 1970). The decline in the unemployment rate was particularly significant for the female labor force. Prior to the construction of the plant, the percentage of unemployed women in the labor force in Delta Borough was 15.7 percent, but during the construction period, female unemployment in the area dropped to 8.2 percent. The rate of male unemployment showed marked decline as well. In 1970, the male unemployment rate was approximately 1 percent, compared to an unemployment rate of about 6 percent prior to construction, reflecting employment opportunities in the construction sector of the local economy.

A number of employment opportunities were presented by the project, and construction of the nuclear facility provided occupational mobility for many workers. The labor pool in the Study Area prior to the project consisted of up to 60 percent unskilled or general farm labor, 20 percent semi-skilled labor, and 20 percent skilled craftsmen (Renova International, Ltd., 1974). Until construction of the plant began, there were few employment opportunities in the Study Area, high levels of seasonal unemployment and underemployment, and high female unemployment rates. Construction of Peach Bottom Units 2 and 3 benefited the seasonal agricultural worker: several of the construction workers from the Study Area were formerly employed in the agricultural sector but gained employment as laborers and semi-skilled laborers on the construction site and ultimately upgraded their skills.

Employment opportunities at the nuclear plant project were especially important to the unemployed and unskilled youth in the area, some of whom became apprentices and received on-the-job training in skilled crafts. Key informants point out that some of these trained individuals remained in the local area following the end of the construction period and commuted to construction jobs outside of the area; although the number of individuals involved was limited, this experience helped to reverse a trend of out-migration by young people.

The local workers who gained employment at Peach Bottom were replaced in the labor force by those who were previously unemployed or underemployed: occupational mobility in this respect was especially important to the female labor force. The decline in the female unemployment rate in the Study Area reflected employment opportunities, such as clerical work at the construction site and in nonbasic jobs.

Although unemployment rates are not available for the Study Area following the termination of construction in 1974, results from interviews with key community informants suggest that unemployment rates increased thereafter. This increase was particularly difficult for women, among whom high levels of unemployment and underemployment persisted during the latter half of the 1970s. The local construction industry also experienced a general slowdown, partly due to the difficulties the industry as a whole was facing in the region at that time. Few construction workers remained in the local area permanently, and Delta Borough was again characterized by a declining population. Because the size of the operations work force was considerably smaller than that of the construction work force, the overall effect of the project on employment and income was also much smaller during the operations period. Only 51 persons employed in project-related jobs were living in the Study Area in 1978.

An important index for measuring change in the standard of living is the level of family income. During the construction period, family income in the Study Area generally increased. The increase reflected changes due to construction wages, nonbasic employment, and income from rentals. The high average annual wage in the Study Area during the construction period was a direct result of the high construction wages for the local workers, which were the highest for that sector in the county.

The Renova International assessment of the impacts of Peach Bottom's construction notes that "The increase in the wage scale had many beneficial effects . . . retail businesses were boosted because of the increase in many expenditures. As business improved, store owners had capital to improve stores and services." (Renova International, 1974.) Nonbasic employment increased in the Study Area, and these jobs went primarily to local residents who were previously unemployed or underemployed; this employment increase, in turn, increased family income.

Additional supplementary income was provided to local area residents through rental payments. Of the housing stock in Delta, about 30 percent (amounting to 100 structures) was rentable. The Renova International study estimated that the average monthly rent in the Study Area was about \$80 in 1973. For 1973, rental incomes from construction workers in Delta Borough totaled over \$100 thousand.

However, there were many for whom the standard of living did not increase during the construction period. Aside from the few merchants who gained economically as a

result of direct expenditures from the construction workers, many local residents did not directly benefit from plant construction, particularly the agricultural community in Peach Bottom Township.

According to 1960 data, the median family income in the Study Area prior to the construction of the Peach Bottom nuclear plant was 86 percent of the median family income in the county; it was only 78 percent of the county's median family income during 1970, the fourth year of construction. While the median family income in York County increased by 76 percent during the 1960-1970 period, the median family income in the Study Area increased by about 60 percent.

Community informants who were interviewed pointed out that the construction period was characterized by increased economic activity in the local impact area, but this activity was not sufficient to transform the economic base of the community or to have effects lasting after the construction of the plant was completed. The overall evaluation of the community with respect to the economic impact of the plant was that it was a temporary shot in the arm and did not prevent the eventual out-migration of population and commerce in the area.

By 1975, even though the plant was operating, the effects of plant construction had dissipated. The residual income effects of plant operation were small: wages at the Peach Bottom plant for the skilled technicians, engineers, and managers were generally higher than were local wage levels, but since most of the local residents were employed in clerical, security, and maintenance jobs, their wages were generally not much higher than local rates. The few skilled workers were in-migrants to the area; thus, there was little improvement in the standard of living for the resident population. Peach Bottom Township has continually had one of the lowest average wages per worker in York County, and the construction of the plant did not alter this: in 1976, two years following the end of construction, the average worker's salary in Peach Bottom Township was less than \$8,000, compared to the average salaries of between \$9 and \$10 thousand in other areas in York County.

CHAPTER 5: POPULATION

5.1 Introduction

The purpose of Chapter 5 is to determine the population effects of the Peach Bottom project in Delta Borough and Peach Bottom Township and to explain the relationship between the project and its population effects. The first step in this chapter is to examine the historical and recent 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. These estimates are formulated in an annual series, which are then stated as a percentage of the study area population to measure the population impacts of the project. Further demographic effects will be addressed in Chapter 8, where the impacts on groups in the study area will be considered.

5.2 Demographic Trends

Since 1900, the overall population trend in Delta Borough and Peach Bottom Township has been generally downward; the historical data are shown in Figure 5-1. However, there have been exceptions to this decline. In 1900, Peach Bottom Township's population reached a peak of 1,888 persons; by 1930 it had declined to 1,420 persons. This decline reflected the national trend of out-migration from rural to urban areas, exacerbated by a decline in slate quarrying centered in Delta Borough. Between 1940 and 1950, Peach Bottom's population increased slightly from 1,309 to 1,362 persons, but during the 1950s, the population again declined. Between 1960 and 1978, rural suburbanization from the Baltimore metropolitan area resulted in a relatively sizeable population increase for the township. In 1960, the township's population was 1,325 persons. This increased to 1,424 persons in 1970 and 1,477 persons in 1975, an increase in population of 11.5 percent since 1960, at a consistent annual rate of increase of 0.7 percent over the two periods.

The population of Delta Borough also experienced fluctuations between 1900 and 1970, attributable largely to employment trends in the community. Between 1900 and 1920, Delta's population increased by almost 25 percent, a result of growth in the slate industry and of Delta's increasing importance as an agricultural service and

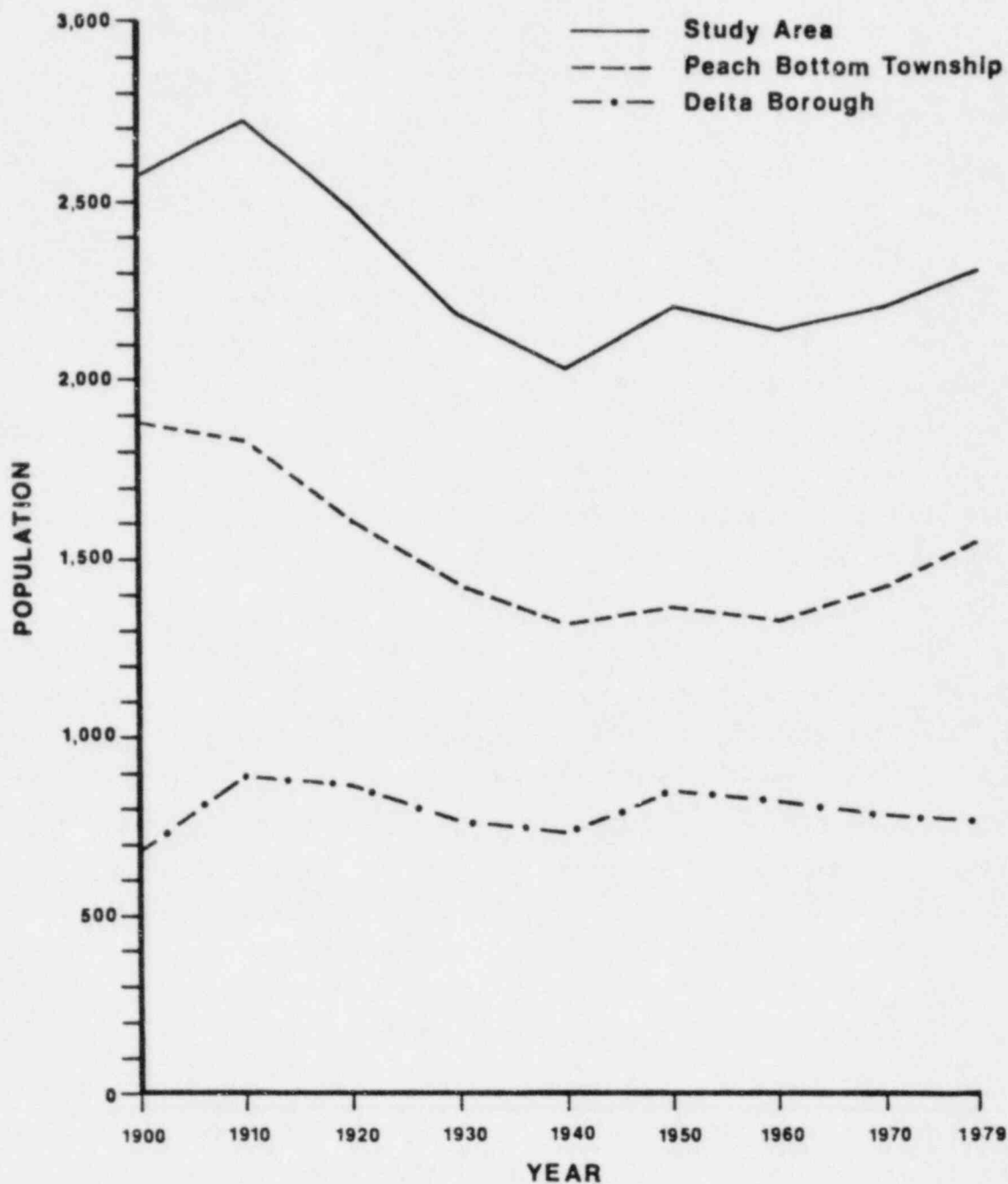


FIGURE 5-1. Population of Delta Borough and Peach Bottom Township, 1900-1979.

Source: York County Planning Commission, 1971a, 1971b, 1973b, 1976, and 1978.

distribution center. However, a serious population decline began in the 1920s with the decline of slate mining. From 1940 and into the early 1950s, the borough's population increased by 16 percent—from 724 to 840 persons—as a result of increased wartime employment in nearby urban areas. Thereafter, the population declined slowly and continuously through 1975. Between 1960 and 1970, the annual loss in population was 0.5 percent. This decline can be traced to the out-migration of young people from Delta Borough, where employment opportunities were limited, to the departure of a number of merchants whose small traditional retail stores were not able to compete with changes in consumer preferences toward regional shopping centers, and to the high death rate because of the relatively large proportion of elderly residents. The rate of the population decline was not as steep as it might have been because of the in-migration of families from Maryland, who were able to obtain homes in Delta at comparatively lower prices than those available in the Baltimore area. Since the 1940s, Delta has served as a "bedroom" community for a sizeable number of families who work within commuting distance. Between 1960 and 1978, this trend accelerated, resulting in the increase in Delta's population that occurred between 1976 and 1978.

Delta Borough had a relatively large number of elderly, retired people, especially widows, compared to Peach Bottom Township or the State of Pennsylvania. In Delta Borough, in 1970, about 20 percent of the population was over 60 years of age, compared to 12 percent in Peach Bottom Township and 15 percent in Pennsylvania. Of the female population in Delta Borough, 27 percent were over 60 years of age, while 18 percent of the males were in this age category. In contrast, the figures for Peach Bottom Township were much lower and more nearly equal for males and females—13 percent of all females and 13 percent of all males were 60 years of age or over.

The prevalence of a large number of retired and elderly people in Delta Borough was due to the early retirement of slate miners, especially those who had developed lung disease because of their occupational exposure to slate particulate matter, the return of retired people who had out-migrated from the area during their working years, and the continued exodus of young people seeking employment.

The average household size in Delta Borough in 1970 was small (3.02 persons), compared to that of Peach Bottom Township (3.65 persons) or the state (3.22 persons)

largely because of the high percentage of older persons in the borough. Concomitantly, the relatively small proportion of the population of Delta Borough in the 20-50 year age category (34 percent in the study area compared to 43 percent in the state) was significant for the Study Area since it is this age group that contributes most to the economy of an area. The influx of suburbanites to Peach Bottom Township during the 1960s and 1970s contributed to an increase in family size in the township, but did not greatly affect economic activity in the area despite their concentration in the 20-50 year age category, since most worked and shopped outside the Study Area. (Renova International, Ltd., 1974; York County Planning Commission, 1971a, 1971b, 1973b.)

The population of the Study Area was predominantly white; there were a few black families in Delta, and Peach Bottom Township had a black population of approximately 5 percent in the late 1960s when construction began on Units 2 and 3. This racial composition, stable for some time, remained relatively unchanged throughout the study period.

5.3 Changes in the Population during the Study Period

The period covered in this section is from 1967 to 1979. Construction of Units 2 and 3 began in 1967; by 1970, construction had been underway for three years, and, as shown in Figure 2-4, the construction work force exceeded 2,500 workers.

Table 5-1 shows the population change in the study area between 1960 and 1970 and between 1970 and 1979. Between 1960 and 1970, Delta Borough's population fell at an annual rate of 0.5 percent and continued to decline through the entire construction period to 1975. However, between 1975 and 1979, Delta Borough's population increased at an average annual rate of 1.5 percent. Peach Bottom Township experienced an average annual rate of growth of 0.7 percent between 1960 and 1975. This rose to 1.2 percent between 1975 and 1979. Thus, data show that Peach Bottom Township grew slowly from the late 1960s to 1979, with a slightly higher annual rate of increase since 1975, while for Delta Borough, the first half of the 1970s was marked by a persistent decline in its population, followed by an increase between 1975 and 1979.

The demographic composition of the Study Area in 1970 was similar to that of 1960, with elderly residents making up a large proportion of the population. Over 17 percent of the population was aged 60 and over in 1970. Interviews with key

TABLE 5-1

POPULATION AND POPULATION CHANGE
DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
1960, 1970, 1975, and 1979

	Population		Percent Annual Growth 1960-1970	Population 1975	Percent Annual Growth 1970-1975	Population 1979 (Estimated)	Percent Annual Growth 1975-1979
	1960	1970					
Delta Borough	822	778	-0.5	727	-1.3	770	+1.5
Peach Bottom Township	1,325	1,424	+0.7	1,477	+0.7	1,550	+1.2
TOTAL	2,147	2,202		2,204		2,320	

Source: U.S. Bureau of the Census 1960 and 1970; York County Planning Commission, 1976, Rural Housing Study; key informant interviews, 1979.

informants indicated that during the 1970s the 25-40 age group grew in size as a result of the in-migration of commuters from the Baltimore metropolitan area.

5.4 Population Effects due to the Project

5.4.1 Introduction

Population effects directly attributable to the construction and operation of the Peach Bottom project have been considered in two categories:¹ 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 driving the population change.

In Chapter 4, the number of plant-related workers in Delta Borough and Peach Bottom Township was determined for both basic and nonbasic employment. In addition, the number of workers who moved into the area and the number of workers who were already residents were determined for the plant-related basic employment. The following sections present estimates of the two categories of population effects due to the construction and operation of Peach Bottom Units 2 and 3.

5.4.2 Population Effects during the Construction Period

Population Change due to In-Migration

The principal demographic effects attributable to Peach Bottom Units 2 and 3 are those resulting from the in-migration of workers and accompanying household members to the Study Area because of project-related employment. In 1973, the project created an estimated 435 jobs in the Study Area, of which 415 were basic and 20 were nonbasic. As was shown in Table 4-2, 246 of the basic jobs went to nonmovers; 34 went to movers with family present, and 135 went to movers who were single or with family absent. It is estimated that all of the nonbasic jobs were filled by residents of the Study Area or by family members of other project-related workers. (Key informant interviews, 1979.) None of these 20 jobs, therefore, contributed to additional in-migration to the Study Area. Table 5-2 shows the distribution of the jobs among the three categories of workers--nonmovers, movers accompanied by families, and movers unaccompanied by families.

¹ Although it is possible that a project could cause out-migration or prevent in-migration or both, neither case appears to apply for Peach Bottom, and therefore neither one is pursued.

TABLE 5-2

PROJECT-RELATED EMPLOYMENT BY TYPE OF WORKER
PEACH BOTTOM TOWNSHIP AND DELTA BOROUGH
1973

Worker Type	Basic	Nonbasic	TOTAL
Nonmovers	246	20	266
Movers Accompanied by Families	34	--	34
Movers Unaccompanied by Families	<u>135</u>	<u>--</u>	<u>135</u>
TOTAL	415	20	435

Source: Mountain West Research, Inc., 1980.

The demographic effects associated with the basic workers at the Peach Bottom plant were estimated by multiplying the number of movers with family present by the average family size of 3.25. The family size estimate was taken from the recent Battelle study on construction workers, which found that, among movers, over 70 percent of those surveyed had family sizes between 3.2 and 3.3 (Malhotra, 1979:211). Table 5-3 shows the employment components and the resulting population changes. The population increase due to in-migration is estimated to have been 246 persons in 1973. Based on the assumption that the proportion of movers to total work force for the construction period remained at the 1973 level, estimates for the annual population increases due to in-migration attributable to the nuclear plant were derived as shown in Table 5-4. This table shows the number of persons present in the Study Area each year because of in-migration caused by the project.

Population Change due to Diminished Out-Migration

Population increases from the construction of Peach Bottom Units 1 and 2 may also have resulted from diminished out-migration. When workers who would normally leave an area to obtain employment stay because they find work at local jobs, the population is increased over what it would have been without those jobs. The maximum population effect from reduced out-migration occurs if all locally-hired residents are mobile, perceive other job opportunities, and will out-migrate if not employed. The minimum population effect occurs if the best alternative for these locally-hired residents is to remain unemployed in the Study Area, in which case there will be no population increase from diminished out-migration.

A realistic position between these extremes can be obtained by examining the out-migration trends in the Study Area. A trend for out-migration by the area's young population was evident from the age and population data presented earlier. The shortage of employment opportunities in the Study Area resulted in steady out-migration of the area's younger residents. Employment opportunities at the Peach Bottom plant were an exception to historical conditions in this area, and it is evident that a reversal in the out-migration trend occurred during the construction period.

To derive the population effects due to diminished out-migration, the pool of nonmovers employed in project-created jobs was divided into two categories: those who would probably have stayed in the study area regardless of a lack of employment opportunities (underemployed women, for example) and those who would have out-

TABLE 5-3

EMPLOYMENT AND POPULATION INCREASE DUE TO IN-MIGRATION
 DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
 1973

Employment Category	Workers	Additional Household Members	Total
Movers with Family	34	77	111
Movers who Are Single or without Family	135	0	135
Nonbasic Movers	0	0	0
Population Increase	169	77	246

Source: Mountain West Research, Inc., 1980.

TABLE 5-4

POPULATION INCREASE DUE TO IN-MIGRATION
OF BASIC WORKERS AND HOUSEHOLD MEMBERS
DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
1967 to 1974

Year	Work Force	Population Increase
1967	150	17
1968	688	76
1969	1,064	117
1970	2,186	241
1971	2,119	234
1972	2,844	314
1973	2,230	246
1974	639	71

Source: Mountain West Research, Inc., 1980.

migrated from the Study Area without the plant-related jobs (the young, unskilled workers, and the unemployed). A total of 266 jobs related to the construction of the nuclear plant went to nonmovers, 246 basic and 20 nonbasic.

According to key informants in the Study Area, the nonbasic jobs that were taken by local residents went primarily to unemployed and underemployed females. It was assumed that a small proportion of these nonbasic workers--10 percent, or 2 people--would have out-migrated from the Study Area had it not been for these jobs.

To determine probable out-migration for the 246 nonmovers holding basic jobs, the employment data during the study period were examined; they showed that, on the average, male unemployment in the Study Area declined from about 6 percent to about 1 percent, probably because of the increased employment opportunities at the Peach Bottom plant. Based on the assumptions that the drop in male unemployment (5 percent of the male labor force) reflected the number of unemployed males finding jobs on the Peach Bottom project and that these unemployed males would have eventually left the Study Area in the absence of local job opportunities, the number of unemployed males who found jobs in construction, and who therefore did not out-migrate, was estimated at 28 workers.

The final component of diminished out-migration was the young population that was employed on plant construction and would have out-migrated were it not for the project. Based on interviews with key informants, it would be reasonable to estimate that 25 additional young people, or about 12 percent of those 15-20 years of age in the Study Area, would have out-migrated had it not been for the project. The total number of nonmovers who did not out-migrate during the 1973 construction year as a consequence of plant-induced employment was thus estimated to be 55 persons.

The next step was to determine the number of additional household members associated with these 55 nonmovers and to derive estimates of induced population increases. For the 1973 construction year, the population increase due to diminished out-migration was derived by calculating the number of workers per household (1.1 workers per household for those households that had a construction worker) and multiplying the number of households by the average household size, 1.5 persons (this estimate was obtained by assuming that the potential out-migrants had an average

family size of only half that of the Study Area—3.0 persons). This produced a total population effect due to diminished out-migration of 83 persons in 1973.

Based on these calculations, annual estimates of population increase were derived, as shown in Table 5-5, by assuming a constant proportion of population increase to total construction employment over the construction period.

Total Population Effects

The total population increase due to the Peach Bottom plant resulted from immigration of basic workers and their families during the construction period and diminished out-migration by local residents due to employment increases in basic and nonbasic employment. Table 5-6 shows the total annual population increase due to the construction of the plant.

During the first half of the 1970s, the population in the Study Area increased markedly because of the plant. In 1973, for example, the population increase from immigration and diminished out-migration was an estimated 329 persons, an increase of approximately 15 percent. Following the end of construction, in 1975, significant out-migration of the resident population occurred. By 1975, for example, Delta Borough had 6.6 percent fewer persons than in 1970, indicating clearly that the population increases due to construction of Peach Bottom Units 2 and 3 were only temporary.

5.4.3 Population Effects during the Operations Period

As during the construction period, the Study Area population increased during the operations period as a result of the employment of in-migrants in basic and nonbasic jobs. In 1978, as discussed in Chapter 4 and shown in Table 4-10, nonbasic employment in the Study Area from operation of the plant was rather small, perhaps three jobs. These jobs were presumably filled by residents of the Study Area. The number of operations workers who in-migrated to the Study Area in 1978 to work at the nuclear facility was an estimated 22 workers.¹ Assuming these workers had households with characteristics similar to those for the state as a whole, the

¹ No population increase was assigned as an effect of the maintenance, repair, and refueling workers since they were temporary.

TABLE 5-5

POPULATION INCREASE DUE TO DIMINISHED OUT-MIGRATION
DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
1967 to 1974

	1967	1968	1969	1970	1971	1972	1973	1974
Diminished Out-Migration	6	26	40	81	79	106	83	24

Source: Mountain West Research, Inc., 1980.

TABLE 5-6

TOTAL POPULATION INCREASE
DUE TO THE CONSTRUCTION OF PEACH BOTTOM ATOMIC GENERATING STATION
DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
1967-1974

Year	In-Migration	Reduced Out-Migration	Total
1967	17	6	23
1968	76	26	102
1969	117	40	157
1970	241	81	322
1971	234	79	313
1972	314	106	420
1973	246	83	329
1974	71	24	95

Source: Mountain West Research, Inc., 1980.

demographic increase attributable to plant operations is the product of the number of operations work force movers and the average household size for Pennsylvania in 1978 (3.53 persons), or 78 persons for 1978. (Pennsylvania Bureau of Statistics, Research and Planning, 1979.)

Of the twenty-six nonmovers who were employed at the plant, many were security personnel, clerical workers, and maintenance personnel. Interviews with a number of these workers suggest that they would not have relocated if employment had not been obtained at the plant. Rather, they would have searched for employment elsewhere and commuted from their homes in the Study Area. This was especially true in the case of female clerical workers whose spouses worked in the area. The evidence suggests that employment at the plant did not result in any diminished out-migration. The total population increase, therefore, was limited to the in-migrant work force and their families, a total of 78 persons. The annual population increase for the operations period, 1974-1979, derived by assuming a constant relationship between population increase and the size of the operations work force, is shown in Table 5-7.

5.4.4 Summary

The total annual population increase in the Study Area during the construction and operation periods is shown in Table 5-8. The greatest population impacts occurred in 1972, the year of peak construction, when the plant-related population accounted for over 14 percent of the study area's population.¹ With the termination of construction in 1974, the number of people in the Study Area due to the plant fell dramatically, reflecting the smaller operations labor force, which had fewer plant-related workers residing there. These data show clearly that during the construction period, the Peach Bottom station had an important demographic effect on the Study Area.

¹Based on the 1970 population of the study area. The population of the Study Area remained relatively steady during the study period and the 1970 population would serve as a good standard for comparative change.

TABLE 5-7

POPULATION INCREASE DUE TO THE OPERATION
OF THE PEACH BOTTOM ATOMIC POWER PLANT
DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
1974 to 1979

Year	Population Increase
1974	56
1975	57
1976	58
1977	65
1978	78
1979	89

Source: Mountain West Research, Inc., 1980.

TABLE 5-8

POPULATION CHANGE DUE TO CONSTRUCTION AND
OPERATION OF THE PEACH BOTTOM ATOMIC POWER PLANT
DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
1967-1979

Year	Construction Period	Operations Period	Total	Project-Related Population as a Percent of Study Area 1970
1967	23	--	23	1.0
1968	102	--	102	4.6
1969	157	--	157	7.1
1970	322	--	322	14.6
1971	313	--	313	14.2
1972	420	--	420	19.1
1973	329	--	329	14.9
1974	95	--	151	6.9
1975	--	57	57	2.6
1976	--	58	58	2.6
1977	--	65	65	3.0
1978	--	78	78	3.5
1979	--	89	89	4.0

Source: Mountain West Research, Inc., 1980.

The movers who came to the local impact area as construction employees were mostly in the 25-40 age group and were primarily single and unaccompanied by household members. The pre-project population in the local impact area, in contrast, had a high proportion of elderly residents and unskilled workers; there was a "settled" character, as opposed to the "transient" or mobile character of the construction work force. On the whole, the movers were not permanent residents, and as construction ended, there was a concomitant out-migration of the construction work force.

During the construction period, the employment opportunities at the Peach Bottom plant resulted in a reversal of the trend of out-migration of the young adult population from the Study Area. A few of the younger people employed at the plant decided to remain in the local area following the end of construction, which, together with the in-migrant suburbanites who were generally in the younger-aged groups, increased the proportion of the population 20-35 years of age in the Study Area; however, no noticeable long-term effects on population characteristics were evident because of plant construction and operation. In spite of some younger people remaining in the Study Area at the end of construction activity, an overall decline in the population occurred as a result of significant out-migration. Overall, the Study Area remained predominantly rural with few changes from the pre-project population. The most dramatic population change since the project began was the in-migration of suburbanites. The construction and operation of the nuclear plant was not an important contributing factor in this population growth.

The in-migration of a technical and professional occupational group to operate the plant did not have a discernible effect on the population. The number of movers in the Study Area employed in the plant's operation was quite small, and they and their families became well integrated into the professional suburbanite group present in the Study Area.

CHAPTER 6: SETTLEMENT PATTERNS AND HOUSING

6.1 Introduction

The purpose of Chapter 6 is to identify the effects of the construction and operation of Peach Bottom Units 2 and 3 on settlement patterns and housing in Peach Bottom Township and Delta Borough. In this chapter, the historical trends are examined with particular attention to the changes in the settlement patterns and housing stock during the study period, 1967-1979, and the factors influencing those changes. Based on the analysis of the preceding chapters, estimates are made of the Peach Bottom effects on new construction, upgrading, and conversions of housing and on the settlement patterns of Delta Borough and Peach Bottom Township. The effects on cost and availability of dwelling units due to the project are discussed, based on key informant interviews and on information describing the numbers and specific residential location of the project-related population in the Study Area.

6.2 Settlement Patterns

6.2.1 Factors Influencing the Settlement Patterns of the Study Area

The settlement patterns of the Study Area were influenced to a large extent by natural features, the availability of resources, and transportation routes. The area's geology, topography, and drainage patterns have determined the use of the land. The study area is hilly, with numerous streams flowing through the valleys. The major geological condition responsible for the early establishment of Delta Borough's economy was a small band of slate located between Delta Borough and the Susquehanna River. The mining of this formation was the primary reason for settlement in the Delta Borough area. However, the soils and climate of the countryside were conducive to agriculture, and intensive cultivation and dairy farming developed primarily along the ridges. (Renova International, Ltd., 1974; York County Planning Commission, 1971b.)

Influenced by the topography, the transportation routes also followed the ridges, with the result that the early settlement pattern followed the north-south orientation of the roads, with a concentration of farms along the new Route 74 and the roads associated with it.

The Susquehanna River and Muddy Creek were natural barriers to east-west movement and contributed to the area's geographic isolation. The development of the

area's transportation system was an important factor in the area's growth. The establishment of a rail line from Baltimore City to York City, with Delta Borough as a transshipment point, strengthened the area's position as an agriculture service center. The development of major regional highways between Baltimore, York City, and Philadelphia resulted in the closing of the rail line in the 1950s. Route 74, linking Delta to York City, was the most important regional route, especially once the Delta Bypass was constructed north of Delta Borough to link local roads with Route 74. During the mid 1960s, Route 372 was built to cross the Susquehanna River, linking the southern portions of York and Lancaster counties and resulting in increased east-west movement. Improved transportation encouraged suburban settlement in the Study Area, particularly in the northwestern part of the township.

Peach Bottom Township remained a primarily rural area characterized by scattered, family-owned and -operated dairy farms and summer homes, with little industrial, commercial, or population growth. A large percentage of land in Peach Bottom Township remained undeveloped and in its natural state at the time of the study period, much of it in areas with greater than twenty degree slopes or associated with the drainage system. This land, though not suitable for intensive uses such as agriculture, was a desirable location for summer cottages, and many summer homes were scattered along the rivers, tributaries, and hills of the township to exploit the vantage points of the rural landscape. Before the construction of Peach Bottom Unit 1, the plant site had been used by residents of the Study Area for summer recreation; a number of cottages and beaches were located there. The construction of Peach Bottom Unit 1 in the early 1960s resulted in the relocation of about forty cottages and the loss of a highly valued landscape¹ to the residents of the Study Area. (Philadelphia Electric Company, n.d.; Renova International, Ltd., 1974; York County Planning Commission, 1971b; Alden, personal communication, 1980; Baldwin, personal communication, 1980; Cooper, personal communication, 1980; Poff, personal communication, 1980.)

Delta Borough historically functioned as the service center for the rural area and developed as a commercial and residential center along the original Route 74 (now Main Street), which gave the borough the impetus for much of its early

¹The cottage owners were paid to relocate.

commercial growth. Residential and commercial uses were mixed in the borough, with no distinct boundary separating the two. Because the town was enclosed within Peach Bottom Township, it could not expand outward. Development outside of the borough was controlled by Peach Bottom Township, which did not want urban development. Natural features also had the effect of limiting residential development: to the south of the town, a ridge of slate prevented residential expansion, and to the north, parallel to the mined ridge of slate, a flood plain blocked additional growth. Delta Borough developed between these two natural features. During the study period, new, intensive commercial development was located near the intersection of local roads, with Route 74, a noticeable change from the historical pattern of commercial activity in the Study Area. (Renova International 1974; York County Planning Commission, 1971b.)

Nevertheless, between 1950 and 1978, the services Delta Borough provided to the agricultural sector—agricultural equipment and repair, chemicals, seeds, dairy processing, vegetable canning, and feed milling—declined. Although some agricultural economic activity remained throughout the study period, the level was considerably below that established earlier in its history. At the time of the study, there were banks, a supermarket, automobile repair shops, and other small retail stores in Delta Borough, making it the commercial center for the Study Area, while Peach Bottom Township had a few commercial establishments, but not enough to provide even the basic requirements of the township residents. Consequently, both the residents of Peach Bottom Township—farmers and suburbanites—and the traditional residents of Delta Borough had established economic ties to places outside of the Study Area. The result was that Delta Borough was in the process of becoming a "bedroom" community, where residents worked, shopped, and obtained professional services outside the town, and the Belair urban area, southwest of the Study Area in Harford County, Maryland, was of growing importance to the Study Area residents.

Delta Borough and Peach Bottom Township were separate political jurisdictions, each with its own government bodies and buildings. At one point in the early 1970s, there was a proposal to construct a Delta Borough-Peach Bottom government building with office spaces as well as meeting rooms, a library, and an historical museum. The proposal was defeated by both Delta Borough and Peach Bottom Township. The township's building, constructed in 1974 and located south of Delta Borough, housed the highway maintenance department and was used for both political and nonpolitical

activities. The Study Area was highly dependent on York County for its public administration and planning, and the level of interaction between York City, the county seat, and the Study Area was very high.

Delta Borough was the center for the area's formal social activities. Most of the churches, the social clubs and organizations, the historical society, and the volunteer fire department were located in Delta Borough as were the Delta-Peach Bottom Elementary School, which had the largest recreational facility in the study area, and the Delta-Cardiff Community Memorial Hall, which provided indoor recreational activities. The township had an abundance of open space that was utilized for recreation, but overall, the planned recreational facilities available in the study area were limited and short of the suggested state standards. However, residents of both Delta Borough and Peach Bottom Townships had access to public and private recreation areas just outside the Study Area.

Delta Borough had traditionally served as the center for the economic and social activities of the Study Area. Although its role as an economic center had declined because of competing places located near the Study Area and changes in the composition of the population, it retained some aspects of this role throughout the study period. Prior to and during the study period, the natural, aesthetically pleasing visual landscape and availability of land in the township were the factors most strongly influencing settlement patterns in the Study Area.

6.2.2 Population Distribution

Several distinct patterns with respect to population distribution in the rural Peach Bottom Township and Delta Borough are apparent. At the time of the study, the township was characterized by widely dispersed farm households, seasonal vacation homes, and recently constructed, more concentrated suburban developments. In 1960, Peach Bottom Township had a low population density, estimated at 43 persons per square mile. By 1970, the density of the township had increased, but 55 percent of the area was still devoted to agriculture, and another 35 percent was open space. Recent suburban growth occurred in two areas: new homes were built on the outskirts of Delta Borough, and a subdivision, known as the Susquehanna Trails Development, was created in 1968 in the northwestern section of the township. This subdivision, which was formerly farm land, expanded with construction of both seasonal homes and year-round residential structures to meet the demands of

suburban in-migrants. Aside from these two areas, however, the population was scattered throughout the township.

While the township was characterized by a generally dispersed population pattern, except for the subdivision on the northwest, the population of over 700 in Delta Borough was highly concentrated in single-family homes, both attached and detached. Along Main Street in Delta Borough, there was a mix of residential and commercial uses; the secondary streets were primarily residential.

6.3 Housing

For the most part, the housing pattern and conditions in the Study Area reflected four historical and economic processes: the dominance of the agricultural economy with scattered family-operated farmsteads; the growth of Delta Borough in the early 1900s as a mining and agricultural service town; the in-migration of recent suburbanites and the development of a residential subdivision in the township; and the long-time use of the area for seasonal vacation homes. By the time construction began on Units 2 and 3, suburban growth in the area was still in its initial stages.

In 1960, 88 percent of the housing units in Delta Borough were single-family residences, divided into clusters of primarily detached units south of Main Street and primarily attached units north of Main Street. The housing stock in Peach Bottom Township were primarily single-family structures. Even before the construction of Peach Bottom Units 2 and 3 began, there were few housing vacancies in the Study Area; during construction on the plant, no sound units were left vacant. In 1960, there were about 297 housing units in Delta Borough and 517 in Peach Bottom Township. (York County Planning Commission, 1971b; 1973a; 1976; 1977.)

Only a few housing units were added to the housing stock in Delta Borough between 1960 and 1978. By 1978, there were an estimated 306 housing units: the increase was primarily from the conversion of large single-family units to multi-family units. The importance of this change to multi-family residences was small compared to the size of the single-family housing stock, but it represented a shift in the social structure of the community. During the 1970s, there was deterioration in housing quality in Delta Borough; some structures assessed to be structurally unsound were vacated. (In 1970, nine such vacant housing units existed.) (Renova International, 1974; York County Planning Commission, 1971a, 1971b, 1973a, 1976; Hughes, personal communication, 1980.)

The deterioration of the housing stock was partly the result of the growth in renter-occupied units, which consistently had a higher percentage of dilapidation and a higher degree of absentee ownership and management, and partly a function of the number and proportion of older structures in Delta Borough. Problems were generally concentrated in these older homes, but the elderly of Delta Borough, who often resided in these homes, were not always financially able to maintain and repair them. In 1960, none of the housing units in Delta Borough were considered dilapidated (U.S. Bureau of the Census, 1960); but by 1970, 4 percent of the residential structures were assessed to be dilapidated, and an additional 9 percent showed major deterioration. Although the number of "marginal" housing structures in Delta Borough increased during the 1970s, the commuting population that relocated to Delta Borough during this period refurbished many of Delta's older homes. (Poff, personal communication, 1980; Baldwin, personal communication, 1980.)

During the study period, 1968-1978, a number of important changes occurred in the housing and population distribution in Peach Bottom Township. Primarily this change resulted from the Study Area's increasing connection with the larger urban centers, particularly the increasing presence of people who were economically and socially connected with the Baltimore metropolitan area. (Reed, personal communication, 1979; Poff, personal communication, 1979.) Areas where residential growth was concentrated during the late 1960s--the Susquehanna Trails, along Route 74, and in the area north of Delta--continued to grow in the 1970s at an accelerated rate.

This increased residential growth was reflected in the changes that occurred in land use in Peach Bottom Township between 1971 and 1976. As shown in Table 6-1, during this period there was a substantial increase in the acreage devoted to rural nonfarm residential uses, a loss in total agricultural and open space acreage, a sizeable increase in land devoted to roads and public rights-of-way, and almost a doubling of acreage of residential land use--the result of acceleration of the rural suburbanization begun in the 1960s. The amount of land for commercial and industrial functions remained unchanged, but the amount of undeveloped land and agricultural and open space decreased by about 7 percent.

Table 6-2 shows the number of housing units in Peach Bottom Township between 1970 and 1978. These reflect the changes represented by changes in land use. In

TABLE 6-1
LAND USE^a
PEACH BOTTOM TOWNSHIP
1971 AND 1976

	1971 (Acres)	Percent of Total	1976 (Acres)	Percent of Total
Residential	410	2.3	823	4.5
Commercial, Industrial, Public	40	0.2	40	0.2
Agricultural and Open Space	17,325	95.6	16,209	88.9
Roads and Public Rights-of-Way	350	1.9	1,162	6.4
TOTAL	18,125		18,234	

^aThe land use acreage in 1971 and 1976 was derived from two sources, and their totals consequently differ.

Sources: York County Planning Commission, August 1979, 1976 Existing Land Use Area in Acres; York County Planning Commission, personal communication, 1979; York County Planning Commission, February 1971, Comprehensive Plans: Lower Chanceford Township, Peach Bottom Township, Delta Borough.

TABLE 6-2
NUMBER OF HOUSING UNITS
STUDY AREA
1970-1979

Year	Number of Housing Units	Number of Mobile Homes	Total Housing	Annual Percent Change
1970	641	26	667	—
1971	643	34	677	1.5
1972	648	42	690	1.9
1973	671	51	722	4.6
1974	693	60	753	4.3
1975	716	70	786	4.4
1976	744	83	827	5.2
1977	788	85	873	5.6
1978	813	88	901	3.2

Source: York County Planning Commission, June 1978, Rural Social Services Study;
A.N. Towan, personal communication, August 1979.

1978, the number of housing units had increased by 172 units over the number in 1970, an increase of almost 27 percent and an average annual increase of 3.6 percent. As seen in this table, the growth in the housing stock in Peach Bottom Township increased at a faster rate in the years following construction of Units 2 and 3 than it did during the peak construction period. Combined with the fact that very few operations workers lived in Peach Bottom Township, this indicates that most of the trend in increased housing in Peach Bottom was due to suburbanization rather than to the Peach Bottom project.

Housing conditions in the Study Area were quite different in Delta Borough than they were in Peach Bottom Township. In Delta Borough, the housing stock was old, and there was no room for expansion except through conversion of existing single-family units into multi-family structures. Furthermore, there had been some deterioration in the housing stock in Delta, but this was partially offset by rehabilitation efforts on units recently purchased by commuters from the Baltimore area.

Peach Bottom Township, on the other hand, experienced steady growth in the stock of housing over the 1970-1980 decade. There was ample developable land in the township, and residential development was expected to continue into the 1980s.

The construction of the nuclear plant did not result in a permanent increase in the population of the Study Area: rather, the construction work force was present only temporarily and stayed primarily in rooms rented in homes in the area (approximately 30 percent of the housing in Delta Borough contained rentable units). Consequently, no new residential growth in Delta Borough can be attributed to the plant's construction. Moreover, there were few people who relocated into the local area permanently for work related to the project, even during the operations phase, and their residences were dispersed throughout the area, thus minimizing the little settlement effect that could have occurred. The few operations workers and their families merged inconspicuously with the growth of the suburban population.

At the same time that construction began on Units 2 and 3, as mentioned before, an area of farmland in the northwestern part of the township was subdivided for residential development. The area, known as the Susquehanna Trails, became the focal point for rural suburbanization. The residents in this area consisted of either

"newcomers"—mostly retired people who were "full-time residents" by virtue of their evolving integration and participation in the community--and suburbanites, who lived in the township but whose place of employment and social ties were outside of the local area. The construction and operation of the nuclear station was not a factor in the development and ultimate growth of this area, either.

A large proportion of the nonmover work force was females employed as clerical workers, maintenance workers, and security personnel, who had previously been employed as agricultural workers or had retired. The nonmovers did not change the settlement patterns of the local area in any measurable way; the number of residential structures in Delta Borough during the last fifteen years remained stable.

The beginning of a commercial center on the northwestern edge of Delta Borough was the most noticeable change in the spatial pattern of commercial activity. Located at a major regional intersection, the large retail supermarket took advantage of its location as a market for commuting construction workers, local residents, and the suburban community. The construction of the nuclear plant was the principal factor in the supermarket's expansion, as the establishment doubled in size during the construction period. The area was zoned for commercial development, and a new bank located there.

The overall effect of the nuclear station on the size of the housing market in the local area was minimal despite its noticeable effect on the population size, since much of the population effect was due to diminished out-migration rather than to significant in-migration. The movers to Delta constituted a small proportion of the total number of construction workers who relocated into the region to work on the project and were primarily workers unaccompanied by families. This was the result of the low vacancy rate of family housing units, the lack of apartment development in the local area, and the plant's proximity to other, more urban centers with higher vacancy rates that absorbed the excess housing demands from the study area.

Although a few people complained about rental costs during the construction period, the Renova International study found that these costs conformed to the general rental costs of housing in the larger region of southeastern York County. Local realtors suggested that property and housing values continued to appreciate during the study period; however, there was no strong evidence that rental costs or

property values deviated from regional or national trends as a consequence of the construction of the Peach Bottom plant.

In summary, since the housing growth potential in Delta during the study period was constrained by the town's limited space and the limited capacity of public services, there was virtually no residential expansion in Delta from 1960 to 1979. In 1960, Delta had a total of 297 units, and by 1979, the housing stock had increased to 306 housing units, reflecting growth in multi-family units. The growth in multi-family units resulted primarily from the conversion of large single-family homes into multi-units and was clearly a change brought about by the pressure exerted by the construction work force for housing near the construction site.

During the first four years of construction, housing quality in Delta Borough deteriorated. This was thought to be due to the limited upkeep and maintenance received by multi-unit rentals held as investments by absentee landlords. When construction ended and the demand for these rentals declined, their quality deteriorated further, and the families that replaced the construction workers differed from the other residents by virtue of their lower socioeconomic status. Although the relative importance of this change was small compared to the size of the single-family housing stock, the change represents a conspicuous shift in home-ownership patterns in the area.

While the housing stock remained constant in Delta Borough over the study period and housing quality deteriorated, the patterns in Peach Bottom Township were different, though essentially unaffected by Peach Bottom Units 2 and 3. Housing starts in Peach Bottom Township grew at a steady rate since 1970 and, additionally, housing quality generally improved during this period. These changes were not influenced by the Peach Bottom facility, although it is probable that the trend toward conversion of seasonal houses to year-round houses may have been partly stimulated by the potential for rental income.

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, to examine the source of revenues, to discuss the pattern of expenditures, to indicate the level of services, and to describe specific areas of services over the study period. The objective is to focus on the provision of public services and on any changes in the sources of revenues and patterns of expenditures that resulted from the construction and operation of the Peach Bottom plant. The discussion is designed to highlight changes associated with significant social or political consequences rather than to provide a detailed fiscal analysis of the Study Area governments.

Once the background description of the local government is outlined, a summary of the budgets for the study period will be presented. Discussions of revenues and expenditures will concentrate on the response the local area made to the increased revenues resulting from plant construction and operation. This examination will include both increased expenditures and reduced tax rates in the township.

The discussion of public services focuses on employment and service trends in four areas: education, transportation, public safety, and social services. These services have been chosen because they are thought to be responsive to socio-economic change in the community, they are often cited as impacted services in the literature, and they would be indicative of other public services effects experienced in the Study Area.

7.2 Government Structure

The Study Area includes separate and distinct local jurisdictions--Delta Borough and Peach Bottom Township. Peach Bottom Township is one of thirty-five townships in York County, and Delta Borough is one of thirty-five such jurisdictions in the county. A township is a subcounty area with the status of a legal municipality, originally established for administrative purposes, while boroughs are small towns within townships. In Pennsylvania, townships and municipalities designated as boroughs had a high degree of administrative autonomy in such matters as regulating taxes (by determining millage tax rates, for example), governmental structure, zoning and planning policy, and local public services. Such activities were highly influenced

by the county, however, which was responsible for providing social and judicial services, funds, and planning expertise and for dispensing revenues to the county's constituent jurisdictions. (Peach Bottom Township, 1977; Pennsylvania Office of State Planning and Development, 1977; York County Board of County Commissioners, 1978; Baldwin, personal communication, 1980; Poff, personal communication, 1979.)

Of special importance to this study was the relationship between the York County Planning Commission and the Study Area. For municipalities with subdivision and housing regulations such as Peach Bottom Township, the Planning Commission reviewed lot plans. Furthermore, the commission, in developing its comprehensive plans, coordinated its activities with all municipalities and reviewed the policies established by the local areas for conformity with the broader goals of the county. In addition, the commission reviewed federal aid applications, provided advisory service, and made contractual arrangements to prepare local comprehensive plans and zoning ordinances. (Poff, personal communication, 1979; Baldwin, personal communication, 1980.)

Delta had an elected, unpaid mayor-council system of government. The local government operated through both scheduled and ad hoc meetings of government officials (when situations requiring an immediate community response developed) and periodic public meetings. While the mayor historically served as the community administrator, in the 1960s, the mayor's power was diffused into four permanent committees: the departments of lighting, finance, water, and streets. (Poff, personal communication, 1980.)

Decision-making was historically based on community consensus through public forums with broad-based community participation and through informal community contacts: decision-making was an open process, and it still was, to a large extent, at the time of the study. Decision-making by consensus was a workable process because of the nature of the decisions that had to be made, usually limited to budgetary concerns; the homogeneity of values, which precluded the growth of public issues and social conflict; and the extensive network of information-communication channels between the decision-makers and the public. Planning and zoning activities were minimal. Delta Borough never worked towards the implementation of a zoning plan: the town was small and could not expand, and there was an already existing mix of

land uses without identifiable boundaries separating them. (Poff, personal communication, 1980, York County Planning Commission, 1971a, 1971b.)

Peach Bottom Township's public administration consisted of three elected, unpaid members of the Board of Supervisors, which established temporary commissions when particular problems surfaced in the community. The prime objective of the Board of Supervisors traditionally was to budget the township's account, to organize and direct the township's departments, and to set the direction of development. Historically, public meetings were called as particular needs arose. Because Peach Bottom Township was an agricultural community, the concerns were generally regarding rural problems (usually small difficulties that could be quickly ameliorated). The township administration was not considered an important institution prior to construction of the Peach Bottom plant, in part because no salient public issues or concerns that required its intervention were expressed.

Public administration in Delta Borough remained essentially unchanged during the study period. There were some changes in governmental officials, but no change in the decision-making process or in the level of governmental activity in Delta Borough. This was not the case in Peach Bottom Township. A number of developments took place during the late 1960s that necessitated a new approach to decision-making in the township. The expansion of the Peach Bottom atomic plant and increased residential growth in the township were critical factors in increasing the level of political activity and in changing the manner in which township problem areas were assessed and actions implemented. For the first time, important public issues and concerns surfaced: the need for their resolution elevated the importance of the supervisor's function and resulted in public participation in the decision-making process. Moreover, the demographic changes occurring in the township meant that the township was no longer a homogeneous social and economic group that expressed cohesive concerns associated primarily with agricultural development. The recent immigrants, for example, placed demands on the township's revenues for upgraded public services such as improvements in roads and sewage systems, while the agricultural community's interest was focused on restricting residential development in the township and using revenues to lower the property tax millage.

Although the structure and size of the township's public administration did not change during the study period, less obvious changes toward increased formalization of the decision-making process occurred, as indicated by the increasingly visible

leadership function required of the elected supervisors. The suburban growth and uncontrolled development of subdivisions during the study period also made it necessary for the township government to change from the traditional role of responding to individual problems in an ad hoc fashion to one of taking the initiative for setting policy. Moreover, the administration of the township became "political" in that it moved away from merely dealing with organizational matters related to the budget toward taking positions on public issues and acting in support of its constituency, the agricultural community. The concerns voiced by the supervisors ranged from decisions over the Peach Bottom nuclear plant to township zoning. In 1971, the first comprehensive land use plan was developed for the township, and in 1973 a zoning ordinance, in addition to subdivision and land development regulations, was established. These regulations were intended to restrict residential development on productive agricultural land. (Sowers, 1979; York County Planning Commission, 1971a, 1971b; Ailes, personal communication, 1980; Baldwin, personal communication, 1980; Blackwell, personal communication, 1980; Buecker, personal communication, 1980; Cooper, B., personal communication, 1980; Hunt, personal communication, 1980; Lawrence, personal communication, 1980.)

In addition to the growth of the township administration's role in planning and land use control, the highways and streets department was expanded, a civil defense expert was hired temporarily, and the township's political activity spread to include neighboring jurisdictions.

7.3 The Budget during the Study Period (1967-1979)

7.3.1 The Budget

The available data on the budgets of the Study Area show the limited administrative activity prior to the study period. In 1965, for example, total revenues for Delta Borough were \$14,179. Table 7-1 shows the revenues for Delta Borough for selected years from 1965 to 1975. On the whole, revenues showed a steady rate of growth between 1967 and 1975, except for a sharp jump between 1967 and 1969. In 1970, total revenues amounted to \$46,317; they increased to \$51,742 in 1973. In 1975, revenues fell below the 1970 figure to \$45,402 and subsequently remained stable at about that level through 1978.

The major constraint to increasing revenues in Delta Borough was the limited land for additional development. Through government loans and adjustments in the

TABLE 7-1

REVENUE RECEIPTS^a
 DELTA BOROUGH
 1965, 1970, 1973, 1975
 (Current Dollars)

Revenue	1965	1970	1973	1975
General Fund				
Real Estate Taxes	\$ 6,002	\$ 7,891	\$ 8,651	\$ 8,874
Per Capita/Act 511 ^b	—	9,767	11,783	13,181
Occupational Taxes	422	474	466	603
Prior Taxes Collected	1,849	—	—	—
Total Taxes Collected	8,273	18,132	20,900	22,658
Miscellaneous Revenues ^c	5,906	28,185	30,842	22,744
Total Revenues	14,179	46,317	51,742	45,402

^aNot included in these figures are the State Liquid Fuels revenues and the nonrevenue receipts such as loans and transfers from local funds. The revenues accruing from the State Liquid Fuels in 1965 amounted to about 50 percent of the total revenue estimate.

^bThe "Act 511" taxes include the following taxes: per capita, earned income, real property transfer, mercantile, amusement, and occupational privilege.

^cMiscellaneous revenues include the following sources of revenues: licenses and permits, fines, state and federal grants, state highway aid, county grants, waste and refuse disposal, highway services, and sanitary sewer rents and charges.

Source: York County Planning Commission, February 1971, Lower Chanceford Township, Peach Bottom Township, Delta Borough Comprehensive Plans: Part 1, The Study; Commonwealth of Pennsylvania, 1970, 1973, 1975, Local Government Financial Statistics.

distribution of monies, revenues exceeded borough expenditures, but the increases in revenues during the 1970s were not sufficient to upgrade or expand public services in the borough.

In Peach Bottom Township, the overall trend for revenues during the 1960s was a slow but steady increase as real estate taxes rose due both to increasing assessed valuation and increasing millage rates. In 1965, total revenues amounted to \$18,313; in 1968 they amounted to \$45,000. Between 1972 and 1974, township revenues increased substantially. In 1972, total revenues amounted to over \$200,000, and the revenues in 1974 exceeded the 1972 total. However, in 1975 and the years following, revenues declined. Figure 7-1 shows the total revenues and expenditures for Peach Bottom Township during the 1968-1978 period. Table 7-2 details the budget for the Study Area from 1969 to 1975.

7.3.2 Revenues

Revenue and expenditure effects related to the Peach Bottom nuclear station were limited to Peach Bottom Township by virtue of the plant's location in the township. Delta Borough received no additional revenues because of the plant, nor were there any expenditure effects on Delta attributable to the Peach Bottom facility. No new housing starts of any significance, for example, occurred during the study period, and Delta Borough was outside the jurisdictional area where taxes on the plant or its workers were levied.

Annual revenues for Peach Bottom Township are shown in Table 7-3. There was a marked increase in township revenues during the construction period and a decline during the operation period. Between 1969 and 1974 (the construction period), annual revenues increased from \$80,668 to \$303,578, an average of 55 percent per year. However, in 1975, the level of revenues dropped sharply compared to that of the previous year, from \$303,578 to \$170,596. Revenue levels then remained relatively stable between 1975 and 1978.

Although the assessed valuation of realty increased during the study period, total revenues from taxes on real estate declined subsequent to 1973 because of the reduction in the millage rate. The township revenues generated by the nuclear plant consisted of three tax components: earned-income tax, real estate tax, and the utility rebate. Peach Bottom Township received very little tax revenue from utility

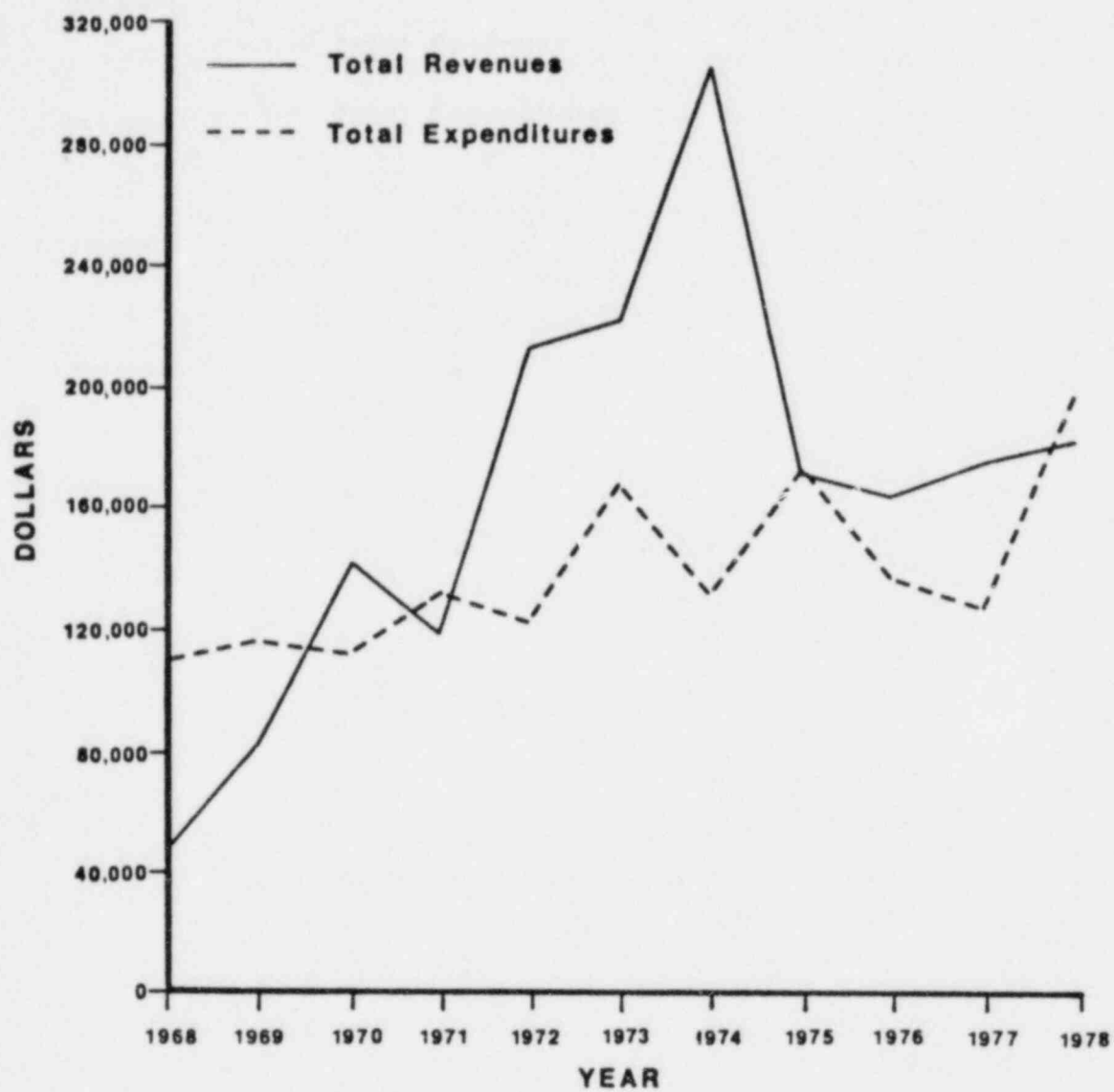


FIGURE 7-1. Revenues and Expenditures, Peach Bottom Township, 1968 - 1978.

Source: Peach Bottom Township, Annual Reports, 1968 - 1978.

TABLE 7-2

STUDY AREA BUDGET^a
 DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
 1969-1975
 (Current Dollars)

DELTA BOROUGH									
Year	Total Expenditure	General Government	Sanitation	Health Service	Public Safety	Urban Renewal	Streets/Highways	Parks and Recreation	Expenses Per Capita
1969	\$ 33,564	\$ 1,259	\$ 2,695	--	\$ 6,620	\$450	\$12,535	--	\$ 40.83
1970	37,629	2,226	27,843	--	6,061	--	15,086	--	48.37
1971	45,832	1,575	8,320	--	6,066	--	14,283	--	58.91
1972	51,243	2,641	7,680	--	6,464	--	23,128	\$125	65.87
1973	52,335	3,038	7,680	--	5,752	--	17,397	769	67.27
1974	48,383	2,754	--	--	6,675	--	11,220	--	62.19
1975	42,227	3,082	--	--	6,392	--	13,948	--	54.28

PEACH BOTTOM TOWNSHIP									
Year	Total Expenditure	General Government	Sanitation	Health Service	Public Safety	Urban Renewal	Streets/Highways	Parks and Recreation	Expenses Per Capita
1969	\$116,138	\$10,228	\$ 1,561	\$30	\$1,261	--	\$28,678	\$ 65	\$87.65
1970	112,086	9,896	--	10	509	--	56,456	5	78.71
1971	131,192	10,118	--	60	500	--	54,046	65	92.13
1972	123,133	14,779	--	--	500	--	52,687	205	86.47
1973	167,041	11,031	--	--	2,253	--	106,771	400	117.30
1974	132,031	14,893	--	--	2,000	--	74,174	758	92.72
1975	172,171	14,851	--	--	3,000	--	46,795	369	120.91

^aExpenditures for capital outlays are not included as a category of expenditures although capital outlays are included in the total expenditure column.

Source: Peach Bottom Township, 1969-1975, Revenues and Expenditures; Commonwealth of Pennsylvania, Department of Community Affairs, 1969-1973, Local Government Financial Statistics.

TABLE 7-3

REVENUE CONTRIBUTION
OF PEACH BOTTOM ATOMIC GENERATING PLANT
TO THE PEACH BOTTOM TOWNSHIP
1969-1978

Year	Total Revenues	Real Estate Revenues	Earned Income Tax	Other Revenue	Taxes Paid on Units 2 and 3 as Percent of Total Revenues
1969	\$80,668	\$21,382	\$27,700	\$31,586	37.09
1970	141,658	19,751	66,517	92,876	48.4
1971	119,870	21,872	56,649	41,349	50.0
1972	212,141	19,043	140,560	52,538	67.2
1973	221,255	6,364	124,096	90,795	57.0
1974	303,578	4,561	184,879	114,138	61.4
1975	170,596	5,251	56,669	108,676	34.4
1976	164,032	4,826	40,487	118,719	25.5
1977	177,490	5,565	30,156	141,769	17.6
1978	184,730	6,991	47,038	130,701	16.9

Source: Commonwealth of Pennsylvania, 1969-1978, Local Government Financial Statistics; Pennsylvania Department of Community Affairs, Don Herbester, 1979, personal communication; Peach Bottom Township, 1969-1978, Budgets; York County Planning Commission, February 1971, Lower Chanceford Township, Peach Bottom Township, Delta Borough Comprehensive Plans: Part 1, The Study.

property tax because the revenues of utility realty taxes were distributed state-wide. In 1978, for example, the township received \$522 of the total utility tax paid by the Philadelphia Electric Company that year for the atomic plant. Local real estate taxes were paid to the township on nonutility real estate associated with the nuclear station based on a levy of 2 mills on twenty percent of the assessed value of the property. The assessed value of the Peach Bottom plant in 1978 was \$295 thousand; thus, the station's property taxes contributed little to the township revenues.

Because the assessed value of the plant was low, the revenue-producing effects of an earned-income tax were important to the township. The major source of revenue for Peach Bottom Township during the construction period was the one-percent earned-income tax invoked by the township in 1969 as a means of increasing its revenues by taxing workers employed in the township. The imposition of this tax was a direct response to the potential revenue that could be generated from the large work force employed to construct the Peach Bottom plant. Table 7-3 shows the annual earned-income tax from 1969 to 1978.

The data show that the substantial increases in township revenues from 1970 to 1974 were the direct result of the one-percent earned-income tax. In 1969, township revenues from the earned-income tax were estimated at \$27,700, which represented approximately 50 percent of the total taxes collected that year. In 1974, the revenues from the earned-income tax increased to \$184,879, or 93 percent of the total taxes collected that year. The revenues from the earned-income tax in 1975 decreased by approximately 70 percent from the previous year, reflecting the termination of construction activity.

For the period prior to construction, the average millage rate on property in the township was 15 mills. The revenues generated through the levy of an earned-income tax enabled the township to lower its millage rate. In 1970, the rate was 13 mills; in 1971, it was reduced to 11 mills, and it was still further reduced to 8 mills in 1972. By 1973, the millage rate for Peach Bottom Township was only 2 mills, the lowest in York County. The reduction of the millage rate on township property was the direct result of the revenues obtained from the earned-income tax on workers at the nuclear station. As a result of the reduction in millage rates, taxpayers in Peach Bottom Township paid fewer taxes than they otherwise would have paid. Table 7-4 shows the difference between the actual property taxes paid by township taxpayers and the

TABLE 7-4

PEACH BOTTOM TOWNSHIP
ACTUAL AND POTENTIAL PROPERTY TAX REVENUES
BASED ON 1969 TAX RATE
1970-1976
(Current Dollars)

Year	Actual Revenues	Potential Revenues	Difference
1970	\$19,751	\$22,215	\$ 2,464
1971	21,872	32,250	10,378
1972	19,043	32,715	13,672
1973	6,364	33,450	27,086
1974	4,561	35,340	30,779
1975	5,251	37,170	31,919
1976	4,826	40,110	35,284
1977	5,565	40,185	33,194
1978	6,991	41,655	34,664

Sources: Commonwealth of Pennsylvania, 1970-1978, Local Government Financial Statistics; Pennsylvania Department of Community Affairs, Don Herbster, 1980, personal communication; Mountain West Research, Inc., 1980.

property taxes that would have been paid if the millage rate had not been lowered. As can be seen in this table, \$219,437 in property taxes was saved by township taxpayers between 1970 and 1978 because of the reduced millage rates. In 1978 alone, tax payments by owners of property in the township were \$34,664 less than they would have been at the 1969 rate of 15 mills. Undoubtedly, this tax saving benefited the owners of real estate in Peach Bottom Township, who were principally farmers.

Table 7-4 shows that as construction ended and the revenues from the earned-income tax declined, "other revenues" contributed an increasing share of the total revenues. Most of these "other" revenues were from federal, state, and county revenue funds. In 1970, the state and federal grants, state highway aid, and county grants to the township amounted to \$25,322. In 1973, these funds totaled \$70,795, and in 1975, they were estimated to be \$76,594. State revenue contributions remained relatively stable during this period.

7.3.3 Expenditures

Since Delta Borough was situated outside of the jurisdiction where tax payments of the plant would accrue, the Peach Bottom plant had virtually no effect on the size of the budget in Delta Borough. The total annual revenues in Delta Borough remained stable throughout the construction period: in 1970, total revenue for Delta was \$46,918, and in 1975, total revenue was estimated at \$45,402. Historically, Delta Borough was not able to increase its assessed valuation because of geographical constraints to development. No major increase in the borough's level of expenditures was needed as a consequence of the nuclear plant, but the lack of revenues in the community prevented the improvement or expansion of public services.

Although the Peach Bottom plant had a large effect on the revenues received by Peach Bottom Township, the project had only a small effect on the level of public services or public employment in the township. Peach Bottom Township's decision to invest much of the earned-income tax and to reduce the millage rate on taxable property resulted in little change in the level of expenditures for public services in the township even though revenues had increased during the construction period. The only area where expenditures markedly increased was in the area of street maintenance during the construction period. In other areas, the increased revenues had a minimal effect. No new employees were added to the township's public

employment. Expenditures for capital outlays, moreover, were in the area of highway improvement.

In Peach Bottom Township, the level of public service expenditures prior to construction of the Peach Bottom plant was low but stable, averaging \$41,233 between 1964 and 1976. By 1971, four years after the start of construction, the level of expenditures was deemed inadequate to meet the improvements needed in the township, according to the township's 1971 comprehensive plan. This plan identified the major shortcomings in the level of public safety and other public services and recommended increases in revenue to ameliorate these problems. (York County Planning Commission, 1971b.)

Overall township revenues increased sharply during the construction period as a consequence of the earned-income tax, but these revenues were only important relative to the level of revenues collected prior to construction. They were neither sufficient nor permanent enough to be used for improvements of major public services or for the expansion of development of facilities, and they were only temporary. The earned-income tax payments did make possible, however, a reduction in the property tax millage rates and improvements to the local highway system. An examination of how the increased resources, demands, and capabilities of local public services changed over the study period in the areas of education, transportation, public safety, and social services is made in the following sections.

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. In dealing with these services, it has been necessary to present an overview that condensed extensive data for an extended period. The objectives are to identify responses to project impacts made by public services and to record structural changes that had important consequences for Study Area residents.

7.4.1 Education

The Study Area is served by the Southeastern School District, which also serves three other townships—Fawn, East Hopewell, and Hopewell—as well as the boroughs located within the boundaries of these townships. Table 7-5 shows the annual revenues and expenditures for the Southeastern School District, and Table 7-6 shows

TABLE 7-5

REVENUES AND EXPENDITURES
SOUTHEASTERN SCHOOL DISTRICT
1968-1979

School Year	Revenues	Percent Increase	Expenditures	Percent Increase
1968-1969	\$1,204,823	--	\$1,173,947	--
1969-1970	1,376,085	\$14.2	1,366,419	16.4
1970-1971	1,484,328	7.9	1,482,110	8.5
1971-1972	1,721,238	15.9	1,686,250	13.8
1972-1973	2,084,495	21.1	1,975,102	17.1
1973-1974	2,105,332	1.0	2,104,346	16.5
1974-1975	2,452,674	16.5	2,500,203	18.8
1975-1976	2,726,094	-0.3	2,801,873	12.1
1976-1977	2,907,738	6.7	3,098,935	10.6
1977-1978	3,349,250	15.2	3,239,251	4.5
1978-1979	3,947,846	17.9	3,542,547	9.4

Source: L.B. Sowers, September 1979, Long Range Plan Southeastern School District; L.B. Sowers, personal communication, August 1979.

TABLE 7-6

SHARE OF TOTAL REVENUE BY SOURCE
SOUTHEASTERN SCHOOL DISTRICT
1973-1978

Revenue Source	1973-74	Percent of Total Revenue	1974-75	Percent of Total Revenue	1975-76	Percent of Total Revenue	1976-77	Percent of Total Revenue	1977-78	Percent of Total Revenue
Federal Funds	\$ 85,127	4.0	\$ 104,835	4.3	\$ 76,766	2.8	\$ 150,209	5.2	\$ 68,598	2.0
State Funds	1,155,147	54.9	1,334,522	54.4	1,425,740	52.3	1,459,829	50.2	1,806,174	53.9
Local Real Estate Funds	591,353	28.1	754,049	30.6	933,084	34.2	992,055	34.1	1,140,911	34.1
Other Local Taxes	273,705	13.0	262,263	10.7	290,504	10.7	305,645	10.5	333,567	10.0
TOTAL	2,105,332	100.0	2,452,674	100.0	2,726,094	100.0	2,907,738	100.0	3,349,250	100.0

Source: L.B. Sowers, September 1979, Long Range Plan Southeastern School District.

the share of total revenues for the school district by revenue source for the school years 1973-1974 to 1977-1978. Local taxes paid to the school district comprise local real estate taxes (106 mills assessed on a twenty percent property valuation) and other local taxes, including a one-half percent earned-income tax based on residency and employment status within the school district, a per capita tax of \$5, a real estate transfer tax of one-half of one percent, and an occupational tax of \$10 imposed on residents employed in the school district.

Federal and state funding levels for the school district remained relatively stable between 1973 and 1978 except for a noticeable 3 percent decrease in federal funding between 1976 and 1977. Local real estate tax contributions increased steadily in absolute dollars, but remained relatively fixed as a proportion of revenues.

In spite of a claim made by a few key informants that the school system became overcrowded as a result of the in-migration of construction workers and their families, the evidence suggests that increased school enrollment was occurring quite apart from the Peach Bottom project and that the increase resulting from construction of the Peach Bottom plant was only a portion of the problem for the school district. The school system could not accommodate the increased enrollment that occurred during the 1970s with its existing capacity; however, the great majority of this increased enrollment was due to suburban growth occurring in the school district rather than to growth due directly to the plant. For example, when construction on Peach Bottom Units 2 and 3 was completed in 1974, school enrollment in the Southeastern School District declined by only 35 to 40 students; school enrollment again increased in 1975. In fact, during the period when the construction work force was declining, after the 1972 peak year, enrollment levels in the school district were increasing, reflecting the growth in suburbanization. (Sowers, 1979; Reed, personal communication, 1980; Sowers, personal communication, 1980.)

Between 1970 and 1974, enrollment in the school district's high school exceeded the high school's 850-student capacity. In response to this overcrowding, a new middle school was built; it was completed in 1975.

The Renova International Study (1974) on the impacts of the Peach Bottom plant examined the changes to the school system brought about by the influx of the construction work force to the local impact area; the report's conclusions support this

study's findings. To illustrate, a study conducted by the Southeastern School District administration regarding the cumulative increase in school enrollment between 1963 and 1972 due to the construction of Peach Bottom's three generating units found a total increase of 83 students during this period. It was concluded that the size of this student population did not present a serious problem to the school system. Additional support for this conclusion was provided by a 1973 construction worker survey, which found a ratio of 0.6 school-aged children for each construction worker that moved into the school district. Based on this figure, about 101 pupils were added to the school district in 1973 because of construction worker in-migration to the Study Area. In itself, this student population did not exceed the enrollment capacity of the school system, but combined with the expansion due to suburbanization, it strained the system's capacity during the early 1970s. (Renova International, 1974; Sowers, personal communication, 1980.)

Annual data on school enrollment in the Southeastern School District are shown in Table 7-7. During the 1969 to 1974 period, the annual rate of increase in student enrollment ranged from 0.8 percent to 5.6 percent, with progressively larger increases each year of this period. The peak increase occurred between the 1972-1973 and 1973-1974 school years. In contrast to this peak, there were lower rates of enrollment increase prior to 1970—0.8 percent between the 1968-1969 and 1969-1970 school years. Additionally, subsequent to 1974, the school population grew slowly, except for a sharp increase in the 1977-78 school year.

7.4.2 Transportation

The responsibility of the Study Area governments for transportation were limited to roads and highways. The rail system that passed near Delta Borough ceased operation in the 1950s, and the Study Area had no public airport or waterway used for transportation. The primary roads in the township were under state jurisdiction. The state was responsible for 29.7 miles of roads, or 39 percent of total road mileage in the township. The remaining 45.9 miles of roads were under the jurisdiction of the township or the borough. The state jurisdiction over the primary roads relieved the local area of substantial maintenance costs, but problems did arise: some local roads were not priorities to the state, and consequently, maintenance of these roads was limited.

TABLE 7-7

TOTAL SCHOOL ENROLLMENT AND IMPACT OF THE NUCLEAR FACILITY
SOUTHEASTERN SCHOOL DISTRICT
1968-1978

School Year	Total Number Enrolled	Change in Enrollment since 1968-1969	Enrollment due to Construction and Operation Work Force Who Moved to Study Area	Plant-Related Percent of Total Enrollment
1968-1969	1,721		31	1.8
1969-1970	1,735	14	48	2.8
1970-1971	1,785	64	99	5.5
1971-1972	1,844	123	96	5.2
1972-1973	1,913	192	129	6.7
1973-1974	2,020	299	101	5.0
1974-1975	2,026	305	42	2.1
1975-1976	2,052	331	14	0.7
1976-1977	2,069	348	14	0.7
1977-1978	2,230	509	16	0.7

Source: L.B. Sowers, personal communication, August 1979.

Table 7-8 shows the expenditures for transportation in the Study Area. As expected, expenditures for streets and highways consistently accounted for a significant proportion of public spending in the Study Area. Between 1970 and 1974, a greater relative share of expenditures was devoted to highway improvement and maintenance than either before or after this period, reflecting the expenditure of some of the revenues received from the earned-income tax described above. Expenditures rose from about \$28,000 in 1969 to a peak of \$107,000 in 1973 and then fell to \$42,000 in 1975.

In the Study Area, state contributions to the revenues for highway maintenance and upgrading were substantial. Between 1970 and 1975, Delta Borough received state highway funds ranging from about \$2,500 to \$5,000 per year. The township's appropriations from the state for highway funds increased from \$21,575 in 1970 to \$33,415 in 1975 and remained stable through the end of the study period.

The major effect on transportation during the construction period was higher traffic density, congestion, lack of parking space in Delta, and roadside litter. Although the utility constructed an access road to the construction site to ease traffic, the large labor force employed at the site and the limited and narrow access routes continued to present difficult traffic problems. In a public survey of the Peach Bottom area conducted by Mountain West Research, Inc. (August 1979), traffic problems resulting from commutation by the large daily work force were identified as an important effect on the Study Area. When questioned about any adverse effects from construction-worker commutation to the plant, approximately 28 percent of the respondents identified traffic problems: traffic problems were identified as the number one negative impact of the work force commuters.

York County's average traffic volume is shown in Table 7-9 for three locations: the main street in Delta Borough, Peach Bottom Road at the first intersection west of the nuclear plant, and Route 851 near Broad Street north of Delta. All of the traffic to the project site passed through one of these points.

These data show a sharp increase in traffic volume from 1966, before construction began on the Peach Bottom plant, until peak construction in 1972. In 1975, traffic volume declined substantially at all three points compared to 1972; this decline correlates strongly with the reduction in the construction work force in 1975 with the completion of Units 2 and 3.

TABLE 7-8

HIGHWAY AND STREET EXPENDITURES^a
 DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
 1969-1975

Year	Peach Bottom Township			Delta Borough		
	Highway Expenditure	Total Expenditure	Percent of Total Expenditure	Street Expenditure	Total Expenditure	Percent of Total Expenditure
1969	\$ 28,674	\$116,138	24.7	\$12,535	\$33,564	37.3
1970	56,456	112,086	50.4	15,086	37,629	40.1
1971	54,086	131,192	41.2	14,283	45,832	31.2
1972	52,687	123,133	42.8	23,128	51,243	45.1
1973	106,771	167,041	63.9	17,397	52,335	33.2
1974	74,174	132,031	56.2	11,220	48,383	23.2
1975	46,795	172,171	27.2	13,948	42,227	33.0

^aThe expenditures do not include capital outlays between 1970 and 1975. Most of the capital outlays were in the area of streets and highways expenditures.

Sources: York County Planning Commission, February 1971, Lower Chanceford Township, Delta Borough, Peach Bottom Township Comprehensive Plans: Part 1, The Study; Commonwealth of Pennsylvania, 1970-1975, Local Government Financial Statistics.

TABLE 7-9

DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
AVERAGE DAILY TRAFFIC VOLUME AT THREE SELECTED POINTS
1966, 1972, 1975

Year	Delta Main Street	Peach Bottom Road Intersection	Route 851
1966	1,200	Not Available	1,350
1972 (Peak Year)	2,700	1,300	4,400
1975	1,400	600	2,100

Source: Pennsylvania Department of Highways, Highway Planning and Traffic Division, 1966, 1972, 1975, York County Traffic Volume Tapes.

7.4.3 Public Safety

The major elements of public safety were the police, fire, rescue, and Civil Defense (preparedness and communications). Expenditures to provide public safety to residents in the Study Area were low, as would be anticipated given the small population and rural characteristics of the area. To illustrate, at the time of the study, one volunteer fire department served Delta Borough, Peach Bottom Township (except for the fringe areas), and the adjacent communities of Cardiff and Whitford, in Harford County, Maryland. Funds for the fire department's operation were shared among the four municipalities. Police service was provided by one part-time officer and an elected constable in Peach Bottom Township and by three part-time officers in Delta Borough. During the construction period, no major problem emerged with respect to public safety. Because Delta Borough and Peach Bottom Township had small part-time police forces, the Study Area relied on the Pennsylvania State Police and the county deputy for serious public safety situations.

The limited capability of Delta Borough's part-time police force to operate effectively became a major public issue in the late 1970s. According to interviews with key informants, population growth in the general area, the lack of public recreational facilities for young people, and the public knowledge that law enforcement in the Study Area was limited resulted in the growth of crime and civil disturbances in the area. Nevertheless, Delta Borough's expenditures for police protection remained stable throughout the study period. (Poff, personal communication, 1980; Ailes, personal communication, 1980; Baldwin, J., personal communication, 1980.)

In Peach Bottom Township, police protection did not become a major political concern; consequently, the increased expenditures in the township during the study period were not directed to this public safety area. Table 7-10 shows the expenditures for public safety in the Study Area from 1969 to 1975.

The all-volunteer fire department did not directly benefit from plant-related tax revenues, although it did benefit indirectly from equipment donations, from both the utility and construction workers, and by the active involvement of construction workers residing in the Study Area. Much of the financial support for the fire department generally came from community fund drives and county grants.

TABLE 7-10

EXPENDITURES FOR PUBLIC SAFETY
IN THE STUDY AREA
1969-1975
(Current Dollars)

Year	Delta Borough	Peach Bottom Township
1969	\$6,620	\$1,261
1970	6,061	509
1971	6,066	500
1972	6,464	500
1973	5,752	2,253
1974	6,675	2,000
1975	6,392	3,000

Source: York County Planning Commission, February 1971 Lower Chanceford Township, Peach Bottom Township, Delta Borough Comprehensive Plans: Part 1, The Study; Commonwealth of Pennsylvania, 1970-1975, Local Government Financial Statistics.

Overall, there was little change in the provision of public safety services in the local area during the study period. The increasing number of persons residing in the Study Area and commuting to the Baltimore metropolitan region resulted in an increasing need for the expansion of police services, but for Delta Borough in particular, public revenues were not sufficient to respond to this need.

7.4.4 Social Services

The Study Area as a rural community with low population density has historically lacked the social services of the more urbanized areas of the county. The 1976 York County Rural Social Services Study concluded that differences in the delivery of social services existed between rural and urban areas and that the level of social services in rural areas had not sufficiently improved during the last decade. Improvements were identified as necessary in the following social services for the county's rural areas: health care, housing services, transportation, employment services, family planning, and juvenile services, especially in the area of drug abuse.

The need for improvement in the delivery of social services was articulated in the Study Area, especially by the younger and more recent in-migrants. The particular concern of some members of the community was the lack of health facilities in the area: Peach Bottom Township and Delta relied exclusively on the service of one physician. Indeed, the lack of adequate health facilities was a significant problem for all of the county's rural areas: in 1975 only 33 out of 326 physicians in York County were located in rural areas; of these, 27 percent were 69 years of age and over and had already retired from active practice. In the late 1970s, there was a proposal to research the feasibility of opening a rural regional health clinic, but that proposal did not receive widespread support. Residents of the Study Area relied upon county social services in the past and have continued to do so.

Changes in the local provision of social services for the elderly were instituted in the late 1970s, but no strong, direct relationship could be found between the construction and operation of the plant and the level of social services provided in the Study Area. Most social services were provided by state and federal funds, and the county played a significant role in the coordination and provision of social services as well. Residential growth in the Study Area during the 1970s resulted in the growth of a younger and more professional population; consequently, demands for increased and upgraded social services were made.

7.5 Summary

The revenues attributable to the Peach Bottom plant were not substantial and depended largely on the imposition of the earned-income tax. In Peach Bottom Township, revenue from the plant's property tax and the earned-income tax were used to expand and improve highway maintenance; other public services did not benefit from these revenues. However, expenditures on the whole slowly but steadily increased in the township, and the property tax rate was substantially reduced, which benefited the farming community. While the earned-income tax benefited Peach Bottom Township, Delta Borough did not benefit from the tax.

The construction and operation of the Peach Bottom plant took place at a time of residential growth in the Study Area, and thus demands for expanded and improved public services increased. However, the revenues from the nuclear plant did not contribute to any major upgrading of public services.

CHAPTER 8: SOCIAL STRUCTURE

8.1 Introduction

The purpose of this chapter is to identify and examine the effects of the project on the social structure of the Study Area. The first step in the approach followed in this chapter includes identifying the major functional social groups in the Study Area at the beginning of the study period, developing a profile of each group, and describing the major features of the relationships among the groups. The next step is to distribute the economic, demographic, housing, and local government effects of the project (see Chapters 4 through 7) among the Study Area groups.

Changes that occurred in the profile of each group and in the relationships among groups during the study period are then identified, and the role the project played in those changes is determined. Much of the information is based on interviews with key informants who represented the groups in the Study Area. Secondary data were also used to substantiate the information provided by the key informants and to further define the groups. Finally, a description of the conclusions outlined in this chapter was presented to residents of the Study Area to confirm the validity and completeness of the information.

8.2 Social Structure at the Beginning of the Study Period (1969)

8.2.1 Identification of Groups

Prior to the construction of Peach Bottom Units 2 and 3, the population of the Study Area fell into five broad social groups: the agricultural community in Peach Bottom Township, the business and professional proprietors, the traditional/old-time residents of Delta Borough, the suburbanites, and the construction workers. These groups were identified to help explain the often complex interactions that took place in the Study Area during the study period and to allow identification of changes in the social structure that were caused by the project.

A premise of this study is that relationships among groups in a community are structured, and that people in a community form functional groups that can be identified and described. The selection of social groups is based primarily on: (1) an examination of the historical development of the Study Area; and (2) interviews with key informants regarding the organization and structure of the Study Area

community. In 1969, the groups were identified as the important functioning social units of the Study Area.

Based on a review of the literature on community organization, social structure, and large-scale project effects, seven attributes were identified as essential to the analyses of project effects on the Study Area social system. These attributes are:

1. Size of group;
2. Livelihood of group members;
3. Demographic characteristics;
4. Geographic characteristics;
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).

The profile of each group takes into account these attributes and focuses on the most distinct characteristics of group membership. Some diversity within each group is indicated, as well as a description of the modal characteristics of each group. Inter- and intra-group changes over the study period are highlighted and those characteristics which remained relatively stable are described.¹

8.2.2 Group Profiles

The Agricultural Community

The members of the agricultural community were residents of Peach Bottom Township, a rural area with a strong and viable agricultural base. At the beginning of the study period, there were approximately 100 operating farms scattered throughout the township, averaging 145 acres per farm. Approximately 20 percent of the people in the township's labor force were either farmers or farm managers. Farming constituted by far the largest employment sector in the Study Area, which gave it substantial importance as an economic force. The farmers, as a group, were a large employer, especially of seasonal workers, and approximately 14 percent of the township's workers were seasonal farm laborers or foremen. The agricultural community (that is, the farm owners and their families), by virtue of its economic

¹The descriptions of the groups were determined from interviews with key informants and are a synthesis of the findings. Individual references are therefore not provided.

predominance and distinctive way of life, was recognized by area residents as a clearly defined socioeconomic group.

The principal agricultural activities of the agricultural community were truck gardening, fruit growing, and, most importantly, dairying. Unlike many agricultural regions in the U.S. where family-owned farms have been sold for rural, residential, and industrial development or for large corporate farming enterprises, the economic and social strength of the family farming unit in Peach Bottom Township prevented such occurrences. Because of the long-term economic stability of the agricultural sector in Peach Bottom Township, there had been minimal dislocation of farmers. Since farms had been retained in family ownership, handed down from father to son, a network of economic and social interaction among the agricultural population had developed, and ownership of the land and farming as a way of life had acquired symbolic value to many in the agricultural community. The farms were generally productive and prosperous. Farm income was sometimes supplemented by the participation of a family member in wage and salary employment, especially during the off-season.

The size of the agricultural group was estimated to be about 450 persons. There was a concentration of older people in the agricultural group, typical of rural areas where the elderly have put down roots and are an integral part of family life, and a relatively low percentage of the group in the ages between 20 and 50, reflecting the limited capacity of most of the small farms in the area to support more than one primary family. Most members of the farming community were white and Protestant, either Presbyterian or Methodist.

An outstanding characteristic of the agricultural community was the high value it placed on the preservation of its rural lifestyle and the economic viability of the agricultural sector. Members of this group generally supported economic growth in the Study Area, partly because much of the area's previous experience with industrial and commercial developments had been with agricultural services (such as feed mills, canning and dairy processing establishments, and agricultural equipment dealers) and partly because economic growth was seen to benefit the local area with which the agricultural community had long and deep social ties.

Environmental-quality concerns were also prevalent among the farming families in the township. Concerns over aesthetics, for example, manifested themselves in the opposition of some farmers to the routing of electrical transmission lines, associated with the earlier installation of Unit 1, across their fields. The potential threats to the township's rural environment and lifestyle as well as to the agricultural economy were carefully monitored by the farmers. Generally, although the agricultural community disapproved of rapid residential growth in the township as a culture-threatening process, recreational land use and the development of vacation homes, located on nonproductive land, were viewed by the agricultural community as compatible with the rural nature of the Study Area and were considered a means to strengthen the township's tax base. Therefore, the agricultural community was especially sensitive to changes in the natural environment that would pose a threat to the recreational use of the area, especially the Conowingo Pond section of the Susquehanna River.

The agricultural group was also sensitive to changes that would affect the area's social structure and traditional rural values. For example, the attachment to traditional values—active church participation, community altruism, family orientation, and regional identification—was expressed in the efforts to bring about local control of education. The importance placed on traditional values, however, did not preclude the use of modern agricultural information and technology.

The long-term economic viability of the agricultural sector in the Study Area resulted in a strong community with shared social values: in addition to the long-term family tenure, with its resulting historical family ties, the shared political values and religious beliefs and geographically insular social interactions all helped farmers and their families define themselves as a distinct social group within the Study Area. However, recent in-migrant farming families who also held traditional values and stressed agricultural efficiency were both supported and accepted. For example, a number of farmers who were interviewed expressed positive opinions about Amish farmers from Lancaster County who had bought two farms in Peach Bottom Township.

The group's cohesiveness was characterized by the nature of intragroup economic, social, and political interactions as well as by the strength of its group identification. Within the agricultural group, there was a high level of informal

communication over economic matters and exchange of goods, equipment, and agricultural products. Nevertheless, both purchases of agricultural materials and exports of products by the agricultural community took place at commercial centers outside of the Study Area.

Interviews with key informants indicated that a well-defined pattern of economic interactions within the group could not be established; there was a high level of individual variability, and most observable economic links were with centers outside the Study Area.

In Peach Bottom Township, the elected supervisors consistently were representatives of the agricultural community, with long family traditions in the area. Although periodic township meetings were held, there was little community-wide involvement. Overall there seemed to be no apparent need for long-term policy development: among members of the farming community, it was felt that preservation of farming as a way of life and the rural quality of the environment were pervasive community values; however, as long as urban residential encroachment was minimal, no strategy for dealing with growth was warranted.

The nature of farming as an occupation and the distances between individual farm residences limited participation and therefore active social interaction between members of the agricultural community in formal social institutions or organizations, the principal exception being the church, in which the agricultural community was very active. Key informants indicated that there were few kin ties within the agricultural group. Of special importance was the high level of interaction between school-aged members of the agricultural group.

The Business Community

The business community in the Study Area included those families that owned retail, wholesale, or manufacturing establishments; those who influenced or directed economic policy through key financial or managerial positions; or those who represented or managed absentee-owned commercial establishments. Also included in this group were families of the independent professionals who worked in the Study Area.

In Peach Bottom Township, commercial activities represented only a small portion of the economy; consequently those involved in these activities were a relatively small portion of the population. In 1969, Peach Bottom Township had seventeen commercial establishments, and Delta Borough had approximately thirty. Most of these were owner-operated with few employees, yet the larger establishments were usually absentee-owned. Given the poor economic conditions in the Study Area prior to the project, those involved with commercial or professional activities had not prospered, and the size of the group had declined.

Prior to the Peach Bottom project, the business community was quite small, about 165 persons or approximately 7 percent of the Study Area population. The members of the business community were exclusively white; in this as in other demographic characteristics, the group approximated the general profile of area residents, with no conspicuous concentration of age or sex. A substantial portion of the business community lived in Delta Borough; the others were widely scattered throughout the township, living near their business establishments. Most members of this group owned their own homes and their own businesses or offices.

The economic cycles of decline and stability experienced in Delta Borough during the last forty years resulted in a substantial movement of businessmen into and out of the town. Consequently, the group was not as cohesive as it might have been: it included merchants who were both long-term traditional residents of the community and those who were more recent arrivals. Some differences were apparent between members of this group in their outlook and approach to commerce and in the desired direction of community growth. Yet a collective desire for growth emerged from their realization of their precarious position as merchants catering to a small town that was economically troubled, by-passed by the major transportation routes, and competing with growing shopping centers nearby. Particularly important was the overwhelming support given by the area's merchants to the proposed Peach Bottom Unit 1. The merchants who were residing in the community at the time of Unit 1's inception believed that the nuclear plant would be the most important positive economic event in Delta Borough's history. Unlike other major commercial activities in the community, the plant was perceived as a permanent fixture in the landscape, not vulnerable to the vicissitudes of market demand.

The principal motivation of the business community was to promote economic stability. Consequently, the businessmen involved in retail trade were traditionally active politically, and the connections between this group and the local government were strong. The local barber, for example, served as mayor of Delta Borough for over thirty years, and 5 out of the 7 council members were members of the business community. The more recent newcomers generally followed this same, well-established pattern.

Although an appreciation for open space, natural recreation areas, and rural qualities was prevalent among members of the business community, environmental quality was not an important concern for this group. Their minimal effort to improve environmental quality was partly a reflection of the growth ethos pervasive in the community and partly a function of the general political conservatism of the business-political leaders. Because Delta Borough's economy was declining and because the need for a stable economic base was the prime motivation of the commercial community, concern for environmental quality was superseded by economic and fiscal considerations.

As a group, the commercial community was distinct only because of its functional role in the economy of the Study Area and because of its influence and participation in the political decision-making process. The business group as a whole was conspicuous by its very high participation in civic organizations, political and social leadership roles, and community involvement.

Traditional/Old-Time Residents

Throughout its history, Delta Borough was an affluent community, and its residents were primarily hard-working miners and merchants. The group that dominated the social environment in the borough was the "old-timers," those individuals and families who had developed long-standing ties to each other and to the town by virtue of their length of residence and shared community experience. Approximately 50 percent of Delta Borough's population belonged to this social group. An important portion of this group was the elderly residents (60 years of age and over), who made up about 25 percent of Delta Borough's population. A small percentage of the labor force within this group (excluding the elderly) were employed in Delta Borough, but most of this group's employment was outside the Study Area in nearby urban centers. There were professionals in this group who were earning high

incomes. The common occupations were those with moderate pay scales—crafts, public administration, management, and common labor. Most of the elderly in Delta Borough were long-standing members of the community and belonged to this group. A few were still active in business and politics and were an important social force in the community. A significant number of the elderly were widows, and a sizeable number of the elderly were supported solely by social security.

The rate of home ownership in Delta Borough was high, and the elderly were included as homeowners. However, Delta Borough was never an affluent community, and a number of this group were unable to maintain their homes to the standards they preferred.

The rural "small town" quality of their community was especially valued by this group. One important attribute of the small-town environment was the high level of social interaction between members of this group. The old-time residents were active in such groups as the local veterans club, the Lions club, and church groups. Moreover, their level of participation in the decision-making process, both in active leadership and in public involvement, was consistently high. The informal dimension of the social interaction of this group was characterized by its friendship patterns: of those individuals within this group that were interviewed, all identified their closest friends and family members as being "old-timers." This is not to say that friendships did not develop with newer residents, but that ties were much closer within the group than they were outside it. Moreover, interviews with "old-timer" families suggested that their geographical orientation was more restricted than that of recent immigrants; they were more community-oriented than regionally-focused. The small-town character of Delta Borough, its dominant working-class social structure, and their shared experiences over time reinforced group solidarity and identity. For this group, civic involvement and pride in the history of their town were important.

The "old-timers" viewed themselves as a separate group based on their long-term association with each other and with the town. This manifested itself in the importance given to historical celebrations, civic involvement, and the preservation of the history of the community. In general, the old-timers held traditional, conservative attitudes, participated actively in church-related functions, held a strong attachment to the community, and did not initiate political actions that were potentially confrontational: they held "traditional" values as important.

In Delta Borough, political leadership and participation were strongly associated with the traditional residents of the community. The communication system in public decision-making tended to be informal, and public feedback to decision-makers was broad-based and effective. There was a high level of active participation by the long-time residents of Delta Borough, as well as by the general public; decision-making was by consensus, and the public meeting served as an efficient forum for the articulation of community concerns.

All in all, based on the levels of social and political intragroup interactions, group cohesiveness was very high. Although bonds among members of the traditional residents were strong, however, this did not pre-empt the acceptance of newcomers into community life. The Study Area received a substantial influx of people from the Baltimore metropolitan area during the 1960s. As a distinct social group, they differed from the traditional residents of the area, but the distinction was often blurred. Since the 1940s, for example, Delta Borough had residents who lived in the borough and commuted to work in Harford County, Maryland. Gradually, these earlier commuters became integrated with the traditional long-time residents. The recent newcomers, on the other hand, usually composed of young families and those who were employed in the professions, were only in the earliest stage of this integration process at the time of the study.

The Suburbanites

The socioeconomic structure of the local area prior to construction was characteristic of a rural farming area with a small town based on agricultural and retail services. During the pre-construction period, however, rural suburbanization was accelerating. In the late 1960s, the suburban group was already dispersed throughout Peach Bottom Township and Delta Borough. This group's employment and social interests were predominantly outside the area, and as a result, the suburbanites, as a group, were not well-organized, nor were its members much involved in the social and political affairs of the Study Area. A few suburbanites bought land and attempted farming on a small and part-time scale; others converted their previously owned vacation homes to year-round residences; and still others built or bought new homes. At the time construction on the nuclear plant began, portions of a number of farms that were recently purchased in the northwestern area of the township were subdivided for residential development; known as the Susquehanna Trails, this development became a densely populated residential area.

Although many of the suburbanites were young families, a sizeable proportion of the suburbanites who located to Peach Bottom Township were elderly. This was partly a reflection of the degree to which individuals utilized what were once their seasonal vacation homes in the township as their permanent residences for retirement. Many of the individuals who converted their seasonal homes in the Susquehanna Trails area to year-round housing units were people who were about to retire or had retired. This tendency is not uncommon in rural-recreational areas that are naturally suited as retirement places.

The level of group cohesiveness was relatively low for the suburban group. As the in-migrants became more settled in the Study Area, they participated more in community affairs, particularly in civic and social organizations and church-related activities. But, for the most part, they did not behave as a group: many had individual interests outside the Study Area; there was little economic interaction between group members; and there was generally no political expression or leadership by members of this group within the Study Area.

8.2.3 Interrelationships among the Groups

Economic

As stated previously, just prior to the construction of Peach Bottom Units 2 and 3, the commercial sector of Delta Borough was declining. Small retail establishments with traditional ties to the local area were closing or relocating, the population was declining, and competition from shopping centers built nearby was increasing. A few of the firms catering to the agricultural community, a dairy processing company, and an agricultural equipment dealer had already relocated. The commercial sector was in the process of both decline and change in ownership patterns. In the late 1960s, the business sector was divided between members of families whose businesses had withstood the vicissitudes of market demands for twenty to thirty years and by recent entrepreneurs who had operated in the area for under five years. Moreover, because Delta Borough served as the service center for Peach Bottom Township, close ties were nurtured between the business community of Delta Borough and the farming community of the township. Nevertheless, these ties were not as prevalent nor as strong as they had previously been. The decline of Delta Borough's position as an agricultural center meant that members of the agricultural community went elsewhere for equipment and service, causing a diffusion of economic orientation and interaction throughout the larger region and a movement away from the focus of economic activity within the Study Area.

The largest employers in the Study Area were the Delta Sewing Company and Philadelphia Electric Company's Unit 1 nuclear plant, which, together with the agricultural community and other elements of the business community, provided most of the employment opportunities in the Study Area. Prior to the construction of Peach Bottom Units 2 and 3, most of the wage and salary workers in the Study Area were members of the old-timer and agricultural communities.

The suburbanites and most of the old-timers in the labor force were commuters to jobs outside the Study Area. Agricultural laborers were from the agricultural community or from the old-timer group, especially younger members, but seasonal workers often came from outside the Study Area to work temporarily in the township.

The growth of neighboring commercial centers in the late 1960s resulted in fewer contacts between the business community and the other residents of the Study Area. These commercial shopping centers became popular; most purchases, were made there. Consequently, the level of economic interrelationships and interdependence among groups in the Study Area was low.

The larger employers in the Study Area--the mining industry, a sewing manufacturer, and an agricultural equipment company--were absentee-owned. On the one hand, this absentee ownership resulted in a lack of participation in Delta Borough's economic welfare by those who had the financial capability to stabilize the community's economy; on the other hand, it inhibited the emergence of an elite group based on commerce. As a consequence, the group of merchants who served the retail and wholesale needs of the local area surfaced as the dominant economic and political force in the community.

Political

Although Delta Borough and Peach Bottom Township were strongly linked economically and socially, they were distinct political entities, and the political relationships between and within their constituent groups differed. In Peach Bottom Township, the elected supervisors were consistently representatives of the agricultural community, with long family ties to the area. Prior to the building of the nuclear station, the scope of the supervisor's activities was limited to organizational matters related to the township budget and to ad hoc responses to specific problem areas, usually related to agriculture. Overall, there seemed to be no apparent need

for long-term policy development since there was little conflict between groups in the Study Area at that time.

In Delta Borough, on the other hand, political leadership and participation were strongly associated with the old-timers and the merchants. Although the political process was an open one with regular public meetings, involvement by the more recent suburbanites was limited, due to their social and employment ties outside of the Study Area. The city council was composed of local merchants and professionals with conservative political leanings. Because no elite social or economic interest was represented in the town, the communication system tended to be informal, and public feedback to decision-makers was broad-based and effective. Decision-making was by consensus, and the public meeting served as an efficient forum for articulating community concerns. Unlike Peach Bottom Township, where decision-making was left to the elected supervisors, high levels of active participation by the public, particularly by the old-timers, were characteristic of Delta Borough.

Prior to the construction of the nuclear facility, no visible public interest groups surfaced in the Study Area; even with the influx of new residents, generally younger and employed as white-collar professionals or as skilled craftsmen, no increase in political activism ensued. Delta Borough, for example, was characterized by a small relatively homogeneous population with active civic-oriented political participation dominated by the merchant/worker social class; political concerns were focused on the problems of upgrading the community economically, and few public issues surfaced.

Social

The old-timers and members of the business community had strong social bonds, manifested in group participation in formal community institutions such as the church and local civic affairs. Moreover, informal contacts, such as visitations between members of the two groups, were also frequent.

The out-migration of long-time residents was perceived by many in the community, especially businessmen, as a disruption and a cause of permanent change to the community's social structure. To others, however, this change was not so disturbing. Key informants suggested that, in the late 1960s, a trend toward the return of retired people and younger professionals to their familial base partly

counteracted the disruption in community social life. Strong bonds between the different generations of long-time residents enhanced the sense of community integration in the area. Among these individuals, participation in community public and social life was prevalent.

The agricultural community had weak ties to both the business community and old-timers as a result of four factors: the scattered spatial pattern of farm residences; the nature of the demanding work schedule for farm families, which precluded a high level of social interaction; the great extent to which social functions were performed within the group rather than outside of the group; and the diminished economic ties with Delta Borough. Nevertheless, informal visitation did take place between some individuals in the two areas: farming families participated in community fund drives and celebrations and belonged to the same churches. Although the agricultural community of Peach Bottom Township participated less as a group in community social affairs than did residents of Delta Borough, there was moderate interaction between the two municipalities with respect to social relationships and membership in social organizations, especially churches.

The most discernible change in social structure, at the time of the study, was the inclusion of recent suburbanites as a group within the social structure of the Study Area. However, the effect of the suburbanites on the social structure was diminished by their economic and social interest outside the Study Area. The integration of these recent in-migrants with the traditional social groups had not developed to any appreciable degree, nor had the existing social organizations been strengthened by their participation.

8.3 Distribution of Project Effects to Groups

8.3.1 New Groups: The Construction Workers

The economic, demographic, housing, and facilities/services effects attributable to the construction and operation of the plant have been identified and described in previous chapters. The purpose of this section is to distribute these effects to the groups in the Study Area. Of particular importance in understanding the magnitude and duration of these effects is the role and nature of the construction work force and their families who relocated into the Study Area. The characteristics of this group have been assessed in order to derive the socioeconomic effects, but as a social group two factors require explication: first, the impact of the movers and their

families on the existing social structure and social process of the Study Area; and, second, the plant-related effects on the movers as a group.

The construction workers employed on the Peach Bottom project have been treated up to this point as either effects of the project or as the means by which effects have been transmitted to the Study Area. This is a useful and accurate perspective, as far as it goes. From another point of view, however, the construction workers and their households can be seen as a group in the Study Area that experienced the project effects in a way that is, if not the same as the experience of the other groups, analogous to it. Therefore, the construction workers are briefly described and added as a temporary group in the Study Area.

The occupations of construction work force personnel were considerably more diverse than the name implies. In addition to the craft workers and unskilled and semiskilled workers, there were engineering, administrative, clerical, and security personnel. In Chapter 4 (Table 4-2), it was estimated that 415 construction workers lived in the county, 246 nonmovers and 169 movers. The nonmovers were already members of the Study Area groups. The movers and their families comprised a new group, movers who were present temporarily in the Study Area during the construction period. Altogether, these workers and their household members were estimated to number 246 persons. About two-thirds of this population located in Delta Borough, and the rest located in Peach Bottom Township. Most of the movers rented rooms in homes in Delta Borough; none bought homes in the Study Area. Most of these movers were white single men or men unaccompanied by families.

The members of the construction worker group tended to value growth and to equate new construction with progress. On the whole, they were highly mobile and had a very limited attachment to the Study Area. They appeared to place little emphasis or value on participation in civic or community affairs. The volunteer fire department enrolled several construction workers, but that seemed to have been the exception among civic groups. The construction workers tended to rely on members of their own group for much of their social interaction. The temporary nature of their residence in the Study Area was a major point distinguishing them from other newcomers. Overall, the construction workers were a visible, relatively unintegrated addition to the area's social structure.

8.3.2 Distribution of Economic, Demographic, Housing and Settlement Patterns, and Public Service Effects to Groups

The effects on the economy, demography, housing and settlement patterns, and government and public services were identified and described in chapters 4 through 7. They are summarized in the appropriate sections below and are distributed among the groups described earlier in this chapter.

Economic Effects

The economic impacts of the Peach Bottom nuclear station on the Study Area were assessed for the 1973 construction year and for the 1978 year of plant operations. Basic and nonbasic employment and income effects were generated in the Study Area; wage and tax-induced effects did not result in measurable changes in income or employment effects to the local economy. Table 8-1 recapitulates the employment and income effects.

Based on interviews with key informants and the economic analysis that was carried out in Chapter 4, the employment and income distributed to the five groups in the Study Area can be approximated as Table 8-2 shows.

The employment and income effects generated directly by plant construction and operation, as shown in Table 8-2, accrued primarily to the old-timers, the agricultural community, and the movers. In addition, there were economic effects due to purchases of plant construction materials and increased incomes to residents due to rent. In 1973, the total expenditures made for rental housing were estimated at about \$160 thousand. Since sixty-six percent of the movers located in Delta Borough and the remainder in Peach Bottom Township, \$105 thousand in rentals accrued primarily to the old-timers in the Study Area, and \$55 thousand went to the agricultural community and the suburbanites in the township. Indirect basic income from purchases of construction material was estimated to have had a minimal income effect; approximately \$13.5 thousand was estimated to have accrued as basic income to the local businesses.

In Chapter 4, the estimated total spendable income generated by plant construction in 1973 and accrued by Study Area residents was \$7.2 million, which included income from basic, nonbasic, and commuter-related expenditures. However, not all of this income was spent within the Study Area. The amount of income retained within an area is based on the capability of the area's economy to provide

TABLE 8-1

EMPLOYMENT AND INCOME EFFECTS
 DELTA BOROUGH AND PEACH BOTTOM TOWNSHIP
 1972 and 1978

	1972		1978	
	Employment	Income (\$000)	Employment	Income (\$000)
Basic Employment				
Nonmovers	246	4,106	26	343
Movers	169	2,820	22	290
Nonbasic Employment				
Nonmovers	20	106	3	39

Source: Mountain West Research, Inc., 1980.

TABLE 8-2

EMPLOYMENT AND INCOME EFFECTS DISTRIBUTED TO FIVE SOCIAL GROUPS
 PEACH BOTTOM TOWNSHIP AND DELTA BOROUGH
 1973 and 1978

Groups	1973		1978	
	Basic and Nonbasic Employment	Income (\$000)	Basic and Nonbasic Employment	Income (\$000)
Old-Timers	141	2,237	29	379
Business and Professional	15	236	—	—
Movers (Construction Workers)	169	2,820	22	290
Suburbanites	45	712	—	—
Agricultural	65	1,027	—	—
	<u>435</u>	<u>7,032</u>	<u>51</u>	<u>669</u>

Source: Mountain West Research, Inc., 1980.

needed goods and services; that is, the position of the Study Area in the regional trading hierarchy. The Study Area had a very limited economic base, possibly less than a first-order place with much of the income leaking out of the area. In a small, rural area, such as Delta Borough and Peach Bottom Township, it is not unreasonable to expect that only about twenty percent of the income would remain in the Study Area. Moreover, the level of personal consumption expenditures can be calculated directly from the basic income estimates derived for the construction period. Nationally, personal consumption expenditures average about 0.79 of personal income (Economic Report of the President, 1979). Assuming this relationship holds, expenditures due to direct income can be derived by taking 0.79 of direct income that remains in the Study Area. The gross income that would accrue to the business community in the Study Area was then estimated to be \$1.1 million for 1973. For the operations period, total basic and nonbasic income was estimated to be \$0.67 million. Using this procedure, approximately \$110 thousand of this would remain in the study area.

For the agricultural group, some economic benefits were realized from the employment of young farm people, some farmers, and women. However, employment opportunities at the plant drew agricultural laborers to the construction site, which resulted in temporary labor shortages in the agricultural sector. No long-term impact resulted from these wage-induced effects on the agricultural sector. On the whole, the agricultural sector did not benefit from increased local spending.

The business community emerged as the leading recipient of the economic gains of constructing and operating the Peach Bottom plant. Some of the firms in the area were able to expand, but the economic effects varied depending upon the type of establishment. As noted in Chapter 4, the construction period was marked by both the acceleration of the demise of a few general stores and the concomitant growth of other stores, in particular the modern supermarket outside of Delta Borough. Overall, however, the economic effects were short-lived and mostly dissipated with the end of construction activity.

Demographic Effects

The demographic effects for the Study Area were estimated in Chapter 5 and summarized in Table 5-7 for the 1967 to 1969 period. The two major components of population changes were those due to increased in-migration and those due to

diminished out-migration. The driving variables were basic and nonbasic employment, the associated household sizes, and the residential status of the work force. In 1973, population in-migration was estimated to be 246 persons, and diminished out-migration, 83 persons, for a total population effect of 329 persons due to the construction of the project (Table 5-5). The distribution of the population increase by group followed the analysis concerning the work force, migration patterns, and household size made in Chapter 5. The distribution of population effects by group in 1973, shown in Table 8-3, was based on the employment patterns for the five groups described above. In general, the nonbasic employment demands induced by construction activity and associated income expenditures were met by residents from the Study Area and not by in-migrants. In 1973, both the old-timer and the agricultural groups experienced reduced out-migration, and consequently additional numbers due to the plant, although these effects were not large. This was thought to have resulted from the project-related employment of younger members of the groups who therefore delayed their out-migration.

For the operations year, 1978, the population increase was estimated at 78 persons due to in-migration of operations workers and their families. The nonbasic employment in the study area attributable to plant operation was filled by residents of the Study Area. The evidence suggests that neither the nonmovers who were employed at the plant (26 workers) nor those in nonbasic jobs would have out-migrated from the Study Area without this employment; consequently, the project did not result in any reduced out-migration in 1978.

In chapters 4 and 5, the demographic effects estimated for the study period had the largest population increases occurring during the peak construction years and a dramatic decline in project-related population increase as construction was completed and operations began. Overall, the resident population was not affected to any significant degree except that a few residents did not leave the area because of construction work. But, when construction work ended, there was a noticeable out-migration of both movers and residents, indicating that out-migration had merely been somewhat delayed for the interval during the construction period.

Distribution of Settlement Pattern and Housing Effects

The overall effect of the nuclear station on the housing market was minimal, reflecting both the nature of the existing housing market prior to construction and

TABLE 8-3

APPROXIMATE DISTRIBUTION OF POPULATION EFFECTS, BY GROUP
 PEACH BOTTOM TOWNSHIP AND DELTA BOROUGH
 1973

	In-Migrants	Reduced Out-Migration
Old-Timers	—	45
Agricultural	—	30
Business and Professional	—	—
Movers	246	—
Suburbanites	—	<u>8</u>
TOTAL	246	83

the size of the in-migrant work force. Because of the low vacancy rate, the relatively small size of the housing stock, and the plant's proximity to more urban centers with larger rental capacity, the Study Area did not accommodate more than a small percentage of those who moved to the region for work on the project. The in-migrating work force numbered 169 workers, which represented 23.4 percent of total movers and 7.6 percent of the total construction work force. Since the movers into the Study Area were primarily single men—not more than 34 were accompanied by their families—their demands were principally for rental units. Because no immigration occurred as a response to nonbasic employment increases, the critical driving variable for impact on the Study Area's housing market during the construction period was the movers.

The movers were primarily renters, and therefore few demands were made for either purchases or construction of homes. The demand for rentals, however, affected some groups in the Study Area. A number of the old-timers, particularly widows residing in Delta Borough, converted rooms in their homes into rental units and obtained considerable supplemental income from renting these rooms to movers during the construction period. The construction of the plant, according to key informants, temporarily inflated the value of real estate, and as a result, a few old-time residents sold their residential properties to investment developers, who in turn converted these properties into multi-unit rental properties for the use of construction workers. Chapter 5 describes the deterioration of the quality of these structures and the utilization of these units by suburban renters of lower economic status than that of most Delta residents. This change was an encroachment upon the established housing type and social patterns of the traditional residents of the Study Area. For the old-timer group, income from rentals was a definite positive effect, especially for the widows in the community. However, the demands for rental units and the conversion of single-family structures ultimately resulted in the intrusion of a small but highly visible group of people who were not considered compatible with the old-timers. Thus, the impact of the plant resulted in both positive and negative effects.

Construction activity and the escalation of real estate values did not prevent the growth of residential development in the township. There is no evidence that the construction of the plant was a catalyst for this growth, although, from the perspective of some members of the agricultural community, the distinction between

suburbanization (which accelerated at the same time that construction commenced) and plant construction was not made. There was some evidence, however, that a number of second homes, previously used as vacation homes, were upgraded or converted to year-round structures with income obtained from their rental to project-related workers. The degree to which such innovation was a factor influencing suburban retirement to the area could not be ascertained. What can be concluded is that construction of the plant may have accelerated the suburbanization process to a limited degree by conversions and upgrading of vacation homes and by stimulating interest among land developers in the area's potential for residential and subdivision development.

The operations work force did not affect the housing market to any appreciable degree. Their houses were scattered throughout the township, integrated with those of the suburbanites. These homes were usually newly built; so they added to the residential growth occurring in the Study Area, but the numbers were so small that they were not a visible component of the suburban growth.

Distribution of Governmental Effects

Chapter 7 provided an overview of the effects of the Peach Bottom project on the Study Area government and the level of public services. The assessment showed that Delta Borough was not the recipient of additional revenues from the plant nor were increased demands placed on the provision of public services. Revenue and expenditure effects related to the Peach Bottom nuclear station were limited to the township by virtue of the plant's location in the township, and therefore only the agricultural and suburban groups were affected. During the period between 1972 and 1974, there was a substantial increase in revenues in the township from the earned-income taxes paid by the direct basic workers at the project. During the operations period, however, these revenues were significantly lower and generally inconsequential.

Except for improvements and the increased maintenance of roads and highways, the Peach Bottom plant had only a small effect on the township's budget (and thus the level of public services and employment). The township's decision (by the agricultural group) to invest much of the earned-income tax and to reduce the millage rate on taxable property resulted in little change in the level of expenditures for public services in the township in spite of increased revenues during the construction period.

Improvements in the road system benefited all groups in the Study Area. The lowered tax rate particularly benefited the agricultural families and suburbanites who were landowners in the township. Between 1970 and 1978, \$219,437 in tax revenues was not paid because of the reduced tax rates. The reduction in tax rates counterbalanced the revenues from the nuclear plant, minimizing the change in available governmental funds; consequently, no major upgrading of public services resulted from the project. The agricultural community favored and promoted this strategy, but the suburbanites generally desired upgraded public services and did not recognize the reduced tax rate as a particular advantage.

8.4 Summary of the Effects of the Project on Groups

This section summarizes the effects of the construction and operation of the nuclear station on each group and the major changes they have produced in the groups during the study period. Overall, the effects of the project on the groups in the Study Area were temporary and relatively slight.

The Agricultural Community

The agricultural community increased its political position as a result of the plant because of its involvement in the litigation/licensing hearings and because of its political action to restrict urban growth in the township, the implementation of which was partly influenced by the construction of the plant. The construction of the plant and associated population in-migration took place at the same time as non-plant-related suburbanization was occurring. The construction of the plant was viewed by farmers as a catalyst for far-reaching changes in the area. Political actions in the form of zoning ordinances to restrict residential development on productive farmland resulted.

The economic situation of the farmers continued to be as viable as it would have been without the building of a plant nearby. However, during the construction period, many farm laborers left their place of employment to work on Peach Bottom, which resulted in manpower shortages for some of the farmers in the local area. These labor shortages were of a temporary nature and had no long-lasting effect on the agricultural economy. There was some change in the position regarding ownership of land as some farm families sold sections of their land to developers for a residential subdivision.

Overall, little structural change occurred in the agricultural group over the thirteen-year study period. The social networks within the group existing prior to the construction of the plant were not altered.

The Business Community

Historically, Delta Borough was geographically isolated and by-passed by the major regional transportation routes; it suffered declining population and diminution of the commercial sector. The businessmen in Delta Borough provided enthusiastic support for the siting and expansion of the Peach Bottom nuclear facility near the town. Although some in the business community were affected positively by the economic and demographic effects of the project, some were not affected, and a few store owners were adversely affected. During the study period, six retail stores ceased operation, and the owners and their families out-migrated.

It is clear that local income increased during the construction period and that basic and nonbasic employment for local residents increased as well. Those businesses that were able to supply construction materials expanded; however, the predominantly single work force with families and residential ties outside of the area coupled with the proximity of a large retail center outside the area resulted in smaller expenditures on local goods and services than were anticipated. Furthermore, the growth of a commercial center within the local area but outside of Delta Borough may have accelerated the demise of a number of traditional but marginal retail stores in Delta Borough. The large supermarket was owned partly by a local resident and partly by absentee businessmen. It marked a change in traditional business practice in the Study Area as decisions were made by individuals outside the Study Area.

Overall, a few business places were modernized, but there was little permanent change in the size, livelihood, property ownership, or location of the business group. The distinction between the older and the more recent business community became sharper, but this was not influenced by the nuclear plant: there has historically been a high level of in- and out-migration of businessmen, and the more recent in-migrants were recognized for having brought with them new management skills and entrepreneurship not commonly found among the older business establishment.

There was no overall expansion of the commercial sector since the plant was completed and no major change in the structure of the business community that was solely and directly attributable to the plant. The growth of a large supermarket in the local area, although initially supported by the expenditures of construction workers, relied more on the suburban population for its continued viability. Delta Borough remained a rural service town, although it continued its trend toward becoming a "bedroom" community, with fewer economic activities.

Traditional/Old-Time Residents

For the long-time residents of the area, the construction period marked a reversal of the long historical trend of geographic isolation and a reduction in the level of out-migration of the population. As a group, they welcomed the changes they expected as a consequence of plant construction: increased prosperity, the retention of Delta Borough's youth, the in-migration of professional and skilled people with leadership qualities, a larger tax base, and population growth. The end result when construction was completed was that little had changed: the traditional, established residents remained the dominant social group in the local area. Had there been sufficient economic stimulus for residential growth, significant nonbasic employment, and in-migration of a sizeable operations work force as permanent residents, the traditional social group may have been greatly changed. However, the spatial constraints for development and urban growth precluded the location of a large in-migrant population in Delta Borough. The construction work force was predominantly unaccompanied by families; they were a transient population with different activity patterns than those of the established population. The result was that the old families were not greatly affected because social contact and integration between the plant's work force and the old-time residents of the local area were limited.

The elderly members of this group continued to be a large proportion of the group's population. Although this elderly group was large in size, it lost some of its political power to younger people. The loss of some general stores in town and expansion on the outskirts, a process that was accelerated to some extent by the plant's construction, did not greatly affect the traditional group, whose shopping patterns had been changing prior to the plant, and whose view of the new commercial development was progressive. In terms of social cohesion, the existence of the plant did not alter the social and economic patterns of the traditional families.

The Suburbanites

In the mid-1960s, the suburban group was small in size and was dispersed throughout Peach Bottom Township and Delta Borough, with interests predominantly outside the area. As a result, this group was not well-organized, and their involvement in social and political affairs was minimal. Since 1967, however, the growth in suburbanization has accelerated, and at the time of the study, these suburbanites constituted a substantial proportion of the population in the local area. Although many of these suburbanites were elderly, some retired and others soon to be retired, the majority were young families employed as professionals outside of the local area.

As the in-migrants became more settled in the local area, they became more involved in community affairs. Participation in civic and social organizations and church-related activities grew; moreover, they became more vocal politically, expressing concerns about the lack of urban services in their residential areas and demanding that township revenues be allocated for the expansion of water, roads, and electrical services. These demands were opposed by the agricultural community in Peach Bottom Township, which retained political leadership, and by virtue of its position, took steps to prevent the encroachment of commercial and residential development on farmland. In the late 1970s, however, a recent in-migrant was elected to Delta Borough's city council, a direct result of the increased size and political participation of the newcomers.

One aspect of this heightened political involvement was the increased demand for improved public facilities and environmental quality. Among the recent in-migrants were a number of concerned environmentalists who became very active in community affairs and effective in bringing about political action through the existing decision-making channels. Of particular concern to this subgroup was the Peach Bottom nuclear station; significant political activity by the Peach Bottom Alliance, an anti-nuclear interest group, focused on the facility. This group represented the first public interest organization with specific political aims in the Study Area and represented a change in community interest by some of the suburbanites. This was a definite result of the concern over nuclear technology subsequent to the TMI accident.

The Peach Bottom Alliance, a small group of active members, formed soon after the Three Mile Island accident. Although the number of active members was

few, the group received support from other organizations in the region: activities and participation in major events were coordinated at the regional level. Nevertheless, the group's interest was highly focused toward the Peach Bottom nuclear plant; the group was active in information-gathering and was responsible for initiating community interest in the shipment of wastes from the Peach Bottom plant and interest in the development of evacuation procedures for use in the event of an accident at the Peach Bottom site. Although active group membership consisted of relatively recent in-migrants, their interest in the area's welfare and concern about the environment grew quickly. The TMI accident was the catalyst for the formation of the group, and the feeling among group members at the time of the study was that TMI's status was still in an emergency state. The Peach Bottom Alliance had three principal aims: to disseminate information about nuclear power in general and the Peach Bottom plant specifically, to challenge the current procedure for waste transport, and, of utmost importance, to guide efforts toward the development of a comprehensive and workable evacuation plan.

While there was little active support for the group among traditional community residents, the group's participation in plant-related discussions at township meetings resulted in limited but growing acceptance of the organization as a legitimate part of the community.

8.5 Changes in the Interrelationships among the Groups

8.5.1 Introduction

The effects of the Peach Bottom project on the Study Area as a whole and on the internal organization of the groups resulted in some changes in group interrelationships. In some cases, the effects of the project were only part of larger trends that were already underway—changes that took place for a variety of reasons in addition to the project. The final result was the alteration of the socioeconomic structure of the Study Area. Since the links between groups were complex and since the time period covered by the study was over a decade, only the major links between groups are discussed. As in Section 8.2, the economic, political, and social interrelationships among groups are examined.

8.5.2 Economic

Because of the out-migration of some of the long-established businessmen during the last ten years, the business community lost its cohesiveness. This loss of

cohesiveness was furthered by the influx of new members who held different attitudes toward growth, development, and community involvement. Moreover, with the growth of a large suburbanite population and the concomitant growth of regional shopping in Belaire outside of the local area, the traditional close ties between the residents of the local area and the business community eroded, a change for which the plant was not responsible. The loss of small traditional general stores, replaced by a large supermarket (part of a regional chain) on the outskirts of Delta Borough, marked a change in the personal relationships between shop owner and consumer. This relationship became impersonal and more formal, and long-term credit based on informal agreements between the consumer and the individual merchant was gradually eliminated.

Although the business community benefited directly from the income generated by the project, this economic gain was only temporary, gradually ending as construction was completed. Overall, the economic structure, both in the aggregate and in specific sector levels, did not change because of the plant. For example, prior to plant construction, the retail sector was declining; the construction of the plant had the effect of sustaining and maintaining the sector for a few years. But once the plant was completed, this sector's economic decline resumed. Delta Borough began evolving into a "bedroom" community with more of the needs of the local population being met outside the local area. The construction and operation of the plant may have delayed these forces, but did not prevent their occurrence. Delta Borough's role as an agricultural service town continued at the level that had existed prior to the plant's construction, but there were signs of economic trouble in this sector as well.

The growth of a commercial center on the periphery of Delta Borough, with a large supermarket as the focus of activity, is indicative of the change toward centralization of commercial functions and the loss of local control (the supermarket was part of a regional chain store). Construction of the nuclear plant may have accelerated these ongoing processes.

The economic relationships among groups shifted in a slight way during the construction period. Agricultural workers left their place of work for employment at the plant. Nonbasic employment increases for the commercial sector of the Study Area were met by employment of a few members of the old-timers, mostly women who were hitherto unemployed. Once construction ended, the pattern of economic

interrelationships existing prior to the construction of the Peach Bottom plant was reinstated.

8.5.3 Political

There was little change in the administrative structure of the Study Area since construction began on the Peach Bottom plant. Political leadership in the Study Area was slightly altered as a response to the changing local environment—new constituencies, public interest groups, and complex problems that required new approaches for their solution. In Delta Borough, the established administration gave way to younger businessmen and professionals (who continued to have familial ties to the old-time social establishment) and to new in-migrants. In Peach Bottom, the more articulate, educated, and successful farmers controlled township politics.

The change in the population characteristics of the local area during the study period resulted in the establishment of a more pluralistic society with various interests and demands placed on the political system. The construction of the nuclear plant at a time when farm land was being sold for a residential subdivision, concomitant with increasing rural suburbanization, was perceived by the agricultural community as a threat to their lifestyle, and appropriate political responses were initiated. In 1971, a land-use plan was established for the local area, and in 1973 a zoning ordinance was passed to restrict residential development on productive land. In addition, the township supervisors accepted public positions and made decisions with respect to the nuclear plant. For example, a part-time Civil Defense expert was hired to develop a nuclear accident contingency plan for the local area, and a resolution was passed to control the transport of low-level radioactive wastes from the nuclear plant. In addition, during the past few years, environmental concerns emerged as political issues in the local area. The traditional political decision-making process was replaced by public interest group confrontations, major policy initiatives, and the increased formalization of politics; this change was partly a function of the change in population characteristics in the local area over the last ten years (namely, the growth in the number of suburban residents, of whom some were active environmentalists) and partly a reflection of the perceived effects of the nuclear plant. The recent emergence of environmental concerns as political issues in the Study Area is largely the result of concerns and political actions taken with respect to the Peach Bottom facility and the "trickling down" of these concerns into general environmental issues. Of particular significance is the involvement of the

Peach Bottom Alliance in township politics. At first this "suburban" group was viewed by the agricultural community with antagonism and seen as too oriented toward confrontation; but toward the end of the study period the group became more accepted by the township because of the agricultural community's concerns over the impacts of nuclear power plants, concerns that surfaced since the accident at Three Mile Island (see Chapter 9).

Two other major changes in the political structure of the local area are directly attributable to the Peach Bottom plant. These include the escalation of political tension between groups in the local area and the emergence of an informal regional political structure among some of the southeastern townships of York County. The political confrontation between groups was manifest in expressed differences over the allocation of tax revenues from the plant. Because of the earned-income tax imposed on both construction and operations workers at the nuclear facility, the property tax rate sharply declined during the early 1970s to become the lowest in York County. Although this may have benefited the suburbanites, especially the elderly, who retired to the area in large numbers, many felt the reduced tax base resulted in underinvestment in public facilities and services. The strategy of tax reduction, as opposed to expenditure increase, was established by the agricultural community and was attacked by some suburbanites. This resulted in social tension between members of these two groups.

The political response of the local area to the nuclear plant in Peach Bottom Township extended across its political borders, with decisions made at the regional level. The involvement of several neighboring townships in the development of a contingency plan in the case of an accident at the Peach Bottom facility is illustrative of the growth of political regionalism. An example of the emergence of cooperation between social groups of different areas experiencing similar effects is the support provided by the township's agricultural community to farmers in neighboring Fulton Township who were opposed to the proposed Fulton nuclear plant. If a regional political alliance develops, the Peach Bottom nuclear plant will have been an important catalyst for this growth.

The political structure and the process by which decisions were made in the local area underwent some change. This change had three dimensions. First, decision-making moved toward policy making and considered analysis. Second, the

decision-making process became "political": that is, political leaders had to respond to the growth of conflicting community interests, and they had to resolve emerging public issues. In so doing, the political leaders had to become representatives of particular public constituencies. Third, the leadership structure in Delta Borough evolved to include both younger members of the traditional families and new immigrants.

The problems and issues that surfaced in the local area by the end of the study period increased the necessity of gathering information and coordinating with county and state government agencies before decisions were made, a reflection of the nature of the issues, requiring technical and planning advice beyond the level of expertise available in the local area. This coordination contrasts with the relatively high level of autonomy in the decision-making process prior to the construction of the Peach Bottom nuclear station and is largely a reflection of concerns over the plant since Three Mile Island.

8.5.4 Social

Although the farming community of Peach Bottom Township participated less as a group in community social affairs than did residents of Delta Borough, there was substantial interaction between the two municipalities with respect to social relationships and membership in social organizations, especially churches.

The major change in social structure was the growth of suburbanization; aside from the impacts on the political decision-making process, however, the effect of the suburbanites on the social structure was minimal because of their residential location—somewhat isolated from other groups—and because their economic and social interests were focused outside of the local area. While the integration of immigrants with the traditional social groups developed slowly, some existing social organizations were strengthened by their participation. Furthermore, the development of a few new organizations by the recent immigrants grew in importance, and at the time of the study there were indications that this tendency will continue. An example of such an organization is the Peach Bottom Alliance.

Even though the operations staff at the station was not an identifiable social group and did not constitute a large portion of one group, the operations personnel of the Peach Bottom plant, especially the utility's employees at the information center,

played an integral role in the civic/social activities of the local area. The utility actively participated in the community's historical celebrations and became the de facto historical curator for the area. In addition, the community's leaders turned to the plant's managers to provide technical advice on problem areas that surfaced in the local area. In particular, one plant manager and his family who lived in the immediate vicinity of the plant became very influential in civic and social events in the area. This high level of community participation reinforced the local residents' perception of the utility as an integral part of the local area with concerns for the area's well-being.

The construction work force was different from the resident population of the local area. The difference between the two populations expressed itself in separate activity patterns and, for the most part, lack of social integration, yet there were no apparent social problems, tensions, or conflicts between the resident population and the construction work force. One unifying element, however, was the participation of the construction workers in the volunteer fire department, a public facility that connoted strong community values.

Overall, the influx of construction workers did not result in any adverse impact on the host communities. However, one school board administrator thought that there were some intergroup social problems:

This area has been a rural, cloistered community where everyone knew everyone. During the construction of Peach Bottom, this relationship broke down to some extent, and the parents of children who had long lived in the community felt that the new situation caused them to lose disciplinary control of their children. The wives of the Bechtel supervisory personnel who moved into the immediate vicinity were quite vocally critical of the school. They seemed to be quite unhappy with the community and the school and never really fitted in. (C. Reed, personal communication, January 1979.)

CHAPTER 9: PUBLIC RESPONSE TO THE PEACH BOTTOM ATOMIC POWER STATION

9.1 Introduction

The purpose of this chapter is to present the major issues and to identify and describe the public response that arose in connection with the project. The response to the Peach Bottom facility included political actors outside the Study Area, especially during the license hearings, as well as participants from the Study Area. The issues and actors will be identified, the institutions, constituencies, and political activities described, and the impact on the Study Area assessed. It is important to ascertain the degree to which residents of the Study Area participated as actors and the salience of issues provoked by the construction and operation of the nuclear plant to residents of the Study Area. This chapter provides a chronological summary of the major public response to the project, with particular attention to the response as a result of the Three Mile Island accident.

9.2 Response during the Pre-Construction Period

The pre-construction period began with the announcement of the Peach Bottom Atomic Generating Plant, Units 2 and 3, in August 1966 and continued until May 1968 when the first structural concrete was poured for Unit 3.

9.2.1 Announcement

The announcement of plans by the Philadelphia Electric Company to build two additional units at the Peach Bottom site in August 1966 did not provoke any major reaction by the utility or the federal and state regulatory agencies. There was strong public support for the building of two additional units, especially from the business community and the long-time residents of Delta Borough, who expected economic prosperity for the town and a reversal of the downward economic trend. The expansion of the Peach Bottom site was favored by York County as well. The agricultural community in Peach Bottom Township, however, expressed apprehension that the addition of two reactor units and their ancillary cooling structures would adversely effect recreational use of the area. (York Dispatch, 1967; Olson, 1974; Renova International, 1974; Alden, personal communication, 1980; Baldwin, J., personal communication, 1980; Delzingaro, personal communication, 1980; McHugh, personal communication, 1980; Sommer, personal communication, 1980.)

9.2.2 Siting

The public response to the announcement of the Philadelphia Electric Company's plan to construct two generating units at the Peach Bottom site in 1966 was tempered by the presence of Peach Bottom Unit 1, an already-established nuclear plant. When Units 2 and 3 were announced, Unit 1 was already completed. The construction of two additional units at the Peach Bottom site was viewed as an extension of an already-established plant, so issues of land purchase or zoning did not arise.

The Philadelphia Electric Company had purchased the site in the 1920s. The site was highly valued by local residents for its landscape and became a well-used recreational area. Loss of the area was painful but stoically accepted by Study Area residents, in part because the construction of Unit 1 was viewed as the participation in a critical national effort to develop the peaceful uses of the atom. Additionally, the construction of Unit 1 was viewed as an important investment that would add to the economic growth of the local area, and alternative recreational land was substituted for that loss to the project. Peach Bottom Unit 1 had proceeded without local intervention. Although the state expressed concern over the lack of information with regard to radioactive discharge, and some residents of Peach Bottom Township opposed the routing of transmission lines in the township, no major issues emerged.¹ The total economic impact experienced in the local area was small, yet Unit 1 was perceived locally as an important regional project, a stabilizing force in an economy that was experiencing difficulties. (York Dispatch, 1967.)

9.2.3 Hearings

Prior to the construction permit hearings, the Peach Bottom Township Planning and Zoning Commission requested that the U.S. Army Corps of Engineers reject the application by the Philadelphia Electric Company for construction of a series of canals and ponds to reduce the level of thermal emissions into Conowingo Pond. The township's position was that such construction would adversely affect the recreational use of the area and would not sufficiently reduce thermal discharges into Conowingo

¹ Four farmers from the local area protested the routing of the transmission lines across their properties, but the Public Utilities Commission authorized the Philadelphia Electric Company to exercise the right of eminent domain.

Pond. The permit was issued, and although the township's concern was not a contention at the construction permit hearings, the issue over thermal emissions was not resolved from the perspective of the township. (York Dispatch, 1967; Baldwin, J., personal communication, 1980.)

In June 1967, the Public Utilities Commission scheduled hearings on the utility's application to acquire rights-of-way for the construction of a transmission line. Two landholders objected to the erection of transmission lines on their land, but the Public Utility Commission upheld the utility's position.

9.2.4 The AEC Construction Permit

The construction permit for Units 2 and 3 was issued by the AEC in January 1968 following a brief and uneventful public hearing. There was a limited appearance at the hearings by one individual, a member of an environmental organization that focused on the Chesapeake Bay, concerning the effects of thermal discharges into the Susquehanna River on the Chesapeake Bay area. No residents from the Study Area expressed concern or objection at the hearings. Supporters of the plant appearing at the hearings included the utility, numerous scientific groups that had conducted studies on behalf of the utility, and county and state officials. (York Dispatch, 1968.)

9.3 Response during the Construction Period

The construction period began with the issuance of the construction permits for Units 2 and 3 in January 1968 and continued until December 1974 when commercial operation of Unit 3 began. Earlier, in July 1974, commercial operation for Unit 2 commenced. The outstanding events during this period were hearings for an issuance of the operating license in May 1973 and July 1974.

9.3.1 Operating License Hearings: The Regional Context

During the operating license hearings in 1973 and 1974, major safety and environmental issues surfaced, reflecting a change in national trends and a growing concern over nuclear technology at the regional level.

The passage of the National Environmental Policy Act of 1970 meant that environmental effects, in addition to questions of reactor safety and radiation hazards, could be considered in siting and operation decisions. During the early

1970s, national public concern over safety issues increased and was manifest in widespread opposition to nuclear plant sitings, causing increased sensitivity by the Atomic Energy Commission to local concerns. (Kasperson et al., 1979.) The opposition to nuclear facilities was rooted in the environmental movement. Utility plans for siting nuclear stations were being challenged at the local level by environmental groups and their supporters. This is not to say that intervention was motivated solely by environmental concerns, but since these were the recognized grounds for contentions, individuals and groups concerned with generic safety and ethical issues over nuclear technology or those who perceived a threat to their economic well-being would use arguments showing the adverse environmental effects of nuclear plants in order to strengthen their positions. This national trend was reflected by events in the State of Pennsylvania. The public concern over the building of two additional Peach Bottom units was part of an apprehension by some in the region over the growing regional dependence on nuclear generation of electricity and the cumulative effects of multiple nuclear facilities. By 1970, for example, decisions had been made to build or expand four nuclear power plants in Pennsylvania: Peach Bottom, Three Mile Island, Limmerick, and Fulton. One of the critical contentions at the Peach Bottom hearing was the cumulative impact on the quality of the Susquehanna River from discharges by both the Three Mile Island plant and the Peach Bottom station. (York Dispatch, 1967-1970; Olson, 1974; Philadelphia Electric Company, 1973; Alden, personal communication, 1980; Hoviss, personal communication, 1980; Kesler, personal communication, 1980.)

Although the public interest organizations in the region challenged the siting of specific nuclear plants, many of these efforts overlapped. The York Committee for a Safe Environment, the principal intervener at the permit hearings for the Peach Bottom plant, also participated in the challenge of the proposed Fulton plant in Lancaster County, Pennsylvania. In addition, the same individuals opposed the issuance of the construction permit for the Limmerick plant and the Peach Bottom plant. (Philadelphia Electric Company, 1979.) The pattern of opposition to the Peach Bottom plant was similar to that at the other plants in the region except perhaps for differences in intensity of conflict and location-specific issues. (Alden, personal communication, 1980; McHugh, personal communication, 1980.)

The commitment to the development of nuclear power in Pennsylvania and the heightened concerns over the hazards of this energy alternative culminated in a state

senate inquiry on nuclear safety. Although widely divergent views on nuclear risks were presented, the articulation of the State Health Department's concern over radiation hazards was significant because the same state agency had intervened in the 1961 hearings of Peach Bottom Unit 1 on the basis of incomplete assessments of waste disposal measures.

9.3.2 The Operation License Hearings

Four groups filed petitions to intervene in the hearings for issuance of an operating permit for Units 2 and 3: the Pennsylvania Department of Environmental Resources, the York Committee for a Safe Environment, Save Salanco's Environment, and the Environmental Coalition on Nuclear Power. The positions of the three public interest organizations were represented by one individual during the May 1973 hearing. The Save Solanco's Environment was a small organization originally organized to challenge the proposed Fulton nuclear plant. The group received support from environmentalists and rural landowners in the area. The Environmental Coalition on Nuclear Power was a regional organization of thirty ecology groups, and the York Committee for a Safe Environment was organized in 1973 to specifically challenge the licensing of Peach Bottom Units 2 and 3. The support for these three interest groups was regionally based, with only minimal support provided by residents in the Study Area. The State of Maryland entered into the proceedings as an "interested state," and seven "limited statements" were made by various individuals. (York Dispatch, 1973, 1974, 1975; Hoviss, personal communication, 1980; McHugh, personal communication, 1980.)

Although the interveners originally raised sixty-five contentions for the hearings, these were reduced to seven by the Atomic Energy Commission. These seven contentions included: the inadequacy of emergency plans in the event of an accident; the inability to control radioactive wastes to meet the "low as practicable" standards; and the adverse environmental consequences of chlorine and thermal discharges into Conowingo Pond. Additional contentions were that the safe transportation of high-level wastes had not been demonstrated and that the cumulative impacts of discharged wastes from other plants, together with those from Peach Bottom, had not been considered.

The major issue at the operating license hearings was thermal emissions from the plant. The problem was initially raised by the AEC before the hearing: while

recommending that licenses be issued for the plant's operation, the AEC gave warnings of potential thermal damage and required the applicant to conduct a special environmental assessment. The State of Maryland voiced concern at the hearing that, unless mitigating measures were taken to reduce thermal discharges, there was a high likelihood of detrimental thermal effects on the Conowingo Pond. This contention was buttressed by the position taken by the Baltimore County Office of Planning: that a supplemental investment in a closed-cycle cooling system by the utility would reduce thermal changes to within desired levels and would reduce thermal impacts during periods of low river flow. (Olson, 1974; PEC, 1973; Cooper, B., personal communication, 1980; Merges, personal communication, 1980.)

In contrast to these concerns, the thermal pollution report submitted by the utility, based on a detailed study of the Conowingo Pond, concluded that environmental degradation and irreversible damage would not occur and that discharged cooling water would have minimal adverse consequences. The findings of the report were contested. The AEC made the adoption of a closed-cycle cooling system by 1975 a stipulation of the issuance of the operating license. (Alden, personal communication, 1980.)

In spite of the stipulation, thermal discharge remained an issue between the utility and the states of Maryland and Pennsylvania. The disagreement involved the jurisdictional relationship between the Federal Water Pollution Control Act Regulations, which were instituted in 1972, and the state water quality statutes. According to the utility, the Water Quality Act required no technical means to reduce thermal levels unless impacts of thermal discharge were proven. The AEC awarded an operating license for Unit 2, in August 1973, but withheld the license for Unit 3 until the water quality issue was resolved. (York Dispatch, 1973; Alden, personal communication, 1980.)

Following this decision, the State of Maryland protested the licensing of Unit 3. The state requested a hearing to discuss its contention that the combined operation of Units 2 and 3 would exceed the water quality standards set by Maryland with respect to Conowingo Pond. After arguments were presented on the type and need for cooling towers, the utility acquiesced and agreed to install two additional open-looped cooling towers.

In addition to the thermal discharge issue, a broad range of concerns were expressed at the operating license hearings. Individual members of the intervening groups made limited appearances concerning questions of the health risks of living near the nuclear station and the effectiveness of emergency plans. The protection of milk products surfaced as a concern at the county level and in Peach Bottom Township, where dairying is the important agricultural activity. Supported by the township, the York County Chamber of Commerce argued that safeguards should be considered to protect "the integrity of the milk-product industries by on-the-farm monitoring and by the development of a system to notify farmers of abnormal releases of radiation." The regional organization and the township also argued that alternative methods of shipping spent fuel and the cumulative effects of radioactive emissions from the Peach Bottom and Three Mile Island plants should be carefully assessed. (PEC, 1973; Cooper, B., personal communication, 1980.)

During the construction permit stage, Peach Bottom Township endorsed the siting of the plant in the township, but voiced concern over the ramifications of its operation on the temperature of Conowingo Pond. At the operating license hearings, Peach Bottom Township, in its limited appearance, reversed its earlier position and expressed misgivings about the plant's impact, especially on the local dairy industry. Peach Bottom Township argued that the utility should be held responsible for possible damages to milk supplies not suitable for marketing due to radiation emissions. By the time of the operating license hearings, construction activity on the Peach Bottom plant had reached its peak. The township representative at the hearing expressed the sentiment of the township supervisors that, while Peach Bottom Township was the recipient of a great burden of risks, it was concurrently adversely affected by construction-related impacts because wages for plant construction contributed to the difficulty of procuring seasonal farm laborers. (York Dispatch, 1973, 1974; PEC, 1973; Baldwin, personal communication, 1980.)

The transportation of radioactive wastes emerged as a major concern at the hearings by local, regional, and state representatives and persisted as an issue through the operating-license hearings and the appeal process. The interveners argued that the safety assessments made on waste shipments were highly generalized and did not adequately or completely address specific problem areas such as training of personnel, accident-response planning, and local conditions for routing. In addition, the Baltimore Regional Planning Council expressed apprehension over the transport of

fuels through areas of high population density. Waste shipment was an issue in the AEC appeal hearing and surfaced again in the U.S. Court of Appeals but remained unresolved.

9.3.3 Concern over the Fulton Nuclear Plant

The proposal by the Philadelphia Electric Company to build a 2300 Mw station across the river from the Peach Bottom site in Fulton Township and the public controversy generated by this decision heightened and reinforced the concerns of township residents over the building of Peach Bottom Units 2 and 3. (Poff, personal communication, 1979; Alden, personal communication, 1980.) The announcement of the Fulton plant, made soon after the operating license was issued for Peach Bottom Unit 2, was instrumental in the intervenor's attempt to re-open the hearing on the basis of the additional radioactive and thermal releases that would be discharged from the proposed plant. Peach Bottom Township took an active position opposing the building of the Fulton nuclear station. The principal concern of many township residents was that the Fulton plant would require the relocation of a number of farmers and their families from the area and the loss of good agricultural land. The agricultural community in Peach Bottom Township perceived this as a threat to their way of life. (Baldwin, personal communication, 1980; U.S. Nuclear Regulatory Commission, 1975; Olson, 1974; Cooper, B., personal communication, 1980.)

The issues surrounding the Fulton plant were dissolved in 1975 when the Philadelphia Electric Company decided to indefinitely delay the Fulton project because of contractual difficulties with the plant designer.

9.3.4 The Tax Issue

In 1973, the court upheld Peach Bottom Township's position that the township could levy a one-percent income tax on workers employed in the township, including those at the Peach Bottom site. The utility had opposed this tax. Although the manner of the allocation of the induced revenue from plant construction was consistent with the requirements of the traditional farming community, it was nevertheless viewed as problematic to the township's recent urban in-migrants, who demanded increased public services. Moreover, the agricultural community invoked a highly restricted urban development plan for the township and argued that the township had no commitment to provide such services on the basis of the original land deeds, which specifically affirmed individual responsibility for improvements in areas zoned as residential.

9.4 Response during the Operation Period

The operations period began in July 1974 when Unit 2 went into commercial operation. Five months later, Unit 3 began commercial operation. Two major issues emerged during this period: the shipment of low level waste from the Peach Bottom plant and the need for an emergency evacuation plan.

9.4.1 The Waste Transportation Issue

The issue over waste transportation persisted after the licensing hearings. The Delta Borough Council, for example, voiced concern to the utility about the potential hazards associated with shipping nuclear wastes by rail. The utility assured the council that, for the immediate future, the wastes would be stored on site. The York County Environment Council (which had earlier made a limited appearance at the operating permit hearing because of its concern over thermal pollution) requested the County Commissioners hold public hearings on the hazards posed by waste transport. Much of this interest was generated as a response to the utility's proposal in 1975 to purchase the rail line between the Peach Bottom plant and the City of York for waste shipments. In response to this proposal, approximately twenty property owners, some of whom were from the Study Area, petitioned the Public Utilities Commission to deny Philadelphia Electric Company the purchase of this line for waste-shipment purposes because of the potential hazards posed to nearby residents. The sale ultimately did not take place. (York Dispatch, 1974, 1975.)

Subsequent to the Three Mile Island accident, Peach Bottom Township residents, with the active support of the Peach Bottom Alliance, expressed concern at township meetings about the dangers of radioactivity from the carriers of any waste material on township highways and the need for adequate protection. In response to this public appeal, Peach Bottom Township passed an ordinance, in October 1979, that required the continuous movement of vehicles transporting radioactive waste through the township on identified routes, a state police escort, seventy-two hours notice of waste removal, and the removal of spent nuclear waste from the township within twenty-four hours after removal of the fuel from the containment building. The ordinance also prohibited waste transport in the event of hazardous road conditions. (Lawrence, personal communication, 1980; Baldwin, J., personal communication, 1980.)

9.4.2 Response to the Accident at Three Mile Island

The Three Mile Island nuclear plant was located about thirty-five miles upwind from the Peach Bottom nuclear station. Four components of the effects of the accident will be investigated: changes in plant operation, economic/demographic effects, institutional effects, and public response and expressions of concern by residents of the local area about the Three Mile Island accident and the Peach Bottom plant.

Residents of the study community were not far removed from the uncertainty and trauma precipitated by the threatening events during the two-week period following the Three Mile Island accident. Although no changes in the operation of the Peach Bottom plant occurred during this period, there was a high level of interaction between management personnel at the utility and residents of the Study Area. Community leaders sought information from the utility, and the utility personnel provided the planning and technical information requested. Although few plant managers lived in the Study Area, the utility's management personnel played an important social function in the local community. Because the local area did not have professional resources, such as planning and environmental departments or college faculties, the utility managers, by virtue of their professional training and the utility's involvement in regional development, were relied upon as technical experts for advice in local decision-making. During the emergency period, utility personnel played a pivotal role in providing information and interpretation of the situation at the Three Mile Island plant. This reinforced the utility's position as a member of the local community. (Fleisher, personal communication, 1980; Poff, personal communication, 1980; Tucker, personal communication, 1980.)

The economic/demographic effects of the accident on the Study Area cannot be quantified. Mountain West Research, Inc. conducted a telephone survey of 250 households in the Study Area five months after the accident, which showed that a majority of households in the Study Area prepared for possible evacuation by purchasing additional groceries, withdrawing cash from banks, and arranging for places to stay. None of those interviewed had actually evacuated, but the survey showed that several days' absence from school and work was not uncommon. (Pijawka, 1980.)

The survey showed that the Three Mile Island accident had virtually no impact on the individual household's economic situation in the local impact area (in terms of economic gain or loss or expenses incurred because of the accident). Approximately 35 percent of the 250 respondents indicated that the accident may have resulted in a depreciation of property values in the area because of the proximity of the Peach Bottom plant. However, interviews with key community informants, particularly real estate people, discounted this hypothesis, and no evidence to support this position was found.

No long-term economic/demographic changes have occurred in the Study Area since the accident at the Three Mile Island plant in March 1979. However, the accident increased the awareness of the local population to the risk imposed by the nearby nuclear power plant and thereby increased the Peach Bottom plant's visibility. Among farmers whose property was close to the plant, there was some concern that the resale value of their property may have decreased, but this concern was not universally shared by those interviewed. However, farmers in the area expressed acute interest in the question of liability in cases where loss of productivity could result from a number of possible events: an accident with consequences of large magnitude as in the case of TMI; excessive radioactive residues found in agricultural products; a change in consumer-shopping behavior because of nearness to the plant;¹ and a decline in the reproductive capacity of farm animals due to biological pathways of emissions from the plant to the animal.

The major consequence of the Three Mile Island accident on the Study Area was its effect on local institutions. The emergence of public issues in the community over the safety of the Peach Bottom plant; a heightened level of public and governmental participation and interaction in the decision-making process; the emergence of an environmental anti-nuclear interest group in the local area; and the initiation of independent planning efforts to mitigate the potential hazards of the Peach Bottom nuclear station were the most notable demonstrations of this effect.

¹One farmer whose land is close to the plant indicated that the level of retail sales of his products has shown a noticeable downward trend since the accident at TMI. The individual also confirmed that, since the accident, some area residents have questioned whether the residue content of his products has been monitored to assure safe consumption levels. However, the degree to which the reduction of the individual's sales was due to the nuclear power plant, if any, has not been confirmed and remains open to questioning.

The emergence of nuclear-energy related issues in the study community may be due to the increased sensitivity of the public and its political representatives to the problems caused by proximity to the Peach Bottom nuclear station; or issues may be attributed to the activities of the local environmental organization that came into being soon after, and as a direct consequence of, the TMI accident; or both may be responsible. There have been a number of community meetings about the long-term consequences to the area, addressing such concerns as the discharge of irradiated water from the TMI plant.

Delta Borough and Peach Bottom Township have also had extensive communication with York County over evacuation plans. Persistent concerns over the adequacy of contingency plans in the event of an accident at the Peach Bottom plant or a recurrence of a major problem at Three Mile Island, coupled with the criticism of existing plans by the local anti-nuclear group, ensured the elevation of a concern for a detailed emergency plan into a public issue.

Two unrelated events contributed to the escalation of a concern over an evacuation plan into a political issue in Peach Bottom Township. A neighboring township, Martic Township, passed a resolution soon after the TMI accident that the Peach Bottom plant should be shut down unless a detailed and workable plan was implemented for the area. The Peach Bottom Alliance, the environmental interest group established in the township soon after the TMI accident, expressed a similar demand to the Board of Supervisors in Peach Bottom Township. York County approved an emergency plan that was considered insufficient by Peach Bottom Township. The York County plan emphasized police involvement and the Civil Defense "chain of command" but did not include an evacuation plan for the immediate areas of southern York County. Subsequently, the township appointed an emergency control coordinator, who contended that no workable proposal for evacuation had developed. To alleviate this problem, the coordinator established a committee consisting of representatives of neighboring townships to develop an area-wide plan. As a consequence of the Three Mile Island accident, changes in the Peach Bottom plant's engineering system components and in the training of station operators were made, as required by new NRC regulations (NUREG 0578). The design modifications were made during normal outages for other plant-related work, and the only additional personnel was one technical advisor, thus, causing minimal effects on plant

operation. (Lawrence, personal communication, 1980; Fleisher, personal communication, 1980; Alden, personal communication, 1980; Baldwin, J., personal communication, 1980.)

9.5 Summary

9.5.1 Measuring Public Concern over the Peach Bottom Plant

One measure of the level of public concern over an issue is the amount of space the issue receives in the communications media. There are numerous problems with the use of such a methodology. Nevertheless, the methodology has specifically been used in the measurement of public concerns over nuclear power and does afford an opportunity to discern temporal shifts in the degree and nature of public concern. (Kasperson, et al., 1974; Mazur, 1977.) The level of public concern as indicated by the amount of newspaper space given to the Peach Bottom nuclear plant over time is shown in Figure 9-1.

Table 9-1 summarizes the issues over the Peach Bottom plant from 1958, when Unit 1 was announced, to the present and shows the degree to which the issues manifest themselves in the Study Area. Of the sixteen major issues identified, ten were issues that involved residents of the Study Area. These concerns and issues can be put into five categories: (1) public safety and health, (2) environmental issues, particularly thermal emissions, (3) land-use conflicts, (4) safety assessments, and (5) economic well-being. Of particular concern has been the perceived threats of the plant on the agricultural economy and changes to the rural way of life. This concern correlates strongly with the traditional value system and predisposition toward growth in Peach Bottom Township held by the farming community. Residents of Delta Borough expressed little concern over safety or environmental issues.

The concerns of the local residents varied over time. Problems during the early phases of Unit 1 were limited to land-use questions such as the routing of a transmission line and were dealt with quickly, often through negotiation with the utility. And, except for disagreements over such things as transmission-line routing, the issues were initiated by participants outside the Study Area. Between 1966 and 1972, residents expressed minimal interest in safety or environmental concerns. Except for interest regarding the impact of cooling towers on the recreational use of Conowingo Pond, there was generally enthusiastic support given by area residents to the project. Most of the interveners during the operating permit hearings were not

FIGURE 9-1

MEASUREMENT OF PUBLIC CONCERN OVER THE PEACH BOTTOM NUCLEAR PLANT: REPORTS IN THE COMMUNICATIONS MEDIA, YORK DISPATCH, 1958 - 1979

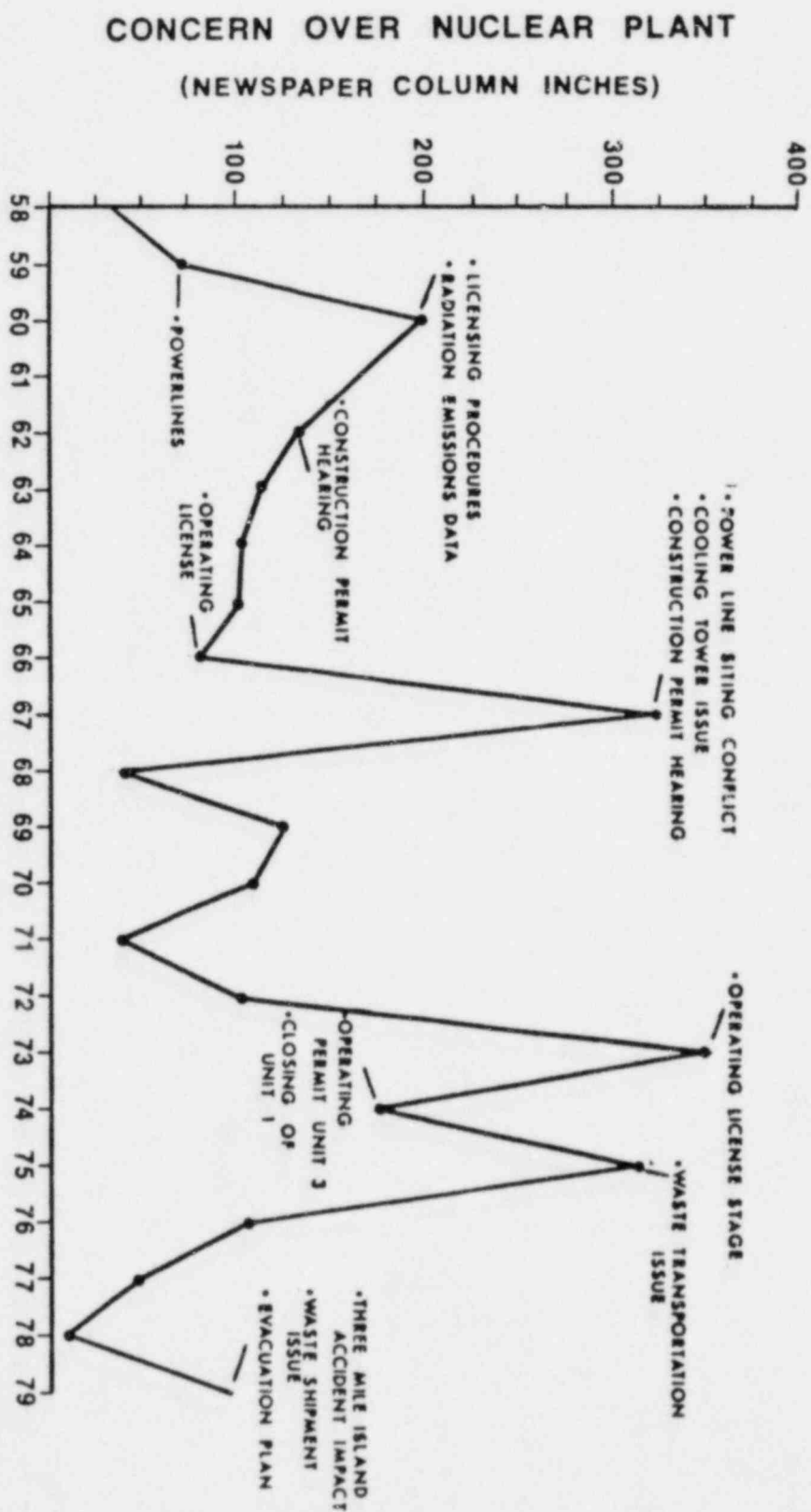


TABLE 9-1

SUMMARY OF MAJOR ISSUES OVER THE PEACH BOTTOM NUCLEAR PLANT
BY TIME, ISSUE, PARTICIPANTS, LOCAL INVOLVEMENT, AND RESOLUTION

Time Period	Issue	Participants	Local Involvement	Resolution
Unit 1	Bird Sanctuary	Conservation Society of York County	No	Resolved through negotiation with utility
	Transmission Line	Four Farmers; Public Utilities Commission	Yes	PUC authorization for utility to exercise the right of eminent domain
	Loss of Recreational Area	Peach Bottom Township	Yes	Loss was accepted by residents, and township was awarded land as a replacement
	Transportation of Reactor Vessel	Delta Borough	Yes	Borough was successful in prohibiting shipment of the reactor through its main street
	Lack of Information on Waste Discharge	Health Agencies of Maryland and Pennsylvania; AEC	No	Decision by the AEC that utility had to furnish detailed information on waste discharges as a condition for a construction permit
	Safety Assessment Procedures	State; AEC	No	Court upheld AEC's procedures for safety assessment as an ongoing process
Units 2 and 3 Pre-construction	Construction of Cooling Towers and Ponds	Peach Bottom Township; U.S. Army Corps of Engineers	Yes	U.S. Army Corps of Engineers authorized permit for construction of cooling system
Construction	Damage to Recreational Value of Conowingo Pond	Peach Bottom Township	Yes	Township position articulated that it would oppose any more nuclear plants near Peach Bottom Township

TABLE 9-1--Continued

SUMMARY OF MAJOR ISSUES OVER THE PEACH BOTTOM NUCLEAR PLANT
BY TIME, ISSUE, PARTICIPANTS, LOCAL INVOLVEMENT, AND RESOLUTION

Time Period	Issue	Participants	Local Involvement	Resolution
Construction Period (Continued)	Transmission Lines	Two Township Landowners	Yes	Opposition to siting of transmission lines was resolved with court decision to uphold the utility's right of eminent domain
	Thermal Discharge Impact in Chesapeake Bay Area	Limited Appearance by a Representative of the Chesapeake Bay Foundation; AEC	No	Concern expressed during construction permit hearing over possible thermal impact on Chesapeake Bay area
	Thermal Emissions	York Committee for a Safe Environment; Save Salanco's Environment; Environmental Coalition on Nuclear Power; Pennsylvania Department of Environmental Resources; State of Maryland; AEC; EPA; York County Environmental Council	No	AEC decision to recommend closed-cycle cooling system as a stipulation to the issuance of an operating license. Following disagreements over water quality standards, the utility, in concert with the states of Maryland and Pennsylvania, installed two open-looped cooling towers
	Emergency Plans	Intervenors; AEC	No	Issue not resolved from perspective of intervenors when operating license issued
	Radioactive Wastes	Intervenors; York County Chamber of Commerce; Limited Appearance by Peach Bottom Township Farmer; Maryland; Peach Bottom Township; AEC	Yes	Peach Bottom Township expressed concern over impacts to dairy industry. The safety of radioiodine releases was considered by the AEC to be inadequate and a re-evaluation of the risks was required by the utility.

TABLE 9-1—Continued

SUMMARY OF MAJOR ISSUES OVER THE PEACH BOTTOM NUCLEAR PLANT
BY TIME, ISSUE, PARTICIPANTS, LOCAL INVOLVEMENT, AND RESOLUTION

Time Period	Issue	Participants	Local Involvement	Resolution
Contruction Period (Continued)	Transportation of Wastes	Intervenors; Maryland; AEC	No	AEC upheld utility's position on the safety of waste transport
Operation	Transportation of Wastes rail line dispute	Intervenors; York County Environmental Council; PUC; Delta Borough; Peach Bottom Township	Yes	The utility did not purchase the rail line to transport fuel from the plant
	shipment through Peach Bottom Town-ship	Peach Bottom Township; Peach Bottom Alliance	Yes	Peach Bottom passed a resolution to control shipment of waste from the plant
	Evacuation	Peach Bottom Township; State; York County; Peach Bottom Alliance; Neigh-boring Townships	Yes	Progress has been made toward the development of a comprehensive evacuation plan for southern York County

from the Study Area were concerned with the more specific effects of the project, particularly possible disruptions to the agricultural economy as a result of releases of radioactive substances.

The Three Mile Island accident changed the local residents' perception of nuclear power in general and of the Peach Bottom plant in particular, which resulted in local political action. The change was clearly shown in the intense political activity, both formal and informal, in Peach Bottom Township, directed at mitigating the risk posed by the Peach Bottom plant. The political actions taken to reduce the risk included the ordinance controlling the transport of low-level radioactive wastes and the employment of a part-time Civil Defense expert to coordinate the development of an emergency evacuation plan for the southeastern townships of York County as described above.

9.5.2 Effect of Regional Response on Groups in the Study Area

The regional response to the Peach Bottom Atomic Power Station had an effect on the agricultural group in the Study Area. Of significance has been the increased involvement of the township in political matters; formerly, the group's concern had been limited to agricultural problems. The expression of concerns and issues in the political arena increased the awareness of the agricultural community to potential changes and to threats to their lifestyle. As a result, the township established large town planning and development strategies and goals. In addition, the political activism of the agricultural community increased to the extent that the township initiated political collaboration with entities outside the Study Area.

CHAPTER 10: EVALUATION AND SIGNIFICANCE OF THE SOCIOECONOMIC EFFECTS OF THE PEACH BOTTOM NUCLEAR STATION

10.1 Introduction

The purpose of this chapter is to describe the evaluation of the effects of construction and operation of the Peach Bottom station by the major social groups in the Study Area. In the determination of the evaluation of the effects by group, the research attempted to ascertain the perception of each group regarding: the magnitude of the individual effects; the positive/negative dimension of the effects; the duration of the changes; and the saliency of the effects to each group and to the Study Area. Following the evaluation of the individual effects the overall evaluation of the plant was measured in terms of its perceived benefits and risks.

The final section describes the overall rating of the significance of the nuclear plant and its effects on the Study Area as a whole. The following criteria were utilized in assessing the significance of the plant's effects: (1) the relative magnitude of the effects; (2) the duration of the effects; (3) the distribution of the effects among social groups—who gained and who lost; (4) the evaluation of the effects; and (5) the role of the plant in the Study Area.

10.2 Evaluation of Project Effects by the Groups in the Study Area

The Agricultural Community

The outstanding characteristic of the agricultural community was the value it placed on the preservation of a rural lifestyle and the economic viability of the agricultural sector. The farmers supported general economic growth in the local area because in the past much of the area's industrial and commercial developments were focused on the agricultural sector (such as feed mills, canning and dairy processing establishments, and agriculture equipment dealers) and because it benefited the area with which the agricultural community had long and deep ties. Environment-quality concerns were also prevalent among the farming families in the township.

On the whole, the farm owners in the agricultural community did not perceive that they greatly benefited from the increased local income and expenditures. During the hearings process for the operating license, members of the agricultural community complained that the township would receive only the risks from the nuclear facility and none of its benefits. Of particular importance to the agricultural

community was the occupational mobility and wage pressure created by the employment opportunities at the construction site which resulted in workers leaving their employment in the agricultural sector for work on the construction project. Manpower shortages were mentioned repeatedly as one of the potentially adverse impacts of the Peach Bottom facility on the agricultural community. However, the actual effect on the economic base of the agricultural sector as evaluated by key informants was quite low since adjustments to the labor shortages proved effective and since long-term damages to the farm economy were avoided; increased labor costs were subsumed in the selling price of agricultural products.

The potential changes that would result from the plant's operation—changes in the township's rural environment and lifestyle as well as in the economy of the agricultural base—were particularly sensitive issues to the agricultural community. Many of the farmers who were interviewed said that, when the plant was first proposed, they questioned the effects the plant would have on their economic well-being, principally on the dairy industry. They argued that the utility should be held responsible for losses if the milk supplies were not suitable for marketing due to radiation emissions. The question of liability was again raised by farmers following the Three Mile Island accident, and concern was expressed by a number of farmers that property value may have decreased due to its proximity to the Peach Bottom plant.

While the growth of recreational homes in the township was generally favored, there was no support given by the agricultural community to the rapid suburbanization that was taking place in the township during the 1970s. Nearly all of the farmers interviewed indicated that, in retrospect, they observed a distinct separation between the rapid suburbanization of the township and the few families that in-migrated to work as operators at the plant during the same time period. However, it was clear that during the plant's construction this distinction was generally blurred, with the nuclear plant symbolizing the demographic changes occurring in the township. The preservation of the township's rural environment, particularly its productive farmland, was a pressing concern for the agricultural community. The township's active opposition to the proposed Fulton nuclear plant and the support given to farmers threatened with expropriation by the Fulton plant proposal was mentioned to exemplify the sense of common cause and the importance given to the preservation of

agricultural values and policies by the township's agricultural community. Generally, the agricultural community disapproved of the residential growth in the township.

The fiscal changes were mentioned by the farmers as one of the positive impacts of the nuclear power plant, but generally they were not regarded as an important contribution to the township's budget. This reflected a belief that since the community was host for a nuclear station and its inherent risks, the community was entitled to compensatory benefits. The agricultural community felt that, since the tax structure for utilities in the state was biased against local municipalities, the township's invocation of the earned-income tax on construction and operation workers was entirely justifiable but that it yielded only a minimal contribution from the project.

The reduction in local property tax rates benefited the farming community, but it was not considered a singularly important impact. In fact, unless specifically questioned about the plant-induced tax change, the farmers who were interviewed generally did not identify it as a positive impact. Aside from improvements to the local street and highway system, few additional revenues were allocated for upgrading public services. From the perspective of the farming community, the reduction in property taxes and the maintenance of minimal public services were acceptable administrative decisions since they meant that the township would provide little incentive for continued rural suburbanization.

The agricultural group was sensitive to changes that would affect the area's traditional rural value system, especially their children's values. They made a considerable effort to enhance local control of education. Of particular concern to the farming community was the potential impact on their value system from the association between the township's school-aged population and the children of the construction workers, who were considered relatively more independent and "street wise" than were children in the township.

However, it appeared that the pressures exerted on the agricultural community by the project were not sufficient to modify the existing group structure. Interviews with farming families identified three factors that mitigated against change: first, the movers were a relatively small group compared to the host population and were considered quite isolated from the community; second, the effects of the project

were temporary; and third, the township administration implemented policies to preserve the low-density residential, rural environment in most of the township. The operation workers and their families were perceived by farmers as part of the new suburban growth that took place during the study period. As such, they were viewed as part of an evolving political force in the area that might reduce pre-eminence of the farming community as the political power. There was a sense that the political strength and cultural dominance of the farming community would be reduced by confrontation with groups whose values were perceived to differ from their own.

The health and safety questions of the Peach Bottom plant were serious concerns for the agricultural community. One of the primary concerns was the impact of radioactive and thermal releases on the economy of the Study Area, especially on the dairy industry and on the recreational use of Conowingo Pond. The Three Mile Island accident heightened the agricultural community's awareness of the risks posed by the Peach Bottom plant and increased the plant's visibility. Most of the farmers who were interviewed indicated that, since the plant was an established fact in the area, the public had to reconcile itself to the risks posed by nuclear technology. To some, the risks were inconsequential or acceptable; to others, the risks were serious, with the occurrence of an accident of the magnitude of TMI viewed as a realistic possibility. Of general concern to the community was the need for an evacuation plan in the case of an accident. Moreover, problems at the Peach Bottom plant soon after the TMI accident, coinciding with the state governor's criticism of the Nuclear Regulatory Commission and the failure of the utility responsible for TMI to report the accident to state authorities promptly, magnified the concern about a major mishap at the Peach Bottom site and the hazards of radioactive discharge. Overall the risks of the plant far outweighed the benefits to the agricultural group.

Two members of the agricultural community highlighted the evaluation of this group:

I've been a dairy farmer all my life. Before the plant came in, the township was a private place; there were no strangers. . . . Wages were high and many of the township's young people got jobs down there and straightened out. It helped the community because it brought money in. . . . The one-percent income tax brought in about \$300-400 thousand and lowered the tax to the township. We keep improving services with the interest from the tax, especially road maintenance. . . . I was thinking about evacuating during Three Mile Island. I was wondering, why kill yourself working when all could be lost—who knows

after Three Mile Island. . . who knows? . . . Many farmers don't seem to mind it the Peach Bottom Plant one bit; a few are scared of it, and as a group, we want changes made for better safety. . . . The changes in the township have mostly been the commuters from Baltimore. These urban people have little concern for the township: the area has grown on the best agricultural land, which has now been ruined; the city farmers on 20 acres of land have made a mess out of what they tried. In a move to conserve farmland, we now have regulations to prohibit development. (Dairy Farmer, Peach Bottom Township, personal communication, August 1979.)

After Three Mile Island, we are conscious of the plant in our area. Who would want to buy my farm now? The farms around here may have been hurt—we won't be able to sell the land for its value if we wanted to do it. (Farmer, Peach Bottom Township, personal communication, August 1979.)

The Business Group

The business community supported the Peach Bottom nuclear station from the time of Unit 1 to the completion of Units 2 and 3. The construction of Unit 1, according to key informants, brought limited, temporary economic gains to the business community; the addition of the two larger units was originally expected to result in substantial gains to the business community. As a consequence, the business community actively promoted and worked for the project. Although the business community was generally satisfied with the economic gains during the construction of the plant, the expectations of this group were not fully realized. Businessmen who were interviewed stated that the economic base of the Study Area was not substantially expanded, fewer expenditures than anticipated were made in Delta Borough and Peach Bottom Township, and out-migration of population and businesses continued after construction ended. The economic situation, then, at the end of the construction period was considered similar to the one preceding construction. The operations work force was not considered a particularly important contributor to the local economy.

Businessmen indicated that the workers at the project, both the commuters and the movers, had positive, although temporary, economic effects on the Study Area. However, the businessmen also identified some negative effects for their group; for example, traffic was mentioned as a principal problem area. There was a general feeling among those interviewed that Delta Borough did not have the necessary economic base to attract sufficient business to permanently stabilize the business sector, but there was some speculation that better entrepreneurship during the construction period and the use of increased incomes for new commercial ventures in Delta Borough could have increased and prolonged the positive effects of the project.

To some of the older businessmen in the Study Area, the "return to the way things were" before the plant was viewed with favor. Although they expressed satisfaction with the increased incomes over the eight-year construction period, they also indicated that the retention of the small-town environment and close social ties were important to them. There was a sense of overall satisfaction that the area had not been altered to any great extent. The economic impacts of the construction of the Peach Bottom plant—that the plant was not totally responsible for the changes that occurred during the last fifteen years—seemed to have been accurately assessed by the business community, even though the coincidence of plant construction and the major socioeconomic changes in the Study Area could have made the plant appear to be the principal driving force. Nevertheless, the Peach Bottom plant was seen as symbolic of the changes that have occurred. The demise of the traditional long-established general stores and the development of the large supermarket outside of Delta Borough were seen as part of an ongoing historical process of which the plant itself was part. Local businessmen indicated that community change, including the loss of local control over commerce, was acceptable, and they appeared to have taken an optimistic view of these changes.

The business community expressed disappointment that there were few revenue effects from the plant in Delta Borough, and, therefore, no improvement in public services, since they viewed the upgrading of public services as critical for reversing the economic decline of the community.

The major change in the social structure of the Study Area as seen by the business community was the influx of suburbanites during the last ten years. The immigrants were welcomed by the business group for their contribution to both the stabilization of the retail business sector and the community's formal and informal social organizations. The business community, however, generally did not favor the restrictions placed on commercial and residential growth in the township by the agricultural community and actively opposed the zoning and land-use controls instituted in the early 1970s. Developmental policy in the township was viewed as detrimental to the growth of the commercial sector in the Study Area. This problem was viewed as a serious handicap for commercial growth but was not perceived as related to the plant.

In interviews concerning the Peach Bottom facility, businesspeople downplayed health and safety questions prior to the Three Mile Island accident. Following the Three Mile Island accident, a number of plant-related concerns surfaced among the business community. These included the necessity for an effective evacuation plan in case of an accident, the safety of shipments of wastes near Delta Borough, and liability questions in case of an accident similar to the one at Three Mile Island. The business community in Delta Borough supported the township ordinance to control shipments of waste. Among the businessmen in the community, an accident of the magnitude of the Three Mile Island accident was perceived as a possibility, albeit very remote, especially because of the regulatory changes brought about as a consequence of that accident. Furthermore, the business community had a high regard for the technical and professional competency of the operation work force and plant managers, some of whom were personal acquaintances.

The Peach Bottom plant was consistently viewed positively by the business community, which as a group had given the utility much support. The perception of the economic effects has a time dimension: during construction of the plant, the economic gains were viewed as an important stabilizing element, but still not as much as had been anticipated. From today's perspective, the plant's impacts were temporary and did not improve, upgrade, or expand the area's economic base. From the long-term perspective, the economic impact of the plant was unimportant. This perception was underscored in interviews with local businessmen:

I have mixed feelings about the construction of the plant; Delta did not get as much as it gave to the plant. It did, however, bring money into the area—the Bechtel people were getting a good salary. Overall we got along well with the construction workers but I don't know of any who stayed in the area. . . . Were there lasting effects of Peach Bottom? Not really. The Philadelphia Electric Company did not turn money back into the community. . . . At the time of plant construction, there was an influx of wages, and rents doubled. But no new businesses opened because of the plant. . . . The town did not improve: it is poor, a lot are on welfare, the entire town is assessed at \$500 thousand. Businesses were hurt by the wage differential: Robinson Brothers and International Harvester were in Delta and moved to Fawn Grove because their employees quit to work on the plant. The area is not growing presently. It might attract new industry, but it hasn't. . . . The town would be the same without the plant. (Funeral Director, Delta Borough, personal communication, August 1979.)

What is my reaction to Units 2 and 3? Unless someone mentioned it, no one cared. . . . Overall, there has been no great impact. . . . Unit 1 brought some benefits only during its construction. The other two units have not helped any.

Most of the construction people did not live here and did not do business. Some local people were hired but not in great numbers; the job was union labor, which required specialized skills that were not available in Delta. . . . Since construction ended, a number of stores have closed; local people drive to other places to shop at centers. . . . We were uneasy about Three Mile Island but are not with Peach Bottom. There is potential for trouble, as in all technology, but I have not stayed awake nights. . . . (Ex-mayor and owner of barber shop, Delta Borough, personal communication.)

Traditional Families/Old-Timers

The employment and income generated by the Peach Bottom plant were considered important by the long-time residents of the Study Area. For example, many mentioned that the employment opportunities provided by the project halted the traditional out-migration of young people. Some local youth obtained training at the project and subsequently settled in the local area, thus allowing continuation of highly valued family ties and contacts. Increased employment of women in this group, in addition to income from rentals, were mentioned as important plant-related benefits. But these were identified as temporary benefits, and at the time of the study, the economic benefits did not seem as important as they had appeared at the time of construction. The families in this group who were interviewed were generally supportive of the plant and often recalled the community's support of the construction of Unit 1. From their perspective, Units 2 and 3 were an addition to an already accepted project—Units 2 and 3 were inherited, as it were. The elderly in this group were also affected by the economic changes: first, the social organizations to which they belonged received financial and membership support; second, the elderly group obtained income from the rental of rooms to construction workers, a very important supplementary income to them.

The small-town environment with long established social ties was described by all the families interviewed as the principal advantage of living in the local area. Rather than perceiving the plant as a disruptive exogenous element, these families viewed the plant as a reinforcement of an already well-formed social structure; they had lived with the plant for more than twenty years and had accepted it as part of the community infrastructure. For a social group with strong historical ties, the plant was seen as one of the few events that aided community cohesiveness and spirit, in contrast to the debilitating and disruptive history of economic instability and decline that has characterized the local area.

The group and its position in the social structure was viewed by the old-timers as unaffected by the plant: the old-timer families retained their political and social status; the church was still an important institution; and there were no new groups who challenged community social well-being--the size of the construction work force was relatively small with activity patterns distinct from those of the old-time residents. Some limited social interaction did take place between families of the construction workers and long-time residents, and friendships developed.

However, some of the families identified the conversion of a few of Delta Borough's single-family houses into multi-family dwellings during the construction period as a negative change that was partly due to the project. The deterioration of these buildings and the influx of "low income" families who were separated from the traditional community and considered non-participating and non-integrative were perceived as a negative impact of the project. The problem, as pointed out in the interviews, was that, for the first time, the economy of the area was not under local control since the owners of the converted multi-family structures were absentee landlords. Furthermore, the trend toward suburbanization (with suburban interests outside of the local impact area) buttressed the concern of the old-timers that the "sense of community" nurtured for so long would dissipate. Enthusiastic support and acceptance had, therefore, been given to in-migrants who showed a desire to participate in local community affairs. Although there was general disagreement by the old-timer families with the Peach Bottom Alliance's opposition to the nuclear facility and little active support for its position or strategy, there was, nevertheless, tacit approval and acceptance of its members as part of the community because of the members' concern for the public welfare of the local area.

Health and safety concerns regarding Peach Bottom nuclear station did not surface as an issue among members of this group prior to the Three Mile Island nuclear plant accident. Opposition to the project on environmental and safety questions was viewed as coming from outside the area, and the old-timers did not share the concerns expressed at the permit hearings. However, the Three Mile Island accident affected the level of concern about safety questions among the old-timers of the area. Interviews with old-timers indicated a common perspective with regard to the Peach Bottom plant subsequent to the Three Mile Island accident, particularly the recognition of the need for an effective evacuation plan in case of an accident. The accident at Three Mile Island increased the awareness of the hazards associated with nuclear technology in general and the Peach Bottom plant specifically.

The Suburban Group

The suburban group indicated that they were generally not affected by plant employment and income, although the few operations workers and their families who were considered part of this group directly benefited. On the whole, the suburbanites felt that they were somewhat detached and remote from the plant's impacts since, as a group, their focus of interest was outside of the local area and since they were not actively involved in community affairs and events in the study area. There were, however, in-migrants and their families that actively participated in local affairs and social organizations, but this participation was not generalized to the group.

The suburban group indicated that they did not benefit from the fiscal changes brought about by the plant, except, as mentioned, in the low property taxes that the group paid. Demands by this group for improved urban public services led to friction with the farming community, which had restricted the upgrading and expansion of public services in the township.

Health and safety concerns were generally not expressed by members of this group prior to the Three Mile Island accident; however, since the accident, a number of safety-related concerns emerged. The distribution of these concerns among the suburban population was not reliably ascertained, but the interviews with key informants suggested that this group had widely diverse perspectives on safety issues related to nuclear technology in general and to the Peach Bottom plant in particular. The major issues promulgated by the Peach Bottom Alliance were over evacuation plans for the Study Area and the question of public safety during shipments of low-level wastes from the Peach Bottom nuclear generating facility.

10.3 Significance of the Plant

10.3.1 Magnitude and Relative Importance of Effects

The Study Area has historically been rural and isolated. There was little industrial activity in the Study Area, and agriculture remained the leading industry in Peach Bottom Township, employing a large percentage of the area's labor force. Delta Borough had experienced a historical decline in its economic base since the early 1900s. Early in its history, Delta Borough had a mature economy based on the mining of slate and serving its agricultural hinterland. The decline of the slate industry and Delta's increasingly isolated geographical position during the 1900s

resulted in the out-migration of population and of retail and wholesale establishments. By the time the plant was announced, Delta was experiencing serious economic problems.

The size of the work force residing in the Study Area and employed in the construction of the plant in 1973 was estimated at 415 workers, which represented about 10 percent of the population of the Study Area. The income of these workers amounted to \$6.7 million, which resulted in economic gains for the Study Area during the construction period. However, because the Study Area was limited in its economic base and could not meet even the basic demands of the Study Area residents for goods and services, much of the income generated by plant employment leaked to urban centers outside of the Study Area. The research findings indicated that the economic gains in the study area were of a temporary nature and were not large enough to transform the economic base of the area either temporarily or permanently. Moreover, aside from the merchants and their families who benefited from increased sales to the plant, the residents who obtained employment at the plant, and the residents who rented rooms to construction workers, most people in the Study Area did not directly benefit.

Some purchases of construction materials and supplies were made at the local level, but from the perspective of the local economy as a whole, the effects from indirect income on employment were minimal. From the perspective of the owners of the few businesses that supplied materials, however, the increase in the volume of sales due to these purchases was substantial (20-25 percent over the normal volume of sales); these increases enabled the expansion and modernization of some of these establishments. The increased demands for goods and materials were met by internal adjustments rather than through increased employment. Thus, material purchases for construction in the Study Area resulted in short-term benefits for a few families; the overall effects were small.

The construction of the Peach Bottom plant increased occupational mobility. Manpower shortages in the agricultural sector became a problem because many agricultural workers left their previous occupations to work on construction. These shortages, however, were effectively counteracted by adjustments in work schedules and increases in salaries for replacement workers. Furthermore, these shortages were not permanent and did not adversely affect agricultural income or employment in the long run.

The increase in disposable income in the Study Area as a result of employment at the project site was a critical factor in the expansion of a commercial zone on the outskirts of Delta Borough. The growth of a large supermarket in this area accelerated the decline of the few general stores in Delta Borough.

The data show that the end of construction marked a return to the conditions existing prior to the project. When construction activity came to an end, a concomitant increase in unemployment resulted. Although the operation of the plant did provide a few jobs for the residents of the local area, the operations period was not as important to the local area as was the construction of the plant. There were few nonlocal workers who relocated into the Study Area. These findings were supported by the Renova International (1974) study on the impacts of the construction of Units 2 and 3. The report states:

The construction phase brought about a temporary economic boom leading to a false sense of prosperity. Had the plant located closer to a metropolitan area the shock would not have been as great. . . . On the whole, certain changes took place . . . few of these will have a prolonged effect.

Changes in population in the Study Area were based on the changes in the levels of employment. Two principal aspects considered in the determination of population change were in-migration and reduced out-migration. The population increase in 1973 associated with the construction in-migrants and reduced out-migration was estimated to be 329 persons, which represented an increase of about 15 percent over the size of the pre-project population. The demographic increases related to plant operations were estimated at 78 persons; because this increase represented only 3.5 percent of the pre-project population, it was not assessed to be important. Operations-related population increases did not measurably affect the size of any of the Study Area groups. Overall, the population of the host communities was not affected to any significant degree.

The influx of construction workers and their families was not a cause of any adverse impact to the host communities. The work force consisted primarily of young single males with different social activity patterns compared to those of the resident population. Although social integration and interaction between the newer groups and the existing residents were limited, no social problems or conflicts between the groups surfaced. In the long-term, there were no noticeable effects on population

characteristics because of plant construction and operation. In 1975, following the end of construction, a marked decline in population occurred, due to significant out-migration. The most dramatic change since the start of the project was the in-migration of the suburbanites: the construction and operation of the nuclear plant did not play a role in this growth.

Except for creating a small shift in the housing stock from single-family to multi-family structures in Delta Borough, the impact of the plant on housing and settlement patterns was temporary and minimal.

Historically, Peach Bottom Township has been a rural community with scattered farms, and this pattern has not changed. During the study period, a substantial growth in suburban housing stock occurred. This growth was a result of the rural suburbanization of residents from Maryland, not the construction and operation of the plant. Suburbanization continued to increase steadily following the end of construction and the out-migration of construction workers, suggesting that suburban growth was not plant-related.

Delta Borough did not experience much growth in the housing sector during the study period. The movers were mostly single males who rented rooms or apartments for the duration of the construction period. The change that did take place in the housing stock resulted from the provision of rental units in single-family houses and the conversion of a few single-family dwelling units to multi-family apartments. When the construction workers moved out of those apartments, they were replaced by a new social group of people of generally lower socioeconomic status than that of most Delta Borough residents. There was a concomitant loss of local control of housing in the Study Area as the ownership of the multi-family units transferred to absentee landlords. In addition, there is some evidence to suggest that the construction of the plant aided in the conversion of seasonal vacation homes to year-round dwelling units. Overall, the magnitude of the changes in the housing sector due to the plant was small.

The size and structure of public administration in the local area remained basically unchanged during the study period. The revenues generated by the plant were not sufficient to warrant major expansion and upgrading of the area's public facilities and services.

The township invoked a 1 percent tax on income earned in the township, including that of the construction and operation workers. This tax generated the most significant revenues for the township during the study period, a high percentage of which were due to the project. In 1969, total revenues to the township were estimated at \$80 thousand, and in 1974, they were approximately \$300 thousand. In 1969, 37 percent of total revenues were from the earned-income tax, but in 1972 and 1974, the earned-income tax accounted for over 60 percent of total revenues. These revenues enabled the township to lower the property tax millage rate from 13 mills in 1970 to 2 mills in 1973, the lowest in York County. During the operations period, however, as the payroll of the project declined, the revenues to the township from the earned-income tax also declined: in 1975, the total township revenues were almost \$133,000 less than they were the previous year.

The effects of the project on demands for and availability of education, transportation, public safety, and social services were examined. With respect to the effects of the plant on the provision of educational services by the school district, two points are conspicuous. During the study period, there was no project-related increase in expenditures by the school district in the Study Area. By itself, the increased enrollment due to the project would not have exceeded the capacity of the schools, but since the project coincided with increasing suburban growth, overcrowding did occur until additional facilities were made available.

The increased revenues from the plant were negligible in Delta Borough and were not sufficient to increase the levels of most public services in the township. Expenditures for maintenance and the improvement of streets and highways did increase substantially because of the revenues from the plant, but public safety, social services, and other public services remained at levels similar to those in existence before the project began.

Overall, the construction and operation of the Peach Bottom plant had very little effect on the groups and only a moderate effect on the social processes and interrelationships between the groups.

For the old-timers of the area, the construction project did not result in any changes in the overall characteristics or positions of the group--the old-timers remained the dominant social group in the area. Had there been greater permanent

economic change, residential growth in Delta Borough, and in-migration of a sizeable operations work force as permanent residents, the old-timers social group may have been altered. However, the families within the old-timers group were not much affected by the in-migration of the temporary construction workers, who, on the whole, did not become integrated into the established social fabric.

For the agricultural community, the project increased its political position as a result of its involvement in litigation/licensing hearings and because of growth and development policy initiatives that were indirectly attributable to the plant. The group's economic position was essentially unaffected by the plant. Overall, little structural change occurred in the agricultural group over the thirteen-year study period. The in-migration of suburbanites resulted in political strains between the two groups. The pressure toward growth and change in the township, symbolized by the nuclear power station, had the effect of reinforcing the traditional value system of the farming community and heightening their concern over preservation of the agriculture way of life.

The political changes in the local area were characterized by changes in leadership as a result of the emergence of new constituencies and public interest groups. In Delta Borough, the traditional administration gave way to younger businessmen and professionals and new in-migrants. The nuclear plant was not a factor in this change.

The township's decision-making process, formerly based upon community consensus and approached in ad hoc fashion, was replaced by public interest group confrontation, policy development, and formal political activity, at least partly as a result of the nuclear plant. The emergence of environmental concerns as political issues in the township was largely a consequence of political activity over the Peach Bottom station.

10.3.2 The Impact of the Three Mile Island (TMI) Accident on the Peach Bottom Area

The seriousness of the threat to safety posed by the Peach Bottom plant as evaluated by residents of the Study Area clearly increased because of the TMI accident. Although the perceived seriousness of the TMI accident itself had substantially diminished by the time the survey was taken (August 1979), a similar decline had not taken place in the level of concern over the Peach Bottom plant. This may be explained by events that were specific to the Peach Bottom plant, the

activities of a local environmental group, township meetings over nuclear plant-community problems, and plant-operational problems at the time.

The TMI accident certainly heightened existing concerns over the Peach Bottom plant and was responsible for an increased level of public awareness of the hazards associated with nuclear technology. Forty percent of the population in the Study Area expressed concerns directly related to TMI, and a number of safety issues arose in the Study Area subsequent to the accident.

When respondents were asked the degree to which they perceived their safety was threatened during the two-week emergency period following the TMI accident, 17.2 percent said they perceived the threat to safety as "very serious." Another 13.2 percent of the respondents considered the threat as "serious," and a further 32.4 percent felt that the situation at TMI was "somewhat serious" during the two-week period. In all, about 20 percent of the respondents considered the events at TMI as "serious" or "very serious" threats to their safety. However, 30 percent of the sample did not consider the events at TMI as threats to their safety. In response to a question regarding concern with radioactive releases from the Three Mile Island plant during this period, 34.4 percent of the respondents said they were "very concerned," 30.8 percent said they were "somewhat concerned," and 28.4 percent expressed no concern.

The perceived seriousness of the threat to safety showed a noticeable decline in the five months following the accident. The percentage of the sample population who thought that the accident at TMI posed a "very serious" threat to safety declined from 17.2 percent to 7.2 percent. Likewise, the proportion of respondents who were "very concerned" over discharges of radioactive substances from TMI fell from 34.4 percent to 19.6 percent. However, in August 1979, 35 percent of the population was still "somewhat concerned" about the release of radioactive emissions from Three Mile Island, about the same level of concern expressed during the emergency period.

The respondents were asked to rate the current threat (at the time of the survey) posed to themselves and their families' safety by the location of the Peach Bottom nuclear plant in their area (Table 10-2). The same question was asked with respect to their assessment of the threat posed by the plant before the TMI accident. Before the TMI accident, a small percentage (9.2 percent) of the population viewed

the Peach Bottom plant as a "serious" or "very serious" threat to safety, with a total of 56.8 percent indicating that the plant presented "no threat." Subsequent to the accident, the percentage that viewed the plant as either a "serious" or a "very serious" threat climbed to 22.8 percent, and the percentage who indicated "no threat" declined to 32.0 percent. Clearly, the accident at TMI increased the level of perceived threat posed by the Peach Bottom plant.

The respondents were asked to identify the three issues or concerns with respect to the Study Area that they felt were most critical. Approximately 50 percent of the respondents could not identify any issue of importance to them. Twenty-six percent of the responses concerned the lack of public services, especially the level of police protection. As an important community issue or concern, the Peach Bottom plant was mentioned by only a few respondents and constituted a mere 5.4 percent of all responses to this question.

In the context of other community concerns and issues, the nuclear station is viewed by the community as less important than the need for improved public services. The need for expanded employment opportunities and the problems associated with the abandoned quarries in the region were considered to be as important as the nuclear plant.

10.3.3 Community Well-Being

Overall, the respondents to the survey and other interviews expressed a positive view about living in the area. When asked to rank the area as a place to live, approximately 75 percent of those interviewed indicated they thought that the area was either a "good" or an "excellent" place to live. A highly favorable attitude toward the Peach Bottom area was also indicated by the answers given to a question regarding the disadvantages of living in the area. About 28 percent of the responses to this question were that "no disadvantages" were found in living in the area near the plant. The principal disadvantage reported was the lack of or distance to public services: 43.6 percent of the responses identified this problem. The disadvantages of having a nuclear plant as a neighbor (17.5 percent of the responses to the question about disadvantages of living in the area) did not seem to detract from the general benefits of living in the area.

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