Study plan : socioeconomic assessment, Exxon Crandon Project. 1980

Austin, Texas: RPC, Inc., 1980

EXXON MINERALS COMPANY

CRANDON PROJECT

SOCIOECONOMIC STUDY

prepared by RPC, Inc.

STUDY PLAN

SOCIOECONOMIC ASSESSMENT

EXXON CRANDON PROJECT

prepared for
Exxon Minerals Company

by
RPC, Inc.
Austin, Texas
Madison, Wisconsin

September 1980

SUMMARY

Exxon Minerals Company has commissioned studies of possible environmental and socioeconomic effects of a proposed zinc/copper deposit on the area and on project neighbors. A careful and responsible assessment of environmental effects, such as those on air and water, is underway. The socioeconomic assessment in progress is a comprehensive study of possible project effects on sociocultural and economic conditions of the area, including effects on Native American communities. Exxon Minerals Company has three purposes for the overall socioeconomic study:

- Provide information to the Wisconsin Department of Natural Resources that will allow that agency to assess the overall effects of the proposed project
- Develop information that will be useful to local officials in planning and management for potential growth resulting from the project
- Provide Exxon Minerals Company with necessary information for company planning

The socioeconomic assessment for the proposed Crandon Project is the basic tool by which issues can be identified and addressed. It is intended to be a decision-making tool. More particularly, it will help many decision-makers with many kinds of decisions:

- Should the state issue a permit for the project?
- Should a county invest in certain public facilities?
- Should a homeowner expect property taxes to go up or down?
- Should Exxon develop the project rapidly or slowly?
- Should a Crandon merchant invest in more display and selling space?

- Should a Milwaukee homebuilder begin operations in the Crandon area?

- Should Native American tribal leaders support a mining-related job training program?

The assessment itself will forecast several possible futures. One of these is the next half-century of the Crandon area without the project--this is called the "without-project" future. The others are the futures that would result from each of several different sets of actions by Exxon, governments, and citizens. Each of these "with-project" futures is determined by examining various possible project plans.

What will these predictions cover? The ideal prediction might seem to be a report that describes every aspect of life in the region that might be affected by the project and that anyone cared about. Even if such a detailed study could be completed in a reasonable time for a reasonable cost, the result would be useless. It would be so detailed and complicated that people would have great difficulty making practical use of it. The key to a useful assessment, then, is to identify the particular aspects of the project's consequences that are important to residents and others, and to strike an appropriate balance between detail and usefulness.

We know from studying similar projects that at least seven basic classes of effects are likely to result from the proposed Exxon development:

1. Changes in population (Demographic Analysis)

2. Changes in employment and business (Economic Analysis)

3. Changes in type, size, and location of the housing stock (Housing and Land Use Analysis)

4. Changes in government behavior (Public Facilities and Services Analysis)

5. Changes in government taxing and spending (Fiscal Analysis)

6. Changes in the way people behave individually and in groups (Sociocultural Analysis)

7. Changes in the lives of Native Americans to the extent that they differ from the other six changes (Native American Communities Analysis)

STUDY ELEMENTS

In the next several pages, we will describe our approach to the seven parts of the study listed above and how they will be distributed and used. The remainder of this study plan is a more technical description of the study that tells how we will perform the research.

Demographic Analysis

In concept, the demographic analysis involves the simplest predictions to make. It estimates the number of people who will live in the local study area each year for 55 years. The more people who can be expected to live in the area with the development than without it is the growth that results from the project itself. There will be a series of with-project estimates. Each one assumes a different policy Exxon might have for job training and employment.

These predictions are not much use in themselves, because population is unlikely to grow so much that crowding or other direct effects will be important. They are, however, very important for predicting the consequences of growth. These consequences will show how people will experience the effects of development.

Economic Analysis

Changes in the way people go about making a living, and their success at it, will be among the most important effects of the proposed Exxon development. New opportunities will arise, new customers will appear on the scene, and there may be competition for use of some resources, such as land. The economic forecasts we propose to make are sophisticated ones, describing production (the amount of goods and services created), employment (how many people are engaged in production), and income (how much money is earned) for 21 portions of the local economy. These 21 sectors are listed below:

1.	Agriculture	Processing Sectors
2.	Forestry, wood, and paper products	
3.	Heavy metals mining	
4.	Stone and clay mining	
5.	Construction	
6.	Food processing	
7.	Zinc and copper processing	
8.	Manufacturing	
9.	Transportation, communication, and utilities	
10.	Wholesale and retail trade	
11.	Finance, insurance, and real estate	
12.	Tourist and recreation services	
13.	Other services	
14.	Government enterprises	
15.	Households	
16.	Value added	Final Payments Sectors
17.	Imports	
18.	Government	Final Demand Sectors
19.	Exports	
20.	Capital investment	
21.	Consumption for unearned income	

We will make these forecasts for the state as a whole and for the local study area. It will be possible to see from these projections how the overall economy of the local study area changes as a result of the project, and--more important--how specific sectors of the economy fare. This will make it possible to anticipate negative effects that might otherwise be lost in an overall summary, and to plan the project's specific development to prevent or reduce those effects.

Housing and Land Use Analysis

While housing is merely a sector of a complicated economic system, it is one that typically experiences the most important changes when new development occurs and one that has most to do with how people feel about their overall quality of life. Accordingly, we plan to make a special study of the housing stock in the local study area and predict not only how many units are likely to be provided and how much they will cost, but where they will be built, with and without the project.

The housing study will pay particular attention to alternative approaches to providing temporary housing for construction workers and other possible strategies to be sure that housing requirements are met.

Public Facilities and Services Analysis

Population increase and change in tastes and expectations of residents affect the provision of public services in several different ways. Chief among those are (1) additional or different services may be needed to provide adequate or minimum levels of service for a larger population, and (2) additional services may be demanded by new residents because their expectations of local government differ from current residents' expectations. We will forecast the following public service needs and associated costs both with and without the project:

- Education
- Law enforcement
- Fire protection
- Health care
- Municipal water supply
- Wastewater treatment and disposal
- Solid waste disposal
- Streets and roads
- Railroads
- Air transportation
- Social services
- Library services
- Senior citizens programs
- Recreation
- Electricity
- Natural gas
- General government administration

Fiscal Analysis

Public services cost money; population growth and rising income and investment increase tax revenues. These effects, and more complicated ones, will affect the fiscal position of local and state governments and, through taxes, the pocketbooks of residents. The fiscal analysis will predict the effects of the project on each affected taxing district and will present those consequences as far as possible in terms of their effects on individual taxpayers.

Sociocultural Analysis

The economic and population measures involved in the previous analyses are important characteristics of the project's effects on Wisconsin and on the local study area, but development has other, equally important, consequences for the "quality of life" that must be described in more subtle ways. We will provide this description of the sociocultural effects of the Crandon Project using both relatively objective indicators of sociocultural conditions, such as

crime rates and divorce statistics, and "softer" measures, such as school quality. The analysis will focus on aspects of the "quality of life" that people in the local study area think important. We will determine what these aspects are by an initial survey research effort.

Native American Communities Analysis

We will conduct a study of the effects of the Crandon Project on the two Native American populations near the discovery site. The analysis will consider potential effects of the project on tribal economy, population, housing, public facilities and services, fiscal conditions, and sociocultural characteristics. We will seek the cooperation of Native American leaders and tribal members to address the issues they find important in ways that are useful and credible to them.

Analogous Communities Analysis

The foregoing studies are predictions of the future as the Crandon Project will affect it. We will also make a separate study of communities that have already undergone development, whose situations are as similar to Crandon's as can be found. This research will be concerned with events that have already occurred, rather than forecasts, and will provide two useful results:

1. A check on the validity of our forecasts

2. Guidance as to successful policies that Exxon and local governments might pursue for project development

GENERAL CONSIDERATIONS

A detailed description of what the study will cover is found in the following chapters of the study plan. Here we review some basic considerations in our prediction process and the plan of the study.

Our basic prediction process is to obtain a careful description of current conditions. We will then apply, in each part of the study, understood and validated principles of economics and social science that describe how communities and regional economies develop over time. This development is different with and without the project, of course. However, the prediction process is valid because the economic and other forces that change the present into the future, and the future into the more distant future, are relatively constant.

Some of these predictions interact: we need to know the population levels at different times to predict the response of the housing market, at so on. Furthermore, we must make the predictions for both local and statewide effects, depending on the effects in question.

A local economy and culture is an extremely complicated mechanism. It can never be described in complete detail because it is made up of people whose behavior is only approximately predictable. Consequently, predictions are less accurate insofar as they try to forecast the more distant future, and insofar as they try to provide extremely detailed results. For example, we can predict the total demand for housing in Forest County for 1990 rather well, but we can predict the number of families in a given township with much less confidence, and we have no idea which family will live in a particular new house.

Fortunately, the prediction techniques we plan to use are relatively accurate in describing the differences that various alternative policies will cause in basic conditions. For example, our predictions of laborers' income with or without the project in 1995 are approximate at best. Intervening national events and random local developments (even the development of another mineral deposit not yet planned or even discovered) might affect these predictions greatly. But most of these influences affect both predictions--with-project and without-project--in the same way; the difference in laborers' income between the two futures can be predicted with some confidence. Since this difference is the effect of the Crandon Project, the prediction process is much more useful than the uncertainty in particular estimates might imply.

We will present the results of the studies at a level of technical sophistication that will allow professional review and criticism. The results will also, insofar as possible, describe the consequences of the project for particular groups of people. Our ideal is to allow anyone to "look himself or herself up" in the project reports and see how he or she--at least people similar in income, location, occupation, and age--will fare with and without the proposed Exxon development.

Finally, the study will not simply produce a batch of finished reports. It will also provide computer models and other devices that can be used to answer questions about the project that will certainly arise as decision-makers consider the first results. The immediate use of these computer models will be to identify negative effects and to test strategies for overcoming them. It will also be possible to predict other effects, or types of effects, that arouse interest as the first study results are reviewed.

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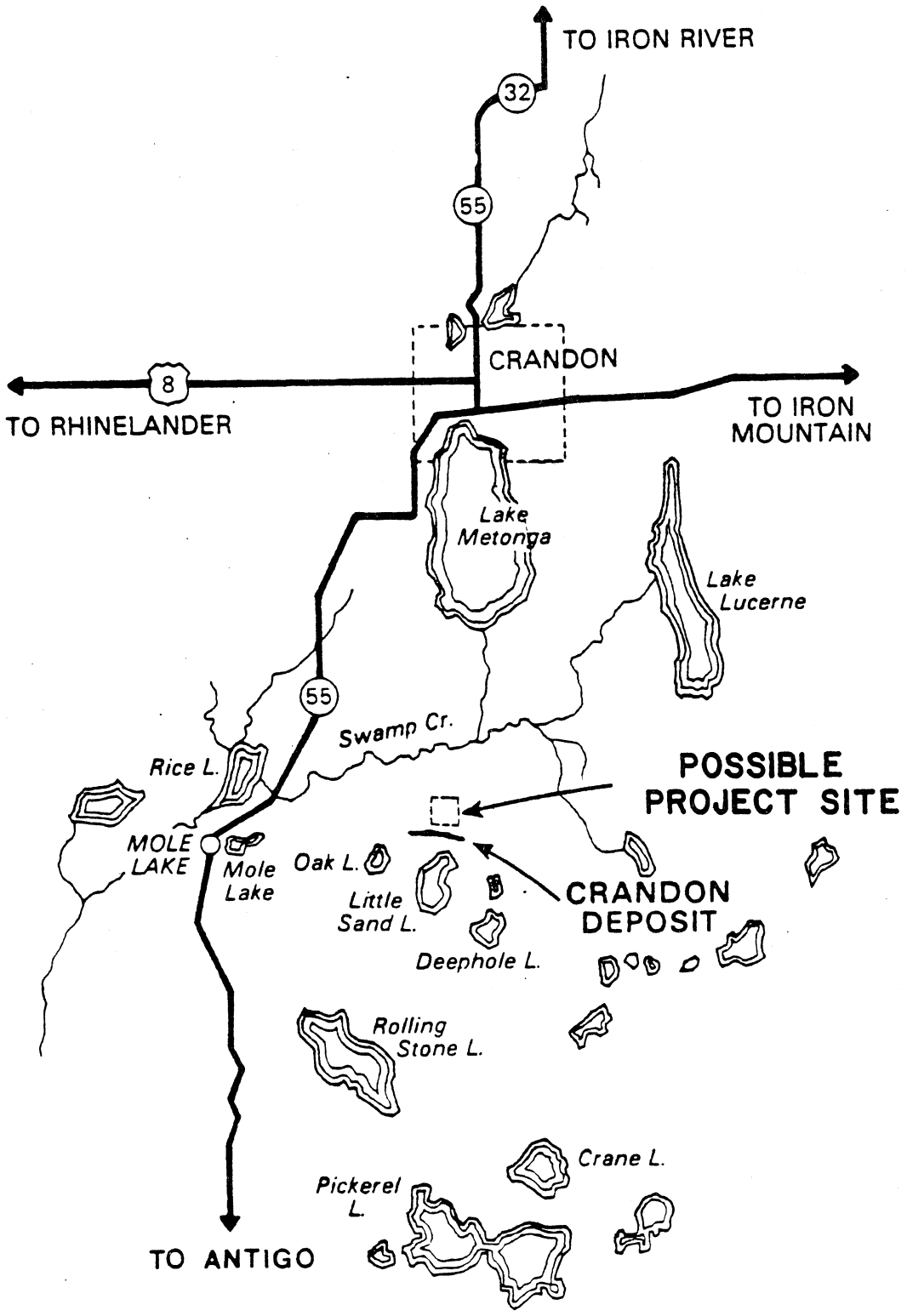
1. THE CRANDON PROJECT

A substantial zinc/copper deposit is located near the city of Crandon in northeastern Wisconsin. Its development will require construction of a mine/mill complex to extract ore by underground methods and to concentrate the ore prior to shipment for further processing. Construction and operation of this facility may substantially increase the population and economic activity of parts of Forest, Langlade, and Oneida Counties and may have other socioeconomic effects.

Figure 1 is a map locating the proposed project site in relation to cities, highways, and lakes. The ore body lies in an area of rolling glacial terrain that is almost completely forested with second-growth hardwoods consisting primarily of maple, birch, basswood, and oak. The northern portion of the area drains northward into Swamp Creek, which flows westward into Rice Lake. The southern part of the site drains southward thorugh and around Little Sand Lake and into Rolling Stone Lake. Low-lying areas nearby contain tamaracks, balsam, fir, and spruce. The surrounding area contains several relatively small, shallow lakes, marshes, and swamps. The Mole Lake Indian Reservation, surrounding Rice Lake, lies two miles west of the ore body. The Potawatomi Reservation lies east of the ore body at a somewhat greater distance. Many of the lakes in the

Figure 1

RELATION OF POSSIBLE PROJECT SITE TO CITIES, HIGHWAYS, AND LAKES



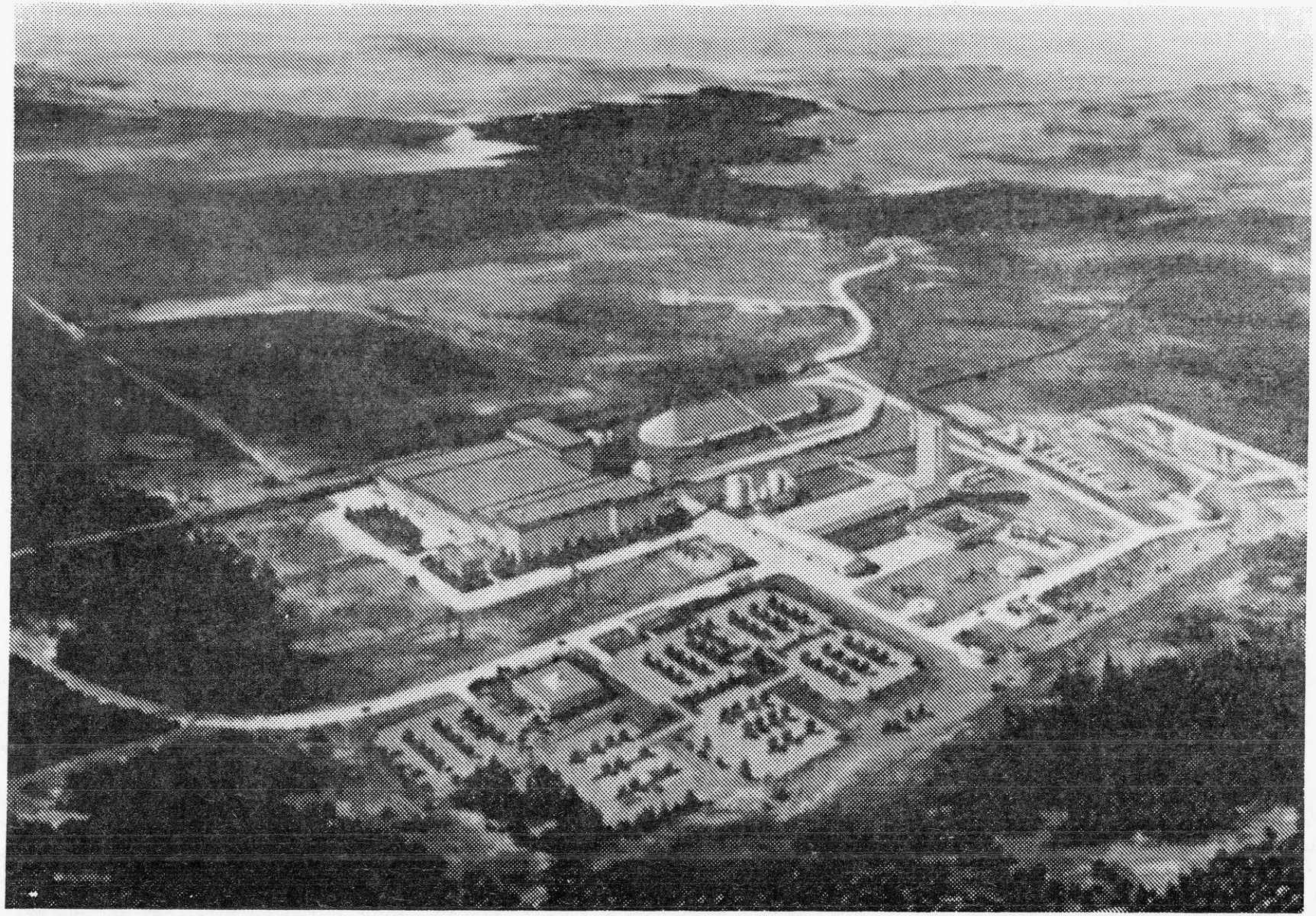
area surrounding the proposed project support resorts, cottages, or summer homes.

The extraction and primary crushing machinery to break up the ore will be underground. However, Exxon expects to construct a cluster of buildings on the surface for offices, maintenance, and to concentrate the ore. These surface facilities will require about 100 acres, approximately one-third occupied by the buildings. The tallest structure will be about 160 feet high. Most of the noise will be confined underground or by the buildings that enclose the machinery. Figure 2 is a preliminary drawing of the possible configuration of the surface facilities. Exxon expects to use an additional 600 to 1,000 acres for tailings, waste rock, and water treatment.

To develop this mineral deposit, Exxon Minerals Company must secure several dozen state and local approvals and possibly Federal approvals, and must obtain zoning approval from Forest County. Wisconsin requires Exxon to secure a metallic mining permit as well as air, water, solid waste, and related approvals. Additional permits may be required from federal governmental agencies, such as the U.S. Environmental Protection Agency and the Corps of Engineers. Exxon must also provide sufficient information so the Wisconsin Department of Natural Resources (DNR) can comply with the Wisconsin Environmental Policy Act (WEPA), and federal agencies can comply with the National Environmental Policy Act (NEPA). State regulations, summarized in "Preliminary Draft Number 2, Environmental Regulations, Data and

Figure 2

PRELIMINARY DRAWING OF PROPOSED PROJECT FACILITIES



Monitoring Requirements for Metallic Mineral Development in Wisconsin," give the DNR principal responsibility for regulation of the effects of mining. The regulations require particular attention to potential socioeconomic effects of mining projects.

2. THE STUDY PLAN

PURPOSE OF THE STUDY PLAN

Exxon has selected RPC, Inc. as its principal socioeconomic consultant. This study plan describes the socioeconomic assessment Exxon has commissioned as a major part of its effort to provide information necessary for good company and community planning and to acquire necessary regulatory approvals for the proposed Crandon Project. We will incorporate the assessment resulting from this study into the Environmental Impact Report (EIR) required by WEPA, and into supporting documentation for other regulatory approvals.

We circulated a draft of the study plan to state officials, local officials, tribal officers, and other interested parties at the beginning of the study to:

1. Let all interested parties know what work Exxon considers adequate to describe the possible socioeconomic effects of the Crandon Project, to provide for company planning, and to satisfy regulatory requirements

2. Hear from all interested parties on the adequacy of the scope and methods in this draft in light of regulatory requirements

3. Find out what modifications may be necessary to compile a final study plan that describes an adequate socioeconomic assessment in the opinion of state officials, local officials, tribal officers, and other interested parties

We revised the draft study plan based on evaluation of comments received and on changes we made in the plan of study during initial data collection.

HOW THIS STUDY PLAN IS ORGANIZED

Chapters 1 through 3 of this study plan provide background material on the project, the entire study, and RPC, Inc. Chapter 4 describes the communications aspects of the study; chapter 5 provides procedural information on the central elements of the study; chapter 6 provides information on data gathering. In chapters 4 through 6, we describe the objectives and approach involved in completing each study element.

Some definitions of terms used in this study plan are in order at this point. We use the term "local study area" to refer to the area that is likely to be affected by the project. Regional effects will most likely be statewide, therefore "state" refers to greater-than-local project effects. "Project site" refers to the immediate vicinity of the proposed mine/mill complex. These and other definitions also appear in the glossary.

SUMMARY OF TECHNICAL APPROACH

The Crandon Project is a large one, both on its own terms and in comparison to the population and economy of the local study area. Furthermore, it will go on for many years. The socioeconomic study will forecast the effects of the project so Exxon, state government, local governments, and project neighbors will have time to respond to them.

The basic philosophy of this prediction process is to describe the differences in the local study area as it is most likely to be in future years without the project (without-project future) and as it will be as the project goes ahead (with-project future). We will compare the without-project and with-project futures to determine what changes result from the project and what changes would occur anyway over the course of time.

For a project of this size, analysts typically use several different forecasting techniques. The forecasting problem is complicated by the fact that different aspects of the quality of life interact: the state of the housing market in Crandon in 1985 will affect the population and the decisions made by local governments in 1987. This study plan describes a rather complicated process of forecasting many different dimensions of life in the local study area and their interactions in great detail. However, the basic approach is fairly simple:

1. We will identify the important socioeconomic aspects of the local study area that the project may affect, and we will carefully describe current conditions.

2. We will also carefully describe how actions by Exxon, governments, or individuals may affect these socioeconomic aspects in subsequent years. We will summarize those descriptions in models.

3. Each of these models will allow inclusion of different assumptions and possible actions by governments and private parties.

4. These models will be capable of describing several different futures the local study area can expect, depending on decisions made by Exxon, state and local governments, and the project neighbors, not only at the beginning of the project, but in subsequent years as development proceeds.

5. The most important difference, of course, is the difference between the future without the development and with the

development. "The development" or "the project" can mean several different things depending on the way both Exxon and local governments respond to events. Many of these responses are currently planned or under consideration, and it is the scenarios that result from these plans that we will evaluate first. Part of this evaluation will be a comparison of scenarios to a forecast of what the area would be like without the project. All of the changes that may occur with development of the project are not necessarily attributable to the project. Change is inevitable with time.

6. An important part of the study plan is to categorize the effects of development relative to the without-project future on different people and groups in the local study area. Not all of these effects will be positive; one of the principal reasons for doing this socioeconomic study is to discover the negative effects that would occur if everyone went ahead as planned. Thus, we can discuss changing the plans to mitigate or avoid undesirable effects.

7. In the final part of the study, we will select the combination of scenario elements and mitigation strategies that make the development project as nearly as possible beneficial to everyone concerned. We will use this information as a basis for cooperation among Exxon, local governments, and interest groups in dealing with the effects of the project.

We must point to some general qualities of this process at the outset. First of all, any forecast, especially one running more than a decade into the future, is approximate and includes important uncertainties. There is simply no way to forecast the future with great precision. Therefore, we will often have to state our forecasts as ranges covering probable variations. We have chosen models to allow us to forecast the future as accurately as possible. These models represent the state-of-the-art in forecasting socioeconomic effects. We will highlight and explain the uncertainties that remain as the analysis proceeds.

Second, the study plan recognizes the need not only for research but also for planning and decision making. We have designed the study plan to encourage feedback for the communication and balancing of interests among the parties involved in the proposed Crandon Project.

GETTING FEEDBACK ON STUDY RESULTS

We will make all interim and final reports of the study available for public review as the work progresses. We have retained a number of senior social science professionals to review each step of the research and analysis. These professionals will examine the completeness and validity of the work and will suggest revisions to the study plan as circumstances dictate. We selected the reviewers because of their national reputations in their fields; in addition, many are residents of Wisconsin (see Table 1, page 14).

We will distribute interim results of the study to government officials and the interested public through a series of reports. These will describe the methodology used to perform a certain analysis, the data used, and full reference to the authorities consulted. When we complete the socioeconomic portion of the EIR, we will distribute it for public review. We are circulating these documents so we can find out how those affecting and affected by the project feel about the study as it progresses. If we learn of gaps or inaccuracies in the work as the study progresses, we can make the final document a better guide to planning and decision making.

The effects of the Crandon Project are not preordained. They will depend on decisions made by Exxon, state and local governments, and by residents of the area. This study will be one of the most complete bodies of facts and projections ever assembled on the local study area. Because of this, the study will be an important resource for those in both public and private sectors. We intend to make the study and its supporting documentation available to the people of Wisconsin to enable them to better manage growth in the area.

HOW TO COMMENT ON THE STUDY

Ultimate responsibility for the conduct and release of the socio-economic study rests with Exxon. Direct comments, suggestions, and requests for information to any of the following:

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3. BACKGROUND OF RPC, INC.

Exxon chose RPC, Inc. (Research and Planning Consultants), as its principal socioeconomic contractor through a careful selection process. The following information describes the background of the professionals we have assigned to the study team. Table 1 lists members of the study team with their institutional affiliations and professional credentials. Those with university affiliations are subcontractors. If you would like more information about RPC, contact Dr. Luke or Mr. Tull.

DEMOGRAPHIC, ECONOMIC, AND FISCAL EFFECTS

We have a great deal of experience in the assessment of demographic, economic, and fiscal effects. The central model for these assessments is one developed by the state of North Dakota. Dr. Leistritz served as a principal investigator on research projects sponsored by the Department of Energy for development of this model, and he recently participated in adapting the latest version of the model for use in East Texas. The adaptation is now operational. This experience in the problems and quirks of transferring a model from one state to another and from one computer to another is an important contribution to the project execution. Mr. Tull has, for the past three years, directed development of demographic, economic, and fiscal models for the Minnesota Copper/Nickel Project.

Table 1

MEMBERS OF THE STUDY TEAM

Judith Burton	M.A. in Social Services Research
Denise Girard	B.A. in Biology
William Gorman (New Mexico State University)	Ph.D. in Agricultural Economics
Nancy Grona	M.A. in Communications
Neil Hahn	M.B.A. in Finance
Pat Hamilton	M.S. in Community and Regional Planning
Jack Huddleston (UW-Madison)	Ph.D. in Agricultural Economics
Kathy Kennedy	M.B.A. in Market Research
Jim Kimmel	M.Ph. in Resource Sociology
Allan King	Ph.D. in Economics
Robert Lansford (New Mexico State University)	Ph.D. in Agricultural Economics
Larry Leistritz (North Dakota State University)	Ph.D. in Agricultural Economics
Ronald Luke	Ph.D. in Public Policy; J.D.
Jim Mertes	Ph.D. in Recreation Planning
Steven M. Murdock (Texas A & M University)	Ph.D. in Sociology
Jim Murray (UW-Green Bay)	Ph.D. in Economics
Mike O'Hare (Mass. Institute of Technology)	M.Arch; Ph.D. in Engineering
Ann Orzech	M.A. in Economics
Robert Peterson (UT-Austin)	Ph.D. in Market Research
Andy Reed	M.S. in Park Administration
Charles Stern	M.A. in City and Regional Planning
Roy Tull	B.A. in Biology
Edwin Warren	B.A. in Economics
Keh-Chiang Yu	M.A. in Computer Science

In addition to our experience in adapting these types of models, we have had considerable experience in developing them. We conducted a two-year study for the state of Texas on the onshore impacts of outer continental shelf oil and gas development. During this study, we developed a comprehensive methodology for the assessment of economic and fiscal effects. In a followup effort, we generalized this methodology and computerized it into the social and economic component of the activity assessment routine. We have used this methodology to prepare assessments used for testimony on socioeconomic effects of water developments, pipelines, liquefied natural gas terminals, oil terminals, and a proposed inland canal industrial park.

We will use a subregional modification of the University of Maryland's INFORUM model as the principal economic model for the study. We have worked with input/output models over the past several years in all the studies listed above. Ms. Orzech has contributed to the development of the regional input/output models for five areas on the Texas coast. This work involved the same steps required to apply the input/output model to the local study area in Wisconsin.

Dr. Lansford and Dr. Gorman also have experience with the use of input/output models and impact analyses. They have prepared economic impact studies on irrigated agriculture, grazing schemes, transmission lines, and mineral development in New Mexico. They have applied economic models to Native American reservations for the Navajo Tribe and the Bureau of Indian Affairs. Through contacts with Los Alamos Laboratory, they have experience with the INFORUM model. Mr. Tull

supervised the development and implementation of an I/O model for forecasting regional economic effects from copper/nickel mining in northeastern Minnesota.

The economic studies encompass much more than modeling. They require the development of profiles and projections of future development of industries in the local study area. Dr. Murray has performed this sort of analysis for a variety of cities, corporations, and planning councils in Wisconsin, Michigan, and Minnesota. He has examined prospects for industrialization in various small towns and Native American reservations. Likewise, Dr. Luke has prepared studies of potentials for nonindustrial economic development for the state of Maine. These studies examined fisheries, agriculture, and tourism/recreation for the entire Maine coast. Mr. Tull directed an economic study of Ely, Minnesota, and a fiscal analysis and impact study of eight communities in northeastern Minnesota.

One of the most important studies within the assessment is the development of a clear understanding of the dynamics and contribution to the economy made by tourism and recreation. Dr. Mertes and Mr. Reed have performed a variety of studies regarding the dynamics and economics of recreational areas and facilities. These studies have been performed for the U.S. Forest Service, the U.S. Corps of Engineers, the American Metals Climax Corporation, Texas Tech University, North Texas Council of Governments, and the Brazos River Authority.

Mr. Hahn is particularly qualified to provide management consultation on fiscal impacts of projects. For many years he served as the regulatory affairs manager to the City Public Service Board for the city

of San Antonio. During this time he was responsible for cost of service studies, rate designs, and regulatory filings. He is familiar with the various rate designs which can be used to effect certain distributions of costs of municipal services. He is also capable of directing cost of service studies in order to determine more precisely the types and levels of municipal service costs which may be encountered during rapid growth.

HOUSING, LAND USE, AND MUNICIPAL SERVICES

We have many years of experience in the analysis of land-use questions. Our first project was the development of an eight-volume study on land-use management policies in Texas. Dr. Luke was the principal author of the policy analysis and recommendations contained in this study. Previously, he was responsible for developing the land-use and land-banking concepts contained in the study, A Maine Manifest, prepared by the Allagash group for the state of Maine.

We have also prepared over a dozen comprehensive plans for cities and counties in Texas. These plans have addressed housing conditions, housing development trends, necessary land-use controls, and the development of capital improvements. Many of these towns, such as Mt. Pleasant, have experienced rapid growth related to the development of natural resources. We recently completed a series of impact planning reports funded by the Coastal Energy Impact Program of the Department of Commerce for cities and counties on the Texas coast that have experienced rapid growth from energy-related developments. These studies all concern the

housing and municipal service needs of these areas. They also address the need for adoption or revision of land-use controls in order to better manage the effects of growth.

Mr. Kimmel previously worked with 23 small towns and counties in East Texas to develop the necessary information on housing, municipal services, and land use to qualify these communities for HUD-sponsored community development block grants. He has recently completed an area Housing Opportunity Plan for the Middle Rio Grande Valley Council of Governments. This plan addresses current housing conditions, housing trends, possible assistance to alleviate needs in the area, and recommendations for action by federal, state, and local governments. Mr. Tull directed a computer-based land-use study of rural areas and communities of the potential copper/nickel mining region of northeastern Minnesota.

Drs. Gorman, Lansford, and Mertes have directed various studies for government agencies in the western United States concerning the proposed role of government in Native American land development, agriculture, mineral development, and forestry. Dr. Mertes is also involved in studies for the U.S. Corps of Engineers and Forest Service on the proper policies for development of second homes in forest areas and the development of green space in relation to major water-development projects.

The social and economic component, which we developed for the Texas Coastal Management Program, required us to become familiar with the interrelationships of economics and municipal services in rapidly growing areas.

We also have extensive experience in helping communities, counties, and state agencies meet the requirements for federally funded projects. This experience will serve us well in analyzing the implications of federal regulations that might have a bearing on the project, the local study area, and the state of Wisconsin.

In addition to the foregoing research experience, Mr. Kimmel, Dr. Luke, and Mr. Tull have worked with local governments. Dr. Luke has been a senior staff member and a board member for regional human service delivery agencies. These positions have involved responsibility for the general planning of service delivery programs in both urban and rural areas. His doctoral dissertation concerned design of a state and local mental health system using principles of operations research and organizational dynamics. The same principles can be applied to an analysis of the managerial needs of the local study area and its development of various services to meet the demands of rapidly expanding population. Mr. Tull served as an advisor to local units of government while at the Sigurd Olson Institute of Wisconsin's Northland College, and he has written articles on community planning and zoning.

SOCIOCULTURAL ASSESSMENT

For preparation of the sociocultural assessment, we will call on the experience of Mr. Kimmel, who has had principal responsibility for performing sociocultural assessments in previous RPC socioeconomic and environmental impact studies. We have performed sociocultural

assessments in regard to industrial park siting, development of water resources, and port development.

Several of these projects involved the design and administration of questionnaires as contemplated for this study. In administering such questionnaires, we draw on our seven years of experience in market and opinion research. Our market and opinion research staff has conducted hundreds of commercial and political marketing surveys for firms throughout the nation. This experience enables us to organize, supervise, and control the quality of a field effort in Wisconsin.

NATIVE AMERICAN STUDY

Dr. Murray, of the University of Wisconsin at Green Bay, has worked on a number of economic development projects for Native Americans, including those groups in the local study area. Dr. Gorman and Dr. Lansford of New Mexico State University have also been very much involved both in economic development projects for Native American groups and in the assessment of socioeconomic effects from development projects in the territories of Native Americans. Work performed by Dr. Leistritz in North Dakota has involved considerations of the socioeconomic effects of energy development on Native Americans.

ANALOGOUS COMMUNITIES

For the past two years, Dr. O'Hare and the MIT energy research project have been collecting and analyzing studies of energy impacts on rural communities. They have also examined siting controversies surrounding

projects which have gone forward and projects which have not. This will enable us to assemble not only relevant work already published, but work in progress.

We have also done extensive case study work on energy impacts in small communities. As part of the outer continental shelf study, we assembled case studies on five communities, including Morgan City, Louisiana, and Mt. Pleasant, Texas. In another element of the Texas Coastal Management Program, we conducted case studies of energy developments in Bay City and Corpus Christi. In a contract for the Department of Energy, we conducted a study of the siting and growth management techniques used in siting a major refinery in Garyville, Louisiana.

4. COMMUNICATIONS

OBJECTIVES

1. Gain acceptance of the study plan for socioeconomic effects by state and local government officials, community groups, and professionals

2. Obtain a thorough professional review of the approach and results of all study elements

3. Provide government officials, local residents, and other interested parties full information on the scope, approach, and results of the study as they are developed

4. Secure feedback from affected parties on the socioeconomic issues raised by the project and the adequacy of the study effort

5. Suggest policies for use by Exxon and government agencies to deal with project effects

6. Develop a consensus on the probable socioeconomic effects of the Crandon Project on the local study area and on the state

APPROACH

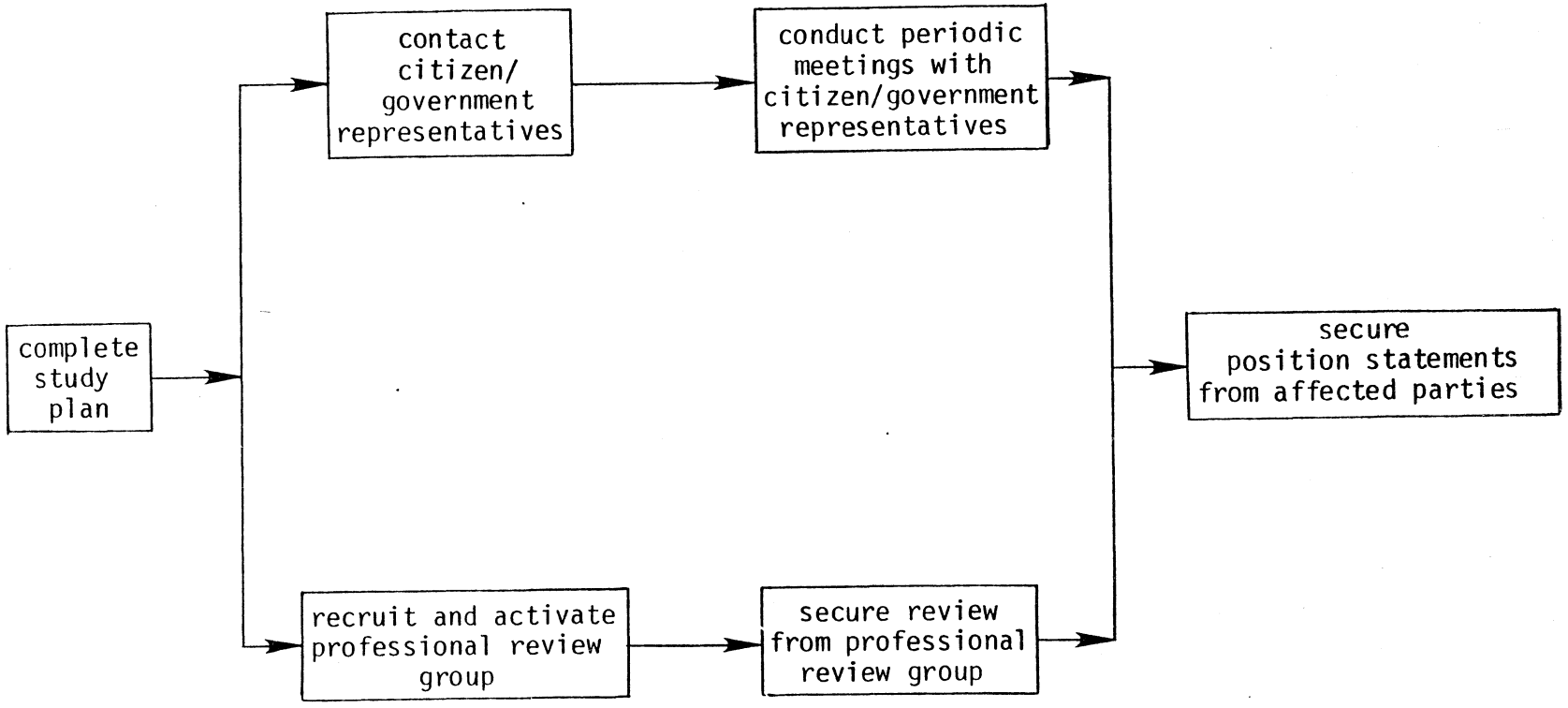
Figure 3 illustrates the tasks involved in the communications effort. The following text describes these tasks.

Complete Study Plan

We discussed the draft study plan with a broad range of government officials and interested citizens in order to identify any deficiencies

Figure 3

COMMUNICATIONS FLOWCHART



in the plan. We will also ask people involved in the discussions to review the study documents.

Presence in Wisconsin

Roy Tull heads our Madison, Wisconsin, office. Mr. Tull lives in Madison and is assigned to this office full-time.

Most of the state officials and much of the data necessary for the study are located in Madison, and the resources of the University of Wisconsin and certain business services make Madison an efficient location for much of the work. A substantial amount of communications activity will occur in Madison.

We will perform an equally important part of the communication work in the local study area. We will gather information from local government files, interview officials and citizens, and conduct other field work in the local study area. We will hold informal meetings in and near Crandon to discuss preliminary results of the study and to obtain feedback to guide revisions.

All of our key staff will spend a significant amount of time in Madison and in the local study area during the study. Officials and others reviewing parts of the study will be able to discuss their comments directly with the personnel responsible for that section of the report.

Citizen/Government Review

We will forward copies of each report to citizens and government representatives with an interest in the project. We consider feedback from the interested public a vital aspect of our communications effort. We encourage people to let us know their opinions of the study as it progresses. To elicit their feedback, we will conduct periodic informal meetings with interested parties to encourage their participation in the socioeconomic study. Our goal in these meetings will be to discuss any objections they may have, consider any suggestions they may offer, and work cooperatively with them to secure their support for the project.

Professional Review

We have contracted with experts in the various subjects addressed by the study (see Table 1, page 14). These experts will review the various reports for professional quality and make recommendations for any modifications or additional work they feel is necessary. We have selected some of these reviewers because they are professionals familiar with Wisconsin. We chose others for their knowledge of techniques used to predict and analyze possible project effects.

Reports

Each element of the study will result in one or more written reports. When the reports are completed, Exxon will release them for public review. After release, any interested party may obtain copies from Exxon's office

in Rhinelander or from our office in Madison. Anyone wishing to comment on any document may do so orally or in writing to either office. Table 2 is a complete list of the anticipated reports. Each report will include a summary, and many of the reports will also contain an index by jurisdiction and economic sector.

Table 2

LIST OF OUTPUTS

Number	Title
1	Study Plan
2	Definition of the Local Study Area
3	Demographic Methodology Paper
4	Housing and Land Use Methodology Paper
5	Public Facilities and Services Methodology Paper
6	Economic Methodology Paper
7	Fiscal Methodology Paper
8	Survey Research Methodology Paper
9	Native American Communities Methodology Paper
10	Sociocultural Methodology Paper
11	Analogous Communities Methodology Paper
12	Baseline Data Report
13	Forecast of Without-Project Conditions
14	Analogous Communities Report
15	Crandon Project and Local Government Scenarios
16	Forecasts of With-Project Conditions
17	Mitigation Analysis Report
18	Native American Report
19	Draft Environmental Impact Report
20	Environmental Impact Report
21	Reports to Specific Communities (10 to 15)
22	Baseline Profile of Control Area for Crandon Project Study Area

5. CENTRAL STUDY ELEMENTS

DEMOGRAPHIC ANALYSIS

Objectives

1. Determine the present size and age-sex composition of population in the local study area for each substantially affected jurisdiction

2. Prepare computer models to make projections of population with and without the Crandon Project using alternative values for key variables, including Exxon's employment and training policies

3. Integrate the demographic analysis with the economic, fiscal, and housing analyses via a programmed interface between the models

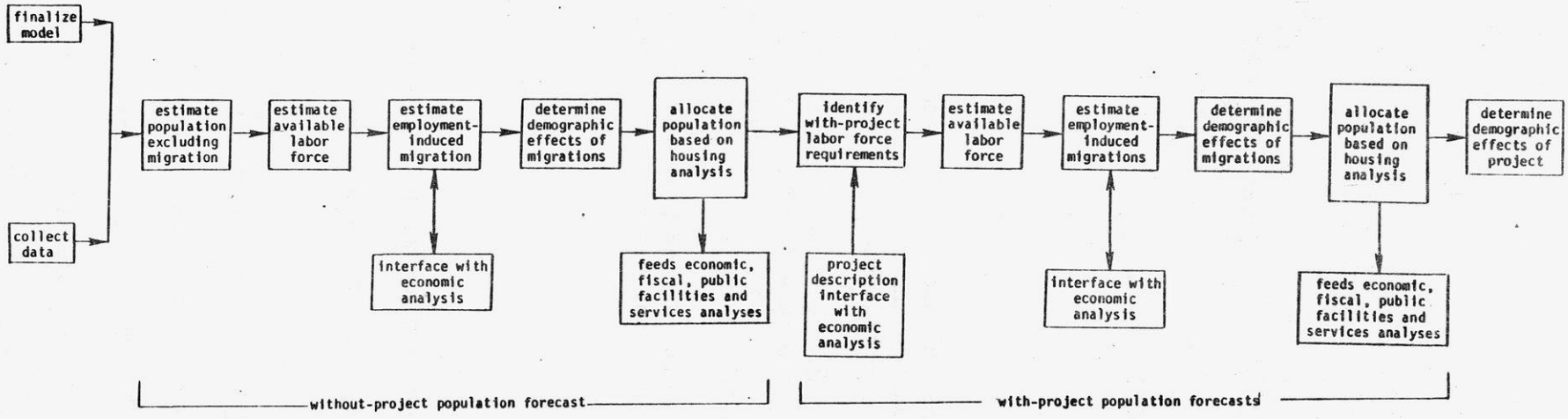
Approach

Figure 4 shows the approach to the demographic analysis. The following pages describe the steps involved.

Develop Model. The cohort-survival technique, commonly used for population forecasts, can satisfy the objectives listed above. The underlying logic for the method is that population at some future date is equal to the present population plus the number of people who are born or move into the area, less the number who die or move away.

Figure 4

DEMOGRAPHIC ANALYSIS FLOWCHART



Forecasts using this technique are more precise if the population is divided into age-sex cohorts (groups), each with its own rate of fertility, mortality, and migration. Total population at the end of a period is the sum of estimated population of all cohorts. The population of the cohort at the end of a given period is the population of the cohort at the beginning of the period, minus the number of people who die or move away, plus the number of people who move in. Estimated births define the youngest cohort. We will then adjust each cohort to account for the aging of people.

The state of North Dakota has developed computer programs for the cohort-survival technique. These programs are generally suitable for this study, although some adaptations may be necessary.

Demographic models such as the cohort-survival model do not account for seasonal population fluctuations due to seasonal and second-home residents and recreational visitors. We will analyze seasonal/second-home residents as part of a special study of the recreation/tourism industry and will draw on a statistical survey of seasonal residents. Questions to be addressed in the study include number and origin of such residents and the employment patterns (e.g., seasonality) and wage structures of the recreation industry.

Collect Baseline Data. Data requirements for the demographic analysis include the following:

1. Base-year population for each age-sex cohort
2. Age-sex-specific migration rates

3. Age-sex-specific mortality rates

4. Age-specific fertility rates

5. Age-sex-specific labor force participation rates

6. Project-related work force requirements

7. Characteristics of inmigrant populations, such as marital status, family size, age-sex distribution

8. Employment requirements of local industries (obtained from economic analysis)

We will obtain these data from field work and published sources. We will gather information on the existing population's labor force participation rates as part of the statistical surveys of permanent residents. We will also review existing information on characteristics of construction and operation workers. Finally, we will examine published analyses of future demographic trends.

Because worker characteristics may change over time, it is crucial to develop a demographic model that can analyze a variety of assumptions concerning inmigrant worker characteristics, rather than to attempt to precisely predict worker characteristics. Such flexibility will permit an examination of potential project effects under different scenarios of worker characteristics such as marital status, age-sex distributions, and the like. The use of scenarios prevents an incomplete analysis tied to only one set of assumptions.

Estimate Without-Project Population. We will estimate the without-project population for each of 55 years through a four-stage process:

1. Calculate resident population by age-sex cohort based on prior year's population, plus births minus deaths

2. Calculate available labor force by comparing population to age-sex-specific labor force participation rates

3. Compare the available labor force with employment requirements to determine the number of migrating workers

4. Determine population changes associated with the migrating workers

Estimate With-Project Population. We will forecast population with the project for each project scenario in essentially the same manner as the without-project forecasts, with some modifications. The following list briefly outlines the process:

1. Identify with-project labor requirements

2. Calculate available labor force, given other employment opportunities

3. Calculate net migration induced by project employment, given net demand for labor and job characteristics

4. Determine population changes associated with net migration

Determine Effects of Each Scenario on Population. We will compare with-project and without-project population estimates for the local study area and for each substantially affected jurisdiction within the local study area to determine project-related population changes.

ECONOMIC ANALYSIS

Objectives

1. Determine the positive, negative, and net economic effects of the proposed Crandon Project on the local study area and on the state

2. Develop models to evaluate the possible scenarios of economic development in the local study area, with and without the project, for a 55-year period; the models will:

    a. Differentiate effects on output, earnings, and employment by economic sector
    b. Account for indirect and induced employment

3. Develop growth management strategies to address any adverse economic effects of the project

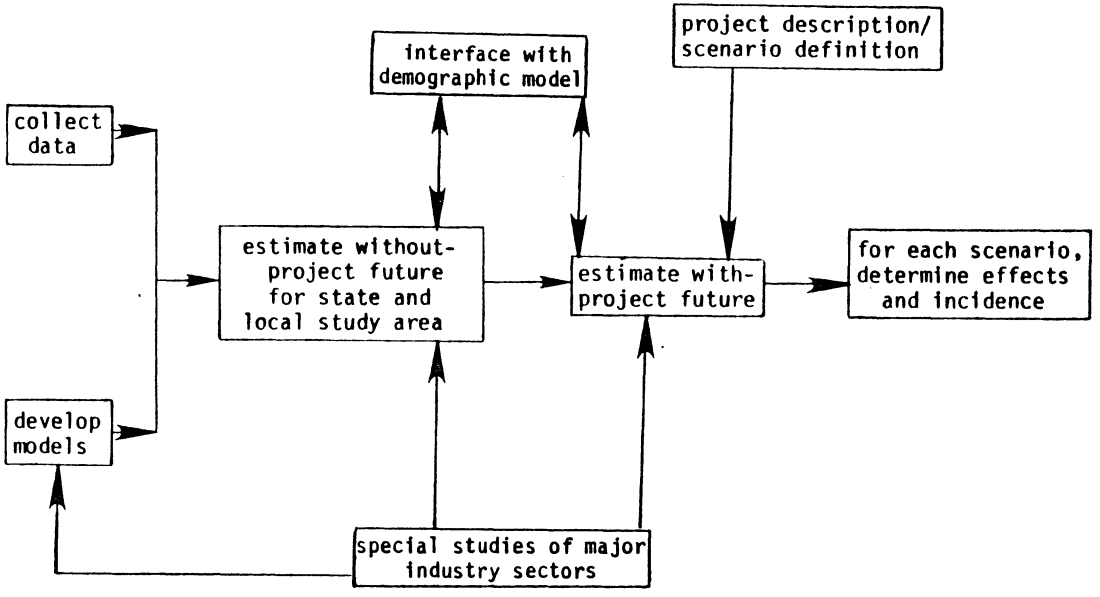
Approach

Figure 5 outlines the major steps in the economic analysis. A discussion of these steps follows.

Collect Baseline Data. Much of the economic data necessary for the analysis is already available through government agencies. Employment and income data are available from the North Central Wisconsin Regional Planning Commission, the Wisconsin Department of Business Development, the Wisconsin Department of Industry, Labor and Human Resources, the U.S. Bureau of Economic Analysis, and the U.S. Bureau of the Census. We will also collect certain data ourselves. For example, to obtain detailed information on certain industries, we will survey managers in key local firms.

Figure 5

ECONOMIC ANALYSIS FLOWCHART



Develop Models. We will use mathematical models to forecast the economic effects of the project and of existing economic trends on the state and on the local study area. The University of Maryland INFORUM project has developed a national input/output (I/O) model, which we will use to develop an I/O model for the local study area. The INFORUM model is iterative, and the technical coefficients are varied to account for postulated changes in technology and relative prices. The INFORUM model forecasts economic conditions under a variety of assumptions concerning energy, population, and growth in GNP. The local model will provide the framework for projections of economic conditions with and without the project. The process consists of the three stages described below. The results of the model development process will be an I/O table for the local study area for each time period.

Compress the INFORUM model to the required number of sectors. The INFORUM model consists of 200 processing (industrial) sectors. We will compress this national model into a local structure as indicated in Table 3.

Adapt the compressed national model to the local study area through application of location quotient techniques. Standard computer programs are available to develop a local model with location quotients verified by surveying businesses in the local study area to verify these coefficients.

Table 3

STRUCTURE OF LOCAL I/O MODEL

A. Processing Sectors

1. Agriculture
2. Forestry, wood, and paper products
3. Heavy metals mining
4. Stone and clay mining
5. Construction
6. Food processing
7. Zinc and copper processing
8. Other manufacturers
9. Transportation, communication, and utilities
10. Wholesale and retail trade
11. Finance, insurance, and real estate
12. Tourist and recreation services
13. Other
14. Government enterprises
15. Households

B. Final Payments Sectors

1. Value added
2. Imports

C. Final Demand Sectors

1. Government
2. Exports
3. Capital investment
4. Consumption from unearned income

Adjust the technical coefficients through time to reflect projected national trends. We will apply the annual rates of change in national inter-industry coefficients to the local study area coefficients to account for probable changes in inter-industry relationships.

Analyze Major Industry Sectors. We will conduct special studies of major industrial sectors to identify development patterns in existing sectors and to estimate probable import substitution. We will use the results to derive estimates of final demand for these sectors, to verify the I/O model, and as inputs to the without-project and with-project forecasts. We will conduct special studies for recreation/tourism, agriculture, forestry/forest products, mining, and retail trade. In the special studies, we will also assess the potential labor market effects on these industries resulting from workers seeking employment with the project.

We will quantify the analyses to the maximum extent possible. However, data limitations may prohibit more than a qualitative discussion of some aspects of the analysis. We will make best estimates to meet data requirements of other elements of the assessment. Even though much of these analyses may be qualitative, they are not without value. It can be of value to know simply whether a variable will decrease or increase over time without a prediction of the amount of change. Similarly, we can benefit from knowing that some groups will be affected more than others, even though we don't know how much they will be affected.

Recreation/tourism. Recreation and tourism in Wisconsin in general, and in the Northwoods in particular, is a major sector of the economy as well as a central component of the quality of life. Therefore, we will develop a profile of the existing recreation/tourism industry linkages with other sectors. We will also assess the sensitivity of this industry to fuel availability. We will identify potential effects of the proposed project on tourism by comparing the without-project future with potential project effects on the industry.

As a first step in constructing a recreation/tourism profile, we can identify at least four categories of resources:

1. Seasonal and second homes
2. Hotels, motels, and resorts
3. Campgrounds and recreational vehicle parks
4. Day-use recreation facilities, including swimming, hiking, biking, boating, hunting, fishing, skiing, snowmobiling, and driving for pleasure

We will refine categories of participants and inventory the firms and facilities in the local study area in the process of the housing and sociocultural analyses.

We will also consider the sensitivity of the various recreation resources to direct or induced changes. This will require breaking each resource into components of attraction including such factors as visual quality, accessibility, lack of noise, available land area, remoteness, and compatibility with other land uses. Finally, we will compare the recreational resource attractions in the local study area with those in the general vicinity of the local study area to determine

those resources that may be competitive. We will also identify resources outside the local study area to which recreational users would typically be diverted.

Sources of information for the analysis include the proposed statistical surveys of seasonal residents and tourists and a survey of retail service firms.

We will use this recreation/tourism profile, a consideration of the overall economic growth expected for the area, and an analysis of the land-use implications of such growth to estimate the without-project future for recreation/tourism in the local study area. Trends we will identify include number and type of users, spending patterns, types of retail services demanded, employment patterns (including seasonality), wage structure in the recreation industry, and recreational facility or residence ownership. We will quantify the analysis of trends to the extent possible and where needed by other elements of the assessment.

We will analyze possible effects on the recreation/tourism industry as part of the determination of economic effects of the project. The major types of effects we will consider include not only the standard factors from the economic model (changes in output, employment, and income), but also a consideration of the following effects:

1. Shifts in housing from seasonal to permanent residents
2. Shifts in employment and wage patterns
3. Potential increase in property values or rental rates of second homes
4. Effects on land use
5. Change in quality of recreational experience

Agriculture. The agricultural sector deserves attention in the economic analysis because it is a primary employment sector. Moreover, it depends on availability of natural resources and land, and thus is subject to direct and indirect effects of changing land-use patterns. In this analysis, we will document the number of establishments in agriculture, the extent of their land holdings and their dependence on land availability, their contributions to the local economy, and the potential effects on these industries of changes in available land area, employment, and wage levels.

Forestry/forest products. The special study of the forestry/forest products industry in the local study area will focus on the existing roles of the sector in the local economy and the extent to which land-use conversions, changes in employment and population, the increase in the number of permanent residences, and changes in wage structure and income affect this sector.

As part of the economic without-project future forecast, we will identify trends in the forestry/forest products industry. These include the amount of available timber production land relative to estimated patterns of land use and anticipated conversions to nonforest and agricultural uses, anticipated changes in the timber supply from the individual "woodlot" land owner, and employment and wage patterns (including seasonality). In addition, we will consider trends in use of wood for fuel consumption and shifts in demand for hard wood, soft wood, and pulp wood. Finally, we will review state and national forest

management programs and factor these programs into the without-project future.

The analysis of the forestry/forest products industry with-project future will focus on particular effects that may be felt in this industry as a result of the proposed project, other than effects that would typically be derived through the economic model. We will also examine the project's potential for taking forest land out of production for other uses.

Mining. The primary objectives of the special study of the mining industry for the Crandon Project are to compile the necessary information for the forecasts of the economic effects of the Crandon mine/mill complex on the area's economy and to identify the extent to which other mining operations might locate in the local study area during the life of the Crandon Project. The ability to estimate mining development is limited by the public geologic record.

The Crandon mine/mill complex will introduce a new economic sector into the local economy. Thus, we must determine the effect the project could have on the local economy from industry-wide expenditure patterns and from data supplied by Exxon concerning probable expenditures that would be made in the local and state economies. We will identify satellite industries for the project and explore the probability of such firms locating in the local study area.

Retail trade. The purpose of the market analysis is to identify major effects of the proposed project on the structure of the retail trade sector. As the population and income base of an area grows, it can support expanded, more diverse, trade and service sectors. Consumer expenditures outside of the area by local residents may diminish correspondingly. In addition, the focus of shopping activity for population centers may shift from the traditional downtown area to shopping centers.

We will profile the existing structure of the retail and service sectors and identify demand thresholds at which we can expect certain types of retail and service activities. We will explore probable changes in the structure of the trade and service sectors resulting from changes in population and income for both the without-project and with-project futures. Finally, we will adjust the I/O model to reflect probable changes resulting from economic growth.

This completes the discussion of the special studies. The following steps apply to the overall economic assessment.

Estimate Without-Project Future. We will estimate probable future conditions for the state and local economies using the models we develop and the special studies. We will estimate output, employment, and income by sector for the state and for the local study area.

Estimate With-Project Future. We will use the models, the special studies, and a detailed project description to estimate future conditions with the project for several scenarios. The description for each scenario will include the following factors:

1. A timeline in terms of years and proposed stages of project development

2. The percent of each employment category that will be filled by residents in the local study area, nonlocal Wisconsin residents, and out-of-state workers

3. The average salary level for each employment category

4. Expected employment levels during construction and operation of the mine/mill complex

5. A description of types and timing of secondary economic activities expected to be engendered by the project

Determine Effects and Their Incidence. For each scenario, we will compare conditions with the project and conditions without the project to determine relative economic effects and their incidence. We will estimate and measure net economic effects in terms of net changes in output, employment, and income resulting from the project.

Propose Mitigation Measures and Analyze Effects. We will identify significant adverse effects and, where appropriate, we will propose mitigation strategies. Finally, we will analyze the effects of each mitigation strategy.

HOUSING AND LAND USE ANALYSIS

Objectives

1. Define the local study area

2. Describe the existing housing stock and identify factors affecting future housing development

3. Develop mathematical models to forecast housing market behavior in the local study area, including prices and types of additional housing

4. Develop models to forecast the probable patterns of population distribution within the local study area with and without the project

5. Develop models or techniques of analysis that can evaluate various assumptions and accommodate the scenarios generated by demographic and economic analyses

Approach

We will use a two-stage process to determine the housing and land use effects of the Crandon Project and to distribute population across the local study area. First, we will make a detailed analysis of the housing market and its response to housing demand generated by project-related employment. Second, we will distribute project-related workers, their families, and the housing they occupy within the local study area through use of a population distribution model.

In analyzing the housing market's response to increased housing demand, we will utilize a housing market model. This model will allow us to simulate the behavior of housing developers and consumers. Focusing on permanent housing and mobile homes, this housing market model will provide us with annual forecasts of the amount and type of new housing units supplied in the local study area. These forecasts will enable us to determine whether a housing shortage is likely to occur in the future.

After determining the amount and types of new housing supplied, we will allocate that housing and its occupants to area cities and townships through use of a population distribution model. The population

distribution model will make its allocations on the basis of cities' and townships' residential attractiveness and proximity to work and retail locations. These housing and population allocations will reflect local physical and institutional restraints on development. The output of the population model will be a township-by-township forecast of housing and population changes resulting from development of the Crandon Project.

Figure 6 illustrates the steps in the housing analysis. The following pages describe these steps.

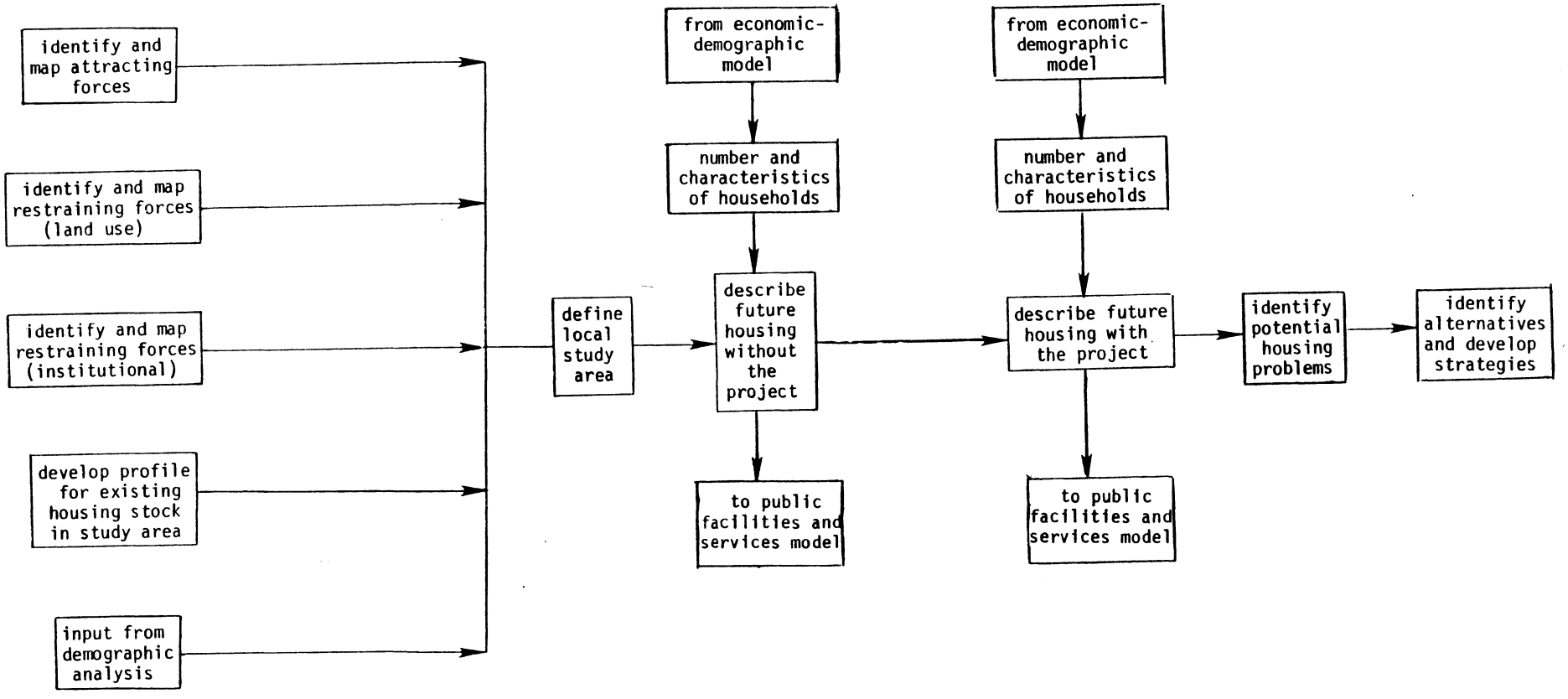
Identify and Map Attracting Forces. The major attracting forces for housing development are the driving time from the work site, and driving time to area retail trade centers. We will measure the driving times from the proposed project site and from the communities of Rhinelander and Antigo. We will prepare baseline maps showing time and distance contours for each of these factors.

We will use the analysis of the driving time contours to establish the area of greatest demand. The attitudes of local residents regarding reasonable and desirable driving times and distances, including future fuel costs and availability, will be a consideration in defining this area.

Identify and Map Restraining Forces (Land Use). Several current land uses or conditions preempt housing developments of various types. These include federal and state forest land, county-owned land, land committed to forest crops, wetlands and floodplains, erodable slopes, and percolation

Figure 6

HOUSING AND LAND USE ANALYSIS FLOWCHART



characteristics prohibiting septic systems. We will map each of these factors for the local study area. We will use these restraining force maps, along with those institutional restraining force maps described below, to delimit areas of attractiveness.

Identify and Map Restraining Forces (Institutional). In addition to the land use and physical restraining forces described above, there are several legal, institutional, and political restraining forces that shape or limit housing development. Those forces include local housing codes and State Uniform Building Code, water and sewer capacities of the various municipalities, building permit and zoning requirements, subdivision regulations and certified surveys, differing approaches to planning and growth by local administrations, and prices. Several of these factors lend themselves to mapping.

We will use the results of this task in conjunction with the maps to identify the most likely areas for housing development. The data management procedure for this section will allow an interactive consideration of various alternative relationships between attracting and restraining forces.

Develop a Profile of the Existing Housing Stock in the Local Study Area. The housing profile will document the number and type of existing residential structures, including owner-occupied; single- and multi-family rental units; and year-round and seasonal residences, and mobile homes. We will also determine the range of residential unit sizes and describe the most typical styles of residential units. We will use this description

as the baseline against which to compare compatibility of potential new development. We will determine the range of housing costs for existing structures, new construction, and single-family and multi-family rental units; the range and distribution of values and costs; and the most common construction methods and characteristics. We will estimate the percentage of substandard dwellings and units suitable for rehabilitation, and where appropriate, we will map these data.

Define Local Study Area. We will use the housing analysis together with demographic and economic analyses to define the local study area. This is the area that encompasses all jurisdictions that are substantially affected by the proposed Crandon Project. We will base this determination on the premise that the effects of the project occur in the places where the project is, and where the workers connected with the project reside. Residential decisions, in turn, depend on and influence the housing market.

Describe Future Housing Without the Project. We will estimate the current supply of housing in the local study area by documenting the number, size, types, and prices of units currently on the market for sale, rent, or lease. We will also estimate the current occupancy rate of new construction in the area.

To obtain an indication of local capacity to respond to new demands for housing, we will analyze the private sector home construction industry and availability of mortgage funds. We will estimate the most

likely mix of housing types (single-family and multi-family) and construction modes (manufactured or site-built).

Analysis of residential building permits will reveal trends regarding size, location, and rates of construction of single-family and multi-family residences, construction of and additions to mobile home parks, and residential (including mobile homes) renovations and additions. We will document trends in regulations, particularly regarding mobile homes.

Describe Future Housing With the Project. We will estimate the locations and amount of probable new residential development with the project by combining population estimates and economic analysis with the housing analysis. We will estimate the types and values of those residences by extrapolating the trends in housing type, value, and characteristics and refining this extrapolation by the results from the economic analysis, which will provide the most likely range of household income, with a resultant estimate of the amount of money which can be spent on housing (usually 25 to 30 percent of income). We will combine this estimate with a prediction of the family types expected to move into the area. Thus, we will be able to estimate the type and price of housing for which a market will exist.

We will be able to describe several scenarios of the demand for housing units resulting from the project, including temporary housing that might be needed for the construction work force. The demand for housing generated by the project may be met by temporary housing, new construction, existing units on the market, and units placed on the market in response to increased demand.

Analyze Local Response. After we estimate locations and number of potential housing development, we will review the ordinances, policies, and political climate of those localities to judge their potential response.

Identify Potential Housing Problems. The foregoing analysis may reveal specific problems in the capacity of the local study area to meet increased housing demands resulting from the proposed Crandon Project. We will describe specific problems, locations, extent of shortfalls, and other potential difficulties.

Identify Alternatives and Develop Strategies. To the extent that we identify problems as discussed above, we will identify a range of alternatives to meet those problems. Clearly, the long-term capital investment involved in the housing sector leads to a proper conservatism. However, increased costs of materials, land, and capital, plus more stringent public regulation of all aspects of housing an infrastructural development have changed the nature of the sector to the extent that it may be essential to seriously consider various alternatives.

PUBLIC FACILITIES AND SERVICES ANALYSIS

Objectives

1. Determine present capacity, distribution, and quality of public facilities and services in the local study area

2. Determine local preference for mix and level of public services

3. Determine the capital and operating costs of increases in public services to meet project and nonproject increases in demand

4. Determine administrative, institutional, and financial limitations on expansion of public facilities and services

5. Determine possible funding sources for various kinds of public facility construction and expansion

Approach

Public facilities and services are those provided by state and local governments, by public utilities (generally electricity and natural gas), by public transportation (air, rail, and bus), and by health care providers. Figure 7 outlines the steps in this analysis of public facilities and services, and the following text describes the procedure. The facilities and services included in the assessment are listed in Table 4.

Describe Baseline for Public Facilities and Services. We will document baseline conditions of public facilities and services through secondary data and interviews with public officials and their engineering consultants in the local study area. Where appropriate, we will also map these conditions. The baseline documentation will include problems, limitations, age, and regulatory variances of all services listed in Table 4.

We will describe and document existing conditions of police and law enforcement services in terms of personnel numbers, experience,

Figure 7

PUBLIC FACILITIES AND SERVICES ANALYSIS FLOWCHART

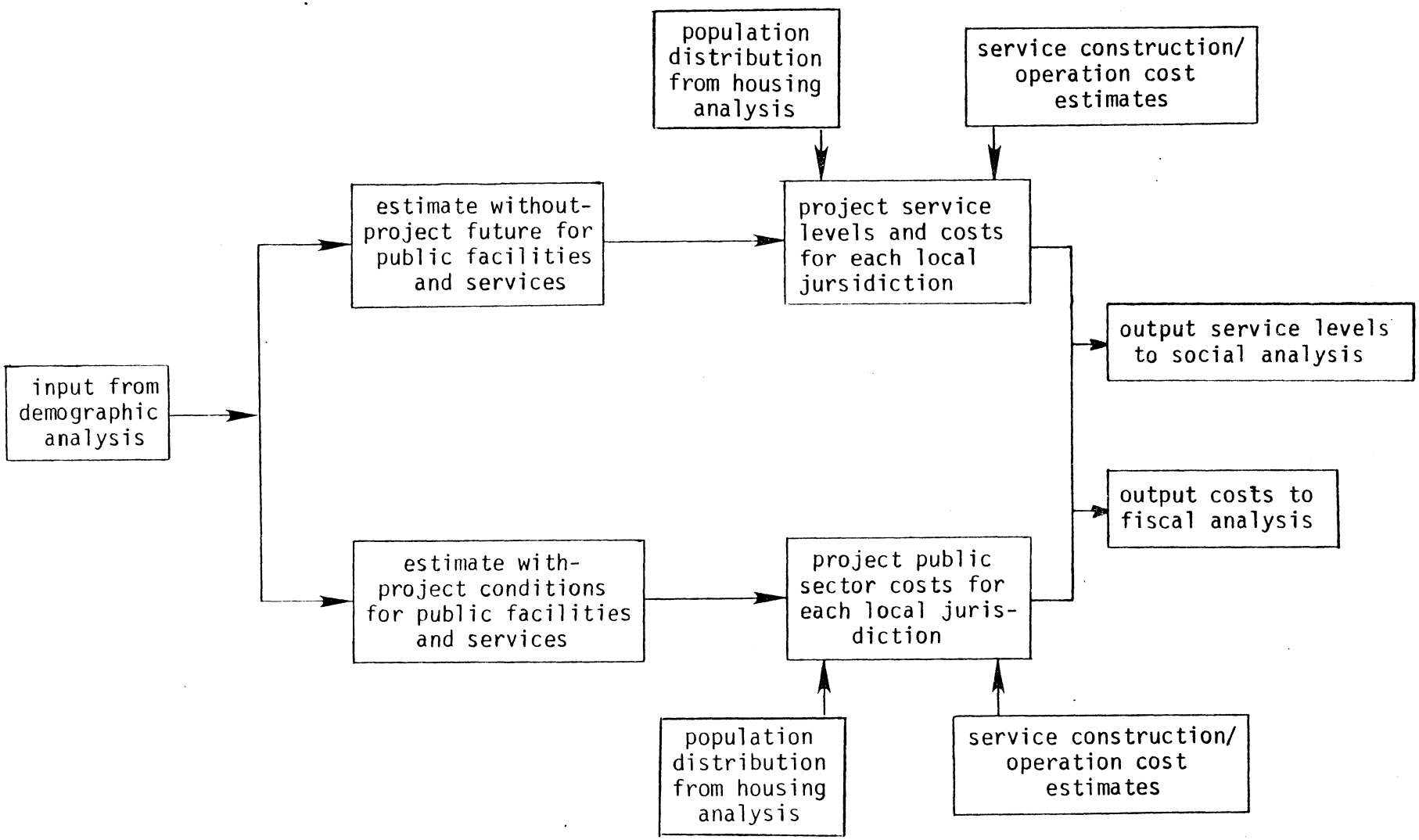


Table 4

PUBLIC FACILITIES AND SERVICES TO BE ASSESSED

Facilities and Services	Area of Effect
Education	School districts, Nicolet VTAE District
Law enforcement	Cities, county
Fire protection	Cities, county
Health care	County
Municipal water supply	Cities
Wastewater treatment and disposal	Cities
Solid waste disposal	Cities, townships, and counties
Streets and roads	Cities, townships, and counties
Railroads	County
Air transportation	County
Social Services	Cities, county
Library services	Cities, county
Senior citizens programs	Cities, county
Recreation	Cities, county
Electricity	Cities, special district
Natural gas	Cities, special district
General government administration	Cities, counties

and training; communication equipment, physical facilities, and vehicles; and fiscal and administrative characteristics and capabilities.

We will analyze fire protection using state fire insurance key rate analyses to determine the adequacy and future capacities of staff (including number, training, and administration), equipment, physical conditions and locations of fire stations, and characteristics of the water distribution system of the service area.

Documentation of baseline conditions of all social services provided in the area will include provisions for physical and mental health, welfare and public assistance, education, public libraries, and other factors of local concern that may be identified. We will document baseline conditions of these services on the basis of secondary data from state and local governments and interviews with the providers of the individual services. The description of baseline conditions will consist of the number and capacities of facilities, staffing, physical and fiscal limitations, and per capita demand rates where relevant.

In describing public facilities and services, and quasi-public services such as utilities, transportation, and health care, we will document present capital and operating costs to use in forecasting the costs of future expansion and for input to the fiscal analysis.

Estimate With-Project Future. We will use the scenarios describing with-project estimates of housing development and population increase to

estimate project-related demand for public services and utilities. We will compare project-related demands and without-project demands to existing reserve capacities and system limitations to determine the capability of the individual public facilities and services to absorb the additional project-related demand. Interviews with managers and administrators of these public services and utilities will help us assess the reasonableness of our estimates and provide us with their perceptions of system capacities to absorb demands.

We will use the housing and population projections to estimate project-related demands for social services for each of the scenarios of the housing and population analyses. After we estimate project-related demands, we will interview administrators of various services. As necessary, we will modify our estimates to take into account comments from local officials.

Estimate Project-Related Public Sector Costs for Each Local Jurisdiction. We will estimate capital costs for required new facilities identified as part of the foregoing analysis primarily on the basis of recent engineering data obtained from local officials and civil engineers with experience in the local study area. We will base operation and maintenance cost estimates primarily on time-series and/or cross-sectional analyses of local government budget data and national expenditure multipliers for local governments of comparable size and growth rate.

We will also consider the planning and management problems inherent in rapid expansion of public services in making cost estimates, as well

as possible economies of scale through joint provision of services by small jurisdictions.

Identify Shortages and Difficulties Attributable to the Crandon Project. We will identify any shortages in the provision of public facilities and services and any financial or institutional difficulties likely to be encountered in expansion of services. We will use this analysis along with the fiscal analysis to identify alternatives for municipal action.

FISCAL ANALYSIS

Objectives

1. Estimate annual costs and revenues for each jurisdiction in the local study area over the estimated life of the project
2. Determine the effect on taxpayers of maintaining a balanced budget in each jurisdiction
3. Develop a model that is compatible with the models for demographic, economic, and housing analyses
4. Develop a model that allows adjustment for inflation rates and tax collection practices

Approach

In this analysis we will use, with modifications, the computer programs for fiscal analysis developed by the state of North Dakota. Equations for Wisconsin taxes and costs of service will replace those

for North Dakota. Figure 8 shows the adaptation process. The following text describes the steps.

Identify Local Taxing Jurisdictions. We will use the results of the demographic, economic, and housing analyses to identify each township, municipality, school district, and county in the local study area, and other major taxing jurisdictions such as the Nicolet VTAE District.

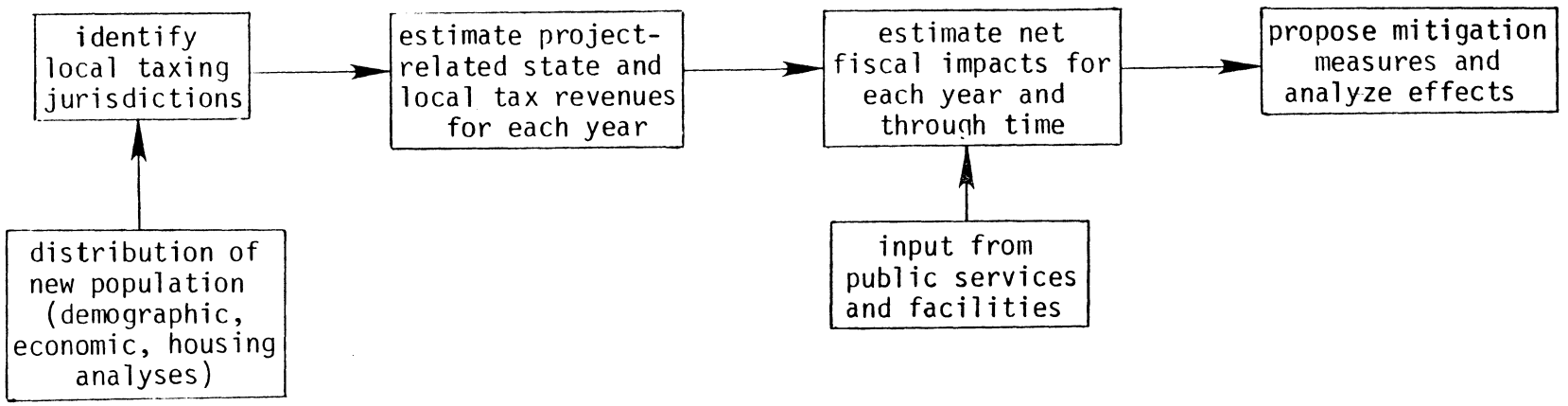
Estimate Project-Related State and Local Tax Revenues for Each Year. We will analyze existing state and local tax structures to identify sources of revenue, methods of computation of revenues, distribution formulas, and federal aid programs to state and local governments and to reservations. We will then determine the methods for estimating project-related tax revenues and transfer payments, based on the preceding analysis and discussions with staff of Exxon, the Wisconsin Department of Revenue, the Wisconsin Department of Local Affairs and Development, and local taxing jurisdictions. Estimating equations will reflect taxing and distribution procedures and will generally reflect relationships between costs, revenues, and predicting variables such as population, industry output, and income.

We will use an appropriate econometric model to estimate project effects on state tax revenues. At the local level, we will include the following sources of revenue in the model:

1. Local property tax
2. State-to-local transfer payments

Figure 8

FISCAL ANALYSIS FLOWCHART



a. Investment and local impact fund (also known as the mining impact fund)
b. Share revenues (utility, per capita, aidable revenues are three major subcomponents)
c. General property tax relief
d. School aids
e. Highway aids
f. Natural resource aids
g. Social services and mental health aids

3. Federal-to-local transfer payments

We will address the state and local effects of the net proceeds tax.

Estimate Net Fiscal Effects. The net fiscal effect of the project for a given jurisdiction in a given year is the difference between the project-related revenues and project-related costs. Cost estimates will come from the public services analysis. We will then sum annual surpluses or deficits over the entire forecast period (55 years) to determine net fiscal effects over time.

We will compute all costs and revenue estimates on the basis of the most current data available and adjust them to the base year price level. The user will be able to inflate those components postulated to be subject to price level changes at any assumed annual inflation rate.

Propose Mitigation Measures and Analyze Effects. We will identify important adverse fiscal effects, and we will propose mitigation strategies. We will then analyze the effects of each mitigation strategy.

SOCIOCULTURAL ANALYSIS

Objectives

1. Determine baseline sociocultural patterns using objective indicators
2. For permanent residents, seasonal residents, and tourists, determine attitudes toward economic growth in the local study area
3. Describe existing quality of life through sociocultural indicators and survey research
4. Forecast possible sociocultural conditions both with and without the Crandon Project

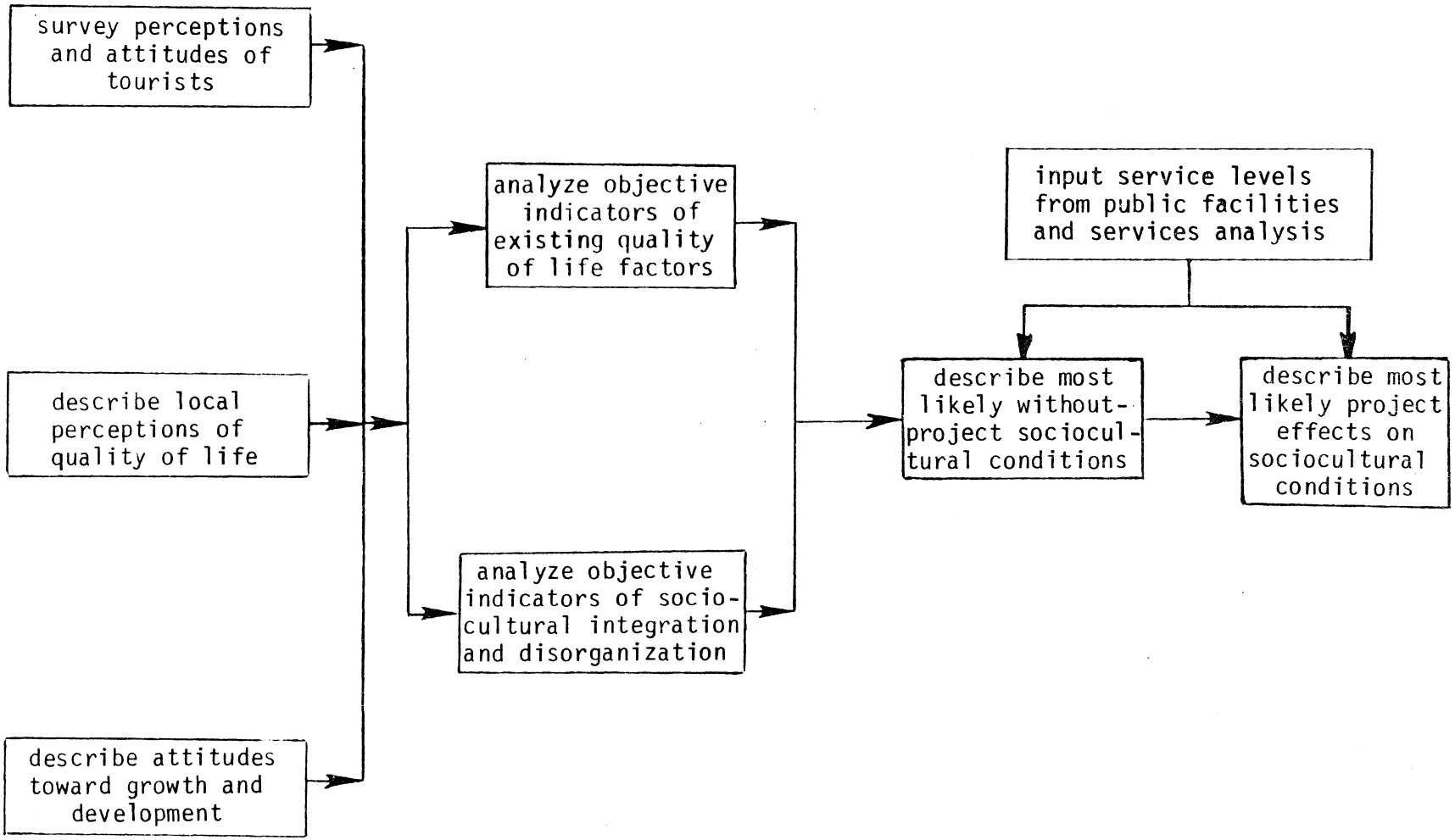
Approach

The sociocultural analysis uses sociocultural indicators, survey research, and participant-observation research to document sociocultural characteristics. This approach provides a solid basis for documentation of current conditions and assessment of actual changes during any stage of project construction and/or operation. Figure 9 outlines the steps in this analysis. The following text describes the approach.

Survey Perceptions and Attitudes of Tourists. We will develop a questionnaire to elicit from recent tourists in the local study area their views on the desirability of the area for recreational activities. We will also ask them to rank the local study area against other Wisconsin recreation areas for quality, price, and accessibility. We

Figure 9

SOCIOCULTURAL ANALYSIS FLOWCHART



will also seek to determine what effect certain possible characteristics of the Crandon Project may have on the attractiveness of the area to tourists.

Describe Local Perceptions of Quality of Life. We will survey permanent residents of the study area regarding their evaluations of outdoor recreation quality, accessibility, and problems; satisfaction with housing quality and neighborhood conditions; perceptions of the quantity, quality, and location of commercial facilities and medical facilities; and evaluation of public schools, streets and roads, police and fire protection, and taxes.

We will use these evaluations to identify issues as perceived by local residents and to determine what data we will need to measure the effect of the project on quality of life.

The questionnaire will draw on a previous longitudinal, nationwide research effort. Information developed through the interviews will yield cross-tabulations of residents' perceptions and attitudes by age, sex, income, ethnic background, occupation, length of residence in the area, and place of residence.

We will use the information developed in this survey in conjunction with information from other parts of the sociocultural analysis to document existing sociocultural conditions in the local study area and to identify potential problem areas that must be addressed during development and operation of the Crandon Project.

Describe Attitudes Toward Growth and Development. The survey of permanent residents will include questions designed to elicit responses from residents of the local study area regarding their attitudes toward local growth and development. The questions designed for this part of the survey will draw on the large body of work previously performed in the area of economic and industrial development in rural areas.

We will combine the results of this survey with other data to establish a baseline of existing attitudes toward growth and development as well as to identify those particular areas that present either problems or opportunities. We will address problems concerning residents' attitudes toward growth and development as part of the construction and operation mode of the Crandon Project. We will also point out opportunities (e.g., residents may desire small-scale low-skill industries) for planning secondary development in the local study area.

Analyze Objective Indicators of Existing Quality of Life Factors. While the information gained through surveys will validly portray residents' perceptions of existing conditions, those perceptions are influenced by many factors that may be external to the reality of the situation. Thus, it is necessary to balance information on perceptions with objective indicators of existing conditions. We will gather much secondary information regarding objective indicators of quality of life factors from documents of local, state, and Federal agencies. This

task will consist of a literature search and analysis of all pertinent publications and file data sources, which will provide objective and statistical indicators for a variety of sociocultural factors.

Analyze Objective Indicators of Sociocultural Integraion and Disorganization. One of the basic purposes underlying a socioeconomic assessment is to determine the likely effects on the continued functioning and viability of the communities involved. Thus, the questions of sociocultural integration and disorganization become central to the analysis. However, the field of sociology has not provided validated measurements of integration and disorganization, though the concepts are widely used. Use of indicators that are assumed to represent the extent of integration and disorganization is the most obvious approach to assessing these characteristics. Common indicators of sociocultural integration include participation in religious and civic organizations and political participation.

Objective indicators of sociocultural disorganization include crime and juvenile delinquency, family dissolution, public welfare dependency, civil disorder, alcoholism and drug abuse, and mental illness and psychological stress. We will gather data on these factors from the records of the various state and local agencies involved in providing the necessary services.

The major purpose of these indicators is to provide a baseline of trends to be compared with forecasted indicators. We will interpret the indicators described above with extreme care. The assumptions on

which these indicators are based are vulnerable, and we must not take the indicators at face value. We will interpret these indicators in light of the survey results, professional observation, and an analysis of the entire range of sociocultural and economic factors considered as part of the study.

Predict Evolution of Sociocultural Patterns With and Without the Project. Using information from the demographic, economic, housing, and analogous communities analyses, we will develop scenarios that focus on the possible effects of the project on the existing sociocultural patterns. These scenarios will be qualitative, but we will base them on the best available quantitative forecasts of changes in major sociocultural and economic factors. We will interpret the effects of sociocultural and economic changes in light of the findings of the analogous communities analysis and of the existing literature.

Details

We will collect the sociocultural statistics shown in Table 5. The statistical surveys section of this study plan provides the technical details of the surveys.

Table 5

SOCIOCULTURAL STATISTICS TO BE COLLECTED

Type of Data	Data Elements
Descriptions of:	Participation rates in religious and civic organizations, political participation, and citizen support of community funding efforts
	Rates of crime and juvenile delinquency, family dissolution, public welfare dependency, civil disorder, alcoholism and drug abuse, mental illness, and psychological stress
	Ranking of school performance
Observation of:	Quality of schools
	Housing and neighborhood conditions
	Types and locations of commercial establishments
	Availability of medical care
Attitudes regarding:	Growth and development
	Attractiveness of the local study area
	Quality and accessibility of recreation
	Housing quality and neighborhood conditions; medical, educational, and municipal services

NATIVE AMERICAN COMMUNITIES ANALYSIS

Objectives

1. Produce a detailed analysis of the effects of the Crandon Project on the two Native American reservations in the local study area

2. Ensure that Native Americans are fully informed regarding possible project effects and have the opportunity to participate in planning

Approach

The approach we chose to assess the effects of the Crandon Project on the Mole Lake Chippewa and Forest County Potawatomi people stresses quantitative sociological and economic methodology. However, assessment of effects on important sociocultural elements will use qualitative informant methods derived from anthropological methodology.

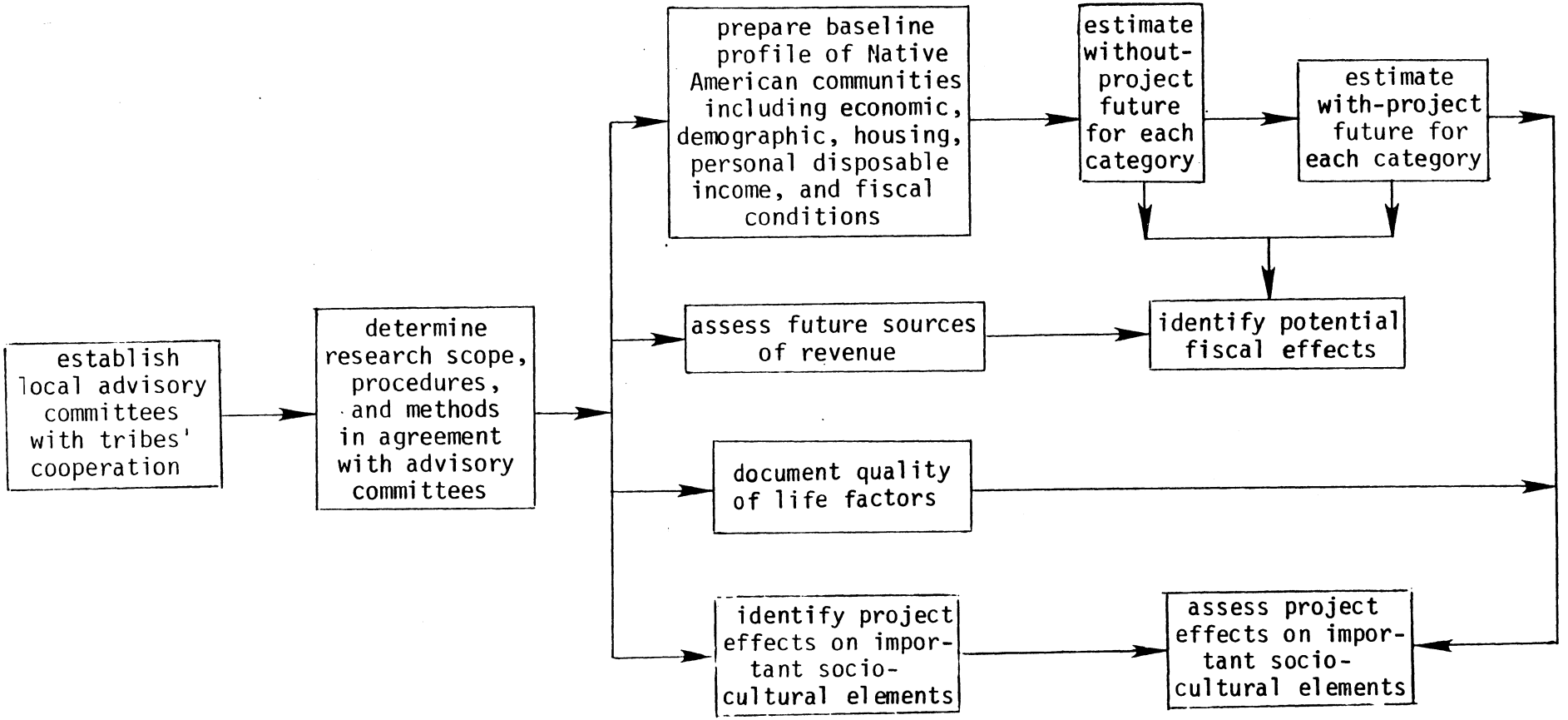
Figure 10 outlines the steps of this approach. The following text describes them.

Establish Local Advisory Committees. We hope to establish an advisory committee on each of the reservations. These committees will help define the study, and they will oversee any data collection on the reservations.

Prepare Baseline Profile of Native American Communities. We will prepare a detailed and comprehensive baseline profile for each Native

Figure 10

NATIVE AMERICAN COMMUNITIES ANALYSIS FLOWCHART



American community. We will use census data, data from the Bureau of Indian Affairs and the Tribal Council, and household interviews to describe numbers, age, sex, natality, mortality, morbidity, and labor force participation characteristics of the population on each reservation. We will also use surveys to collect information from enrolled tribal members who live off the reservations. We will use this information to make population forecasts and to develop a work force profile for Native American residents of the local study area. In addition, we will collect data on objective sociocultural indicators, including housing conditions; accessibility to commercial, educational, recreational, and medical facilities; community infrastructure; crime rates; rates of alcoholism and drug abuse; rates of family dissolution (within the context of tribal culture); and educational performance and employability.

For each reservation, we will gather data regarding the economic base conditions of the reservation. We will include in the analysis all privately owned enterprises and all activities of the Tribal Council that produce income for the tribe. We will describe the number and conditions of the housing stock on the reservations. We will also document the current fiscal condition of each tribe.

Describe Without-Project Future. Using the baseline data described above, we will derive population estimates for Native Americans for conditions without the Crandon Project. These estimates will include total numbers and age and sex distribution.

We will base our estimates of without-project economic conditions of the reservation on analysis of past economic trends and review of all planned economic activities. These estimates will include input from the demographic analysis, which will estimate the number of residents expected on the reservation without the Crandon Project. We will use estimates of without-project population growth to estimate future housing needs on the reservations.

We will use current and recent past trends in employment and personal income, in addition to the economic analysis for the nonreservation area, to estimate aggregate personal disposable income under conditions without the project.

We will estimate fiscal requirements through the forecast time of the without-project future on the basis of inputs from demographic, economic, and housing analyses of the reservations without the project.

Describe With-Project Future. With data developed in the without-project description of demographic characteristics, plus Exxon's estimate of total project employment and an estimate of inmigration to the reservations as the result of increased employment opportunities, we will estimate the demographic characteristics of Native Americans under conditions of construction and operation of the Crandon Project.

Using inputs from the demographic study of Native Americans, data from the without-project future analysis, and estimates of Native American employment by the Crandon Project and by associated industries, we will estimate the with-project economic future of the reservations. We will then estimate increased demand for housing and public services

and facilities resulting from the Crandon Project, including types of housing, using information developed in the with-project demographic analysis.

Estimate Personal Income. We will use estimates of project and related employment of Native Americans, plus the information generated in the analysis of with-project economic conditions for the nonreservation areas, to estimate total aggregate disposable personal income for the reservations.

Assess Future Sources of Revenue. Interviews with field representatives and regional staff members of appropriate federal and Wisconsin agencies will describe the most probable sources and levels of funding for Native Americans through the forecast times of this study. With the possible exception of the Bureau of Indian Affairs, most of these descriptions and estimates will be qualitative and based on existing or anticipated programs at those agencies.

Identify Potential Fiscal Effects. Using inputs from the analysis of with-project characteristics of population, tribal economics, and housing, we will estimate fiscal requirements for conditions with the project. We will compare estimated fiscal needs with likely sources and levels of funding to identify effects on the fiscal stability of the reservations.

Document Quality of Life Factors. Using a combination of information from previous studies and additional primary research, we will describe existing quality of life indicators.

Identify Important Sociocultural Elements. Using methodologies developed in conjunction with the advisory committees, we will identify and analyze the important sociocultural elements of tribal life. The methodology calls for objective documentation of sociocultural elements to serve as a basis for future comparisons. This documentation will include photographs, tapes, maps, and other materials, as available.

Assess Project Effects on Important Sociocultural Elements. We will assess potential effects of project-related activities on important sociocultural elements. We will try to separate perceived effects from actual effects. We will analyze perceived effects in terms of their incidence on various ages, sexes, locations, and status groups within the tribes.

6. DATA GATHERING

ANALOGOUS COMMUNITIES ANALYSIS

Objectives

1. Document changes that resulted from industrialization in areas similar to Crandon
2. Provide an empirical context within which we can make reasonable statements about change and to cross-check the results of the socioeconomic assessment
3. Determine which social and economic factors we should monitor for effective growth management
4. Document the responses of industry and local governments to rural industrialization in analogous areas and describe the results of these responses
5. Prepare baseline data for a comparable site to contrast with the Crandon Project

Approach

We will review the available literature to select up to five cases of rural industrialization for analysis. In addition, we will study an area similar to the Crandon Project that has experienced development and a corresponding undeveloped control area. Finally, we will choose an area in Wisconsin that has not experienced industrialization, and that is not likely to, for long-term comparison to the local study area.

However, if the previous control location chosen is in Wisconsin, and if that undeveloped site is directly comparable to the Crandon site, it can serve as the second control site.

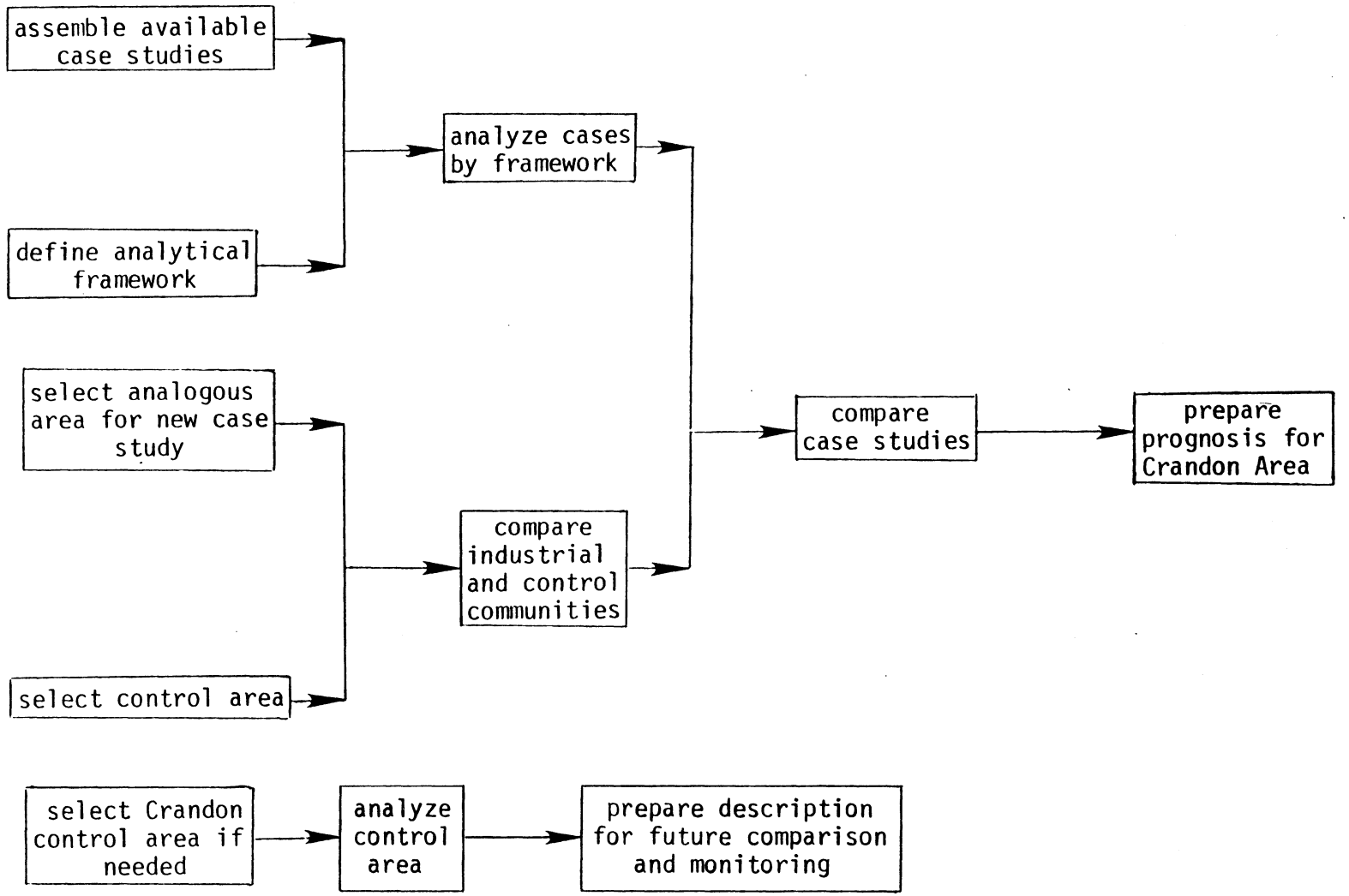
Figure 11 outlines the steps in this approach. The following text describes the approach.

Assemble Available Case Studies. The first step in this approach is to assemble copies of all retrospective case studies of industrialization in rural areas. We will draw on the published literature and we will search out unpublished studies commissioned by government agencies and foundations.

Define Analytical Framework. The assembled studies will be of diverse formats, depth, and scope. They will concern sites and activities that vary in their similarity to the Crandon Project. For this reason, it is important that we systematically analyze these studies and categorize both their settings and their findings to allow clear interpretation. In this step, we will develop an analytical framework for the analogous communities studies. We will, after a survey of the literature on growth management, add to this framework categories representing the various responses industry and local government have made to the potential effects of rapid growth. We will also note the types of special conditions, such as the presence of Native American population or certain resource industries, which may make the study more analogous to the Crandon Project.

Figure 11

ANALOGOUS COMMUNITIES ANALYSIS FLOWCHART



Select Analogous Area for New Case Study. We will select an area that has experienced development similar to the Crandon Project. We will analyze the selected site for changes in population, economic, governmental, education, and quality of life indicators, including political/governmental response to change.

Select Control Area. We will choose a control location comparable to the case study location. However, the control area will not have experienced industrial development. We will analyze indicators for this location as we did in our analysis of the new case study area.

Compare Industrial and Control Communities. We will compare changes measured at the control location to those measured at the development location and prepare a statement of changes attributable to the development. The industrial location will have experienced the effects of a project similar to the Crandon mine/mill complex and will meet specific criteria for the purpose of comparison.

Select and Analyze Crandon Control Area. We will also select a control location in Wisconsin comparable to the Crandon site and which can be used for ongoing impact monitoring comparison. We will prepare a baseline of existing conditions for that site, comparable to that prepared for the local study area. As explained in the introduction to the approach, we may not need to select an additional control area to fulfill this requirement. If we do select a second control area for

comparison to the project site, we can inventory it during the data collection phase for the local study area.

Analyze Cases by Framework. We will analyze each case study according to the analytical framework established. This will involve development of worksheets on each case study, wherein we will enter information on the classification of the setting and industry, the values of the change in impact parameters, and the responses and special conditions. If significant information is missing from a case study that appears to be particularly relevant to the Crandon situation, we will do followup research on this case. We will contact the relevant industry or government personnel in an attempt to secure the missing information.

Compare Case Studies. We will combine the analysis worksheets on each case study into a large matrix. Case studies will comprise one axis of the matrix; the other axis will be the analytical framework. We will be able to approach this matrix through a variety of statistical and less formal methods of analysis to sort the cases by their similarities and differences. This comparative examination of the cases should result in conclusions on the relationships between baseline conditions and the resulting effects, the type of industrial activity and the resulting effects, the industrial response to rapid growth and the resulting effects, and local government response to rapid growth and the resulting effects.

Prepare Prognosis for the Crandon Area. One of the purposes of this analysis is to use the evidence from analogous communities to estimate the type and magnitude of effects of the project on the Crandon area. We will produce this prognosis by taking the evidence and analysis from previous steps and drawing conclusions on potential effects through a comparison of baseline conditions and the proposed project at Crandon with those in other areas. It will be particularly important to note the special conditions, both in the case study areas and in the Crandon area that can result in different effects. Similarities between our estimates and development in analogous communities will tend to validate our forecasts. Differences will force us to question and rethink our methodology.

Prepare Description for Future Monitoring and Comparison. The purpose of this step is to provide all parties with a factual basis for longitudinal comparisons between the local study area and the control area. Exxon will consider ongoing monitoring of the control site as well as the project site to allow parties to distinguish effects of the project from effects of socioeconomic forces other than the project.

STATISTICAL SURVEYS

Objective

Obtain statistically valid information on all populations (including Native Americans) affected by the Crandon Project regarding:

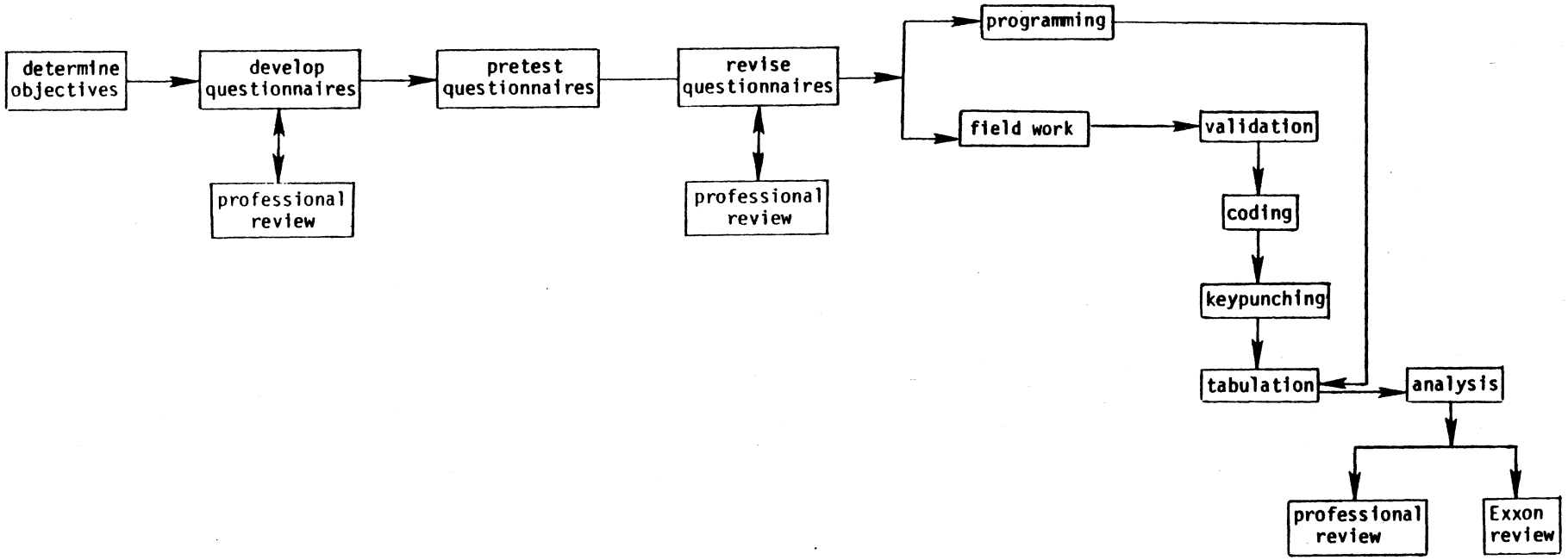
1. Demographic characteristics
2. Housing
3. Labor force participation
4. Lifestyle characteristics
5. Attitudes with regard to the Crandon area and the Crandon Project
6. Perceptions of services and facilities
7. Seasonal and permanent residents' and tourists' use of the area

Approach

We plan to survey five separate groups: permanent residents, seasonal residents, tourists, on-reservation Native Americans, and off-reservation Native Americans. The following paragraphs describe each of these surveys. Figure 12 is a flowchart of our overall approach to conducting the surveys. The economic analysis section includes descriptions of interviews conducted for the special studies of industry groups.

Figure 12

STATISTICAL SURVEYS* FLOWCHART



*Permanent residents survey, seasonal residents survey, tourist survey, and Native American surveys

In order to ensure credibility of the survey research, the design and professional review section of each survey includes budgeted time for professional academic survey research methodologists to assist in selection of the sample, design of the survey instrument, and verification of results if necessary in hearings. We will seek the cooperation of the North Central Wisconsin Regional Planning Commission in preparation of questionnaires.

Permanent Residents Survey. We will obtain a total of 600 35-minute telephone interviews with persons who reside in the local study area at least six months a year. The sampling frame for the permanent residents survey will be a computer-generated list of residential and farm customers of the Wisconsin Public Utility Corporation. We will select respondent households at random using interval sampling with a random start. The respondent for each household will be the male or female head of household whose next birthday is nearest in the future. The sample size of 600 affords, at a 95 percent confidence level, a confidence interval of plus or minus 4.0 percent for the overall sample. That is, if the sample response to a particular question is 50 percent positive and 50 percent negative, we can be 95 percent sure that the positive or negative response of the total population would be between 46 and 54 percent.

This survey will elicit information about attitudinal factors; housing characteristics and labor force participation; perceptions of the quality of outdoor recreation; perceptions of the quantity, quality,

and location of commercial facilities and medical facilities; and evaluation of area public schools, streets and roads, police and fire protection, and taxes.

Seasonal Residents Survey. We will complete interviews with 350 seasonal residents from a computer-generated seasonal customer list of the Wisconsin Public Utility Corporation. As in the survey of permanent residents, we will use interval sampling with a random start to select respondent households, and the "nearest birthday" criterion will specify the respondent within the household. Such a sample size will allow a confidence interval for the entire sample of plus or minus 5.2 percent at a 95 percent confidence level. This survey will establish a baseline of attitudes and perceptions of the attractions and desirability of the general area, with an identification of those particular aspects of the area that are considered attractive and those considered unattractive. Those aspects will include isolation, services, facilities, specific recreation activities, long-term association with the area, associations with other seasonal residents and permanent residents, and distance from home residence.

Tourist Survey. We will draw on registers of motels, trailer parks and campgrounds, and lodges in the local study area for a representative sample of recreational users. If we do not receive a minimum of 250 responses from our first effort, we add to our sample until we reach that goal. The resulting profile will focus on user origin,

spending patterns, preferred types of recreation, and sensitivity of the various recreational resources to direct or induced changes. Comparison of recreational resource attractions in the local study area with other attractions in the state will reveal comparable resources and how tourists rank these alternatives.

Native American Surveys. We would like to interview two groups of Native Americans from each of the two reservations: those who live on the reservation and those who live off the reservation but who may return to the reservation at will. However, this will be done only if we receive timely permission from tribal authorities.

GLOSSARY

analogous community - a community that is similar to Crandon or that has experienced development similar to the Crandon Project

base employment sector - those employed in areas whose goods are sold mostly outside the area industries

baseline - a description of existing conditions

cohort - group

cohort-survival technique - a population projection technique in which the population is grouped according to criteria such as age or sex; population for a group at some future date equals the present population plus the number of people who are born or move in, less the number who die or move away

column - a vertical element of a matrix

demographic - relating to population characteristics, including population distribution

econometric model - a mathematical representation of the economic activity of an area

endogenous - internal

exogenous - external

gravity model - a model that assumes that distribution of new population is directly proportional to the attractiveness of the city and inversely proportional to the distance from employment and amenities

housing market model - a model that predicts how the housing construction industry will respond to the demands of new population

import substitution - the substitution by residents of purchases made within the local economy for purchases presently made outside the local economy

input/output model - a model based on the interdependence of a region's industries and households as suppliers of inputs and purchasers of products

iterative technique - repetition of a procedure using the results of one repetition as input to the next

local study area - the area our analysis indicates is likely to be most affected by the project

project - Exxon Minerals' proposed mine/mill complex

row - a horizontal element of a matrix

scenario analysis - analysis of the possible effects of different situations; "what-if" analysis

state - the state of Wisconsin; any part of the state of Wisconsin that lies outside the local study area