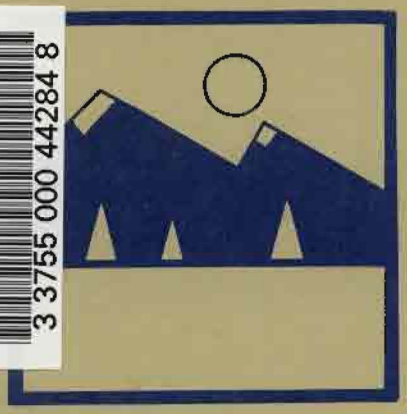
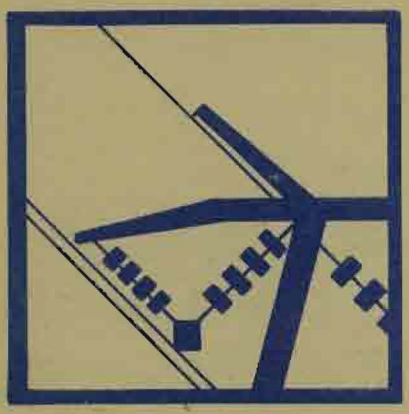


ALASKA POWER AUTHORITY

SUSITNA HYDROELECTRIC PROJECT



ACRES

ALASKA POWER AUTHORITY

SUSITNA HYDROELECTRIC PROJECT

PLAN OF STUDY - REVISION I

SEPTEMBER 1980

by

ACRES AMERICAN INCORPORATED
Liberty Bank Building, Main at Court
Buffalo, New York 14202

September 29, 1980

AN OPEN LETTER TO THE PUBLIC AT LARGE AND TO ALL INTERESTED AGENCIES AND ORGANIZATIONS

On February 4, 1980, I introduced you to the detailed Plan of Study for the Susitna Hydroelectric Project. I noted at the time that the plan did not permanently fix the manner in which the proposed work would be accomplished and expressed my desire that your assistance would contribute to its steady improvement.

The Project Team, composed of the Power Authority, Acres American and numerous subcontractors, has been heavily engaged during the past nine months in accomplishing the many tasks and subtasks which together will ultimately lead to the basis upon which the State of Alaska can make an informed decision as to whether it can or should proceed with the Susitna Hydroelectric Project. Construction of a camp was completed in April 1980 near the Watana dam site. Field crews have operated since then from the Watana Camp and from a number of other locations. Important information has been and continues to be collected. We know much more now about the geology, hydrology, seismology, environment, and especially about the concerns and interests of the public.

Even while the work has progressed, my hope for program improvement has been realized. A number of important changes have been made to the plan. This volume documents the revisions and briefly describes their genesis. Once again, your careful review and comments would be very much appreciated. I sincerely hope you will take the time to address them to:

Ms. Nancy Blunck
Public Participation Officer
Alaska Power Authority
333 West 4th Avenue, Suite 31
Anchorage, Alaska 99501

On behalf of the entire Project Team, I want to express my appreciation for the strong interest you have expressed to date. With your assistance, the revised plan will continue to be a dynamic document.

Sincerely,

E. P. Yould

Eric P. Yould
Executive Director

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ATTACHMENT A: Plan for Financing the Susitna Project
Task 11 - Marketing and Financing

R.1 - INTRODUCTION

Since the issue of the February 1980 POS, several events have taken place which have required that revisions be made to the POS, in regard to consideration of power alternatives and studies of alternatives within the Susitna Basin.

(a) Public meetings and workshop sessions held in Alaska between April and July 1980

During these sessions it became apparent that it would be desirable to increase the level of effort devoted to studying alternative generating facilities to Susitna and also to alternative developments within the Susitna basin. By expanding the scope associated with these aspects it would be possible to address the concerns expressed by a large group of people that the scope of work as outlined in the February 1980 POS unduly favored the Susitna Project. This increased level of detail is required to upgrade the degree of accuracy associated with all possible alternatives to the currently proposed U.S. Corps of Engineers scheme, thereby facilitating more accurate comparisons of costs and environmental and other intangible aspects.

(b) Report to the Alaska State Legislature on Electric Power Supply Planning issued in May 1980, by Arlon R. Tussing and Associates, Inc.

This report reemphasized the aspects discussed above and gave further impetus to increasing the level of detail associated with studying alternatives to development of the Susitna Basin. APA instructed Acres on April 23, 1980 to proceed to develop expansions to the studies in Tasks 1, 6 and 11 in order to address the concerns discussed above.

(c) The Alaska State Legislature Act "Relating to power projects of the Alaska Power Authority and the Susitna River hydroelectric project"

This was passed by the Alaska Legislature in June 1980 and as of June 6 effectively debarred Acres from participating any further with the alternatives studies outlined in Task 1 and the risk studies associated with the alternatives to Susitna under Task 11.

(d) The June 1980 ISER Report "Electric Power Consumption for the Railbelt; A Projection of Requirements"

This report indicated a much lower load growth than that used for the previous U.S. Corps of Engineers studies. This meant that the current Susitna development scheme proposed by the Corps should be carefully reassessed and a more detailed study of alternative lower levels of development be considered.

As a result of the above developments, APA instructed Acres June 13, 1980 and June 30, 1980 to make the following revisions to the POS.

TASK 1: Complete work on Subtasks 1.01 and 1.02 as originally proposed in the February 1980 POS and terminate all work on Subtasks 1.03 to 1.07. Prepare a completion report which includes discussion of the proposed expansion of work in this Task as developed by Acres with a view to increasing the level of detail devoted to the study of alternatives.

TASK 6: Revise the work plan to incorporate more detailed study of alternative Susitna Basin developments and to allow Acres to proceed with planning the Susitna Basin development, as part of the Railbelt system, complying as closely as possible with the February POS study schedule. The revised work plan should include preparation of appropriate inputs to the "Preliminary Reports" to be submitted by APA to the State Legislature by March 30, 1981, and April 30, 1982, recommending whether work should continue on the Susitna Project.

TASK 11: Revise the scope of work by eliminating the risk studies associated with the "assessment of power alternatives".

The following sections outline in detail the study scope and budget revisions.

R.2 - REVISIONS TO DETAILED ACTIVITY DESCRIPTIONS OF TASKS

Revisions to detailed activity descriptions of Tasks as originally proposed in the February 1980 POS are presented by Task in the following pages.

R.2.1 - TASK 1 - POWER STUDIES - REVISIONS

(i) Introduction

In response to the May 1980 Tussing Report and other public comment during the period April-June 1980, proposed revisions to the scope of Task 1 studies were developed and forwarded to the Power Authority May 7, 1980, for review and approval. These revisions involved significant expansion of scope of all subtasks and the addition of Subtask 1.07, Power Study Review Panel. Pending formal approval of this expanded scope, work continued on Subtasks 1.01 through 1.04.

As of June 6, following changes in State legislation, the Power Authority directed Acres to terminate work on Subtasks 1.03 through 1.07 and to complete Subtasks 1.01 - Review of the ISER Work Plan and Methodologies, and 1.02 - Forecasting Peak Load Demand, as originally proposed in the February 1980 POS. Acres was also requested to make formal recommendations to the Power Authority on the interfacing requirements with the independent consultant to be appointed to undertake Power Alternatives studies following termination of Acres' Subtasks 1.03 through 1.07. These requirements were such that Task 6 - Design Development, and Task 11 - Marketing and Financing Studies, could be continued without delay to the scheduled submission by APA of the required "Preliminary Reports" to the Alaska State Legislature in March 1981 and April 1982. The Power Authority also directed Acres to prepare an appropriate termination report for Task 1 activities.

(ii) Revised Scope of Work (Subtasks 1.03 to 1.08)

Subtasks 1.01 and 1.02 remain as in the February 1980 POS. Subtasks 1.03 to 1.07 are eliminated. A new Subtask 1.08 - Termination Activities, has been established for this work. The detailed scope of work for Subtask 1.08 and revisions to schedules for Subtasks 1.01 and 1.02 resulting from the events discussed above, are presented in the following pages.

Subtask 1.08 - Termination Activities

(a) Objective

Perform all activities necessary to terminate Subtasks 1.03 to 1.07 and prepare a Task 1 Termination Report.

(b) Approach

This subtask incorporates all Task 1 work performed at the request of APA, other than on Subtasks 1.01 and 1.02, following the termination of work on Subtasks 1.03 to 1.07 June 6, 1980. This work includes:

- preparation and presentation to representatives of Governor's Office of proposals for options available for continuation of objective power alternatives studies;
- assessment of impacts of State Legislature actions on Tasks 6 and 11 Studies;
- determination of interfacing requirements between independent power alternatives studies and Acres Tasks 6 and 11 studies;
- preparation of the Task 1 Termination Report;
- associated administrative costs, including preparation of the final termination cost statement.

The Termination Report will address:

- electric energy demand (a summary of completed work under Subtask 1.01);
- forecasting peak load demand (a summary of work completed to date under Subtask 1.02 and plans for completion of this activity);
- All other Task 1 activities which had been completed or were in progress as of the time the termination notice was received, including detailed work plans which had been under preparation for expanding the scope of work under Subtasks 1.02 through 1.07
- listing of reports gathered;
- notes/minutes of all important contacts made.

(c) Discussion

The Termination Report will provide a permanent record of activities undertaken during the conduct of Task 1, as well as a starting point for activities to be conducted by the independent firm to be selected for analysis of alternatives.

The termination cost statement will itemize all costs resulting from termination of work on Subtasks 1.03 to 1.07.

(d) Schedule

The originally proposed schedule for completion of Subtask 1.01 has been delayed by late issue of the ISER report. In addition, because of the complications caused by the proposed expansion to and subsequent termination of Task 1 activities, completion of Subtask 1.02 has been delayed until the end of September 1980. The currently proposed schedule is as follows:

Subtask 1.01 - Weeks 1 through 33
Subtask 1.02 - Weeks 15 through 39
Subtask 1.08 - Termination Activities, Weeks 23 through 33.

The issuance of the termination cost statement will follow receipt of all details of all incurred costs, currently anticipated by December 31, 1980.

R.2.2 - TASK 6 - DESIGN DEVELOPMENT - REVISIONS

(i) Introduction

The original scope of Task 6 Studies performed in the February 1980 POS placed heavy reliance on the results of system generation planning studies undertaken under Task 1.

In order to continue technical work in determining the most viable project arrangements for development of the Susitna River at and upstream of Devil Canyon, it is necessary to develop (or simulate) as best as practical the condition which will exist in the Railbelt electrical system within the timeframe of project implementation. This definition of system conditions will:

- determine the basic generation resources, characteristics of future generating resources, future growth in demand for electric power and energy, load characteristics and system costs of the regional electrical system;

- determine a realistic timeframe and economical capacity size increments for commissioning the proposed Susitna development;

- allow evaluation of feasibility of incremental Susitna developments from a cost and system reliability aspect;

- provide electrical data needed for preparation of the FERC license application Exhibit U and portions of Exhibits H, I and W.

The primary objective is to determine the optimum plan for adding Susitna to the Railbelt electrical system. At the same time further assurances of the viability of the project will be tested by changing system variables to determine the sensitivity of the project to potential future conditions outside the anticipated range of assumptions. Such conditions will include:

- the impact of low and high electrical load growth;

- the effect of various future trends of fuel costs and availability on the economic justification of Susitna;

- the impact of possible nonstructural measures in conservation and load management on system benefits of the Susitna Project.

Consequently, the benefits of the system study will be two-fold. First, it will allow evaluation of the Susitna development which best meets anticipated Railbelt electrical system needs. Secondly, it will determine the variability of Susitna benefits under different economic or growth conditions. The latter results will provide an important input to the finanical viability of the project as further developed in Task 11. The system study will also provide the planning data necessary to determine an adequately reliable system within the proposed timeframe of the Susitna Project implementation.

This work will be undertaken under Task 6 by means of seven additional subtasks:

Subtask 6.32 - Thermal Generating Resources
Subtask 6.33 - Hydro Generating Resources
Subtask 6.34 - Environmental Analysis
Subtask 6.35 - Load Management and Conservation
Subtask 6.36 - Generation Planning
Subtask 6.37 - Update Generation Plan
Subtask 6.38 - Liaison with Power Alternatives Consultant

The work approach is shown in schedule form in Section R3. The study first involves the development of characteristics of the anticipated available generating resources of various types, the transmission system and system loads. Also considered are variations in system load characteristics which might be caused by future trends toward conservation and load management within the various sectors of demand. For the purposes of this phase of study, all system planning will be based on the assumption that the Fairbanks - Anchorage intertie will be in place and capable of transmitting full Susitna capacity as and when required.

The developed data will be utilized to analyze the Railbelt electrical system via a production cost model. The model proposed for the simulation is the OGP-5 program, developed by the General Electric Company. This program is one of only a few comprehensive production cost models available to and used by the electric utilities and associated industries for system generation expansion planning purposes. Several production cost optimization runs will be undertaken to develop the results needed to determine the most advantageous Susitna development plan and the impact of Susitna on the electrical system costs and reliability.

The output of the work on system generation expansion planning, Subtasks 6.32 through 6.38, will be incorporated into the Development Selection Report (Subtask 6.05). An earlier Planning Status Report will also be provided to the Power Authority for use by the independent consultant selected for evaluating energy alternatives in the Railbelt Region.

System planning activities proposed prior to license submittal also involve review of the findings of independent energy alternatives studies. Documentation of the potential impact of, and discrepancies between the independent studies and the results of this Task will also be necessary. An appropriate activity, Subtask 6.38, is also included for liaison with the selected Power Alternatives Study consultant.

(ii) Revised Scope of Work
(Subtasks 6.01 to 6.07, 6.32 to 6.38)

Subtasks 6.01 - Review of Previous Studies, and 6.04 - Devil Canyon Arch Dam Evaluation, remain as in the February 1980 POS. Subtasks 6.02 Investigate Tunnel Alternative, 6.03 - Evaluation of Alternative Susitna Developments and 6.06 - Watana/Devil Canyon Staged Development Alternatives, have been expanded to incorporate more studies of alternative Susitna Basin developments and more detailed work on staging concepts. Subtasks 6.07 and 6.08, Preliminary Watana Dam and Devil Canyon Dam Alternatives respectively, have also been adjusted to allow for the development of conceptual designs of a Watana - Devil Canyon Susitna Basin development scheme significantly different from the currently proposed US Corps of Engineers scheme. Subtasks 6.32 to 6.38, Thermal Generation Resources, Hydro Generation Resources, Environmental Analysis, Load Management and Conservation, Generation Planning, Update Generation Plan, and Liaison with Power Alternatives Consultant respectively, have been added to provide the information necessary to complete the Susitna Basin planning studies on schedule. Subtask 6.05 - Development Selection Report has been expanded to incorporate the results of Subtasks 6.06 and 6.32 to 6.38.

These revisions are necessary to ensure that Susitna Basin planning studies may proceed independently of power alternatives studies for the Railbelt Region being undertaken by others. Detailed scopes of work for these additions are presented in the following pages.

Subtask 6.02 - Investigate Tunnel Alternatives - Additional Studies

(a) Objective

The studies outlined in the original Subtask 6.02 are aimed at developing a conceptual scheme or schemes having an installed capacity approximately equal to that of the current Devil Canyon/Watana scheme. The objective of this addition is to develop a tunnel scheme of smaller capacity and assess the potential for staging the tunnel scheme development.

(b) Approach

Using the layouts for the larger scheme as a basis, conceptual layouts for a smaller scheme will be developed. Consideration will be given to shortening the tunnel and/or reducing its diameter. The installed capacity of the scheme to be developed will be obtained after preliminary results from the generation planning studies (Subtask 6.36) are available. Cost estimates and construction schedules will be developed and the power and energy values assessed.

A brief environmental impact assessment of the scheme will be undertaken. Of prime concern will be the required compensation flows for the reach between the Watana damsite and the tunnel outlet point.

(c) Discussion

Depending on the outcome of the early work in Subtask 6.02 it may be appropriate to divert this study effort to assessing the potential for a tunnel development at an alternative damsite.

(d) Schedule

Weeks 22 through 50 (start 8 weeks ahead of February POS schedule).

Subtask 6.03 - Evaluate Alternative Susitna Developments - Additional Studies

(a) Objective

To expand the work outlined in the original Subtask 6.03 by incorporating more detailed studies of the development of smaller hydroelectric facilities at the Watana and Devil Canyon sites and developments at other previously unidentified sites.

(b) Approach

Based on the output derived from the ranking of sites in the Susitna Basin carried out as part of the original Subtask, several alternative schemes to the current Devil Canyon/Watana development will be selected and conceptual layouts, cost estimates and construction schedules prepared. It is anticipated that this will involve up to 4 different sites with up to 2 or 3 levels of development at each.

To assist in the economic evaluation of these additional schemes, a computer planning model will be applied. Input data to this model will include seasonal streamflow, the costs and energy output associated with various levels of development at the sites and the load projection and associated load factor. The model will then be used to select the optimum schemes and the approximate schedule of development which minimizes total energy costs. This model will also be used to provide an estimate of the required seasonal reservoir drawdown. Certain environmental constraints will be incorporated directly in the planning model. These include limitations to reservoir level and downstream discharge fluctuations.

The model will be applied for several different load forecasts and used to assess the optimum Susitna development schemes for each. These results will be reviewed and used to assess the best possible development scheme or schemes which would be economically most suitable for a range of future load demands.

The results of planning model studies will be refined for those schemes selected as "best" in Subtask 6.36 using the multi-reservoir monthly simulation model discussed in Subtask 3.04. this model will incorporate load stacking on a monthly basis and will be used to refine the operational rules for the Susitna development and to assess the hydrologic risks of Susitna not meeting its expected power output.

(c) Discussion

The work undertaken in this Subtask will be continually coordinated with the system generation planning work to be undertaken in Subtask 6.36 - Generation Planning, to ensure that the correct system characteristics are incorporated (i.e., the load factor used in the planning model and the load stacking incorporated in the simulation model.) It is anticipated that several interactive runs with both the

planning model and the generation planning model in Subtask 6.36 will be required to finalize the appropriate scheme or schemes.

The activities in this subtask will also be closely coordinated with those in Subtask 6.33 - Hydro Generating Resources, to ensure uniformity of the capital cost estimates and the methods of evaluating power and energy.

(d) Schedule

Weeks 16 through 63. (Start advanced 14 weeks, completion delayed by 3 weeks).

Subtask 6.05 - Development Selection Report - Additional Studies

(a) Objective

To provide additional information in the report sufficient to meet the needs of the Power Authority in preparing its "Preliminary Report" to the Alaska State Legislature in March 1981.

(b) Approach

The scope of the report will be expanded to incorporate the additional studies outlined in Subtasks 6.02 - Investigate Tunnel Alternative, and 6.03 - Evaluate Alternative Susitna Developments. Also included will be the staging studies included in Subtask 6.06 - Watana/Devil Canyon Staged Development Alternatives, and the generation and planning studies in Subtasks 6.32 to 6.38.

A Planning Status Report will be issued prior to completion of the Development Selection Report. We anticipate at this stage that most of the planning work will have been completed, and one or more appropriate Susitna development schemes will have been identified and the associated economic parameters evaluated. The Planning Status Report will contain a summary of the results of the studies to date. It will include a description of the alternative schemes studied and discuss the economics of the Susitna development options. The Planning Status Report will contain the information needed by the Consultant undertaking the Railbelt Electrical Power Alternatives Study. However, much of the detailed backup information which will be submitted with the Development Selection Report will not be included in the Planning Status Report.

(c) Schedule

Development Selection Report (final draft) - Weeks 48 through 65.
Planning Status Report - Weeks 48 through 57.

Subtask 6.06 - Watana and Devil Canyon Staged Development - Additional Studies

(a) Objective

As originally planned, Subtask 6.06 evaluated the potential for staging the selected Susitna development. The objective of this addition is to broaden this scope to include study of staging of alternative sites within the Susitna Basin and to include a more detailed study of the mechanical and electrical equipment requirements for staged development.

(b) Approach

For the alternative sites studied, the potential for staging will be assessed. Where feasible and appropriate, conceptual staging schemes will be developed along the lines outlined in the February POS. To facilitate planning of a potentially large number of possible staged developments, the information developed in this subtask will be fed into the Susitna Basin planning model described in Subtask 6.03.

In addition to the above studies, a review of current experience with mechanical and electrical equipment for staged development will be carried out. Further study will be undertaken to identify equipment types and procedures necessary for staged development within the Susitna Basin. The types of procedures available for dealing with these problems include provision for replacing turbine runners, operating units outside their maximum efficiency range for extended periods, and changing generator operating speeds (by rewinding, installation of two-speed generators, etc.).

(c) Discussion

The studies outlined in the February POS for Subtask 6.06 will be advanced and run in parallel with the studies in Subtask 6.03. This has become necessary because of the lower ISER 1980 load forecasts. To meet these lower demands in the most economic way may require a staged development.

(d) Schedule

Weeks 30 through 63. (Completion date 12 weeks advanced on February POS.)

Subtasks 6.07 and 6.08 - Preliminary Watana and Devil Canyon Dam Alternatives - Additional Studies

It may be necessary to consider a lower level of development at these sites than is currently envisaged in the U.S. Corps of Engineers report. The basic Corps schemes may therefore not be suitable starting points for these studies. While these two subtasks remain essentially the same, a slight budget adjustment has been made to allow for additional project layout work to be undertaken.

Subtask 6.32 - Thermal Generating Resources

(a) Objective

To provide cost information and characteristics of the most likely fossil fueled generating resources potentially available to the Railbelt electrical system within the timeframe of Susitna commercial service dates.

(b) Approach

Information will be prepared for coal, gas and diesel-fired power generation resources only. Preparation of the required input data is separated into two activities: preparation of generating plant costs and characteristics and development of potential fuel price scenarios.

Thermal plant types to be examined are:

- mine mouth coal fired steam
- combustion turbine - gas fired
- combined cycle - gas fired
- conventional diesel

In addition to the above, the potential for cogeneration will be assessed. If it is considered to be significant, approximate capacities and costs will be evaluated.

For each type, estimated capital and operating costs will be developed for arctic operating conditions. Capital costs will be based upon generic plant designs (and costs associated with them) such as have been developed for the Electric Power Research Institute (EPRI). The costs of construction will be modifed to reflect Alaska labor rates and material prices and will include items required for cold region operation. The coal fired plant cost will include the cost of all services and facilities required to establish and operate such a project in a presently undeveloped region.

Plant sizes will be consistent with available data and the generation system needs. As a general guideline, the following unit capacities will be used as the basis of the study:

Coal fired steam		500 MW
Gas turbine		75 MW
Combined cycle		250 MW
Diesel	approx.	10 MW

Coal-fired plant costs will be divided into generating plant, transmission, transportation facilities and community development, such that the cost of either a plant at Beluga or plant extensions at Healy can be identified. Operating costs, plant performance and operating requirements will be determined based upon EPRI standard plant designs wherever possible.

Construction schedules will be developed based upon Alaskan weather conditions and site accessibility. Detailed development analysis will not be performed; allowances will be made based upon general categories of construction tasks.

Small diesel generating plants will be costed for comparative purposes and to cover application where small isolated systems are considered or to facilitate increased system reliability where long interconnections are involved.

Fuel cost scenarios, fuel availability and emission factors will be developed for coal, gas and oil. Estimates of coal cost at the mine mouth will be developed based upon continuous operation, reflecting fixed charges on the mining facilities, labor and maintenance. Coal quality will be investigated to identify boiler operating conditions, fuel handling needs and emissions control equipment requirements.

Estimates of gas value will be developed for the cases of:

- LNG plant installations
- pipeline construction
- existing market conditions

The impact of the Fuel Use Act on the availability of natural gas as power plant fuel will also be examined.

(c) Discussion

Fuel supplies available in the Railbelt region for future electric generation plants are primarily untapped coal and natural gas resources. Petroleum products are available but relatively high prices and regulatory constraints make it unlikely that they will be used as the primary fuel for additions to the generation system in the Railbelt.

At present, gas production capability in the region of the Kenai peninsula far exceeds demand, as no transportation system exists to export markets. Consequently, the price of natural gas in the region is far below free market prices. Construction of a natural gas liquefaction facility or a pipeline spur with the proposed Alaskan Gas Pipeline could dramatically alter the value of this resource.

Coal resources exist within a few hundred miles of Anchorage in the Beluga area, and near Healy, where a 100 MW plant is in operation. Development of the Beluga coal reserves would require establishment of a mining operation, transportation system, and supporting community where none exists at present. Construction of a mine mouth plant would further require installation and/or upgrading of a transmission connection to the Railbelt corridor.

Of the study items, the price and availability of natural gas will be given most careful study. Generation with gas fired combustion turbines at present prices will probably produce power at very attractive costs.

Whether these present generation costs can be expected to continue depends upon development of a transportation mode to markets overseas or on the U.S. mainland, or whether use of gas for generating electricity is halted by the Fuel Use Act.

Standard plant characteristics and costs have been developed by EPRI for the types of generating plants selected. As the estimates have been developed for Lower 48 application, some modifications will be required for application to Alaska. Background data for these estimates which is presently in hand will be updated and all costs will be brought to 1980 levels using the available information.

Large oil fired, nuclear, geothermal and other types of thermal generation plants will not be examined. Oil-fired power plants are not likely to be economically competitive in the time frame under consideration. Nuclear plant costs are at present little different than those for coal fired plants in the Lower 48 states, where an experienced nuclear construction labor pool, a good transportation system, and manufacturing facilities exist. Such conditions do not exist in Alaska. Nuclear plants in Alaska are likely to exhibit an even greater cost escalation over Lower 48 costs than that expected for coal fired plants and economic feasibility is therefore doubtful. There are also severe institutional constraints to nuclear development in Alaska.

Geothermal resources have been identified east of the Railbelt region, but are as yet undeveloped. As these sites are a substantial distance from the existing transmission system, plant costs will be high and probably uneconomic. Geothermal is expected to be examined in the independent Power Alternatives Study, and will not be studied in Task 6.

Municipal solid waste, wood-fired, peat-fired, biomass and other more exotic forms of power generation under consideration in Alaska are not likely to be economically competitive to any significant extent in the time frame under consideration. However, such sources are potential components of a decentralized system to serve isolated load centers, and will be assessed on this basis.

(d) Schedule

Weeks 30 through 44 inclusive

Subtask 6.33 - Hydroelectric Generation Sources

(a) Objective

To provide cost information and characteristics of hydroelectric resources that could be expected to be included in the Railbelt electric system within the timeframe of the Susitna commercial service dates.

(b) Approach

Hydroelectric facilities which might be a part of the Railbelt generating resources will be identified and classified as follows:

- projects currently under active implementation planning
- projects competitive with Susitna (i.e., projects of a similar size)
- non-competitive projects (i.e., smaller scale developments)

The basic source of data will be the approximately 120 sites inventoried by FERC, the Corps, and DOE which include developed and undeveloped hydroelectric sites in the Railbelt region. An initial rough screening process will be used to eliminate sites which are clearly not cost effective in the framework of any type of generating scenario or which have severe environmental impacts.

It is not considered likely that decentralized development of small-scale hydro resources will be economically competitive in the timeframe considered. However, consideration will be given to such a scenario to properly evaluate its potential possibly in conjunction with small gas- or oil-fired plants for reserve and backup capability.

A second more refined screening approval will then be applied (see Subtask 6.34). This will take into account revised physical characteristics of the sites successfully passing the initial rough screen. In order to be considered for future development, a project will have to be competitive with Susitna on the basis of the following criteria:

- It must have a similar projected power cost either based upon $/kW of installed capacity or $/MWH energy cost (whichever is more competitive)

- It must be developable within the timeframe considered and cannot be currently prohibited from development by law (i.e., Wild and Scenic Rivers Act).

The first cost criteria will compare the site to the highest cost Susitna alternative passing selection from Subtasks 6.03 and 6.06. This will ensure that sites having higher costs, but more effective system benefits due to timing or phased construction impacts, will not be prematurely screened. Those sites passing the second screening will be incorporated into the generation planning evaluation of Subtask 6.36.

Consideration will also be given to the proposed Cook Inlet tidal hydropower projects as a potential future resource. Available reports and material will be reviewed to determine costs and energy and capacity generation capability of the schemes studied.

(c) Discussion

It is likely that the future generating resources of the Railbelt electrical system will ultimately include a major component of hydro capacity due to the abundant number of sites available for development. The primary concern to be identified in this subtask is whether there are sites which would better fill the needs of the system than Susitna and the resultant impact of such projects on implementation of Susitna.

Based upon past studies of regional hydro potentials, in particular the 1976 Alaska Power Survey (FPC), it is not anticipated that there will be any environmentally acceptable hydro projects with a lower incremental capital cost than Susitna. However, the 1976 survey indicated several sites which could potentially be more viable short-term alternatives to Susitna. This is due to the large total capacity of the Susitna developments and likelihood of a more costly phased construction.

There will be a limitation to the accuracy of the study results due to the relatively small amount of site information available. There is an important need to maintain a consistent approach with the studies in Subtasks 6.03 and 6.06 so that all cost, hydrological and environmental characteristics are considered on a uniform basis.

(d) Schedule

Weeks 30 through 40

Subtask 6.34 - Environmental Analysis

(a) Objective

To provide environmental screening of proposed thermal, hydro and tidal generating facilities in order to eliminate obvious environmentally unsound developments, and to evaluate the general environmental impacts associated with and without a Susitna development generating scenario for the Railbelt.

(b) Approach

Based on available information, quantitative and non-quantitative environmental parameters associated with the proposed generating facilities will be developed. A significant portion of this information will be based on generic type impacts; i.e., those applicable to particular types of generating facilities. However, where appropriate and feasible, site specific impacts for both thermal and hydro facilities will also be assessed. The parameters will encompass ecologic (i.e., effect on wildlife and wildlife habitat, fisheries, etc.), socioeconomic, institutional and legal aspects.

Environmental screening criteria will be developed and applied in conjunction with the economic criteria to screen out those facilities which need not be considered further in the planning studies. These criteria will involve both quantitative (i.e., cost of energy, land acquisition required, area of land inundated) and non- quantitative (e.g., minor or major impact on fisheries and wildlife) parameters.

The screened list of generating facilities will be incorporated in the generation planning studies (Subtasks 6.36 and 6.37).

As the generation scenarios are developed, the environmental parameters evaluated for the specific facilities will be used to evaluate the overall impact of the scenarios. These impacts, which incorporate quantitative and non-quantitative parameters, will be used to assist in the selection of the most suitable generation scenarios and will also be used to determine the differential environmental impact for the with- and without-Susitna development alternatives.

(c) Discussion

The work described above will be based on available information. No new investigatory work will be undertaken.

(d) Schedule

Weeks 30 through 65

Subtask 6.35 - Load Management and Conservation

(a) Objective

To determine the effects of load management and conservation on the alternatives for development of the Susitna project.

(b) Approach

The basis for the selection of the alternatives for development of the Susitna project will be the energy forecast developed by the ISER and system load characteristics developed by WCC in Subtask 1.02. The primary efforts under this subtask will consequently be concerned with reviewing portions of that work. The output will be an analysis of the impacts of various levels of load management and conservation and the resultant modified load forecasts to be used in the Subtask 6.36 analyses. Consideration of conservation as a nonstructural pseudo-generation source will not be undertaken since this would more appropriately be included in the scope of the independent alternatives study.

The degree of success of future modification to load shapes and patterns as identified by ISER and included in their forecast will be identified. A critical analysis of this portion of the ISER forecasting methodology will be performed. This work will essentially follow up on the various reviews of the May, 1980 ISER report and the results of WCC studies in Subtasks 1.01 and 1.02.

The possible effect on the future power demand of potential conservation and load management measures not considered in Subtasks 1.01 and 1.02 or considered and rejected in those studies will be reconsidered. The general likelihood of these measures and their social and economic costs will be assessed. From the foregoing reviews, conceptual plans for additional load management and conservation will be developed with the objective of evaluating the sensitivity of the load forecast to additional measures to modify load shapes and patterns. The conceptual plan will be based on judgments of the applicability of the additional measure, using the most up-to-date published data from related conservation and load management research programs. A determination will be made of the impact of the conceptual plan on the total capacity and energy as well as the shape of the forecast load duration curve.

(c) Discussion

The output of this Subtask will include documentation of the load forecast projections outside the ISER-WCC forecast envelope. The reasons for such deviations include load management or conservation programs or consumer responses more radical than previously predicted. An assessment will be made of the probability of these forecasts happening, together with an estimate of the social and/or economic

costs of achieving these scenarios. These revised forecasts will only be used to determine the sensitivity of the planned Susitna development to such measures (Subtask 6.36) and not as defensible projected futures. Thus, some of the aspects associated with load management and conservation will necessarily be based on subjective judgment and results of other studies.

(d) Schedule

Weeks 30 through 48

Subtask 6.36 - Generation Planning

(a) Objective

To determine the most suitable size of development and scheduling for the Susitna Basin hydro schemes, and to evaluate the sensitivity of these schemes to changes in certain key parameters such as projected load growth and fuel cost escalation and availability.

(b) Approach

A major tool to be used in this analysis will be a power generation planning model. At this stage we propose to use the General Electric OGP5 program. However, an initial review of other production cost models available for immediate use will be undertaken. This review will assess the generation planning options available, determine which program appears most appropriate for meeting the subtask objective and evaluate whether there are additional costs or time constraints associated with its use. Key program features to be considered will be the handling of hydro generating stations, system reliability criteria, production cost methodology, optimization capability, the potential for handling load forecast uncertainty, and the analysis of overbuilding and underbuilding impacts.

An important aspect early in the study will be the identification of assumed values for key generation planning parameters such as the fuel costs and availability, interest rates, escalation rates, target system reliability criteria, interconnection capabilities and the criteria on which optimum generation expansion scenarios will be evaluated. A design transmittal will be prepared documenting this information for review and approval by APA and coordination with Task 11 Studies prior to use.

Data on the existing Railbelt power supply system will be obtained. This will include a list of all the major generating facilities, their costs, reliability and planned retirement dates (if known). A general assessment of their efficiency and mechanical condition will also be made. The data on the existing system, the ISER forecasts and the thermal and hydroelectric resources data established under Subtasks 6.32 and 6.33 will be fed into the selected generation planning model. The model will then be operated using these potential generation resources to establish an initial optimum generation mix scenario. This scenario will be developed using the selected "most probable" forecast.

Building upon the initial scenario, Susitna alternatives will be introduced and the costs and other system impacts compared. The initial analyses will be performed using the most probable forecast, and the optimum Susitna developments from Subtasks 6.03 and 6.06.

Several runs will also be undertaken with the high and low load growth projections to determine the flexibility of the generation plan to cope with load growth uncertainties. The system performance with alternative Susitna developments in terms of cost, reliability, environmental impact (Subtask 6.34), and financibility and risk (Task 11) will be compared to determine the most suitable development plan.

Sensitivity analyses will be undertaken for the selected developmental plan. These analyses will entail the comparison of production costs of the alternative generating scenarios for load forecasts incorporating conservation and load management, different rates of fuel cost escalation and several interest rates. This information will be evaluated in an iterative process, to determine whether any rejected Susitna alternatives should be reevaluated or other further sensitivity analyses are required.

(c) Discussion

Important results of the above analyses will be the determination of the values of certain key parameters such as the rates of load growth, fuel cost escalation, and interest rates which define the limits of economic Susitna basin development.

Of primary concern in these studies will be to determine whether the Susitna Basin should be part of the selected generating scenario, and what level of Susitna Basin development is appropriate. Should the above analyses reveal that either of these decisions is sensitive to load growth projections then a more formalized approach to the question of load growth uncertainty will be adopted. This approach will involve a simplified decision tree model in which the effects on system economics and reliability due to differences in projected and actual load growths are systematically explored. We propose to use this information to assist in a judgmental approach to planning. In this approach, careful reviews will be made of the consequences of the sequential decision-making process rather than utilizing the model output to select the optimum development scheme based on a single composite index (i.e., minimum expected generating costs).

These activities will be closely coordinated with the Susitna Base Plan Initial Risk Analysis (Subtask 11.03).

(d) Schedule

Weeks 37 through 65

Subtask 6.37 - Update Generation Plan

(a) Objective

To update the results of the generation planning studies prior to FERC license application finalization.

(b) Approach

Updated information for the selected Susitna Project (Subtasks 6.26 and 6.27) and necessary modifications to the generation plan will be developed. This information will be based upon the result of the independent Power Alternatives Study and will be incorporated into an updated generation plan. The system benefits of the project will subsequently be re-evaluated using the production cost model.

Utilizing this information plus the results of the independent Power Alternatives Study, reports for inclusion in the FERC application Exhibit I (describe load and market), Exhibit U (power utilization statement) and Exhibit W (alternatives to proposed action) will be assembled. The Exhibit W will essentially comprise the report prepared by the independent Power Alternatives Study consultant.

(c) Discussion

Further data supporting cost and performance characteristics of the selected Susitna development scheme will be available in March 1982. The independent generation alternatives study for the Railbelt Region will also be completed at this stage and will require review and analysis to determine the sources and reasons for any discrepancies which may occur between the results of that study and those conducted in Subtask 6.36. It is important that the most current data be provided in the license application and that any differences in opinion on the subject of need for the project and alternatives be resolved.

(d) Schedule

Weeks 112 through 120

Subtask 6.38 - Liaison with Power Alternatives Consultant

(a) Objective

Provide for liaison, coordination and information exchange with the independent consultant selected for study of power alternatives.

(b) Approach

As soon as a consulting firm has been selected, Acres will provide a briefing on activities conducted to date as well as a discussion of plans for future work. A basis will be established for proper information flow and critical milestones will be identified to ensure that the schedules of both parties can be maintained. From time to time, coordination meetings will be scheduled. Frequent contact by phone and exchange of correspondence will occur.

(c) Discussion

Until a consulting firm has been selected, it is not possible to predict precisely what total liaison requirements will be necessary. In that regard, for example, the location of the selected firm as well as the plan to be drawn up for study of alternatives will directly influence costs and frequency of coordination meetings. Even so, it is clear that liaison must occur. To the extent that early agreement can be reached on fundamental data (e.g., interest rates, assumed escalation,costs of individual potential generation alternatives, possible power-on-line dates), the effectiveness of both parties will be enhanced. It is equally important to ensure that evolving Susitna Basin Power Alternatives developed by Acres should be compatible with the information needs of the selected consulting firm. As the work progresses, it will also be necessary to ensure that those portions of the FERC license application dealing with alternatives will be prepared in proper format and sufficient depth to meet submission requirements.

The budget established for this Subtask will be modified if necessary after mutual coordination needs have been established with the selected firm.

(d) Schedule

From time of selection of Power Alternatives Consultant throughout remainder of project period.

R.2.3 - TASK 11: MARKETING AND FINANCING - REVISIONS

(i) Introduction

In response to the May 1980 Tussing Report and other public comment during the period April-June 1980, and also as a result of discussions with the Power Authority concerning the proposed marketing and financing studies, and finally the recent changes in Alaska State Legislation, the scope and scheduling of the Task 11 activities originally proposed in the February 1980 POS have been modified.

Essentially, the major modifications include:

- Advancement of schedule and increase in level of effort for the initial project overview and internal report documents
- Elimination of Alternative Power Source Risk Analysis from the Acres POS
- Advancement of schedule and increase in level of effort for the Susitna Basin Plan Risk Analysis
- Delay of schedule and reduction in level of effort for identification of Parties in Interest
- Indefinite delay of commencement of work in Resolution of the Tax-Exempt Bond Issue
- Advancement of schedule and increases in level of effort for Susitna Financing Risk Analysis
- Subtasks have been appropriately renumbered.

(ii) Revised Scope of Work (Task 11)

At the request of the Alaska Power Authority, the scope of work for Task 11 as proposed in the Acres' Plan of Study dated February 1980 has been amended to exclude the Alternative Power Source Risk Analysis (originally Subtask 11.03), and to defer until further notice the Resolution of the Tax-Exempt Bond Issue (originally Subtask 11.07). The originally proposed Subtasks 11.10, Liaison with APA Bond Underwriting Managers and 11.11, Draft Documentation for Bond Offering support have also been deferred. Subtask 11.12, Preliminary Financial and Marketing Study, subsequently proposed as a result of the Arlon Tussing Report, has also now been eliminated. Subtask numbering has been appropriately revised.

TASK 11: MARKETING AND FINANCING

(i) Task Objectives

To carry out a comprehensive economic evaluation of the Susitna Hydroelectric Project and to perform those economic, financial and marketing analyses of possible generation sequences capable of meeting the needs of the Railbelt to allow Susitna to be presented in proper perspective.

To establish the feasibility of financing the project and to develop an approach which provides optimum financing cost to Alaska Power Authority and the best overall benefit to the State of Alaska. An essential element of this task will be to build confidence in the project if it is shown to be the most appropriate for future development.

(ii) Task Output

At the request of the Alaska Power Authority, the scope of work for Task 11 as proposed in the Acres' Plan of Study dated February 1980 has been amended to exclude the Alternative Power Source Risk Analysis (originally Subtask 11.03), and to defer until further notice the Resolution of the Tax-Exempt Bond Issue (originally Subtask 11.07). The originally proposed Subtasks 11.10, Liaison with APA Bond Underwriting Managers and 11.11, Draft Documentation for Bond Offering support have also been deferred. Subtask 11.12, Preliminary Financial and Marketing Study, subsequently proposed as a result of the Arlon Tussing Report, has also now been eliminated. Subtask numbering has been appropriately revised.

The principal output of this task will be the Project Overview, which will incorporate comprehensive, but readily understood, documentation of major issues affecting the financing of the Project. This document will first be issued prior to the first decision point on whether or not Susitna studies should continue, currently scheduled for March, 1981. Two subsequent updates of the report will also be prepared through March, 1982. A series of internal management reports will also be prepared. Notable outputs unique to the marketing and financing issue include a series of risk analyses and procedures for risk control and minimization, as well as a taxation report addressing the important question of eligibility for tax-exempt bond issuance.

The main topics to be dealt with in the Project Overview and Internal Reports will include:

(a) Project Overview:

- General Description of Susitna Hydroelectric Project
- Review of Design and Construction Concepts and Methodology
- Review of Cost Estimates and Schedule

(a)	Project Overview (Cont'd)	- Economic Evaluation of Project and Its Limits
		- Major Risks and Responses
		- Overrun Possibilities and the Security of the Project Capital Structure
		- Review of Environmental Constraints and Mitigation Plans
		- Development of the Organization for Management and Operation of Project
		- Preliminary Assessment of the Financial Plan and Requirements for Bond Offering Documentation
(b)	Internal Reports For Management/ Financial Consideration (Provisional Listing):	- Economic Feasibility Study and Determination of Probable Economic Limits for the Project
		- General Economic Review
		- Review of Global Energy Economics
		- Economic Impact on the State of Alaska
		- Assessment of Capital Costs, Schedules and Program of Expenditures
		- Assessment of Project Operating Costs, and Maintenance/Replacement Expenditures
		- Assessment of Critical Engineering Tasks and Associated Risk Analyses
		- Project Contingencies, Risk Analysis, Policies and Planning for Mitigation of Risks
		- Escalation Assessment and Analysis of Capital Cost Overrun Possibilities
		- Security of Project Capital Structure
		- Financing Requirements of all Parties and for the Completion Guarantee
		- Evaluation of Alternative Markets Available for Susitna Output

(b) Internal Reports for Management/ Financial Consideration (Provisional Listing) (Cont'd)

- Evaluation of Alternative Options for Meeting Railbelt Power Needs (by others)
- Assessment of Socio-economic Aspects
- Review of Construction Contract Performance History in Alaska Relating to Cost and Schedule

The Internal Reports and the Project Overview will form the basis for any Bond Offering Memorandum (BOM) Support Documentation that may ultimately be required. Preparation of BOM documentation would normally begin after completion of the Susitna Feasibility Studies and submission of an Application for Licensing to the FERC.

The subject matter of Internal Reports and the Project Overview will also be such as to address the requirements of the BOM documentation, which provisionally will include:

- Primary Volumes:
  - Power Contracts
  - Engineering Report
  - Statutory Agreements, Legal Approvals and Land Claims
  - Summary of Corporate Documents
  - Technical Abstract and Engineer's Certificate
  - Construction Cost Estimate Summary
  - Construction Schedule and Project Expenditure Program
  - Insurance
  - Financing Summary

- Support Volumes:
  - Overall Project Organization
  - Engineering Reports (Construction)
    - -- Access and Site Preservation
    - -- Environmental Standards, Monitoring and Control
    - -- Quality Assurance and Testing Programs
    - -- Support Facilities and Logistics

- Support Volumes: (Cont'd)
  - Engineering Reports (Operations)
    -- Operating and Replacement Expenditures
    -- Chargeable Corporate Expenditures
  - Labor Agreements
  - Plan for Alaska Manpower and Procurement Content
  - Risk Management and Minimization
    -- Risk Analysis and Control
    -- Risk Minimization
  - Taxation Report
  - Legal Report
  - Review of Giant Projects
    -- Financing
    -- Construction and Engineering
  - Alternative Energy Sources

(iii) List of Subtasks (revised)

Subtask 11.01 - Project Overview Preparation and Update
Subtask 11.02 - Internal Report Preparation
Subtask 11.03 - Susitna Base Plan Initial Risk Analysis
Subtask 11.04 - Susitna Base Plan Extension and Revision
Subtask 11.05 - Susitna Financing Risk Analysis
Subtask 11.06 - Resolution of Tax Exempt Bond Issue
Subtask 11.07 - Identify Parties in Interest
Subtask 11.08 - Revenue Assurance Procedures
Subtask 11.09 - Liaison with APA Bond Underwriting Managers
Subtask 11.10 - Draft Documentation for Bond Offering Support

Note that Subtasks 11.03 through 11.10 are renumbered following amendments to scope of work, and 11.06, 11.09 and 11.10 activities are currently deferred.

(iv) Subtask Scope Statements

It is recognized that if the Susitna Project is selected as an appropriate element in the growth of generating capacity in the Railbelt Region, it is most likely to proceed on the basis of a project financing. Essential to this will be an accurate determination of revenues and properly established energy sales agreements. Furthermore, all project risks must be identified, their potential impact assessed, and appropriate contingency plans and provisions made.

In the approach recommended, a close working arrangement will be established from the outset of the study between technical, economic and financial advisory groups. The interaction between these interests will be developed through a series of specific tasks which provide the Authority with successively more comprehensive outlines and definition of a financing plan.

As the study proceeds, the specific requirements for supporting material essential for financing will be identified and its preparation undertaken in close collaboration with the selected bond underwriters. Work undertaken prior to license application will provide the foundation upon which bond offering support documentation can later be prepared. The completeness and excellence of bond offering support documentation is judged to be of crucial importance to a successful project. The work involves numerous, complex and interlinked tasks; and only comprehensive pre-planning can achieve the desired result.

In order to present the project in proper perspective to the many parties involved--Federal, State and local agencies, regulatory authorities, power purchasers, potential lenders, institutions, political groups and public--a comprehensive overview will be prepared. This will initially be in general terms, but will endeavor to cover all the interrelated elements of the project. As work proceeds, successive editions of the overview report become more explicit and complete. In the event that a Susitna development is shown to be feasible and most appropriate for satisfaction of electrical energy needs in the Railbelt, studies and explanations which may seem unnecessary to the sponsoring group may well be needed to convince third parties and engender their enthusiasm.

It is furthermore vitally important to disperse the knowledge among those employed on the project that all potential problems have been thoroughly examined and solved. If, on the other hand, no Susitna development is found to be warranted, careful and reasoned analysis of the appropriate alternative will be necessary to ensure that the State's decision to proceed with some other project (or projects) is based upon thorough studies which establish technical, economic and financial feasibility as well as environmental acceptability.

The work of the interdisciplinary group incorporating technical, economic, financial, and other skills would, furthermore, demonstrate clearly for management consideration the clear economic limits to the Susitna project or some other alternative (e.g.,its maximum acceptable cost) and the time period in which its accomplishment must be regarded as a certainty before other measures to meet Alaska's power needs would have to be adopted. While examination of the negative limits of the project could be regarded as an expression of pessimism or recognized to be even, in the ultimate, capable of cancelling the project, we consider such analysis vital. It should serve to establish the general robustness of the project and to demonstrate beyond doubt to the various governments, investors, lenders, completion guarantors, concerned interests and others the viability and acceptability of any recommended scheme for development.

The approach to be adopted would derive full benefit from previous financing efforts for major capital projects requiring capital funding of $1 billion or more. Experience has demonstrated the need for close and effective interaction between the owner of such projects and the various elements of his advisory team with the wide range of interests involved.

(v) Risk Assessments

As the various elements of the project study reach the appropriate level of completion, it is planned to apply a rigorous analysis of risk and to recommend contingency provisions. The approaches to be used would involve modern techniques of analysis and probability assessment and deal with cost, schedule, technical and other controlling elements of the project.

Risks to be assessed include those associated with the planning, design and construction of the project as well as the financing of it. There are a number of basic project financing risks which must be addressed. The analysis, assessment, and, where appropriate, quantification of these risks will be accomplished under Subtasks 11.03 through 11.05. Financing risks include:

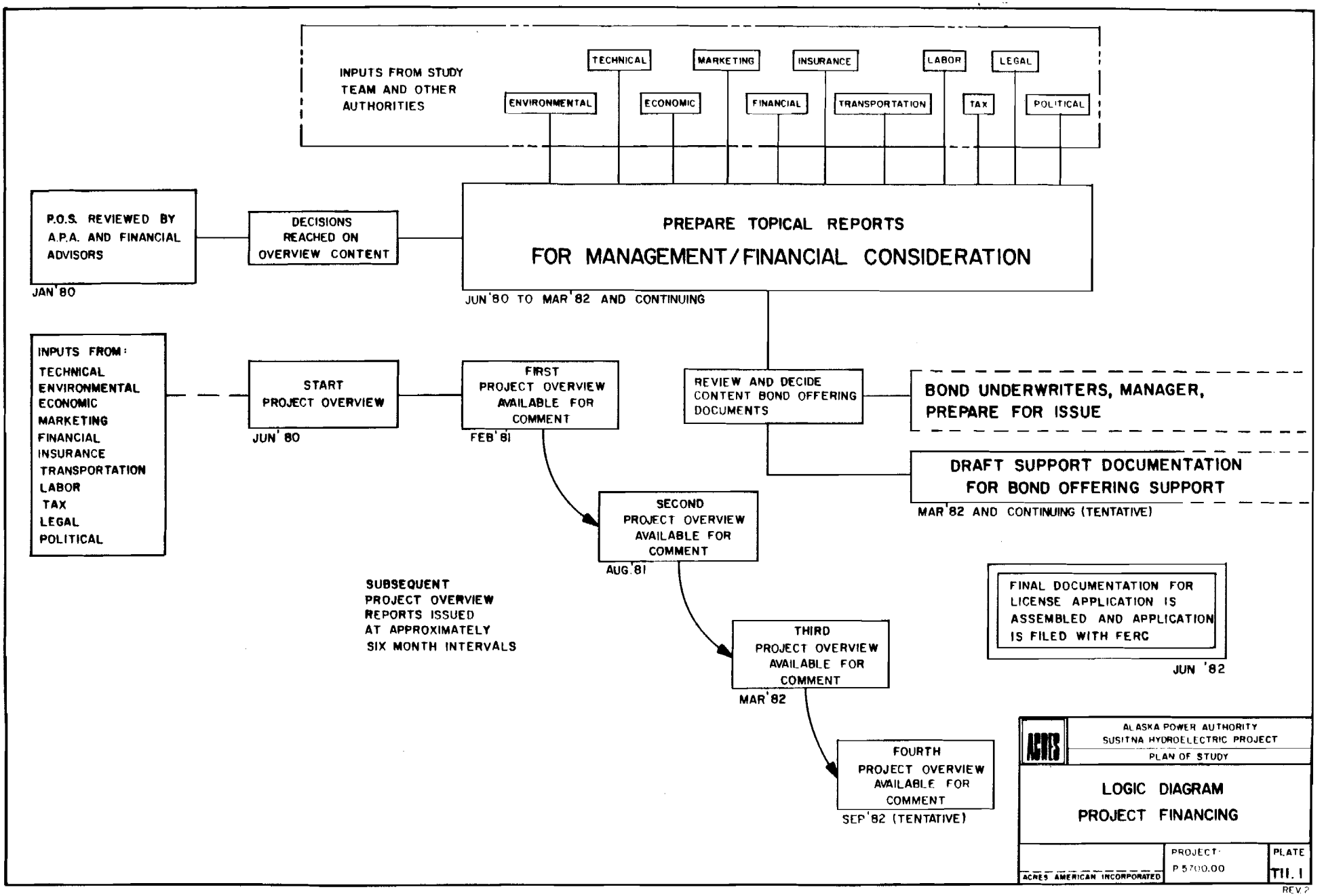
-- Cost overruns prior to completion
-- Late completion and non-completion
-- Partial or total post-completion outages
-- Customer failure to provide anticipated cash flows
-- Regulatory risks, particularly insofar as new regulations affect the operation (and, therefore, of course, the profitability and/or consumer costs)
-- Technological risks, particularly insofar as the extent to which new or relatively unproven technology may increase financing difficulties

(vi) Logic Diagram

A logic diagram is shown in Plate T11.1 to illustrate the manner in which various documents are prepared, interrelated, and assembled.

(vii) Investment Banker Inputs

In the February 1980 POS, it was proposed that Salomon Brothers, an investment banking firm whose knowledge and experience of financing large undertakings is unchallenged, would be retained as financial advisors to Acres. Although the advice of Salomon Brothers and of the First South West Bank, financial advisors to the Power Authority will be sought from time to time on financial matters, no formal arrangement for participation of Salomon Brothers in the Susitna studies is contemplated at this time.


INPUTS FROM STUDY TEAM AND OTHER AUTHORITIES
TECHNICAL
MARKETING
INSURANCE
LABOR
LEGAL
ENVIRONMENTAL
ECONOMIC
FINANCIAL
TRANSPORTATION
TAX
POLITICAL
P.O.S. REVIEWED BY A.P.A. AND FINANCIAL ADVISORS
JAN '80
DECISIONS REACHED ON OVERVIEW CONTENT
PREPARE TOPICAL REPORTS
FOR MANAGEMENT/FINANCIAL CONSIDERATION
JUN '80 TO MAR '82 AND CONTINUING
INPUTS FROM:
TECHNICAL
ENVIRONMENTAL
ECONOMIC
MARKETING
FINANCIAL
INSURANCE
TRANSPORTATION
LABOR
TAX
LEGAL
POLITICAL
START PROJECT OVERVIEW
JUN '80
FIRST PROJECT OVERVIEW AVAILABLE FOR COMMENT
FEB '81
REVIEW AND DECIDE CONTENT BOND OFFERING DOCUMENTS
BOND UNDERWRITERS, MANAGER, PREPARE FOR ISSUE
DRAFT SUPPORT DOCUMENTATION FOR BOND OFFERING SUPPORT
MAR '82 AND CONTINUING (TENTATIVE)
SECOND PROJECT OVERVIEW AVAILABLE FOR COMMENT
AUG '81
SUBSEQUENT PROJECT OVERVIEW REPORTS ISSUED AT APPROXIMATELY SIX MONTH INTERVALS
THIRD PROJECT OVERVIEW AVAILABLE FOR COMMENT
MAR '82
FINAL DOCUMENTATION FOR LICENSE APPLICATION IS ASSEMBLED AND APPLICATION IS FILED WITH FERC
JUN '82
FOURTH PROJECT OVERVIEW AVAILABLE FOR COMMENT
SEP '82 (TENTATIVE)
ACRES
ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT
PLAN OF STUDY
LOGIC DIAGRAM
PROJECT FINANCING
ACRES AMERICAN INCORPORATED
PROJECT: P 5700.00
PLATE TII. 1
REV. 2

Subtask 11.01 - Project Overview Preparation and Update

(a) Objective

To provide a key project document which reviews all major aspects of the project and its objectives, determining in principle whether these can be successfully met; provide through successive updating a continuing reassessment of the project's overall viability and financibility as various milestones are reached; and allow multidisciplinary inputs from many sources to be properly coordinated into a cohesive and well-balanced definition of the project.

(b) Approach

This Subtask will be performed by a small team who will receive inputs from many multidisciplinary sectors involved in the study. The team will be directed by experienced senior staff familiar with the approach essential to projects of such magnitude and the complex financing arrangements that these involve.

Initially the Project Overview will concentrate on descriptive outlines of the project objectives, the site for development and the project facilities. Capital costs and schedules will be at the outset preliminary only, but nonetheless considered adequate to determine initial overall viability. The Project Overview will identify the sensitivity to various risks and outline methods of mitigating these and possibly removing some from further consideration. The initial Project Overview Report will be scheduled to be available for review by all parties concerned prior to the March 1981 decision point on whether or not to continue the Susitna Feasibility Study. It will also be available for review prior to the public meeting scheduled in the spring of 1981, and it will incorporate as comprehensive a review of issues involved in judging Susitna as can be assembled at that time.

The Project Overview and its subsequent revisions in updated form at intervals throughout the study will be presented from the "owner's viewpoint" and will consider all important aspects which affect the viability, acceptance, financibility and the undertaking of construction of the hydroelectric facilities. The first update will be completed approximately nineteen weeks after the Susitna Development Report is prepared under Subtask 6.05.

In achieving its goal of preparation of a comprehensive, clearly understandable, concise and accurate overview of the project, the Project Overview Task Force will call on specific inputs from many sources, including:

- Technical
- Environmental
- Economic
- Marketing
- Financial
- Insurance
- Transportation
- Labor
- Tax
- Legal
- Political

Typical elements of the Project Overview are listed in Subparagraph (ii)(a) of Task Output above.

The final issue of the Project Overview during the study phase will provide a valuable summary document to bridge into subsequent licensing and preliminary design phases of the work. It will be available prior to the March 1982 decision point on whether or not to proceed with a FERC license application for the Susitna Project. Eventually its content will have significant value for the Bond Offering Support Document and a variety of other applications, including preparation of project brochures as part of the public participation program.

(c) Discussion

The concept of the continuously updated "Project Overview" is of relatively recent origin and has developed from the special needs of large complex projects. It is necessary to address the complexity with a well planned compilation of material which places all the technical, commercial, economic, financial, contractual, environmental and other aspects in proper perspective and demonstrates that all vital problems are being sensibly addressed. The overview is planned to provide a consistent thread of documentation through the whole study process and, if construction should proceed, to provide a datum baseline for judging actual performance of the many elements in relation to the plans.

As the documents will have to serve many varied and non-technical interests, the language must be appropriately chosen and carefully edited for clarity and ease of understanding. Extensive use will be made of graphics, drawings, maps and pictorial illustrations. Production and binding will reflect the level of economy appropriate to draft and eventually final documentation.

(d) Schedule

First Project Overview ..... Weeks 22 through 63
First Update ..... Weeks 64 through 85
Second Update ..... Weeks 86 through 117

Subtask 11.02 - Internal Report Preparation

(a) Objective

To prepare topical reports, for management consideration, on those aspects of the project which have a strong bearing on the economic analysis and financibility of the Susitna project; present material derived from the overall study in form suitable for easy assimilation by non-engineering participants in the overall task; and present the risks to which the project is exposed in the proper perspective.

(b) Approach

The team provided to assess the overall financibility of the project will be responsible for drawing together from many sources data, viewpoints, reports, assessments, impact statements, documents and a variety of other supporting material. In carrying out this task, the multidisciplinary specialists who will be supporting the team will assemble and edit topical internal reports for consideration by managerial staff of the Authority, their financial advisors/underwriting managers and others guiding the project through its study phase to implementation or abandonment. The internal reports may ultimately form a substantial proportion of documents to be subsequently produced in direct support of the financing or for a variety of other purposes. Every effort will be made to foresee all future possible uses of the material and its presentation will be appropriately arranged.

One element of the internal reports which will receive special consideration is risk assessment, which will be applied to several aspects of the project such as technical, financial overrun, schedule delay, operating reliability, etc. Means of mitigating project risks will be dealt with in a comprehensive manner as will be the contribution from insurance sources in dealing with residual exposures. The important detailed risk analysis itself is covered under Subtasks 11.03 through 11.05 below. Related internal reports prepared as a a part of this subtask will present the results of those detailed professional studies in a manner which can be easily understood by decision makers whose ultimate agreement is essential to eventual construction.

Subparagraph (ii)(b) of the Task Output sets out a listing of typical documents which may be required. This listing would be finalized in conjunction with the Authority and their advisors. Control sheets outlining responsibilities for specific input, index of contacts, and required schedule will be prepared in this planning stage.

The internal reports provide, on a selective basis, much of the material for the various editions of the Project Overview and the production of both series will be closely coordinated.

A consistent and cohesive series of reports will be prepared which will clearly address all the vital issues which in due course would be necessary prior to releasing the project for construction.

(c) Discussion

While documents of the type envisaged are the inevitable products of a comprehensive study, the benefit of a specific source of consistent internal reports is that the Authority will receive objective, well balanced, professional arguments on key issues to allow properly informed decisions. It is important to note that this approach is responsive to the APA plan to remain a lean, efficient organization. In a bigger and more highly staffed organization undertaking a major project of the scale of Susitna, the internal reports would be produced, no doubt, by individual specialist departments for the owners' project team responsible for final decision.

The proposed approach permits APA to avoid overstaffing for relatively short study or project management periods. An opportunity is offered for the special project task force to perform these functions under the control and direction of the Executive Director and the Board.

The team will be closely linked to the overall project study organization and perform functions which will be an essential part of the study task. It will serve, however, the owners' control group directly in providing the basis for assessment and decision on many issues having an impact on the project.

Preparation of internal management reports would not normally cease with submission of the FERC license application. Similar reports would be undertaken as appropriate during the post-application phases of the project.

(d) Schedule

Weeks 22 through 117

Subtask 11.03 - Susitna Base Plan Initial Risk Analysis

(a) Objective

To identify all relevant risks in terms of specific problems associated with specific major components of the project; to identify all relevant preventative and responsive measures associated with these risks; to identify which risks are minor given effective responses, and which need further attention; make a preliminary quantitative assessment of some key construction time risks, and their relationships with other key project cost risks, flagging risks which are important but best treated as conditions with respect to the current quantitative analysis; to stimulate information flow between planning groups with respect to likely departures from the base plan; and stimulate documentation of problems and solutions to those problems underlying the base plan.

(b) Approach

The Acres marketing and financing task force will coordinate this assessment. Input will be obtained from project personnel responsible for each component. Procedures already developed by Acres will be used to assess construction time risk as follows:

- Risk lists will be produced, labelling and describing all the relevant risks all those involved can identify.
- Response lists will be produced, labelling and describing all relevant responses associated with each risk.
- Secondary risk and response lists will be produced, considering risks associated with responses.
- Rough quantitative assessment of risk/response sequences will allow some risks to be identified as minor, and not worth further analysis at present.
- Still using risk/response lists, responses will be partially structured. Responses common to more than one risk will be identified. Responses will be preference ordered. Where possible, decision rules defining when responses would be used will be identified.
- Special diagrams will be constructed to summarize the above analysis in a simple form.
- Key base plan assumptions and key assumptions concerning responses to potential problems will be identified.

Probabilities necessary to assess key assumptions will be estimated. Most will be very specific conditional probabilities: for example, what is the probability of X working days for a particular activity in a particular month?

The implications of key assumptions will be examined, first in the context of specific risks for specific activities, gradually at a broader and broader level. For example, we will assess the chance of achieving the planned work on a specific activity in a specific season in relation to one or two key risks first, then look at other risks and other seasons. We will not relate different activities until we are satisfied with assumptions key to the activity itself. A variety of output forms will be used, depending on the questions being asked of the analysis. Most will be comparative probability distribution representations: for example, the probability of finishing activity Y by month X given a start in May, June, July, etc.

Construction time risk will be summarized and converted to construction cost risk. Other sources of construction cost risk will be considered in a similar manner and linked to produce overall construction cost probability representations for confidence limit assessment purposes. Appropriate confidence limit assessment will be based on a comparison of quantified risks and nonquantified risks which must be treated as conditions.

Construction cost risk analysis will take place in a fixed time frame structure, unlike the PERT based analysis usually employed. That is, we will consider uncertainty in terms of "how much work can we achieve in a given time", instead of "how long will it take to achieve a given amount of work". This approach makes it much easier to assess probabilities, always a difficult task. It facilitates the consideration of weather windows and other seasonal dependencies. It also facilitates integrating construction cost risk with inflation and escalation studies at this point.

Other sources of project risk will be considered qualitatively in a similar manner, structuring risks and responses via listing procedures and simple summary diagrams.

Computation procedures are based on numerical integration techniques in a semi-Markov process framework. Another key advantage of the fixed time frame is the efficiency and precision of this approach relative to the more usual simulation or moment integration analytical procedures.

A preliminary risk analysis will be conducted in time for consideration prior to ranking and selecting Susitna Basin development alternatives under Task 6. If Susitna studies are continued beyond March 1982, further, more detailed risk studies will be carried out as the study of the proposed Susitna development is consolidated.

(c) Discussion

All aspects of the Acres approach to risk analysis have been widely used in the context of fault-tree and event-tree analysis, reliability analysis, generalized PERT, Markov process and decision-tree analysis. However, the way we have integrated these aspects into a procedure tested in a variety of application areas is unique. Areas of application of the integrated procedure include hydro projects, thermal power projects, arctic gas pipelines, offshore North Sea oil pipelines and platforms and underground energy storage projects.

The effort to be expended on risk analysis has been increased from the level originally planned to ensure that all viable Susitna alternatives are fully treated. However, the effort must be expended in a systematic manner, and experience suggests that at this stage in a project's life a relatively simple quantitative analysis will suffice provided risks and associated preventative and responsive measures are carefully identified. If they are not, quantification of risks is rather meaningless because it is not clear what has and has not been included.

(d) Schedule

Weeks 22 through 77:	Develop preliminary risk analysis for alternative developments within the Susitna Basin, including quantitative analysis to test key base plan assumptions
Weeks 77 through 107:	Conduct risk analysis on expansion sequences which include the selected most favorable Susitna Basin alternative(s).

Subtask 11.04 - Susitna Base Plan Extension and Revision

(a) Objectives

To revise the base plan initial risk assessment periodically as the base plan develops; explore key risk areas identified earlier; assist with base plan development as and when necessary; and respond to FERC requests for further analysis.

(b) Approach

Within the basic framework established in Subtask 11.03, undertake further specific extensions and revisions of risk analyses of the proposed Susitna development.

(c) Discussion

Experience suggests risk analysis can be extremely useful at this stage in a project's development, but it is difficult to predict what sort of issues will benefit from further analysis until preliminary risk analysis results are available.

The level of effort proposed for this Subtask is estimated to be adequate at this time to allow updating as necessary, response to a reasonable number of risk areas uncovered earlier and assessment of key changes proposed for the base plan.

Similar assessments would also normally be undertaken during the post-application phases of the project.

(d) Schedule

Weeks 109 through 113: Extension and revisions to the Susitna Basin alternatives risk analyses during the conduct of sensitivity analyses under Task 6.

Weeks 113 through 130: Continued work as and when necessary to ensure proper support of the decision on whether or not to proceed with FERC licensing of the Project.

Subtask 11.05 - Susitna Financing Risk Analysis

(a) Objective

To build on earlier risk analysis consideration of financial issues not yet developed, including assessment of contract and insurance arrangements, and an appropriate level of direct and indirect "insurance".

(b) Approach

Within the basic framework established in Subtask 11.04, undertake specific extensions and revisions, in terms of both quantitative and qualitative analysis of the proposed financing of the Susitna Project.

(c) Discussion

Earlier listing and structuring of risks and responses is of great value at this stage. Each proposed contract can be assessed against appropriate checklists of potential problems, and contract arrangements or insurances which cover a number of different sources of risk can be developed into an effective overall risk management pattern.

This subtask will be performed after selected expansion scenarios with and without Susitna have been developed by others during the power alternatives studies. It may be expected that similar assessments will continue after license application, should the decision be taken to proceed with such application.

(d) Schedule

Weeks 77 through 111 and intermittently thereafter as necessary.

Subtask 11.06 - Resolution of Tax Exempt Bond Issue

(a) Introduction

This task has not been authorized to proceed at this time and will probably be handled by Bond Offering Managing Underwriters yet to be appointed by the Alaska Power Authority. Nevertheless it is important to discuss the issues which this activity should address.

Studies under Task 11, Marketing and Financing, will proceed bearing in mind the vital importance of this issue and advice on the matter will be sought as appropriate to allow other subtasks to proceed. A preliminary plan for detailed examination of the Tax Exempt Bond Issue is presented herein for further guidance.

(b) Objective

Explore all legal means to secure tax-exempt financing for the Susitna Project and identify and describe those measures which must be taken in each case to secure that end.

Rank in order preferred approaches in the event more than one legal means is identified. Prepare a report summarizing reasons tax-exempt financing is found to be impossible in the event no legal means is identified.

(c) Approach

A memorandum on financing considerations prepared by Salomon Brothers is included as Attachment A to this scope statement. As noted therein, a number of possible alternatives under the IRS Code can be explored. The special rules provided under Section 103 of Treasury Regulations for applying trade or business test and security interest test to bonds issued to finance an electric generating facility owned and operated by an exempt person (in this case, the State of Alaska or a public power authority) will be considered in a series of sequential steps summarized as follows:

(1) Classify the anticipated purchasers of power from the Susitna project into exempt and nonexempt persons. For example, municipalities such as Anchorage and Fairbanks will be exempt persons, whereas private electrical co-ops will be nonexempt.

(2) Determine whether any one nonexempt person will contract to take, or take or pay for, more than 25 percent of the project output of the Susitna project. If there is such a person, then the trade or business test is met.

(3) If there is no such person, identify the nonexempt persons who will each pay annual guaranteed minimum payments exceeding 3 percent of the average debt service on the Susitna bonds. The trade or business test is satisfied if the aggregate amount of power which these persons contract to take, or take or pay for, exceeds 25 percent of the project output of the Susitna project.

(4) If the trade or business test is met, total the payments that will be both pledged or used to pay debt service on the Susitna bonds and made pursuant to the contracts referred to in either paragraph 2 or 3 above. The security interest test is met if this aggregate amount exceeds 25 percent of the total debt service on the Susitna bonds.

If it appears that the Susitna bonds may be industrial development bonds because of the commitments by nonexempt persons to purchase power, consideration may be given to altering the makeup of the group of purchasers to avoid the trade or business test or security interest test. Assuming that one or more approaches are found to be possible, each will be evaluated in terms of the associated difficulties and probabilities of successful defense against challenge by or on behalf of regulatory authorities. All reasonable approaches will be rank ordered and the apparent best will be developed into a series of explicit measures to be taken by the State (including recommendations for legislation to be passed), the Alaska Power Authority, and others.

In the event that tax exempt financing is found to be impossible, a report will be prepared detailing the reasons that no reasonable approach could be found.

Results of this effort will provide important input to the financing risk analysis to be conducted under Subtask 11.05.

(d) Discussion

The question of tax-exemption on interest to be paid on bonds issued to finance the project is of extreme importance, for the overall cost of the project power and the type of financing plan to be developed hinge upon its resolution. So important, in fact, is this issue that even a negative report should not necessarily be regarded as a final and irrevocable ruling on the matter. Indeed, given the importance which the federal government has now attached to domestic energy production (especially from renewable resources) it is not inconceivable that federal regulatory or statutory changes can be achieved.

In the event, however, that negative findings on the tax-exempt question are produced and cannot be reversed, the financibility of the project will not then necessarily become doubtful. The best alternative to tax-exempt bonds will be recommended by an experienced professional investment banking firm whose successful historical participation in large project financing is well documented.

Legislation now pending could serve to resolve this issue in favor of tax-exemption for bonds associated with hydroelectric development. In the event that this legislation passes, the level of effort will be reduced to that amount necessary to ensure compliance with new laws.

(e) Schedule

Weeks 52 through 77. Intermittent updates thereafter.

Subtask 11.07 - Identify Parties in Interest

(a) Objective

To identify potential candidates to share some of the direct and indirect project risks and describe their possible involvements.

(b) Approach

A survey of all organizations and entities with any possible direct or indirect risk sharing involvement will be accomplished. These parties might include, for example, municipal electric systems, rural electric cooperatives, investor-owned utilities, the Alaska Power Administration, and others. A profile will be drawn up for each and an assessment will be made as to how much of the total risk each may be expected to share under appropriate alternative scenarios and as to how such sharing can reasonably be accomplished.

(c) Discussion

A number of technological and financing risks will be addressed under Subtasks 11.03 through 11.05. Given these risks and reasonably detailed profiles of potential risk sharing parties, it is possible to consider a number of alternative participation scenarios. As successive iterations of the risk analysis efforts occur, the possible involvements of parties-in-interest are correspondingly clarified. An essential first step in this process, however, is the task of identifying and profiling potential candidates. Thus, this subtask provides an explicit recognition of that need.

(d) Schedule

Weeks 31 through 53: Initial identification of parties in interest.

Weeks 77 through 111: Reconsideration of parties in interest to be associated with selected expansion sequences.

Subtask 11.08 - Revenue Assurance Procedures

(a) Objective

To explore alternative means to provide adequate revenue assurance to protect investors against the risk of default; develop a strategy for success.

(b) Approach

For large energy projects, the necessary revenue assurance may be derived from a demonstration of demand for the project output and adequate customer and regulatory support of the price for the power. Demonstration of demand can be satisfied by power sales contracts between APA and the immediate customers (e.g., municipalities, cooperatives, military bases, industrial plants, etc.). We intend to consider a number of alternative types of commitments and match them against immediate customers identified earlier in the group of parties-in-interest (see Subtask 11.07). These include take-or-pay obligations, take-and-pay obligations, minimum payment obligations, and step-up provisions.

Since price regulation and other regulatory constraints would necessarily affect the project, it is important to include discussions with all governmental and regulatory agencies in this exploration of revenue assurance.

In addition to project-related power sales contracts, guaranties by the State or Federal government or others would provide further assurances. Guarantee possibilities will be identified and a preliminary assessment will be made of the probability of acquiring them.

A number of funds will be required (including, for example, "Reserve and Contingency Fund" or Operating Fund") to ensure protection against unexpected shortfalls. Each such requirement will be identified along with its source.

As a final step in the development of revenue assurance procedures, the apparent best strategy for successfully achieving the desired degree of revenue assurance will be described in a report to be prepared as a part of this subtask.

(c) Discussion

The basic credit risk against which investors attempt to protect themselves is the risk of default. The risk of default lies in the borrower's inability to meet interest and principal payments on his debt obligations in a timely fashion. Adequate revenue assurance protects the investor against the risk.

It will not be sufficient to conduct a one-time study of the revenue assurance issue and then assume the results will continue to remain valid throughout the course of the financing effort. Rather, a relatively continuous updating process is essential. In this regard, the provision of investment banker's services by a firm experienced in providing financial services for large projects is particularly important.

These types of studies will be continued during the post-license-application phase of the work. The level of effort shown in cost summary tables includes only pre-application costs. The primary effort will be expended after selected expansion sequences have been identified, including those containing alternative Susitna Basin developments.

(d) Schedule

Weeks 77 through 111 with updates thereafter as necessary.

Subtask 11.09 - Liaison with APA Bond Underwriting Managers

(a) Objective

To provide a continuing input as appropriate from study tasks of information and data which may have an impact on financing; provide engineering advice to the financing management group; and report to the Project Manager on any issues where financing considerations have an impact on the evolution of the project.

(b) Approach

Financing of a major project such as Susitna will call for a level of effort and ingenuity well beyond that normally involved in public works undertakings. Experience (particularly from the $1 billion Churchill Falls Project) has established the benefit in a particularly close relationship between technically oriented senior staff closely associated with the engineering related development of the project and the financial, legal, insurance, economic and other professional advisors assembled by the owner. The leader of the task force carrying the responsibilities under Subtasks 11.01 and 11.02 will be eminently suited and placed to provide this liaison function as an essential part of his other duties.

(c) Discussion

In major projects, there must be continual emphasis on multidisciplinary approaches to most of the important issues that have to be resolved. When capital investment is more modest and where many precedent cases are available for guiding decisions, the degree of liaison and interlinking of interests contemplated here might be viewed as extravagant. However, it may be suggested that the exigencies of even less ambitious capital works exposed to excessive cost escalation and the many risks imposed by current public and political attitudes call for closeknit coordination of all project interests throughout the undertaking from concept to completion.

The target is completion in the most efficient and cost-effective way possible and the strictest level of adherence to schedule and budget throughout the project. The aim can be most effectively taken by close cooperation between all interests from the outset.

(e) Schedule

Continuous through the full period of study.

Subtask 11.10 - Draft Documentation for Bond Offering Support

(a) Introduction

Work on this subtask will not normally commence until after a decision to submit the FERC license application for the Susitna Project. However, a preliminary plan for the required effort is presented herein to provide a complete description of the ultimate purpose of this financing task.

(b) Objective

To review with the Authority's Bond Underwriting Manager the requirements for support documents; prepare and issue outline index and content specifications and allocated responsibility for input; prepare, edit and produce successive draft documents in parallel with other findings, reports, etc., being produced in the later phases of the overall study, and prepare "Engineers' Opinions" to support certification of the project.

(c) Approach

Throughout the financing support task, attention will be continually focused on the ultimate objective of a successful bond issue. Very large projects requiring financing at levels of $1 billion or more call for a particularly high standard of support documentation to build a sufficient level of confidence in the investment potential. Managers in their approach, particularly to major projects, and owners and underwriting managers must respond to their more exacting requirements.

We see the vital importance of preparing inputs to the bond offering support documents as the study proceeds. It is planned that draft documents will be available by the conclusion of the study and will be available for further refinement as the project proceeds through licensing to its release date.

The specific approach to be adopted could well parallel the successful precedent of Churchill Falls Hydroelectric Power Development which led in 1968 to the marketing of $550 million in First Mortgage Bonds. While in this case work was heavily concentrated in a 3-month period in 1967 and continued at a lesser level for 15 months, the support materials for Susitna should be methodically assembled throughout the period following submission of the FERC license application and prepared in draft form well in anticipation of any offering. A provisional listing of Bond Offering Documentation is set out in subparagraph (ii) of Task 11 above, and a summary of the objectives of each of the proposed documents is shown in Table T11.1.

(d) Discussion

It will be apparent from the provisional listing of documents that a wide range of interrelated topics must be addressed. This calls for input from a multidisiplinary group of specialists and sensitive coordination of all material into a cohesive, balanced and interrelated series of documents. These serve to demonstrate that all important questions have, in fact, been properly addressed and that the project has a high level of overall security as a result.

In view of the legal significance of these documents, the process of editing, approval and publication will require close working arrangement with the Authority's counsel, the underwriting managers, legislative interests in the State of Alaska, and the owners' management team. The effort requires a painstaking level of careful processing of very large amounts of data and material and justifies its assignment to our selected team which has appropriate prior exposure to this function.

A list of bond offering support documentation as displayed in Table T11.1 reveals that there are great similarities to documentation required as exhibits to the FERC license application (see Task 10). Thus, in many cases it may be possible to use the same documentation both as an exhibit and as bond-offering support documentation. In others, it will be necessary to reformat exhibit data to meet financing needs. To the extent possible, however, bond offering support documentation will be delayed until after license exhibits have otherwise been prepared.

(e) Schedule

Commence after license application and to be presented in a form for continuing effort into subsequent phases of the project.

TABLE T11.1

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC POWER PROJECT

PROVISIONAL LIST OF BOND OFFERING SUPPORT DOCUMENTS

A - PRIMARY DOCUMENTS	OBJECTIVES
1. Power Contracts	To outline the terms and conditions of sale of the power and energy output from the Susitna Project.
2. Engineering Report	To provide a comprehensive statement, in simple language, regarding the physical nature of the site, the basis of development, the determination of energy output, and a description of all facilities.
3. Statutory Agreements, Legal Approvals/Land Claims	To provide a comprehensive assembly of all relevant agreements as far as possible in their original layout and form.
4. Summary of Corporate Documents	To provide a comprehensive assembly of documents relating to the Alaska Power Authority and any other participants in the project.
5. Technical Abstract and Engineer's Certificate	To summarize the engineering report, construction cost estimates, schedule, operating and replacement expenditure estimates, and other documents leading to firm conclusions supported by an Engineer's Certificate of Opinion relating to operation, cost and schedule.
6. Construction Cost Estimate	To set out the basis of the construction cost estimate, including contingency provisions and to provide the necessary detail to establish an adequate level of completeness and confidence.
7. Construction Schedule and Project Expenditure Program	To provide a concise, but detailed, description of the construction schedule and project expenditure program of all facilities and critical path networks of all supporting activities in the overall construction plan.

TABLE T11.1 (Cont'd)

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC POWER PROJECT

PROVISIONAL LIST OF BOND OFFERING SUPPORT DOCUMENTS

A - PRIMARY DOCUMENTS	OBJECTIVES
8. Insurance	To set out a concise statement of risks during construction and operation with an evaluation of the maximum foreseeable loss.
9. Financing Summary	To provide a summary of equity, debt and completion guarantee standby financing requirements with a schedule of draw-downs to meet construction plans.
B - SUPPORT DOCUMENTS	
1. Overall Project Organization	To provide a summary of relationships of all companies involved in the project with details of origins, responsibilities and corporate structures, supplemented with organization charts showing lines of reporting and authority.
2. Engineering Reports (Construction)	
2.1 - Access and Site Preservation	To provide a detailed description of the arrangements made for access and heavy transportation to the project site with a full statement of measures taken for site preservation and avoidance of delay arising from environmental concern.
2.2 - Environmental Standards, Monitoring and Control	To provide a comprehensive summary of all applicable requirements, responses and reports concerning environmental aspects of the project construction and operation.
2.3 - Quality Assurance and Testing Programs	To set out quality assurance directives established by the Authority and detailed evidence to demonstrate the methods by which these will be achieved.

TABLE T11.1 (Cont'd)

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC POWER PROJECT

PROVISIONAL LIST OF BOND OFFERING SUPPORT DOCUMENTS

B - SUPPORT DOCUMENTS	OBJECTIVES
2.4 - Support Facilities	To provide a comprehensive description of all construction and operational support facilities with demonstration of the adequacy of these to meet project requirements, including contingencies.
3. Engineering Report (Operations)	
3.1 - Operating and Replacement Expenditures	To provide details of the basis of estimate for manning and operating of the power project and for the continuing maintenance plans.
3.2 - Chargeable Corporate Expenditures	To set out the estimates of corporate expenditures incurred by the Authority which can be legitimately charged to operations.
4. Labor Agreements	To review the labor situation on both the national and state level, together with the legislative framework under which special labor agreements may be formed. To provide precedent data on experience with master project labor agreements. To include a statement of intent for such agreements to apply to the project, and to demonstrate the impact of these on project risk exposure.
5. Plan for Alaskan Manpower and Procurement Content	To present sufficient evidence to demonstrate that the desired portion of Alaskan content will be incorporated in the overall project.
6. Risk Management	
6.1 - Risk Analysis and Control	This section will describe in detail the optimal responses to a risk minimization study, the organization of a formal risk management team, its policies and method of operation. It will also describe review policies and reporting systems designed to ensure continuous updating of both risk identification and response.

TABLE T11.1 (Cont'd)

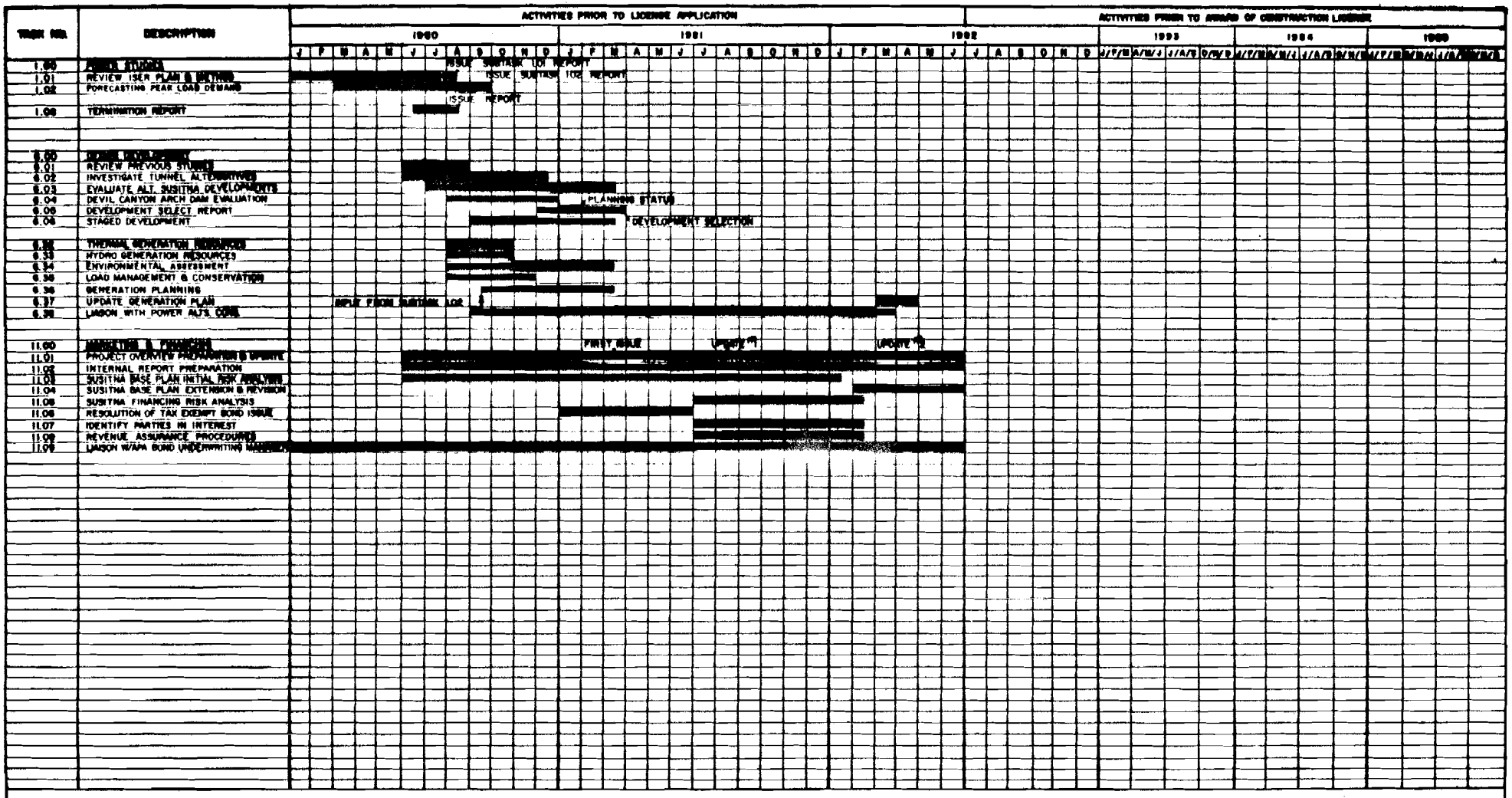
ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC POWER PROJECT

PROVISIONAL LIST OF BOND OFFERING SUPPORT DOCUMENTS

B - SUPPORT DOCUMENTS	OBJECTIVES
6.2 - Risk Minimization	To identify all risks to which the project may be subjected and plan responses to them which demonstrably reduce those risks collectively and individually to a minimum. The residual risk figure thus determined is an important factor in demonstrating the reliability and confidence level of the project.
7. Taxation Report	To deal with the impact of all aspects of federal, state and local taxation pertinent to the project.
8. Legal Report	To deal with all aspects of legislation and legal requirements under which the project will be constructed.
9. Review of Giant Projects	
9.1 - Financing	To identify and describe other relevant project financing to demonstrate the adequacy and logic of the project approach.
9.2 - Construction and Engineering	To summarize the experience accumulated from major North American capital projects in relation to achievement of engineering cost estimates and schedules.
10. Alternative Energy Sources	To provide a comprehensive review of alternative energy generation modes applicable to Alaska, with estimates of delivered energy cost and long-term reliability of supply.

R.3 - REVISIONS TO PROJECT SCHEDULES

Schedule revisions for Subtasks 1.01, 1.02, 1.08, 6.01 through 6.06 and 6.32 through 6.38, and 11.01 through 11.09 are illustrated in the attached Bar Chart.



SUSITNA HYDROELECTRIC PROJECT

PLAN OF STUDY

MASTER SCHEDULE REVISION 1 SEPT 1980

R.4 - REVISIONS TO PROJECT BUDGETS

R4.1 - INTRODUCTION

A set of eight worksheets is attached. Costs entered thereon represent a proposed distribution of budgets associated with scope changes in Tasks 1, 6, and 11. (Upon approval by the Alaska Power Authority, these worksheets will form the basis for entering changes into the official project budget).

R4.2 - SUMMARY OF CHANGES

Changes covered by the worksheets are summarized as follows:

Reason for Change	1979 $ Value	Reserve for Escalation	Total Change
a. Termination of portions of Task 1; Responses to Tussing report for modifying Task 1 prior to Termination action	$(215,193)	$(14,267)	$(229,460)
b. Changes to Task 6 to account for requirement to conduct early generation planning	179,290	17,929	197,219
c. Changes to Task 6 to account for post-Tussing additions	181,818	18,182	200,000
d. Changes to Task 6 for liaison with Power Alternatives Consultant	20,710	2,071	22,781
e. Changes to Task 11 to account for post-Tussing additions and for deletion of original Subtasks 11.03 and 11.12	75,000	7,500	82,500
TOTAL CHANGES	$241,625	$ 31,415	$ 273,040

R4.3 - FIXED FEE ADJUSTMENTS

The proposed changes include increased Acres' labor costs amounting to $382,796 including payroll cost of services and overhead. Based on this value, a change in fixed fee in 1979 dollars is requested in the amount of $38,280. Including an allowance for escalation, the total increase in fixed fee is $42,064. It should be noted that percentage escalation on fixed fee for these changes is less than was used in the original agreement since seven months of the original escalation period have elapsed.

R4.4 - OTHER CHANGES

A number of changes to the Project budget are pending (e.g., new R&M contract value, in-stream flow studies). To avoid confusion, changes reflected in the attached worksheets are based on the existing budget as currently printed. Approved budgets associated with other changes will be entered in the project budget as soon as the new budget control system has been validated.

R4.5 - WORKSHEETS

The following worksheets are attached:

(a) Summary of Proposed Budget Changes
(b) T1-1. Task 1 - Changes
(c) T6-1. Task 6 - Changes Resulting from Tussing Report
(d) T6-2. Task 6 - Changes Resulting from Early Generation Planning
(e) T6-3. Task 6 - Changes Resulting from Liaison with Power Alternatives Consultant
(f) T11-1. Task 11 - Changes
(g) T11-2. Reconciliation of Task 11 with Earlier Approval by APA
(h) General Notes

R4.6 - TERMINATION CLAIM

The attached worksheets do not include administrative costs which will be incurred in connection with the termination action. A termination claim will be submitted in accordance with the terms of the Agreement between Acres and APA within the allowed ten-month period. It will include costs associated wtih renegotiation of certain subcontracts, inefficiencies associated with abrupt curtailment of dedicated staff involvement, relocation of J. Landman and the like. This claim will be submitted not later than December 31, 1980.

WORKSHEET T1-1
CHANGES RESULTING FROM PARTIAL TERMINATION OF TASK 1 (EXCLUSIVE OF TERMINATION CLAIM)

	Original Task 1 Budget[2]	Budget Subtask 1.01[2]	Budget Subtask 1.02	Expended thru June 1.03-1.06	Subtask 1.08 Termination Report	Subtask 1.08 Prep for Termination	Total Task 1 Manpower Budgets	Disbursements thru June 6	Disbursements to complete 1.02	Task Wide Costs	Total Task 1 Budget	Net Change from Original
Acres												
Manhours	3,350				190	510						
Project Cost of Service	55,268	11,738	14,000	12,463	3,771	10,729	52,701				52,701	(2,567)
Overhead	41,453	8,804	10,500	9,347	2,828	8,048	39,527				39,527	(1,926)
Handling Fee	6,397							728	728	2,276	2,276	(4,121)
Disbursements												
900 Misc	3,000								200			
901 Travel	9,600				200	200			200			
902 Telephone/Telex/etc.	4,200				100	100			200			
903 Reproductions	4,100				100	100						
915 Publications	4,500											
916 Photography	900											
921 Computer	6,000							[2]				
Subtotal Disbursement	32,300				400	400		17,689	600	19,089	19,089	(13,211)
Fee on Services	11,586									11,048[3]	11,048	(538)
TOTAL ACRES	147,004											(23,363)
WCC												
Manhours	3,900	600	800									
Manhour Costs	212,600	29,400	40,900									
Disbursements	17,600	2,800	2,800									
TOTAL WCC	230,200	32,200	43,700	17,032			92,932				92,932	(137,268)
TES												
Manhours	1,750											
Manhour Costs	51,500											
Disbursements	5,830											
TOTAL TES	57,330			1,768			1,768				1,768	(55,562)
SUBTOTAL	434,534				7,000	19,177					219,341	(215,193)
ESCALATION	28,810[1]										14,543	(14,267)
GRAND TOTAL	453,344										233,884	(229,460)

Notes:

(1) Allocated portion of total contract escalation after removing fee escalation from total contract escalation.

(2) Budget to complete is greater than original budgeted for these subtasks due to: a) effort expended in May on Tussing changes, b) late completion by ISER on energy forecast and extraordinary monitoring requirements.

(3) Prorated in same ratio as in Column 1 for fee to labor cost.

WORKSHEET - SUMMARY OF PROPOSED BUDGET CHANGES - TASKS 1, 6 and 11

	Original Project Budget	Task 1 Termination Changes	Task 6 Tussing Changes	Task 6 Additions For Gen. Planning	Task 6 Additions for Liaison	Task 11 Scope Changes	Total Change	Proposed Project Budget
Acres								
Project Cost of Service	2,108,308	(2,567)	83,003	73,185	5,673	59,875	219,169	2,327,477
Overhead	1,583,362	(1,926)	62,254	54,889	4,255	44,155	163,627	1,746,989
Handling Fee	425,036	(4,121)	403	728	190	(794)	(3,594)	421,442
Disbursements	1,173,510	(13,211)	20,180	36,400	9,500	137,400	190,269	1,363,779
Fee on Services	430,000	(538)	15,978)	14,088	1,092	11,444	42,064	472,064
TOTAL ACRES	5,720,216	(22,363)	181,818	179,290	20,710	252,080	611,535	6,331,751
Direct Costs	3,850,800							3,850,800
WCC	1,319,400	(137,268)				(1,000)	(138,268)	1,181,132
TES	3,117,470	(55,562)					(55,562)	3,061,908
R&M	4,178,100							4,178,100
CIRI/H&N	4,445,901							4,445,901
FMA	230,800							230,800
SALOMON	179,200					(176,080)	(176,080)	3,120
TOTAL PROJECT	25,798,487	(215,193)	181,818	179,290	20,710	75,000	241,625	26,040,112
ESCALATION	354,720	(14,267)	18,182	17,929	2,071	7,500	31,415	386,135
GRAND TOTAL	26,153,207	(229,460)	200,000	197,219	22,781	82,500	273,040	26,426,247

(1) Escalation per POS less $80,000 fixed fee escalation.

WORKSHEET T6-1
CHANGES TO TASK 6 RESULTING FROM TUSSING REPORT

	Original Task 6 Budget	Additions to Subtask 6.02	Additions to Subtask 6.03	Additions to Subtask 6.05	Additions to Subtask 6.06	Additions to Subtask 6.07	Additions to Subtask 6.08	Task Wide Changes This Sheet	Total Scope Changes This Sheet	Subtotal New Task 6 Budget
Acres										
Manhours	39,235	450	2,000	200	1,600	200	200		4,650	43,885
Project Cost of Service	495,495	8,033	35,700	3,570	28,560	3,570	3,570		83,003	578,498
Overhead	371,624	6,025	26,775	2,678	21,420	2,678	2,678		62,254	433,878
Handling Fee	2,180							403	403	2,583
Disbursements										
900 Misc	600							180	180	780
901 Travel	30,600							4,900	4,900	35,500
902 Telephone/Telex/etc.	7,800							1,200	1,200	9,000
903 Reproductions	22,500							3,600	3,600	26,100
915 Publications	1,000							200	200	1,200
916 Photography	500							100	100	600
921 Computer	41,000							10,000	10,000	51,000
Subtotal Disbursement	104,000							20,180	20,180	124,180
Fee on Services	103,879							15,978(3)	15,978	119,857
TOTAL ACRES	1,077,178								181,818	1,258,996
R&M Consultants										
Manhours	130									130
Manhours Cost	4,500									4,500
Disbursements	500									500
TOTAL R&M	5,000									5,000
TOTAL TASK	1,082,178								181,818	1,263,996
ESCALATION	71,748(1)								18,182(2)	89,930
TOTAL WITH ESCALATION	1,153,926								200,000	1,353,926

Notes:

(1) Total escalation on total contract was 8.15% (See Table A3.15, p 3-16 in POS). Original Acres amount (unescalated) was $5,353,700 plus 8.15% ($434,720). After removing escalated portion of fixed fee (= $80,000), the remaining escalation is 6.63%.

(2) The Tussing addition must include all escalation, including any which exceeds original estimates. We have used 10% as more likely then the average original estimate of 6.63% for all additions to the work. Note that escalation on fixed fee is already included in line 15 so that total escalation including that for fixed fee is more than 11% for remaining 23 months.

(3) Escalated fixed fee taken at 11% vs 12.28% on original contract since seven months of highest assumed escalation have passed.

WORKSHEET T6-2
CHANGES TO TASK 6 RESULTING FROM EARLY GENERATION PLANNING ADDED TO TASK 6

	Subtotal from T6-1	New Subtask 6.32	New Subtask 6.33	New Subtask 6.34	New Subtask 6.35	New Subtask 6.36	New Subtask 6.37	Task Wide Changes This Sheet	Total Changes This Sheet	Subtotal Proposed New Task 6 Budget
Acres										
Manhours	43,885	800	700	1,000	300	900	400		4,100	47,985
Project Cost of Service	578,498	14,280	12,495	17,850	5,355	16,065	7,140		73,185	651,683
Overhead	433,878	10,710	9,371	13,388	4,016	12,049	5,355		54,889	488,767
Handling Fee	2,583							728	728	3,311
Disbursements										
900 Misc	780							200	200	380
901 Travel	35,500							7,000	7,000	42,500
902 Telephone/Telex/etc.	9,000							900	900	9,900
903 Reproductions	26,100							2,700	2,700	28,800
915 Publications	1,200							500	500	1,700
916 Photography	600							100	100	700
921 Computer	51,000							25,000	25,000	76,000
Subtotal Disbursement	124,180							36,400	36,400	160,580
Fee on Services	119,857							14,088[3]	14,088	133,945
TOTAL ACRES	1,258,996								179,290	1,438,286
R&M Consultants										
Manhours	130									130
Manhours Cost	4,500									4,500
Disbursements	500									500
TOTAL R&M	5,000									5,000
TOTAL TASK	1,263,996								179,290	1,443,286
ESCALATION	89,930								17,923[2]	107,859
TOTAL WITH ESCALATION	1,353,926								197,219	1,551,145

See Notes on W.S. T6-1

WORKSHEET T6-3
CHANGES TO TASK 6 RESULTING FROM LIAISON WITH POWER ALTERNATIVES CONSULTANT

	Subtotal from T6-2	New Subtask 6.38	Task Wide Changes This Sheet	Total Change This Sheet	Proposed New Task 6 Budget
Acres					
Manhours	47,885	320		320	48,305
Project Cost of Service	651,683	5,673		5,673	657,356
Overhead	488,767	4,255		4,255	494,440
Handling Fee	3,311		190	190	3,501
Disbursements					
900 Misc	980		600	600	1,580
901 Travel	42,500		8,000	8,000	50,500
902 Telephone/Telex/etc.	9,900		500	500	10,400
903 Reproductions	28,800		400	400	29,200
915 Publications	1,700				1,700
916 Photography	700				700
921 Computer	76,000				76,000
Subtotal Disbursement	160,580		9,500 (3)	9,500	170,080
Fee on Services	133,945		1,092	1,092	135,037
TOTAL ACRES	1,438,286			20,710	1,458,996
R&M Consultants					
Manhours	130				130
Manhours Cost	4,500				4,500
Disbursements	500				500
TOTAL R&M	5,000				5,000
TOTAL TASK	1,443,286			20,710	1,463,996
ESCALATION	107,589			2,071 (2)	109,660
TOTAL WITH ESCALATION	1,551,145			22,781	1,573,926

WORKSHEET T11-1
PROPOSED NEW TASK 11 RESULTING FROM TUSSING ADDITIONS AND APPROVAL BY APA OF EARLIER RECOMMENDATIONS BY ACRES

	Original Task 11 Budget	New Subtask 11.01	New Subtask 11.02	11.03 New Subtask (Old 11.04)	11.04 New Subtask (Old 11.05)	11.05 New Subtask (Old 11.06)	11.07 New Subtask (Old 11.08)	11.08 New Subtask (Old 11.09)	Task Wide Change	Total New Task 11 Budget	Change from original Budget
Acres											
Manhours	3,140	2,200	2,025	950	140	205	180	260	350 (1)	6,310	3,170
Project Cost of Service	61,400	43,707	40,230	18,874	2,781	4,072	3,576	5,165	2,870 (1)	121,275	59,875
Overhead	46,802	32,780	30,173	14,156	2,086	3,054	2,682	3,874	2,152 (1)	90,957	44,155
Handling Fee	4,144	428	1,216	338				356	1,012	3,350	(794)
Disbursements											
900 Misc	5,500								5,500	5,500	-
901 Travel	3,300								9,000	9,000	5,700
902 Telephone/Telex/etc.	2,500								5,000	5,000	25,000
903 Reproductions	2,800								10,000	10,000	7,200
912 Outside Consultants	6,200	21,400	60,800	10,000				17,800		110,000	104,000
915 Publications									3,000	3,000	3,000
921 Computer									15,000	15,000	15,000
Subtotal Disbursement	20,100								47,500	157,500	137,400
Fee on Services	12,872								24,316	24,316	11,444
TOTAL ACRES	145,318									397,398	252,080
WCC											
Manhours	20										(20)
Manhour Costs	1,000										(1,000)
TOTAL WCC											
FMA											
Manhours	80			80						80	
Manhour Costs	5,380			5,380						5,380	
Disbursements	1,500			6,880						6,880	
TOTAL FMA	6,880			6,880						6,880	
SALOMON BROTHERS (or others)	179,200								3,120	3,120	(176,080)
TOTAL TASK	332,398									407,398	75,000
ESCALATION	22,038									29,538	7,500
TOTAL WITH ESCALATION	354,436									436,936	82,500

(1) These values to be transferred to Task 00 to account for increased secretarial costs stemming from added reporting.

WORKSHEET T11-2
RECONCILIATION OF EARLIER APPROVALS BY APA WITH OTHER TASK 11 CHANGES

		Approved by APA May 9 POS Based	Transfer to Task 00 & other Reconcili-ation	APA Approval in Budget Format	Proposed New Task 11 Budget	Difference Column 4 - 3
11.01		131,500	(28,194)	103,306	124,306	21,000
11.02		137,300	(9,898)	127,042	148,902	21,500
11.03		25,000	(5,107)	19,893	-	(19,893)
11.04	(New 11.03)	24,500	(1,770)	22,730	65,230	42,500
11.05	(New 11.04)	10,000	(594)	9,406	9,406	-
11.06	(New 11.05)	10,000	-	10,000	10,000	-
11.07	(New 11.06)	-	-	-	-	-
11.08	(New 11.07)	14,000	(4,543)	9,457	9,457	-
11.09	(New 11.08)	30,800	(596)	30,204	30,204	-
11.10	(New 11.09)	-	-	-	-	-
11.11	(New 11.10)	-	-	-	-	-
11.12	(New 11.11)	-	-	-	-	-
Additions to Task 00 and other Reconciliation		-	50,702	-	9,898	9,898
TOTAL		383,100	-	332,398	407,398	75,005
ESCALATION ON CHANGES						7,500
TOTAL WITH ESCALATION						82,500

(1) This value accounts for increased secretarial and associated costs to account for greater report frequency and volume in 11.01, 11.02, 11.04.

GENERAL NOTES TO ACCOMPANY SPREAD WORK SHEETS

A. To provide some indication of escalation changes, the original contract escalation was considered to apply to each task in proportion to the value of the task. More precise escalation assessments will be generated when approval of cost and schedule is granted for new scopes.

B. Note that the original contract escalation was reduced by the escalated portion of Acres' fixed fee prior to allocation by task since the budget includes escalated fixed fee above the "Total project" line.

C. Fixed fee associated with new work was calculated at a lower value than in original contract. (Original escalated percentage = 12.28%. Value used for additions in three worksheets = 11%).

D. Escalation allowed for new work was taken as a total of 10% of the added work. This exceeds the 6.63% associated with original contract value after note B was applied. This greater value is assumed to be more likely to occur than had been estimated with December 1979.

E. All work sheets are based on the Project budget. A number of changes to the this budget are pending (e.g., new R&M contract values, in-stream flow etc.), but it was considered least confusing to compare changes to the current printed budget.

F. Subtasks 1.01 and 1.02 reflect expenditures in excess of original budget due to: 1) Work expended in connection with Tussing changes and; 2) Delays and extended monitoring in connection with late ISER results.

TASK 11 - MARKETING & FINANCING

ATTACHMENT A: PLAN FOR FINANCING
THE SUSITNA PROJECT

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EXHIBIT 1

Salomon Brothers' Memorandum of December 16, 1976

I. INTRODUCTION

This memorandum is submitted in response to a request from Acres American Incorporated ("Acres"). We understand that Acres and two other engineering firms have been selected to make presentations to the Alaska Power Authority ("APA") regarding the proposed Susitna Hydroelectric Project. We further understand that Mr. Eric Yould, General Manager of APA, specifically requested that Acres include in their presentation some views regarding certain issues which may affect the financing of the Susitna Project. Salomon Brothers has been asked by Acres to prepare a discussion of such issues for inclusion in their presentation.

Before addressing these questions, we would like to express thanks to Acres for giving us this opportunity to offer our analysis of the financing considerations for the Susitna Project and our sincere hope that the Board of Directors and Staff of APA find this information helpful in developing the plan of financing for this Project.

Familiarity with the Susitna Project

We have been involved and have kept abreast of the Susitna Project since 1976. Our first involvement came at the request of former Commerce Commissioner Langhorne A. Motley in the Fall of 1976.

At that time, we met with the U.S. Army Corps of Engineers in Anchorage for a briefing on the Project, and reviewed the feasibility report prepared by the Corps. Later that month, we met with U.S. Senator Mike Gravel, Commissioner Motley, Mr. Eric Wohlforth of Wohlforth & Flint, and Corps representatives in Washington, D.C. to discuss the Project and the financing alternatives. That meeting resulted in several proposed amendments to the federal Alaska Hydroelectric Power Development Act, based on suggestions made by Mr. Wohlforth and ourselves. Subsequently, we held telephone conversations with Mr. Wohlforth to discuss the amendments as he had drafted them.

Early in December 1976, Salomon Brothers prepared a memorandum to APA on the Project, which has been attached as Exhibit 1 for your reference. It outlines certain problems involved in financing the Project, based on some type of federal involvement.

Scope of the Report

This memorandum addresses the key issues that APA will face if it undertakes the Susitna Project on an independent basis. In that case, it is likely that the funds borrowed to finance the Project would ultimately be repaid from revenues generated by it, an approach known as a project financing.

Whether APA securities issued to finance this Project will be tax-exempt will have a significant influence on the planning for it. For this reason, we have addressed in Section II the factors determining tax-exemption: namely, Section 103 of the Internal Revenue Code and the taxability if the bonds are industrial development bonds. Section III discusses the elements of a successful project financing, and notes that many considerations will be relevant whether the Project is done on a taxable or tax-exempt basis. After the financing plan has been developed and security agreements are in place, APA securities can be issued. Section IV offers a brief overview of the general types of securities that may be used to enter the financial markets. As an appendix, we have included a discussion of Salomon Brothers and our experience in public power area.

It should be noted that this memorandum has not proposed alternatives dependent on either state or federal government involvement. Such possibilities have received considerable attention in the past, and involve complicated political issues, but as yet no commitments beyond the study stage have been made. Naturally, if state or federal government support is forthcoming, certain avenues not discussed will be possible. In our role as financial consultants for the Acres report, however, we have focused on the present situation and addressed the issues facing APA if it undertakes the Susitna project on an independent basis.

II. TAX-EXEMPT FINANCING FOR THE SUSITNA PROJECT

A fundamental question is whether or not the interest paid on bonds issued to finance the Project would be tax-exempt income to the holders of the bonds. This point will affect the overall cost of the Project power and the type of financing plan which is developed. Hence, at the outset of this memorandum an examination of the factors determining the tax-exemption question would be helpful.

A. INTERNAL REVENUE CODE - SECTION 103

Section 103 of the Internal Revenue Code exempts from federal income tax interest on obligations issued by states and their political subdivisions, including state public authorities. The exemption does not apply, however, to interest on "industrial development bonds" unless the bonds are used to provide one of the types of exempt facilities. Such include port facilities, sports facilities, pollution control facilities, airports and facilities for the local furnishing of electrical power, but not public power projects with a broad service area.

APA bonds issued to finance the Susitna Project would be industrial development bonds, and therefore taxable, if (i) more than 25 percent of their proceeds are used in a trade or business carried on by a "nonexempt person" (the "trade or business test"), and (ii) the payment of more than 25 percent of the principal or interest on the

bonds is secured by property used in a trade or business, or payments in respect of such property (the "security interest test"). Both the trade or business test and the security interest test must be satisfied in order for obligations to be industrial development bonds. An exempt person is a state or local governmental unit or an organization exempt from tax under sections 501(a) and 501(c)(3) of the Internal Revenue Code (relating to nonprofit, charitable organizations). Non-public, profitmaking enterprises, as well as the federal government and its agencies and instrumentalities, are thus nonexempt persons.

Since public power projects with broad service areas are not exempt facilities, the foregoing provisions of section 103 would permit the issuance of tax-exempt bonds to finance the Susitna Project, only if the Susitna bonds are not industrial development bonds.

Section B, which follows below, describes the special rules for the trade or business test and security interest test in more detail, and suggests several strategies that may prevent Susitna bonds from being classified as industrial development bonds. Section C discusses how other sources of security may be used to prevent the security interest test from being satisfied if this cannot be accomplished where Susitna Project revenues are used as security for the bonds. Section D describes the tax exemption for interest on industrial development bonds used to provide "facilities for the local furnishing of electric energy".

B. USE OF SUSITNA PROJECT REVENUES AS SECURITY

1. Special Rules for Trade or Business and Security Interest Tests

Treasury regulations under section 103 provide special rules for applying the trade or business test and security interest test to bonds issued to finance an electric generating facility owned and operated by an exempt person (such as a state, municipality or public power authority). These rules take the approach that the benefits of ownership of such a facility, and the burden of paying debt service on bonds used to finance it, will be transferred to nonexempt persons under power purchase contracts meeting certain conditions, with the result that such bonds would be industrial development bonds and, therefore, taxable. The trade or business test is satisfied with respect to bonds issued to finance a power project if either (i) one nonexempt person contracts to take, or to take or pay for, more than 25 percent of the output of the project over the period beginning on the date that output is first taken by a nonexempt person and ending on the last maturity date of the bonds ("project output"), or (ii) two or more nonexempt persons, each paying annually a guaranteed minimum payment exceeding 3 percent of the average annual debt service on the bonds, contract in the aggregate to take, or to take or pay for, more than 25 percent of the project output.

The security interest test is satisfied if all of the payments to be made with respect to the contract or contracts taken into account in applying the trade or business test exceed 25 percent of the total debt service on the bonds.

2. Special Rules Applied to Susitna Project

The special rules described above may be applied in steps to the Susitna Project to determine whether the Susitna bonds may be industrial development bonds:

a. Classify the anticipated purchasers of power from the Susitna project into exempt and nonexempt persons. For example, municipalities such as Anchorage and Fairbanks will be exempt persons, whereas private electrical co-ops will be nonexempt.

b. Determine whether any one nonexempt person will contract to take, or take or pay for, more than 25 percent of the project output of the Susitna project. If there is such a person, then the trade or business test is met.

c. If there is no such person, identify the nonexempt persons who will each pay annual guaranteed minimum payments exceeding 3 percent of the average debt service on the Susitna bonds. The trade or business test is satisfied if the aggregate amount of power which these persons contract to take, or take or pay for, exceeds 25 percent of the project output of the Susitna project.

d. If the trade or business test is met, total the payments that will be both pledged or used to pay debt service on the Susitna bonds and made pursuant to the contracts referred to in either paragraph 2 or 3 above. The security interest test is met if this aggregate amount exceeds 25 percent of the total debt service on the Susitna bonds.

3. Possible Alternatives Under the IRS Code

If it appears that the Susitna bonds may be industrial development bonds because of the commitments by nonexempt persons to purchase power, consideration may be given to altering the makeup of the group of purchasers to avoid the trade or business test or security interest test.

a. Trade or Business Test

One approach could be implemented by channeling power from existing plants to nonexempt users and using a correspondingly greater portion of the power from the Susitna Project to supply municipalities and other exempt persons. Alternatively, consideration should be given to using existing power authorities, or newly formed authorities, qualifying as exempt persons, to buy power from the Susitna project and supply nonexempt persons. Any such authority would have to be more than a conduit (i.e., it would have to enter into contracts to purchase power from

the Susitna Project that were not matched term for term by contracts with its customers) in order for it (and not the customers) to be treated as the purchaser of power from the Susitna project.

b. Security Interest Test

Another approach could be used if the Susitna bonds are industrial development bonds because of the number of nonexempt persons that both are committed to make annual guaranteed payments exceeding 3 percent of average annual debt service and purchase power on behalf of others (through a cooperative arrangement or otherwise). In this situation, it may be possible to avoid the 3 percent test (and thereby reduce the number of nonexempt persons whose purchases of power would be counted toward the 25 percent limits) by bypassing the intermediary and selling directly to the ultimate customer. The intermediate purchaser could still be used to service accounts and transmit power for a fee, but it would not be obligated to purchase power from the Susitna Project.

C. ALTERNATIVE SOURCES OF SECURITY

On the other hand, if the use of Susitna Project revenues to secure the Susitna bonds would cause the bonds to be industrial development bonds, consideration should be given to the availability for this purpose of alternative funds that are independent

of the Susitna project and not otherwise derived from a trade or business carried on by a nonexempt person, such as general revenues of the State of Alaska or an allocation of funds from the Alaska Permanent Fund.

It would not be necessary to substitute different security for all of the Susitna Project revenues, but only for an amount sufficient to avoid the security interest test.

It should be noted that the existence of a full faith and credit guarantee of payment of the Susitna bonds by the State of Alaska would not avoid the security interest test if the bonds were still secured by, or were expected to be repaid with, Susitna Project revenues meeting the requirements of the security interest test.

D. LOCAL FURNISHING EXEMPTION

If the Susitna bonds are industrial development bonds, then they will be taxable unless the bonds are used to provide an exempt facility. The only exemption that could possibly apply to the Susitna Project is that for "facilities for the local furnishing of electric energy". While it is unlikely that this exemption will apply, it is considered here for the sake of completeness.

Facilities entitled to the exemption are those used to produce, collect, generate, store, distribute, or convey electric energy that are part of a system providing service to the general populace of one or more communities or municipalities in not more than two contiguous counties (or a policital equivalent) or a city and one contiguous county. For this purpose, a city that is not within, or does not consist of, one or more counties (or a political equivalent) is treated as a county (or a political equivalent). An otherwise qualifying facility is not disqualified because it is connected to a system for interconnection with other public utility systems for the emergency transfer of electric energy. The facilities need not be located in the area served by them.

In addition to the foregoing tests, facilities for the local furnishing of electric power must be available for use by the general public. This test is met if the owner or operator of a facility is obligated by law to furnish electric energy to all persons who desire it and are within the service area of such owner or operator, and it is reasonably expected that such facility will serve or be available to a large segment of the general public in such service area.

This discussion has addressed the regulations that will determine whether or not Susitna bonds would qualify for tax exemption. Considerably more attention will have to be focused on these rules, and various alternatives explored, so that the financing plan ultimately developed will be the best possible for APA.

III. ELEMENTS OF A SUCCESSFUL PROJECT FINANCING

Assuming that the federal or state governments do not offer unlimited funding or guaranties for the project, it is likely that the funds for it will be raised by a project financing. This means that the funds borrowed to finance the construction of the Project will ultimately be repaid from revenues generated by it.

Naturally, it would be desirable if the tax-exemption questions raised in the preceding section were resolved in APA's favor; but, whether done on a taxable or tax-exempt basis the basic elements of a successful project financing are essentially the same. Hence, the concepts developed in this section will be relevant regardless of the outcome of the tax-exemption questions.

The most important characteristic of any project financing is its economic viability. Prospective lenders will support a project of this magnitude only after they are convinced that it will become self-supporting from an economic standpoint. (Our present understanding is that the Project will produce a total of 1,601 mw from two sites, with an estimated cost of $2.5 billion.) Thus, a thorough assessment of projected power supply and demand within the potential service area is needed to support the economic viability of the Project.

A. DETERMINING THE MARKET

APA must obtain informed judgments on two critical matters: that a market will exist for the power which the Susitna Project has the potential to produce, and that the Project offers the best means, from an overall cost standpoint, to meet that future market. APA must define this market and specify the conditions under which it can reasonably expect to maintain the projected customer load. Additionally, APA should establish the extent to which the market will result from displacement, growth, or a combination of the two. Furthermore, it should be determined whether such growth or displacement will come from new or existing customers and when these various elements of market demand will materialize. It should be noted that the ability to forecast energy demand is important not only in determining the aggregate construction and financing requirements but also in demonstrating the quantitative ability to interpret market requirements accurately.

Identifying the market should also involve an assessment of the costs and benefits to each potential project participant. A directed effort then can be made to evaluate each of those parties, their priorities and creditworthiness in order to combine effectively into one project approach the interests of those most vitally concerned.

B. PROJECT RISKS

In addition to the satisfactory evaluation of the market for the power and the type of project to serve that market, there are certain risks inherent in any project financing, which must be defined, isolated and overcome before the financing can be assured. The basic project financing risks which must be addressed include:

1. Cost Overruns Prior to Completion

With most extended construction periods, there is a reasonable probability that cost overruns will result from delays, changes in Project design, and inflation. APA must be able to price its power sufficiently to cover cost overruns, including the cost of additional capital, while still remaining competitive with other energy sources.

2. Late Completion and Non-Completion

Delays due to technological or other reasons, in addition to causing cost overruns, may affect the timely completion of the Project. Under extreme circumstances, a project may be abandoned prior to completion or so substantially altered as not to meet anticipated output. Investors looking to the future revenue streams will demand assurance that such revenue streams materialize.

3. Partial or Total Post-Completion Outages

Once the Project is complete, there exists the risk that the Project's operation will be suspended for a period of time, either partially or totally, and therefore not generate revenues sufficient to service outstanding debt. Although this risk is remote, consideration must be given to its possible occurrence. Since the Project will consist of generation, transmission and inter-tie facilities, some part of the Project may suffer an outage which would compromise the entire operation.

4. Customer Failure to Provide Anticipated Cash Flows

The Project customers may provide less than anticipated cash flows notwithstanding timely completion and full operability of the Project. This can result from demand shortages, competitive power supply pressures or regulatory factors. To provide comfort to investors with regard to this risk, APA must be able to demonstrate its ability to service Project debt while operating at less than anticipated levels or by selling power at lower than anticipated prices.

5. Regulatory Risk

Regulatory risks generally exist both before and after the Project is completed. Fundamentally, any action which may be taken by a governmental or quasi-governmental agency which may adversely affect the Project's revenues or its ability to effect power interchanges with other bodies constitutes a regulatory risk. To the extent possible, the ability of any regulatory body to affect these two areas should be determined beforehand and coordinated with the development of the Project financing plan.

6. Technological Risk

Traditionally, lenders to project financings have been reluctant to extend credit to projects which embrace unproven technology. Because of the many financial and operating risks associated with projects, the addition of a technology risk with its attendant uncertainties may prove unacceptable. To the extent that the construction techniques or generation, transmission, or distribution facilities consist of new or unproven technology, the Project will be more difficult to finance.

The above risks have been confronted and overcome in all successful projects in a variety of ways.

C. IDENTIFYING THE PARTIES-IN-INTEREST

On a preliminary basis, APA and its investment bankers must identify the entities which are potential candidates to share some of the risks, either directly or indirectly, associated with the development of the Susitna Project. In some cases, one or more of these various parties-in-interest would be direct participants in the Project, while in others they would provide direct or indirect credit support through guaranties or other contractual undertakings. These parties might include municipal electric systems, rural electric cooperatives, investor-owned utilities, and the state and federal governments.

Having identified the parties-in-interest, APA and its investment bankers would develop a financing structure which would address the basic requirement for investors in a project financing: creditor protection.

D. CREDITOR PROTECTION: REVENUE ASSURANCE

The basic credit risk against which investors attempt to protect themselves is the risk of default. The risk of default lies in the borrower's inability to meet interest and principal payments on his debt obligations in a timely fashion. Adequate revenue assurance protects the investor against this risk.

For large energy projects, the necessary revenue assurance may be derived from a demonstration of demand for the project output and adequate customer and regulatory support of the price for the power.

1. Power Sales Contracts

The demand for Project output may be formalized with power sales contracts between APA and the immediate customers for the Project's power. Such contracts may be with municipalities, cooperatives, industrial corporations and federal government installations and would serve as a source of credit support for the Project.

The types of commitments under such contracts vary considerably among different issuers. Such types of provisions which APA may wish to consider are:

a. Take-or-pay Obligations - These require users of project output to commit a defined payment for the life of the contract, regardless of the level of project output or a user's need for power. It effectively obligates the users to provide funds that can be used for debt service.

b. Take-and-pay Obligations - This requires users to pay only for the project output which is available to them. It does not ensure that funds would be available for debt service if the project suffers an extended outage.

c. Minimum Payment Obligations - The user is contractually obligated to make only a minimum payment in the event it is unable or unwilling to receive all of the contracted for output. The minimum payment obligation provides for debt service in the event of project outage, while reducing the burden of project credit support on the various obligors to an amount less than that which would be payable with the project fully operable. The unconditional nature of the minimum payment obligation, combined with the credit strength of project customers, comprise the ultimate source for project creditworthiness in the eyes of lenders.

d. Step-up Provisions - Most projects having sponsoring customers whose creditworthiness is somewhat disparate include some measure of protection against the risk of individual customer default in their power sales contracts. This protection takes the form of a specified percentage step-up for the non-defaulting customers. In such cases, upon the failure of any customer to make any payment, the share of all other customers not in default under the contractual support agreement is subject to an automatic increase.

Since the Project output at some point may become subject to price regulation or other regulatory constraints, it is incumbent upon APA to include in discussions all governmental and regulatory agencies which can possibly affect the price of the Project output. Revenue assurance would be achieved through APA's ability to set rates at levels sufficient to discharge its debt obligations without regulatory interference.

2. Guaranties or Other Sources of Payment - Guaranties by a credit worthy party, such as the State, would provide further assurance to investors that monies needed to meet debt service will be paid from power sales contracts or the guarantor. As previously mentioned in Section II, such a guaranty of the bonds will not necessarily solve the tax-exemption question, since it

would be contemplated that the bonds would be paid from the power sales contracts. However, if another source of payment, such as monies from the Alaska Permanent Fund, were used to pay all or a portion of the bonds, it may enable the bonds to qualify for tax-exemption.

3. Funds

In such projects, additional protection for meeting annual debt service requirements is supplied through the use of "Funds" of various types. The purpose of these funds is to provide protection against any unexpected shortfalls in revenues, and provide for unanticipated expenses. The Funds are established at the outset of the project financing and are subsequently maintained by a primary allocation of project revenues on a gross or net basis. The Funds are labeled to describe either their source, use, or the type of risk they are intended to cover. "Revenue Fund", Construction Fund", "Reserve and Contingency Fund", "Operating Fund", "Bond Fund" and "Bond Reserve Fund" are some common examples.

Typically, the Funds are interlocking and spill-over into one another. Thus, a Revenue Fund would be sourced from all of the revenues of the project and spill-over into the Operating Fund which would be used to pay all operating expenses. The Bond Fund, the second level spill-over from the Revenue Fund, would receive payments necessary to meet all project interest, principal and bond retirements. The Bond Reserve

Fund would be used to make up any deficiency in the Bond Fund in order to keep payments of interest and principal current if project cash flows were temporarily insufficient. The Reserve and Contingency Fund would be available to meet any deficiencies in paying operating and maintenance expenses and would also be available to replenish the Bond Reserve Fund or Bond Fund.

To establish the creditworthiness of the Project at the start of construction, the various Funds may be established through borrowing or sponsors' contributions and subsequently maintained by mandatory allocations of Project revenues. While this would increase APA's financing requirements, it would provide a form of quasi-equity which enhances Project creditworthiness during the lengthy construction period.

We have examined the key elements of a successful project financing, namely: defining the market for the power, ascertaining the Project's suitability to serve that market, addressing the project's risks, and providing adequate repayment security to the investors. Each will provide challenges for APA on the Susitna Project but, with creative approaches and experienced professional advisors, a successful outcome will be achieved.

IV. ACCESS TO THE FINANCIAL MARKETS

After the tax-exemption questions have been resolved and the financing plan and security provisions structured, it will be possible to raise funds for the Project through the issuance of securities. This section will address the investment banker's role in this process, and the types of securities which might eventually be issued.

A. INVESTMENT BANKER'S SERVICES

In financing a new project, the role of the investment banker is far more difficult and far more important than in the financing of an established, market-tested credit. The essence of the investment banker's role in such a financing is to establish the creditworthiness of an entity where none has previously existed and to introduce this new borrowing entity to the marketplace.

The services provided by APA's investment banker should correspond with the various stages of the Project development plan. We envision these stages as follows: (1) the preliminary study phase; (2) the consulting and negotiating phase; and (3) the execution phase.

Much of the work which will occur during the first two steps has been discussed in the preceding sections of this report.

In particular, APA's investment banker will work closely with APA and its other professional advisors to determine the optimal structure for undertaking the Project. After the Project structure, participants and various contractual agreements have been determined, the investment banker's attention will focus on financing strategies, for both the short and long term financial needs of the Project.

Before the actual funding of the Project could be undertaken, the investment banker would assist in the preparation of a presentation to the potential investors and rating agencies and the description of the Project to be included in the official statement. Because of the generally complex nature of public power financings, the investor and rating agency presentations and disclosure material are especially important. The necessity of explaining the intricacies of the Project in a sufficiently comprehensive manner so as to obtain the optimum credit rating and develop investor acceptance requires an investment banker well versed in public power financing.

B. TYPES OF SECURITIES

The final stage of the Project, the execution phase, would involve the actual funding of the Project through the sale of APA securities. Several types of securities could be offered, some examples of which are described below:

1. Interim Financing - Prior to the construction phase APA will incur a number of expenses, so that at some point access to funds would be desirable. In general, such funds would be provided from a short-term loan which would eventually be repaid from the proceeds of a long term bond financing. The most common sources for such funds are bank loans, the sale of notes, private placements and in the very early stages, advances from the State.

2. Tax-Exempt Commercial Paper - Another possible source of short-term funds presently being developed is tax-exempt commercial paper. Presently there is no such market, but it is possible that some of the large well-established public power credits may soon start issuing these securities.

3. Long-Term Bond Financing - The actual construction of the Project will be financed from the sale of long-term bonds. As was discussed in the earlier sections, these would be repaid over a number of years from revenues generated by the project and

secured by various contractual agreements. Assuming the tax considerations already discussed can be satisfactorily addressed, the interest on these bonds would be tax-exempt.

Considering the large capital needs of the Susitna Project, and the economical energy it is expected to produce, it is likely that the various APA securities would be attractive to major institutional investors. An aggressive marketing program by APA's investment banker can develop that interest; with such support, APA's securities will enjoy an active market and be well received by investors in the years to come.

December 16, 1976

Financing Considerations
Alaska Power Authority

The Alaska Power Authority (the "Authority") proposes to finance the cost of construction of the Susitna River Project consisting of two dams, Devil Canyon and Watana, and the transmission facilities necessary to deliver the output to the Fairbanks and Anchorage area (the "Project"). The Project will be constructed by the U.S. Army Corps of Engineers (the "Corps") under a "turnkey" arrangement with the Authority wherein the Corps will complete the Project or reimburse the Authority for all costs incurred by the Authority. The output of the Project will be used to meet the projected power needs of the Fairbanks - Anchorage area and sold to certain Power Purchasers (i.e., municipal electric utilities, industry, and federal government installations) pursuant to long-term power supply contracts.

The business risks associated with the proposed financing can be separated into: (1) those risks associated with the failure of the Project to provide electric power and energy at reasonable cost, and; (2) those risks associated with the ability of the Power Purchasers to fully utilize and pay for the power supplied.

PROJECT RISKS

The risks associated with the failure of the Project to provide power and energy at the initial projected costs may be divided into:

A. Prior to Commercial Operation

(1) Non-completion due to any reason

(2) Construction cost overrun due to

(a) Inadequate initial design

(b) General inflation and/or cost escalation and/or cost increases due to required Project additions.

B. After Commercial Operation

(1) Long Project outage due to design

(2) Long Project outage due to physical damage

(3) Low water operation

Prior to Commercial Operation

Non-completion. The risks associated with non-completion of the Project are assumed by the Corps under the turnkey contract wherein the Corps would guarantee commercial operation of the Project. Commercial operation would be established by certain objective tests or by certain performance guarantees (e.g., one year of full power operation). Non-completion, the failure to meet the objective tests for commercial operation, would require the Corps to reimburse the Authority,

through a Federal funding process, for all costs, including interest charges incurred. This reimbursement procedure would be operative prior to the commencement of the Authority's financing program and be established such that the bonds issued by the Authority could be called or paid as they mature, at the option of the bondholder. Essentially, if the Project is not completed, the bondholder will be paid by the Federal government.

Construction Cost Overruns. If, in order to complete the Project, funds in addition to those originally planned are needed, then, if the cause of the cost overrun is due to design, the Corps would have responsibility to provide the funds necessary to bring the Project to commercial operation as provided for in the turnkey arrangement. To the extent the overrun is due to general cost increases, the Authority would assume the responsibility of supplying the additional funds. The overall responsibility of the Authority would be limited to a dollar amount established prior to the commencement of the Authority's financing program. This amount ("Feasible Project Costs") would be determined through negotiation with the Corps and be above the initial estimated Project cost but below the cost which would make the Project not economically feasible.

In order to insure the completion of the Project another source (e.g., the Corps or the State) would be obligated to

provide funds needed above this amount.

After Commercial Operation

Long Project Outage Due to Design. The costs associated with the failure of operation due to design would be assumed by the Corps wherein the Corps would provide funds necessary to restore the Project to operation and meet the Authority's costs not provided for out of various reserve funds.

Project Outage due to Physical Damage. The costs associated with returning the Project to commercial operation would be assumed by the Authority to the extent the funds needed do not exceed Feasible Project Cost. Costs above that amount would be provided by another source (i.e., the Corps, the State, insurance). This arrangment would be established prior to the Authority's first financing.

Low Water Operation. The higher cost associated with low water would be assumed by the Authority.

Power Purchaser Risks

The risks associated with the ability of power purchasers to utilize and to pay for the power supplied are:

(1) That the growth in demand for power and energy, as projected by an independent consulting engineer, does not develop.

(2) That the rates necessary to pay the costs associated with the Project are excessive, for reasons other than inadequate demand growth, when compared with the income levels of the population being served or when compared with power available from other power supply resources.

Both of these risks relate to the cost of power and are assumed by the Power Purchasers under the power supply contracts which will provide that payments will be made by the Power Purchasers sufficient to cover all the Authority's costs incurred in the operation and maintenance of the Project.

Further Considerations

The risk that the Power Purchasers will not be able to make payments as required by the Power Supply Contracts usually has been addressed in an independent consulting engineer's financial feasibility report which, among other things, concludes that:

(a) The Project is technically and economically feasible and the estimated cost of construction is reasonable.

(b) At the estimated date of commercial operation the power purchasers will have the need and the ability to pay for the output from the Project.

(c) Of the projected available power resources, the Project, when integrated into existing resources, will best fulfill the future power supply requirements of the power purchasers.

(d) The revenues derived from the sale of power will

be sufficient to meet the power purchasers' obligations.

In the proposed Alaska Power Authority financing, however, two differences exist. First is that there is usually a projected general market demand for Project power besides the demand from those Power Purchasers who have specifically contracted to receive such power. The power from the Project has a limited market area and no such assurances as to the general market demand will be available. The second is that the Project is in Alaska which involves investor concern over environmental difficulties, natural catastrophes (e.g., earthquakes) and other problems. Because of these differences additional security may be needed to assure investors of the strength and adequacy of the revenue flow.

To determine Project feasibility the Authority would issue short-term bonds the proceeds of which would be used by the Corps for feasibility studies. The ultimate determination of Project feasibility would be the initial issuance of a significant amount of Bonds by the Authority (e.g., $100 million) a portion of the proceeds of which would be used to pay the maturing short-term bonds. If the Project is not feasible, the Corps would reimburse the Authority for all costs incurred, including interest expense.