# SUSITNA HYDROELECTRIC PROJECT

## TASK 2 – SURVEYS AND SITE FACILITIES



**SUBTASK 2.10**
**ACCESS ROADS**
**CLOSEOUT REPORTS**
**ACCESS ROUTE SELECTION REPORT**
**FINAL DRAFT**
**MARCH 1982**

**Prepared by:**

ACRES

ALASKA POWER AUTHORITY

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ACCESS ROAD SELECTION

SUMMARY REPORT

TABLE OF CONTENTS

LIST OF TABLES
LIST OF FIGURES

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

ACCESS ROAD SELECTION

SUMMARY REPORT

TABLE OF CONTENTS (Cont'd)

LIST OF TABLES

LIST OF FIGURES

# 1 - INTRODUCTION

## 1.1 - Background and Purpose of Report

The Acres American Incorporated (Acres) Plan of Study (POS) for the Susitna Hydroelectric Project was issued by the Alaska Power Authority (Power Authority) for public review and comment in 1980. Task 2 of the POS deals with surveys and site facilities including, under Subtask 2.10, consideration of access to the proposed Susitna hydroelectric development. The objective of Subtask 2.10 is to define alternative access routes which will be required for construction and operation of the power developments at the Watana and Devil Canyon damsites, to evaluate the related economical, environmental and engineering factors involved and to select a preferred route.

The original POS proposed that a single route would be selected by May 1981 to be followed by detailed environmental investigations of this route. Early in the study three main access corridors were developed. Consideration of these plans on the basis of available information, comment and concerns from various state agencies and a recommendation from the Susitna Steering Committee, led to a decision to assess three alternative routes in more detail throughout 1981 and recommend one selected route late in the year. Accordingly, this assessment included environmental studies, engineering studies, aerial photography, drilling, and geologic mapping of all three alternatives, rather than the single route initially envisaged.

This report presents the results of studies conducted to date by Acres to determine the optimum location of the access route. Subcontractors and others contributing to this report and their respective contributing areas are:

- Terrestrial Environmental Specialists, Inc. - Environmental Analyses;
- R&M Consultants, Inc. - Engineering, Capital Construction and Logistics Costs;
- Stephen Braund Associates - Local/Public Preferences; and
- Alaska Power Authority - Local/Public Preferences.

Appendix C contains the results of the Local/Public Preference Studies. The environmental and engineering reports are available from the Power Authority in their entirety and are referenced at the end of this report.

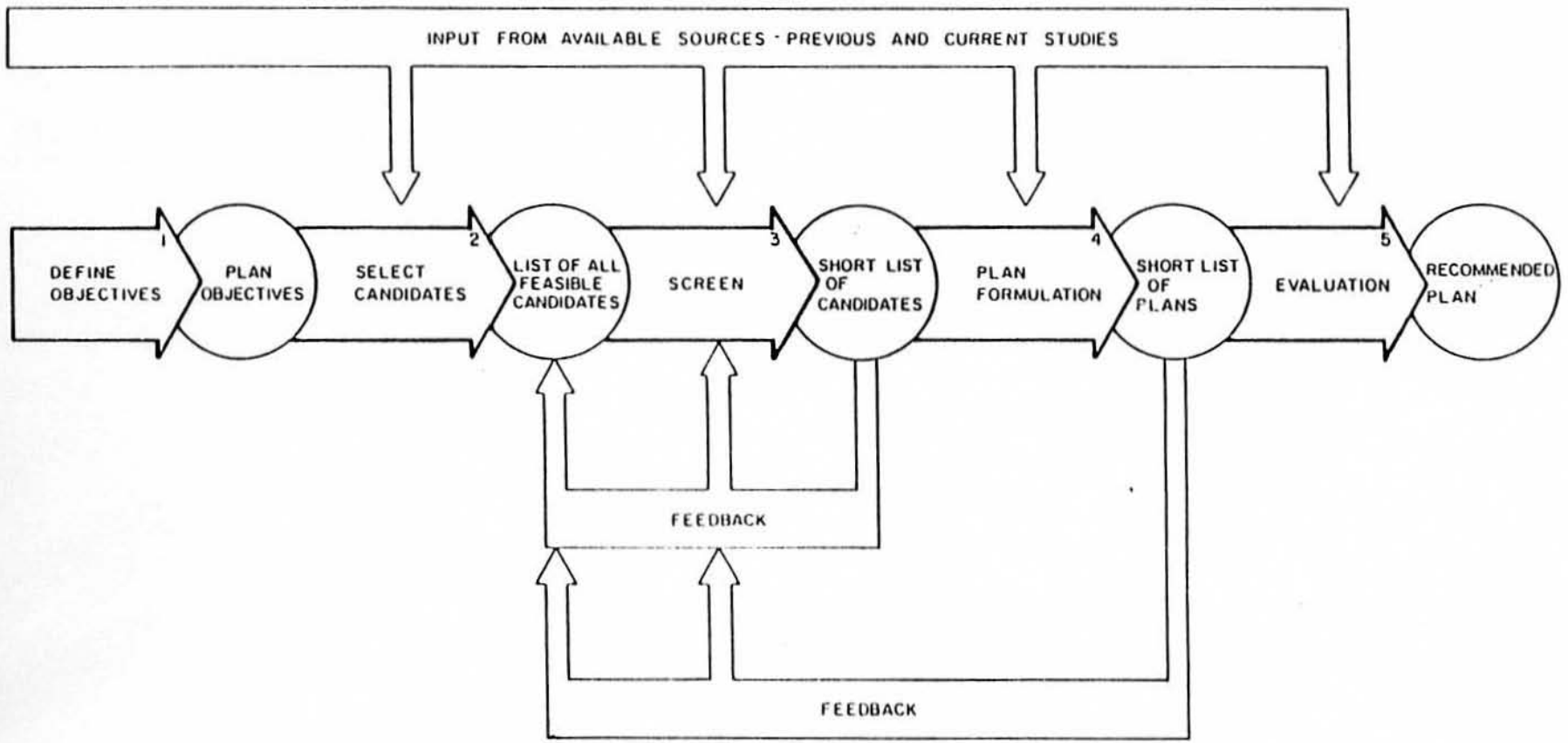
## 1.2 - Organization of Report

This report is organized to describe sequentially the process by which the recommendation for an access plan was reached. Section 2 is a summary of the report. Section 3 discusses the objectives and approach. Section 4 describes the 11 basic plans evaluated; Section 5 presents the evaluation of each plan, considering schedule, costs, biological impacts, and social impacts. Conflicts in trying to meet all selection criteria are presented in Section 6. Acres' recommendation is discussed in Section 7, and mitigation recommendations to reduce impacts associated with the recommended plan appear in Section 8. Tradeoffs in the selection process, including objectives that were not fully met, are discussed in Section 9. Section 10 contains the conclusions and recommendations.

## 1.3 - Plan Formulation and Selection Process

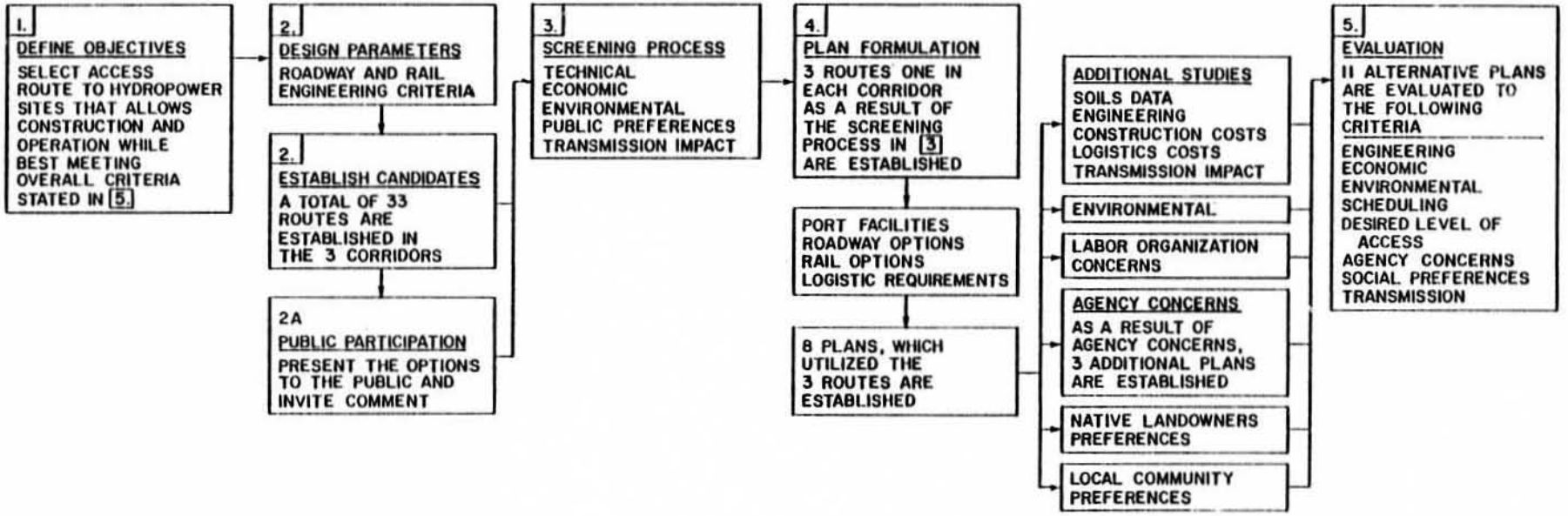
The selection process used to arrive at an access recommendation is described generically in Figure 1.1. It consists basically of a "narrowing down" process, with steps provided for adjustments of the alternative routes and for feedback. This generic process has been applied to all Susitna Hydroelectric Project decisions which required an evaluation of alternatives.

The methodology as specifically applied to the access road selection is described in Section 3.2 and presented graphically in Figure 1.2.




PLAN FORMULATION AND SELECTION METHODOLOGY

FIGURE 1.1




## ACCESS PLAN SELECTION METHODOLOGY

FIGURE I.2

# 2 - SUMMARY

## 2.1 - Scope of Work

The scope of work for the Access Road Selection task is to define and evaluate alternative access routes required for construction and subsequent operation of the power developments at the Watana and Devil Canyon damsites, and select one route. The evaluation is carried out considering engineering, economic, environmental, and social criteria.

Engineering studies conducted on the alternative routes consisted of development of design criteria, layouts of the alternative routes, preliminary field investigations, estimated cost of constructing the alternative routes and costs in transporting supplies and materials to the damsites. Environmental studies included identification, field investigation and evaluation of biological impacts for each of the alternative routes. Social, cultural, socioeconomic, and a public participation program were included among the studies. Public concerns and preferences, particularly those of the sector that would be impacted the most directly, were solicited and fully considered in the evaluation.

The evaluation of the alternative plans included development of evaluation criteria, comparisons of the alternative plans, identification of conflicts among the alternative plans relative to the evaluation criteria, resolution of the conflicts in the evaluation criteria, and the tradeoffs made in the evaluation process.

## 2.2 - Selection of Alternative Plans

Early in the study three broad corridors to the damsites were identified (see Figure 2.1). These were comprised of the following:

- A corridor running west to east from the Parks Highway to the damsites on the north side of the Susitna;

- A corridor running west to east from the Parks Highway to the damsites on the south side of the Susitna River; and

- A corridor running north to south from the Denali Highway to the damsites.

Within the three broad corridors a total of 30 alternative routes were established. The establishment of the 30 routes was accomplished by laying out alternative routes on topographic maps in accordance with road and rail design criteria developed for the routes. Through the selection process a short list of 3 routes, the preferred route in each corridor, was established. The selection process included engineering, economic, biological, and social criteria in narrowing down the alternatives from 30 to 3.

From the 3 routes selected, slight modifications to the alignments were made to diminish as much as practicable, potential adverse biological impacts (see Figure 2.2).

Eleven access plans were eventually developed from the 3 selected routes. The 11 plans established the logistics that would accompany the transport of supplies and materials. The logistics defined the origin of the materials and supplies, entering ports, mode of transport, rail or truck and location of railheads. The 11 plans are presented schematically in Figures 2.6 through 2.11.

## 2.3 - Evaluation of Plans

To meet the prime objective of allowing the orderly development of the damsites, the following criteria was used to evaluate the 11 alternative access plans:

- minimize construction costs and logistics costs;
- facilitate operation and maintenance;
- ensure adequate flexibility in construction logistics and transportation;
- minimize adverse biological impacts;
- address social impacts;
- address resource agency concerns;
- address transmission requirements; and
- address recreation requirements.

An important constraint affecting the Alternative Access Plans evaluation is the overall project scheduling requirements. This constraint resulted from the objective of meeting the power on-line date of 1993(1). The requirement of having the Susitna power on line in 1993 resulted from extensive studies on energy demand forecasts and alternative sources and developments to meet the demand. The delay of the on-line date by one year would have the following negative impacts: a cost penalty in the order of $50 million in long-term present worth costs; another source of fossil fuel generation would have to be constructed to meet the demand or the loss of load probability must be violated; and exploitation of land and other resources required for the construction of the additional fossil fuel generating sources.

This constraint was given prime consideration during the initial evaluation of the plans due to the fact that any alternative other than the Denali Highway route requires approximately three years to construct while the Denali route can meet the construction access requirements in one year(3). Reviewing the construction schedule for the dam, the powerhouse, and the overall power development necessitated continual access is required by mid-1986 to meet the on-line date of 1993 (refer to Appendix B).

The estimated issuance of the FERC license is 1985 and hence the commencement of construction activities is scheduled to coincide with the license issuance in 1985. To meet all the aforementioned requirements, the only alternative is the Denali route. This would eliminate all the other alternatives.

A method was developed utilizing a "pioneer" road concept and commencing construction in 1983 whereby the other alternatives from the Parks Highway and Gold Creek can meet the overall project scheduling requirements. This retained the alternatives for further evaluation.

The 11 plans established varied to the criteria and the degree to which they satisfied the criteria. The 11 plans are grouped into the following broad categories for this summary.

(a) Access from the Parks Highway

The access from the Parks Highway satisfies the cost criterion and the ease of operation and maintenance criterion. The access from the Parks Highway has a definite advantage over all the other plans in the construction logistics and transportation flexibility criterion, and it also avoids many potential biological impacts and also partially satisfies the agency concerns. The only criteria the access does not fully meet is the local community preference. Although there is some local community preference for the Parks Highway access, the majority of the population of the local communities did not favor the access. The access basically satisfies the native landowner preferences.

(b) Access from the Denali Highway

The access from the Denali Highway satisfies the cost criterion, the ease of operation and maintenance criterion, and the construction logistics and transportation flexibility criterion. This access has a definite disadvantage in the minimizing biological impacts criterion, in the agency concerns, and in the native landowner preferences. The access from the Denali Highway has an advantage in local community preferences.

(c) Access from Gold Creek

The access from Gold Creek involves a rail access only to the damsites or a road from Gold Creek to the damsites which involves having a rail link only service, and no connection to a major highway. This access satisfies the cost criterion, the minimizing biological impacts criteria, and local community preference. The access from Gold Creek was also preferred by the agencies. It has a definite disadvantage in construction logistics and transportation flexibility and does not fully meet the ease of operation and maintenance criteria. The access basically meets the native landowner preferences.

In the evaluation of the alternative routes, there was no single alternative that satisfied all the criteria better than the others.

## 2.4 - Plan Recommendation

Access alternatives from Gold Creek has a definite disadvantage in construction logistics and transportation flexibility. This disadvantage is considered great enough to eliminate these alternatives from further consideration.

The access from the Parks Highway has the advantage over the access from the Denali Highway in every category except local community preference. Through the adoption of appropriate mitigation measures such as management, the concerns of the local communities can be minimized.

For the reasons presented, it is Acres' recommendation that the access plan from the Parks Highway be adopted. The access plan, designated Access Plan 5 in this and referenced reports, is comprised of the following:

- An access road commencing on the Parks Highway near Hurricane and traversing southeast along the Indian River to Gold Creek;

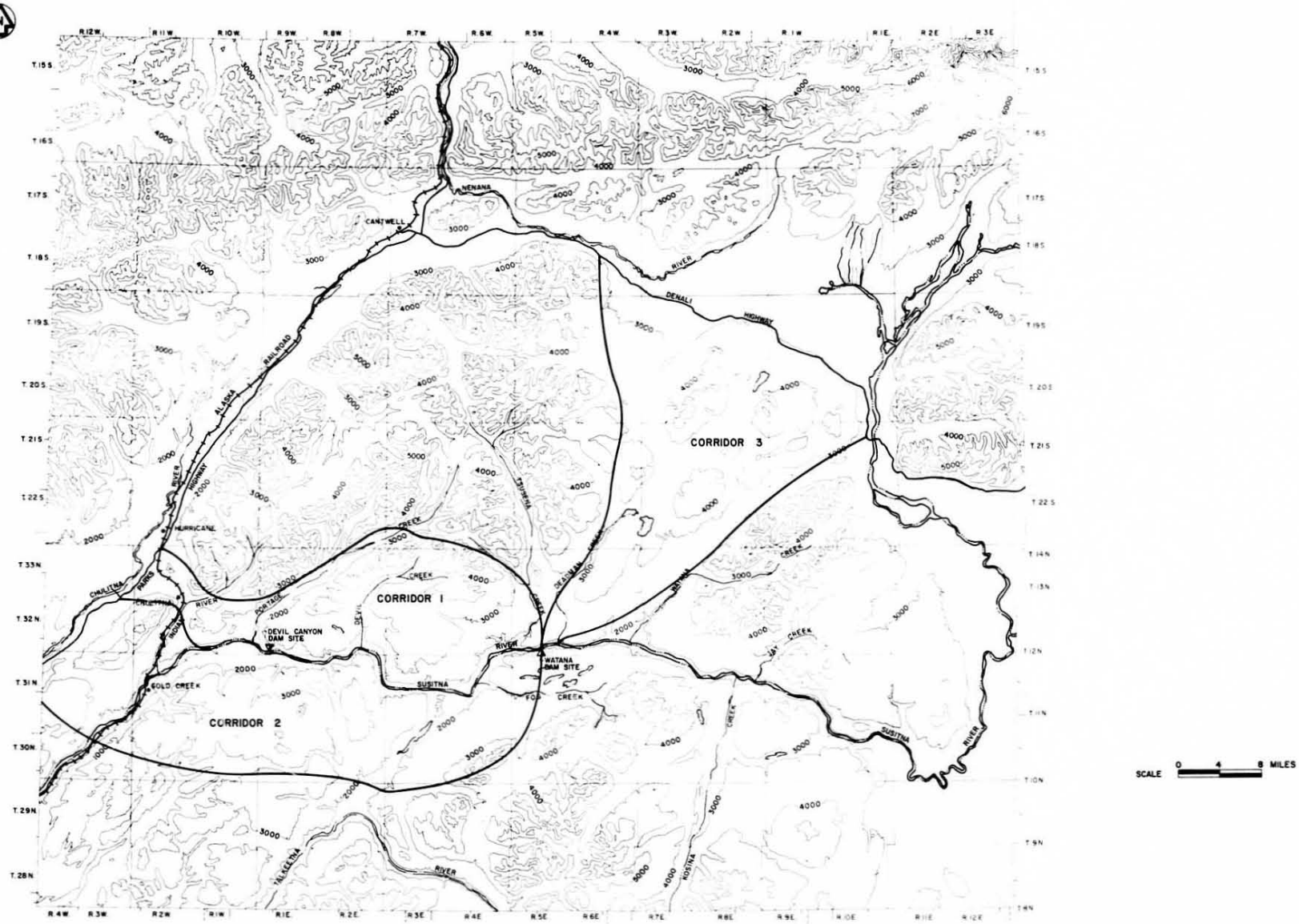
- From Gold Creek the road will continue east to the Devil Canyon damsite, south of the Susitna River; and

- At the Devil Canyon damsite, the road will cross a low level bridge and continue east to the Watana damsite on the north side of the Susitna River;

After completion of the Devil Canyon Power Development, the route will use the top of the dam as the road (See Figure 2.3).

It is Acres' further recommendation to not commence construction of the section of road between the Parks Highway and Gold Creek until after issuance of the FERC license. It is believed this will substantially reduce the prime public and agency concern of introducing access to previously unaccessible areas in the event the FERC license is denied or the project is cancelled.

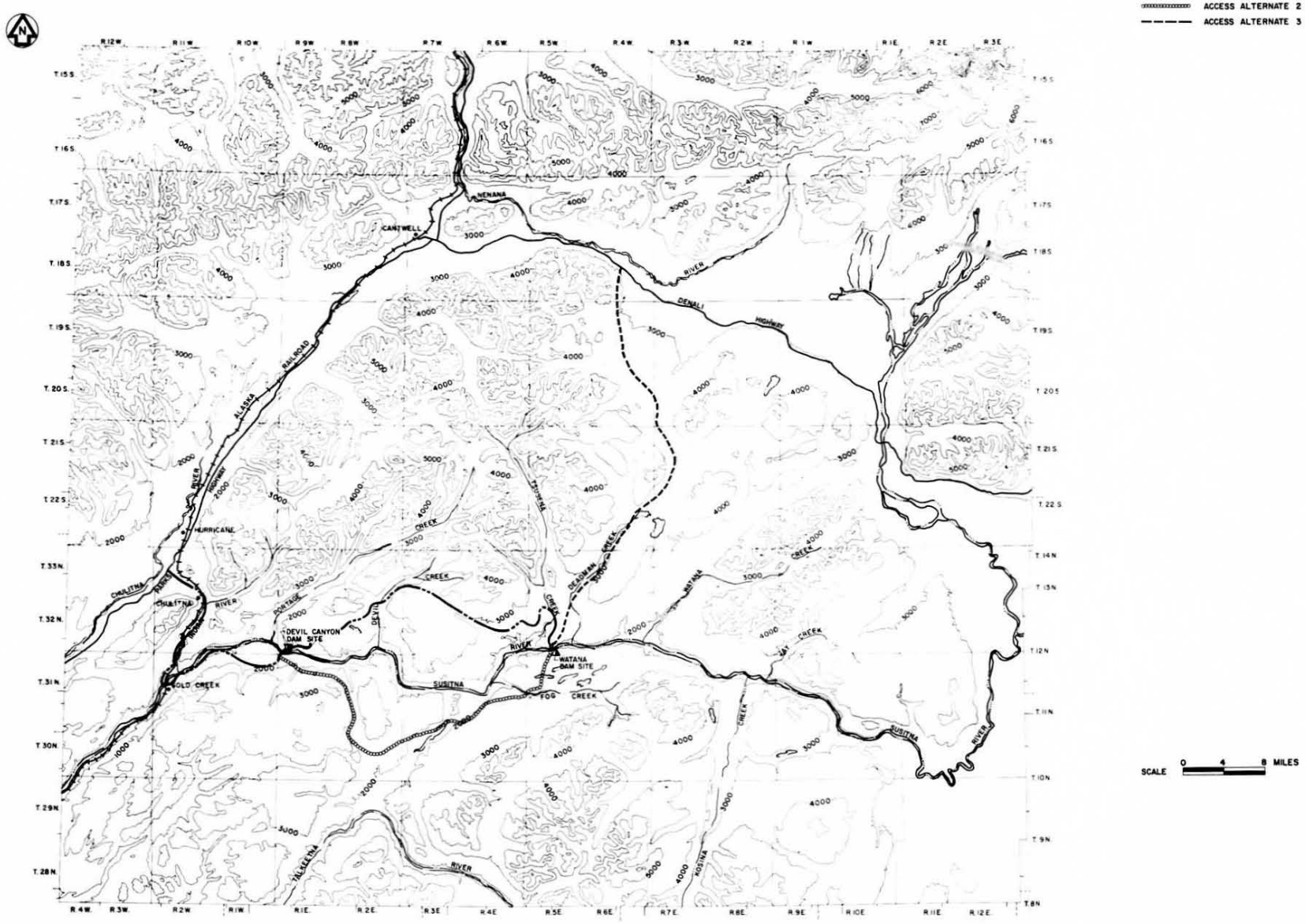
The Access Plan 5 recommendation also carries with it the recommendation of mitigation measures to reduce potential impacts to the local communities along the Parks Highway. These measures include, but are not limited to, control of the road as a private road during construction of the two damsites not allowing any public traffic, incentives to the construction work force to remain at the work site for the longest period of time thus reducing commuter travel, development and maintenance of a dual status camp which will reduce the potential for workers to relocate their families to nearby communities, and establish management policies for the road after construction of the power development is complete.




REFERENCE: BASE MAP FROM USGS, 1:250,000
HEALY, ALASKA
TALKEETNA MOUNTAINS, ALASKA

ALTERNATIVE ACCESS CORRIDORS

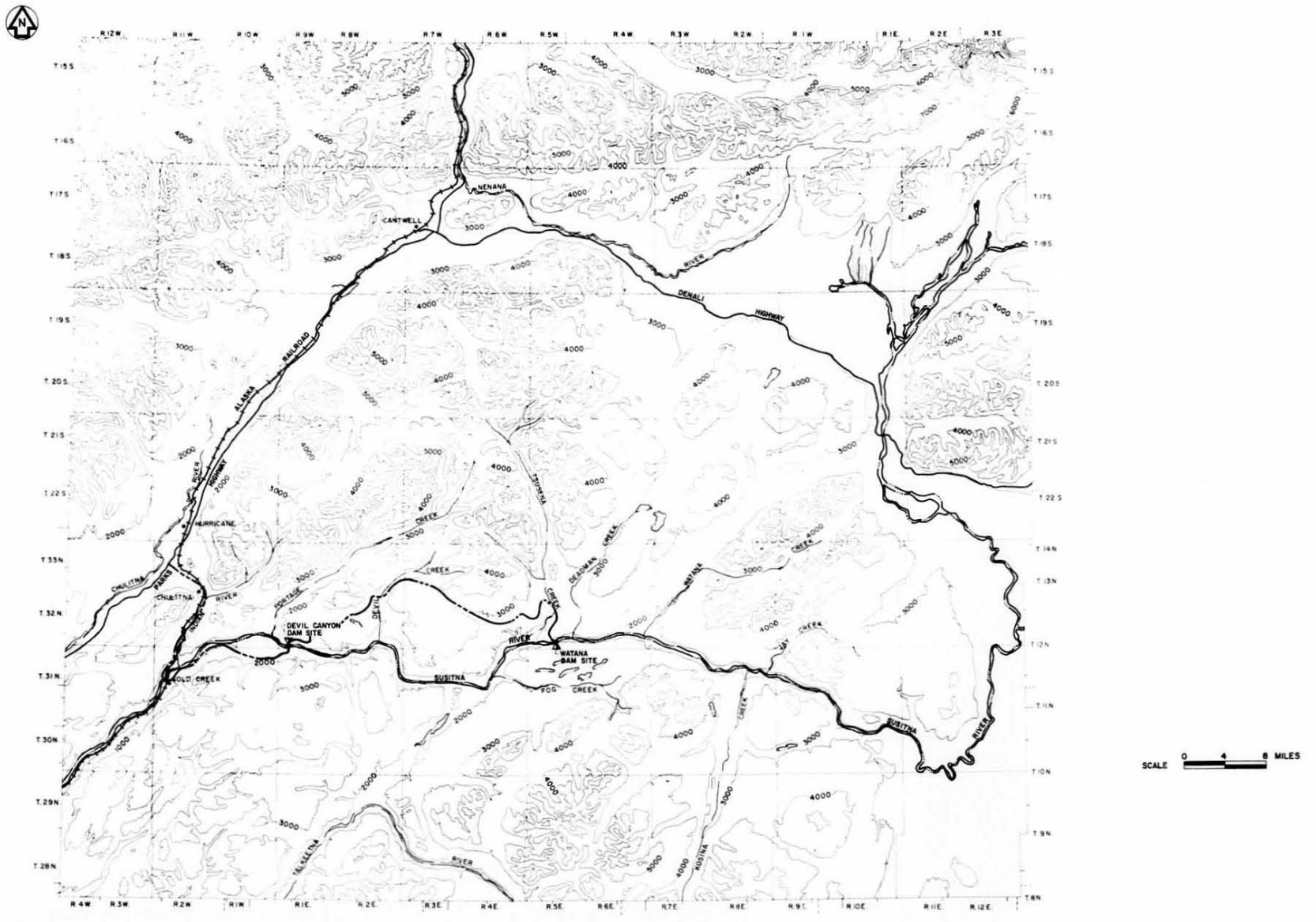
FIGURE 2.1




REFERENCE: BASE MAP FROM USGS, 1:250,000
HEALY, ALASKA
TALKEETNA MOUNTAINS, ALASKA

## ALTERNATIVE ACCESS ROUTES

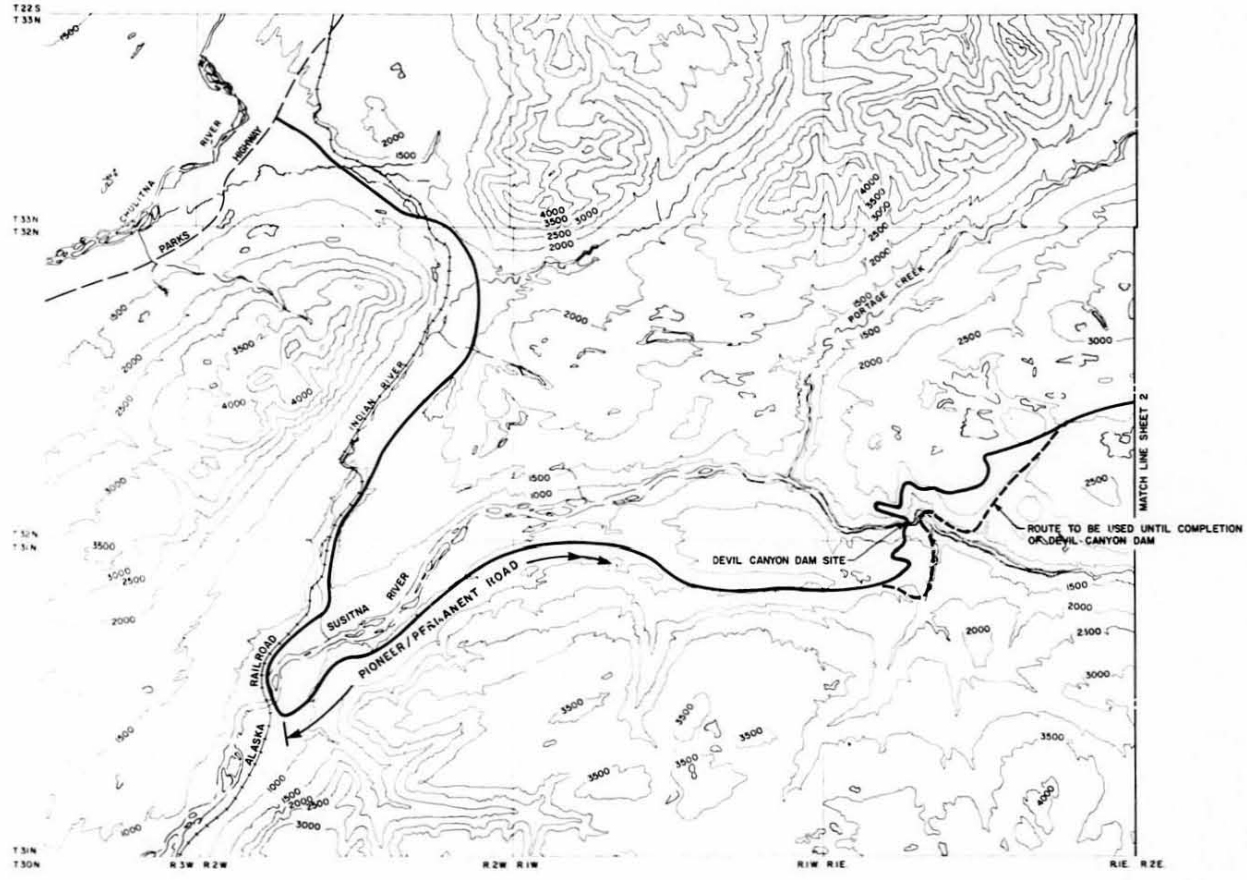
FIGURE 2.2




REFERENCE: BASE MAP FROM USGS, 1:250,000
HEALY, ALASKA
TALKEETNA MOUNTAINS, ALASKA

ACCESS PLAN RECOMMENDED ROUTE

FIGURE 2.3

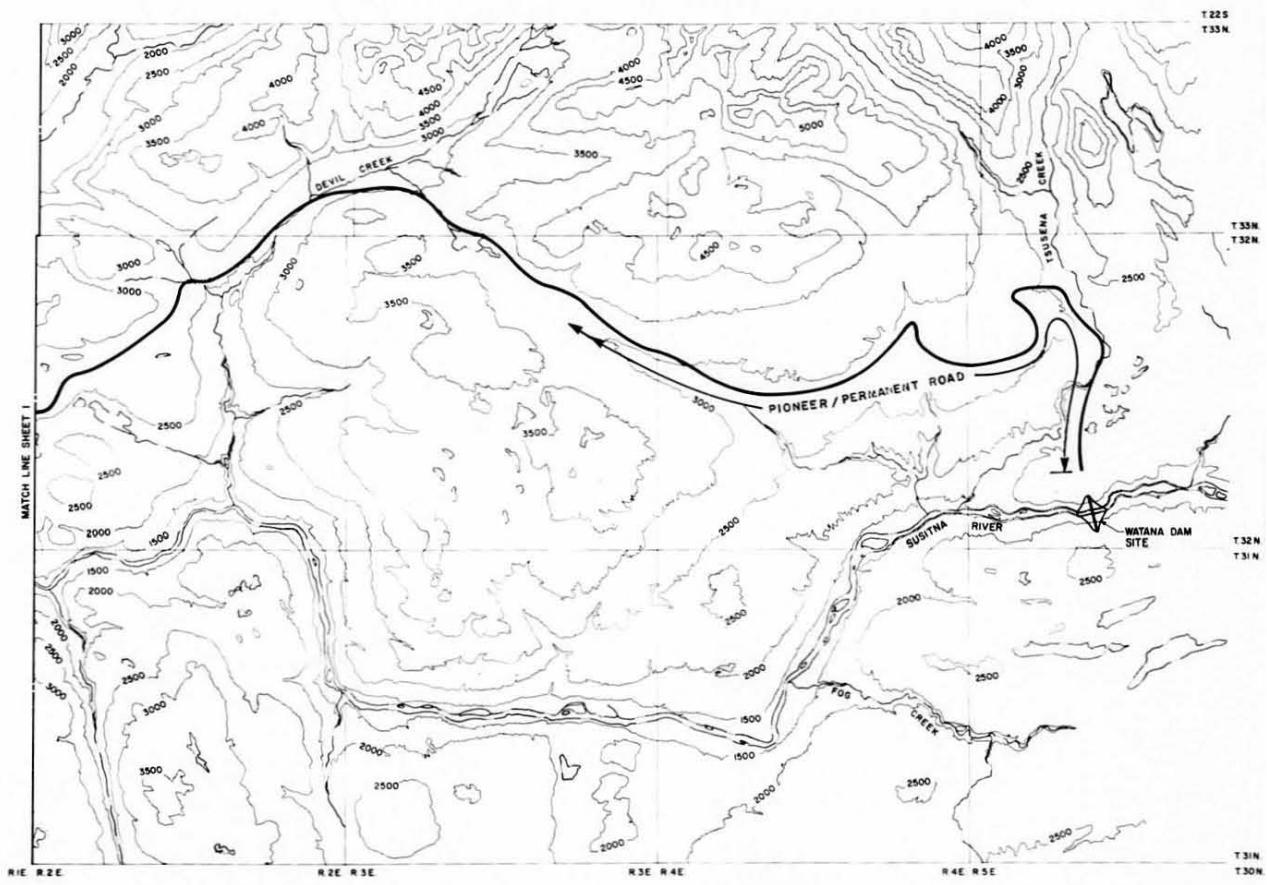



SCALE 0 1 2 MILES

REFERENCE: BASE MAP FROM USGS 1:63,360 ALASKA QUADRANGLES, TALKEETNA MOUNTAINS, C-5, D-5, C-6, D-6

## ACCESS PLAN-RECOMMENDED ROUTE
## SHEET 1 OF 2

FIGURE 2.4

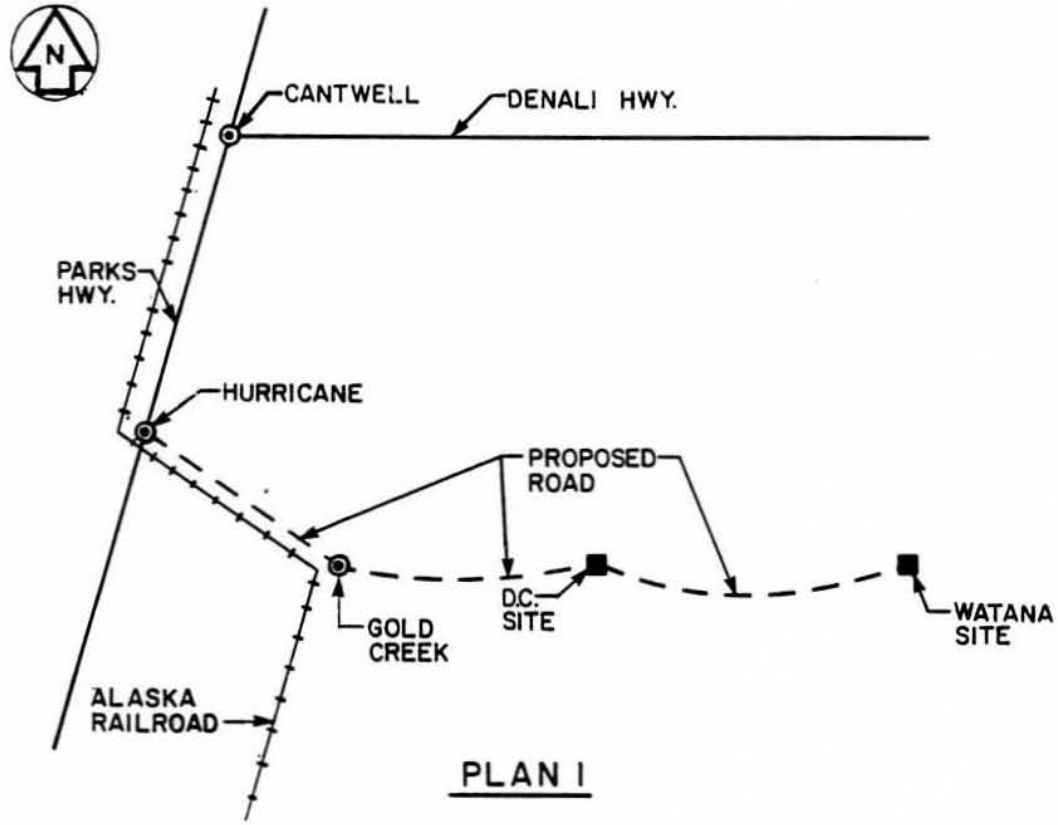



SCALE 0 1 2 MILES

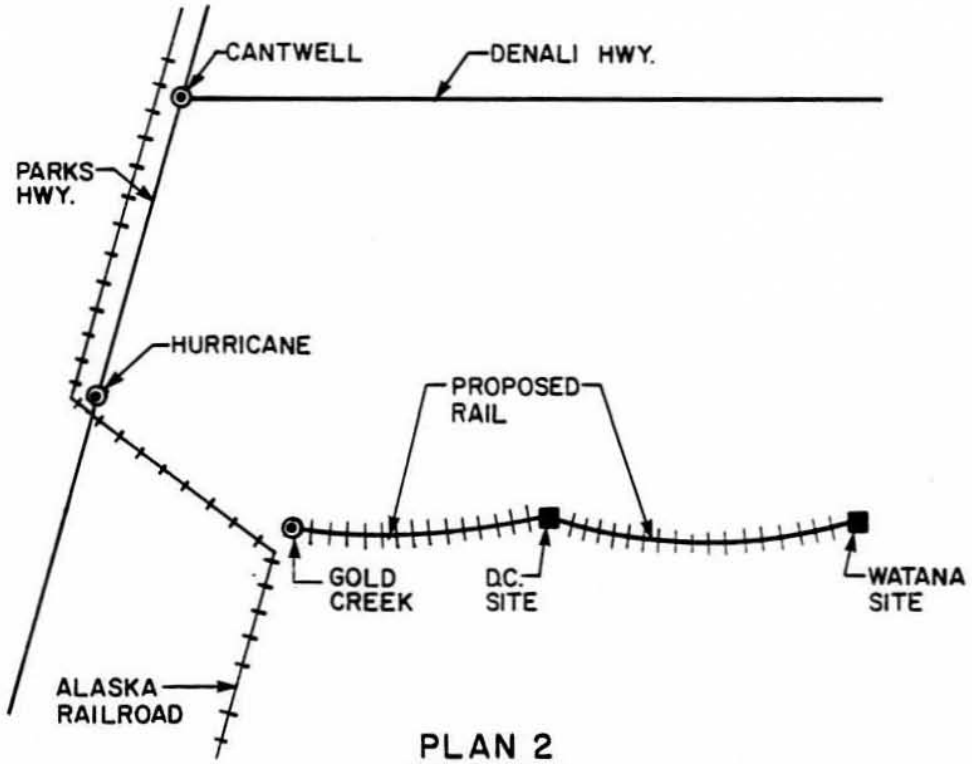
REFERENCE: BASE MAP FROM USGS 1:63,360 ALASKA QUADRANGLE, TALKEETNA MOUNTAINS, C-3, D-3, C-4, D-4, C-5, D-5

## ACCESS PLAN-RECOMMENDED ROUTE
## SHEET 2 OF 2

FIGURE 2.5




PLAN 1




PLAN 2

FIGURE 2.6

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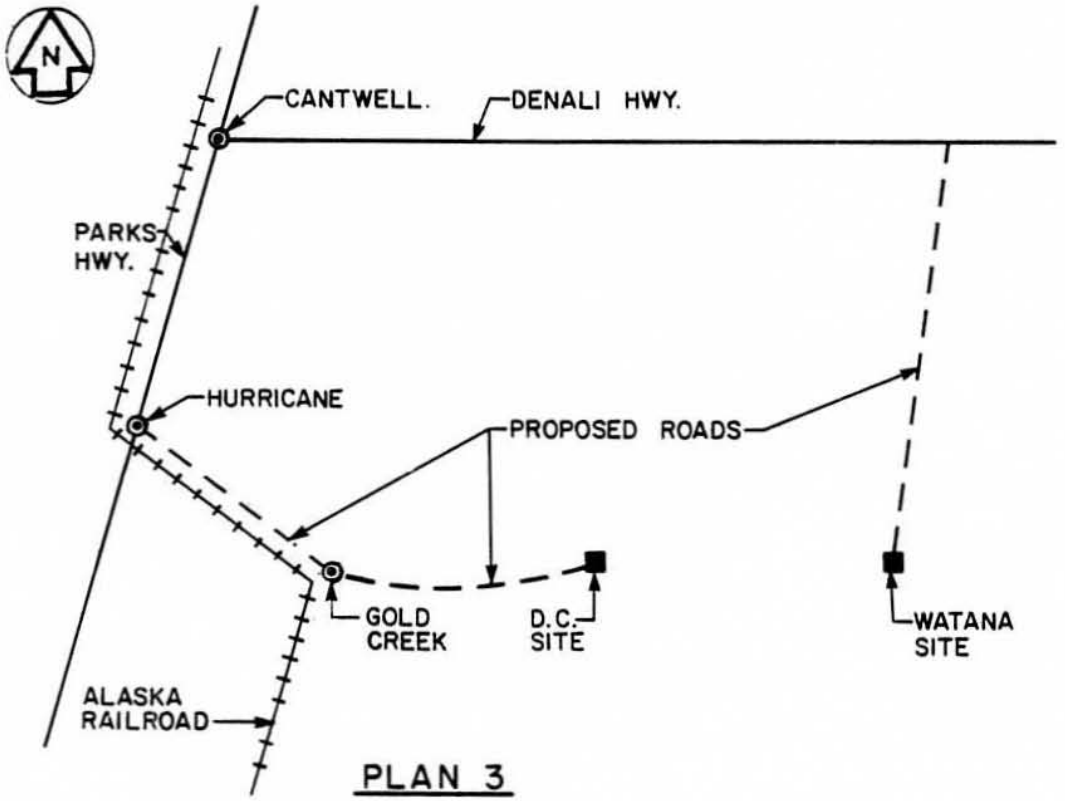
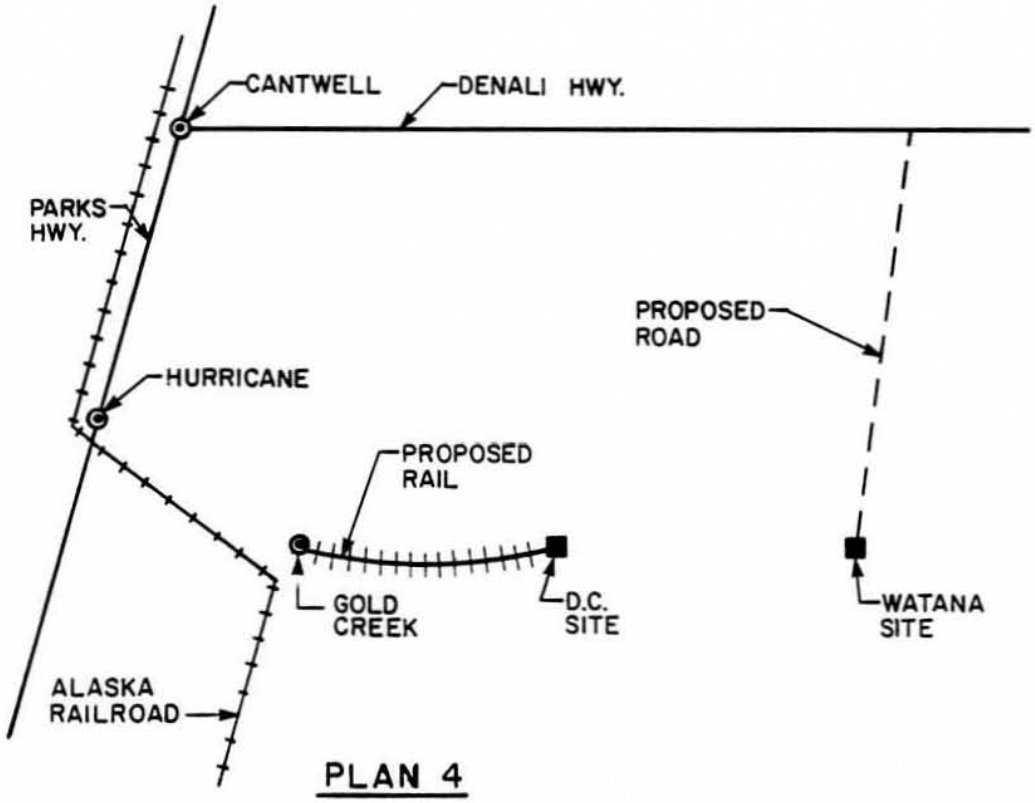


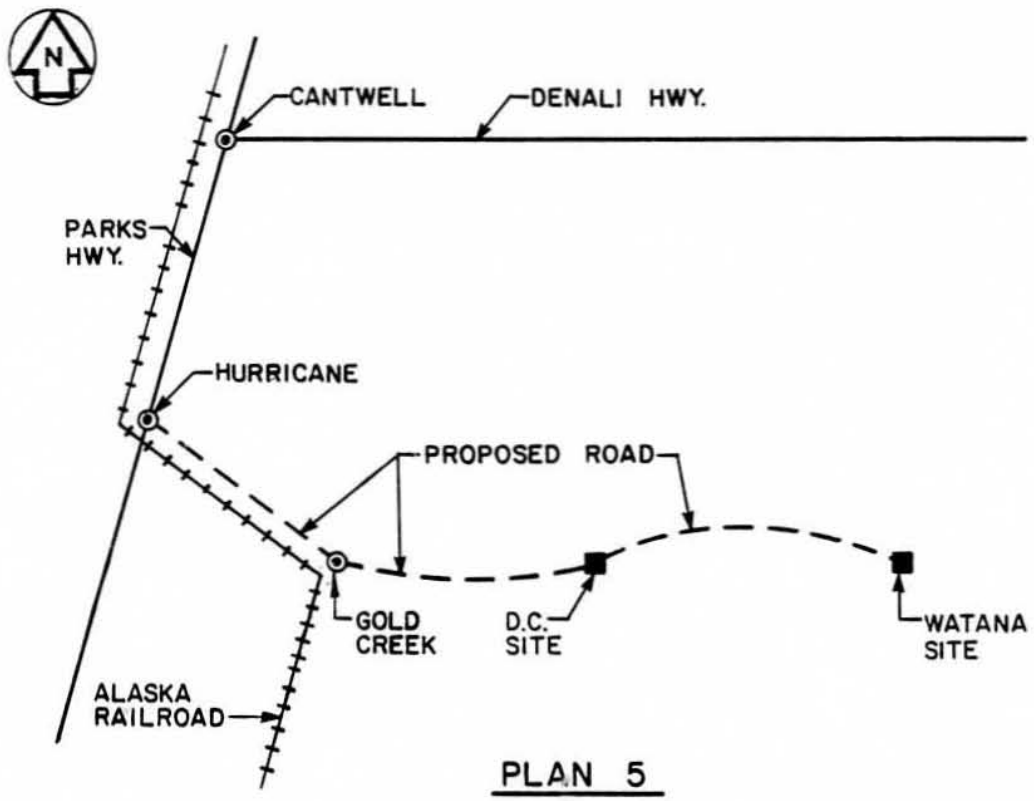

PLAN 3



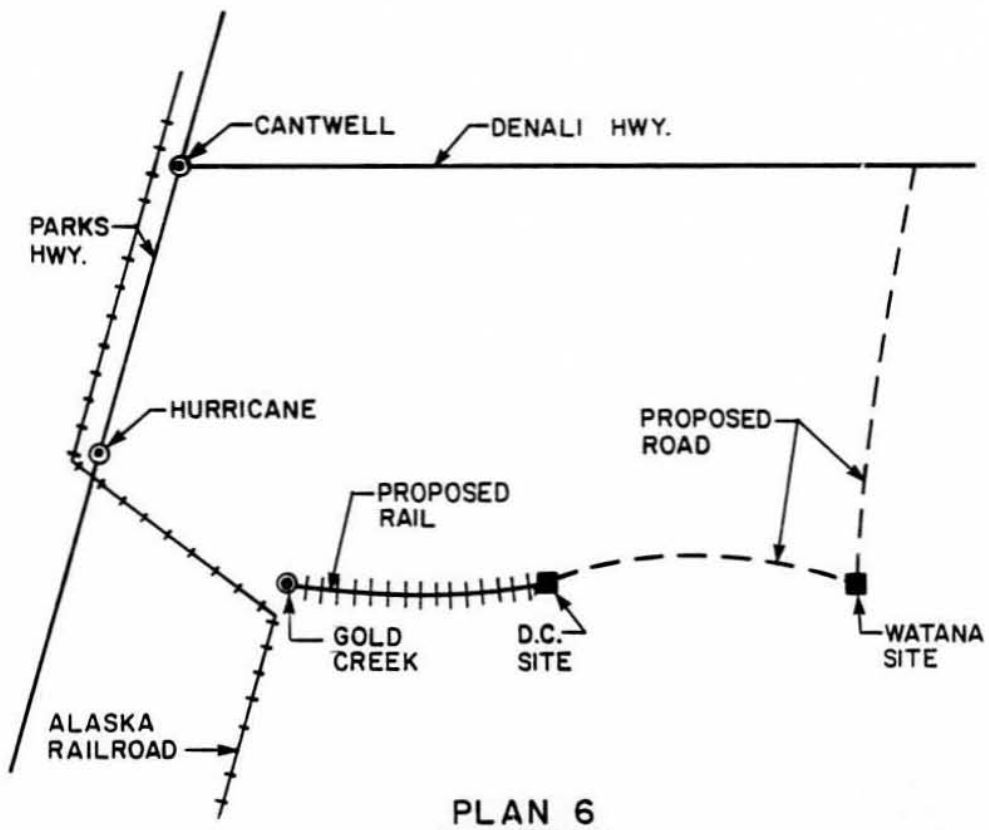

PLAN 4

ACRES

FIGURE 2.7

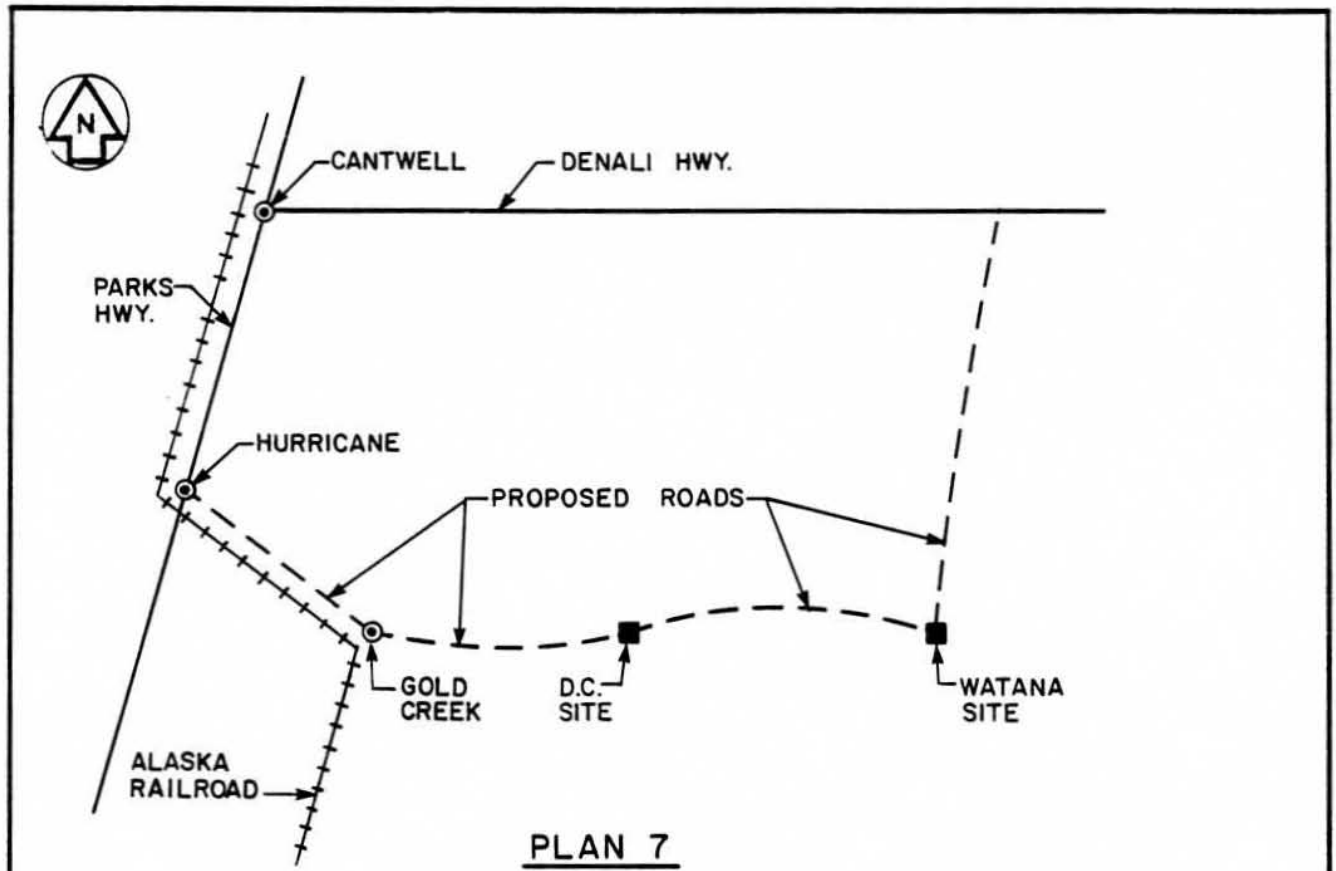



PLAN 5

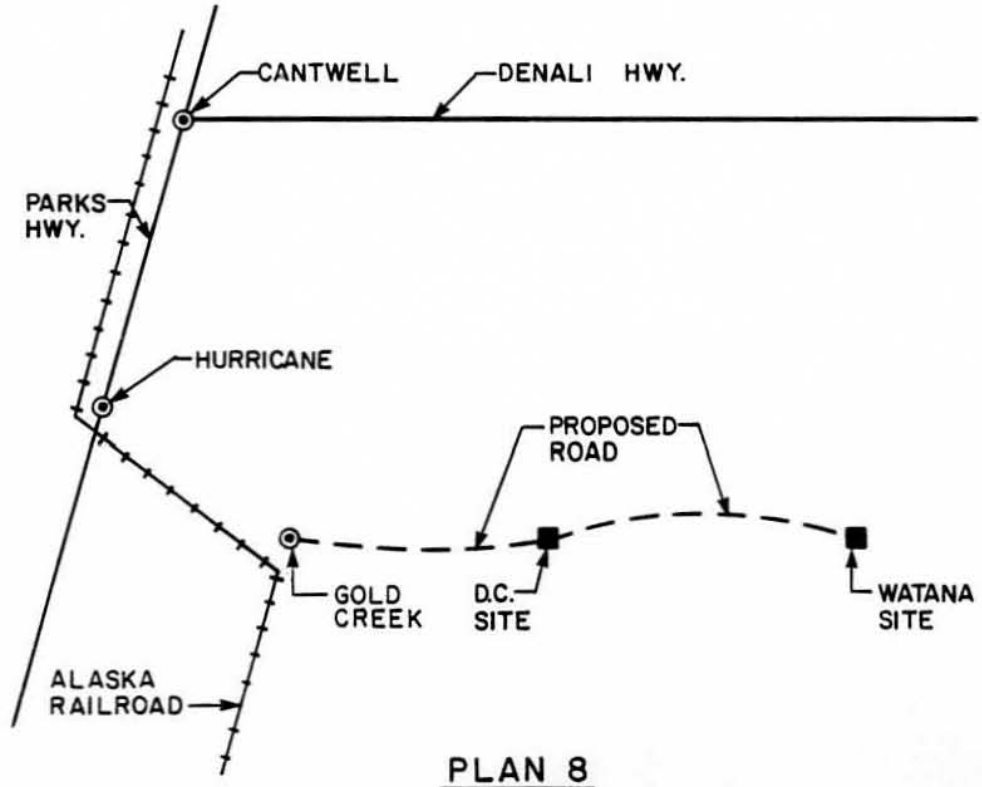



PLAN 6

FIGURE 2.8




PLAN 7




PLAN 8

FIGURE 2.9

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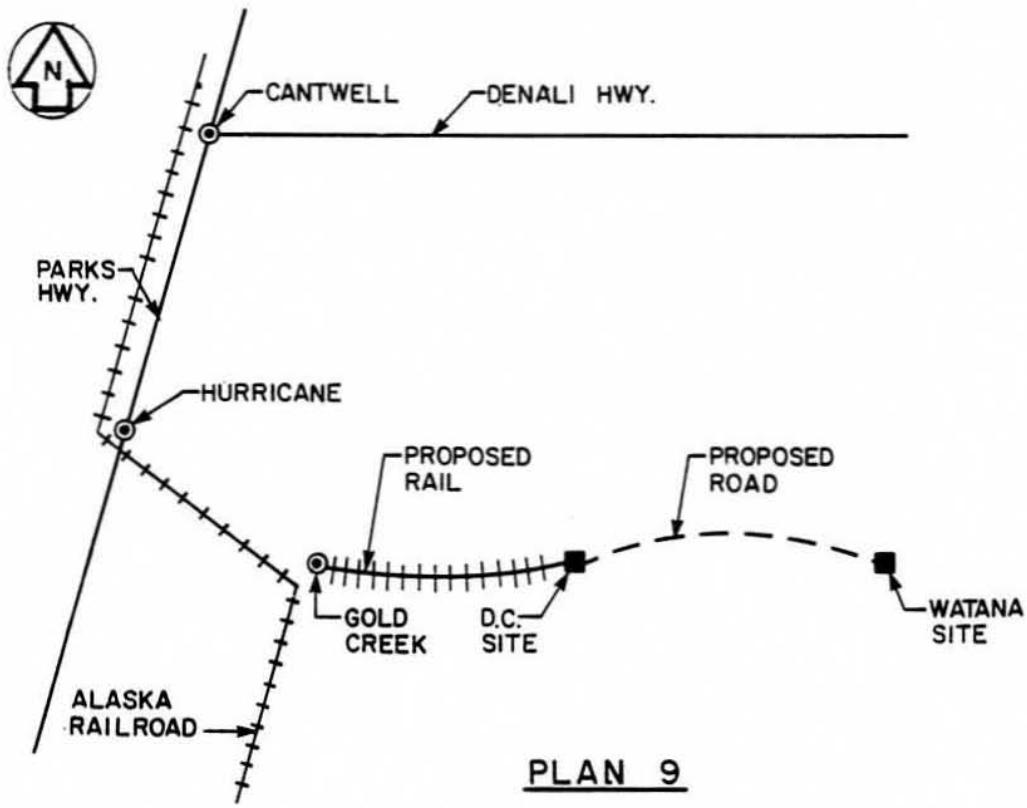
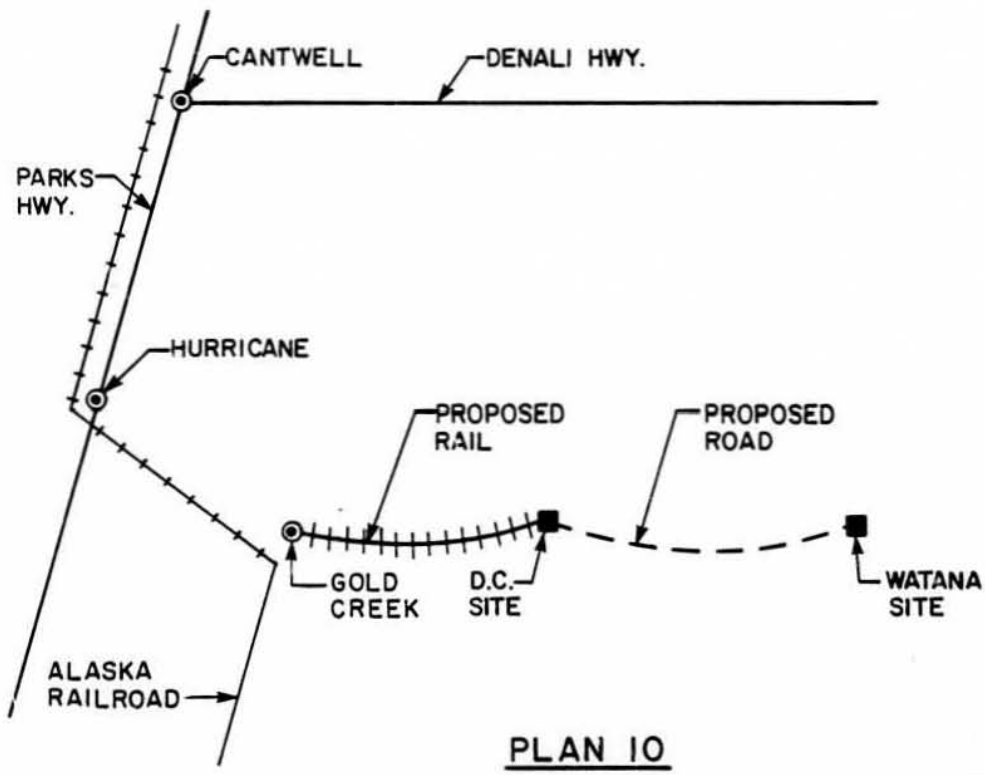



PLAN 9




PLAN 10

FIGURE 2.10

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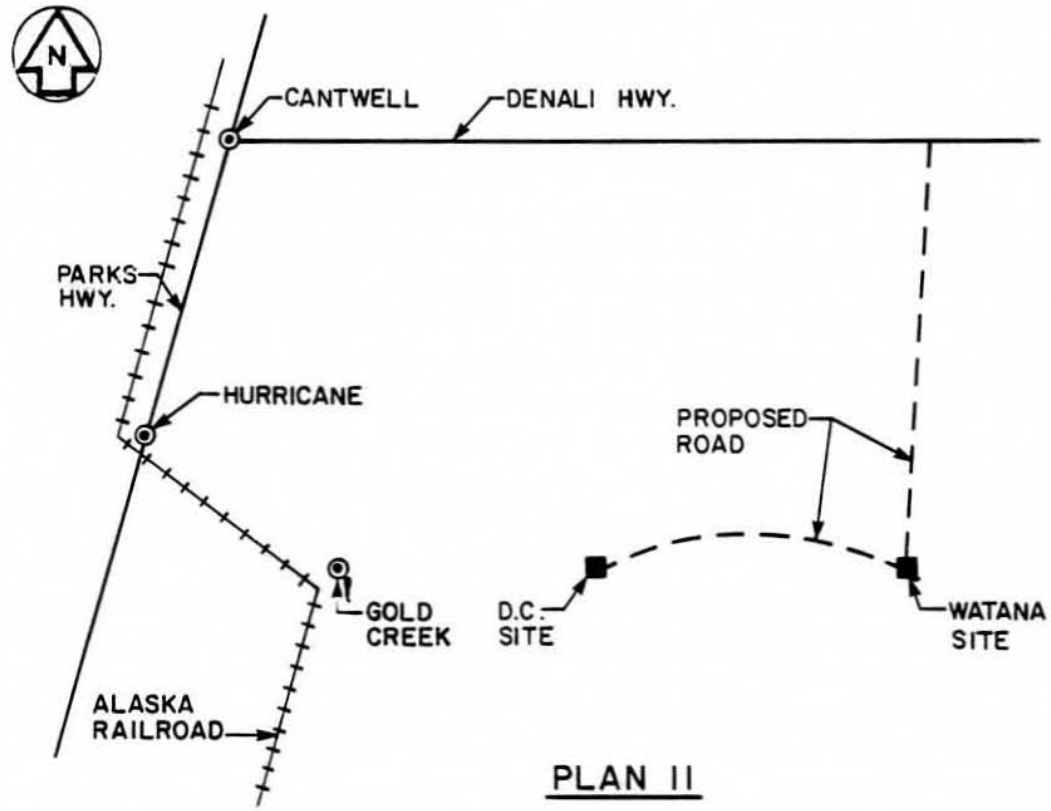



PLAN II

FIGURE 2.11

# 3 - SCOPE OF WORK

## 3.1 - Objectives

The primary objective of the access route is to allow for the orderly development and maintenance of site facilities and construction activities in order that the Susitna power developments can be constructed and electric power be reliably and continuously provided to the Railbelt Area of Alaska.

In meeting the primary objective stated above, several specific objectives were developed as a basis of evaluation of the alternative access route. These objectives are:

(a) To allow the construction of the Susitna project to proceed on a schedule that would supply the necessary power to the Railbelt Area of Alaska when needed;

(b) To minimize cost including capital construction costs, logistics costs of supporting construction activities and the logistics costs of operation of the project;

(c) To allow for ease of operation and maintenance to ensure reliability in the power supply;

(d) To minimize adverse biological impacts;

(e) To accommodate the preferences of local communities; and

(f) To accommodate the preferences of Native landowners.

## 3.2 - Approach

The approach utilized to arrive at an access recommendation was basically an adaptation of the generic plan formulation and selection methodology described previously in Section 1.3.

To aid in understanding the selection process and the various studies conducted, the following definitions are provided:

- Corridor - On a plan view or surface, a wide path, generally 2 miles wide or greater, indicating direction between two points or areas.

- Route - On a plan view or surface, a path, generally 1/2 mile wide or less, indicating direction between two points.

- Segment - Portions of a route which when combined constitute one alternate route between two points.

- Alternative Route - One of several routes which will be evaluated between two points.

- Plan - An access plan includes a single or a combination of existing and new alternative routes. The plan will also define the logistics involved in the transportation of supplies and materials.

The first step of the selection process was the establishment of basic corridors leading from existing transportation routes to the damsites. Alternative routes which met engineering design parameters were then established and evaluated against technical, economic, and environmental criteria. A short list of the preferred three routes, one in each corridor, was then compiled. Access plans for each route were developed, and these plans evaluated in detail, leading to a final recommendation of a route within a corridor and a plan to utilize this route. Figure 1.2 depicts this process in more detail and illustrates how other concerns, including those of agencies and the public, were incorporated into the decision-making process.

# 4 - SELECTION OF PLANS

## 4.1 - Overview of Studies Prior to Plan Selection

### (a) Corridor Selection and Evaluation

The first step in the selection process involved the identification of general corridors. These corridors were selected based upon the existing transportation network in reasonable proximity to the damsites and the fact that the purpose of the access route would be to provide access to the damsites. The transportation network consists of the Parks Highway and the Alaska Railroad to the west and the Denali Highway to the north of the damsites. Based upon this, the following three general corridors were identified.

- Corridor 1 - From the Parks Highway to the Watana damsite via the north side of the Susitna River.

- Corridor 2 - From the Parks Highway to the Watana damsite via the south side of the Susitna River.

- Corridor 3 - From the Denali Highway to the Watana damsite.

A general environmental analysis was conducted on the three corridors(2). The results of this analysis are presented below. The major environmental constraints identified within each corridor are potential impacts on the following:

- Corridor 1:

  - Fishery resources in the Susitna and Indian Rivers;
  - Cliff-nesting raptors near Portage Creek and Devil Canyon;
  - Furbearer habitat near Portage Creek and High Lake;
  - Moose habitat on the Susitna River; and
  - Caribou habitat between Devil Creek and Deadman Creek.

- Corridor 2:

  - Fishery resources in the Susitna and Indian River;
  - Cliff-nesting raptors near south side of the Susitna River;
  - Waterfowl habitat in the Stephan Lake-Fog Lake areas; and
  - Furbearer habitat in the Stephan Lake-Fog Lake areas.

- Corridor 3:

  - Caribou calving area near Butte Lake;
  - Furbearer habitat; and
  - Some waterfowl habitat.

In addition, increased access will cause various impacts which are common to all corridors. Archaeological resources could pose a constraint; at this time, location of these resources are unknown.

Finally, socioeconomic impacts will vary both in magnitude and areas of concentration, depending upon which access route or combination of access routes is selected, and whether a road or railroad is used. With the socioeconomic assessment of access schemes, there is more concern with the origin and type of access than with the actual route, because these will affect the communities more than the actual route.

With a road from the Parks Highway to the damsites (Corridors 1 and 2), effects generally would be concentrated on the western side of the project area. An easily accessible road corridor would provide for transportation of construction materials, equipment, and labor as well as post-construction uses of the Upper Susitna Basin (such as recreation). The impact of a railroad from the same side would likewise be concentrated on the western side. However, in every socioeconomic category, impacts would be the same or less than with the road. The single exception would be in rail industry activities, which would experience major changes.

With a road constructed from the Denali Highway to the damsites (Corridor 3), impacts along the Parks Highway-Alaska Railroad corridor would depend upon whether materials were to be shipped by road or rail to Cantwell before being transported along the Denali Highway to the access road. Impacts would occur in the Cantwell area, however, regardless of transportation mode.

(b) Route Selection and Evaluation

Following identification of major corridors, access routes were selected and evaluated based on engineering and economic criteria. Environmental analysis was then utilized to modify the selected routes.

(i) Engineering Criteria

Construction of the Susitna project will require a dependable, safe, and efficient access route suitable for transporting personnel, consumable supplies, and large pieces of equipment for an extended period in adverse weather conditions.

The preliminary design criteria adopted for access road and rail alternatives were selected on the basis of similar facilities provided for other remote projects of this nature. Basic parameters were as follows:

- Maximum Grade of 6 percent;
- Maximum curvature of 5°;
- Design loading of $80^{k}$ axle and $200^{k}$ total during construction; and;
- Design loading of HS-20 after construction.

Railroad design parameters utilized were as follows:

- Maximum Grade of 2.5 percent;
- Maximum Curvature of 10°; and
- Loading of E-50.

Following corridor definition, various segments that met engineering criteria were mapped. These segments were then joined to form various alternative routes which were compared on the basis of:

- Overall length;
- Average grade per mile; and
- Average deflection per mile.

(ii) Economic Criteria

In the early screening stages of corridor and route selection, the only economic criteria applied were total centerline length of the road with minor adjustments for average grade and curvature. Preliminary capital costs for construction were estimated to be 1.25 million dollars per mile, in 1981 dollars.

(iii) Results

The mountainous terrain, combined with the criteria adopted regarding maximum grades and degree of curvature, strictly limits the number of available segments and routes. The 16 segments and 30 routes identified within the three corridors are about the only practicable routes available. All the routes are technically feasible, complete within themselves, and insure safe operation. The routes have been plotted on USGS maps at a 1 inch = 1 mile scale(3).

The alternatives identified as being most favorable based on length, alignment, and grade are as follows:

- Corridor 1 - Parks Highway to Watana damsite - North side

| | |
|---|---|
| Overall Length | 64.9 miles |
| Average Grade | 2.4 percent |
| Deflection Per Mile | 7°06'± |

- Corridor 2 - Parks Highway to Watana damsite - South side

| | |
|---|---|
| Overall Length | 66.5 miles |
| Average Grade | 2.2 percent |
| Deflection Per Mile | 4°50'± |

- Corridor 3 - Watana Dam to Denali Highway

| | |
|---|---|
| Overall Length | 39.1 miles |
| Average Grade | 1.3 percent |
| Deflection Per Mile | 1°30'± |

- Railroad - The south side of the river from Gold Creek to Watana damsite. This closely follows the preferred road alignment for Corridor 2.

| | |
|---|---|
| Overall Length | 58 miles |
| Average Grade | 0.5% percent |
| Deflection Per Mile | 5°11'± |

(iv) Environmental Influences on Alternative Routes

After the engineering and economic assessment identified 3 road routes and 1 rail route, an initial screening was made which resulted in several refinements to the alternative routes under consideration. A major refinement involved the deletion of a large portion of the road access corridor from the Parks Highway on the north side of the river (Corridor 1). The segment connecting the Highway and Devil Canyon damsite routed around Portage Creek was deleted mainly on the basis of potentially severe environmental impacts on anadromous fish, furbearers, and raptors. The topography in the Portage Creek area is furthermore such that the alignment necessary to meet the established criteria is inordinately long. In addition the construction of the segment would be extremely difficult due to the predominance of steep sidehill excavation required.

Another major refinement to the corridors was the routing to the west of the northern portion of the Denali route (Corridor 3). This routing was advocated on environmental grounds in an attempt to reduce potential impacts on the caribou subherd calving area near Butte Lake. A final refinement consisted of realignment of the portion of the Corridor on the south side of the river (Corridor 2) in the Stephen Lake-Fog Lake area to reduce potential environmental impacts to furbearers and waterfowl.

The main routes within the corridors remaining after the initial screening were as follows:

- Parks Highway to Devil Canyon - This route encompasses the existing rail route between Gold Creek and the intersection of the railroad with the Parks Highway just south of Hurricane. Traveling southeast from Hurricane, this route passes through Chulitna Pass and then parallels the Indian River to Gold Creek. The existing river channel periphery provides for a natural passageway for a road. From Gold Creek to Devil Canyon the route lies south of the Susitna River, paralleling the river on a high ridge.

- Devil Canyon to Watana, South Side of Susitna River - This route generally parallels the Susitna River and traverses west to east from Devil Canyon to Watana. The initial topography is mountainous and the route contains the most difficult construction of the three routes as there are considerable sidehill alignments, in rock and soil. This route also includes the environmentally sensitive Stephan Lake and Fog Lake areas.

- Devil Canyon to Watana North Side of Susitna River - This route generally parallels the Susitna River and traverses west to east from Devil Canyon to Watana. This route is mountainous and includes terrain at the highest elevations of all routes, however, construction of the road would not be as difficult as the route between the damsites, on the south side of the Susitna River.

- Denali Highway to Watana - This route connects the Denali Highway with the Watana damsite and runs in a north-south direction. This route is the easiest to construct of the alternative routes. The terrain is relatively flat with a few wetlands involved. This route would not require any major bridges.

## 4.2 - Description of Basic Plans

From the three routes remaining after the initial screening, eight plans were developed. These plans were studied, investigated, and evaluated in more detail then originally planned in the original POS. The additional investigations and evaluations resulted from information and assessments conducted to date, concerns of state agencies, and also following recommendation by the Susitna Steering Committee, refer to Appendix A - Correspondence. The additional investigation and evaluations, consisting mainly of environmental fieldwork, and geological and topographical mapping and subsurface borings, provided a better data base upon which to make a selection.

The plans are presented below and are also shown schematically in Figures 2.6 through 2.9.

### (a) Plan 1

This plan utilizes a roadway from the Parks Highway to Watana dam along the south side of the river. Current construction planning using this access plan is based on materials such as cement and steel being brought into the state through Whittier on rail cars. Food and other camp supplies would be imported through Anchorage via container, and fuel directly from Kenai to Anchorage via existing pipeline. All materials and supplies would be carried by rail to a rail head and storage area at Gold Creek. At Gold Creek materials would be transferred to trucks for transport to the site. The remainder of materials and supplies would be transported by truck from the Parks Highway. An alternative for fuel would be rail haul from the refinery at North Pole, Alaska.

### (b) Plan 2 - All Rail

This plan would serve both damsites by a rail line. This alternative would preclude public access. Construction planning for this mode of access would be based on trains being broken down and cars dropped on the siding at Gold Creek. An engine and train crew would be stationed at Gold Creek. This crew would shuttle cars from Gold creek to the project site daily. Passenger rail service would be required daily. If public access is desired after construction the rails could be removed and the road bed graded into a one lane road with turnouts.

(c) Plan 3

This plan envisages use of a combination of rail and truck. Construction of Watana dam would be served from a rail head at Cantwell, by truck across the Denali highway and along a newly constructed road from the Denali Highway. Construction of Devil Canyon dam would be served by truck from a rail head at Gold Creek and a r id access to the Parks Highway is included. This plan does not includ a connection between the two dams.

(d) Plan 4

This plan serves Watana by truck from a rail head at Cantwell and Devil Canyon by rail from Gold Creek. In the plan there is no connection between dams.

(e) Plan 5

This plan serves both dams by truck from a rail head at Gold Creek. The south side of the river is used to Devil Canyon with a major bridge downstream from the damsite, then following the north side of the river to Watana. There is a road connection to the Parks Highway.

(f) Plan 6

This plan is identical to Plan 4 except that a service road for maintenance purpose is included on the north side of the river between the two dams.

(g) Plan 7

This plan is the same as Plan 3 except that a service road would be provided along the north side of the river as in Plan 7.

(h) Plan 8

This plan is the same as Plan 5 except there is no road connection to the Parks Highway. A newly constructed road would service Devil Canyon from Gold Creek on the south side of the river. A major bridge would be required downstream of Devil Canyon and a new road on the north side of the river would connect the two dams. This alternative plan precludes public access.

4.3 - Additional Plans

Following selection and evaluation of the eight plans described above, presentations were made to the Power Authority and the Susitna Hydroelectric Project Steering Committee. These presentations and subsequent discussions resulted in the addition of three plans as follows and as shown on Figures 2.10 and 2.11.

(a) Plan 9

This plan is the same as Plan 8 except the road between Gold Creek and Devil Canyon is changed to rail and the railhead is at Devil Canyon.

(b) Plan 10

This plan is identical to Plan 9 except that the road connecting Devil Canyon and Watana is on the south side of the Susitna River.

(c) Plan 11

This plan utilizes a railhead at Cantwell, the Denali Highway, a road from the Denali Highway to Watana and a road from Watana to Devil Canyon on the north side of the River.

Plans 9 and 10 were added as a suggestion by the Steering Committee as a means to reduce accessibility and thus adverse environmental impacts into the Susitna Basin by having no road available until Devil Canyon.

Plan 11 was added as a possible way to provide access from only one area while also alleviating the socioeconomic impacts the west side communities would feel as a result of an access road from the west.

# 5 - EVALUATION OF PLANS

## 5.1 - Objectives and Evaluation Criteria

The objectives for the access route are presented previously in Section 3.2.

The criteria used to assess the degree to which these objectives can be met are as follows:

(a) Minimize Construction Costs and Logistics Costs

The construction costs are the associated capital costs to construct the project while the logistics costs are the capital costs associated with transporting labor, fuels, equipment, materials, and supplies to construct the power developments.

(b) Ease of Operation and Maintenance

This criterion addresses the ease of operation of the developments after construction is complete. This criterion reduces to the effects of having a road connecting the two damsites directly. It is planned to operate and maintain both damsites initially from the Watana damsite. Subsequent operation will occur from a remote operating station, however, maintenance will continue to originate from one central location, which is currently proposed to be at Watana. The Watana location was selected for the plant operation and maintenance facility and the permanent village since Watana will be constructed before Devil Canyon. The concept of having one operation and maintenance facility, and one permanent village serving both damsites is superior to that with separate operation and maintenance facilities, and permanent villages at each site. Efficiency and economies dictate one location. In this respect access plans with a road connection between the two sites have been evaluated as being superior in terms of ease of operation and maintenance than plans without a road connection.

(c) Construction Logistics and Transportation Flexibility

This criterion addresses the ease of construction and the flexibility involved in construction and the associated risks.

This criterion for the Susitna Project narrows down to effects of having a road connection to a major highway or not having a road connection to a major highway. In this case comparison of a rail access only link is made versus a road connection to the Parks or Denali Highway. The concept here is to ensure that as much flexibility as possible is built into the access plan. The increased flexibility lessens the risks associated with stoppages and delays resulting from unforeseen, adverse events.

A road access from a major highway is more flexible to adapt to different situations, than an all rail or rail link access. A road access to a major highway allows more control over the project by the contractors themselves. Rail access or access link plans have higher risks of project delay and subsequent cost increases. With rail access only, the operation of all ground transportation to the site is removed from the contractors' control.

Any breakdown in the rail system would result in a loss of all ground transportation to the site and the likelihood of project delays and contractors' claims. Although project delay risks are inherent in any transportation system, they are higher with rail than with road.

The increased risk of delays have cost penalties associated with it. The cost penalties are extremely difficult to quantify for evaluation, however, an analysis was carried out and a dollar amount has been arrived at. Refer to Appendix D. These costs have been incorporated into the flexibility criterion, and the criterion addresses minimizing the costs.

In addition to the quantifiable flexibility a road access offers associated with risk, there is the additional flexibility with a road for ease of supply which does not have a cost penalty associated with it. With a road access the task of supply is made much easier from the planning and scheduling viewpoint.

The existing Alaska railroad paralleling the Parks Highway, the majority of the distance to the project site, combined with having road access to a major highway lends itself ideally to competitive bidding and obtaining the minimum capital cost to maintain the construction of the developments. Although it has been shown and preliminarily planned to ship the majority of materials and supplies by rail, without competition from trucking, price gouging could occur.

Road access to a major highway also offers flexibility in personnel transportation and the use of private transportation.

(d) Environmental (Excluding Social)

The biological objective is to develop an access plan that minimizes changes to the natural environment. The criteria used to assess the degree to which this objective can be met were:

(i) Effects on Big Game

A primary concern associated with the selection of an access plan is the potential effect on the Nelchina caribou herd and specifically the subpopulation of approximately 1,000 animals that inhabit the northwestern section of the Upper Susitna Basin. The impacts of hunters on moose and bear are also considered but as secondary concerns. These impacts can be greatly lessened by selecting a route other than the access from the Denali Highway.

The aspects used to determine the potential effects of a proposed route on resident and migratory big game species were:

- The increased public access afforded by the route to big game habitat and the resultant disturbance of animals using those areas.

- The effect of a proposed route on caribou, in particular, a species which may be more vulnerable to disturbance than other big game species.

- The proximity of the route to denning sites of wolves and bears.

(ii) Effects on Fisheries

In the case of resident fisheries, there are relatively isolated lakes (Butte Lake, Big Lake) and streams in the northwestern section of the Upper Susitna Basin, and the Fog Lakes area that would receive additional angling pressure if road access was provided. These impacts can be lessened by avoiding access from the Denali Highway and the route on the south side of the Susitna River between the damsites.

For anadromous fisheries and since Devil Canyon acts as a natural barrier to anadromous fish migration, there is no concern regarding the effect of improved access on this resource upstream of Devil Canyon. However, Indian River, and the Susitna River up to Portage Creek, are important for salmon. Any access plans that follow or cross these rivers could affect salmon directly through habitat disruption (i.e. sedimentation) or indirectly through increased fishing pressure. These impacts could be lessened by avoiding road access paralleling the Indian River.

The aspects used to determine the potential effects of a proposed route on fisheries were:

- The number of stream or lake crossings the route required.

- The fishery potential of the water being crossed.

- The potential for increased public access created by the particular plan.

- The effects, in particular, on anadromous fish habitat.

(iii) Effects on Furbearers

Wetlands, important to furbearers, have been identified between the Parks Highway and Gold Creek, near Deadman Mountain, near Deadman and Big Lakes and the Upper Deadman Creek. In addition, the Fog Lake - Stephan Lakes wetlands complex is a valuable furbearer habitat. A red fox denning complex has also been identified south of Deadman Mountain. Any access road crossing through these areas has the potential for negative impacts on furbearers. Impacts on furbearers would be least by selecting access from Gold Creek to Devil Canyon on the south side of the Susitna River and on the north side of the river between the damsites.

Evaluation aspects for furbearer effects were:

- The degree to which the route will increase public access to important furbearer habitat.
- The sensitivity of the habitat involved.
- The type of furbears that could be affected.
- The proximity of a proposed route to waterways and lakes.

(iv) Effects on Birds and Small Mammals

Heavily forested areas between the Parks Highway and Devil Canyon along riverbanks are productive avian habitat. Construction through these areas would disturb this habitat.

The aspects used to determine the potential effects of a proposed route on birds and small mammals were:

- Numbers of species affected and their density along an access route or in an area.
- Types of habitat encountered.
- Existence of raptor habitats.
- Existence of wetlands.
- Degree to which a route will facilitate public access to a sensitive area.

(v) Effects on Wilderness Setting

The Upper Susitna Basin is presently in a state of wilderness to semi-wilderness. Although continued intrusion with ATVs from Denali Highway, potential development of native lands and the establishment of the Indian River remote land disposal sites have the potential of changing the character of sections of the basin. The improved public access associated with construction of the Susitna Hydroelectric Project will produce a major alteration in the remoteness of the area. Natural resource agencies and the local public have expressed a desire to mimic the status quo to the maximum extent possible. People from the urban centers of Anchorage and Fairbanks have expressed desire to provide road access and open the area for recreation development. The factor used to assess the potential effect of a proposed route on the wilderness setting was the ease by which the public would have access to the area.

(vi) Effects on Archeological Resources

Archaeological resources are likely present along all access routes. The segment with the least potential for affecting archaeological

sites is between Gold Creek and Devil Canyon. All other segments have a moderate to high potential of disturbing cultural resource sites. The segments from the Denali Highway to Watana and from the Devil Canyon site to Watana north of the Susitna River have a higher potential for archaeological disturbance due to the treeless topography and thin soils.

(e) Social

(i) Preferences Expressed by Native Landowners

- CIRI

The CIRI organization has selected lands surrounding the impoundment areas and south of the Susitna River between the damsites. CIRI has officially expressed a preference for a plan providing road access from Parks Highway to both damsites along the south side of the Susitna River (Plan 1). Unofficially they have indicated that only Plan 1 is fully acceptable to them (refer to Appendix A).

- AHTNA

The AHTNA native corporation presently owns lands boardering the Denali Highway. At a public meeting in Cantwell in October 1981, a number of AHTNA members expressed a preference for a route involving the Denali Highway; however, no official position from the AHTNA Corporation has been documented.

In evaluating the compatibility of a proposed route with native landowner preference, it was considered that only Plan 1 met the preference expressed by CIRI and that Plans 3, 4, 6, 7, or 11 would meet the preference of AHTNA. Since CIRI is the largest native landowner in the area and since they have officially expressed their preference, greater importance was given to their preference.

(ii) Effects on Native Landowners

For the purposes of plan evaluation, distinction has been made between the native preferences as expressed and Acres evaluation as to how the various access plans would affect the opportunity for the natives to develop their lands on the south side of the river.

The aspects used to assess the effect of a proposed route on the opportunity for CIRI to develop their lands were:

- The degree of access provided from a major transportation corridor to native lands.

- The degree of access provided on native lands.

- The type of access provided.

(iii) Preferences Expressed by Local Communities

The local communities have expressed opinions relating to:

- The access plan they prefer;
- The general community lifestyle patterns they prefer; and
- The general setting in the surrounding area they prefer.

Since the local communities are likely to receive more adverse impacts than direct project benefits of a Susitna development, the objective to accommodate local community preferences has been included in our access plan selection process. These preferences are discussed by each community. This summary refers mainly to the opinion expressed by the majority of residents within each community. Complete documentation of community preferences is presented in the report submitted by S. Braund (refer to Appendix C). The criteria used in assessing the degree to which this objective is met is divided into four areas due to the differences in community preferences.

- Cantwell

  The majority of residents in Cantwell preferred the Denali access route provided stringent hunter control was enforced.

  The community desired economic stimulus and were in favor of the economic changes that could result from having a major construction project in the area.

  They preferred the semiwilderness setting of the Upper Susitna Basin and expressed concern over the potential effects of a Denali access on the fish and wildlife resources of the area.

- Railroad Communities North of Talkeetna

  The residents of these communities were unanimous in their preference for no increase in access or development of the area. If access was required, they preferred the all-rail alternative. These communities also expressed a strong preference for maintenance of the status quo within their communities and the surrounding area.

- Talkeetna

  Attitudes were somewhat divided within this community (see S. Braund report, Appendix C). However, the majority of residents:

  . Preferred to maintain their general lifestyle patterns.

  . Preferred the all-rail access plan.

  . Preferred to maintain semiwilderness-wilderness setting in the Upper Susitna Basin area.

- Trapper Creek

Altnough alternative access plans considered could affect Trapper Creek differently than Talkeetna, the preferences expressed by this community were similar to those outlined for Talkeetna.

- Willow/Wasila Area

These communities were not contacted through Susitna community workshops or the sociocultural study. Data from a study conducted in the Mat-Su Borough by the Overall Economic Development Program, Inc. (Economic Conditions, Development Options, and Projections, July 1980) indicate that people in the Willow, Houston, Wasila, and Palmer tend to favor a higher rate of development than the communities north of Willow.

- Indian River Land Disposal Sites

In 1981 a total of 75 remote state land parcels were awarded by lottery in the Indian River area. Of these, 35 were staked in the summer of 1981. The 35 land holders were contacted by letter through the Power Authority public participation office. Of the 12 responses received to date, 11 favored retention of the remote status of the area and one favored road access to the area. This area would be most affected by road access from the Parks Highway and least affected by access from the Denali Highway.

(iv) Effect on Local Communities

For the purposes of plan evaluation, distinction has been made between the local community preferences as expressed and Acres evaluation as to how the various access plans would affect the local communities.

- Preferences in regards to general lifestyle patterns were used to assess whether or not the communities would view projected socioeconomic changes as being positive or negative.

- Preferences in regards to the general setting in the surrounding area were used to assess whether or not project changes to this setting would be considered positive or negative.

- It was Acres evaluation that the Denali route, with stringent hunting regulations implemented and enforced, would best meet the preferences expressed by the majority of the residents in Cantwell.

- It was Acres assessment that for the communities north of Talkeetna, Talkeetna and Trapper Creek, the all-rail access and the road access would be equal in meeting their preferences for "the general community lifestyle patterns." The communities

expressed preference for the all-rail access assuming it would better maintain the status quo. Acres assessment indicates that if rail access only is provided, the practicality of a self-contained family status community at either of the sites would be greatly diminished and a single-status-only camp facility would likely be established. If this were to be the case, workers would tend to locate their families in the nearest communities, thus increasing the impacts on these communities.

(f) Agency Concerns

These criteria address the concerns of the various agencies involved. Correspondence, meetings and interaction with the agencies and with the Susitna Hydroelectric Project Steering Committee have occurred throughout the study. Agency comments have been considered in the evaluation. The concerns of the agencies have been environmental, with the emphasis on biological and land use impacts. Therefore, evaluation by the environmental criteria discussed previously is considered to basically include agency concerns.

The Susitna Hydroelectric Steering Committee has expressed the following:

- Access corridors which serve a dual, or triple, purpose would be highly desirable.

- If feasible, they generally prefer a rail mode of access to and within the project site.

Three environmentally sensitive areas that should be avoided are:

- Routes from Denali Highway;

- The route crossing the Indian River and through wetlands to the Parks Highway; and

- The route on the south side of the Susitna River from Devil Canyon to the proposed Watana damsite.

A pioneer road should not be built before FERC licensing.

(g) Transmission

Access plan selection has been coordinated with the transmission line studies. The transmission line studies to date have identified two corridors, one north of the Susitna River and one south of the Susitna River from Watana to Gold Creek. Although corridors run along the river, there is flexibility to expand the corridor to include the access road when the decision on which access route will be constructed is made. Due to more stringent engineering criteria of lines and grades for road alignments, it was decided that the selection of a transmission line route would occur subsequent to the access road selection.

The other decision that has been made in the transmission studies is if the northern Denali access route is selected, the transmission line would not follow that route due to excessive cost and visual impacts.

In addition to coordinating with the transmission studies, minor adjustments in route alignment have been made to allow efficient access to borrow areas and the construction camp.

(h) Recreation

This criterion of coordination of the access plan with recreation studies has been adopted to the following. In meetings, discussions, and evaluation of recreation plans, it has emerged the recreation plans are flexible enough to adopt to any access route selected. No one route was identified which had superior recreational potential associated with it. Therefore compatability with recreational aspects was essentially eliminated as an evaluation criteria.

## 5.2 - Evaluation of Plans

Specific concern for each of the 11 access plans under consideration are discussed below. In addition to these, a major concern for all access plans is the creation of access to areas previously inaccessible or relatively inaccessible. Such access could lead to impacts to furbearers through increased trapping pressure and to big game through hunting pressure. In addition, detrimental effects could occur to all wildlife through disturbance and destruction of habitat by ATVs. Cultural resources would also be vulnerable to amateur collectors and ATV traffic.

(a) Access to both Parks and Denali Highway (Plans 3 and 7)

(i) Cost

In the evaluation of the costs involved, the accuracy of the estimates must be considered. The construction costs could change by $10 million very easily due to unknown geologic conditions. Therefore, construction costs with less than $10 million difference are considered equal. A difference of $50 million in construction costs is a definite difference. The maintenance costs are a very small percentage of the total costs and a large change in the maintenance costs will have a negligible effect on the overall costs. The logistics costs are about as accurate as they can be. The logistics costs are based on current freight rates applicable at this time. The logistics costs for all the plans vary by less than 10 percent, however, a definite cost advantage of about $15 million can be observed for any plan using the Parks Highway over any plan using the Denali Highway (Table 5.1). This is expected due to the additional 52 miles of haulage required for any plan using the Denali route. The personnel shuttle costs and contingency risk costs are debatable, however, they are the best estimates of these costs available at this time. When comparing the total costs, the plans were considered equal if the total costs were within $20 million, and a

definite cost advantage was considered if there was a $50 million difference.

Access Plan 3 is comparable to the minimum cost alternative. Access Plan 7 has approximately a $60 million cost disadvantage when compared to the minimum cost alternatives.

(ii) Ease of Operation, Maintenance and Construction Flexibility

Access Plan 3 does not meet the ease of operation and maintenance criteria by not having a connecting road between the two sites. Access Plan 7 does meet the ease of operation criteria by having a connecting road between the two sites.

Access Plans 3 and 7 satisfy the flexibility criteria by having a road access connecting to a major highway.

(iii) Biological

The primary biological conerns for these two plans are in the effects the road would have on furbearers, big game, and cultural resources.

A roadway from the Parks Highway would cross wetland habitat between the highway and Gold Creek. these wetland areas are productive furbearer habitat. the Denali segment of both these plans also crosses aquatic furbearer habitat near Deadman Mountain, Deadman and Big Lakes, and Upper Deadman Creek. In addition, a red fox denning complex south of Deadman Mountain is present within one mile of the proposed road and is likely to be affected.

The primary big game concern for both these plans is the Denali segment, which would pass through an area that has frequently been used by either major portions or all of the Nelchina herd and includes the calving and summer ranges of the northwestern subgroups of the Nelchina caribou herd. The route also lies across the late summer migration route of caribou moving toward Butte Lake and Gold Creek and parallels a traditional spring migration route southward to the Susitna River.

The direct effects upon this group of caribou should Access Plan 3 or 7 be implemented include: a disturbance to cows and calves during the road construction period, a disturbance and possible impediment to caribou migration as a result of increased traffic in the area, and the possibility of direct mortality from road kills. However, the presence of the road should not interfere with migration, since caribou are known to cross roads. Moreover, interference with the calving areas could cause a major adverse impact on the females who show an affinity to traditional calving grounds.

Of greater importance than these factors, however, are the indirect consequences to this group of caribou of increased access to its

range. An access road across this alpine tundra would provide the opportunity for all terrain verhicles to push a network of unplanned trails throughout this subherd's range. This new access would cause disturbance and increased mortality to these caribou from their contact with vehicles, campers, and hunters. Thus, there is a chance that this route could lead to partial abandonment of important caribou habitat. Since the caribou hunt is controlled through permitting, increased hunting mortality due to improved access should be minimal although additional controls may be required.

The actual magnitude of impact is difficult to assess since it depends on the somewhat unpredictable behavior of both caribou and man. With an increased emphasis on management of the area and stringent hunter control, it is technically possible to lessen the potential extent of impact. It is noted, however, that resource agencies are apprehensive about the success of any mitigation plans and would resist any road access from the Denali Highway.

(iv) Social

Without the use of mitigating measures, access plans with a roadway originating from the Parks Highway could significantly impact the westside communities in terms of demand for increase services, changes in population, housing availability, government expenditures and revenues, labor demand, and unemployment. There will also be significant effects on construction, retail trade, and tourism. Many of these changes will occur as construction workers attempt to relocate to the communities near the construction site. Depending upon commuting modes to the camp, there could be a large increase in vehicular traffic in the area.

These access plans also include a road from the Denali Highway. As such, many of the impacts which would be felt in the west side communities of Talkeetna, Trapper Creek, and rail communities north of Talkeetna would also occur in Cantwell. With a road from the north, it is expected many of the workers would settle in Fairbanks, thereby reducing some of the impacts which the west side communities would experience.

These plans would create economic stimulus in Cantwell but will not meet the preferences expressed by those in the westside communities who desire no change.

However, road access connecting the Denali and Parks Highway would create extensive public access following construction thus creating the maximum change in the status quo of the area.

As discussed under Section 8, it is considered that mitigation measures can be implemented to lessen the effects on the westside communities of Talkeetna and Trapper Creek. With road access from the Parks Highway, change in the remoteness of Gold Creek and the Indian River Land Disposal sites will occur regardless of mitigation.

(b) Access from Parks Highway Only (Plans 5 and 1)

(i) Costs

Access Plans 5 and 1 are both comparable to the minimum cost alternative (Table 5.1).

(ii) Ease of Operation and Construction Flexibility

Both Access Plans 5 and 1 satisfy the ease of operation criteria by having a road directly connecting both sites. Both Access Plans 5 and 1 satisfy the flexibility criteria by having a road connection with a major highway.

An advantage Access Plans 5 and 1 have against any alternative having access via Denali Highway is in a least haul distance and time savings.

Anchorage has been identified as the most viable port of entry for the majority of the materials and supplies(3). When comparing Access Plans 5 and 1, or in broader terms access from the Parks Highway versus access from the Denali Highway, any access from the Parks Highway has a logistics and cost advantage over any access from the Denali Highway. With the majority of materials and supplies coming from Anchorage, the access route from the Denali Highway would involve an additional haul of approximately 52 miles to Watana when compared to an access from the Parks Highway. The additional 52 miles of haul to Watana, for a Denali access alternative, would be a disadvantage in long-term operation and maintenance.

(iii) Biological

The primary concerns with access from only the Parks Highway were discussed in (a) above. Briefly, the concerns are the potential impact to furbearer habitat between the highway and Gold Creek and potential degradation of fisheries habitat in the Indian and Susitna rivers. Of lesser concern is the disturbance of moose and bear populations and removal of their habitat caused by the northside connecting road in Plan 5.

In addition to these, Plan 1 includes a connection on the southside of the Susitna River between the two damsites. This road would pass near and through extensive wetland areas in the Stephan Lake-Fog Lake area. These wetlands provide habitat for furbearers and waterfowl and support a large, year-round concentration of moose. Because this area is currently relatively inaccessible, potential impacts include removal of habitat and increased mortality through hunting and trapping.

(iv) Social

Evaluation of these plans from a socioeconomic aspect reveals this access origin will result in the greatest impact to the westside communities. Because access is provided from the west only, the majority of the impacts would be felt in the westside communities. There would be more tendency for people to relocate in the communities and perhaps in Anchorage and less tendency to live in the Fairbanks area. There would be some impacts to the Cantwell area, but fewer than with a road from Denali. Impacts would be the same as discussed in (a) above.

In terms of public preference, these plans least meet the desires of people living in the project area. The plans would cause the greatest change in the Talkeetna-Trapper Creek area (where residents have expressed negative attitudes toward social change) and would minimize impacts to the Cantwell area (where residents have expressed a desire for change). The Indian River land disposal site and Gold Creek would experience the greatest change with the selection of one of these plans.

(c) Access from Denali Highway (Plans 6, 4 and 11)

(i) Costs

Access Plans 6 and 11 have approximately a $30 million disadvantage in costs compared to the least cost alternative. This additional cost in Plan 6 is due to the construction cost. This plan requires approximately 40 miles of additional new road over the least cost alternative. The additional cost of Plan 11 is due to the logistics cost. This plan requires an additional haul distance to Watana and especially Devil Canyon where the additional haul distance is approximately 110 miles greater than any other alternative. Access Plan 4 is comparable in cost to the least cost alternative (Table 5.1).

(ii) Ease of Operation and Construction Flexibility

Access Plan 4 does not satisfy the ease of operation criteria due to the absence of a road directly connecting the two damsites. Access Plans 6 and 11 both have a road directly connecting the damsites, therefore both plans satisfy the ease of operation criteria.

Access Plan 4 partially does not meet the flexibility criteria. In this plan there is a road connection to a major highway for the Watana development, however, for the Devil Canyon development there is no road connection to a major highway. Access Plans 6 and 11 both satisfy the flexibility criteria by having a connection to a major highway.

(iii) Biological

These three plans all involve road access from Denali Highway to Watana damsite. The potential biological and cultural impacts associated with this route were discussed under (a) above. Basically impacts could occur to portions of the Nelchina caribou herd through increased hunting mortality and potential interference with migration and calving. Increased access and trapping pressure could also impact furbearers. In addition, because of the treeless topography and shallow soil disturbance and removal of any cultural resources could result.

Plans 4 and 6 also involve construction of rail from Gold Creek to Devil Canyon. No major environmental problems are present along this portion. The connection road on the north side of the Susitna River between the two dams was discussed under (b) above, the only environmental concern was the crossing of moose habitat.

(iv) Social

These plans move the major access origin from the Railbelt Corridor to the Denali Highway. As such, workers' families would tend to locate to more communities, including Cantwell and Fairbanks. Due to the rail access from Gold Creek, there would still be some impact on the west side communities, but fewer than with a road originating from the Parks Highway. Plan 11, involving access from Denali Highway only, would cause the greatest number of changes in the Cantwell and Fairbanks area and fewer changes to the westside communities. These changes would be the same as described in (a) above.

Access Plans 4, 6, and 11 all meet the public preference expressed by those in Cantwell, as change would occur, with the greatest change occurring with Plan 11. Plans 4 and 6 do not meet the preference of those in the westside communities completely, as changes would still occur. These changes would be fewer, however, than for Plans 1, 3, 5, and 7.

(d) Access from Gold Creek Only (Plans 2, 8, 9 and 10)

(i) Cost

Access Plans 8 and 9 are comparable to the minimum cost alternative in total costs. Access Plans 2 and 10 have approximately a $40 million disadvantage when compared to the minimum cost alternative in total costs. Access Plans 2 and 10 are comparable in construction and logistics costs to the minimum cost alternatives, however, the additional personnel shuttle and contingency risk costs account for the disadvantage. Access Plans 8 and 9 have approximately a $40 million advantage over the minimum cost alternative in construction costs. These are offset by the personnel shuttle and contingency risk costs (Table 5.1).

(ii) Ease of Operation and Construction Flexibility

Access Plan 2 does not meet the ease of operation criteria. The dams are directly connected with a rail route, however, this would create operational problems trying to maintain both damsites with one rail car. If two rail cars are used, this would necessitate additional manpower in the form of dispatch, control, and monitoring personnel for the rail cars. Access Plans 8, 9, and 10 partially satisfy the ease of operation and maintenance criteria. These plans have a road directly connecting the two damsites, however, they do not have a connection to a major highway. This reduces the flexibility in operation and maintenance of the sites. This is discussed in Section 5.1(c) as it pertains to construction, however, the flexibility carries on into the operations and maintenance phase of the developments.

Access Plans 2, 8, 9, and 10 do not satisfy the flexibility criteria for construction as they do not have a road connection to a major highway.

(iii) Biological

These plans all preclude access from the Parks Highway or Denali Highway; therefore, the impacts associated with increased access are substantially reduced.

Plans 2 and 10, which involve connections between the two dams on the south side of the Susitna River, have as the major potential environmental impacts the disturbance of wetland areas near Stephan and Fog Lakes, as discussed under (b) above. Plans 8 and 9 have the connecting road on the north side of the river. Concerns with this route include impacts to moose habitat as discussed in (a) above.

The reduction in access and the fact there is no access connecting with the Denali Highway to the north indicates these plans would result in the least number of impacts to biological and cultural resources.

(iv) Social

These plans all involve access from the west only, the only difference being road or rail, and if rail, the distance into the basin the railroad extends. As such, impacts would again be concentrated on the westside communities. these impacts would likely be concentrated in the Gold Creek area as well as Talkeetna and Hurricane because of their location at rail-highway intersections. The Cantwell and Fairbanks areas would be less affected as there would be no northerly access.

The public has expressed a preference for a rail access and a maintenance of the status quo. Although rail access would best maintain

the status quo of the Upper Susitna Basin in general with the rail access, significant changes could occur in the Talkeetna/Trapper Creek area as discussed in Section 5.1(e).

These plans would not meet the public preferences expressed by Cantwell residents.

TABLE 5.1 - SUSITNA ACCESS PLANS

| PLAN | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DESCRIPTION: | ROADWAY: PARKS HIGHWAY TO DEVIL CANYON & WATANA ON SOUTH SIDE OF SUSITNA | RAIL: GOLD CREEK TO DEVIL CANYON & WATANA ON SOUTH SIDE OF SUSITNA | ROADWAY: DENALI HIGHWAY TO WATANA, PARKS HIGHWAY TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA. NO CONNECTING ROAD | ROADWAY: DENALI HIGHWAY TO WATANA, RAIL, GOLD CREEK TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA. NO CONNECTING ROAD | ROADWAY: PARKS HIGHWAY TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA, DEVIL CANYON TO WATANA ON NORTH SIDE OF SUSITNA. | ROADWAY: DENALI HIGHWAY TO WATANA, RAIL, GOLD CREEK TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA. CONNECTING ROAD ON NORTH SIDE OF SUSITNA. | ROADWAY: DENALI HIGHWAY TO WATANA, PARKS HIGHWAY TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA. CONNECTING ROAD ON NORTH SIDE OF SUSITNA. | ROADWAY: GOLD CREEK TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA, DEVIL CANYON TO WATANA ON NORTH SIDE OF SUSITNA. | RAIL: GOLD CREEK TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA, ROADWAY DEVIL CANYON TO WATANA ON NORTH SIDE OF SUSITNA. | RAIL: GOLD CREEK TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA. ROADWAY DEVIL CANYON TO WATANA ON SOUTH SIDE OF SUSITNA. | ROADWAY: DENALI HIGHWAY TO WATANA CONNECTING ROAD BETWEEN WATANA AND DEVIL CANYON ON NORTH SIDE OF SUSITNA. |
| MILEAGE OF NEW ROAD | 62 | 58 | 70 | 60 | 68 | 102 | 111 | 54 | 58 | 53 | 86 |
| CONSTRUCTION COST ($ x 1,000,000) | 158 | 140 | 151 | 119 | 143 | 179 | 209 | 93 | 108 | 123 | 145 |
| MAINTENANCE COST ($ x 1,000,000) | 5 | 4 | 6 | 5 | 8 | 8 | 9 | 7 | 5 | 5 | 11 |
| LOGISTICS COST ($ x 1,000,000) | 215 | 210 | 231 | 230 | 214 | 230 | 231 | 214 | 216 | 214 | 258 |
| SUBTOTAL ($ x 1,000,000) | 378 | 354 | 388 | 354 | 365 | 417 | 449 | 314 | 329 | 342 | 414 |
| PERSONNEL SHUTTLE COST ($ x 1,000,000) | 0 | 25 | 0 | 10 | 0 | 0 | 0 | 25 | 25 | 25 | 0 |
| CONTINGENCY RISK ($ x 1,000,000) | 0 | 40 | 0 | 15 | 0 | 0 | 0 | 40 | 40 | 40 | 0 |
| TOTAL COSTS ($ x 1,000,000) | 378 | 419 | 388 | 379 | 365 | 417 | 449 | 379 | 394 | 407 | 414 |
| CONSTRUCTION SCHEDULE | 3-4 | 3-4 | 1 | 1 | 3-4 | 1 | 1 | 3 | 3 | 3 | 1 |
| MAJOR BRIDGES | 2 | 2 | 0/1 | 0 | 2 | 0 | 0/1 | 1 | 1 | 1 | 0 |

## 6 - IDENTIFICATION OF CONFLICTS

From the evaluations in the previous section it can be seen no one plan or route meets all the objectives or satisfies all the criteria. The basic conflicts identified were:

(a) Social and Biological vs Construction and Operation Logistics

Rail or road access from a railhead at Gold Creek only would eliminate road access from a major highway thus limiting social and biological changes in the immediate project area and retaining the status quo to the greatest extent possible. This option is in direct conflict with providing flexibility in construction logistics/transportation and for providing ease of operation and maintenance. The selection of such an option would increase the risk of high costs, schedule delays, safety problems and decreased reliability.

(b) Social vs Biological

Social and biological objectives are not in conflict in the sense limited access to the project area is most desirable in both cases. If however the assumption is made that road access to a major highway will be provided, then a conflict arises. From the social/local public preference perspective, access from the Denali Highway is preferred. This plan would create the economic stimulus desired in Cantwell, reduce the potential for change in the Trapper Creek/Talkeetna area while retaining the remoteness of the Indian River land disposal site and the railroad communities north of Talkeetna. The Denali access, however, is in conflict with biological objectives since it would allow access by hunters and ATVs to a large portion of the Upper Susitna Basin and create potential impacts on the Nelchina caribou, other big game species including moose and bear, the fisheries in isolated lakes and streams and furbearer habitat. In addition, the potential for disturbance of archaeological sites in this area is greatest. Although technically mitigation measures can be employed to reduce these potential biological impacts, it is noted that government resource agencies are apprehensive about the success of any control programs and would thus be opposed to any access from the Denali Highway.

The selection of a Denali access plan could result in unacceptable delays in license approval or a subsequent rejection of this plan necessitating a reassessment of access plans from the west.

Table 6.1 broadly summarizes the conflicts in the evaluation.

TABLE 6.1 - IDENTIFICATION OF CONFLICTS

| Criteria | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Costs | | | | | | | | | | | |
| Minimize Costs | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 3 | 3 | 3 | 1 |
| Ease of Operation and Construction Flexibility | | | | | | | | | | | |
| Ease of Operation and Maintenance | 3 | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 3 |
| Construction Flexibility | 3 | 1 | 3 | 2 | 3 | 2 | 3 | 1 | 1 | 1 | 3 |
| Biological | | | | | | | | | | | |
| Minimize Biological Impacts | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 3 | 3 | 3 | 1 |
| Social | | | | | | | | | | | |
| Accommodate Preference of Native Landowners | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Accommodate Local Community Preference | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |

1 - Does not Satisfy Criteria
2 - Intermediate
3 - Satisfies Criteria

# 7 - COMPARISON AND SELECTION OF RECOMMENDED PLAN

## 7.1 - Comparisons

(a) Access from Railhead at Gold Creek (Plans 2, 8, 9, 10) vs
Access from Major Highway (Plans 1, 3, 4, 5, 6, 7, 11)

Considerable cost, schedule, safety and reliability risks are associated with construction of an important, major project without road access to a major highway. On the other hand road access to a major highway will create additional change in the status quo of the Upper Susitna Basin. If the decision is made to develop a large scale hydroelectric facility in the Upper Susitna Basin, it is considered essential that the orderly development and maintenance of the facility should be afforded a higher priority than maintenance of the status quo. Thus, access plans originating at a railhead at Gold Creek only are not recommended.

This conclusion results in the rejection of plans not providing road access to a major highway.

| | |
|---|---|
| Plans rejected in this comparison: | 2, 8, 9, 10 |
| Plans remaining: | 1, 3, 4, 5, 6, 7, 11 |

(b) Access from both Parks Highway and Denali Highway (Plans 3, 7) vs
Access from Only One Highway (Plans 1, 2, 4, 5, 6, 8, 9, 10, 11)

The plans which optimize transportation flexibility and ease of operation involve the initial construction of a road from Denali Highway to Watana damsite. To allow for improved logistics during the peak construction at Watana and throughout the construction of Devil Canyon, road access would also be created to the Parks Highway. The problems with these plans is that they would create the maximum change in the status quo producing both the biological impacts associated with the Denali link and the social impacts associated with the Parks Highway link. These impacts are further augmented with both roads since the connection of the Parks and the Denali Highway would encourage hunters and tourists to drive the complete loop.

These plans are also more costly than the minimum cost alternatives. It is considered that the social and biological impacts that would result from these plans cannot be justified by the added transportation flexibility and ease of operation benefits associated with road access to both the Parks and Denali Highways.

This conclusion results in the rejection of plans providing road access to both the Parks and Denali Highway.

| | |
|---|---|
| Plans rejected in this comparison: | 3, 7 |
| Plans remaining: | 1, 4, 5, 6, 11 |

(c) Roadway Connecting the Damsites Directly (Plans 1, 2, 5, 6, 7, 8, 9, 10, 11) vs No Roadway Connecting the Damsites Directly (3, 4)

Plans incorporating a road connecting the damsites directly are clearly superior in terms of ease of operation and maintenance to plans which do not directly connect the damsites. The access plans which do not connect the damsites directly do not have advantages in any of the other, or combined criteria to warrant not eliminating these alternatives from further consideration.

This conclusion results in the rejection of plans not connecting the damsites directly.

| | |
|---|---|
| Plans rejected this comparison: | 3, 4 |
| Plans remaining: | 1, 5, 6, 11 |

(d) Access to Denali Highway (Plans 3, 4, 6, 7, 11) vs Access to Parks Highway (Plans 1, 5)

The main concerns associated with the Denali access are the potential effects on the Nelchina caribou herd, increased access to a large area of alpine tundra with the associated effects of disturbance by ATVs, and disturbance of potential cultural resources.

Although there are some fisheries and furbearer concerns in the Indian River area associated with a Parks Highway access, from the biological perspective, Parks Highway access is preferred to a Denali Highway access.

In terms of construction logistics and long-term operation, the access from the Parks Highway is preferred. Any access plan which utilizes the Denali has an additional haul distance of 52 miles for the majority of construction equipment and supplies and long-term maintenance and resupply. With a Denali road access it is still preferable to transport equipment and supplies to Devil Canyon from Gold Creek, thus creating access to the area from both the north via Denali and the west from Gold Creek. In terms of initial project scheduling, the Denali route or the Parks Highway route with the pioneer road are considered similar.

From a perspective of social change, the Denali route is considered to have the advantage compared to the Parks Highway route. The Denali route would promote the economic stimulus desired in Cantwell while reducing the influence on the communities of Trapper Creek, Talkeetna, and north of Talkeetna which have expressed a desire to maintain their general lifestyle patterns. It is considered, however, that even with a Parks Highway access, mitigation in the form of self-contained construction camp facilities, regulation of commuter schedules and control of transportation modes can reduce or avoid many of the potential changes in Talkeetna and Trapper Creek. It is also considered that, with the Parks Highway access, changes to these communities would be greater than changes that would occur with a Denali access. These changes, however, are not considered significantly greater, and therefore, for comparison purposes the Denali route is considered to have a slight advantage.

A Parks Highway route also allows the transmission line and access road to be constructed in a common corridor.

Considering native landowner preferences, the Parks Highway route is considered to have the advantage over the Denali route.

With any access plan from the west, a major railhead would be located at Gold Creek creating significant local changes. With road access from the Parks Highway to Gold Creek, changes will also occur at Indian River land disposal sites.

Based on the above discussion, it is concluded that the Parks Highway access is preferable to the Denali access plan. This conclusion is based on the assumption that:

- If a Denali route were selected, it would be Plan 6 which would still result in significant social changes in the Gold Creek area;

- Changes in local communities can, to a large degree, be mitigated through controls imposed on contractor and construction workers; and

- Controls would be very difficult to impose upon hunters and ATV operators who would utilize the Denali's route after construction.

Since there are a number of significant environmental concerns with the Denali route expressed by resource agencies, mitigation planning, preparation of environmental impact statements, and the permitting process itself could cause delays of 1 to 2 years if the Denali route is selected.

The resulting conclusion is the elimination of plans involving access from the Denali Highway.

| | |
|---|---|
| Plans rejected in this comparison: | 3, 4, 6, 7, 11 |
| Plans remaining: | 1, 5 |

(e) Comparison of Plan 1 vs Plan 5

Access Plans 1 and 5 both commence on the Parks Highway near Hurricane and proceed through Chulitna Pass and along the Indian River to Gold Creek. From Gold Creek both Plans proceed east on the south side of the Susitna River to the Devil Canyon site. At Devil Canyon, Plan 1 proceed east on the south side of the Susitna River to the Watana site. Plan 5 crosses the Susitna River at Devil Canyon and proceeds east on the north side of the Susitna River to the Watana site. Access Plan 1 has potential for greater environmental impacts than Access Plan 5. This is due to the extensive wetland areas in the Stephan Lake - Fog Lake area which provide habitat for furbearers and waterfowl and support a large, year-round concentration of moose. Providing road access into this area increases the potential for adverse impacts by removal of habitat and increased mortality through hunting and trapping.

Access Plan 1 is more difficult to construct then Access Plan 5 due to the more difficult terrain in the segment between Devil Canyon and Watana, south of the Susitna River. The difficult terrain would require considerable steep sidehill construction and a large bridge over Cheechacko Creek, just east of the Devil Canyon damsite.

Access Plan 1 has an advantage over Access Plan 5 in native landowner (CIRI) preference. Although Plan 5 does not totally meet the preference expressed by CIRI, it does create road access to native lands, thus providing a major transportation link which would allow the native landowners increased opportunity to develop their lands than is presently possible.

Based on the above considerations it is concluded that Access Plan 5 would better meet the overall project objectives then Access Plan 1.

| | |
|---|---|
| Plans rejected this comparison: | 1 |
| Plans remaining: | 5 |

## 7.2 - Recommendations

Based on the above discussion, it is Acres' recommendation that:

(a) The Power Authority select as an access plan for the construction and operation of the Susitna Hydroelectric Project, a road commencing near MP156 on the Parks Highway, proceeding southeast crossing the Susitna River at Gold Creek, turning northeast to Devil Canyon damsite along the southern side of the Susitna River, crossing the Susitna River at Devil Canyon, and proceeding along the north side of the Susitna River to Watana damsite (Figure 2.3, 2.4, 2.5).

(b) To allow for continued access for project construction by mid-1986, a pioneer road (limited access) between Gold Creek and Watana damsite be constructed commencing in mid-1983. The application for permits to construct this pioneer road be submitted to the State of Alaska and the Bureau of Land Management by August 1982, independent of the FERC license application.

(c) To mitigate against the possibility of unrestricted public access to the area in the event that the project is not built, road access between the Parks Highway and Gold Creek not commence until after FERC license approval. If the project does not proceed after the pioneer road is constructed, the road as such should be rendered impassable to future vehicular traffic.

(d) To minimize potential impacts to furbearers and fisheries resources in the Indian River and Susitna River areas special construction techniques be utilized (including adequate bank stabilization, revegetation and restoration) when crossing wetland areas or when constructing in proximity to any important stream, river or water body.

(e) To minimize the effects of public access during the operation phase of the project, consideration be given to controlling public access across Devil

Canyon dam. If access is provided east of Devil Canyon damsite, restrictions should be placed on the use of ATVs and hunting.

(f) To assist in minimizing changes in the local communities of Talkeetna, Trapper Creek, Sherman and Curry it is strongly recommended that subsequent decisions on construction camp facilities, commuter modes, work incentives, and general policies incorporate a special effort to minimize the effects of construction on these local communities. Specific mitigation recommendations are included in Section 8.

## 7.3 - Assumptions Affecting Selection Process

An important constraint affecting the Alternative Access Plans evaluation is the overall project scheduling requirements. This constraint resulted from the objective of meeting the power on-line date of 1993(1). The requirement of having the Susitna power on-line in 1993 resulted from extensive studies on energy demand forecasts, and alternative sources and developments to meet the demand. The delay of the on-line date by one year would have the following negative impacts: a cost penalty in the order of $50 million in long-term present worth costs; another source of fossil fuel generation would have to be constructed to meet the demand or the loss of load probability must be violated; and exploitation of land and other resources required for the construction of the additional fossil fuel generating sources. The estimated cost penalty is based on the incremental cost of thermal energy replacing Susitna power for one year. The cost is developed from load forecasts, incremental interest rates, and various fuel escalation rates.

This constraint was given prime consideration during the initial evaluation of the plans due to the fact that any alternative other than the Denali Highway route requires approximately three years to construct while the Denali route can meet the construction access requirements in one year. Reviewing the construction schedule for the dam, the powerhouse, and the overall power development necessitating continual access is required by mid-1986 to meet the on-line date of 1993. A detailed discussion of this aspect is presented in Appendix B.

The estimated issuance of the FERC license is 1985 and hence the commencement of construction activities is scheduled to coincide with the license issuance in 1985. To meet all the aforementioned requirements, the only alternative is the Denali route. This would eliminate all the other alternatives.

A method was developed utilizing a "pioneer" road concept and commencing construction in 1983, whereby the other alternatives from the Parks Highway and Gold Creek can meet the overall project scheduling requirements. This retained all the alternatives for further evaluation from which Access Plan 5 was considered the best in meeting the evaluation criteria.

The "pioneer" road will consist of a gravel based road with periodic passing turnouts and will be constructed on existing ground insofar as possible to avoid significant cuts or fills. Temporary Bailey bridges will be used at river crossings.

The pioneer road will add capital costs to any scheme which utilizes the concept. This additional cost is due to clearing, excavation, and fill work for the pioneer road in locations where it does not follow the permanent road alignment. This cost is estimated at $8,000,000. This cost, although significant, does not affect the evaluation and has not been included in Table 5.1.

As stated previously since there are a number of significant environmental concerns with the Denali route expressed by the resource agencies, the planning and permitting process itself could cause delays of 1 to 2 years if the Denali route is selected. Although the concept of commencing construction prior to the issuance of a FERC license was not received favorably by a few state and federal agencies, the idea was not rejected altogether. The proposed permitting schedule with the recommended Access Plan 5 is such that applications will be filed for all permits in August 1982 for the pioneer access road from Gold Creek to Watana. The segment between the Parks Highway and Gold Creek will be applied for in late 1983. Deferring the start of construction of the segment from the Parks Highway to Gold Creek until after issuance of the FERC permit is believed to be prudent at this time. This approach inevitably requires construction during the first two years be supported with a rail only link. This is not considered to be an insurmountable problem. A graphical presentation of the detailed design and permitting schedule is shown in Figure 7.1.

## 7.4 - Assumptions Affecting Recommendation

(a) The pioneer road concept will be approved by government regulatory agencies since the pioneer road would not connect to any existing road before the issuing of a FERC license, thus not making the prior commitment to allowing public access to the Upper Susitna Basin.

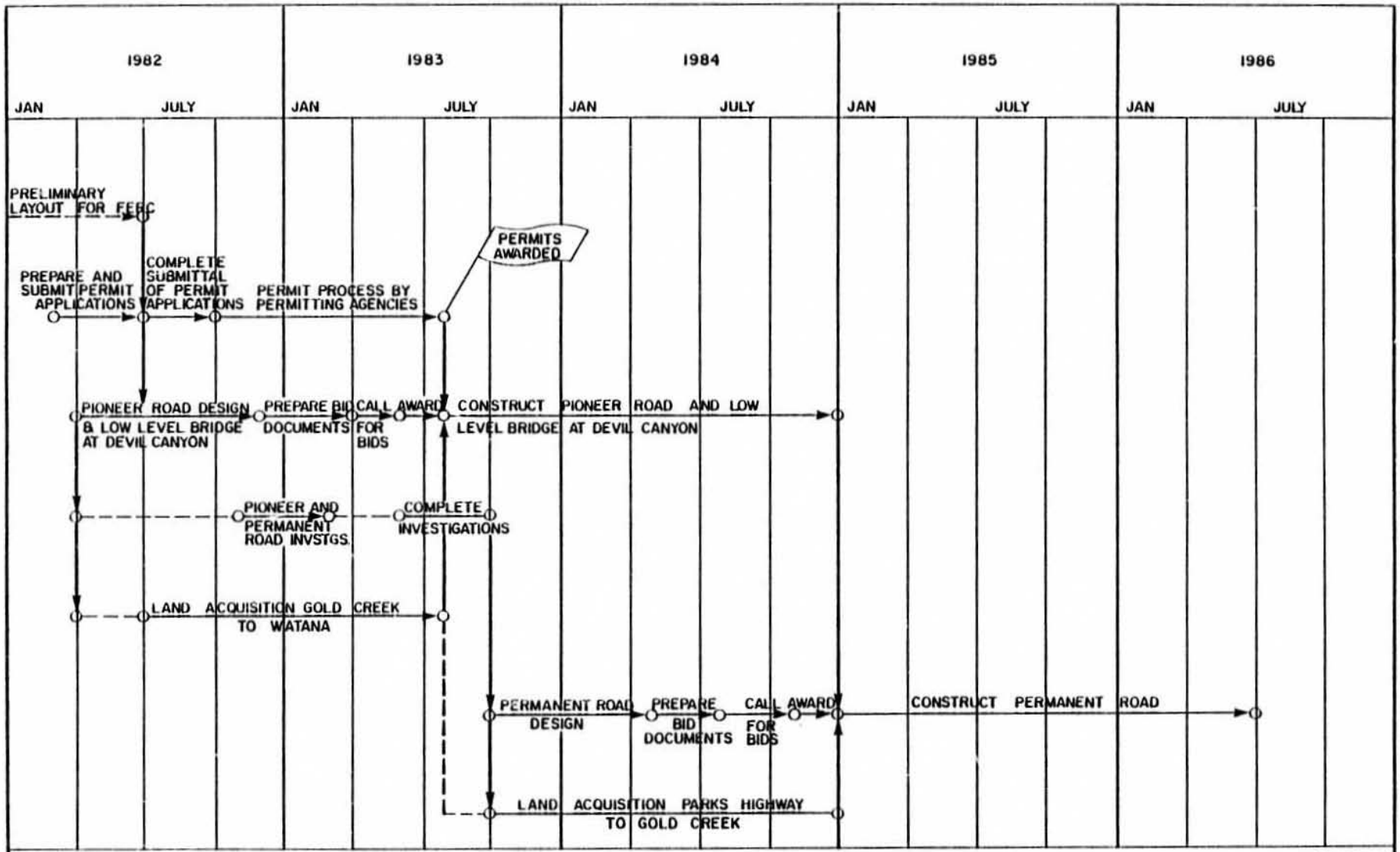
(b) Although the native landowners (CIRI) have expressed a strong preference for road access from Parks Highway to both damsites along the south side of the Susitna River, they would receive significant benefits from the recommended route to their existing land holdings.

(c) Public access will be prohibited during the construction phase of the project. Also, the selection of Plan 5 offers some flexibility in regards to the degree and type of public access subsequent to 1993.

(d) Most biological and social impacts will be mitigated through adoption of the recommendations presented in Section 8.

## 7.5 - Possible Consequences

If the pioneer road concept receives institutional opposition from agencies from which permits must be received, then a Denali route alternative (preferably Plan 6) is the only means by which the overall project schedule can be retained. If the required permits are not obtained by mid-1983 it will be necessary to re-evaluate the options, and possibly amend the FERC License Application to include an access plan that retains the overall project schedule.




SCHEDULE FOR FINAL DESIGN AND PERMITTING

FIGURE 7.1

ACRES

## 8 - MITIGATION RECOMMENDATIONS

The plan recommended by Acres does not satisfy all the evaluation criteria outlined in Section 4. In order to reduce potential impacts to biological and cultural resources and to alleviate socioeconomic impacts to the communities of Talkeetna, Trapper Creek, and rail communities north of Talkeetna, the following mitigation measures are recommended:

(a) Permit only construction workers while on duty to have access to both the pioneer road and access road.

(b) After construction of the power developments is complete, maintain a controlled access beyond the Devil Canyon dam. It is anticipated a cooperative agreement could be reached with the responsible agencies concerning the number of people permitted access to the areas. Control measures could be implemented by maintenance and security personnel.

(c) The construction camp should be as self-contained as possible, thus limiting the number of workers who might otherwise bring their families to a nearby community and commute daily.

(d) Provide incentives to encourage workers to work the longest time possible between leaves. Although the final schedule will not be known until labor agreements are made and construction commences, longer work periods between breaks can be advocated. In addition such measures as not guaranteeing the "same" job if a worker takes a leave. A worker electing to take a leave will be guaranteed a job when they return, however, it may not be the "same" job they were previously working on. This incentive has been used successfully on previous projects.

(e) Provide planning assistance if requested to the communities of Talkeetna, Trapper Creek, and rail communities north of Talkeetna to aid them in preparing for the effects of increased populations.

(f) Evaluate various commuter management policies and select the one which reduces impacts to the local communities. Socioeconomic impact assessment studies currently under way for the Susitna project will provide important input data for evaluating possible commuter management policies.

(g) Utilize excavated cuts and other construction techniques to prohibit utilization of the pioneer road after construction of the access road. Areas used for the pioneer road which do not follow final road alignment should be reclaimed.

The total costs for the mitigation measures are estimated to cost approximately $3.5 million dollars. These capital costs are not considered to influence the evaluation and comparison of alternatives.

# 9 - TRADEOFFS MADE IN THE SELECTION PROCESS

## 9.1 - Basis of Selection Process

From the natural resource and local public preference perspective, maintenance of their general lifestyle patterns is probably ideal. However, to construct a project the size of Susitna without changing the existing character of sections of the Upper Susitna Valley is unrealistic.

Access to the damsites is a complex and controversial issue. As such, it has received considerable attention from the Acres' study team, Power Authority, resource agencies and the public. Although the studies have determined that there is no single access plan that satisfies all the project objectives and evaluation criteria, it has been possible to develop an access plan which provides a reasonable tradeoff of preferences. These tradeoffs are essentially based on the following compromises:

(a) All disciplines must present a degree of flexibility, otherwise a satisfactory compromise is impossible.

(b) Whenever a specific objective is partially compromised, considerable effort is made during subsequent decisions to compensate.

(c) Any compromises made are clearly outlined such that decision makers reviewing the final recommendation are aware of negotiations to date.

## 9.2 - Tradeoffs Made in the Selection Process

### (a) Engineering

Concessions made include:

- No road access from Denali Highway which would include a complete loop connecting Parks Highway with Denali Highway;
- No pioneer road to Parks Highway prior to the issuance of a FERC license;
- Commitment to be prepared to make the pioneer road impassible if FERC license not granted; and
- Restrictions to be placed on worker commuting schedules and mode; worker incentives to be provided to minimize effects on local communities.

Objectives retained include:

- Road access to both damsites to allow for ease of construction, operation and maintenance of the project;
- Maintenance of schedule through retention of the pioneer road concept.

(b) Biological

Concessions made include:

- Road access from Parks Highway affecting Indian River area and providing partial public access to the Upper Susitna Basin.

Objectives retained include:

- No access from Denali Highway which was considered to have the greatest potential for environmental impact;

- No route on the south side of the Susitna River between the damsites, thus avoiding the sensitive Stephan Lake and Fog Lakes area;

- Emphasis on construction mitigation when developing road link between Parks Highway and Gold Creek; and

- Retention of a degree of control on future public access by accepting the Parks Highway plan where, due to the terrain, private vehicles are basically restricted to the access corridor between Parks Highway and the Devil Canyon damsite. The degree and type of access east of Devil Canyon can be somewhat controlled by regulation of access across the Devil Canyon dam.

The alternative of not connecting to a major highway was considered to have the least net adverse biological impact. The ease of operation and maintenance and the construction flexibility criteria, as explained previously, was considered to outweigh this advantage. The mitigation measures and road management will reduce the adverse biological impacts associated with an access connection to a major highway, to a minimum.

(c) Social

Concessions made include:

- Road access to the Upper Susitna Basin; and
- Road access from Parks Highway which creates greatest potential for change in the Indian River land disposal site.

Objectives retained include:

- Through the implementation of a relatively self-contained construction camp, restriction of private vehicles from the construction site, implementation of mass transit modes for commuting workers, incentives to encourage workers to remain on site and controlled public access east of Devil Canyon following construction, it is considered that changes in the local communities of Trapper Creek/Talkeetna area will be minimized;

- Although the western communities favored a rail access, they also favored maintaining their general lifestyle patterns. The recommended plan with its associated mitigation should produce less change in the Talkeetna/Trapper Creek area than an all-rail access plan.

Overall consensus of the local community preference favored access from the Denali Highway. The advantages of the Parks Highway access over the Denali access in reducing the biological impacts is considered to outweigh the local community preference. In addition to the lessened biological impacts, the recommended plan better meets the preferences of native landowners.

The recommended plan does not fully meet the preferences of the native landowners. They would prefer the access road between Devil Canyon and Watana be located on the south side of the Susitna River. The advantages of the road being located on the north side of the Susitna River include, reduced biological impacts, the actual construction of the road is easier than if located on the south side. The recommended plan would however provide a major transportation link which would allow the native landowners to develop their lands than is presently possible. These advantages are considered to outweigh the native landowner preference of having the road located on the south side of the Susitna River.

## 10 - RECOMMENDATIONS FOR CONTINUING WORK

This report is intended to serve as a summary report of all the various studies, evaluations and reports that contributed to the selection of the recommended plan. The recommendation of Access Plan 5 carries with it the following schedule anticipated for implementation.

- Additional final design of the road and permitting would be carried out between March 1982 and June 1984. Refer to Figure 7.1 for anticipated scheduling of the design and permitting.

- As can be seen from Figure 7.1, the critical activities of preparing and submitting the permit applications to the Bureau of Land Management (BLM) and the Corps of Engineers (COE) will be carried out between March 1982 and August 1982 with submission in early August. It is believed these activities can be completed in the time frame due to the preliminary engineering work that will have been carried out for the FERC license. This preparation and submittal is definitely for the section of road between Gold Creek and Watana. The preparation and submittal of the permits for the section between the Parks Highway and Gold Creek could be carried out in 1983.

LIST OF REFERENCES

(1) Acres American Incorporated, Task C - Design Development Final Report, October 1981.

(2) Terrestrial Environmental Specialists, Environmental and Socioeconomic and Land Use Analysis of Alternative Access Plans, October 1981.

(3) R&M Consultants, Subtask 2.10 - Access Planning Study, March, 1982.

# APPENDIX A

# CORRESPONDENCE

# STATE OF ALASKA

JAY S. HAMMOND, GOVERNOR

**DEPARTMENT OF NATURAL RESOURCES**

DIVISION OF RESEARCH & DEVELOPMENT

323 E. 4TH AVENUE
ANCHORAGE, ALASKA 99501

279-5577


March 26, 1981

Eric Yould
Executive Director
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333 West 4th, Suite 31
Anchorage, AK 99501

Dear Mr. Yould:

The purpose of this letter is to transmit to you the findings and recommendations of the Susitna Hydro Steering Committee in response to APA's request for input and recommendations on the selection of an access road to the Susitna Hydro Dam sites. On March 6, 1981, Alaska Power Authority staff, contractors and subcontractors provided several agency representatives with a briefing and a request for comments in order to make a determination for surface access to the dam sites. It was requested that our comments be provided to APA by March 23, 1981. As a result of comments and concerns expressed by agency representatives at the March 6 meeting, I agreed to convene the Susitna Hydro Steering Committee in order to identify and coordinate the concerns of those agency representatives regarding access to the Susitna Hydro sites. The Susitna Hydro Steering Committee met on Friday, March 20, 1981. We spent the afternoon discussing various issues and concerns surrounding access to the dam sites with the subcontractors to Acres American. As a result of these discussions and review of the pertinent documents, report studies, etc., the Susitna Hydro Steering Committee makes the following comments and recommendations:

1. The Steering Committee representatives recommend coordination between the decision about access road routes and transmission line routes. Until this issue was raised by a Steering Committee member at the March 20 meeting there had been little discussion. The documents reviewed indicate that this was not a criterion for establishing potential access routes.

2. There needs to be a systematic decision-making process explicitly laid out for determining an access route for the Susitna dams. This decision-making process should be straight forward so that agency participants can understand and effectively participate in establishing proposed access routes. There needs to be a broad range of criteria established for determining the acceptability or nonacceptibility of various route alternatives. Information provided by Acres and their subcontractors to date indicates that

the criteria used to determine access roads were eight in number and are roadway and railroad technical design parameters exclusively. It is the recommendation of the Steering Committee members that there are numerous other criteria which are critical and need consideration along with the technical road and railroad design parameters. I would refer you to an attached document entitled "Suitability for Haul Roads" to give you an example of a more comprehensive lists of criteria that need to be incorporated in any decision with respect to access to the dam sites.

3. There needs to be a clearer explanation and understanding of the decisions regarding the timing of building access roads vs. FERC approval for the project. We were advised by subcontractors that the timing depends on which access mode and route is determined. The time of construction and design of these routes varies from one to three years. The agencies on the Steering Committee need to have a better understanding of how these facts and assumptions interrelate to each other in order to make informed recommendations to APA.

4. There are numerous specific decisions that will be required regardless of which access mode and route is ultimately determined the most appropriate. The location and development of these facilities could significantly affect the preference and recommendations from agencies. For example, identification of gravel sites, spoil sites, stream crossings, construction camp service and maintenance facilities will be needed. The members of the Susitna Hydro Steering Committee unanimously felt that it was important and necessary for APA to provide an understanding of how these decisions will be made and how a quality control system will be in effect to ensure that tasks are accomplished in accordance with approvals and designs.

5. The Susitna Hydro Steering Committee members in reviewing the March 6 and 20 meetings and discussing with subcontractors have determined that data gathering planned for this summer should be carried out on several access routes in order to make the final decision as to which one is most acceptable. To make a determination on a specific route with the lack of data/information that we are currently dealing with and then send researchers and data gatherers into the field this summer to gather site specific data on only one route is of questionable utility and logic. The primary reason why this is questionable is because unless comparable data on several of the prime routes is provided, the agencies will be unable to provide comments as to which route is most acceptable. In summary, we see the gathering and analysis of data on several proposed routes as the rational basis for making a determination as to which access route should be ultimately chosen.

In summary, the Steering Committee wishes to emphasize that it is willing and anxious to work cooperatively and expeditiously with APA in identifying and resolving the numerous questions which need to be

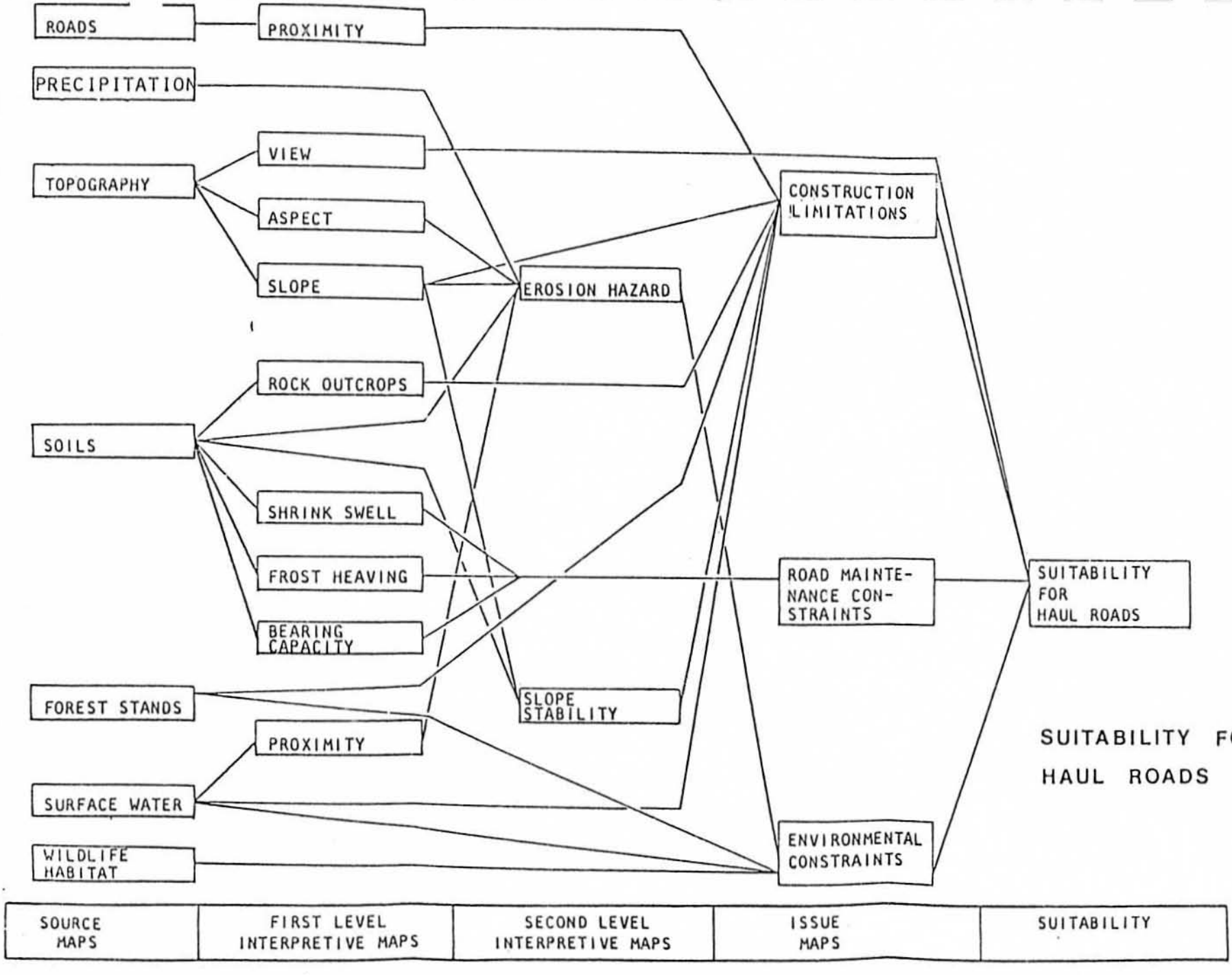
answered in order to make rational decisions with respect to access to Susitna Hydro sites. Once you and your staff have had an opportunity to review this letter, I would appreciate an opportunity to sit down and discuss the specifics of these comments in further detail.

Sincerely yours,

Al Carson

Al Carson, Chairman
Susitna Hydro Steering Committee

cc: Susitna Hydro Steering Committee Members
R. E. LeResche
Reed Stoops


ROADS
PROXIMITY
PRECIPITATION
VIEW
TOPOGRAPHY
ASPECT
SLOPE
EROSION HAZARD
CONSTRUCTION LIMITATIONS
ROCK OUTCROPS
SOILS
SHRINK SWELL
FROST HEAVING
ROAD MAINTE-NANCE CON-STRAINTS
SUITABILITY FOR HAUL ROADS
BEARING CAPACITY
FOREST STANDS
SLOPE STABILITY
PROXIMITY
SURFACE WATER
ENVIRONMENTAL CONSTRAINTS
WILDLIFE HABITAT
SUITABILITY FOR HAUL ROADS
SOURCE MAPS
FIRST LEVEL INTERPRETIVE MAPS
SECOND LEVEL INTERPRETIVE MAPS
ISSUE MAPS
SUITABILITY

# STATE OF ALASKA

JAY S. HAMMOND, GOVERNOR

**DEPARTMENT OF NATURAL RESOURCES**

*DIVISION OF RESEARCH & DEVELOPMENT*

323 E. 4TH AVENUE
ANCHORAGE, ALASKA 99501
276-2653


November 5, 1981



Mr. Eric Yould, Executive Director
Alaska Power Authority
333 West Fourth Avenue
Anchorage, Alaska 99501

Dear Mr. Yould:

The purpose of this letter is to transmit to the Alaska Power Authority (APA) comments from the Susitna Hydroelectric Steering Committee (SHSC) concerning APA's proposals for access to the proposed Susitna River dam sites. These comments are in response to information provided the SHSC from two access route meetings with APA and their contractors and the documents prepared by APA contractors and distributed during these meetings. At the October 20, 1981 meeting APA requested SHSC comments by November 6, 1981. The SHSC appreciates the fact that APA continued detailed consideration and studies of several access route options this year rather than focusing on a single route.

The SHSC review identified four areas of concern that merited comment. Those four are:

1. A critique of the studies of access routes which provide for construction of the dams.

2. The relationship between timing of access route construction and Federal Energy Regulatory Commission (FERC) approval for dams.

3. The relationship of access route decision and modes of access to regional land use management policies.

4. The issues resultant from land status and land ownership affected by the proposed project.

The assessment of corridor route alternatives should more adequately weigh the potential impacts of borrow sites and access to these sites, and transmission line(s) routing. Access corridors which serve a dual, or triple, purpose in regard to these other project access needs would be highly desirable from all decision-making criteria.

The access preferences expressed below pertain to the general locations cited for the corridors and are based upon the environmental data and conclusions contained within the environmental documents prepared for Subtask 2.10. Access Road Assessment. It does not represent our endorsement of a particular 1-mile-wide corridor, as presented.

The SHSC agrees with the Terrestrial Environmental Specialists, Inc. position that access via the Alaska Railroad to Gold Creek is environmentally preferable. Railroad access to at least Devil Canyon would alleviate the need for a staging area at Gold Creek and the consequent human activity, land use, fuel spills, and other impacts on the Gold Creek area. We recognized that a staging area at Devil Canyon would be required in any case. The use of this area as the terminus of a railroad appears to make a great deal of sense. Additionally, we feel that the south side route from Gold Creek to Devil Canyon is preferable since a trail already exists there. From Devil Canyon to Watana, we prefer a route on the north side of the Susitna River. At the October 20, 1981 meeting the SHSC was informed by Mr. David Wozniak of APA that there were two (2) additional railroad route/mode options (a total of 10) . If feasible we generally prefer a rail mode of access to and within the project site.

The SHSC identified three (3) environmentally sensitive areas that should be avoided. Those are:

1. The routes from the Denali Highway.

2. The route crossing the Indian River and through wetlands to the Parks Highway.

3. The route on the south side of the Susitna River from Devils Canyon to the proposed Watana dam site.

In evaluating the access route selection process undertaken by the APA and its contractors, the Steering Committee questions the validity of the power-on-line in 1993 assumption/mandate. The "We've got to hurry up and put in a road to meet the 1993 deadline" approach appears, from currently available reports and the briefings received by the Susitna Hydroelectric Steering Committee on October 20, 1981, to point toward the necessity of a pioneer road constructed before a FERC license is granted, or selection of an apparently environmentally unacceptable Denali Highway access route.

Local utilities are not approaching construction of a project the magnitude of Susitna in 1993 as a foregone conclusion and are making contingency plans to meet projected power needs. Gas and coal generated power options are being examined. In addition, feasibility studies are currently being undertaken by the U.S. Army Corps of Engineers and the APA at numerous potential hydroelectric generating sites. The Battelle Railbelt Electric Power Alternative Study should provide insight into additional power generation options. As such, we believe that the 1993 "deadline" for power-on-line from Susitna may not be that firm and imperative. Thus the SHSC does not believe the 1993 deadline should constrain the overall decision-making process and the orderly progress of various studies on project feasibility and environmental impacts. Permitting and resource agencies, including FERC, should be expected to link a pioneer road to the overall project.

Public access to the dam sites and through the Upper Susitna Valley is complex and a controversial subject and we believe this issue should be given thorough evaluation in the route selection process. How construction-related access is obtained to a great extent determines the project-related wildlife and socioeconomic impacts. The APA has been soliciting the views of local residents (Talkeetna, Trapper Creek, etc.) in regard to the access question. The majority of residents want to minimize impacts to both their community and the Upper Susitna Valley. The APA has solicited the views of the state and federal resource agencies. It has been the predominant view of these agencies, which represent public interests on a state or national level, that project-related wildlife impacts should be limited to the maximum extent practicable. In addition, the APA has expressed the desire to maximize the options for future public access. We believe that these views mesh. Minimizing impacts and maximizing options for future public access can be achieved by mimicking, to the extent possible, the status quo. For example, to provide full public access through a road system, forecloses the future option of maintaining the existing character of the Upper Susitna Valley.

Use of rail as the access mode increases the potential for management and control of socioeconomic and environmental impacts. Maximized rail use provides for the following advantages over road access:

1. Maintains a maximum range of future decision options.

2. Provides for control of worker impacts on local communities and wildlife.

3. Decreases the potential of hazardous material spills due to adverse weather conditions and multiple handling.

4. Disturbance to wildlife adjacent to the route can be more easily controlled.

5. Direct access right-of-way related habitat losses can be significantly limited.

Briefly the land status of the project area has not changed significantly within the last year. There are several complex problems concerning land status that have been brought to your attention by BLM.

Thank you for the opportunity to review and comment on the Access Road Assessment documents. We look forward to receiving the final version of these documents after November 15, 1981, and anticipate providing additional recommendations into this decision-making process.

Sincerely,

Al Carson

Al Carson, Chairman
Susitna Hydroelectric
Steering Committee

cc: D. Wozniak, APA
Steering Committee Members
R. Stoops

TYONEK NATIVE CORPORATION
912 East 15th Avenue, Suite 200
Anchorage, Alaska 99501
(907) 272-4548

April 6, 1981

Mr. Eric Yould, Executive Director
Alaska Power Authority
333 West 4th Ave., Suite 31
Anchorage, Alaska 99501

Dear Mr. Yould:

We fully support the Southern Road (Access Route A) as preferable to our affected villages. There is, as we understand, some possibility of a railroad from Gold Creek to Watana being a part of the construction activity. Our feelings are that permanent access to the damsites should be by road. If, then, the railroad is built to support construction activities we feel the roadbed should be converted after construction into a permanent road access to the Parks Highway.

Employment of Alaskans in maintenance and operation positions on the Susitna Dam Projects is also of importance to our villages. We feel the Power Authority should establish a training program to allow our shareholders, as well as Alaskans in general, to be trained for operations positons. This training should commence early enough so that newly trained technicians would be available for initial start up of the facility.

We would be pleased to meet with you to recommend procedures and assist in establishment of training guidelines.

Sincerely,

B. Agnes Brown
Chairman, CIRI Village Presidents

NOTE: THIS IS A REPRINT OF THE ORIGINAL LETTER.

# APPENDIX B

# PROJECT CONSTRUCTION REQUIREMENTS SCHEDULING

ALASKA POWER AUTHORITY

SUSITNA HYDROELECTRIC PROJECT

# PROJECT CONSTRUCTION REQUIREMENTS SCHEDULING

## TASK 2 - SURVEYS AND SITE FACILITIES

OCTOBER 1981

ACRES AMERICAN INCORPORATED
1000 Liberty Bank Building
Main at Court
Buffalo, New York 14202
Telephone: (716) 853-7525

SUSITNA HYDROELECTRIC PROJECT

ACCESS ROAD STUDIES

PROJECT CONSTRUCTION REQUIREMENTS - SCHEDULING

## 1 - GENERAL

The access road studies currently being undertaken are evaluated against various criteria. The methodology of the access road selection is shown in Figure 1. The evaluation is shown as step 5 of the methodology, along with the various criteria for evaluation. The one criteria this paper addresses is scheduling.

## 2 - SCHEDULING CONSIDERATIONS

Access to site must allow for the orderly development and maintenance of site facilities and construction activities in order that first power can be brought on line in 1993.

The various scheduling requirements to be considered are:

(a) Schedule of Access Development

This has been shown graphically on Figures 2 and 3 as schedule Plans A and B. Both schedule plans allow for an orderly development from limited access conditions through improved to full continuous access.

(b) Flexibility of Supply System

The system of supply to the site should be flexible to accommodate the various requirements of work. The flexibility should allow for alternative means of resupply in the event of strikes, delays, and unforeseen circumstances. Movement of people quickly to and from site in case of strikes, civil disruption and emergencies must also be allowed for.

The Schedule Plans A and B show different types of access: limited, improved, continuous, and complete. The "complete" access is the final product. The "limited" access would be extremely rough and allow only a limited number and type of vehicle travel. The "continuous" road would have all subgrade work completed and would allow reasonable truck traffic continuously. A requirement of the project is that "continuous" access is necessary by mid-1986 to support the construction activities. The "improved" access is better than "limited" and not as good as "continuous".

Schedule Plan A requires a "pioneer road" to be constructed. A "pioneer road", for definition, is a road which would allow limited access to several points along the permanent access road, to allow a rapid start and accelerated construction of the permanent road. The pioneer road would typically be a gravel surfaced road with turnouts; would be on existing ground, unless conditions made it absolutely necessary to place subgrade material or require excavation; and would have about 10 percent maximum grades and small radius curves. The pioneer road would generally have the same alignment as the permanent access road. However, in many places it would have to follow another alignment to avoid any major excavation or fill work.

A pioneer road at major river crossings would have temporary floating Bailey Bridges. These bridges would have to be removed in winter and temporary ice crossings built.

Schedule Plans A and B have the following as key dates:

1. JANUARY 1, 1985, LIMITED ACCESS REQUIREMENTS

   A. Mobilization of construction equipment and materials to build main access road.

   B. Mobilization of camp buildings and facilities to support diversion construction.

   C. Mobilization construction equipment and materials to construct diversion tunnels.

2. JANUARY 1, 1986, IMPROVED ACCESS REQUIREMENTS

A. Supply of cement for diversion tunnel construction.
B. Expansion of camp and facilities to support main dam contractor.

3. JULY 1, 1986, CONTINUOUS ACCESS REQUIREMENTS

A. Support of main dam contractor's activities.
B. Development of camp and facilities to support other contractors.

The preceding Schedule Plans A and B were developed during evaluation of the overall access plans. The schedule plans allow the orderly development and maintenance of site facilities and construction activities in order that first power be brought on line in 1993.

One small advantage of a pioneer road is it could provide some support in the Phase II investigation and design of the project.

## 3 - ACCESS PLANS AND SCHEDULING

The overall access plans are presented in Figure 4. Figure 4 also presents a summary of plans and technical points of the studies. Access plans 1, 2, 5 and 8, all of which originate from the east, the Parks Highway or Gold Creek, all require three to four years for complete construction. Access plans 3, 4, 6 and 7, all of which originate from the north and the Denali Highway, require one year to have an access to Watana.

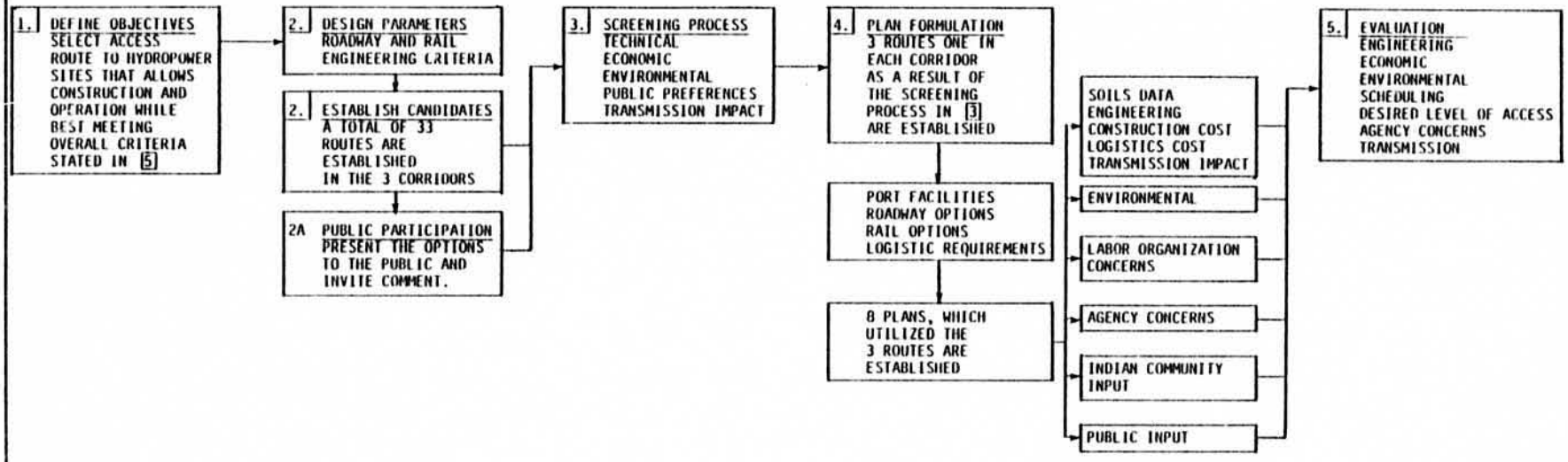
As stated above access plans 3, 4, 6 and 7, all of which originate from the Denali Highway, can meet this requirement. Access plans 1 and 2, 5 and 8 cannot meet this requirement unless a pioneer road is constructed prior to 1985. This can be accommodated in the alotted time frame. For access plans 1 and 2, 5 and 8 the pioneer road would be constructed during 1983 and 1984. Detailed design and obtaining the necessary permits would have to be carried out during the last half of 1982 and the first half of 1983. This would allow the construction

of the full access road to be commenced in 1985 and the first half of 1986, with completion in 1987. The major bridge at Gold Creek would be constructed in 1985 and 1986, with access during this period being accommodated by a floating Bailey Bridge. A floating bridge would also be required at Watana or Devil Canyon during 1985 and 1986 depending on the road location.

Access plans 5 and 8 would require construction of the permanent bridge at Devil Canyon to commence at the same time the pioneer road is started. For the bridge at Devil Canyon all necessary site work and the foundations would be complete by January 1985 to allow erection of the bridge in 1985 and completion in 1986.

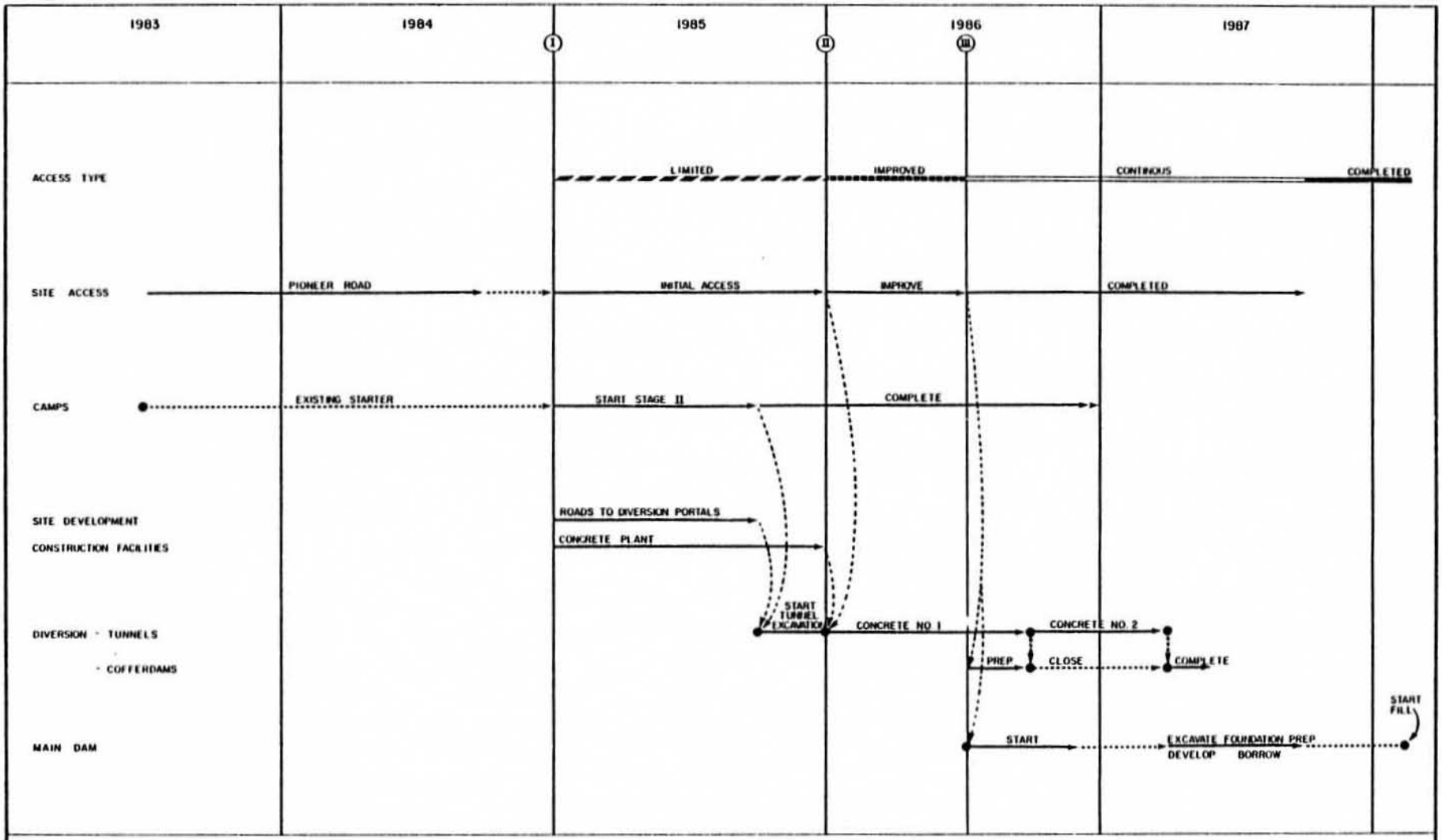
Access plans 2 and 8, which do not have a connection to a major highway, would have to bear an additional expense of transporting personnel in and out of the sites. By not having a connection to a major highway the option of having a portion of the personnel bear the cost of transportation to and from the site by private vehicle is eliminated. This shuttle expense is estimated to be in the order of $25,000,000 by air. Shuttle train service would be less expensive. For these purposes, it has been established that 50 percent of the personnel will have their transportation costs paid by the project.

Rail access plans 2 and 8 have a higher contingency risk than a roadway access. The risk is the possible loss of all ground transport and supply to the site associated with a breakdown of the rail system. Rail access does not provide the flexibility provided by a road access. A road access allows more control over the project by the contractors themselves. A road access from a major highway is more flexible to adapt to different situations, thus lessening the risk of work delays, stoppages, and contractor's claims. It has a "safety valve" the rail access options do not have.




ACCESS PLAN SELECTION METHODOLOGY

FIGURE 1

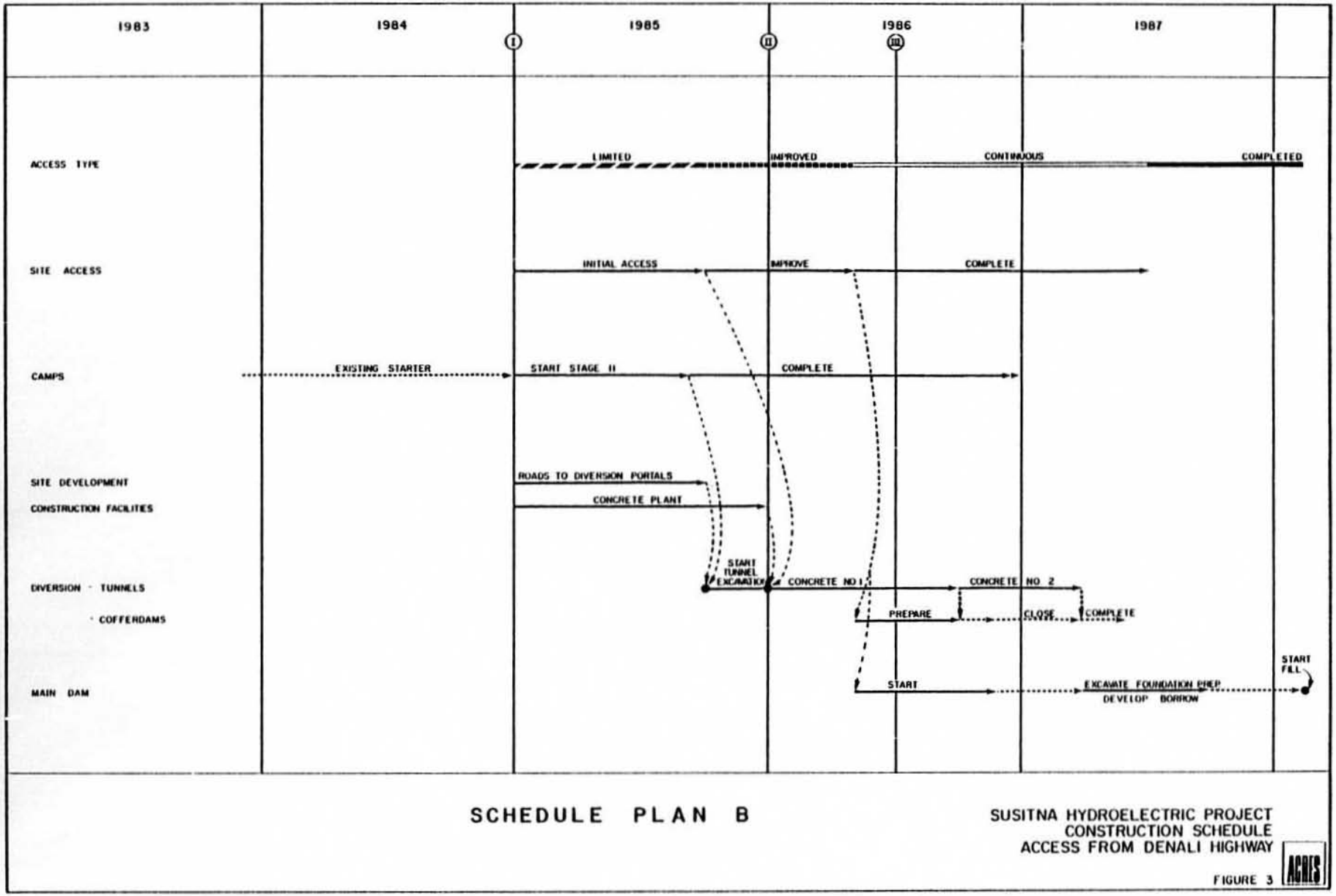



SCHEDULE PLAN A

SUSITNA HYDROELECTRIC PROJECT
CONSTRUCTION SCHEDULE
ACCESS FROM PARKS HIGHWAY

FIGURE 2

ACRES




## SCHEDULE PLAN B

SUSITNA HYDROELECTRIC PROJECT
CONSTRUCTION SCHEDULE
ACCESS FROM DENALI HIGHWAY

FIGURE 3

ACRES

## SUSITNA ACCESS PLANS

| PLAN | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| DESCRIPTION: | ROADWAY: PARKS HIGHWAY TO DEVIL CANYON & WATANA ON SOUTH SIDE OF SUSITNA | RAIL: GOLD CREEK TO DEVIL CANYON & WATANA ON SOUTH SIDE OF SUSITNA | ROADWAY: DENALI HIGHWAY TO WATANA, PARKS HIGHWAY TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA. NO CONNECTING ROAD | ROADWAY: DENALI HIGHWAY TO WATANA,RAIL, GOLD CREEK TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA. NO CONNECTING ROAD | ROADWAY: PARKS HIGHWAY TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA, DEVIL CANYON TO WATANA ON NORTH SIDE OF SUSITNA. | ROADWAY: DENALI HIGHWAY TO WATANA,RAIL, GOLD CREEK TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA. CONNECTING ROAD ON NORTH SIDE OF SUSITNA. | ROADWAY: DENALI HIGHWAY TO WATANA, PARKS HIGHWAY TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA. CONNECTING ROAD ON NORTH SIDE OF SUSITNA. | ROADWAY: GOLD CREEK TO DEVIL CANYON ON SOUTH SIDE OF SUSITNA, DEVIL CANYON TO WATANA ON NORTH SIDE OF SUSITNA. |
| MILEAGE OF NEW ROAD | 62 | 58 | 70 | 60 | 68 | 102 | 111 | 54 |
| CONSTRUCTION COST ($ x 1,000,000) | 158 | 140 | 151 | 119 | 143 | 179 | 209 | 93 |
| MAINTENANCE COST ($ x 1,000,000) | 5 | 4 | 6 | 5 | 8 | 8 | 9 | 7 |
| LOGISTICS COST ($ x 1,000,000) | 215 | 210 | 231 | 230 | 214 | 230 | 231 | 214 |
| TOTAL COST ($ x 1,000,000) | 378 | 354 | 388 | 354 | 365 | 417 | 449 | 314 |
| PERSONNEL SHUTTLE COST ($ x 1,000,000) | 0 | 25 | 0 | 10 | 0 | 0 | 0 | 25 |
| CONSTRUCTION SCHEDULE (YEARS) | 3-4 | 3-4 | 1 | 1 | 3-4 | 1 | 1 | 3-4 |
| MAJOR BRIDGES | 2 | 2 | 0/1 | 0 | 2 | 0 | 0/1 | 1 |
| SCHEDULE PLAN | A | A | B | B | A | B | B | A |
| ADDED CONTINGENCY RISK | NO | YES | NO | NO - WATANA<br>YES - DEVIL CANYON | NO | NO | NO | YES |

FIGURE 4

ACRES

# APPENDIX C

# PUBLIC PARTICIPATION

ALASKA POWER AUTHORITY

# SUSITNA HYDROELECTRIC PROJECT

# DRAFT SUMMARY OF ENVIRONMENTAL REPORT

## TASK 2 - SURVEYS AND SITE FACILITIES

OCTOBER 1981

ACRES AMERICAN INCORPORATED
1000 Liberty Bank Building
Main at Court
Buffalo, New York 14202
Telephone: (716) 853-7525

Access Road Environmental Analysis Summary

An environmental analysis was conducted of the eight access plans under consideration. Each plan was evaluated in terms of its potential input to vegetation, wildlife(furbearers, big game, birds and small mammals), fish and culture resources. Each access plan involves construction of a road or railroad in two or more of the following segments:

Parks Highway to Gold Creek

Gold Creek to Devil Canyon Damsite

Devil Canyon Damsite to Watana Damsite via the north side of the Susitna River

Devil Canyon Damsite to Watana Damsite via the south side of the Susitna River

Denali Highway to Watana Damsite

Table I indicates the access plans studied.

The major potential environmental impacts identified for each of the access segments were as follows:

Parks Highway to Gold Creek: Removal of wetland areas, disruption of furbearer habitat, disturbance of anadromous fisheries habitat in the Susitna and Indian river and disturbance of archaeological resources.

Gold Creek to Devil Canyon Damsite: disturbance of forested area along the Susna River.

Devil Canyon Damsite to Watana Damsite via north side of Susitna River; potential restoration difficulties, disturbance of cultural resources.

Devil Canyon Damsite to Watana Damsite via south side of Susitna River: disturbance of wetland area and furbearer habitat near Stephan Lake, Fog Lake and Fog Creek, disturbance of moose and caribou habitat, increased fishing pressure to resident fishes.

TABLE I. SUSITNA ACCESS PLANS

| Plan | Description |
|---|---|
| 1. | Road from the Parks Highway to Devil Canyon, continuing to Watana on the south side of the Susitna River. |
| 2. | Railroad from Gold Creek to Devil Canyon, continuing to Watana on south side of the Susitna River. |
| 3. | Road from the Parks Highway terminating at Devil Canyon. A second road from the Denali Highway to Watana. |
| 4. | Road from Gold Creek Terminating at Devil Canyon. A second road from the Denali Highway to Watana. |
| 5. | Road from the Parks Highway to Devil Canyon on the south side of the Susitna river, crossing the Susitna and continuing to Watana on the north side. |
| 6. | Road from Gold Creek to Devil Canyon on south side of Susitna River; connecting road between two dams on north side Susitna River.<br>Road from Denali Highway to Watana |
| 7. | Road from Gold Creek to Devil Canyon south side of Susitna River; connecting road between two dams on north side of Susitna River.<br>Road from Denali Highway to Watana. |
| 8. | Road from Gold Creek to Devil Canyon on south side of Susitna River, crossing Susitna and continuing to Watana on north side. |

Denali Highway to Watana Damsite: disturbance of fox denning sites near Deadman Mountain, interference with migration and calving of portions of the Nelchina caribou herd, disturbance to cultural resources.

In addition to these specific concerns, a major concern for all access plans was the creation of access to areas previously inaccessible or relatively inaccessible. This increased access could lead to impacts to furbearers (through trapping) and to big game through hunting. In addition, detrimental effects could occur to all wildlife through disturbance and destruction of habitat by ATV's. Cultural resources would also be vulnerable to amateur collectors and ATV traffic.

Considering the potential of these impacts to occur in each plan resulted in the conclusion that plan 8 would cause the least environmental disturbance. This was because the utilization of roadway beginning at Gold Creek and continuing to Watana will preclude public access into the area. Furthermore, the road from Devil Canyon to Watana on the north side of the Susitna River covers areas that are not of great importance to wildlife or fisheries.

Plans 1,3,5, and 7 would provide increased access into the area. This is because the roadways would begin at the Parks Highway which is accessible to all outside traffic. For this reason, there plans were found not to have the potential for greater impacts than Plan 8.

Plans 1 and 2 connect the Watana and Devil Canyon dam sites via a road on the south side of the Susitna river. Because these plans would cross wetlands and furbearer habitat near Stephan and Fog Lakes and open this area to increased fishing pressure, the plans were considered to be less desirable than Plan 8.

Plans 3, 4, 6 and 7 all involve a road from Watana dam north to the Denali highway. Because of the increased access this road would provide and the potential for impacts to portions of the Nelchina caribou herd, to furbearers (particularly fox denning areas) and to cultural resources,

these plans were also considered less desirable than Plan 8.

The above evaluations were conducted without consideration of mitigation plans. Certain mitigation techniques could be utilized to substantially reduce the potential for impacts and permit utilization of plans other than plan 8. For instance, timing restrictions for stream crossings and utilization of siltation control devices could reduce impacts to anadromous fish; final alignment of the road bed above wetland areas would reduce impact to aquatic furbearers; strict patrols and control of access may reduce impacts to caribou.

Final plan selection will incorporate engineering, economic and environmental considerations, including utilization of mitigation techniques.

Access Roads

Socioeconomic and Land Use Analysis Summary

Each of the access plans under consideration originates at one or two of the following points: the Parks Highway at Hurricane,. the Alaska Railroad at Gold Creek and the Denali Highway near Denali. For purposes of socioeconomic and land use analysis, the point of origination is the dominant variable, with mode (road or railroad) an important variable and actual alignment a minor variable.

Each of the access plans was evaluated in terms of its effect on socio-economic conditions and land use in the area. Socioeconomic parameters evaluated included effects on population levels, cultural activities, community, political and social organizations, housing, public service, government finance, labor and economic base. Land use parameters evaluated included land uses and associated site-specific activities, dispersed and isolated activities, land management activities, and related concerns and natural aesthetics.

Impacts were evaluated for three general geographic areas:

- Parks Highway-Railroad corridor on Westside, containing the communities of Healy, Cantwell, Chulitna, Talkeetna, Willow and Wasilla
- Richardson Highway corridor on eastside containing the communities of Glennallen, Gulkana, Paxson and others along the Richardson Highway
- Anchorage, Whittier and Fairbanks

Evaluations showed effects on Fairbanks to be the same for each access plan and therefore was not included in the comparisons.

Acres plans (lands) with a roadway originating at Hurricaine will significantly impact the westside communities in terms of demand for

increased services, changes in population, housing availability, government expenditures and revenues, labor demand and unemployment. There will also be significant effects on construction, retail trade and tourism. Many of the changes will occur as construction workers attempt to relocate to the communities near the construction site.

Significant land use changes would occur in the Westside communities, particularly in residential and commercial uses.

Except for a possible significant increase in wholesale trade, roads from the west should have only slight socioeconomic and land use effect on Anchorage, Whittier and the eastside communities.

Access plans 2 and 8 originate at Gold Creek. As such, impacts would be concentrated on the Westside communities as described for plans 1 and 5. However, the effects would be magnified in Talkeetna and Hurricane because of their location at rail-highway intersections.

The Anchorage/Whittier area would be significantly or moderately effected in construction, port and rail transportation, wholesale and retail trade and service industries. In addition, Whittier would experience moderate effects on employment.

Only negligible effects would be felt on eastside communities.

Land use impacts are expected to be minor in the interior of the project area, because access to the site would require utilizing the Alaskan Railroad to Gold Creek. Significant land use change would occur in the westside communities, particularly in residential and commercial uses in Talkeetna and Hurricane.

Access plans 4 and 6 move the access origin from the Railbelt corridor to the Denali Highway in the north. Workers' families would tend to locate in more communities and possibly concentrate in Anchorage. Significant or major effects would likely be felt in Cantwell in terms of population, culture/way-of-life, community, political and social organization, housing availability, government expenditures and revenues, labor demand, unemployed labor, public services, construction, public utilities, communications and retail trade and services.

Anchorage would experience a significant effect on wholesale trade and Whittier would feel moderate effects on employment, retail trade and service.

The eastside communities would experience moderate changes, due permanently to spillover effects of increased tourism from access on the Denali Highway.

Land use changes would occur in Cantwell, primarily in residential and commercial use. There would also be changes in land use in the area between Denali Highway and Watana, due to increased access.

Access Plans 3 and 7

These effects will be essentially the same as plans 4 and 6. Westside communities would be effected as workers' families move further up the corridor. Significant changes would occur in many of the communities as road access would begin at both Hurricane and Cantwell.

Evvects to Anchorage, Whittier and the Eastside communities would be the same as for plans 1 and 5.

Land use changes in the interior may be great, as road access is provided at two places. In addition, commercial and residential land use changes would occur in the westside communities.

## Access Road Environmental Summary

### Public Preference

Public preference regarding the access and recreation development plans was acquired through mail-in questionnaires, workshop questionnaires, personal interviews and other forms of written and verbal communication. As different groups were reached through these various media the results acquired from each are not directly comparable.

### Mail-In Questionnaires - Recreation

As a component of the recreation planning program a mail-in questionnaire was forwarded to 2145 residents, 715 to each of the Fairbanks, Anchorage and Railbelt (excluding Fairbanks and Anchorage) areas. 502 or 23 percent of the questionnaires were completed and returned. As shown on Table II the general concensus from all three regions was that 15-20% of the respondents favored no or restricted access and no recreation development 21-26% favored access with little or no recreation development and 56-60% favored access with moderate to high development. It must be noted that when this questionnaire was distributed the option of providing access to the site by rail was not offered as an alternative and thus the results of this survey do not take the option of a rail access into account. In addition, this questionnaire was distributed for the purpose of accessing the degree and type of recreation development preferred. Thus the responses may have differed somewhat had the primary questions been directed towards the degree, mode and point of origin for access roads.

### Public Workshop Questionnaire - Recreation

The results of the recreation questionnaire as received through the March 1981 public workshop differed significantly from the mail-in responses. The exact reasons for this difference is unknown although speculation is presented. A total of 82 responses were received with 18, 35 and 29 from Fairbanks, Anchorage and the Railbelt (excluding Anchorage and Fairbanks) respectively. As shown on Table III the results from these sectors varied

greatly. In Fairbanks 72% of the respondents favored no or restricted access with no recreation development, and 8% favored access with moderate to high recreation development. Anchorage was almost the reverse with 6%, 9% and 71% favoring no or restricted access, access with minimum development and access with moderate to high development, respectively. The results of the central Railbelt as reflected by the responses from the Talkeetna workshop were more evenly divided with 45% favoring no or restricted access, 17% favoring access with minimal recreation development and 38% favoring access with moderate to high development.

It is speculated that the results from the Fairbanks workshop tend to represent the views of concerned interest groups that had a large representation at the Fairbanks workshop. The dicotomy of the responses from the Talkeetna workshop are probably a reflection of the attitudes that exist in this community as indicated by the results of the socio-cultural studies. In Anchorage the very high level preference for access with moderate to high recreation development differs in degree from the mail-in results although both surveys demonstrate a preference in Anchorage for access with development.

TABLE II: RESPONSE FROM MAIL-IN QUESTIONNAIRES ON RECREATION

| | | Fairbanks % | Railbelt % | Anchorage % |
|---|---|---|---|---|
| A) | No road access or restricted access | 15 | 19 | 20 |
| B) | Access but little or no recreation development | 26 | 26 | 21 |
| C) | Access with moderate to high development | 59 | 56 | 59 |

TABLE III: RESPONSE FROM THE PUBLIC WORKSHOP QUESTIONNAIRE ON RECREATION

| | | Fairbanks % | Railbelt % | Anchorage % |
|---|---|---|---|---|
| A) | No road access or restricted access | 72 | 45 | 6 |
| B) | Access but little or no recreation development | 0 | 17 | 9 |
| C) | Access with moderate to high development | 8 | 38 | 71 |

Public Workshop Questionnaire - Access

The results of the access questionnaire as received through the March 1981 public workshop are presented in Table 3 below.

| Route | Fairbanks % | Talkeetna % | Anchorage* % | Total % |
|---|---|---|---|---|
| A) Road access from Parks Hwy to both dam sites | 6 | 17 | 7 | 10 |
| B) Rail access from Gold Creek to both dam sites | 72 | 67 | 40 | 59 |
| C) Road from Denali Hwy to Watana rail from both Creek to Devil Canyon | 17 | 11 | 20 | 16 |
| D) Road from Denali Hwy and Parks Hwy | 0 | 0 | 33 | 10 |
| No Preference | 6 | 6 | 0 | 4 |

* Mail responses were mostly from the Anchorage area, reflecting the thinking of that area, and were thus included in the Anchorage results.

A total of 51 responses were received with 18, 15, and 18 from the Fairbanks, Anchorage and Talkeetna areas respectively.

In Fairbanks 72% of the respondents favored a rail only access, 17% favored a combination of road rail and 6% favored road only access. None of the respondents favored road access from both the Denali and Parks Highway.

In Talkeetna a similar trend emerged with 67, 11, 17 and 0% favoring rail access only, road and rail access, road only and road access to both Denali and Parks Highways, respectively.

In Anchorage 40% of the respondents favored rail access only, 20% favored road/rail access, and 41% favored road only. 33% of the total respondents favored road access from both the Denali and Parks Highways

Those trends demonstrated by these results are comparable with the results of the public workshop recreation questionnaire although the degree of preferences vary. The Fairbanks respondents, which favored no or restriced access with no recreation development also favored rail access only (72%). In Talkeetna the dicotomy expressed in the public workshop recreation questionnaire response is also reflected in the access questionnaire results, however, a definite preference (67%) was shown for the rail only access (40%) and higher preference for some type of road access (60%) is again comparable to the results of the workshop recreation questionnaire. The greatest difference between the Anchorage and the Fairbanks/Talkeetna results in the 33% for no preference for road access from both the Parks and Denali highway.

Questionnaire Interpretation

Interpretation of the results from the public preference questionnaires must be made with caution. The largest sample size with 502 responses was associated with the recreation mail-in questionnaire. In addition, the fact that the questionnaire had a random distribution, improves the probability that it more accurately reflects the attitudes of the general public. Its main drawback was that it was directed mainly towards the question of recreation development with access being a secondary issue. The problem in interpreting the results of the workshop questionnaires is a comfirmation of sample size (Recreation questionnaire - 82 responses; Access questionnaire - 51 responses) and an evaluation as to what component of the communities are actually represented.

Sociocultural Studies - Access Report

Railroad Communities north of Talkeetna

These communities prefer the access system which allows the minimum amount of public access and least amount of population and industrial growth. They feel that the rail access only would lead to the minimal disruption to existing residential and recreational patterns.

Talkeetna

Two factions were identified:

1) The first group desires minimum impact on the community as well as the wildlife and general environment of the surrounding area. If the dam is constructed they perceive the railroad as the best means to limit access and change in the study area.

2) The second group tends to be pro-economic development and was divided into two subgroups.
   a) This group is in favor of the dam although they still value the rural, small-town atmosphere in which they have chosen to live. As such, to limit the impact on the community and surrounding wilderness they prefer a railroad access only to the dam sites.
   b) The second subgroup of Talkeetna residents which favor economic development in general are also in favor of roads to open the country. Views in this category represent the minority opinion of those interviewed.

Trapper Creek

As with Talkeetna two factions emerged.

1) This group is against the Susitna project as well as other large scale development in the area. This group expressed concern about road access from the Parks Highway or Denali Highway. As the alternative that would have the least impact on their community as well as the environment in general they preferred the railroad only plan.

2) The second group although in favor of Susitna was divided on the issue of access modes and routes.
   a) The first subgroup preferred not to see the area opened up with roads. They preferred the railroad only plan and were opposed to highway access from Hurricane to Gold Creek.

b) Members of the second subgroup preferred road access in order to provide the maximum public access to otherwise inaccessible areas. This subgroup is comprised mainly of older residents who have already experienced considerable change in the area.

Cantwell

In regards to access the following groups emerged:

1) Pro the Denali Spur:
   a) Many Cantwell residents, especially local businessmen and those in search of a job, are strongly in favor of the dam, a railhead at Cantwell, the Denali Spur and any additional development which would enhance economic progress of the community. This group was also in favor of upgrading of the Denali Highway. People in this category had a strong voice but did not represent the majority opinion in Cantwell.
   b) Members of this subgroup acknowledge that Cantwell needs the economic stimulation and appreciate the logic and engineering compatability of the Denali Spur. However, they are very concerned about the potential adverse impacts on wildlife in the area and would only be in favor of the Denali Spur if stringent hunting regulations were implemented and enforced. This group represented the majority opinion in Cantwell.

2) This group has considerable concern regarding the potential impact on the fish and wildlife of the area. This group, which represented the minority of those interviewed, was comprised mainly of local trappers, non-locals with recreational cabins and locals who felt the potential adverse impact on wildlife outweighed the use of this corridor.

Native Preference

The CIRI Corporation has stated that it is their intent, with or without the project, to develop the lands surrounding the Devil Canyon and Watana

proposed damsites mainly for its mineral potential. As such they are strongly in favor of a permanent road to the damsite and have stated their preference for the Southern Road from the Parks Highway. They do not favor a railroad but if a railroad is built they feel the railroad bed should be converted into a permanent road with access to the Parks Highway. It is also their contention that since much of the land in question is private land, belonging to CIRI, access should be subject to their wishes.

ALASKA POWER AUTHORITY

PUBLIC PARTICIPATION OFFICE

# ACCESS REPORT

October 9, 1981

## Section I

## SUMMARY AND CONCLUSIONS

### March 1981 Workshop Results

The results of three workshops held and questionnaires sent out by the Public Participation Office concerning the question of access to the proposed Watana and Devil Canyon hydroelectric sites show a preference for a rail only alternative. Sixty (60) percent of the participants in the workshops held in Fairbanks, Talkeetna, and Anchorage preferred rail access. Almost 80% of the Talkeetna respondents and more than 80% of the Fairbanks participants favored the rail only alternative. Likewise, a sizeable portion of the game guides registered in Unit 13 (Upper Susitna Basin) who responded to a questionnaire favored the rail access.

The reasons for this preference varied somewhat among communities and interest groups. Nevertheless, a pattern did emerge. The participants at the Talkeetna meeting felt that their way of life would be altered if road access through any nearby community was selected. The workshop participants' choice of rail only access reflects their concern for the potential amount of change that could occur if such an access road were selected.

A second factor in the choice of the rail only route was the desire to limit the impact on wildlife and the ecology of the Upper Susitna Basin that increased recreational opportunity would cause. This was especially true of the participants in Fairbanks and the responses of the game guides. Both these groups did not respond to limiting impacts on the communities along the Parks Highway, but tended to focus on the potential impacts on game and the environment. Of primary concern was the Nelchina caribou herd and also the moose and bear populations. All three groups mentioned potential impacts from all terrain vehicles (ATV's) and increased hunting and fishing opportunities.

In analyzing these responses and in recent discussions with Robert Anderson of Terrestial Environmental Specialists (TES), Peter Rogers of Frank Orth & Associates, and Stephen Braund who is conducting the socio-cultural study, several variables need to be considered in respect to a rail only alternative. It is our thinking that several potential impacts could result from a rail only access that were not considered by these communities. One would be the size and location of a staging or stockpiling area for construction materials (and its possible visual impact or the size of the work force needed to operate it). A second would be the regularity that workers would be allowed to ride the train to the construction site. If workers could ride in either daily, weekly, or bi-weekly, impacts in the southern communities could be nearly as great as with a road access. This would include the need for parking facilities in Talkeetna or Hurricane, and the result of workers and their families relocating in the southern communities. The increased demand in service could potentially impact a broad range of activities that the Talkeetna participants expressed an interest in limiting.

The Public Participation Office (PPO) intends to point out these things to the communities when we hold our next workshop sessions the week of October 19. As the result of recent discussions among the PPO staff Stephen Braund, Peter Rogers, and Robert Anderson, one possible way to reduce impacts on the southern communities is a northern access from the Denali Highway, with a full service construction camp, commuter schedules, and clearly defined state policies, in combination with no access from the west (either rail or road). Although a northern route only was originally considered, it was not among the options presented at the community workshops in March 1981. Another option to reduce impacts would be all rail or rail to Gold Creek with workers commuting to and from Anchorage by airplane. This option was not presented either. We suggest that these access options and the explanation of the possible impacts of the rail only access need to be presented to the southern communities in order that a more informed decision can be made. Especially because the thinking of these communities tended to reflect the idea that the rail only access would have the least

impact on their communities. It is possible that the full range of impacts, both primary and secondary, have not been understood or considered. The primary consideration appeared to be the long term implications of public access after construction. Nevertheless, construction related impacts may be of greatest concern to these communities given the 10 to 15 year time span of construction.

In addition, the results of the recreational development questionnaire that was also distributed at the community workshops also showed a preference for limiting development and access. More than 60% of those who responded to the recreation questionnaire favored a minimally developed and managed wilderness. This choice demonstrated a desire to either limit or permit no access to the project area. Rail access was mentioned several times as the best method of access.

Communities Where No Workshops Were Held

Willow, Houston, Wasilla, and Palmer:

It should be pointed out that community workshops were not held in the communities south of Talkeetna (Willow, Houston, Wasilla, and Palmer) and no one from these areas attended the March 1981 workshop in Talkeetna. Generally, the Mat-Su area has been economically slow in recent years (the capital move to Willow has not occurred) and people in some of these communities may well perceive changes and impacts brought about by the Susitna project as beneficial if economic development is stimulated. Data from a study conducted in the Mat-Su Borough by the Overall Economic Development Program, Inc. (Economic Conditions, Development Options and Projections, July 1980) indicates that people in Willow, Houston, Wasilla, and Palmer tend to favor a higher rate of development than the communities north of Willow. Additional information frm planners at the Mat-Su Borough, the Borough Manager, Assembly, Planning and Zoning Commission, and local residents might be useful.

Trapper Creek:

The lack of representation from Trapper Creek at the March workshop at Talkeetna also limits the information from that meeting. The community

of Trapper Creek did not seem to perceive the Susitna projects as having a potential impact on their community. One member of the community council later expressed the perception that Trapper Creek would be less affected than Talkeetna would be by Susitna. In addition, the workshop was held in Talkeetna which is a 60 mile round trip for Trapper Creek residents and, given the public sentiment as reflected by the above statement, it doesn't seem likely that people would make the trip. Stephen Braund has recently spent some time in the Trapper Creek area and his information should help in assessing the preference of that community. A joint meeting with Trapper Creek and Talkeetna is being planned for Wednesday, October 21. It will be held at Susitna Valley High School, located half way between Trapper Creek and Talkeetna, and we hope to get representation from both these communities.

People living along the railroad north of Talkeetna:

The small clusters of people north of Talkeetna along the railroad were also not well represented at the Talkeetna workshop. Some people from the Chase area attended the workshop, but people further north along the railroad (Lane Creek, Sherman, and Gold Creek) did not attend. The PPO did communicate with people living or owning land at Lane Creek and Sherman during the public participation work on the intertie project. The general feeling in these areas was one of strong opposition to the transmission lines because people had moved to the area to get away from development. We would expect strong resistance to any access choice which would cause changes along the railroad in these areas.

Cantwell and McKinley Park areas:

Another area where the PPO had no contact concerning access is the Cantwell and McKinley Park areas. In communications with both these areas on the intertie issue, Cantwell has been generally pro-development and pro-intertie. Community sentiment indicated the desire for a substation at Cantwell (along with distribution lines) so the community would not have to rely on diesel generation for electricity. Discussions with Stephen Braund and Tom Lonner have indicated that the McKinley

Park area would not be affected by access plans, but Cantwell would, especially if the Denali Highway access is selected. To better understand the concerns of the Cantwell community, a community workshop is being planned for Thursday, October 22.

Indian River Subdivision and Indian River Remote lands:

A final group of people whose preference was not obtained was the Indian River Subdivision owners and the Indian River remote parcel owners. The subdivision contains about 140 parcels on or near the Parks Highway in the area of the proposed road access to Devil Canyon. The Department of Natural Resources estimates that 90 of these sites have been awarded since July 1981. Consequently the people who are now owners have not been contacted concerning their views on either Susitna in general or on the question of access. DNR also reports that demand was not great for the subdivision lands except along the highway. This was not the case for the Indian River remote parcels. Because these remote parcels had railroad access and most remote parcels have no access at all, DNR reports that it was one of the more popular remote parcel offerings the state has had. Seventy-five person were given authorization to stake in this area.

## Conclusions

1. What emerges from the responses received in the community workshops, both on access and recreation, is the desire to limit growth and development that could occur should the Susitna project be constructed, especially in the Talkeetna area and the railroad communities north of Talkeetna. One of the drivers of the type and magnitude of the impacts on the southern communities is the location of the access route and the mode of transportation used on the route. Although the clear preference stated is for a rail only access, more information needs to be presented to the potentially impacted communities concerning the nature of impacts during the construction phase if a rail only route is selected.

2. In recent discussions with Stephen Braund, Robert Anderson, and Peter Rogers, it has become clear that the question of access and mode alone are not the only considerations that need to be presented to the potentially impacted communities. An equally important consideration is the size and nature of the construction facility. Various options are available and depending on what is selected the impacts on the surrounding communities will vary. A full service, planned community providing the widest range of services for the workers and their families would have a much different impact than a low service, construction camp with no family facilities. This type of decision, as well as the policies that the State of Alaska (through the Power Authority) would adopt or not adopt concerning the nature of the construction site, access to the site, and the scheduling of commuting workers to and from the site will be the primary factor in determining the impacts on local communities.

3. PPO suggests the following method for looking at how various options would either decrease or encourage the amount of change that could potentially occur in local communities. Six possible objectives are given below. We recognize that some of these objectives appear mutually exclusive. They do, however, reflect the range of preferences that have been heard in the communities so far. PPO would like more community input to determine which preference reflects the majority of a given community.

The six objectives are:

1. To encourage changes in the Willow, Houston, Wasilla and Palmer areas.
2. To limit changes in the railroad communities north of Talkeetna.
3. To limit changes in the Talkeetna and Trapper Creek areas.
4. To encourage changes in the the Talkeetna and Trapper Creek areas.
5. To encourage changes in the Cantwell area.
6. To limit changes in the Cantwell area.

The next four pages are a preliminary discussion of how decisions could be made to implement either one or a combination of these objectives. The information on these pages was written in a work session with Robert Anderson, Peter Rogers, Stephen Braund, and PPO staff. More time could be spent in refining this. In addition, the thinking of several other disciplines is needed to make the picture more complete.

Based on what we know now, the Power Authority's "access/recreation/construction facilities/construction policies" objectives would be to: 1) encourage change in the Willow, Houston, Wasilla, and Palmer areas; and 2) to limit changes in the railroad communities north of Talkeetna. We do not yet have enough information to establish clear planning objectives for the Trapper Creek, Talkeetna, and Cantwell areas. ***

The remainder of the report (Section II) is the back-up data that supports the summary and conclusions from the workshops and questionnaires. Included as exhibits are copies of the various questionnaires used to solicit responses.

*** PPO is relying on the sociocultural study being conducted by Stephen Braund and Associates to supply additional information in order to better articulate these objectives. In addition, we intend to check our perceptions of community preferences one more time with the communities the week of October 19th.

OBJECTIVE 1: To encourage changes in Willow, Houston, Wasilla, and Palmer areas.

PLAN A:

1. Access Corridor: access from the west; no access at all from the Denali Highway.

2. Mode: road.

3. Nature of construction camp facilities: Minimal construction camp: trailers, mess hall, recreation hall, some family facilities for supervisory personnel.

4. Policies:
   a. Individuals drive their own private vehicles to the sites.
   b. No policies about when workers come and go, from where, or use of private vehicles.

5. Commuter Schedules:
   a. None.
   b. No policy on public access.
   c. No policy on use of fish and game.

Objective I: To encourage changes in Willow, HOuston, Wasilla, and Palmer areas.

PLAN B:

1. Access Corridor:
   rail access, either through Gold Creek with road to site or rail directly to Devil Canyon.

2. Mode: rail

3. Nature of construction camp facilities: Minimal construction camp: trailers, mess hall, recreation hall, some family facilities for supervisory personnel.

4. Policies:
   a. Policy reagarding use of personal vehicles by workers.
   b. Policy to control public access to area.

5. Commuter Schedules: Organized commuter schedule using aircraft from the Wasilla-Palmer area.

   Or organized rail commuter schedule with workers getting on and off the train in the Palmer and Wasilla areas.

OBJECTIVE II: To limit changes in railroad communities north of Talkeetna.

PLAN A:

1. Access Corridor: Road from Denali Highway to Watana; service road from Watana to Devil Canyon; no access at all from the west (neither rail nor road).

2. Mode: road.

3. Nature of construction camp facilities:

   The larger the camp, and the more services, the less the impacts on surrounding local communities. Services that would help reduce impacts include: stores, post office, schools.

   Proposal: to construct a "mixed camp", meaning a camp where workers live with their families if desired, or where workers live in trailers or barracks without families if desired.

   Part of the construction camp could/would become a permanent city for the operating phase.

   The temporary camp could be sited and located so that it would be inundated by water later.

   The siting of a permanent camp for families would be important so that the experience is as pleasant as possible: meaning, it was sited on dry land so people could get out and walk, and near trees and sun exposure if possible. The more pleasant the place is to live, the more families will enjoy living there and impact existing local communities less.

   Limited r & r would be available at camp; workers or families would periodically get out to other areas (larger areas like Anchorage and Fairbanks) for more extended r & r and cultural activities, etc.

4. Policies:

   a. strict regulations where people can go in the upper basin to protect resources, especially hunting and fishing.

   b. No private planes flying in and out.

   c. Policy regarding use of personal vehicles.

   d. Policy to control public access off corridor.

OBJECTIVE II: Plan A cont.

5. Commuter Schedules:

   a. ORGANIZED commuter schedule for those who don't live with families. Could be busing from Fairbanks, Anchorage, or Cantwell.

   b. ORGANIZED air commuting from Anchorage, or fom Palmer and Wasilla.

OBJECTIVE III: To limit changes in the Talkeetna and Trapper Creek areas.

PLAN A:

1. Access Corridor: Road from Denali Highway to Watana (this would spread the impacts to include Cantwell). Service road from Watana to Devil Canyon; no access at all from the west (neither rail nor road).

2. Mode: road.**

3. Nature of construction camp facilities: The larger the camp, and the more services, the less the impacts on surrounding local communities. Services that would help reduce impacts include: stores, post office, schools.

   Proposal: to construct a "mixed camp", meaning a camp where workers live with their families if desired, or where workers live in trailers or barracks without families if desired.

   Part of the construction camp could/would become a permanent city for the operating phase.

   The temporary camp could be sited and located so that it would be inundated by water later.

   The siting of a permanent camp for families would be important so that the experience is as pleasant as possible: meaning, it was sited on dry land so people could get out and walk, and near trees and sun exposure if possible. The more pleasant the place is to live, the more families will enjoy living there and impact existing local communities less.

   Limited r & r would be available at camp; workers or families would periodically get out to other areas (larger areas like Anchorage and Fairbanks) for more extended r & r and cultural activities, etc.

4. Policies:

   a. strict regulations where people can go in the upper basin to protect resources, especially hunting and fishing.

   b. No private planes flying in and out.

   c. Policy regarding use of personal vehicles.

   d. Policy to control public access off corridor.

Objective III: Plan A cont.

5. Commuter Schedules:

   a. ORGANIZED commuter scedule for those who don't live with families. Could be busing from Fairbanks, Anchorage, or Cantwell.

   b. Assumption was made that air commuter would not be reliable enough because of weather.

**Rail on this route could be feasible, but was not considered.

OBJECTIVE III: To limit changes in the Talkeetna and Trapper Creek areas.

PLAN B:

1. Access Corridor: Either rail to Devil Canyon orGold Creek, or all rail. No direct road access from the west or north.

2. Mode: rail.

3. Nature of construction camp facilities: Something less than a full service camp would appropriate if the workers can commute in and out to be with their families on a weekly or bi-weekly basis.

4. Policies: the same policies would apply as in Plan A.

5. Commuter Schedules:
   a. ORGANIZED commuter air and rail schedules from the Anchorage and Wasilla-Palmer areas.

OBJECTIVE IV: To encourage changes in the Cantwell area.

1. Access Corridor: access from the Denali Highway only, with a railhead at Cantwell. No access from the west.

2. Mode: rail to Cantwell and road from Cantwell to the Watana site.

3. Nature of construction camp facilities: Minimal facilities: trailers to sleep in (or barracks), mess hall, recreation hall, some family housing for supervisory personnel.

4. Policies:

   a. Individuals drive their own private vehicles to the sites.

   b. No policies about when workers come and go, from where, or use of private vehicles.

   Again, the same as in Objective III: the absence of policies by the state of Alaska (through the Power Authority) might result in the most changes in Cantwell.

   Another kind of policy would be the lack of assertive action: for instance, a state policy to upgrade only the west side of the Denali Highway (and not the entire route) would encourage users to come from Cantwell and go back out to Cantwell, rather than driving on through to the Richardson Highway.

5. Commuter Schedules:

   a. None.

   b. No policy on public access.

   c. No policy on use of fish and game along corridor.

OBJECTIVE V: To limit changes in the Cantwell area.

1. Access Corridor: access from the Parks Highway on the west; no access at all from the Denali Highway.

2. Mode: either road or railroad.

3. Nature of construction camp facilities: Full service camp, with complete services for all who wish to bring their families. Same description that limits changes in the southern communities would also help to limit changes in Cantwell. See Objective IVa.

4. Polices:

   Same policies that limit changes in the southern communities would help to limit changes in Cantwell also. See Objective IVa.

5. Commuter Schedules:

   ORGANIZED commuter schedules on some regular basis (weekly or bi-weekly.)

SECTION 2

BACK-UP DATA

COMMUNITY WORKSHOPS

Community workshops were held in Fairbanks, Talkeetna, and Anchorage in March 1981 in an attempt to determine what concerns the people of these areas had relating to recreation and access planning on the Susitna hydroelectric feasibility study. Information was presented at each workshop concerning several access and recreation plans and comments recorded that could be used to help in access and recreation planning. In all, more than 300 comments were received in response to printed questionnaires. Of these 50 pertained directly to the question of access. Questionnaires were also received relating to recreation, but these comments also often related to access.

Participants in the workshops were presented with four alternative access plans which used various combinations of road and rail access in combination with existing routes (Figure 1). They were: 1) Access Route A -construction of a new road from Hurricane to the Devil Canyon and Watana sites; 2) Access Route B - construction of a railroad to both dam sites from Gold Creek; 3) Access Route C - construction of a road from the Denali Highway to the Watana site. construction of a service road from Watana to Devil Canyon, and construction of a railroad spur from Gold Creek to Devil Canyon; and 4) Access Route D - the same as Route C except that a new road from the Parks Highway would replace the rail spur.

The following table shows the response of the workshop participants.

| Route | Fairbanks | Talkeetna | Anchorage | Mail* | Total |
|---|---|---|---|---|---|
| Route A | 1 | 3 | 0 | 1 | 5 |
| Route B | 13 | 12 | 1 | 5 | 30 |
| Route C | 3 | 2 | 0 | 3 | 8 |
| Route D | 0 | 0 | 3 | 2 | 5 |
| No Preference | 1 | 1 | 0 | 0 | 2 |

*Mail responses were mostly from the Anchorage area and reflect the thinking of that area.

This table shows that most of the people attending the workshops in Fairbanks and Talkeetna favor rail access during and after construction. Additionally, almost half the people in Anchorage favored the rail only alternative. Some of the reasons given were: 1) fewer environmental impacts; 2) easier to limit the number of people and types of activity in surrounding areas; 3) less expensive; and 4) more energy efficient.

About half the people in Anchorage and one-third of the people in Fairbanks and Talkeetna favored some type of road access because they could gain access to areas they feel are currently inaccessible. The Anchorage people tended to favor the Denali route, but in Fairbanks several people spoke out against it because of the potential adverse effects on caribou calving grounds near that route.

In addition, some people at each workshop indicated they favored no access or very limited access. Suggestions ranged from brining in supplies during the winter on snow roads to access by air. Those in favor of air access suggested it as a way to bring workers to the construction site that would lessen impacts on other railbelt communities.

The following is a detailed breakdown of the reasons behind the preferences expressed in the Fairbanks, Talkeetna, and Anchorage workshops.

FAIRBANKS (36 attended, 17 responded)

One who preferred access Route A gave this reason:

1. As a land owner (lottery winner - 20 acres in area east of Indian River and north of Susitna) I'm in favor of access Route A for accessibility into my property. There are a total of 75 people who will be staking up to 20 acres each in the are I've mentioned... Marilyn Stark

Those who preferred access Route B gave these reasons:

1. Less environmental damage; less public access the better. Also lower cost. I don't want any access.
2. Route B would give the least access and thus cause the least human impact onto land and wildlife. This is the only hope for preserving any of the Nelchina caribou herd.
3. I prefer the all rail alternative because it curtails unlimited public road access. If a road is built, I don't think there's any doubt that pressure will be exerted eventually to open it to the public (as with the haul road). The mere presence of the reservoir(s) will greatly increase boat and float (and ski) plane access, and I think that's enough (too much, in fact). A railroad is the best approach to controlling unlimited access. If alternative route A-2 is feasible, then a rail link from Gold Creek to Devil Canyon should be included, and a road on the north side to Watana, just so there isn't road access all the way in.
4. a) lowest $ cost to build and operate
   b) possible interruptions in imported oil supply make more fuel-efficient railroads desirable

c) I'm concerned about impact on Denali Highway

5. Minimal cost; minimal impact on fish and wildlife, wetlands; minimal access; minimal fuel consumption; minimal other energy waste. In short RAIL ONLY IS THE NEXT ROUTE TO NONE AT ALL.

6. This choice minimizes impact if I must choose an access. I also see this as a way to control access as if it is a public project sponsored by public $ and the public can legally demand access (i.e. the haul road). But -- if A, could be fully controlled I'd go with that because as reads -- it causes minimal impact.

7. I would prefer no access from the Denali Highway and I think this is the only access route that prevents this. Also, I think maybe a railroad line could be built to Devil Canyon then a service road could be built on the north side of the river to Watana. The engineering concerns might put construction back two or three years, but this would save 100 years effect on wildlife and environmental concerns.

8. Since feasibility studies on the whole hydro studies are incomplete and inconclusive, as well as studies on access routes, one cannot make a well informed decision at this time. Therefore, I cannot find any particular route acceptable. However, since a rail access route would be most limiting to private vehicular traffic, I favor it over others, since I value the existing recreational and scenic potential, and hope for a minimal change in those potentials.

9. a) railroad right-of-way has less impact than a road or highway.
   b) access of the general public is better controlled into the area.
   c) construction of the railroad appears to be less costly way to go. You can haul more material or freight on one train than what 60 trucks could do.

10. to limit the access to recreationalists; no recreational vehicles; no speed boats.
11. no road; costs less; costs less to maintain road.
12. Rail only has the least long term impact. I feel this should be considered even if it puts your starting date for construction back 1-3 years. The added time (i.e. setback) will be the best for the long term. I favor as little impact. (I prefer no Susitna dam). If the dam was built -- rail should be the only access.
13. With a railroad spur which will be needed to move in the big turbines and other pieces of equipment you will not need a road system and it is also the less costly of all of the access routes and it will keep the area wilderness and limit public access.

Those who favored access Route C gave these reasons:

1. The highway access via the Denali should be eliminated if "C" is considered (environmental concerns and mainstream development to the south are prime reasons for this choice. I would like to see interconstruction development at rail nodes kept to a minimum and a consistent awareness for the local habitants kept as a forerunning concern.
2. Most expedient, hence lowest cost especially as regards Watana.
3. Apparently lowest impact on wildlife habitat along Denali Highway. Watana route, depending on recreational plan decided on.
4. The least environmental impact.

No reason for favoring Route D.

One comment with no choice:

1. I don't feel I have enough information as to the pros and cons of

route.

Each one interferes with wildlife habitat and migration routes in about equal ways, it seems.

Using a railroad seems a less disturbing way -- it can control access -- but a road cannot. Even the railroad will allow off road vehicles to get in there.

TALKEETNA (38 attended, 17 responded)

Those who favored access Route A did so for these reasons:

1. Keep the countryside as much like it is as possible.
2. a) Retain the wilderness status of this area as much as possible.
   b) I do not accept the assumption that there will be public access.
   c) Rail access from Gold Creek with tourists riding in and out may be acceptable.
   d) I especially don't want to see boats on the lake and their associated hunting and fishing, camping, etc. pose a great threat to the wilderness.
   e) Large buffer zones of no access on the lake and power lines.
3. Minimum road access.

Those who favored access Route B did so for these reasons:

1. a) restrict private and commercial vehicles to the sites.
   b) environmental impact of railroad (after construction) would appear to be much less severe than a road.
      1) no stopping, parking, shooting, etc. from the side of the road.
      2) no 4 x 4's or ATV's driving off into the wilderness.

c) cheapest alternative

d) least impact on communities.

1) would limit the manpower to air transport.

2. Least public impact, yet allowing those that are willing to go through the trouble to get there, the ways and the means to do so. Also, once completed possibly would be less problem maintaining.

3. Least adverse effect on environment over long term.

4. The railroad would at least minimize impact on the area.

5. Limit access for construction and maintenance only; no public road needed; railroad easiest to regulate in this manner could be removed after construction is finished.

6. Railbelt area already handles population. Expancing this service is easier than developing new population centers or areas. Public access is contained to certain places (designated by train stops).

7. Railroad only gives greater control over access. Americans must and can learn to divorce themselves from their vehicles. With railroad only, you gain greater control over total numbers going to the site and also control over developments along the route.

8. Would get the project completed with the least amount of _____.

9. The railroad would be far more economical way to move materials with the least long-lasting impact.

10. Least impact on area and future generations will get to see and enjoy it as it was. People don't bring their ATV with them on the train, nor do they have the ability to stop everywhere. The area along railroads is less impacted than areas along roads. And people in the future will travel via public transportation -- not private cars.

11. Limits access by the masses by train or air. I am 100% opposed to any road use especially as it applies to vehicular (private autos).

One favored C over A for this reason:

1. The reason for my choice between A or C is cost. I live close to Mile 99½ Parks Highway. I'm not necessarily excited about more roads but there is a need. If a road is put in hopefully the wildlife would be protected for all to see and enjoy. No hunting permitted close to the highway. Perhaps park rangers would teach people how to appreciate and care for their state. I'd just like to see people enjoy Alaska as we did 16 years ago before it became overcrowded.

No one favored D.

One didn't mark a choice, but noted this comment:

This meeting is supposed to be part of a feasibility study so you shouldn't be giving just four options to choose from. I resent the feeling you give me that you are trying to sell me a plan with a few options to choose from. If I must accept this dam then I favor access routes that allow the least amount of public access and the least amount of human population growth. The social and economic aspects of the dam will have the greatest impact on the natural environment, and they should be minimized. The haphazard way you gather comments is not good. It favors people who are most vocal and doesn't give a true consensus of opinion. The less people that enter the area the better. M. C. Schwab

ANCHORAGE (40 attended, 4 responded)

No one preferred access Route A.

One preferred access Route B for this reason:

1. Access B will limit impacts.

   Is it possible to mail materials ahead of time so public can study?

   Why hasn't Corps study been read?

   Has effect of overall population on recreation been considered?

   Why isn't more hard data available to public?

No one preferred C.

Three preferred D for these reasons:

1. This alternative will provide quick access for construction with later maximum recreational benefit. C is second choice, A is third, B is fourth.
2. Provides maximum public access to otherwise inaccessible areas.

   Provides better access from Anchorage to Denali Highway area. The greater length of highway system decreases hunting pressure on any segment of road or nearby fly in lakes.

   Additional routes allow for flexibility and diverstiy in hauling in materials, equipment and supplies.

   The service road between the dam MUST be open for the public as public funds will be used for _____. This access to this area is required regardless of dam construction.
3. Prefer D with modifications:

   Road mode is most flexible during construction phase and most useable by the public after construction -- I am very familiar with the country and favor a road from Hurricane to Devil Canyon, then cross the river and on to Watana on the north side -- this segment will have south slope aspect (much better than south side of river), a lot of wind ex-

posure so will be easier to keep snow free -- I do not favor construction from Denali Highway south to Watana -- that is unnecessary if the above scheme were followed -- permafrost, wetlands impacts and deep snow problems abound on this route -- the preferred "Watana construction first" can be accomplished with this proposal as you will have to cross at Devil Canyon anyway -- this routing would also avoid some very difficult construction along south side of Su east of Devil Canyon.

MAIL (11 responded, mostly from the Anchorage area)

<u>One who preferred access Route A gave this reason:</u>

1. Felt a road to both dam sites would be of benefit to all parties, both during and after construction.
2. No practical reason to build road from Denali; the majority of workers will be coming from Anchorage and Fairbanks and for the few workers from Delta, Glennallen, and Paxon the extra distance wouldn't justify the cost. Tourists will come from Anchorage also.

<u>Those who favored access Route B gave these reasons.</u>

1. a) minimal disruption to existing recreation patterns
   b) minimal tax dollar waste to accommodate governmentally contrived recreation programs, frivolity in a time of serious national needs.
   c) minimal imposed detriments to the habitat.
2. a) rail access sufficient for construction and maintenance
   b) delay is a plus - more time to study environmental implications such as impact on Cook Inlet fisheries.
   c) rail access least expensive.

3. rail access lesser evil as access could be more effectively limited. The potential loss of wetlands and raptor nesting habitat is particularly disturbing.
4. a) cheapest (don't waste money)
   b) disturbs the wilderness least; can be removed when both dams are built.
   c) access for maintenance by float plane or helicopter.
   d) hard to maintain either a railroad or highway in heavy snow or cold winters.
5. restricts or limits access and has minimal effect to the area.

One who favored C or D gave these reasons.

1. Gets away from the scheduling problems of A and B.
2. Economically best after B.
3. Opens up large new area for recreation.
4. Preserves the environmental integrity of the roadless south side of the river.

Two who favored access Route C gave these reasons.

1. Having worked for the Dept. of Highways in the area for 20 years, observation that a road from the Denali would be easiest to build and maintain; less hills, less wetlands, and is more suited to road construction.
2. a) provides easy access for construction and opens up beautiful areas for recreational purposes.

b) highway access is important not only for construction but for continued public access not dependent of train schedules or passenger services limitations.

Two who favored access Route D gave these reasons:

1. Would let most all highway travellers see one dam area while keeping the Watana area under less pressure by people.
   Don't want to see State and Federal governments involved in railroad unless the State purchases the railroad before the dams are constructed.
2. a) no service road between dams.
   b) construct and service power lines between dams with helicopters.
   c) boat access to reservoirs; road access would make it look like Big Lake.

MINERS AND GAME GUIDE QUESTIONNAIRES

Two separate questionnaires were distributed: one to game guides registered in Unit 13 of the Upper Susitna Basin; the other to members of the Alaska Miners Association in Fairbanks and Anchorage. The game guide questionnaire was mailed to 200 guides and 29 responses were received, a return of 15%. The miners' questionnaires were given to members of the Miners Association in Fairbanks and the Board of Directors in Anchorage. It is not known how many were distributed. Eighteen were returned.

Fifty-six (56) percent of the game guides were in favor of public access while 31% were opposed. Responses on what game habitats should not be disturbed were varied, but tended to indicate several areas of concern. One was the Deadman's Creek drainage and the area south of the

Denali Highway that is utilized by the Nelchina caribou herd. Other areas mentioned were the Susitna River proper and several of its major tributary areas. The project area in general was seen to be a prime game and fishing area. Over 40% of the guides favored rail only access and this was often mentioned as first choice with others listed second or third.

The questionnaire included a map (Figure 2) that showed four access routes. These were not the same routes that were presented at the community workshops. The reason for this is the route north of the Susitna was eliminated from consideration due to environmental and engineering problems around the Portage Creek area.

Almost all the miners (90%) favored some type of public access, but the questionnaire did not present alternative routes. Most of this group used the general project area for some type of mineral related activity and use was limited to summer months.

GAME GUIDE QUESTIONNAIRE - February and March 1981

1. What areas of the Susitna River basin do you use?

General answers included Upper Susitna, Tsusena Valley, Clark Creek, Talkeetna River to Kosina Creek, Denali Creek area, Clarence Lake, Lake Louise, Watana Creek.

8 said they used all or most of it. 5 said they used none of it.

2. What kind of use?

25 considered themselves primarily game guides. Of these, 19 included the words "hunting and fishing" as part of their occupation, such as in "guiding hunting and fishing trips". A total of 22 included "hunting or "fishing" plus some other use, such as "mining, prospecting", "rock-hounding", "trapping", "rafting", or "photography".

3. What level of use do you give these areas?

The words "heavy", "moderate", and "light" were used in similar proportion. The seasons listed most were spring through fall. Three persons responded that they use the area from eight months to all year.

Specifically:

| | | | |
|---|---|---|---|
| May - October: | 3 | July - Sept.: | 1 |
| June - October: | 2 | May - Dec.: | 1 |
| July - August: | 1 | 10 mo./year: | 1 |
| June - Sept.: | 1 | Apr.-May/Aug.-Sept. | 1 |
| August - Sept.: | 2 | | |

4. What game habitats should not be disturbed?

Specific locations mentioned included Watana Creek, Kosina Creek, Jay Creek, the area along the Susitna River, Fog Creek, north and southwest of Moosehorn Lake, Stephan Lake, Clarence Lake, Big Lake, along the Alaska Railroad proposed, Portage Creek, Butte Lake, Otter Lake. One person expressed concern about the possible disturbance of swan and salmon spawning grounds. Several expressed concern for the habitats of moose, grizzly and black bear, and caribou. Some specific statements were:

> Impossible to list, Big Su is a key game habitat; effort should be made to stay near water with all travel.
>
> Caribou migration routes, winter moose areas, black and grizzly bear denning areas.
>
> The area bounded by Portage Creek to the west, the Susitna River to the south and east and the Denali Highway to the north is the best game country left in the Talkeetna Mountains.
>
> Wintering areas in all major drainages should not be disturbed.

Those who saw no problems if game habitats are disturbed: 9 .
Those who mentioned concern about the disturbance in specific locations, or of specific animals, or disturbance of the wilderness in general: 16.

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>
> Wintering areas in all major drainages should not be disturbed.

Those who saw no problems if game habitats are disturbed: 9 .
Those who mentioned concern about the disturbance in specific locations, or of specific animals, or disturbance of the wilderness in general: 16.

5. Which access do you prefer?

The guides were given four choices: Corridor 1 - North side of Susitna River from Talkeetna: Corridor 2 - South side of Susitna River from Talkeetna; Corridor 3 - North from Denali Highway; and Railroad - South side of Susitna River. They were also allowed to check all the boxes they felt were acceptable.

| | | | |
|---|---|---|---|
| Corridor 1 | 6 | Railroad | 18 |
| Corridor 2 | 11 | Left it blank | 4 |
| Corridor 3 | 10 | Answered "none of the above" | 1 |
| | | Answered "whatever is cheapest and best" | 1 |

6. Reasons for the above choice:

Comments supporting the railroad included: "less vehicle access means less impact on the animal population and the environment"; OR "It would be more direct." When specific corridors were chosen, the comments tended to be general about the possible distrubance of one or another animal population. Occasionally there was a specific individual comment, such as, "I suppose it's just selfishness but Corridor 1 come closest to the access I use."

7. Would you like to see public access to the project area by privately-owned vehicles after construction is completed?

| | | | |
|---|---|---|---|
| Yes: | 18 | Not sure: | 1 |
| No: | 10 | Limited access only: | 1 |
| | | No response: | 2 |

8. Reason for position on public access:

Those who said yes: I'm paying for it so I'll use it; I support hydro power; all Americans have the right to all of America with the exception of land that is privately owned; we need tourist development and recreational development.

Those who said no: There will be an innundation of people; business will suffer; animal habitats will be destroyed along the river; would prefer the area be left a wilderness; what will happen to the fish; this is a power project, not a recreational facility.

Respondents to this questionnaire reside in:

| | | | |
|---|---|---|---|
| Anchorage | 9 | Haines | 1 |
| Eagle River | 1 | Chugiak | 2 |
| Palmer | 3 | Homer | 1 |
| Cantwell | 1 | Ketchikan | 1 |
| Willow | 3 | Juneau | 1 |
| Gustavus | 1 | Kasilof | 1 |
| Fairbanks | 1 | Wasilla | 1 |
| Tok Highway | 1 | No name or address | 1 |

MINERS QUESTIONNAIRE -- February and March 1981

1. Member of what group or groups:

| | |
|---|---|
| Fairbanks Alaska Miners | 11 |
| Anchorage Alaska Miners | 6 |
| Nome Alaska Miners | 1 |
| Interior Alaska Trappers | 0 |
| Southcentral Trappers | 0 |
| Registered guide | 1 |
| Other: Fur Takers of America | 1 |

Miners reside in:

| | |
|---|---|
| Fairbanks | 10 |
| Anchorage | 6 |
| Maclaren River | 1 |
| Palmer | 1 |

2. What part of the Upper Susitna basin is of particular interest to you:

Almost every respondent had a different answer. Specifically they were:

| | | | |
|---|---|---|---|
| Watana Creek | 1 | Butte Creek | 1 |
| Coal Creek | 1 | Clearwater Mtns. | 1 |
| Portage Creek-Tsusena Creek | 1 | Fog Lakes | 1 |
| Valdez Creek | 1 | Gold Creek | 1 |
| Oshetna and Black Rivers | 1 | Chulitna | 1 |
| Devil Canyon | 1 | Maclaren | 1 |
| | | All parts | 4 |
| | | No parts | 1 |
| | | Upper Susitna Basin | 1 |

One respondent who answered the form in detail said, "Of course, the Maclaren is of major interest to me since that is my home base. However, I would be violently opposed to using the Denali Highway as as dam access. Aside from the esthetic reasons, it would be an economic disaster for me, as a major portion of my trapline runs from Mile 7 Denali Highway to Mile 71."

3. What area of the river basin do you currently use:

Answers mirrored those above. Specifically:

| | | | |
|---|---|---|---|
| Watana Creek | 2 | Butte Creek | 1 |
| Coal Creek | 1 | Clearwater Mtns. | 1 |
| Chulitna Canyon | 1 | Lower Susitna | 1 |
| Chulitna Creek | 1 | Upper Susitna | 1 |
| Stephan-Fog Lakes | 1 | Upper + Middle | 1 |
| South side-Susitna drainage of Fhunilma Creek | 1 | Upper Tsusena Creek | 1 |
| | | Devil Canyon | 1 |
| | | N/A | 1 |
| | | None | 4 |

4. What kind of use?

| | | | |
|---|---|---|---|
| Minerals exploration | 2 | Recreation/rest | 2 |
| Trapping wolves that prey on wintering moose | 1 | Mining | 5 |
| | | Hunting/fishing | 4 |
| | | Hardrock minerals | 1 |
| Mineral development | 1 | None | 1 |
| Trapping | 1 | N/A | 1 |

5. What level of use do you give the areas:

Light use was listed most frequently, though moderate and heavy use were also put down. Specific dates:

| | |
|---|---|
| June - September | 7 |
| Oct. 15 - April 1 plus Sept. deer hunt | 1 |
| None | 1 |
| N/A | 1 |
| Fall and Winter | 2 |
| Year-round | 1 |
| September - October | 1 |

6. Would you like to see public access via privately-owned vehicle after construction is completed?

| | |
|---|---|
| Yes | 16 |
| No | 2 |

7. What is the principal reason for your position on access?

Yes answers:

| | |
|---|---|
| Access to potentially productive mineral deposits | 5 |
| Public funds, public use | 10 |
| Recreation use | 3 |
| Hunting and fishing | 1 |

One respondent who answered yes, added, "I strongly feel we should extract all minerals from this area before we complete the dam and begin flooding the area."

No answers:

| | |
|---|---|
| The area is undisturbed now, don't want to lose that | 1 |
| The game population will be driven down | 1 |

# ALASKA POWER AUTHORITY

SUSITNA HYDROELECTRIC PROJECT

WORKSHOP # 3

## ACCESS ROUTE SELECTION QUESTIONNAIRE

1. Which Access routes do you find acceptable?

_____ A _____ B _____ C _____ D

2. Please give the reasons for your choices.

# ALASKA POWER AUTHORITY

ACCESS TO PROPOSED SUSITNA HYDROELECTRIC PROJECT

1. What areas of the Susitna River basin do you currently use? _____

2. What kind of use? _____

3. What level of use do you give those areas? (Be as specific as possible: months of year? every year? heavy, moderate or light? etc.?)

4. Please list the location of significant game habitats that you feel should not be disturbed. Be as specific as possible. Efforts will be made to avoid key game habitats.

5. Look at the map on the back of the yellow flyer. Which access do you prefer? Check all the ones you find acceptable.

_____ Corridor one _____ Corridor two _____ Corridor three _____ Railroad

6. Please give your reasons for your choices in #5. (Your reasons give the planners important information to use in making their recommendations for an access plan.)

7. Would you like to see public access to the Susitna hydroelectric project area by privately owned vehicle after the construction is completed?

8. What is the principle reason for your position on public access to the project area?

NAME _____ PHONE _____

ADDRESS _____ ZIP _____

Thank you for your assistance! Please return this form before March 15th to:

Alaska Power Authority
Public Participation Office
333 West 4th Avenue, Suite 31
Anchorage, Alaska 99501

UNIVERSITY OF ALASKA, FAIRBANKS
Fairbanks, Alaska 99701

SUSITNA HYDROELECTRIC PROJECT

RECREATION PLAN

Public Forum Questionnaire

1. The development approach I most prefer is _____. (List only one.)
(letter)

2. Do you have any suggested modification to the above selected approach? Please number each suggestion.

_____

_____

_____

_____

3. Why did you chose your particular approach?

_____

_____

_____

4. a. In which region of the state do you live:

_____ Anchorage

_____ Fairbanks

_____ Railbelt (between Anchorage and Fairbanks)

b. How would you classify the place where you live?

_____ Urban _____ Small town

_____ Rural _____ Rural remote

_____ Other...list _____

c. Do you represent a particular interest group? If so, please list.

_____

You may use the back side for any additional comments.

Thank you.

# APPENDIX D

# CONTINGENCY RISK METHODOLOGY

## ACCESS ROAD

METHODOLOGY FOR QUANTITATIVE RISK ANALYSIS FOR ROAD VS. RAIL LINK ACCESS ONLY.

1 - Background and Definition

The "risk" that is addressed here is the increased risk associated with stoppages and delays involved with a rail link access only. A road access is more flexible to adapt to different adverse situations than a rail is.

2 - Approach

(a) Identify and list possible adverse events which could occur for a rail access that could result in stoppages and delays. Examples are as follows.

- Rail Strike by the rail workers.

- There is a possibility (a low probability of occurance) that the teamsters would tie up the job if a rail link access only is implemented. This would occur in rebellion of a plan to utilize rail and not truck, thus eliminating, some teamster jobs. This probability would be greater if an all rail route were planned however the combination truck/rail reduces this probability considerably.

- Earthquake, mudslide, flood. In these occurances, which are low probability occurances, the risk in delays is associated with longer delays for putting a rail line back in service than a roadway. In other words the risks of an earthquake, mudslide, etc. are equal when comparing a road versus rail however a roadway is more flexible and could be put back into service in a shorter period of time.

- Derailments - The risk and resulting damage in derailments involves not only delays in putting the line back in service, but in lost cargo also.

- Breakdowns - The risk in breakdowns is the same as derailments however the duration of the delays is very small (in order of hours, not days or weeks) and the cargo generally is not lost.

(b) For each event determine the length of delay and any consequences other than costs of the delay.

(c) For each event determine the probability that the event could occur. This will entail review of historical records to determine the occurance of such events in the past.

(d) For each event determine the cost penalties associated with each event or delay.

(e) To arrive at a cost figure associated with each event, or the "cost of insurance" for each event, multiply the total damages of each event X the probability of that event occuring over the life of the project.

cost of insurance = damage X probability

(f) Sum the "cost of insurance" for each event to arrive at a total "cost of insurance" figure.

3 - Alternative Approach

An alternative approach is the multiple probability approach. In this approach the road is estimated to have some multiple of the probability of adverse events than a rail is. This is to say a multiple of events would have to occur with a road to cause the same delays or damages one single event would with a rail.

(a) Determine the multiple of probabilities the road is in comparison to a rail.

(b) Determine the overall total number of days and costs that could be lost due to adverse events.

(c) Determine a probability of occurance which would include all events and determine the total "cost of insurance".

(d) Due to the multiple probability of a road, multiply the probabilities of the road and determine the "cost of insurance" for the road. (For example if it is determined there is a 1% (.01) probability of delays which is used to determine the cost of insurance, and it is determined the road has twice the probability or twice the number of events, which would have to occur, the probability associated with the road is (.01) X (.01) = .0001).