ALASKA LEGISLATURE COMMITTEE FILES, 1989-1990 8672
6706 SENATE STATE AFFAIRS 1110

NATURAL RESOURCE DEVELOPMENT

IN NORTHWESTERN BRITISH COLUMBIA, 1988

A.D. Grove Sept 22/88

Resource development in northwestern B.C. is highly dependant upon access and power. The area is rich in natural resources but has only limited access via Highway 37, a few aircraft landing strips, no rail, and no major developed power supply.

Stewart, B.C.'s most northerly port on the Pacific coast, has recently become the transportation hub for much of the area and is now a booming community because of logging along part of Highway 37, and mine exploration and development from Stewart to the Sulphurets Creek area. This surge of activity came about at Stewart largely because Cassiar Asbestos abandoned its Skagway route and chose a cheaper truck-barge haul through Stewart. Logging operators have also taken advantage of the route and are now shipping increasingly larger volumes of saw and pulp wood through this port.

Recent plans to build a major pulp mill at Stewart appear to have many obstacles at this time and an alternative will be to ship logs and chips to existing mills. The cut from the Telegraph Creek area alone has been estimated from 400-500,000 tons annually.

At the present time 1.2 million cubic meters of wood are shipped annually through Stewart. Current timber cutting licenses are good until 1996 at the same allowable cut from the North Kalum T.S.A. The larger Cassiar T.S.A. has a volume of 330 million cubic meters of mature timber of which 70 million cubic meters (21%) are found in the relatively small Iskut River timber block which currently lacks access and power.

The main mineral product now shipped along Highway 37 through Stewart is asbestos from the Cassiar Mine. Because of a recent B.C. government loan of $25 million new jobs have been added and production from open pit and underground has been assured to the year 2000. Stewart will also benefit from the new open pit operations at the nearby Silbak Premier and Big Missouri mines which will process 2,000 tons per day of gold-silver-copper-lead-zinc ore. Numerous new and revived mineral developments in the immediate Stewart area have added to the town's prosperity. In spite of the distance and lack of easy access, Stewart and Terrace, B.C. have also benefited from the huge surge of activity in the Iskut River-Unuk River-Sulphurets Creek area where at least 75 resource companies are actively developing major new gold-silver deposits. One of these, Skyline Explorations Ltd. Johnny Mountain Gold Mine, is now in production and a second, the nearby Cominco-Delaware SNIP property is nearing a production decision. Both these develop-

ments as well as a number of others in the Iskut River Gold Belt have largely switched to Wrangell as the more convenient air transportation centre.

Other deposits in the same area include copper, lead and zinc mineralization which because of the lack of access and power must remain undeveloped. Road access to the coast and electrical power would change the economics of developing the forest and mineral resources of the entire Iskut River, Unuk River and Sulphurets Creek area.

Most of the area from Stewart to Telegraph Creek was explored in the 1950's through the 70's for porphyry copper and molybdenum deposits. Several world scale copper-moly deposits such as the 1.6 billion ton Shaft Creek, the Stikine Copper deposit and others have been found and partly developed but will go into production only when economic conditions including power and access to a sea port are considered appropriate.

Coal and ore concentrates from the general area extending from Cassiar to Stewart, but particularly from the Iskut River axis, would benefit from shorter road access to a sea port other than that currently provided by Stewart. A road along the Iskut River route to Bradfield Canal and a deep sea shipping facility would cut about 75 km off the current route. As Cassiar Asbestos has shown resource companies will switch routes and transport if there are benefits.

Shipments through the system are extremely difficult to forecast but if only a few of the potential copper mines were considered there would be a potential for over 300 000 tons of concentrates per year. Lead and zinc, coal, and asbestos could add a further 1.3 million tons per year at peak cycles. Together with wood forecasts the area could be projected to export 2 million (+) tons per year, provide hundreds of new jobs, and import large tonnages by sea and road.

Good road access to the sea would also benefit local tourist industries of the entire region.

Sept 22/88

E. W. GROVE CONSULTANTS LTD.

EDWARD W. GROVE, Ph.D., P.Eng.
CONSULTING GEOLOGIST

4581 Boulderwood Drive
Victoria, British Columbia
Canada V8Y 3A5

Phone (604) 658-2356
Fax (604) 658-5289

B.C. MINING OPERATIONS

VOLUMES, VALUES & FLIGHTS

NUMBER OF INTERNATIONAL FLIGHT OPERATIONS WRANGELL AIRPORT

Year	1986	1987	1988	1989
# Flights	279	3,600	6,361	7,372

AIRCRAFT CARGO VOLUME 4/1/88 - 4/1/89

FUEL	7,646,308	LBS.
LUBRICANTS	108,352	LBS.
FOOD & SUNDRIES	356,937	LBS.
BLDG. & HARDWARE SUPPLIES	177,000	LBS.
EQUIP. REPAIR & FABRICATION	72,000	LBS.
PROPANE, ACETYLENE, OXYGEN ETC.	236,900	LBS.
MISC. EQUIPMENT & SUPPLIES	22,000	
IN TRANSIT HEAVY EQUIPMENT & SUPPLIES	3,943,892	LBS.
ORE CONCENTRATES	76,275	LBS.
TOTAL AIRCRAFT CARGO VOLUME	12,642,644	LBS.

AIRCRAFT CARGO VALUE (local purchase) 4/1/88 -4/1/89

PETROLEUM PRODUCTS	$1,678,228
FOOD AND SUNDRIES	497,000
BUILDING, HARDWARE, AUTOMOTIVE	178,000
MISCELLANEOUS SERVICES (trucking, equipment repair, longshore, video rentals, hotel, meals etc.)	135,000
TOTAL LOCAL PURCHASES	$2,488,228

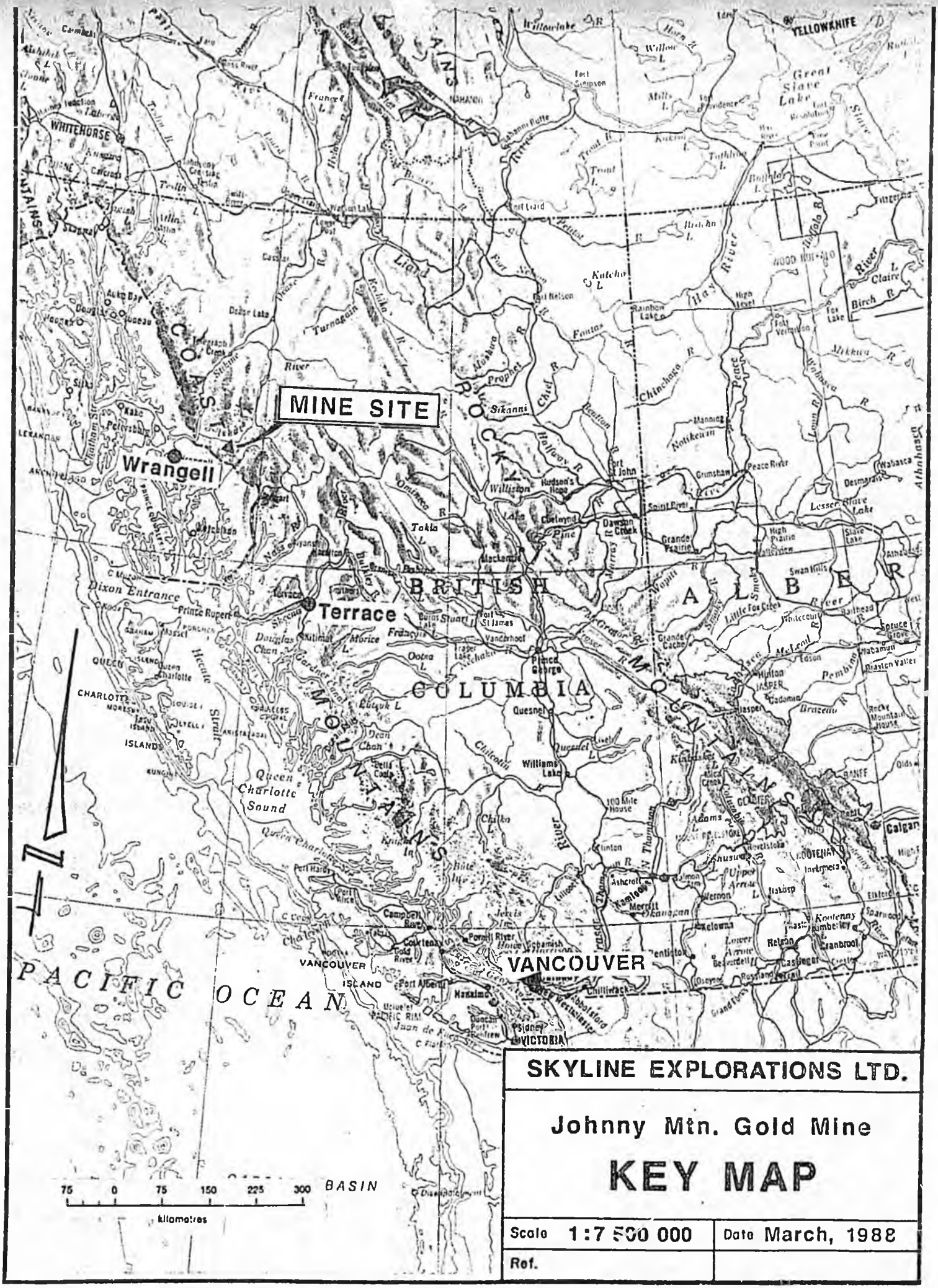
NEW BUSINESSES & JOBS AS A DIRECT RESULT OF MINING ACTIVITY

North Arm Expediting (new business)	3 employees
White Pass Oil (new business)	3 employees
Bradfield Electric (new business) (will have construction crew for power line)	1 employee
U.S. Customs	1 new employee
City Market	5 new employees
Diamond Aviation	1 new employee
Chevron Oil	1 new employee
Longshoremen	5 new jobs

TOTALS: 3 NEW BUSINESSES & 20 NEW JOBS

In addition there are 3 Canadian air carriers working out of Wrangell. Two servicing mining operations daily with 3 -4 employees staying in Wrangell. One transporting mining personnel for R & R one trip per week.

Estimated Overall Economic Value to Wrangell is in excess of $15,000,000.00.



SKYLINE EXPLORATIONS LTD.

Johnny Mtn. Gold Mine

KEY MAP

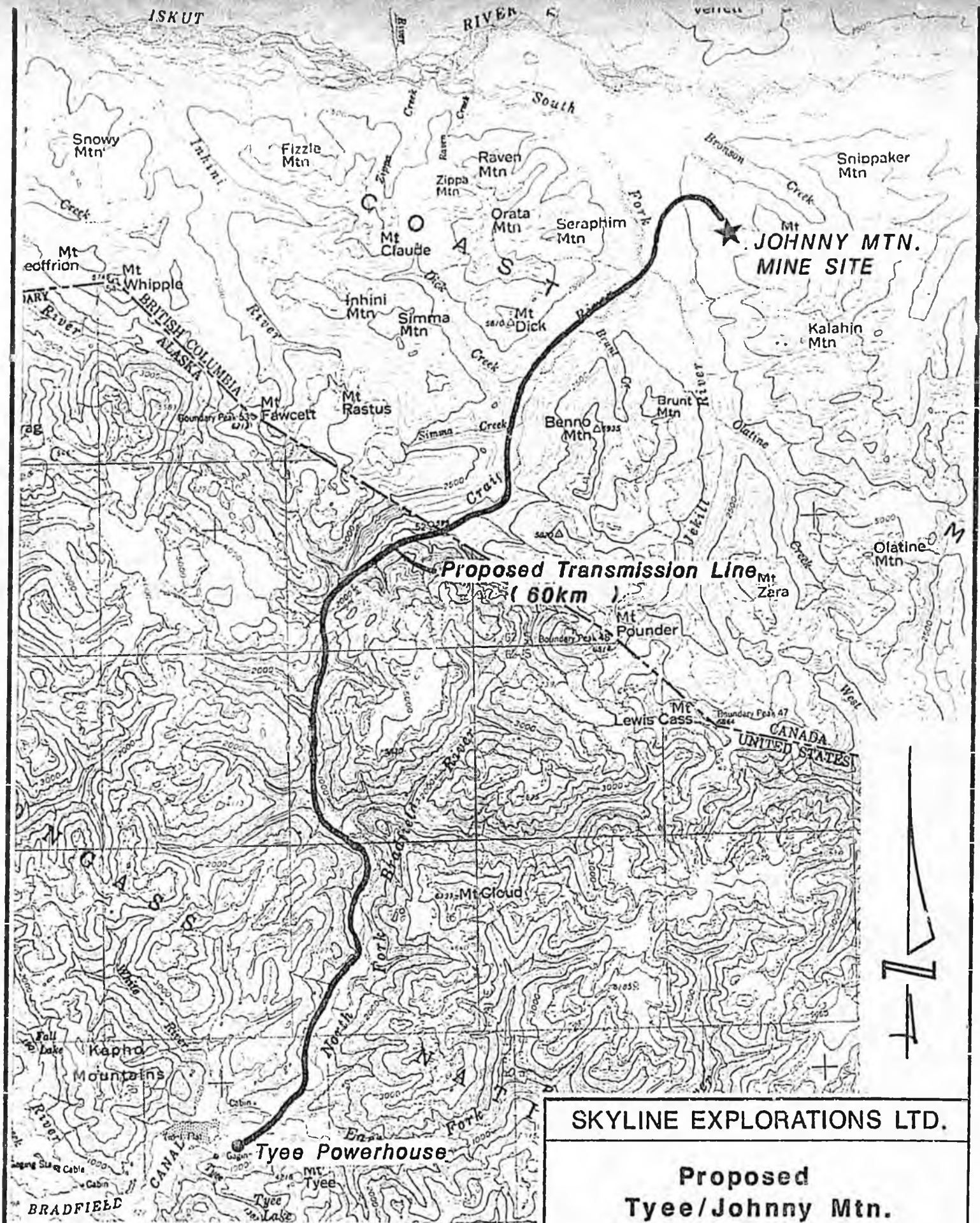
Scale 1:7 500 000	Date March, 1988
Ref.	

SKYLINE EXPLORATIONS LTD.

Johnny Mtn. Gold Mine

LOCATION MAP

Scale 1:2 000 000	Date March, 1988
Ref.	



SKYLINE EXPLORATIONS LTD.

Proposed Tyee/Johnny Mtn. Transmission Line

Scale	1 : 250000	Date	88/02/22
N.T.S.	N.T.S. 104/B		

PROPOSED BRADFIELD-CRAIG ROAD

APPROXIMATE MILE/KILOMETERS

	MILES	KILOMETERS
BRADFIELD CANAL TO CASSIAR HIGHWAY (@ BOB QUINN LAKE)	86.0	138.40
BRADFIELD CANAL TO CANADIAN BORDER	31.0	41.38
CANADIAN BORDER TO JOHNNY MOUNTAIN MINE	15.0	24.14
JOHNNY MOUNTAIN TO CASSIER HIGHWAY	45.0	72.50
BRADFIELD CANAL TO CASSIAR JUNCTION	278.0	447.60
STEWART B.C. TO BOB QUINN LAKE	134.0	217.0
STEWART B.C. TO CASSIER JUNCTION	327.0	526.0

15. Bradfield Canal

LOCATION: At head of Bradfield Canal, southeast of Wrangell.

LEGAL DESCRIPTION: T. 65 S., R. 89 E.; T 65 S., R. 90 E., C.R.M.

ACREAGE: 5,020 - nominated
4,090 - proposed for selection

NOMINATED BY: City of Wrangell

ACCESS: By boat to anchorage in Bradfield Canal. Tidewater terminus of future transportation corridor into British Columbia (Iskut River, Cassier Highway). Airstrip for Tyee power project is within nomination. Old logging roads lead up North Fork Bradfield River.

NEARBY COMMUNITIES: Wrangell - 45 miles NW, Myers Chuck - 60 miles SW

LAND STATUS: National Forest

GENERAL DESCRIPTION: Flat valley land from above confluence of north and east forks of Bradfield River to Bradfield Canal. There are extensive mudflats and wet grasslands (over 2 square miles) at head of Bradfield Canal. The valley walls are steep and forested. Proposed selection includes some steep slopes adjacent to Bradfield Canal and relatively flat areas near the mouth of the Harding River that could be used as a port site.

The Tyee Lake hydroelectric project powerhouse is located within nomination, Tyee Lake is to the south. This power project, administered by the Alaska Power Authority, supplies electricity to Wrangell and Petersburg (see selection proposal #16).

East Fork Bradfield River is a natural transportation corridor to active mining areas near Mt. Johnny B.C., 35 miles to the NE. Mine developers are interested in power line to Tyee project and eventual road to tidewater. A road could eventually link to Cassier Highway and continental road system.

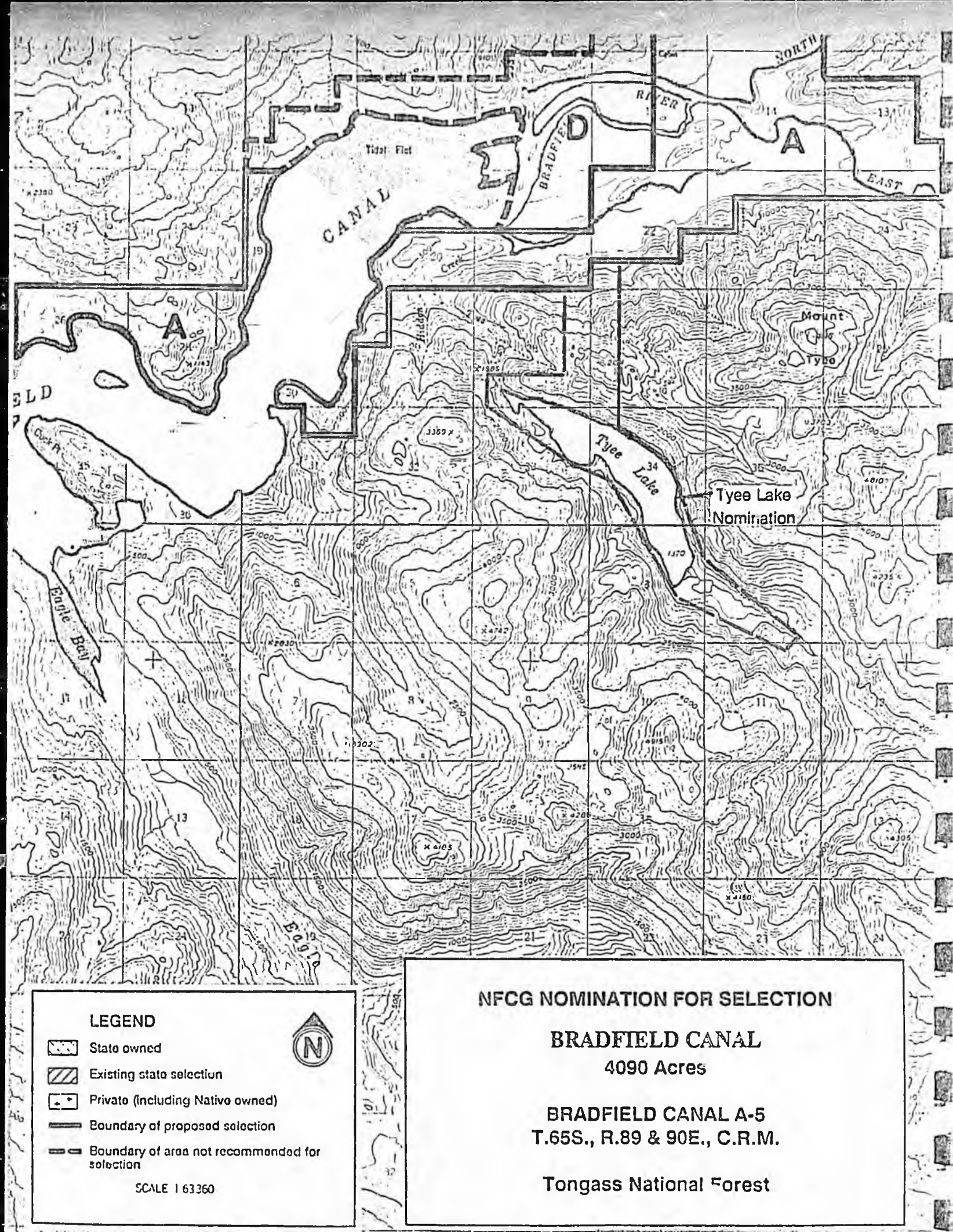
PURPOSE AND SUITABILITY: If a road or railroad is built into B.C., this site would become a port. Development of a new community is possible. There is a large area of flat land suitable for community development.

The North Fork of the Bradfield River is one of the two most likely transportation routes to the Iskut River, the other route being along Aaron Creek and the Katete River. Routes up the Stikine River are costly due to necessary bridges and also run through federally designated wilderness.

SELECTION HISTORY: None.

DIFFERENCE BETWEEN STATE AND FEDERAL MANAGEMENT. Port development would be much easier if the land is state owned. Community development could only occur under state ownership.

RECOMMENDATION: Priority A, although future use is speculative. Steep slopes on north side of Bradfield Canal and extensive mudflats that have high habitat values have been excluded from the selection.



NFCG NOMINATION FOR SELECTION

BRADFIELD CANAL

4090 Acres

BRADFIELD CANAL A-5
T.65S., R.89 & 90E., C.R.M.

Tongass National Forest

LEGEND

- State owned
- Existing state selection
- Private (including Native owned)
- Boundary of proposed selection
- Boundary of area not recommended for selection

SCALE 1:63360

N

DECISION NOTICE
and
FINDING OF NO SIGNIFICANT IMPACT

ENVIRONMENTAL ASSESSMENT
BRADFIELD ELECTRIC TRANSMISSION CORRIDOR

USDA, Forest Service, Tongass National Forest
Stikine Area, Wrangell Ranger District

An environmental assessment that discusses the proposed Bradfield Electric power transmission line is available for public review in the Forest Service, Wrangell Ranger District office in Wrangell, Alaska.

Bradfield Electric, of Wrangell, Alaska, has requested a special use permit to survey, construct, operate and maintain a 69 KV power transmission line across National Forest lands from the Tyee power house to the Canadian border to serve short term mining interests around Johnny Mountain, B.C.

A Forest Service interdisciplinary team analyzed the potential environmental effects of this proposal, as well as the alternatives of using a long span design and buried transmission cable. Alternative routes were not considered because all other routes were either physically, economically, or legislatively undesirable. In addition, an alternative of denying the permit was considered. An environmental analysis document was then prepared.

The analysis indicates that alternative number 3 would provide the most desirable corridor for the powerline ROW because this route would have the least adverse environmental effects; the greatest potential for mitigation; would be acceptable within a LUD II area; and would not significantly interfere with the potential for future development within the corridor.

Based on this evaluation, it is my decision to adopt alternative number 3, a short span power transmission line, and to issue the required special use permit to Bradfield Electric, Wrangell, Alaska. This permit will allow for the survey, construction, operation and maintenance of a 69 KV power transmission line across National Forest lands. The approved route is from the Tyee powerhouse to the Canadian border along the North Fork Bradfield and Craig River drainages. All mitigation measures for protection of fish, wildlife, visual and soils resources as listed in the Environmental Assessment are adopted and shall be incorporated in the special use permit. In addition, the powerline will be designed to cross rivers and streams at a low angle of incidence, where physically possible, to help avoid bird strikes.

The proposed action will have no significant effect on subsistence uses or resources in accordance with ANILCA section 810.

I have determined that this action would not significantly affect the quality of the human environment. Therefore an Environmental Impact Statement is not needed.

Since the proposal to plan, construct, operate and maintain a power transmission line on National Forest lands may include wetlands or floodplains, implementation of this project shall not take place until thirty days after the date of this decision notice.

This decision is subject to administrative review pursuant to 36 CFR 211.18. Notice of appeal must be in writing and submitted to Douglas K. Barber, Acting Forest Supervisor, Stikine Area, P.O. Box 309, Petersburg, AK 99833, within 45 days of the date of this decision.

May 6, 1988
Date

/s/ Douglas K. Barber
DOUGLAS K. BARBER
Acting Forest Supervisor

BRADFIELD-CRAIG

ROAD & PORT PROJECT

SUPPORTING RESOLUTIONS

SOUTHEAST CONFERENCE

P.O. Box 22286 Juneau, Alaska 99802

SOUTHEAST CONFERENCE
RESOLUTION #88-09

RELATING TO THE CONSTRUCTION OF A ROAD FROM THE CANADIAN BORDER TO THE SEA VIA THE BRADFIELD-CRAIG RIVER CORRIDOR AND THE CONSTRUCTION OF A DEEP WATER PORT FACILITY ON THE BRADFIELD CANAL

WHEREAS, the Southeast Conference is dedicated to improving the economic stability and quality of life in all Southeast Alaskan communities; and

WHEREAS, efficient transportation systems are the key element for the movement of goods and services and the resulting development of a stable and diverse economic foundation in Southeast Alaska; and

WHEREAS, economic development in Southeast Alaska today is severely handicapped by high tariffs Jones Act restrictions, market inaccessibility and other barriers directly attributable to inadequate transportation systems; and

WHEREAS, the success of any effort to broaden the economic base in Southeast Alaska is highly dependent upon our ability to develop a hard surface link to the mainland that will provide a viable alternative for accessing new markets in the United States and Canada; and

WHEREAS, the pending United States-Canada Free Trade Agreement affords and opportunity for furthering our economic relationships with Canada if we have access to the Canadian markets; and

WHEREAS, massive natural resource developments in British Columbia have created a legitimate long term demand for access to the sea via a road system through Central Southeast Alaska; and

WHEREAS, the State of Alaska has completed numerous reconnaissance studies in Central Southeast Alaska to determine the most practical road route to access the mainland; and

WHEREAS, a road up the Bradfield-Craig River Corridor and construction for a deep water port on the Bradfield Canal has been adjudged the least sensitive environmentally and the most viable from an engineering standpoint by the Alaska Department of Transportation and Public Facilities (AK DOT/PF); and

WHEREAS, this route lends itself to AK DOT/PF long range transportation plans for expansion of road systems in Central Southeast Alaska; and

WHEREAS, the State of Alaska has nominated land selections for port development on the Bradfield Canal in anticipation of road construction; and

WHEREAS, the State of Alaska has allocated funds for, and is proceeding with, an economic feasibility study on the Bradfield-Craig Road and Port Project; and

WHEREAS, a utility corridor to supply power to Canadian mining companies has already been established parallel to the proposed Bradfield-Craig road route; and

WHEREAS, the State of Alaska has initiated diplomatic contact with British Columbia to discuss the Bradfield-Craig road and its continuation on the Canadian side of the border to intersect with the British Columbia highway system to complete the intercontinental link from Central Southeast Alaska to Canada and the Continental United States; and

WHEREAS, Canadian resource development interests have given their assurances to the State of Alaska and the Province of British Columbia that they find the proposed Bradfield-Craig Road and Port highly desirable as a route to the sea for export of raw materials, and that they will lend their support to the development of the project; and

WHEREAS, the City and Borough of Juneau, the Ketchikan Gateway Borough, and the Cities of Wrangell and Petersburg have endorsed the project by passing formal resolutions expressing their support for the Bradfield-Craig Road and Port Project.

NOW THEREFORE BE IT RESOLVED that the State of Alaska is urged to expedite construction of a road to Canada via the Bradfield-Craig River Corridor and the construction of a deep water port facility on the Bradfield Canal; and

BE IT FURTHER RESOLVED that because of the importance of this project to the future economic security of all Southeast Alaska, the Southeast Conference places the Bradfield-Craig Road and Port Project as a high priority of the Conference.

Adopted by the Southeast Conference this 24th day of September, 1988.

Ernest Polley, President

K E T C H I K A N G A T E W A Y B O R O U G H

Resolution No. 785

A RESOLUTION OF THE ASSEMBLY OF THE KETCHIKAN GATEWAY BOROUGH, ALASKA, URGING THE GOVERNOR AND THE ALASKA LEGISLATURE TO APPROPRIATE FUNDS FOR THE TIMELY CONSTRUCTION OF A ROAD FROM THE CANADIAN BORDER TO THE SEA VIA THE BRADFIELD-CRAIG RIVER CORRIDOR AND CONSTRUCTION OF A DEEP WATER PORT FACILITY ON THE BRADFIELD CANAL; AND ESTABLISHING AN EFFECTIVE DATE

R E C I T A L S

A. The Ketchikan Gateway Borough Assembly supports construction of a road from Canada through Central Southeast Alaska to access a deep sea port on the Bradfield Canal.

B. The Alaska Department of Transportation and Public Facilities (ADOT/PF) has conducted studies to determine the most practical route for such a road. Of the several corridors identified, designated roadless and wilderness areas selected by the American and Canadian governments hinder road construction on all but the route from the Canadian Border to the Bradfield-Craig River watersheds.

C. Extensive mining activity in British Columbia creates long-term demand for road access to deep water port facilities. Canadian mining and other resource development interests have expressed a preference for a route through the Bradfield-Craig corridor because of its access to the sea.

D. The Canadian mining company involved has a major capital investment in their operations and has assured the City of Wrangell they will actively participate in road construction to link up with the Bradfield-Craig route.

E. Construction of this road now will assure continuing trade relations with our Canadian neighbors.

F. The centralized location of this corridor lends itself to future expansion of transportation systems vital to the diverse economic development of Southeast Alaska. This corridor will promote commerce and industry, provide an alternate land route, and improve national defense.

NOW THEREFORE, BE IT RESOLVED BY THE ASSEMBLY OF THE KETCHIKAN GATEWAY BOROUGH, ALASKA, as follows:

Section 1. The Assembly requests Governor Cowper to direct ADOT/PF to determine the construction cost for the Bradfield-Craig River Route Road and deep water port facility on the Bradfield Canal.

Section 2. Governor Cowper is further requested to join with the Alaska State Legislature to introduce legislation based upon the ADOT/PF cost findings that will enable the Bradfield-Craig Road and Bradfield Deep Water Port Projects to proceed in a timely manner.

Section 3. The Assembly urges all Alaska Legislators to support the development of the road and port project.

Section 4. The Borough Clerk is directed to send copies of this resolution to Governor Cowper, Commissioner Hickey, Commissioner Brady, Commissionerer Smith, Colonel Willbur T. Gregory Jr., and all members of the Alaska State Legislature.

Section 5. This resolution shall become effective upon adoption.

ADOPTED this 20th day of June, 1988.

BOROUGH MAYOR

ATTEST:

BOROUGH CLERK

Approved as to form:

MUNICIPAL ATTORNEY

AGENDA

6-14-88

Presented by: The Manager
Introduced: 05/16/88
Drafted by: K.C.R.

RESOLUTION OF THE CITY AND BOROUGH OF JUNEAU, ALASKA

Serial No. 1310

A RESOLUTION SUPPORTING THE CONSTRUCTION OF A ROAD FROM THE CANADIAN BORDER TO THE SEA VIA THE BRADFIELD-CRAIG RIVER CORRIDOR AND SUPPORTING THE CONSTRUCTION OF A DEEP WATER PORT FACILITY ON THE BRADFIELD CANAL.

WHEREAS, the City of Wrangell has requested that the City and Borough of Juneau support the proposed Bradfield-Craig road and port project, and

WHEREAS, economic development anywhere in Southeast Alaska is directly or indirectly of benefit to all of the residents of Southeast Alaska, and

WHEREAS, extensive mining in British Columbia fifteen miles from the border crossing of the proposed Bradfield-Craig route has created an immediate and legitimate long-term demand for road access to the sea and deep water port facilities, and

WHEREAS, Canadian mining and other resource development interests have expressed a preference for the route through the Bradfield-Craig area because of its close proximity to the sea, and

WHEREAS, the mining interests already have major capital investment in their operations and have assured city and borough officials that they will actively participate in road construction to link up with the Bradfield-Craig route, and

WHEREAS, construction now of a twenty-six mile segment of road will ensure continuing trade relations with our Canadian neighbors, and

WHEREAS, this international road connection would provide many opportunities to implement the new United States-Canada Free Trade Agreement and thereby foster social, cultural, and economic relationships beneficial to both countries;

NOW, THEREFORE, BE IT RESOLVED BY THE ASSEMBLY OF THE CITY AND BOROUGH OF JUNEAU, ALASKA:

1. That the State of Alaska is urged to pursue the construction of a road from Canada down the Bradfield-Craig River Corridor and the construction of a deep water port facility on the Bradfield Canal.

2. Effective Date. This resolution shall be effective immediately upon adoption.

Adopted this 16th day of May, 1988.

Mayor

Attest:

Clerk

MAY 6 - '88 AGENDA

RESOLUTION 1139-R

CITY OF PETERSBURG 5-10-88

A RESOLUTION OF THE PETERSBURG CITY COUNCIL URGING THE GOVERNOR AND THE LEGISLATURE OF THE STATE OF ALASKA TO INITIATE LEGISLATION TO APPROPRIATE FUNDS TO ENABLE THE TIMELY CONSTRUCTION OF A ROAD FROM THE CANADIAN BORDER TO THE SEA VIA THE BRADFIELD-CRAIG RIVER CORRIDOR AND CONSTRUCTION OF A DEEP WATER PORT FACILITY ON THE BRADFIELD CANAL.

WHEREAS, for the past three decades the City of Petersburg has supported construction of a road from Canada through Central Southeast Alaska to the sea; and

WHEREAS, these requests have resulted in seemingly interminable reconnaissance studies by the Alaska Department of Transportation and Public Facilities to determine the most practicable route for such a road; and

WHEREAS, the reconnaissance studies have resulted in a number of designated route potentials for a road; and

WHEREAS, legislative actions by the governments of the United States and Canada have now designated roadless and wilderness areas that would discourage road construction on all but one of the routes proposed in the reconnaissance studies; and

WHEREAS, a twenty six mile segment of that one remaining alternate route is from the Canadian Border down the Bradfield-Craig River watersheds and is the shortest route to the sea and deep water port capability; and

WHEREAS, extensive mining activity in British Columbia, fifteen miles from the border crossing of the proposed Bradfield-Craig route, has created an immediate and legitimate long term demand for road access to the sea and deep water port facilities; and

WHEREAS, Canadian mining and other resource development interests have expressed a preference for the route through the Bradfield-Craig area because of its close proximity to the sea; and

WHEREAS, the mining interests already have a major capital investment in their operations and have assured us they will actively participate in road construction to link up with the Bradfield-Craig route; and

WHEREAS, construction of a twenty six mile segment of road now will ensure continuing trade relations with our Canadian neighbors, but to procrastinate will send them the message that we are not interested and force them to go inland with all of their business; and

WHEREAS, construction of twenty six miles of road in this centralized location lends itself to future expansion of hard surface transportation systems vital to the economic diversification and development of all Southeast Alaska; and

WHEREAS, this international road connection would provide the opportunity for maximum utilization of the new United States-Canada Free Trade Agreement and foster social, cultural and economic relationships beneficial to both countries; and

WHEREAS, said international road would increase traffic flow efficiency for commerce and industry, provide a viable alternative land route for the traveler, improve national defense in the event of foreign hostilities and provide an evacuation route in the event of a coastal catastrophe.

NOW THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PETERSBURG, ALASKA:

1. Governor Cowper is hereby requested to direct the Department of Transportation and Public Facilities to make an accurate determination of construction costs for the Bradfield-Craig River route to the Canadian Border and a deep water port facility on the Bradfield Canal.

2. Governor Cowper is further requested to join with the Alaska State Legislature to introduce legislation based upon the cost finding of AK DOT/PF, that will enable the Bradfield-Craig Road and Bradfield Deep Water Port projects to proceed in a timely and expeditious manner.

3. In the name of prudent economic development and the furtherance of a strong self-supporting economic base in Southeast Alaska, we ask all legislators of the State of Alaska to support the development of this road and port project.

4. The City Clerk is hereby directed to transmit copies of this resolution to:

Governor Steve Cowper
Commissioner Mark Hickey, AK DOT/PF
Commissioner Judith Brady, AK DNR
Commissioner Anthony Smith, AK DOC/ED
Colonel Wilber T. Gregory Jr., Army Corps of Engineers
All members of the Alaska State Legislature

PASSED and APPROVED this 2? day of May, 1988.

Mayor

ATTEST:

City Clerk

CITY OF WRANGELL, ALASKA

RESOLUTION NO. 4-88-295

A RESOLUTION OF THE COUNCIL OF THE CITY OF WRANGELL, ALASKA URGING THE GOVERNOR AND THE LEGISLATURE OF THE STATE OF ALASKA TO INITIATE LEGISLATION TO APPROPRIATE FUNDS TO ENABLE THE TIMELY CONSTRUCTION OF A ROAD FROM THE CANADIAN BORDER TO THE SEA VIA THE BRADFIELD-CRAIG RIVER CORRIDOR AND CONSTRUCTION OF A DEEP WATER PORT FACILITY ON THE BRADFIELD CANAL.

WHEREAS, for the past three decades the City of Wrangell has been asking for construction of a road from Canada through Central Southeast Alaska to the sea; and

WHEREAS, these requests have resulted in seemingly interminable reconnaissance studies by the Alaska Department of Transportation and Public Facilities to determine the most practicable route for such a road; and

WHEREAS, the reconnaissance studies have resulted in a number of designated route potentials for a road; and

WHEREAS, legislative actions by the governments of the United States and Canada have now designated roadless and wilderness areas that would discourage road construction on all but one of the routes proposed in the reconnaissance studies; and

WHEREAS, a twenty six mile segment of that one remaining alternate route is from the Canadian Border down the Bradfield-Craig River watersheds and is the shortest route to the sea and deep water port capability; and

WHEREAS, extensive mining activity in British Columbia fifteen miles from the border crossing of the proposed Bradfield-Craig route has created an immediate and legitimate long term demand for road access to the sea and deep water port facilities; and

WHEREAS, Canadian mining and other resource development interests have expressed a preference for the route through the Bradfield-Craig area because of its close proximity to the sea; and

WHEREAS, the mining interests already have a major capital investment in their operations and have assured us they will actively participate in road construction to link up with the Bradfield-Craig route; and

WHEREAS, construction of a twenty six mile segment of road <u>now</u> will ensure continuing trade relations with our Canadian neighbors, but to procrastinate will send them the message that we are not interested and force them to go inland with all of their business; and

WHEREAS, construction of twenty six miles of road in this centralized location lends itself to future expansion of hard surface transportation systems vital to the economic diversification and development of all Southeast Alaska; and

WHEREAS, this intercontinental road connection would provide the opportunity for maximum utilization of the new United States-Canada Free Trade Agreement and foster social, cultural and economic relationships beneficial to both countries; and

WHEREAS, said intercontinental road would increase traffic flow efficiency for commerce and industry, provide a viable alternative land route for the traveler, improve national defense in the event of foreign hostilities and provide an evacuation route in the event of a coastal catastrophe.

NOW THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF WRANGELL, ALASKA:

Section 1. Governor Cowper is hereby requested to direct the Department of Transportation and Public Facilities to make an accurate determination of construction costs for the Bradfield-Craig River route to the Canadian Border and a deep water port facility on the Bradfield Canal.

Section 2. Governor Cowper is further requested to join with the Alaska State Legislature to introduce legislation based upon the cost findings of AK DOT/PF, that will enable the Bradfield-Craig Road and Bradfield Deep Water Port projects to proceed in a timely and expeditious manner.

Section 3. In the name of prudent economic development and the furtherance of a strong self-supporting economic base in Southeast Alaska, we ask all legislators of the State of Alaska to support the development of this road and port project.

Section 4. The City Clerk is hereby directed to transmit copies of this resolution to:

Governor Steve Cowper
Commissioner Mark Hickey, AK DOT/PF
Commissioner Judith Brady, AK DNR
Commissioner Anthony Smith, AK DOC/ED
Colonel Wilbur T. Gregory Jr., Army Corps of Engineers
All members of the Alaska State Legislature

Section 5. This resolution shall become effective on approval.

PASSED AND APPROVED: April 12, 1988

Mayor

Certified a true and correct copy of the original filed in my office.

City Clerk – Acting
City of Wrangell, [illegible]

ATTEST:
City Clerk (Acting)

CHAMBER OF COMMERCE
CITY OF WRANGELL, ALASKA

A RESOLUTION OF THE CHAMBER OF COMMERCE OF THE CITY OF WRANGELL, ALASKA SUPPORTING CONSTRUCTION OF A ROAD FROM CENTRAL SOUTHEAST ALASKA TO BRITISH COLUMBIA VIA THE BRADFIELD-CRAIG RIVER CORRIDOR, AND THE ESTABLISHMENT OF DEEP WATER PORT FACILITIES AT AN ACCEPTABLE SITE. WE REQUEST THAT OUR LOCAL, STATE, AND FEDERAL OFFICIALS TAKE APPROPRIATE MEASURES TO INSTITUTE THE PLANNING, PERMITTING AND FINANCING NECESSARY TO COMPLETE THIS PROJECT IN A TIMELY MANNER.

WHEREAS, the Wrangell Chamber of Commerce has historically supported construction of a road system connecting Central Southeast Alaska with British Columbia; and

WHEREAS, a road between Central Southeast Alaska and British Columbia would generate industrial, commercial and recreational opportunities essential to the economic stability, diversification and future growth of the region; and

WHEREAS, recent mining activity in British Columbia has created a rapidly expanding demand for road access to the sea and deep water port facilities in Central Southeast Alaska; and

WHEREAS, the Alaska Department of Transportation and Public Facilities has conducted a series of reconnaissance studies during the past three decades to determine the most feasible routes for road access from Central Southeast Alaska to Canada; and

WHEREAS, within the past ten years congressional action and other considerations in Canada and Alaska have created roadless and wilderness areas within the reconnaissance study area; and

WHEREAS, the wilderness and/or roadless designation adversely affects road construction on all routes proposed in the reconnaissance studies with the exception of the route through the Bradfield-Craig River watershed area; and

WHEREAS, the Bradfield-Craig route is geographically the shortest distance to deep water port potential from the mining operations and other proposed renewable resource (timber) harvest areas in British Columbia; and

WHEREAS, Canadian mining firms have expressed a preference for this road route to the sea for shipment of ore concentrates to outside refining facilities; and

WHEREAS, the Canadian timber industry would open new areas and utilize the road for timber shipments to the sea; and

WHEREAS, the route from deep water on the Bradfield Canal to the Canadian border (approx. 25 miles) will accommodate the demand for deep water access at a cost considerably less than heretofore proposed routes; and

WHEREAS, construction of this road will herald the beginnings of long term Canadian-American relationships mutually beneficial to the future growth, economic diversification and overall economic development programs for the citizens of both countries.

NOW THEREFORE, BE IT RESOLVED BY THE CHAMBER OF COMMERCE OF THE CITY OF WRANGELL, ALASKA:

Section 1. The City of Wrangell, The State of Alaska Office of the Governor, Departments of Transportation, Natural Resources, Commerce & Economic Development; The United States Forest Service and the United States Corps of Engineers are hereby rquested to jointly and cooperatively take appropriate measures to institute planning, permitting, financing, and diplomatic intercourse with Canada in order to expidite construction of a road from Central Southeast Alaska to British Columbia via the Bradfield-Craig River corridor and to establish a deep water port facility at an appropriate site.

Section 2. The Secretary of the Wrangell Chamber of Commerce is hereby directed to transmit a copy of this resolution to each of the following:

Mayor Fern Neimeyer, City of Wrangell
Paul Meyhoff II, Office of the Governor
Commissioner Mark Hickey, AK DOT/PF
Commissioner Judy Brady, AK DNR
Commissioner Anthony Smith, AK DOC/ED
Walt Sheridan, USFS ANILCA Coordinator
Colonel Wilbur T. Gregory Jr., U.S. Army Engineers, Alaska District
Senator Ted Stevens
Senator Frank Murkowski
Congressman Donald Young
Lloyd Jones, Alaska State Senator
Robin Taylor, Alaska State Representative
John Sund, Alaska State representative

Section 3. This Resolution shall become effective on approval.

PASSED AND APPROVED: February 13, 1988

Clifford James
President, Wrangell Chamber of Commerce

ATTEST: [signature]
Secretary

U.S.-CANADA FREE TRADE AGREEMENT

SYNOPSIS

THE WHITE HOUSE

Office of the Press Secretary

For Immediate Release January 2, 1988

FACT SHEET

U.S.-CANADA FREE TRADE AGREEMENT

The United States and Canada have entered into a free trade agreement that, if approved and implemented, will take effect on January 1, 1989. The agreement will:

- Eliminate all tariffs on bilateral goods trade within 10 years of implementation;
- Reduce nontariff trade barriers;
- Establish principles for the conduct of bilateral trade in services;
- Establish rules for the conduct of bilateral investment;
- Resolve many outstanding bilateral trade issues;
- Enhance the energy and national security of the two countries;
- Facilitate business travel; and
- Establish a timely bilateral dispute settlement mechanism.

Economic Implications

Each year the U.S. and Canada exchange more goods and services than any two countries in the world. Bilateral trade in goods and services exceeded $150 billion in 1986.

The elimination of tariffs and most other barriers to trade between the two countries will increase economic growth, lower prices, expand employment and enhance the competitiveness of both countries in the world marketplace.

Chronology of the Negotiation

- In March 1985, President Reagan and Prime Minister Mulroney asked their trade officials to explore ways to reduce and

MORE

eliminate existing barriers to trade between the U.S. and Canada.

- On September 26, 1985, Prime Minister Mulroney formally requested that the U.S. and Canada examine the potential for negotiating a comprehensive free trade agreement.

- On December 10, 1985, President Reagan notified the Congress of his intent to enter into bilateral negotiations with Canada using "fast track" procedures.

- On June 17, 1986, U.S. and Canadian negotiators on the free trade area met for the first time in Ottawa.

- On October 3, 1987, President Reagan notified Congress of his intent to enter into a free trade agreement with Canada.

- On December 9, 1987, U.S. and Canadian negotiators initialled a final text of the agreement.

- On January 2, 1988, President Reagan and Prime Minister Mulroney signed the final text of the agreement.

The Fast Track

Section 102 of the Trade Act of 1974 authorizes the President to enter into bilateral free trade agreements and to have the Congress approve them on a "fast track" basis. Section 102 authority expires at midnight on January 2, 1988.

In order for a bilateral agreement to qualify for fast track consideration, several conditions must be met:

- The negotiation must be requested by the foreign country;

- The President must notify the House Ways and Means and Senate Finance Committees of the negotiations, giving them 60 legislative days advance notice:

- The President must notify the Congress of his intent to enter into an agreement 90 days before doing so.

After entering into an agreement, the President must submit it to Congress, along with a draft implementing bill, a statement of any administrative action proposed to implement the agreement, an explanation of how the bill or statement changes or affects existing law and a statement of reasons why the agreement serves the interests of U.S. commerce and why the bill and proposed action are required and appropriate.

The implementing bill is introduced in both Houses of Congress on the day it is submitted and is referred to the committees of jurisdiction. House committees have 45 days in which the House is in session to report the bill; they are discharged automatically from further consideration after that period. The House votes within 15 days in session after the measure has been received from the House committees.

After receiving the bill from the House, the Senate committees have 15 days in which the Senate is in session to report the bill; they are discharged automatically from further consideration after that period. The Senate votes within 15 days in session after the measure has been received from the Senate committees.

Amendments to the bill are not in order. A simple majority of each House is required for approval.

# # #

BRADFIELD INDUSTRIAL ROAD FEASIBILITY STUDY

FINAL REPORT
September 1989

Submitted to:
Alaska Department of Transportation and Public Facilities
Southeast Region
P.O. Box 021467
Juneau, Alaska

Prepared by:
S.C. Jacoby and Associates
Juneau, Alaska

with
Baxandall Associates
Juneau, Alaska

and
Mr. Phil R. Holdsworth
Juneau, Alaska

BRADFIELD INDUSTRIAL ROAD
FEASIBILITY STUDY

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1.0 INTRODUCTION

During October 1988, the Alaska Department of Transportation and Public Facilities requested proposals for a study to determine the economic feasibility of building an industrial road from the head of the Bradfield Canal, via the Bradfield and Craig River drainages to the Canadian border -- a distance of 31 miles. The principal focus of the road, routing and destination would be to serve the transportational needs of Canadian mining interests in the lower Iskut River region by providing "straight-through" trucking to deep water at the Bradfield Canal.

In late October, a contract was awarded to Stephen C. Jacoby & Associates in conjunction with Baxandall Associates, P.E., and Mr. Phil R. Holdsworth, E.M., and a scope of work agreed on.

2.0 OBJECTIVES

The Bradfield Industrial Road feasibility study undertaken over the last several months has focused on a host of resource, economic, and policy issues relating to the feasibility of this project. The project objectives relate to three principal areas of input data;

1) Resource Assessment
Identification of the principal mining interests in the Iskut River area and surrounding mineral districts possibly affected by a port destination resource road. Assessment of present mine production and mine development forecasting for various mineral deposit classes. Similarly a timber resource analysis was performed assessing present inventory volume within the region and annual allowable cut estimates determined. The mineral and timber resource assessment would provide the basis for 1) prospective in-haul and out-haul relationships related to road access development and 2) unit haul cost analysis for route alternatives.

2) Bradfield Route - Engineering and Cost Analysis
An analysis of the Bradfield Route clearly defined two design alternatives, 1) continuous surface road, point to point and 2) road/tunnel point to point. Construction costs estimates were developed for both alternatives and incorporated into comprehensive cost equations, for road development, and operation and maintenance along this route. All cost estimating has undergone final refinement following nominal route reconnaissance during August 1989.

An on-going Iskut Valley Route alternative study, joint-funded by the British Columbia Ministry of Energy, Mines & Petroleum Resources and cooperators within the B.C. mining industry, will provide construction cost estimates based on preferred

alignments for Iskut River Road development from the Cassiar Hwy. (Highway 37) at Bob Quinn Lake to the Johnny Mountain mine area. Two tributary roads will additionally be evaluated, one up the Craig River to the international boundary, interfacing with the Bradfield Route at the common border, and another tributary link to the lower Unuk River.

3) Economic Analysis of the Bradfield Route Alternatives
The analysis looked at the various alternatives and a comparative evaluation performed to determine the estimated expense in the development and operation of an access road to and through the Iskut Region. The construction, maintenance and operation and haul costs developed within the Engineering and Cost Analysis section were used in developing the route comparisons.

3.0 SUMMARY

The summary conclusions derived from the benefit cost analysis of the Bradfield Industrial Road, using best available information on mineral potential and current cost data, were based on two points of reference;

1) The total construction, operating and haul cost of two Bradfield route alternatives from a marine transfer site at the head of the Bradfield Canal to the U.S.-Canada border, approximately 31 miles in length. Alternative 1, a continuous surface road, is estimated to cost 20 million dollars, based on alignment and construction standards detailed in Section 5 of this report. Alternative 2, a road/tunnel option, is estimated to cost 23 million dollars. *Alternative 2, the road /tunnel option is the preferred alternative .* The increased initial cost of construction for this alternative is offset by improved year around efficiency of the facility and an overall reduction in adverse haul gradient.

2) A comparative evaluation was then performed for the Alternative 2-Bradfield road/tunnel option contrasted with an Iskut River to Cassiar Highway routing with Stewart as the port destination. This evaluation incorporated construction, maintenance and haul as cost parameters. The benefit cost comparisons of the two routings were based on a common point of origin, and reflected best available cost data for the Canadian portion of the routings. Two seperate analysis were run, one isolating haul cost, the other included haul cost. *In both cases the Bradfield routing demonstrates a favorable rate of return(13.6% and 42.6% respectively) over the Iskut/Stewart routing.*

The reported findings contained in this Bradfield Industrial Road analysis provide a certain measure of insight as to the economic feasibility of more direct and shorter road access for the mineral and timber resources within the Iskut Region of

Northwestern British Columbia. The task of reliably assessing mineral resource potential is predicated on numerous assumptions relating to current exploration data, driven by strong base metal and precious metal pricing. A number of qualifications deserve recognition; for example, if the public sector were to absorb an increased percentage of infrastructure costs, the financial viability of the regional mineral properties would be vastly improved. Also, further exploration activities at major properties may define greater ore reserves or improved ore grades which could substantially change the viability of the prospects by increasing projected revenues, increasing the scale of operations while reducing unit costs of operation, or extending projected mine life. Similarly, through exploration, a number of apparently minor properties, based on present knowledge, could reach a higher potential. In short, there is considerable uncertainty regarding the timing and extent of resource development which cannot be avoided.

It should also be noted that this study recognizes that as a result of resource depletion and changing economic conditions, potential mines, once in production, could inevitably close over the course of the study period(twenty year life). The implications of such closures would have to be dealt with on a case by case basis.

The benefit cost analysis of the Bradfield route, incorporating construction cost and comparative haul cost analysis indicate the Bradfield route is economically viable when compared to the alternative Iskut River/Cassiar Highway routing to Stewart. This conclusion is based in part on assumptions regarding commodity movement and the potential for increased mine development activity within the Iskut Region. Construction costs for the various alternate routes were closely related. The key factor identified is the haul cost savings that would be realized in the cost of out-haul transport of resource commodities to a marine terminal and in-haul volume for mine development and annual operation.

Regardless of a favorable showing of viability found for the Bradfield route when compared to the Iskut/Stewart routing, there remain serious questions with respect to regional pleasure in British Columbia regarding transport and port destination for Canadian mineral and timber commodities, and the resulting service centers either absorbed or displaced in an expanding resource development economy. The need for continued and expanded dialogue by both the State of Alaska and the Province of British Columbia is viewed as essential for developing a common position on this regional transportation issue.

BRADFIELD INDUSTRIAL ROAD

FEASIBILITY STUDY

LOCATION MAP

Scale . 1:2 000 000	Date MARCH 1989
Ref.	FIGURE 1

4.0 REGIONAL RESOURCES

4.1 MINERAL POTENTIAL

It has long been recognized that mining development would be the key growth sector in northwest British Columbia (Economic Development in northwest British Columbia: Challenges and Opportunities, May 1982). The Iskut region of northwest British Columbia has been the focus of a vigorous exploration program by the Canadian mining industry resulting in an unprecedented number of submissions to the Canadian government mine development review process for stage 1 and stage 2 reviews. During 1988 more than 30 companies engaged in exploration and drilling programs, spending in excess of $15 million. The main focus continues to be on gold and silver.

The assessment of the mineral potential of the Iskut region, as in any area, requires the review of available best data and the use of certain assumptions as to the likelihood of advancement to mine development. For this study, the Iskut region was divided into 3 distinct districts for mineral potential review. These districts are;

- The Iskut River District
- Unuk/Sulphurets District
- Stikine District

Each of these districts are positioned as potential beneficiaries from road access in the Iskut Region and to date have suffered erratic development because of the lack of easy access, high costs, and difficult weather conditions. If the suggested Bradfield Road system were followed, all noted deposits from these districts will use that portion of the road system on the Alaskan side of the border. There would be common useage of many segments of the road system on the Canadian side.

Within each district, the mineral properties were reviewed and significant properties identified on the basis of the following mineral deposit classes:

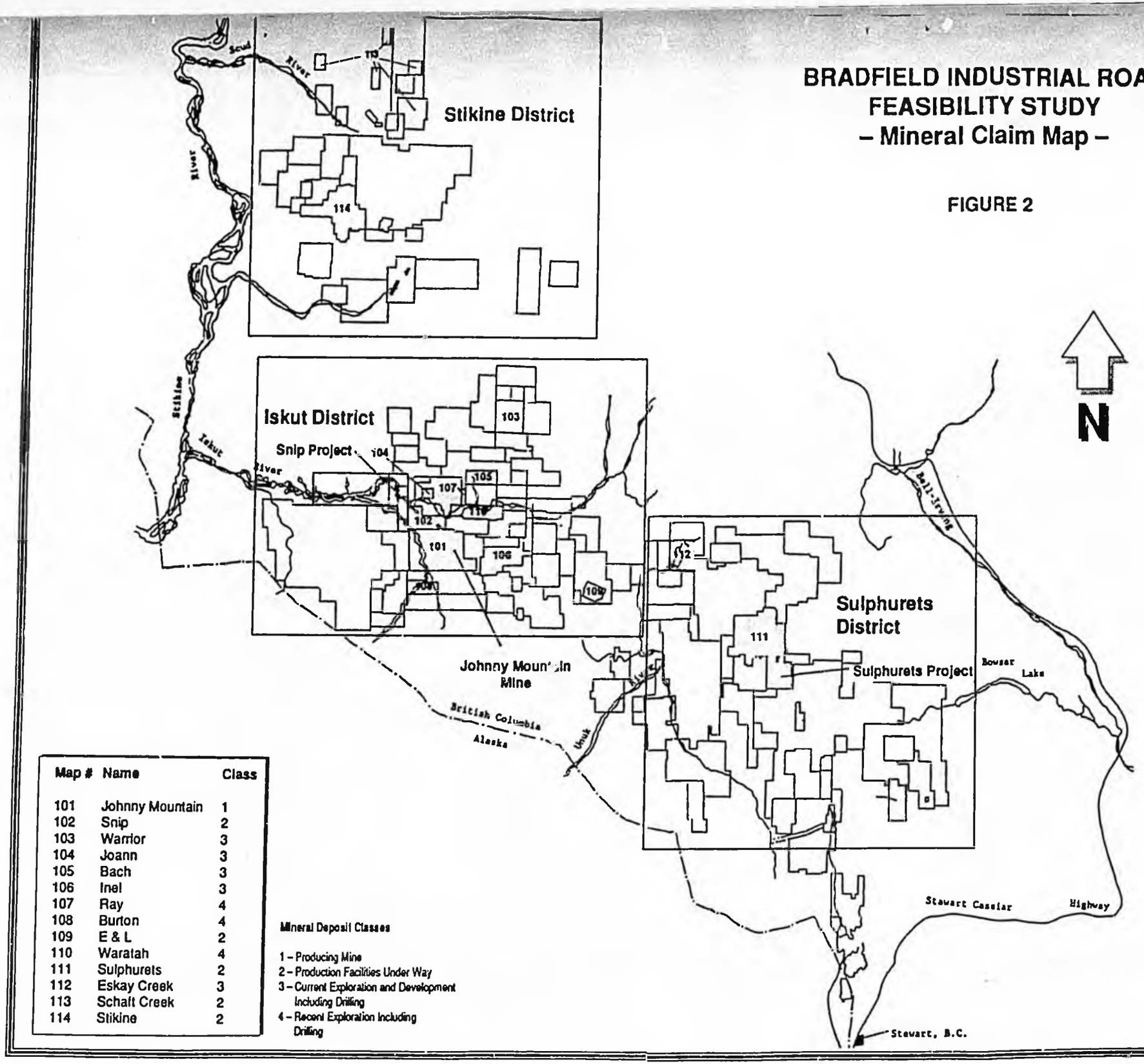
Class: 1) Producing mine
2) Production facilities under way
3) Current exploration and development, including drilling
4) Recent exploration, including drilling

Those deposits identified as Class 3 and 4 are active prospects which have generally received advanced exploration in recent years with annual expenditures in the million dollar range. There is a possibility that they might develop into small scale producers. See Mineral Claim Map, Figure 2.

Fourteen mineral properties were carried forward to the mineral property listing to provide assumed production data. Forecasting of mineral production, both volume

BRADFIELD INDUSTRIAL ROAD FEASIBILITY STUDY
– Mineral Claim Map –

FIGURE 2



Map #	Name	Class
101	Johnny Mountain	1
102	Snip	2
103	Warrior	3
104	Joann	3
105	Bach	3
106	Inel	3
107	Ray	4
108	Burton	4
109	E & L	2
110	Waratah	4
111	Sulphurets	2
112	Eskay Creek	3
113	Schaft Creek	2
114	Stikine	2

Mineral Deposit Classes

1 – Producing Mine
2 – Production Facilities Under Way
3 – Current Exploration and Development Including Drilling
4 – Recent Exploration Including Drilling

and timing, is extremely difficult due to the range of unforeseen development parameters. However, best-estimate production volumes were developed from reserve data to support in-haul/out-haul tonnage estimates and applied unit haul cost analysis.

Significant data for projects identified from this review, for each of the three districts, are summarized in Table 1.

BRADFIELD INDUSTRIAL ROAD FEASIBILITY STUDY
Mineral Property Analysis
September 1989

TABLE I

	Map #	Name	Operator	Class	Commodities	Potential Reserves	Tons/day Milled	Tons Concentrate per year	Mine Life	Probable on-line Production	Miles to Bradfield	Miles to Stewart	Ratio
ISKUT DISTRICT	101	Johnny Mountain	Skyline, Ltd	1	Au, Ag, Cu	1,000,000 Tons	400	14,000	8 yrs	Now producing	43	160	3.7:1
	102	Snip	Cominco	2	Au, Ag, Cu	1,570,000 Tons	500	Potential future Cu Concentrate	8 yrs	1990	43	160	3.7:1
	103	Warrior	Gulf International	3	Au, Ag	Unknown	–	None Dore bullion	–	1995?	69	174	2.5:1
	104	Joann	Merridor Res	3	Fe/Cu, Au, Ag	Unknown	Possible 200	Possible 8,000	–	1995?	47	179	3.8:1
	105	Bach	International Wildcat	3	Au, Ag	Unknown	Possible 200	Dore Bullion	–	1995?	53	179	3.4:1
	106	Inel	Inel Resources	3	Au, Ag, Cu, Zn	Unknown	Possible 200	Possible 8,000	–	1995?	62	178	2.9:1
	107	Ray	Delaware Resources	4	Ag, Au, Zn, Pb, Cu	Unknown	Possible 200	Possible 8,000	–	1995?	47	179	3.8:1
	108	Burton	NW/Iskut Gold Syndicate	4	Ag, Au, Cu, Pb, Zn	Unknown	Possible 200	Possible 8,000	–	1995?	40	184	4.1:1
	109	E & L	Consolidated Silver Standard	2	Ni,Cu	3,200,000 Tons	Possible 1,000	Possible 3,200	9 yrs	2000?	53	165	3:1
	110	Waratah	Tungco Resources	4	Au	Unknown	–	Dore Bullion	–	1995?	46	174	3.8:1
SULPHERETS DISTRICT	111	Sulphurets	Newhawk Gold Mines	2	Au, Ag, Cu, Cu, Pb, Zn	Lode 1,500,000 Heap Leach 20,000,000	500	Possible 15,000 Dore bullion	8 yrs	1991	95	189	2:1
	112	Eskay Creek	Calpine/ Consolidated Stikine	2	Au, Ag, Pb, Zn	Unknown	–	Possible 8,000	–	1995?	73	167	2.3:1
STIKINE DISTRICT	113	Schaft Creek	Teck Corporation	2	Cu, Mo, Ag, Au	900,000,000 Tons	100,000 open pit	318,000	25 yrs	2000?	87	178	2:1
	114	Stikine	Stikine Silver, Ltd.	2	Cu, Ag, Au	151,000,000 Tons	30,000 open pit	303,000	14 yrs	2000?	98	216	2.2:1

4.1.1 ISKUT RIVER DISTRICT

Most recent exploration and development expenditures in NW British Columbia were for precious metals and most were located in the rugged northwestern part of the province where the Iskut Gold Camp, site of the Reg (Johnny Mtn. - Class 1) and Snip (Class 2) deposits are found. This district has attained a very significant status with greater than 1.75 million ounces of gold identified between these two deposits alone. Over 75 mineral properties are located north and south along the lower to mid Iskut River axis.

The Johnny Mountain Mine, B.C.'s newest gold mine, shows reserves of 1.08 million tons grading 0.70 oz./T AU, 0.73 oz./T AG, and 0.75% CU. This is presently regarded a 250 ton per day operation, supplied entirely by air transport and employing 115 people. Official opening of the mine was August 17, 1988. Capital expenditures on this project are reported at $41 million.

Present in-haul transport requirements for the Johnny Mountain mine are estimated at 5,000 tons per year. Fuel for on-site power supply generation is the leading in-haul cargo volume component with 80,000-90,000 gallons a month flown on in-haul, representing over sixty percent of annual shipping volume. Concentrate out-haul production is currently(September 1989) averaging 350 metric tons(2,205 lbs) per month.

The adjacent Snip deposit has reserves of 1.57 million tons grading 0.64 oz./T AU, and has been on a fast track to production at a planned 300 tons per day milled in 1990, with long term production planned at 500 tons per day. The 1989-90 scope of activity at the Snip has been reduced, indicating potential sart-up to production will be delayed. Anticipated capital costs are in excess of $30 million with a projected employment of 115.

Seven other properties in the Iskut River District were identified as having significant current or recent exploration programs, including drilling. These properties and related production data are listed in Table 1.

4.1.2. UNUK/SULPHURETS DISTRICT

The Unuk/Sulphurets District is formed around the axis of the Unuk River drainage, approximately 24 miles southeast of the Iskut - Johnny Mtn. area, and one of two districts (Unuk/Sulphurets and Stikine) periphery to the core Iskut River District. A total of over 40 properties are found in this district.

The Sulphurets property (Property #111 - Class 2) is a significant property within this

district with reserves of 775,000 tons(Stage 1 Reporting) grading 0.50 oz./T AU and 20.18 oz./T AG. The property has seen continued exploration with an extensive drilling and underground drifting program, and currently has temporary road access from Highway 37 via Bowser Lake.

4.1.3. STIKINE DISTRICT

Peripheral to the deposits in the Sulphurets - Iskut mineral belt are two large copper deposits in the Stikine River area, both of which could benefit from the development of the Bradfield Road.

The Schaft Creek deposit (property #113 - Class 2) is basically a copper/molybdenum orebody with minor amounts of silver and gold. Access would require construction of 44 miles of road from the deposit to Bob Quinn Lake; and then the choice of one of the two alternate routes to tidewater, 134 miles via Highway 37 to Stewart or 87 miles to the Bradfield Terminal. Much of this latter route would service the majority of listed deposits in both the Iskut and Unuk districts. Unlike the gold deposits which have been developed to date, the equipment, facilities and rolling stock required for production at Schaft Creek would be substantial.

The Stikine Deposit(property # 114- Class 2) is a relatively highgrade copper ore body with minor amounts of silver and gold. Final development is expected to be delayed because of difficult access involving a 3.3 mile tunnel, and the difficulty of permitting a 25-mile road down the Stikine River corridor to the Iskut River and then 28 miles up the Iskut to Bronson Creek, junction point for Stewart or the Bradfield Canal destination.

4.1.4. OTHER PROPERTIES

In 1983, a Canadian inter-ministry task force, directed by the Cabinet Committee on Economic Development, completed a series of studies on the scale and timing of potential mineral developments in northwest British Columbia (Northwest Economic Development Studies - Mineral Resources, 1983). This study identified nine "cornerstone" properties over a list of 23 known significant, but undeveloped mineral properties in the region. The Schaft Creek and Stikine copper deposits (as listed in 4.1.3.) were 2 of these 9 properties.

The Mt. Klappan deposit was also among the 9 properties listed which has, perhaps, regional proximity to the Bradfield Project. Mt. Klappan is a deposit of anthracite coal having undergone extensive exploration, determining that the deposit could be mined by low cost, open pit methods. A major constraint to this large project is the

limited size of the world market for anthracite coal. Logistically, this deposit lies 62 air miles to the east of Cassiar Highway and it is unlikely that the Bradfield Route would be of any value for coal export to foreign markets. The report concludes a road route to Stewart would be most cost effective, aligned south from the mine site down the Skeena and Nass Rivers to Meziadin Junction and then 39 miles west to Stewart on the existing highway.

Another significant mineral deposit which might utilize the Bradfield Route is the Cassiar Asbestos (McDame Extension) property located 70 miles north of Dease Lake on the existing road system. This former open-pit operation is now being converted to an underground operation, and has developed reserves of 178 million tons containing 5.57% fibre (equivalent to 10 million tons of marketable product). This indicates a mine life of over 100 years. Over 50 million dollars have been spent so far on mine development, and with the existing mill would treat 1.6 million tons per year -- equivalent to 90,000 tons per year of marketable fibre. Estimated employment is 150 people, and production is scheduled for 1990.

If the movement of this tonnage per year was planned to be trucked to Stewart via the Cassiar Hwy., and the Iskut River/Bradfield River Road from Bob Quinn Lake Junction to the Bradfield Terminal was available, the mileage would be 65 miles shorter by use of the latter.

4.2 TIMBER RESOURCES

4.2.1 ISKUT SUPPLY BLOCK

An analysis of the timber supply in the region of Northwestern British Columbia was undertaken to provide reliable estimates as to the acreage, type, volume, and accessibility of timber resources as a contributor to commodity movement in this region. Forest inventory data from the Ministry of Forests and Lands, Smithers office provided the base inventory data from which to describe the timber resource and develop estimates of a long-term annual allowable cut (AAC) - an indicator of potential timber supply and annual transport volume component.

The results of the first timber supply analysis performed by the British Columbia Ministry of Forests (April, 1984) describes the region of Norhtwestern B.C. as the Cassiar Timber Supply Area (TSA). Past harvesting patterns and proposed development plans show that in the Cassiar TSA only a very limited area of the forest is economically accessible, and in this area, only the best stands are merchantable.

The Iskut Supply Block, located in the southern region of the Cassiar TSA is the principle focus of the timber supply analysis. Forest inventory area and volume

summaries, based on mature forest stands within the gross productive crown forest land base of the Iskut Supply Block, are estimated at 435,357 acres and a total inventory volume of 69,928,020 cubic meters(m^3). The majority of the Iskut Supply Block is mountainous, innaccessible and non-productive (with respect to timber) but there is a corridor of forest land along Highway 37 and the Lower Iskut Rivers axis which support sufficient, good quality stands to be considered economically accessible. Additional timber volume is conceptually described in the Craig River and the Unuk River drainages. Several small Timber Sale Licences have been awarded in the Iskut Supply Block over recent times, however there are currently no active forest tenure licences in this area. The Iskut Supply Block has been a source of logs for export via the port of Stewart.

4.2.2 TIMBER TYPE AND VOLUME

The most current forest inventory data available is that which supported the Lower Iskut River Development Study, conducted by the B.C. Minstry of Forests and Lands in September, 1988. As reported, the forest cover of the Lower Iskut River area comprises mainly mature and overmature hemlock, spruce, balsam, cottonwood, and pine (Forest Cover Map-Inventory Branch, Cassiar Timber Supply Area Report, September, 1988). The predominant species is hemlock, making up 85 percent of the total volume. Spruce occupies 10 percent of the total volume strata, balsam, cottonwood, and pine making up the remaining five percent.

Fifteen engineering units, totaling 107,484 acres, have been conceptually described in the Lower Iskut-Craig River area. Of these fifteen units, five have significant operable limitations(correspondence dated 9-14-89, B.C. Ministry of Forests and Lands) and have been deleted from the operable timber supply base. Table 2, on page 14, shows the acreage, volume, and species composition for each of the remaining ten individual units. Earlier reporting(April, 1989) indicated a total volume of approximatley 14,878,000 cubic meters (m^3) found on the total fifteen units. The total volume on the remaining ten operable units is reported as 11,474,000 cubic meters(m^3) found on 83,616 acres. The Unuk River drainage, south of the Iskut River axis to the U.S. border, has reported timber inventory acreage within six engineering units of 21,688 acres and volume estimated at 4,229,000m^3. Together, total estimated operable timber volumes in the lower Iskut-Craig River and Unuk River system is 15,703,000m^3. An annual allowable cut (AAC) estimated at 231,000m^3 per year is suggested by the Ministry of Forests for the Iskut-Craig area if the entire operable area, once accessed, proceeded under a forest license development plan providing a maximum and intense harvest level. The Unuk River system, currently with no allowable cut estimates, could presumably yield an additional 84,500m^3 per year. A total annual allowable cut of 315,500m^3 for the Isukut-Craig River and Unuk River systems equates to approximatley 300,500 tons of annual log volume as a

potential contributor to transport volume from this region.

The AAC figure was arrived at using the following productivity factors, based on the preliminary operability mapping of the area:

Daily Output:	250m^3/shift/crew
Number of crews:	6
Annual Working Period:	200 days
Harvesting Cycle:	50 years
Operable acres:	105,304
Reported Net Volume:	15,703,000m^3

Estimated Annual Allowable Cut: 315,500m^3 per year or 300,500 tons/yr

The long/short term needs for these drainage systems involve other resource users, hence some level of operational constraint is anticipated from an otherwise maximum harvest level.

4.2.3 Round Log Export

On the recommendation of the British Columbia Minister of Forest and Lands, and signed by Executive Order No. 2177 on December 10, 1986, provisions for round log export allow the following;

> " all species of standing timber originating within the boundary area of the Cassiar Timber Supply Area which cannot be processed economically in the vicinity of land from which it is cut or produced, and cannot be transported economically to a processing facility located elsewhere in the province, be exempted from manufacture in the province under section 136 of the Forest Act under the following conditions:
> a) an export permit be obtained from the regional manager
> b) in addition to any other sum payable to the Crown, a fee in lieu of manufacture within the province shall be paid at the rate of $1.00 per cubic meter for timber suitable for the manufacture of lumber.

This order is in effect until December 31, 1990.

TIMBER RESOURCE ANALYSIS
Lower Iskut River Area, Cassiar T.S.A.
September 1989

TABLE 2

Lower Iskut River Operable Engineering Units–Volume Summary

Unit #	Acres	Total Volume (1000 Cu.Meters)	Total Volume (1000 Tons)	Volume by Species [1000 cubic meters and (%)] Hemlock	Balsam	Spruce	Pine	Cot
1	8,580	951	934	858 (91)	51(5)	–	42(4)	–
3	7,332	1,063	1,024	899 (84)	–	164 (15)	–	1
4	9,048	1,080	1,059	1,023 (95)	–	48(4)		9
5	10,140	1,006	996	1,005 (100)	–	–	–	
6	15,288	1,822	1,794	1,767 (97)	–	47(2)	–	8
10	6,552	1,310	1,204	1,147 (88)	–	163 (12)	–	–
11	9,828	1,369	1,171	326 (24)	691 (50)	352 (26)	–	–
12	2,964	638	619	563 (88)	–	75 (12)	–	–
13	7,644	1,485	1,456	1,412 (95)	–	67(4)	–	5
14	6,240	750	708	557 (74)	–	177 (24)	–	16
Sub–Total	83,616	11,474	10,965	9,558 (83)	742 (6)	1,093 (10)	42	39

Unuk River Operable Engineering Units–Volume Summary

1	642	151	148	37(24)	114(76)	–	–	–
2	1,537	269	265	172(64)	67(25)	30(11)	–	–
3	2,108	363	357	363(100)	–	–	–	–
4	6,704	1,208	1,189	1,153(95)	1	51(4)	–	3
5	5,520	1,212	1,194	1,171(97)	–	38(3)	–	3
6	5,177	1,026	1,010	1,016(99)	–	10(1)	–	–
Sub-Total	21,688	4,229	4,165	3,913(92)	182(4)	130(3)	–	7(1)

Grand Total	105,304	15,703	15,130	13,471(86)	924(6)	1,223(8)	42	46

CUBIC CONVERSIONS

Hemlock: 1.01 cubic meters/ton
36 cu. ft/ton
180 board feet (Scribner)/ton

Spruce/Balsam/Pine: 1.23 cubic meter/ton
43 cubic ft/ton
210 board feet/ton

5.0 BRADFIELD ROUTE ANALYSIS

5.1 GENERAL

The objective of the route analysis and reconnaissance engineering is the evaluation of both the feasibility and the cost of constructing a ground transportation facility to provide additional access from Southeast Alaska to the adjoining transportation facilities within Canada. The facility in turn would provide a more direct and shorter access route to salt water for the mineral and timber resources within the Iskut River region of British Columbia.

Recognizing the initial facility need and transport volumes as well as the availability of construction funding, the utilization of phase construction was chosen as the most viable approach. Initial construction would be a minimal facility with a basic alignment and gradient that could be upgraded to at least a Federal secondary standard as increased traffic volumes and types demanded.

Source data for review and analysis of the routes and standards included the following;
1) Department of Transportation and Public Facilities- Southeast Region's Route Feasibility Study, Wrangell to Canada Border, November 1974, 2) Supplemental Reconnaissance Study, Bradfield Canal Route, January, 1986, 3) Reconnaissance of Iskut Valley Route-Cassiar Highway to U.S. Border, B.C. Ministry of Highways,
4) Skyline Exploration Ltd's Stage 1 Report for a Proposed Mineral Access Road, Iskut River Area, B.C., April 1982. Additionally, the video tapes of the DOT&PF aerial reconnaissance of the Bradfield Canal Route initially flown September 26, 1985 with a follow-up flight on February 2, 1988.

5.1.1. LAND STATUS

At the present time, the entire route corridor is Tongass National Forest land, and there are no active mining claims, withdrawals or easements within the corridor. Mining claims that were staked in the past and had land common to the corridor have expired. Two special use permits are issued by the U.S. Forest Service in the project area; 1) to the Alaska Energy Authority for the Tyee Hydroelectric Project, and 2) to Bradfield Electric for the planned construction, operation and maintenance of a 69 KV power transmission line, extending from the Tyee Powerhouse to the Canadian border.

The State of Alaska, during 1989, filed a National Forest Community Grant(NFCG) nomination for a tentative land selection of 5,020 acres at the east end of Bradfield Canal. A tentative selection of 4,090 acres was approved by the U.S. Forest Service

5.2 ENGINEERING AND COSTS

5.2.1. ROAD STANDARDS

Initial construction would be a 16 foot wide, single lane roadway with intervisible turnouts. Vertical alignment would be limited to 8 percent maximum with maximum horizontal curvature of 15 degrees. This standard of road has been used extensively throughout Southeast Alaska and within most National Forests and has shown that it can readily handle an ADT of 100 vehicles. With reasonable traffic control measures, this number could be increased.

The road subgrade should be constructed of shot rock or other materials which would be capable of supporting "off highway" vehicle loadings. Roadway surfaces would be a crushed gravel surfacing material.

The majority of the road traverses moderate to flat terrain. Previous corridor studies conducted by ADOT&PF suggest keeping the entire road on the west side of the Bradfield river. This study suggests moving the route to the east side to take advantage of the existing roadbed where possible. The first few miles of terrain along the west side of the river is fairly steep and provides minimal opportunity to place the roadway up, off the river flats. It is likely that the route would encounter extensive side hill cuts in locating the roadway in this area. See section 5.2.3., Route Reconnaisance.

Major drainage structures would be initially constructed as a double lane facility. The structure would be capable of supporting a single off highway vehicle or normal two way traffic with standard highway loadings. This approach has been used within the Tongass National Forest on routes where future upgrading is anticipated and has shown to be a cost effective alternative.

The initial tunnel construction standards are based on a 20-foot wide by 15-foot high bore. The tunnel would be self ventilating with lighting throughout. Based on our discussions with DOT&PF personnel, a 30-foot wide by 20-foot high bore was also evaluated for a measure to Federal Highway standards.

The assumptions used for marine terminal analysis provide for a 300 foot long steel sheetpile cell bulkhead with mooring dolphins at either end to allow tying up large draft open going vessels. There would be a 200' by 500' gravel surface staging area adjacent to the bulkhead. A wooden float with gangway would be provided to allow landing of small vessels and float planes.

The marine terminal was sited on the east side of the Bradfield Canal as it appeared during initial review that this location provides more protection from prevailing

for selection on August 28, 1989, and classified NFCG 288. The Bradfield selection will next be forwarded to the Bureau of Land Management for adjudication.

The approved selection covers the area of the east-side, preferred deep water marine transfer site, upland staging area, additional west-side waterfront acreage, and approximately the lower four miles of the proposed road route. The nominated lower road route includes adequate acreage for community and infrastructure development. The legal description for the approved selection is described as follows;

Bradfield Canal NFCG 288

T.65S., R.89E., C.R.M.
Section 25: All
Section 26: N1/2, N1/2SW1/4, NW1/4NW1/4SE1/4, excl. USS 2623;
Section 36: N1/2N1/2

T.65S., R.90E., C.R.M.
Section 10: S1/2SE1/4;
Section 11: S1/2SW1/4, SE1/4;
Section 13: SW1/4NE1/4, S1/2NW1/4, SW1/4, W1/2SE1/4, SE1/4SE1/4;
Section 14: All;
Section 15: E1/2;
Section 19: W1/2
Section 20: S1/2N1/2, S1/2;
Section 21: S1/2
Section 22: N1/2, N1/2SW1/4, NW1/4SE1/4;
Section 23: N1/2N1/2, SW1/4NW1/4;
Section 24: N1/2N1/2
Section 29: W1/2NW1/4;
Section 30: All;
Section 31: N1/2NE1/4.

Containing 4,090 acres, more or less.

southeast winds, avoids a major braided crossing at the mouth of the Bradfield River, and has suitable upland storage nearby the transfer point. The west shore appeared to form the major outwash zone of the Bradfield River contributing continuous silt loading, in addition to sidewall constraints for marine transfer. The August 1989 field reconnaisance verified these assumptions on marine transfer siting. Direct surface access to a deep water transfer site is more reliably provided by traversing the existing transmission cable routing which exits the Tyee powerhouse facility on an approach to the east side of Bradfield Canal, via an east-west corridor. A significant, near vertical, tidewater sidewall is encountered at the marine transfer point, and runs continuosly along the eastern shore of Bradfield Canal. Recognizing the marine sidewall constraints, a combination of shallow drafted barge into the existing(Tyee project) transfer point on the Bradfield River, supporting vehicle and equipment transfer, in combination with the above described mooring dolphin facility at the tidewater site for storage and conveyor loading of concentratee direct to deep drafted vessels appears to support the range of transfer requirements.

5.2.2. ROUTE DESCRIPTION

The planned route would commence at a marine terminal located on the east side of the head of Bradfield Canal, approximately two miles west of the Tyee Lake Powerhouse(See figure 3). The route would then proceed along the south side of the Bradfield River, passing the powerhouse and continuing along the old timber access road. This would allow utilization of the existing roadbed. The route would cross the East Fork of the Bradfield at approximately M.P. 4.1 and continue up the east side of the North Fork crossing to the west side at approximately M.P. 11.3. The crossing would require fairly major drainage structures at M.P. 11.4 and 12.2. The route would then proceed up the west side of the drainage to approximately M.P. 21.2. At this point the route would either continue up the west side or cross to the east side of the drainage depending on the route alternative selected. The route would cross the height of land between the Bradfield River Drainage and the Craig River Drainage at approximately M.P. 25. The route would then proceed down the Craig River along its southeast side to approximately M.P. 29.5 where it would cross the Craig River to its western side and continue down the drainage, intersecting the Canadian Border at approximately M.P. 31.0 (See Map Pocket inside back cover for a 1"=1mile route alignment map).

The B.C. Ministry of Mine, Energy and Petroleum is presently reveiwing access alignments and conducting bewnefit-cost analysis of an Iskut River resource road, providing access from Bob Quinn Lake at Highway 37, west to Bronson Creek(nearby confluence of the Craig River and the Iskut River), with tributary road access to the U.S.-Canada border along the Craig River, and a second tributary road into the lower Unuk River drainage and Sulphurets Camp.

5.2.3. ROUTE RECONNAISANCE

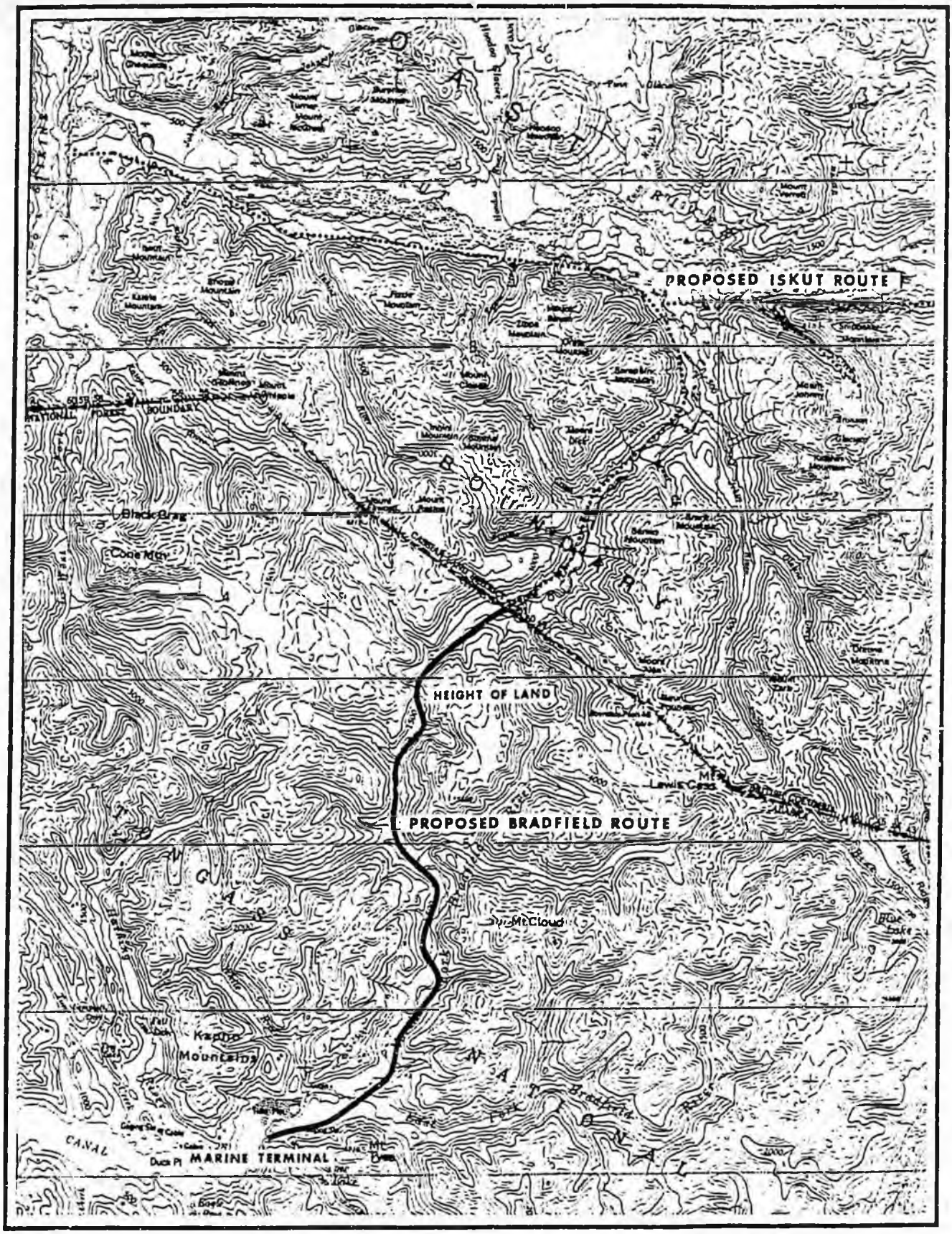
An aerial field reconnaissance of the proposed route was made on August 9, 1989. The work was done using a Hughes 500-D helicopter. An on the ground reconnaissance of the ground south of the height of land and the proposed south tunnel portal was also accomplished.

The reconnaissance confirmed that the road/tunnel alternative(Alternative 2) is the most practical approach. Considering the expense of constructing the road up over the height of land and then providing reasonable year around maintenance of that portion of the road makes the surface road alternative a poor choice. In the section from mile post 21, across the height of land and down to mile post 29 would be subject to numerous snow and rock debris avalanche zones. Construction would encounter extensive rock excavation, and from the height of land to mile post 29, the route would traverse an extremely steep side slope requiring a full bench section.

During the reconnaissance, the route along the west side of the Bradfield River from salt water to where the proposed route crosses the river at mile post 11-12 was reviewed. This specific west-side route alignment was identified by the Alaska Department of Transportation and Public Facilities in a supplemental Route Reconnaissance Study for the Bradfield River route in January 1986. This ADOT&PF alignment was chosen in part to mitigate perceived environmental constraints in placing the road along the present roadbed located on the valley floor. Consequently, to place the route entirely on the west side of the river would require extended sections of full bench construction and significantly higher cost. End haul would most likely be required to remove excess excavation so as to minimize the potential for impacting the valley floor below the route. Considering both the potential for environmental impacts and additional construction costs that would be encountered by locating the road in this area, it is felt the proposed east-side route location, as described in this report, is preferred.

The proposed route would encompass a good portion of the existing road bed (MP 2 to MP 11) which reduces the need for establishing new borrow sources and would result in less overall impacts to the Bradfield valley. All major streams and tributary drainages along the proposed route would utilize either bridges or open bottom culverts to minimize stream and fish habitat impacts. The west-side route would not reduce the number of stream and drainage crossings.

The reconnaisance of the proposed route did identify several areas where additional construction costs would be encountered over that anticipated in the draft report dated April 1989. The cost estimates for both Alternatives 1 and 2 were adjusted to recognize these changes as well as being updated to reflect current cost factors for performing the work.



Bradfield Industrial Road Feasibility Study

ROUTE LOCATION MAP

0 5 10 15 Miles

5.2.4. ROUTE ALTERNATIVES

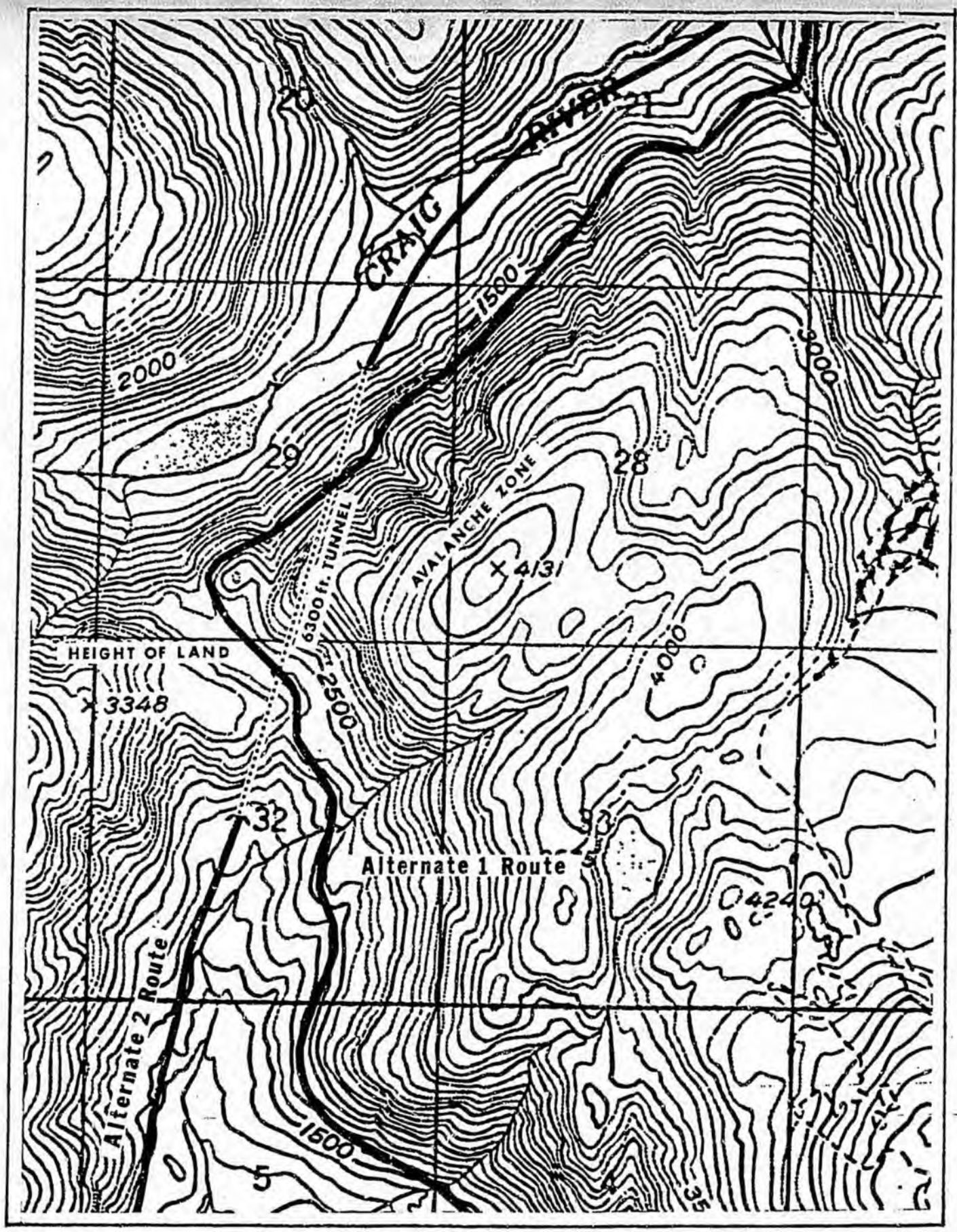
5.2.4.1. *Alternative 1.- Continuous Surface Road*

This alternative would involve construction of a continuous surface road from the marine terminal site to the Canadian border. The routing would require construction of 31.0 miles of road which will have basically a sustained gradient of 8% from M.P. 21 to M.P. 25.0 at the height of land, then a continued sustained 8% down to the Craig River at M.P. 29.4. The route also traverses excessively steep side slopes between M.P. 25 and M.P. 27 where a full bench roadway section as well as numerous avalanche sheds to protect the road users during winter travel will be required.

5.2.4.2. *Alternative 2.- Road/Tunnel*

This alternative uses a surface road with a 6300 foot long tunnel that allows the route to pass through the most adverse terrain at the height of land between the two river drainages. It reduces the extended adverse road gradients as well as allowing the route to avoid the high avalanche zones. This routing would result in an overall route length of 30.2 miles between the marine terminal and the border. See figure 4, Height of Land Crossing.

An alternative that utilized an aerial tramway for crossing the adverse terrain at the height of land between the two river drainages was considered, but dropped. Though initial construction costs for this alternative were the least expensive of the three considered, the requirement for transfer of goods and materials between the tramway and ground transport vehicles and the expense of operation and upkeep, resulted in the alternative appearing to be uneconomical.



Bradfield Industrial Road Feasibility Study

HEIGHT OF LAND CROSSING

SCALE 1" = 2000 FEET

5.2.5. CONSTRUCTION COST ESTIMATES

Based on location of the planned road and its construction standards, the U.S. Forest Service Cost Estimating Guide for the Tongass National Forest was used as the basis for estimating the road and drainage structure construction costs. The estimated costs were also evaluated against State of Alaska construction costs as well as other cost estimate data to help assure reasonableness.

	CONTINUOUS SURFACE ROAD	ROAD/TUNNEL
Road Mileage	31.0 mi.	29.0 mi.
Tunnel length		6300 ft.
Road Construction	$7,530,600	$5,579,400
Bridges	2,477,000	2,172,800
Riprap	91,700	91,700
Guard Rail	90,600	30,200
Snow Sheds	4,874,800	-0-
Tunnel[1]	-0-	9,261,000
Subtotal	$15,064,700	$16,783,000
Mobilization	419,000	427,000
Construction Camp Costs	442,000	491,500
Construction Staking	195,100	163,600
Contingency (20%)	3,013,000	3,440,000
Preliminary Engineering	835,000	953,000
TOTAL	$ 19,969,000	$ 22,676,900

* Construction of a Bradfield Canal marine transfer terminal is estimated at $3,000,000.00

[1] Costs for the tunneling are based primarily on data from the contractor who constructed the tunnels for the Snettisham Powerhouse tap of Crater Lake and those of a recent access tunnel at the Kensington Mine just north of Juneau. The Crater Lake bore was a 11-foot high, horseshoe bore while the Kensington access was a 15-foot high by 20-foot wide bore. Tunneling cost figures from past DOT&PF cost estimates and from Canadian construction projects were also analyzed. The tunneling costs reported below are estimated for a 30-foot wide by 20-foot high bore, design standards meeting Federal Highway standards. Costs for reducing to a 20 feet by 15 feet bore are estimated to be 40 percent lower than that reported for the larger bore. Based on information gathered, it appears that if the larger tunnel is needed at some future date, it would be most cost effective to do the larger bore initially.

5.2.6. MAINTENANCE AND OPERATION COSTS

Costs for both summer and winter maintenance of the Bradfield road are based on Department of Transportation and Public Facilities estimates. Data collected form the British Columbia Ministry of Transportation personnel indicate lower costs might likely be experienced, but based on discussions with those involved with this project and the costs being experienced on the road between Skagway and Carcross, it was felt that the best approach would be to use the higher cost figures.

ANNUAL MAINTENANCE AND OPERATION COSTS

	CONTINUOUS SURFACE ROAD	ROAD/TUNNEL
Summer Mtc.	$404,000	$348,000
Winter Mtc.	402,000	335,000
Avalanche Control	80,000	20,000
Tunnel Mtc. & Operation	–	120,000
TOTAL M&O	$886,400	$823,000

* Maintenance and Operation of Marine Terminal- $100,000

5.2.7. HAUL COST ESTIMATES

Haul cost data for Alternative 1(Continuous surface road to border) and Alternative 2 (Road/tunnel to border) were generated to initiate a benefit-cost analysis for the two Bradfield route alternatives. This haul cost analysis does not include the capital cost of the transportation facility. **In summary, the results indicate that Alternative 2 provides a net benefit in haul cost as the road/tunnel alignment helps minimize haul gradients.**

The haul cost in dollars per ton for the two Bradfield route alternatives are presented as follows;

BRADFIELD ROUTE ALTERNATIVES
HAUL COSTS COMPARISONS

Bradfield River Alternative 1. (Continuous Surface Road)

Terminal to Border

Highway Vehicles	$24.69/ton
Off-Highway Vehicles	$21.85/ton

Border to Terminal

Highway Vehicles	$24.55/ton
Off-Highway Vehicles	$21.97/ton

Bradfield River Alternative 2. (Road/Tunnel)

Terminal to Border

Highway Vehicles	$22.47/ton
Off-Highway Vehicles	$19.65/ton

Border to Terminal

Highway Vehicles	$22.31/ton
Off-Highway Vehicles	$19.46/ton

A second set of data was generated to allow a haul cost comparison of transporting targeted resource commodities to two differing marine transfer points- the Bradfield marine transfer site versus the Stewart, British Columbia transfer site. As the basis of comparison, the Bradfield road/tunnel alternative would serve as the haul routing to the Bradfield marine transfer site, contrasted by a haul routing along the Iskut River to Bob Quinn Lake and on to Stewart via the Cassiar Highway. (See Location Map, page 4). The average haul cost in dollars per ton for the Bradfield route versus the Iskut/Stewart route are presented as follows;

HAUL COST COMPARISON BY ROUTE

Bradfield Route:

Bronson Creek to Bradfield terminal: 47 miles one-way

Standard Highway Vehicles :$35.44/ton

Iskut/Stewart Route:

Bronson Creek to Stewart port: 158 miles one-way

Standard Highway Vehicles: $102.00/ton

There was no attempt made to try to estimate construction costs for other Canadian tributary routes. The costs used for the British Columbia portion of the routing are general in nature as data for the actual road gradients is not readily available. This data would certainly need further expansion before one could make any actual haul direction determinations. Recent submissions of alignment studies to the B.C. Ministry of Mines, Energy and Petroleum will provide current cost data for the various arterial sections of the Iskut routing, notably the link serving Bronson Creek to border, and the Unuk river and Sulphurets area.

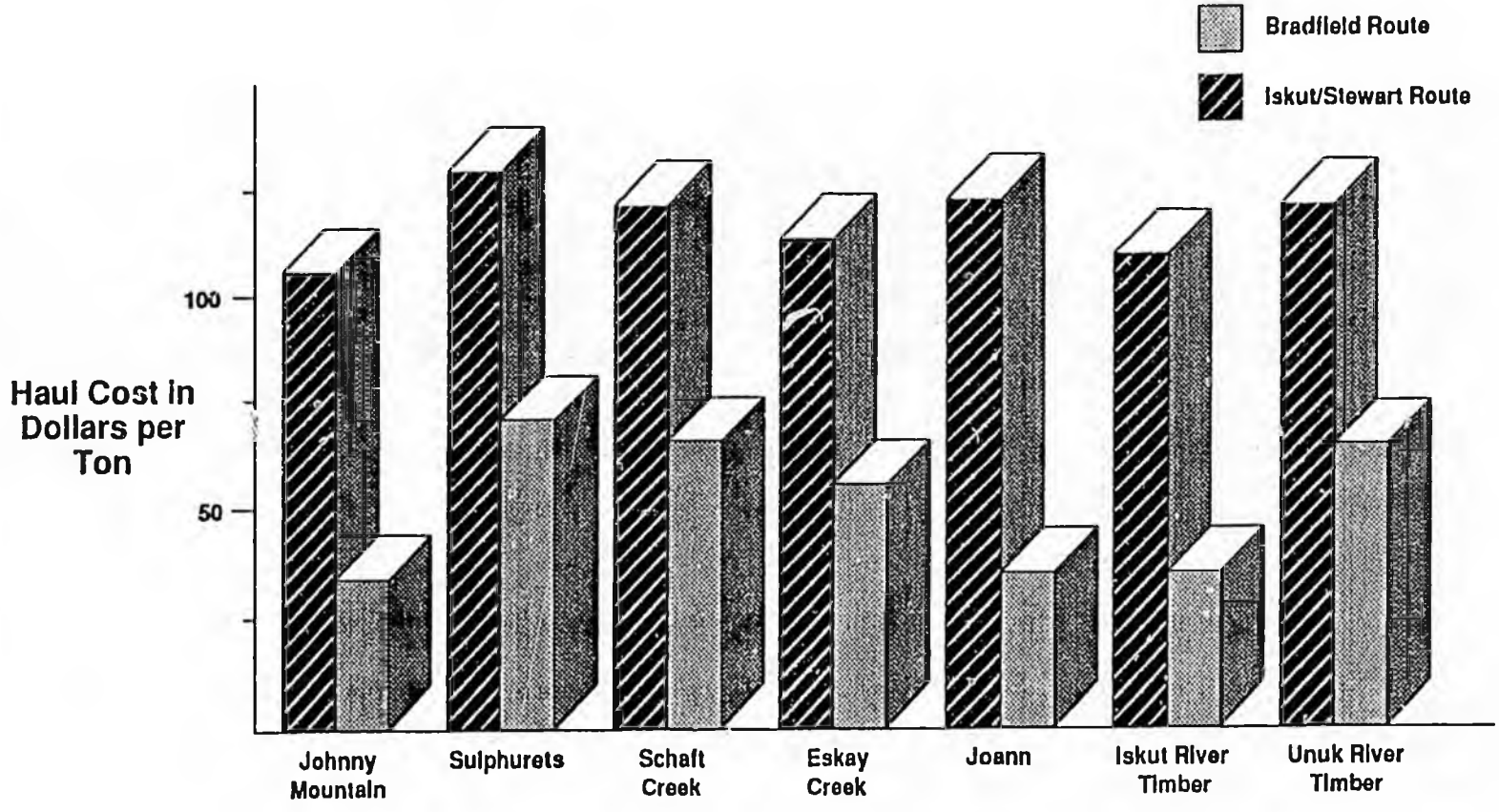
As a final expansion of the haul cost comparisons, five of the listed mineral properties found on Table 1, in addition to the Iskut River and Unuk River timber supplies were targeted as commodity haul sources. The haul cost estimates for the Canadian mineral resources used in this comparison are based on mileage estimates originating from the source properties. As for the timber supply, a mean point of origin within the operable area was used as the basis for mileage for each of the two timber supply regions. The haul cost comparisons are based on standard highway vehicle loads and expressed in dollars per ton. See Figure 5- Haul Cost Comparisons, on the following page.

FIGURE 5

Haul Cost Comparisons

STANDARD HIGHWAY VEHICLES

September 1989



6.0 ECONOMIC ANALYSIS OF ALTERNATIVES

The evaluation of alternatives was initiated with a comparison between the two route alternatives 1 and 2(road vs. road/tunnel) for the Bradfield route. It is concluded the primary difference between the two Bradfield route alternatives is the additional costs in construction of the Federal Highway standard tunnel. In the initial analysis, a smaller tunnel bore(20-foot x 15-foot) was considered and indicated the road/tunnel option to be the preferred alternative. When the larger bore(30-foot x 20-foot) was incorporated in the analysis, for reasons of addressing Federal Highway standards, the continuous surface road became the better alternative, with an estimated 4.5% rate of return over the road/tunnel alternative. Considering the haul cost savings and the likelihood of being better able to maintain a transportation corridor year around through use of the tunnel, the remainder of the economic analysis was run using the road/tunnel alternative for the Bradfield route. The August 1989 route reconnaissance confirms this conclusion (See section 5.2.3).

Two economic comparisons were then evaluated between the Bradfield Route, using the road/tunnel alternative and the Iskut/Stewart Route. For these comparisons, the construction and haul costs analysis used Bronson Creek as the point of origin for mineral and timber supply movement, with contrasting destination of Bradfield marine transfer site versus the Stewart port.

The first of the two Bradfield versus Iskut/Stewart route comparisons(See Section 6.2) looked at the relationship between the two routes considering just construction and maintenance costs. The cost of road construction and maintenance are derived using Bronson Creek as the point of origin. It is assummed that the cost of transporting commodities to this point from specific properties in the Iskut District would be similar, regardless which final route was chosen to tidewater. **Under this scenario, the Bradfield route demonstrates a favorable 13.6 percent rate of return over the Iskut/Stewart route.**

The second of the two Bradfield versus Iskut/Stewart route comparisons included the haul cost expense in addition to the road construction and maintenance costs found in the previous comparison. The cost for the marine terminals and their operation were not included due to limited cost data for expanded operations at the port of Stewart. Consequently, the assumption was made that the marine transfer development costs would be similar for both sites. In this comparison, the lesser haul cost associated with the Bradfield route is the key cost parameter which demonstrates the Bradfield as the route providing the greatest benefit to cost. **Under this scenario, the Bradfield route demonstrates a more favorable 42.6 percent rate of return over the Iskut/Stewart route.**

In summary, the haul cost relationship proves to be the significant cost parameter

throughout this evaluation. The haul cost saving associated with the shorter Bradfield route identifies this route as the preferred alternative using strictly a haul cost analysis and, as shown above, plays the biggest role in strengthening the rate of return on investment when incoporated as a contributor to total operating cost.

The following analysis of the alternatives found in sections 6.1-6.3 used a 20 year life, a minimum rate of return of 10% and a 5% per year increase in annual expense costs. The evaluation of the two Bradfield routes(Section 6.1) and the Bradfield versus Iskut/Stewart alternatives(Section 6.2 and 6.3) assumed an initial haul volume of 30,000 tons with an annual increase of 5%. As the reduction in haul costs by use of the Bradfield is significant, any increase in annual haul volume results in an increase in the rate of return for the Bradfield Route. The costs for the construction, operation and maintenance do not include the marine terminal. As previously stated, without better cost data for the port of Stewart, the premise was taken that marine transfer costs would be experienced equally for both terminal locations.

The costs associated with the use of both off-highway and on-highway vehicles were analyzed. As it is unlikely that off-highway vehicles would be allowed on the Cassiar Highway, the benefit-cost analysis were done using on-highway vehicle costs only.

6.1 BRADFIELD ROUTE ALTERNATIVES EVALUATION

Alternative 1- Continuous Surface Road
Alternative 2- Road/Tunnel
*includes Construction, Operation and Maintenance, and Haul cost

-Abstract-

This evaluation was done to compare the relationship between the surface road alternative and the road/tunnel alternative. As shown, the surface road option was the better alternative, only as the result of the costs incurred in going to the larger tunnel bore to meet Federal Highway standards. Reducing the bore size with compliance to the proposed roadway standard results in the road/tunnel option becoming the better alternative. Although the results indicate a preference for the surface road option, the remaining analysis used the road/tunnel option as it is felt that this alternative would be more reliable in providing a year around roadway. The operating and haul costs reflect the costs assuming haul from the border to the marine terminal.

MRRR (%): 10
Study period (years): 20
Tax status: Before-tax analysis

	ROAD	ROAD\TUNNEL
Investment value ($):	1.9969E+07	2.26769E+07
Salvage value ($):	0	0
Economic life (years):	20	20
Present worth ($):	-3.864462E+07	-3.971618E+07
Annual worth ($):	-4539182	-4665047
Rate of return (%):	4.483915	

The better alternative is: ROAD

	ROAD			ROAD\TUNNEL		
Year	Annual Income	Annual Expense	Annual Tax	Annual Income	Annual Expense	Annual Tax
1	$0.	$1,541,900.	$0.	$0.	$1,406,800.	$0.
2	$0.	$1,618,995.	$0.	$0.	$1,477,140.	$0.
3	$0.	$1,699,945.	$0.	$0.	$1,550,997.	$0.
4	$0.	$1,784,942.	$0.	$0.	$1,628,547.	$0.
5	$0.	$1,874,189.	$0.	$0.	$1,709,974.	$0.
6	$0.	$1,967,898.	$0.	$0.	$1,795,472.	$0.
7	$0.	$2,066,293.	$0.	$0.	$1,885,246.	$0.
8	$0.	$2,169,607.	$0.	$0.	$1,979,508.	$0.
9	$0.	$2,278,088.	$0.	$0.	$2,078,483.	$0.
10	$0.	$2,391,992.	$0.	$0.	$2,182,408.	$0.
11	$0.	$2,511,591.	$0.	$0.	$2,291,528.	$0.
12	$0.	$2,637,171.	$0.	$0.	$2,406,104.	$0.
13	$0.	$2,769,029.	$0.	$0.	$2,526,409.	$0.
14	$0.	$2,907,481.	$0.	$0.	$2,652,729.	$0.
15	$0.	$3,052,855.	$0.	$0.	$2,785,366.	$0.
16	$0.	$3,205,497.	$0.	$0.	$2,924,634.	$0.
17	$0.	$3,365,772.	$0.	$0.	$3,070,865.	$0.
18	$0.	$3,534,060.	$0.	$0.	$3,224,408.	$0.
19	$0.	$3,710,763.	$0.	$0.	$3,385,629.	$0.
20	$0.	$3,896,301.	$0.	$0.	$3,554,910.	$0.

6.2 BRADFIELD ROUTE vs ISKUT-STEWART ROUTE EVALUATION 1

*includes Construction and Maintenance Cost

-Abstract-

This analysis is based on using only the road construction and maintenance portion of the overall operating costs. Road construction and maintenance costs are developed using the Bronson Creek airstrip as the point of origin. Bronson Creek represents the point on the proposed transportation system common to both route alternatives. The Bradfield route represents a favorable 13.6 % rate of return over the Iskut/Stewart route.

MRRR (%):	10	
Study period (years):	20	
Tax status:	Before-tax analysis	
	BRADFIELD ROUTE	ISKUT\STEWART ROUTE
Investment value ($):	2.60618E+07	1.67465E+07
Salvage value ($):	0	0
Economic life (years):	20	20
Present worth ($):	-3.984534E+07	-4.279232E+07
Annual worth ($):	-4680219	-5026369
Rate of return (%):	13.62651	

The better alternative is: BRADFIELD ROUTE

	BRADFIELD ROUTE			ISKUT\STEWART ROUTE		
Year	Annual Income	Annual Expense	Annual Tax	Annual Income	Annual Expense	Annual Tax
1	$0.	$1,138,000.	$0.	$0.	$2,150,400.	$0.
2	$0.	$1,194,900.	$0.	$0.	$2,257,920.	$0.
3	$0.	$1,254,645.	$0.	$0.	$2,370,816.	$0.
4	$0.	$1,317,377.	$0.	$0.	$2,489,357.	$0.
5	$0.	$1,383,246.	$0.	$0.	$2,613,825.	$0.
6	$0.	$1,452,408.	$0.	$0.	$2,744,516.	$0.
7	$0.	$1,525,029.	$0.	$0.	$2,881,741.	$0.
8	$0.	$1,601,280.	$0.	$0.	$3,025,829.	$0.
9	$0.	$1,681,344.	$0.	$0.	$3,177,120.	$0.
10	$0.	$1,765,411.	$0.	$0.	$3,335,975.	$0.
11	$0.	$1,853,682.	$0.	$0.	$3,502,774.	$0.
12	$0.	$1,946,366.	$0.	$0.	$3,677,912.	$0.
13	$0.	$2,043,684.	$0.	$0.	$3,861,808.	$0.
14	$0.	$2,145,868.	$0.	$0.	$4,054,898.	$0.
15	$0.	$2,253,161.	$0.	$0.	$4,257,643.	$0.
16	$0.	$2,365,819.	$0.	$0.	$4,470,525.	$0.
17	$0.	$2,484,110.	$0.	$0.	$4,694,051.	$0.
18	$0.	$2,608,315.	$0.	$0.	$4,928,753.	$0.
19	$0.	$2,738,731.	$0.	$0.	$5,175,191.	$0.
20	$0.	$2,875,667.	$0.	$0.	$5,433,950.	$0.

6.3 BRADFIELD ROUTE vs ISKUT-STEWART ROUTE EVALUATION 2

*includes Construction , Maintenace and Operation Cost, and Haul Cost

-Abstract-

This analysis is based on the total operating costs which includes haul cost. The inclusion of Haul cost in this analysis represented a significant cost parameter as the Bradfield route assumes a 42.6 % favorable rate of return over the Iskut/Stewart route.

MRRR (%): 10
Study period (years): 20
Tax status: Before-tax analysis

	BRADFIELD ROUTE	ISKUT\STEWART ROUTE
Investment value ($):	2.60618E+07	1.67465E+07
Salvage value ($):	0	0
Economic life (years):	20	20
Present worth ($):	-5.168612E+07	-8.494959E+07
Annual worth ($):	-6071032	-9978147
Rate of return (%):	42.65778	

The better alternative is: BRADFIELD ROUTE

	BRADFIELD ROUTE			ISKUT\STEWART ROUTE		
Year	Annual Income	Annual Expense	Annual Tax	Annual Income	Annual Expense	Annual Tax
1	$0.	$2,115,600.	$0.	$0.	$5,631,000.	$0.
2	$0.	$2,221,380.	$0.	$0.	$5,912,550.	$0.
3	$0.	$2,332,449.	$0.	$0.	$6,208,177.	$0.
4	$0.	$2,449,071.	$0.	$0.	$6,518,585.	$0.
5	$0.	$2,571,525.	$0.	$0.	$6,844,514.	$0.
6	$0.	$2,700,101.	$0.	$0.	$7,186,740.	$0.
7	$0.	$2,835,106.	$0.	$0.	$7,546,076.	$0.
8	$0.	$2,976,861.	$0.	$0.	$7,923,380.	$0.
9	$0.	$3,125,704.	$0.	$0.	$8,319,548.	$0.
10	$0.	$3,281,989.	$0.	$0.	$8,735,525.	$0.
11	$0.	$3,446,088.	$0.	$0.	$9,172,301.	$0.
12	$0.	$3,618,393.	$0.	$0.	$9,630,916.	$0.
13	$0.	$3,799,312.	$0.	$0.	%$10,112,461.	$ 0.
14	$0.	$3,989,278.	$0.	$0.	%$10,618,084.	$ 0.
15	$0.	$4,188,741.	$0.	$0.	%$11,148,988.	$ 0.
16	$0.	$4,398,178.	$0.	$0.	%$11,706,437.	$ 0.
17	$0.	$4,618,087.	$0.	$0.	%$12,291,758.	$ 0.
18	$0.	$4,848,991.	$0.	$0.	%$12,906,345.	$ 0.
19	$0.	$5,091,440.	$0.	$0.	%$13,551,662.	$ 0.
20	$0.	$5,346,012.	$0.	$0.	%$14,229,244.	$ 0.

7.0 OTHER CONSIDERATIONS

7.1 POWER SUPPLY OPTIONS

Power supply options have been examined by B.C. Hydro for supplying regional power to the existing mine at Johnny Mountain as well as other potential mine developments throughout Northwest British Columbia. In all cases, the results were subject to unforseeable start-up dates for mine development and general uncertainties relating to the potential Stikine/Iskut hydro electric project.

Four power supply options are considered:

Option 1) Extension from British Columbia Hydro's grid.
Option 2) Hydro generation near mine sites (more creek for Shaft Creek and/or Stikine Copper, and small hydro, where identified, for other mines.
Option 3) Diesel generators at mine sites
Option 4) Extension from Tyee Lake Hydro at Bradfield Canal.

Option 1 Is contingent on the Stikine/Iskut Power Project, a forseeably delayed opportunity due to many environmental and political considerations.

Options 2 and 3 Suggest, in most cases, diesel operation is preferred to small hydro as an on-site source of electricity.

Option 4 The average energy costs from the Tyee Project should provide more efficient operation, improve power reliability, and is compatible with Regional Intertie System Development.

Power supply options 1 and 4 are biased upward for mines and potential mines where supplemental diesel operation is required because of the start-up date of the mine precedes the earliest, feasible, in-service date for another source of power such as the potential Stikine/Iskut power project or Tyee Power. Thus, if mine start-up is sensitive to power costs, it may be advantageous for some potential mines to delay production until after a network power project proceeds.

This is not to suggest that a decision on the Stikine/Iskut or Tyee extension can be based on mine development in the region. Such a decision must be based on future regional energy demand, possible energy export demand and the successful negotiation of international agreements.

Extension of Tyee Hydroelectric Project power via the Bradfield Corridor is supported by the Alaska Energy Authority consistent with Federal Law providing for the export and sale of electricity and electric power lines crossing international borders

(Department of Energy-Guide to Authorization Procedures, November 1980). A Harza Engineering Study released in October 1987, for the Alaska Power Authority - Transmission Intertie Study concludes:

1) An economic potential for utilization of surplus power from Tyee, and
2) Interconnecting Tyee to various mining projects is supported, in most cases, by the close geographical proximity of District mining properties

7.2 FUNDING OPTIONS

An assessment of present and near term availability of capital funds for access road development required review of four principal sources:

1) State of Alaska General Fund
2) FHWA - (Federal Highway Funds)
3) AIDEA Funds - (Alaska Industrial Development and Export Authority)
4) Toll Facility Revenue Bonds
5) Mining Industry Capitalization

Subject to source number 1) The state of Alaska General Fund appears very remote. Present capital funds are restricted to declining state revenues, and highly prioritized statewide public transportation objectives. In simple terms the general fund allocation in it's present form and rate of growth is regionally and fractionally apportioned to meet diverse operational needs. The net effect being a poor source for single-use capital intensive investment.

Subject to source number 2) The 1988 Federal Highway Fund apportionment for the State of Alaska was $150-160 million. The Department of Transportation S.E. Region allocation was less than 10 percent or roughly $13 million. For the same problematic reasons as the State General Fund, the Southeast Regional Funds are allocated throughout the region for public transportation needs and provide little opportunity for access road development. The opportunity for FHWA source funding would require strict prioritization of the Southeast regional funding allocation, an option receiving very little support due to the range of facility funding needs presently recognized throughout the region.

Subject to source number 3) The Alaska Industrial Development and Export Authority Funds provide the greatest opportunity for access road capital funds. The authority was created by the Alaska State Legislature in 1967 pursuant to the Industrial Development Act to finance industrial and business enterprises for the purpose of promoting the general prosperity and economic welfare of the people of the state, and to relieve problems of unemployment.

In February 1987 an AIDA agreement entitled Delong Mountain Transportation Project, provided for the authority to construct, own and operate a 52 mile road and deepwater port to serve the Red Dog Mineral Deposit. Proceeds from revenue bonds issued by the authority and state appropriations ensure project financing. The initial principal user of the project is Cominco Alaska Incorporated, and under the agreement Cominco is to pay the authority established Toll Fees including certain "Pledged Revenues" or minimum annual assessment. Total project expenditures are assigned at $165 million. Toll charges are presently assessed at a rate which is expected to repay construction costs over a 50-year period, inclusive of a 6.5 percent rate of return. The tolls may be reevaluated, and subject to change, based on volume and value shipped. It is important to recognize that the Red Dog project is designed as a single-user project, that Cominco Alaska Incorporated holds complete liability to provide cost recovery tolls and other pledged revenues. In the case of the Bradfield Road project, the cost recovery responsibility will likely be shared by multi-users, the numbers and attitudes of which are unclear at this time.

Authority funding for the Bradfield Industrial Road would be dependent upon satisfactory arrangements being consumated between the users of the facility and the Authority. Those user(s) agreements would have to contain acceptable financial provisions to ensure that funds utilized for the construction and operation of the facility would be repaid by those using the transportation system. Arriving at such mutually satisfactory agreements will require direct negotiations between the potential users, i.e. mining industry, as well as the Government of British Columbia and the State of Alaska.

Subject to Source number 4) The State of Alaska may issue Toll Facility Revenue Bonds pursuant to Alaska Statutes 37.15.610-760 to acquire or construct toll highways, bridges, tunnels, and other facilities. The issuance of bonds would require that:

a) They be found necessary by the commissioner of transportation and public facilities;
b) The commissioner submit a feasibility study to the Governor and Legislature demonstrating financial feasibility and including, if necessary, a description of other funding sources required for feasibility;
c) the office of management and budget review the study and report its findings to the Governor and legislature; and
d) the legislature approve the bonds.

Similar to AIDEA financing, financial feasibility would require user agreements to assure payment of a minimum amount of tolls for a specified period of time. The minimum level of tolls, net of operating and maintenance costs, would need to

exceed some multiple of the debt service on the bonds. This is referred to as "coverage". Depending on the risk of the project, coverage requirements may range from 1.25 to over 2.00 times annual debt service.

Subject to source number 5) Canadian mining industry capitalization for access road and port development. Recommendations are for the Alaska Department of Transportation to maintain dialogue with the Canadian study team evaluating Iskut River access routes and associated cost estimates. Upon completion of the Iskut River Alignment study and subsequent benefit cost analysis, overall facility cost and user efficiency may be more clearly defined against the Bradfield alternative. In the past, the British Columbia Province has expected the private sector to take the lead responsibility for mine access road development. This position has only strengthened with poor outllooks for provincial infrastructure capital. The Canadian mining industry will carefully evaluate salt water access with maximum utility and minimal debt service for long term mine viability.

BEAR VALLEY

EXISTING TUNNEL

EXISTING RAIL ROAD

PORTAGE CREEK

PROPOSED BRIDGE

PROPOSED PARKING & ROAD

EXISTING TUNNEL

PASSAGE CHANNEL

TANK FARM

AIRPORT

PORTAGE GLACIER VISITOR CENTER

PORTAGE LAKE

PROPOSED PARKING & ROAD

WHITTIER

BYRON GLACIER

PORTAGE GLACIER

PLAN

SCALE (FEET)

0 500 1000 2000 4000

EXISTING RAILROAD SECTION

WIDENED TUNNEL SECTION

BRIDGE SECTION

CONCRETE DECK

STEEL BOX GIRDERS

CONCRETE PIER

WHITTIER ACCESS

Peratrovich, Nottingham & Drage, Inc.

Engineering Consultants

1506 West 36th Avenue, Anchorage, Alaska 99503

(907) 561-1011

CONCEPT PLAN

1-1

(9) "revenue fund" means the International Airports Revenue Fund created by AS 37.15.430. (§ 1 ch 149 SLA 1972)

Revisor's notes. — Reorganized in 1988 to alphabetize the defined terms.

Article 4. Toll Facilities Revenue Bonds.

Sec. 37.15.610. Bond authorization. For the purpose of providing part or all of the money to be used, with or without any grants or other money that may become available, the issuance and sale of revenue bonds of the state in the total principal sum of not to exceed $500,000,000 is authorized to acquire, construct, equip, and install the additions, improvements, extensions, and facilities authorized in AS 37.15.720 and 37.15.730. The principal of and interest on these bonds are paid out of and secured by the gross revenue derived by the state from the ownership, use, and operation of the toll facilities, and out of any other revenue or money that the state legislature may provide exclusive of any state tax or license. Bonds may not be issued to assist in the acquisition, financing, or operation of projects without prior approval from the legislature. (§ 1 ch 162 SLA 1984)

Sec. 37.15.620. Construction fund. (a) The toll facilities construction fund is established for deposit of proceeds of the sale of the bonds authorized by AS 37.15.610 and any grant or other money that is legally provided for the same purposes for which the bonds are authorized except for any accrued interest paid on the bonds by the purchaser. The money in the construction fund is used to pay the cost of acquiring, constructing, and equipping facilities authorized in AS 37.15.720 and 37.15.730 and costs incidental to those activities, including costs of the authorization, issuance, and sale of the bonds. To the extent allowed in the bond resolution, money in the construction fund may also be used for the payment of interest on the bonds during the time of actual construction, and for any additional time, not exceeding one year after construction is completed. Money in the construction fund may also be transferred to the bond redemption fund, as permitted by the bond resolution, to establish a reserve for the payment of the principal and interest on the bonds.

(b) The bond resolution may provide for the investment of money in the construction fund as the committee determines. The interest earned upon or any profit derived from the sale of the investment is deposited in the construction fund. (§ 1 ch 162 SLA 1984)

Sec. 37.15.630. Revenue fund. (a) The toll facilities revenue fund is established and shall be set apart from all other money of the state. The toll facilities revenue fund is a trust fund for the purposes under AS 37.15.610 — 37.15.760, where all revenue, fees, tolls, charges, and rentals are deposited that are derived by the state from the ownership, lease, use, and operation of the facilities authorized by AS 37.15.720 and 37.15.730. The revenue, fees, tolls, charges, and rentals may not include the proceeds of any state tax or license. The money in the revenue fund may only be used to

(1) pay or secure the payment of the principal of and interest on the toll facilities bonds and principal of and interest on any other revenue bonds issued by authorization of the legislature to provide money to acquire, construct, and equip facilities authorized by AS 37.15.720 and 37.15.730 and to be payable out of the revenue fund;

(2) pay the normal and necessary costs of maintaining and operating the facilities acquired, constructed, or equipped under AS 37.15.610 — 37.15.760;

(3) pay the costs of renewals, replacements, and extraordinary repairs to facilities acquired, constructed, or equipped under AS 37.15.610 — 37.15.760;

(4) redeem before their fixed maturities any and all revenue bonds issued for the purpose of acquiring, constructing, and equipping facilities authorized by AS 37.15.720 and 37.15.730;

(5) provide money to acquire, construct, and equip necessary additions and improvements to facilities authorized by AS 37.15.720 and 37.15.730; and

(6) provide money to pay any and all other costs relating to the ownership, use, and operation of the facilities.

(b) The investment of money in the revenue fund may be made as the committee determines. The interest earned upon or any profits derived from the sale of an investment under this subsection shall be deposited in the revenue fund. (§ 1 ch 162 SLA 1984)

Sec. 37.15.640. Bond redemption fund. The toll facilities revenue bond redemption fund is established for deposit in trust of money for paying and securing the payment of principal of and interest and redemption premium, if any, on bonds and is set apart from all other money of the state. The committee, on behalf of the state, shall obligate the state to set aside and pay into the bond redemption fund from the revenue fund an amount of money sufficient to pay the principal of and interest and redemption premium, if any, on the bonds as the

payments become due and, if the committee considers it necessary, to set aside and maintain a reserve for this purpose. The bond redemption fund is drawn upon for the purpose of paying the principal of and interest and redemption premium, if any, on the bonds, and the bonds do not constitute a general obligation of the state. (§ 1 ch 162 SLA 1984)

Sec. 37.15.650. Bond terms. (a) The toll facilities bonds are sold in the amounts or series and at the time as determined by the committee. Before selling a series of bonds, the committee shall give notice inviting sealed bids. If satisfactory bids are received, the bonds offered for sale are awarded to the highest responsible bidder. If the committee determines that a bid received is not satisfactory as to price or responsibility of the bidder, the committee may reject the bid received. Bonds, or a series of bonds, may not be sold if the effective interest rate over the life of the bonds exceeds 11 percent per year or that rate of interest that is 125 percent of the rate of the Bond Buyer Index of 20 Municipal Bond Average Yields for the week previous to the date of sale of the bonds, whichever is higher. Interest is payable annually or semiannually.

(b) The bonds mature at the time fixed by the committee. The bonds may be subject to redemption before their fixed maturities as determined by the committee and with the premium fixed by the committee, but a bond may not be subject to redemption before its fixed maturity date unless the right to redeem that bond is expressly mentioned on the face of the bond. The bonds

(1) may be in denominations determined by the committee;

(2) may be issued in coupon form or in fully registered form, and may be registrable as to principal or both principal and interest, all under regulations and conditions the committee provides;

(3) are payable as to principal and interest at the place determined by the committee;

(4) shall be signed on behalf of the state by the governor and shall be attested to by the lieutenant governor, both of which signatures may be facsimile signatures, and each of the interest coupons attached to them shall be signed by the facsimile signatures of these officials;

(5) shall have the seal of the state impressed, printed, or lithographed on them; and

(6) shall be issued under and subject to the terms, conditions, and covenants, providing for the payment of the principal of and interest on the bonds and the other terms, conditions, covenants, and protective features safeguarding this payment and relating to the maintenance, operation, and improvement of the toll facilities as found necessary by the committee, which covenants may include a provision requiring the setting aside and maintenance of certain reserves to secure the payment of the principal and interest.

(c) If found reasonably necessary, the committee may select a trustee or trustees for the holders of the bonds or any series of the bonds, for the safeguarding and disbursement of any of the money in any of the funds created by AS 37.15.620, 37.15.630, and 37.15.640, or for the duties for authentication, delivery, and registration of the bonds as the committee may determine. The committee shall also fix the rights, duties, powers, and obligations of the trustee or trustees.

(d) In the committee's determination of all of the matters and questions relating to the issuance and sale of the bonds and the fixing of the maturities, terms, conditions, and covenants of the bonds as provided in (a) — (c) of this section, the decisions of the committee shall be those found to be reasonably necessary for the best interests of the state and its inhabitants, and those that will accomplish the most advantageous sale of the bonds, with due regard, however, (1) to necessary or normal costs of maintenance and operation; (2) to renewals and replacements of and repairs to the toll facilities; (3) to all improvements to toll facilities and property of toll facilities owned, used, operated, or leased in connection with toll facilities; and (4) to the future growth and expansion of all of the facilities and the possibility of additional revenue bond financing for toll facilities purposes. A decision of the committee, as expressed in any bond resolution, is final when any bonds have been issued under the bond resolution.

(e) A bond resolution may provide that the bonds issued contain a recital that they are issued under AS 37.15.610 — 37.15.760, and any bonds containing this recital are conclusively considered to be valid and to have been issued in conformity with AS 37.15.610 — 37.15.760.

(f) The validity of the authorization and issuance of bonds is not affected by any proceeding for the acquisition or construction of the additions, improvements, or facilities for which the bonds have been issued or by any contract in connection with the acquisition or construction. (§ 1 ch 162 SLA 1984)

Sec. 37.15.660. Bond resolution. The committee is authorized and directed to adopt the bond resolution and prepare all other documents and proceedings necessary for the issuance, sale, and delivery of the bonds or any part or series of them. The bond resolution shall fix the principal amount, denomination, date, maturities, place or places of payment, rights of redemption, if any, terms, form, conditions, and covenants of the bonds or each series of them. The committee shall also determine and provide for the date and manner of sale of the bonds, and shall provide whether the notice of sale is to be published elsewhere in addition to the publication required by AS 37.15.650. (§ 1 ch 162 SLA 1984)

Sec. 37.15.670. Enforcement by holder. The holder of any bonds or the trustee for the holders of the bonds or any series of them, may, by appropriate proceedings in the courts of record of the state, compel the transfer, setting aside, and payment of money and the enforcement of all of the terms, conditions, and covenants as required and provided in AS 37.15.610 — 37.15.760 and in the bond resolution. (§ 1 ch 162 SLA 1984)

Sec. 37.15.680. Amounts required for payments. The committee shall, before December 31 of each year, commencing with the year in which the bonds are issued, certify to the commissioner of revenue and the commissioner of transportation and public facilities the amounts required in the next ensuing calendar year by a bond resolution to be paid out of the revenue fund into the bond redemption fund and to be paid into and maintained in any reserve fund or account or any other fund or account created by a bond resolution. The committee shall also certify to the commissioners the last date upon which payments may be made. (§ 1 ch 162 SLA 1984)

Sec. 37.15.690. Bond negotiability. The bonds and the coupons attached to them are fully negotiable instruments under the laws of the state. (§ 1 ch 162 SLA 1984)

Sec. 37.15.700. Refunding. (a) The bonds or any part of them may be refunded at or before their maturity by the issuance of refunding revenue bonds of the state if in the opinion of the committee refunding is advantageous to and in the best interest of the state and its inhabitants.

(b) The issuance of refunding bonds need not be authorized by an act of the legislature, and the committee shall adopt the resolution and prepare all other documents and proceedings necessary for the issuance, exchange or sale, and delivery of the bonds. All provisions of AS 37.15.610 — 37.15.760 applicable to revenue bonds are applicable to the refunding bonds and to the issuance, sale, or exchange of the bonds, except as otherwise provided in this section.

(c) Refunding bonds may be issued in a principal amount sufficient to provide money for the payment of all bonds to be refunded by them, and, in addition, for the payment of all expenses incident to the calling, retiring, or paying of the outstanding bonds, and the issuance of the refunding bonds. These expenses include the difference in amount between the par value of the refunding bonds and any amount less than par for which the refunding bonds are sold, any amount necessary to be made available for the payment of interest on the refunding bonds from the date of sale of them to the date of payment of the bonds to be refunded or to the date upon which the bonds to be refunded will be paid under the call of the bonds or agreement with the holders of

them, and the premium, if any, necessary to be paid in order to call or retire the outstanding bonds and the interest accruing on the outstanding bonds to the date of the call or retirement. (§ 1 ch 162 SLA 1984)

Sec. 37.15.710. Bonds as legal investments. Toll facilities bonds are legal investments for all banks, trust companies, savings banks, savings and loan associations, and other persons carrying on a banking business, all insurance companies and other persons carrying on an insurance business, and all executors, administrators, trustees, and other fiduciaries. The bonds may be accepted as security for deposits of all money of the state and its political subdivisions. (§ 1 ch 162 SLA 1984)

Sec. 37.15.720. State toll facilities. The state is authorized to acquire, construct, equip, and maintain toll bridges, tunnels, highways, roads, crossings, and causeways found to be necessary by the commissioner of transportation and public facilities. (§ 1 ch 162 SLA 1984; am § 2 ch 165 SLA 1988)

Effect of amendments. — The 1988 amendment inserted "tunnels." Safeguards project & protects State

Sec. 37.15.730. Review of toll facility projects. A toll facility may be financed under AS 37.15.610 — 37.15.760 if the following conditions are met for that toll facility:

DOT (1) the department submits to the governor and the legislature a feasibility study that finds that the toll facility is financially feasible and able to produce revenue adequate to repay the bonds with which it is financed;

(2) if financing in addition to revenue bonds is required to finance the toll facility, the department submits to the governor and legislature a finance plan that includes an estimate of the total cost of the toll facility and a description of the sources of money that will be used to finance the total cost of the toll facility; and

(3) the office of management and budget reviews the feasibility study and the finance plan, if required, and reports its findings and recommendations to the governor and legislature not later than 90 days after the study and plan are received by the office. (§ 1 ch 162 SLA 1984; am § 3 ch 165 SLA 1988)

Effect of amendments. — The 1988 amendment rewrote the catchline, which read "Knik Arm Crossing," rewrote the introductory language, which read "Notwithstanding the provisions of AS 37.15.720 the first state toll facility to be financed under AS 37.15.610 — 37.15.660 is the Knik Arm Crossing near Anchorage if the following conditions are met," substituted "toll facility" for "crossing" in paragraph (1) and, in paragraph (2), substituted "required to finance the toll facil-

ity" for "anticipated," "that includes" for "to include," and "cost of the toll facility" for "cost of the project" twice.

Sec. 37.15.740. Toll facility charges. The commissioner of transportation and public facilities shall fix and collect the fees, charges, tolls, and rentals derived by the state from the ownership, lease, use, and operation of the facilities authorized by AS 37.15.720 and 37.15.730 and improvements of the facilities as will provide revenue sufficient to comply with all of the covenants of the bond resolution. (§ 1 ch 162 SLA 1984)

Sec. 37.15.750. Statutory construction. AS 37.15.610 — 37.15.760 shall be liberally construed in order to carry out the purposes for which the provisions were enacted, and all existing laws in conflict with AS 37.15.610 — 37.15.760 are superseded as necessary to accomplish the purposes of AS 37.15.610 — 37.15.760. (§ 1 ch 162 SLA 1984)

Sec. 37.15.760. Definitions. In AS 37.15.610 — 37.15.760, unless the context requires otherwise

(1) "bond redemption fund" means the toll facilities revenue bond redemption fund created by AS 37.15.640, including any accounts that are created in that fund after October 4, 1984;

(2) "bond resolution" means the resolution authorizing the issuance of bonds, adopted by the committee under AS 37.15.660;

(3) "bonds" means the toll facilities revenue bonds authorized by AS 37.15.610 — 37.15.760;

(4) "committee" means the state bond committee created by AS 37.15.110, or any other committee, body, department, or officer of the state that or who succeeds to the rights, powers, duties, and obligations of the state bond committee by act of the legislature;

(5) "construction fund" means the toll facilities construction fund created by AS 37.15.620;

(6) "revenue fund" means the toll facilities revenue fund created by AS 37.15.630;

(7) "toll facilities" means highways, roads, bridges, tunnels, crossings, and causeways upon which tolls, charges, rentals, or other user fees are placed by the commissioner of transportation and public facilities. (§ 1 ch 162 SLA 1984; am § 4 ch 165 SLA 1988)

Effect of amendments. — The 1988 amendment inserted "tunnels" in paragraph (7).

SECTION #6

THIS SECTION PROVIDES A CLOSE LOOK AT THE ACTUAL METHOD BEING CONSIDERED TO FINANCE THIS PROJECT. THE FINANCIAL FEASIBILITY OF THIS PROJECT IS DISCUSSED AT LENGTH IN THIS SECTION.

FINANCING & BONDING

Last year, the Department of Revenue, State Bond Committee reviewed House Bill 311 to provide an analysis of the bonding capacity of this project. The traffic projections, annual debt service, bond sale monies and other factors were taken into consideration. As revenue bonds are stand alone bonds with no pledge or collateral from the state of Alaska, it becomes very important to make the project a financially feasible project in order to attract bond buyers.

The Department estimates that $27 million would be the maximum amount this project should be bonded for. Of this $27 million, $22.950 million would be actual construction dollars. The remaining $4.050 million would be required to cover financial fees, reserve requirements and other up front charges.

Key assumptions used in determining the bonding capacity of each alternative include:

- Passenger and vehicle tolls, as well as O & M expenses, are assumed to increase at the rate of inflation, taken for this analysis to be 5 percent per annum.

- Revenue bonds are based on the net revenues of the project. Typically, a debt service coverage factor of at least 1.35 is required to satisfy the financial safety requirements of potential bond buyers. This factor implies that for every $1.00 borrowed in the form of revenue bonds $1.35 must be available to repay the debt from net revenues.

- The Bond Buyer's Index of Municipal Bond Interest Rates, which is an indicator of bond interest trends for the United States published by the Daily Bond Buyer, indicated a range of interest rates from 8.85 to 10.31 percent for revenue bond issues nationwide in 1985. Bond rates in Alaska are generally on the high end of the scale, due to the relatively volatile nature of the state economy. For this analysis revenue bonds are assumed to be issued at a tax free market interest rate of 10 percent per annum.

- Revenue bonds are typically issued for a period of twenty to thirty years following completion of capital construction. For this analysis a thirty year period has been used.

- Eighty five percent of projected bonding capacity was assumed to be available to pay for the costs of construction, including outlays for engineering design and construction administration. The remaining 15 percent was assumed to be required to offset bond sales costs, reserve requirements, and other up-front expenses.

- Bonding capacities were based on the net revenue streams for the period 1988 to 2007. For each alternative, the net present value of the revenue streams was deflated to represent 1986 dollars.

TABLE 4-5

ALTERNATIVES 2 AND 5

PROJECTED NET REVENUES AND BONDING CAPACITY

	ANNUAL O&M COSTS	NET REVENUES HIGH FORECAST	NET REVENUES MEDIUM FORECAST	NET REVENUES LOW FORECAST
1988	$1,398,625	$1,691,666	$887,446	$737,440
1989	$1,678,556	$1,895,051	$989,714	$812,835
1990	$1,762,484	$2,593,935	$1,302,007	$896,210
1991	$1,850,608	$5,203,396	$3,541,873	$990,699
1992	$1,943,139	$5,731,030	$3,876,952	$1,096,688
1993	$2,040,296	$6,315,374	$4,250,882	$1,381,061
1994	$2,142,310	$7,143,284	$4,666,509	$1,523,180
1995	$2,249,426	$7,881,245	$5,312,424	$1,682,579
1996	$2,361,897	$8,653,690	$5,780,856	$1,862,990
1997	$2,479,992	$9,650,093	$6,256,808	$2,065,354
1998	$2,603,992	$10,556,079	$6,784,799	$2,505,692
1999	$2,734,191	$11,573,139	$7,599,141	$2,774,419
2000	$2,870,901	$14,230,278	$9,433,648	$3,078,017
2001	$3,014,446	$15,272,651	$10,047,758	$3,295,244
2002	$3,165,168	$16,410,275	$10,710,565	$3,530,119
2003	$3,323,427	$17,912,476	$11,700,766	$4,053,366
2004	$3,489,598	$19,279,057	$12,477,981	$4,341,316
2005	$3,664,078	$20,773,418	$13,327,431	$4,652,119
2006	$3,847,282	$22,708,946	$14,246,039	$4,987,548
2007	$4,039,646	$24,519,632	$15,578,020	$5,349,510
NET PRESENT VALUE (1988-2005, 10%)		$56,801,591	$36,665,031	$13,108,230
BONDING CAPACITY (NPV/1.35, ROUNDED TO NEAREST 0.1 MILLION)		$42,100,000	$27,200,000	$9,700,000
AMOUNT AVAILABLE FOR CONSTRUCTION		$35,785,000	$23,120,000	$8,245,000

ASSUMPTIONS:

AVERAGE REALIZED REVENUES, INITIAL YEAR -
$20.00 PER VEHICLE
$4.00 PER PASSENGER

TARIFFS AND EXPENSES ESCALATED AT 5 PERCENT PER YEAR

CONSTRUCTION FUNDING CAPACITY EQUAL TO 85% OF BONDING CAPACITY

SOURCE: TAMS ENGINEERS

TABLE 3-10

ALTERNATIVES 2, 3, 4, and 5

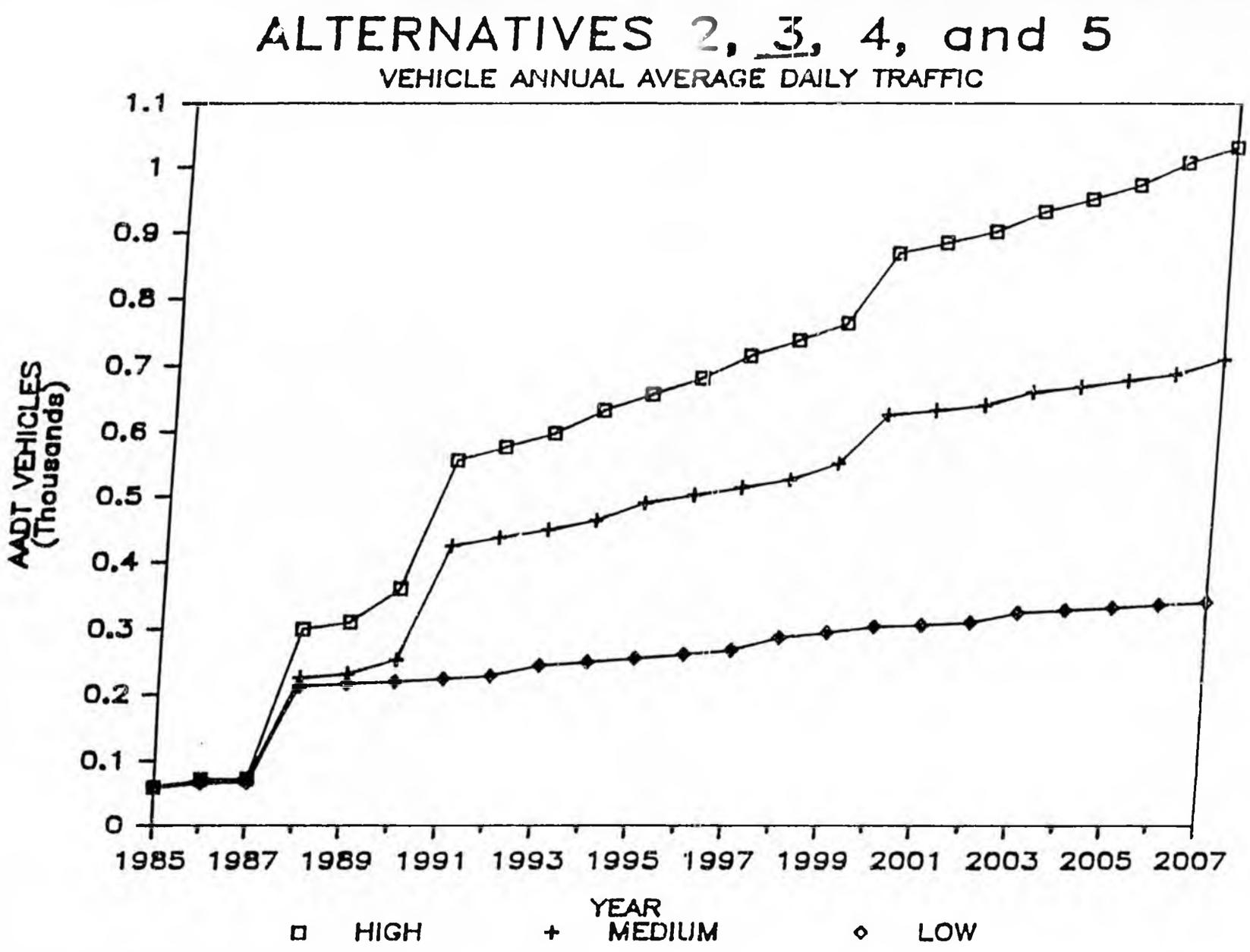
ANNUAL AVERAGE DAILY TRAFFIC

	HIGH		MEDIUM		LOW	
	TOTAL PASSENGERS	TOTAL VEHICLES	TOTAL PASSENGERS	TOTAL VEHICLES	TOTAL PASSENGERS	TOTAL VEHICLES
1985	403	60	403	60	403	60
1986	482	72	467	69	451	67
1987	490	73	475	71	457	68
*1988	751	300	568	227	533	213
1989	777	311	580	232	542	217
1990	902	361	635	254	551	220
1991	1,391	556	1,064	425	560	224
1992	1,441	577	1,093	437	571	228
1993	1,495	598	1,125	450	612	245
1994	1,582	633	1,160	464	624	250
1995	1,644	658	1,227	491	638	255
1996	1,702	681	1,258	503	653	261
1997	1,785	714	1,286	514	669	268
1998	1,845	738	1,316	526	716	286
1999	1,910	764	1,379	552	735	294
2000	2,174	870	1,564	626	756	303
2001	2,214	886	1,582	633	764	306
2002	2,257	903	1,600	640	772	309
2003	2,332	933	1,650	660	810	324
2004	2,381	953	1,670	668	819	328
2005	2,434	974	1,693	677	828	331
2006	2,519	1,008	1,716	687	838	335
2007	2,580	1,032	1,772	709	849	339
Average Annual Growth	8.80%	*6.72%	6.96%	*6.18%	3.44%	*2.48%

Source: TAMS Engineers

Note: *1988 - first year of new service.
1986 and 1987 figures are based on current service.
Percentage growth is derived with base year 1986.

FIGURE 3-4



SOURCE: TAMS Engineers

BRADFIELD RESOURCES ROAD

ALASKA AND BRITISH COLUMBIA WOULD BENEFIT MUTUALLY

HISTORY

Wrangell, Petersburg and Ketchikan have long been interested in gaining highway access to Canada. Since the early 1900's there have been efforts to construct highways into British Columbia from the southern southeast region of Alaska. In 1980, at the peak of the first United States environmental movement, two of the best routes from Alaska's perspective, the Stikine and Unuk River drainages were placed into wilderness areas. Roads are not allowed under any conditions in these areas.

In recent years, when Skyline Explorations Ltd., owner of the Johnny Mountain claim and other firms, such as Cominco, began to utilize Wrangell as the supply center for gold exploration efforts, a renewed interest by both British Columbia miners and by Alaskans at developing a road commenced. Responding to the increasing benefits that precious metal exploration efforts were having on Wrangell's economy and recalling historic economic ties between the residents of the Stikine area from both Alaska and B.C., local residents resumed the call for a road link.

With declining state revenues, it was obvious that construction of new highways would only occur where there was a resource of sufficient quantity to "pave the way" through a public/private partnership. Understanding this, Senator Lloyd Jones, Chairman of the Senate Transportation Committee began to encourage this type of road.

Envisioning the opportunities which these mines might present, in early 1988, Senator Jones facilitated meetings between Skyline officers and State of Alaska officials aimed at exploring road financing possibilities for the Alaska portion of the road. Senator Jones and Mark Hickey, Commissioner of Transportation and Public Facilities, met with various British Columbia government ministers and ministry officials in Victoria to discuss the potential Bradfield to Johnny Mountain road corridor. At these meetings when it was realized that an economic analysis would be necessary to determine what was the most feasible route for a resource road.

Recognizing the future long term economic opportunities for southern southeast Alaska through tourism and trade, in 1988 the Alaska Legislature appropriated $50,000 for an economic feasibility study for a resource road from Bradfield Canal to the mines in the Iskut River region of British Columbia. The purpose of the Alaska Department of Transportation study is to assess the costs of constructing a resource road, determine whether it is economic, and suggest methods of financing the road. The study was to look at all of the available resources in the Iskut and Unuk area.

ECONOMIC OPPORTUNITIES

The road would bring many new economic opportunities to southeast Alaska and to Alaska as a whole. Assuming it is constructed and once the road is brought to full federal highway standards, it would create new and less expensive travel opportunities to tourists and the residents of Alaska and British Columbia. A trip out of state would no longer mandate either a long ferry ride to Skagway or Prince Rupert, as the sole travel avenue.

Shippers of fish, other fresh seafood and mariculture products, which are subject to spoilage, would have a less expensive shipping alternative(to airlines) to markets such as Seattle, Washington and Vancouver, British Columbia. Milk, produce and other products also subject to spoilage could be shipped at a better pace to Alaska, thereby preserving freshness. Alaska would have a new alternative shipping point for goods from the lower forty-eight.

Wrangell's economy, long subject to strong peaks and valleys, would have new opportunities for industry and commerce - a road is expected to broaden its economic base much like the Klondike highway has benefitted Skagway. Southeast and the rest of Alaska should have better access to competitive Canadian goods.

It is thought, with the limited dollars available for road construction from the State of Alaska, a "toll" resource road would provide the best chance for financing the initial road. As the economy and traffic develops, the road could be upgraded to federal highway standards.

STUDY COMPLETION

The study commenced in October of 1988. The draft is now complete, however, the final report is scheduled for publishing in late June of 1989.

At nearly the same time the Province of British Columbia initiated a similar analysis for the Iskut area which will compliment Alaska's effort. The British Columbia and Alaska consulting firms have been sharing information so as to obtain the maximum amount of data from the fixed amount of study dollars. Both papers are due to be completed at roughly the same time.

A draft version of the Alaska study has been sent out to British Columbia Provincial officials and to the various mining interests located in or near the Iskut area for corrections, comments and additional input. Responses to the draft will be incorporated into the final report.

INFRASTRUCTURE STATISTICS/COSTS

The road would be built from tidewater to the border, a distance of 29.0 miles. It would be to a resource road standard, 16' wide, single lane with intervisible turnouts. Bridges would be built to federal highway standards to accommodate single off-road vehicles or two-way traffic. A 6300 foot tunnel, 30" wide by 20' high is expected to be the most cost effective, since the road is being considered for future upgrading to a public highway, and, also when it was compared to the continuous road surface alternative. The alternative would be subject to numerous avalanche paths, which the tunnel option avoids.

Total cost assigned for the project, including the road, tunnel, bridges and marine terminal using conservative estimates is $25,003,000. The tunnel is estimated at 9.3 million, bridges at 2.7 million, the terminal at $3 million. The road bed is estimated at $4.8 million, the balance would be for mobilization efforts($425,000), construction camp costs($488,000), staking(($229,000), contingency-20 percent($3.36 million) and preliminary engineering($722,000).

Year round maintenance and operation is estimated at $853,000.

The distance to the Johnny Mountain mine is estimated to be 16 miles from the Alaska/British Columbia border. Road building conditions in British Columbia appear to be much more favorable.

RECOMMENDATIONS AND CONCLUSIONS

The report, notwithstanding the lack of field surveyed confirmation of the road costs, is essentially complete. The results, absent the detailed information on the alternative Iskut/Stewart road, clearly shows the