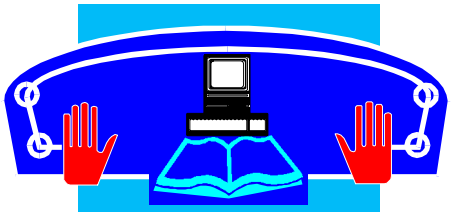


Cumberland Sound Fisheries Limited Survey And Future Potential
Type of Study: Exploration / Stock Assess.Fisheries, Baffin Cumberland Sound
Date of Report: 1992
Author: Canadian Fishery Consultants Limited Catalogue Number: 3-5-10

3-5-10

REPORT

CUMBERLAND SOUND FISHERIES LIMITED

SURVEY AND FUTURE POTENTIAL

Pangnirtung, N.W.T.

Prepared For:

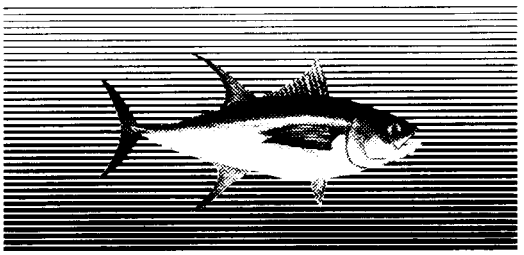
Northwest Territories Development Corporation
Yellowknife, N.W.T.

Prepared By:

Canadian Fishery Consultants Limited
Halifax, Nova Scotia

May 1992

PROJECT NO. A565



CANADIAN FISHERY CONSULTANTS LIMITED

May *31, 1992*

PROJ/FILE No: A565-1

Northwest Territories Development Corporation
P.O. Box 1437
Yellowknife, N.W.T.
XIA 2P1

ATTENTION: Ms. Cleo D. Prellwitz, Business Manager

Dear Ms. Prellwitz:

RE: CUMBERLAND SOUND FISHERIES LIMITED
SURVEY AND FUTURE POTENTIAL

Canadian Fishery Consultants Limited is pleased to present, herewith, six (6) copies of our report entitled "Cumberland Sound Fisheries Limited - Survey and Future Potential". As you can appreciate, the timing for the preparation of this report was extremely limited in order to meet your requirements for meetings scheduled in the first week of June. We appreciated the full cooperation of all the people we worked with, and in particular, Paul Comeau, in the preparation of this report.

We find that Cumberland Sound Fisheries Limited is at a crossroads in which major policy decisions must be made. The report attempts to present the necessary background information and key factors which will, hopefully, assist you and your colleagues in coming to a decision as to the future direction of Cumberland Sound Fisheries.

Since our last involvement in this fishery back in 1988, Canadian Fishery Consultants Limited has been impressed at the growth and volume of fish generated by the winter turbot fishery.

We trust that our report is satisfactory and meets your needs and expectations. Should you have any questions or require clarification on any section of the report, please do not hesitate to contact us.

It has been our pleasure to serve you on this project and we look forward to continuing our association with the Northwest Territories Development Corporation on possible future fisheries related activities.

Yours very truly,

CANADIAN FISHERY CONSULTANTS LIMITED

W. Bryce Fisher, P. Eng.
Vice President
WBF:cc
Enclosures

P.O. Box *8732,* Station A, Halifax, Nova Scotia, Canada, B3K 5M4 Tel: (902) 422-4698 Fax: (902) 422-8147

ACKNOWLEDGEMENTS

Canadian Fishery Consultants Limited would like to acknowledge, with thanks, their assistance, time, helpfulness, and patience with our many questions, to:

Mr. Paul Comeau
Mr. Johnny Mike
Ms. Nora Chadwick
Ms. Phoebe Etuangat
Mr. Roger Alivaktuk

all from Cumberland Sound Fisheries Limited,

and to all the individuals who graciously made time available to answer questions and provide information for the preparation of this report.

TABLE OF CONTENTS

APPENDICES

1.0 PROJECT HISTORY AND BACKGROUND

1.1 Background on the Fishery

The Inuit of Baffin Island have long relied on the sea as a source of food and wealth. The whaling, sealing and fishing industries have, over the years grow and fallen, as a result of industry cycles and long term consumer/environmental changes. Recently, the turbot (*Reinhardtius Hippoglossoides*) fishery has been targeted by the Department of Economic Development and Tourism as a priority area for development.

Beginning in 1985, the Hunter and Trappers Association (HTA), with financial support from the Government of Northwest Territories, executed a number, exploratory fishing projects to investigate the potential to develop a Turbot fishery. Each successive fishery saw increased landings, and the output was test marketed in the south.

Results of the fishing effort suggested that the species was migratory and best harvested during the winter months. In addition, during the winter months, turbot from other suppliers (Newfoundland, Gaspé, Greenland) was not available, suggesting better price performance. For these reasons, it was decided that the fishery would be best developed as a winter fishery.

The turbot are harvested using longline technology. After baiting, the longlines are weighted and fed through a hole in the ice. Each line consists of 100-130 hooks. Some fishermen use motorized hydraulic trawlers. When the fish are landed, the head and guts are removed. The fish are bled by removing the tail. Some of this waste is used as bait for further fishing.

The fish are washed and kept in sea water. The containers are usually insulated "Xactic" boxes to prevent freezing. The fish are then transported to the processing plant by snowmobile and Komotiq (sled).

1.2 Corporate Background

Established in 1988, Cumberland Sound Fisheries Ltd. (CSFL) is an Inuit owned fish processing company operating in Pangnirtung, Northwest Territories. Initial processing tests were carried out in a community cooler/cold store owned by the HTA. In 1988, Canadian Fishery Consultants Limited (CFCL) was contracted by the Government of the Northwest Territories (GNWT) to develop productivity systems and to undertake an overall economic assessment of the Pangnirtung Winter Turbot Fishery. The facility

was expanded during the fall, 1989, ready for the 1990 processing season.

Other studies have been carried out throughout the project. Canadian Fishery Consultants Limited reviewed two (2) studies by C-MAC consultants:

> "A Report on Cumberland Sound Fisheries Ltd., Plant Production and Profitability", May, 1990
>
> "A Business Plan for Cumberland Sound Fisheries Ltd." (DRAFT), November 4, 1990

In February 1991, a General Manager was contracted by GNWT to manage the operations. Mr. Paul Comeau has acted as General Manager since.

Exhibit 1-1 presents the Board of Directors for CSFL, their position on the Board and their principal occupation. All members of the Board are shareholders of the corporation.

EXHIBIT 1-1
BOARD OF DIRECTORS - MEMBERS

NAME	POSITION IN CSFL	PRINCIPAL OCCUPATION
Johnny Mike	Chairman of the Board President	Plant Superintendent - NWT Power Station
Sakiasie Sowdlooapik	Vice President	Administration, Parks Canada
Andrew Diana	Secretary/Treasurer Co-op Representative	Translator, Self Employed
Roposie Alivaktuk	Board Member	General Contractor, Fisherman
Apak Qaqasiq	HTA Representative	Chairman of HTA, Fisherman
Imoona Qappik	Board Member	Print Maker
Peteroosie Qappik	Board Member	Fisherman
Thomasie Alikatuktuk	Board Member	Currently Unemployed
Philiposie Kunilusie	Board Member	Housing Maintenance
Kevin Smart	Development Corp Representative	Fish Plant Owner/Operator

1.3 This Assignment - Objectives Canadian Fishery Consultants Limited was contacted 14 May 1992, with respect to evaluating the operation to date and establish alternatives for strategic direction. CFCL responded immediately and, based on our interpretation of' Development Corp's requirements, prepared the following work program:

- Engineering inspection of the facility to evaluate existing technical constraints, condition of the plant and site infrastructure;
- Review landings statistics and other available fisheries resource data;
- Review existing plant operations and fishing activities to determine operational constraints and potential future landings;
- Undertake a market analysis to review past price trends, market requirements and project future market demand/prices;
- In consultation with the plant manager, review all existing operation costs (labour, utilities, packaging, insurance, advertising, transportation, raw material supply, etc.);
- Prepare future projected production plan based on anticipated potential landings and market demand;
- Prepare recommended preliminary plant layouts to suit the proposed production plan, utilizing existing facilities/equipment as much as possible;
- Estimate future requirements for plant staff (including training required), utilities, waste treatment/disposal and other operational parameters;
- Prepare cash flow projections based on the proposed plant and identify the requirements for construction funds and working capital;
- Prepare a report of all analyses, suggested plant layout, cost estimates, financial analysis and all findings together with a proposed schedule for the implementation.

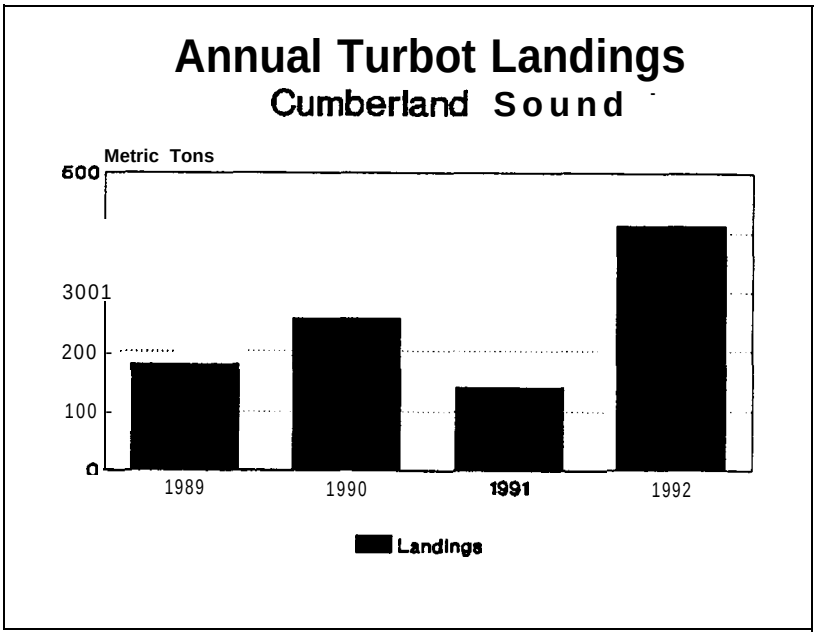
The work in the field was carried out during the period 20 May - 27 May and the Report prepared in time to be sent to the Northwest Territories Development Corporation on 1 June 1992.

2.0 RESOURCE ASSESSMENT

2.1 Introduction

In recent years, the Cumberland Sound turbot fishery has grown significantly. In 1988, 180,000 kg were landed and in 1992, 413,000 kg were landed. This equates to an annual compound growth rate of 23%. If growth of landings continues at this rate, 1993 landings would be approximately 508,000 kg, an increase of almost 100,000 kg. Exhibit 2-1 presents the landings of turbot during the past few years.

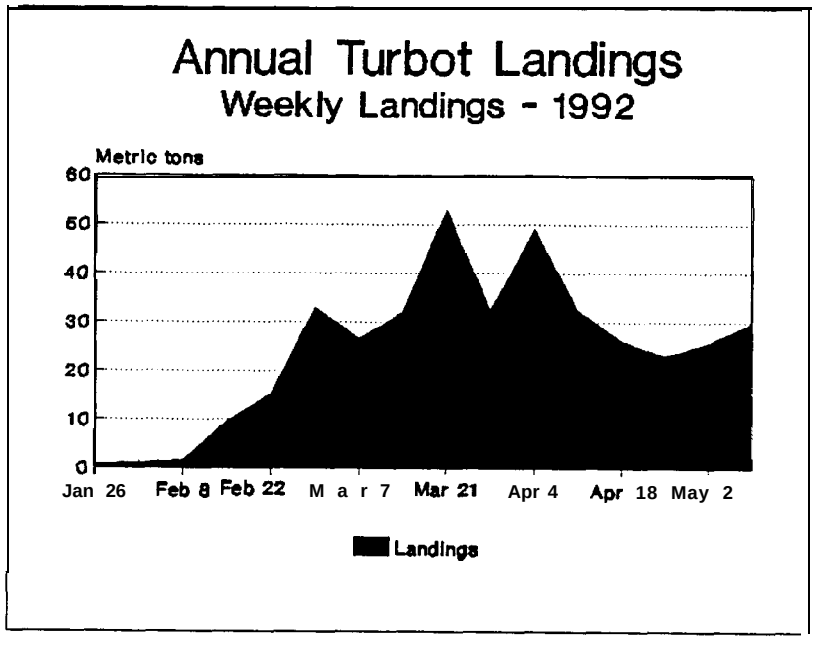
EXHIBIT 2-1



2.2 Operational Season

The Baffin Island turbot fishery operates from January 1 to May 31. Fishing effort is low in January but begins to increase significantly around mid-February. The busiest period extends from late February to mid-April. Exhibit 2-2 presents the weekly landings of turbot in Cumberland Sound. The landings were delivered to CSFL and P&L Services. As can be seen, there is some variability in landings (± 20,000 lbs in one week). This factor indicates that process capacity is an important issue relating to cool storage (for raw material and finished product) and processing capacity (layout, manpower, etc.). These issues are addressed in later sections of this Report.

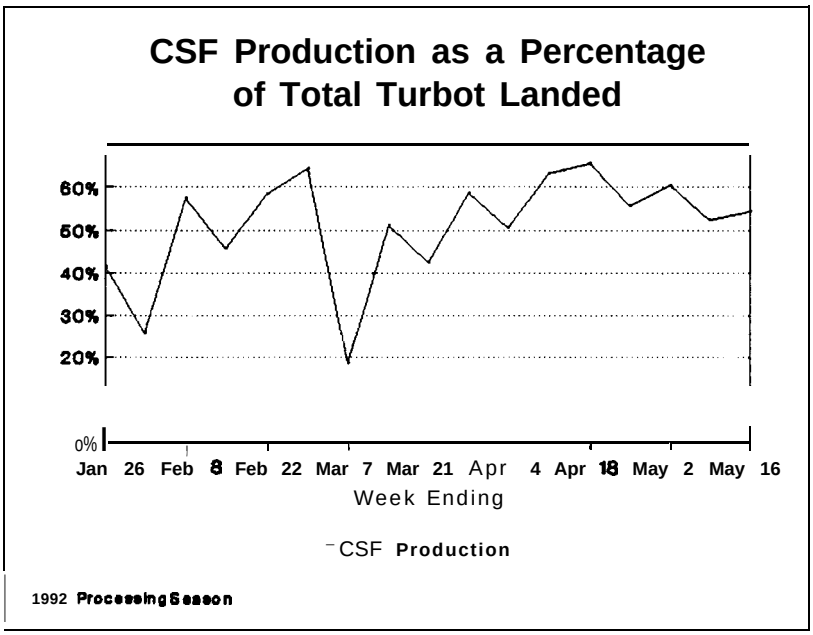
EXHIBIT 2-2



2.3 Processor/Packers

Currently there are two (2) companies in Pangnirtung purchasing turbot from the fishermen, Cumberland Sound Fisheries Limited (CSFL) and P&L Services Limited (P&L). CSFL operates a DFO approved and registered processing plant, while P&L operates a pack/distribution operation. CSFL produces fillets, steaks and headed and gutted (h&g) (all in fresh form), while P&L packs only h&g (as received from the fishermen). Each operation has purchased approximately the same amount of fish from the fishermen this season (1992). However, there has been some fluctuation on a weekly basis. For the overall season, CSFL purchased 52% of total fish landed, the minimum on a weekly basis being the week ending March 7 when only 18% of fish landed was purchased, and the maximum being the week ending April 18 at 65% of landings. Exhibit 2-3 presents the CSFL purchases of h&g fish as a percentage of total turbot landings in Cumberland Sound.

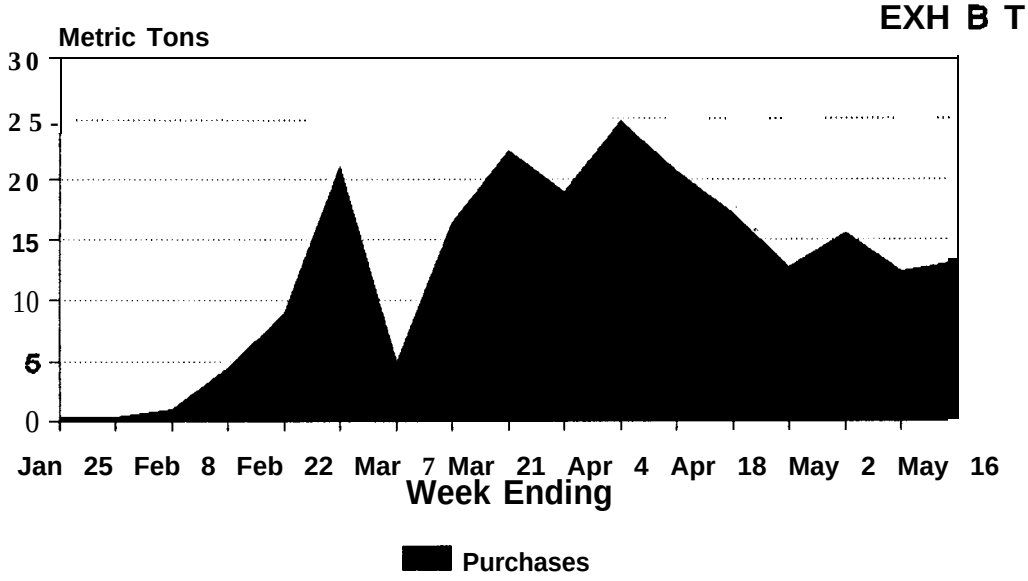
EXHIBIT 2-3



Exhibits 2-4 and 2-5 present the weekly turbot purchases from the fishermen for CSFL and P&L, respectively. Note that the March 7 minimum % purchase (Exhibit 2-3) is a result of reduced purchase by CSFL and increased purchases by P&L. Mr. Paul Comeau, General Manager of CSFL, explains that National Sea Products Ltd. were experiencing some difficulty marketing the fresh turbot. As a result, CSFL management and Board of Directors decided to cease operations for a period of five (5) days to allow NATSEA to find markets for the existing fresh inventory.

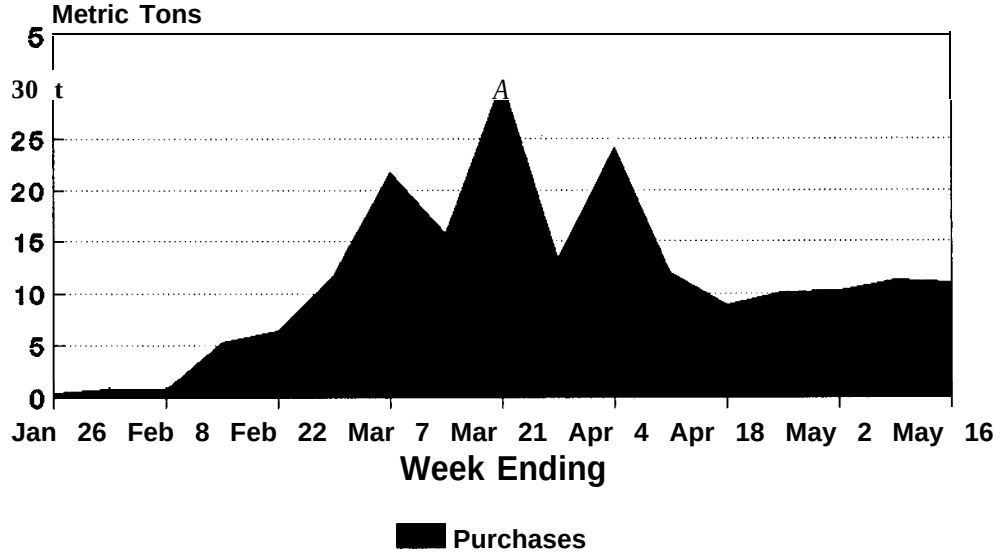
Weekly Purchases
Cumberland Sound Fisheries Ltd.

EXH B T 2-4



Weekly Purchases
P&L Services

EXHIBIT 2-5



2.4 Quotas/Future Landings

As described earlier in this Chapter (Section 2.1), landings have been increasing an average of 23% per year since 1988. The increase can be attributed to increased number of fishermen fishing and increased catch per fishermen. The driving forces behind the increased number of fishermen include:

- Source of income;
- Benefits for UIC;
- Return to traditional forms of employment;
- SeIf-esteem/actualization resulting from meaningful employment.

Increased landings per fisherman can be attributed to:

- Increased days fishing,
- Mechanized haulers,
- Assistant labour,
- Learning curve effects.

There is every reason to believe these trends will continue into the foreseeable future. Current total landings (412 t) represent only 21% of total quota for the region (2,000 ret), so there is sufficient resource to allow for increased landings. Two (2) factors will, however, limit expansion of the fishery:

- Local processing capacity, and
- Market linkages.

These issues will be developed later in this report (Market Linkages - Section 3.0 and Processing Constraints - Section 5.0).

The optimistic projections assume the growth in landings will continue to grow at the same rate as the 1989-1992 four (4) year average (23 %). The underlying assumption behind the optimistic projection is that new process capacity is installed (by CSFL, P&L or new entrant) and that market links are improved. The conservative projections assume that no new processing capacity will be installed. This would mean that growth of around 20% might be expected for 1993, but would require that CSFL double shift and that P&L can absorb 40,000 kg more fish next year. Under the conservative scenario, maximum capacity (as opposed to full capacity currently operating under) would be reached by 1993 so that growth in landings might fall to 10% in 1994 and 5% in 1995.

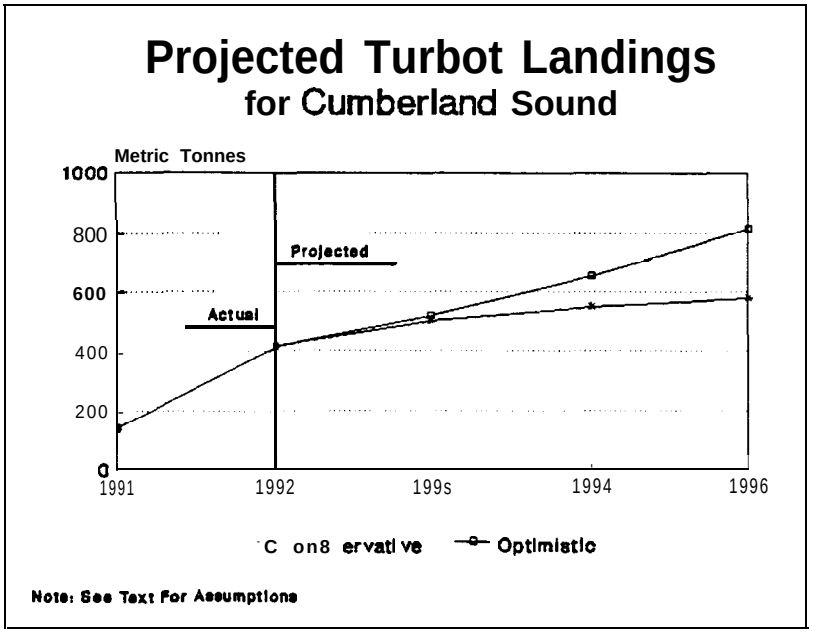
Exhibit 2-6 presents conservative and optimistic projections of future landings. Exhibit 2-7 shows both scenarios graphically.

EXHIBIT 2-6
PROJECTED TURBOT LANDINGS IN
CUMBERLAND SOUND (metric tomes)

	ACTUAL		PROJECTIONS		
	1991[1]	1992	1993	1994	1995
CONSERVATIVE	140	413	500	550	580
Growth Over Previous Year		95%[1]	21%	10%	5%
OPTIMISTIC	140	413	520	650	810
Growth Over Previous Year		95 %[1]	25%	25%	25%

[1] 1991 production was low due to a management decision to cease production prior to the end of season.

EXHIBIT 2-7



3.0 MARKET OVERVIEW

3.1 North American Market

Turbot is sold throughout the developed world in three primary markets: North America, Europe and Japan, Japan being the largest single country market for turbot in the world. Each of these regions have domestic turbot fisheries and, as such, have developed markets and products based on turbot. These products vary in each market so processing capacity and capability will dictate which geographic market a producer/marketer may enter. For example, Japan imports h&g primarily, while cold smoked product is quite common in parts of Europe. Some interesting value-added products are being developed including a honey cured, beechwood smoked product for the catering and retail markets.

In North America, product mix varies according to level of processing, fresh/frozen and size. Turbot is processed into a number of products including:

- Head-off, gutted (tail bled)
- Steaks
- Fillets (Individually Quick Frozen (IQF), Frozen Block, Shatter packs)
- Sticks and Portions

with fillets being the preferred product form in North America.

Cumberland Sound Fisheries Limited currently produces steaks, fillets and head-off gutted, all in fresh form. Exhibit 3-1, following page, illustrates fresh steaks and fillets.

Each of the product forms may be marketed in fresh or frozen form, the fresh form generally obtaining higher margins (however this does vary according to supply/demand imbalances). Fresh product is less flexible since it has a limited shelf life when compared to frozen product.

In Exhibit 3-2 (page 3-3), the relative price ratios for fresh and frozen for imports into the United States are given, illustrating the variability in market prices.

BAFFIN ISLAND TURBOT in insulated containers awaiting processing,.

FRESH TURBOT STEAKS AND FILLETS ready for packing and shipping to market.

EXHIBIT 3-1

EXHIBIT 3-2
FRESH/FROZEN MARKETS

PRODUCT FORM	1989	1990	1991
Fresh	*3.11*	*3.45*	*7.02*
Frozen	3.28	4.28	4.46
Price Ratio [1]	95%	81%	157%

1 Fresh Price/Frozen Price
2 Prices are in US$/kg, average for US imports
Source: NMFS, 1992

Turbot is supplied from a variety of different regions in North America including: Greenland, Gulf of St. Lawrence (primarily Gaspé), Newfoundland and Labrador, Baffin Island, and Nova Scotia.

Each resource is harvested during different seasons and, as such, the aggregate supply in the market is seasonal. Exhibit 3-3 presents each region's most recent harvest and season:

EXHIBIT 3-3
NORTH AMERICAN TURBOT FISHERIES

DFO REGION	HARVEST t	YEAR	SEASON
Greenland	n/a	-	Winter
Gulf	4971	1991	Spring/Summer
Scotia Fundy	50	1991	Spring/Summer
Quebec	1,5671	1991	Spring/Summer
Nfld & Lab.	17,420	1991	Spring/Summer
Baffin Island	412	1992	Winter

As can been seen, Baffin Island Turbot does not readily compete with other fisheries until later in its processing season (late spring). This suggests that Baffin Island turbot should have ready markets available to it, with little competition from substitute supplies.

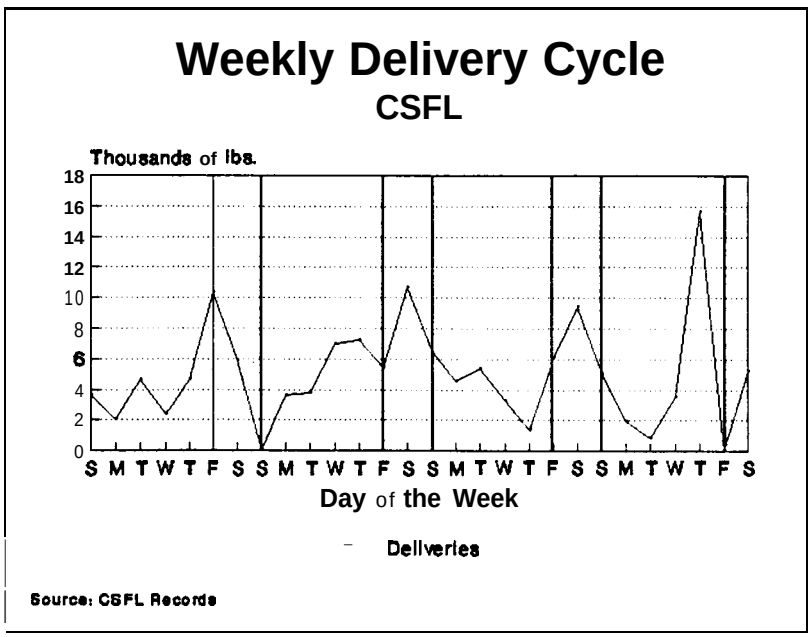
Other sources of competition include Pacific Halibut (*Hippoglossus stenolepis*) and Atlantic Halibut (*Hippoglossus hippoglossus*). These fish are virtually indistinguishable from each other but are somewhat different in texture from turbot.

3.2 Production of Fresh Fishery Commodities

Producing fresh fish commodities has certain operational and marketing problems associated with it.

At CSFL, daily deliveries of fish generally peak on Thursday, Friday or Saturday of each week, the volume of which may be twice as high as the slower days. Apparently, this is because fishermen want to come back to Pangnirtung for the weekend to be with their families. Exhibit 3-4 illustrates this weekly cycle, the areas between the vertical lines representing weekends.

EXHIBIT 3-4



Whenever daily deliveries exceed daily production capacity, the process plant requires a cool room (at + 10C) to keep the unprocessed material from freezing as it awaits processing. Another similar problem involves finished product storage and handling. The finished product must be stored in a cool room (+ 10 C), but separate from any contact with any incoming unprocessed materials.

Handling between the CSFL plant and the runway is accomplished by a 1/2 ton truck, without an insulated box, requiring careful coordination with the airline schedule to avoid freezing of the product on the runway.

Perhaps the most critical implication of producing fresh fish only is marketing, more specifically, sales. Brokers and distributors quickly learn that the firm produces fresh product only. Once the broker establishes this fact, he is then in a better position to negotiate his purchase price, especially if the market is slow/saturated and CSFL production is high. In situations such as these, CSFL becomes a "price taker" since they may have no other buyers to absorb their perishable product at higher prices. As a result, average margins will be lower than if CSFL had the capacity to shift production to more stable, longer shelf life products.

Some examples will illustrate the effect of selling "with your back against the wall" (in this case National Sea Products on behalf of CSFL). CSFL produced 104,860 lbs. of steaks which were sold though NATSEA at an average price of $1.52/lb.. The maximum selling price for steaks was $3.65/lb. (Lockwood) while the minimum price was $0.80/lb. (Levittown). The Levittown sales were essentially distress sales because' NATSEA was having difficulty marketing the fresh product.

Similarly, NATSEA sold 1,950 lbs. of fillets for $0.18/lb. even though the average price for fillets during the season was $3.46/lb.. We have estimated that poor marketing by NATSEA, combined with CSFL's inability to divert fresh product into more stable products cost in the order of $150,000-$200,000 in lost profits.

As discussed in Section 2.4, landings are expected to rise in 1993, thus exasperating the current situation. If CSFL is to continue increasing production, it will have to pursue two separate strategies with respect to marketing:

- Strengthen its marketing network to include a greater diversity of high volume, fresh product brokers,

- Invest in product development directed towards producing more diversified and stable (less time sensitive) products such as frozen block, frozen portions, IQF, smoked etc..

4.0 EXISTING PROCESSING INFRASTRUCTURE - EVALUATION

4.1 Introduction

For the past number of years, the winter turbot fishery in Pangnirtung used the Hunter and Trappers Association (HTA) Community Freezer Building for the processing of turbot for southern markets. It is understood that these freezers were installed in a number of northern communities for use primarily during summer months for the storage of country meats such as caribou, seal, etc.. The exploratory fishery has been using this building in Pangnirtung on a regular basis during the winter turbot season from January through May. Cumberland Sound Fisheries Limited, with financial support from the Government of the Northwest Territories, constructed an addition to the HTA facility in 1989, at a cost of approximately $150,000-$200,000. This addition is currently listed as an asset of CSFL and is being depreciated at a 10% rate annually.

Over the years the winter turbot fishery has expanded, both in volume of product processed as well as volume of fish landed. It is becoming increasingly evident that the current facility is not particularly suited for the processing of fish due to a number of deficiencies including ceiling height, open web steel joists, inappropriate layout and configuration, and more recently, lack of adequate space to properly and efficiently handle the ever increasing volumes of fish.

4.2 Site of Existing Fish Processing Plant

According to information obtained from the. Hamlet of Pangnirtung, the current HTA freezer and associated CSFL addition is located on Lot No. 247 containing approximately 0.36 acres. The lot is triangular in shape and is immediately adjacent to the airport runway, with approximately 266 feet bordering the airport property.

The road frontage is again around 260 feet. The third and final side abuts a road allowance according to the Hamlet plan. In this road allowance is an open water course leading from the airport runway and from adjacent lands towards the roadway, under which a culvert has been installed to carry the run-off towards the fiord. This road allowance also abuts the newly constructed weave centre (Uqqurmuit Inuit Artist Association Building).

The site is steeply graded from the high area adjacent to the airport runway to the lower areas adjacent to the roadway. Much

of the site is unusable due to steep banks and inaccessible areas due to substantial grades.

Exhibit 4-1 shows the general configuration of the site and locates the existing structure upon it.

4.3 Plant Description and Layout

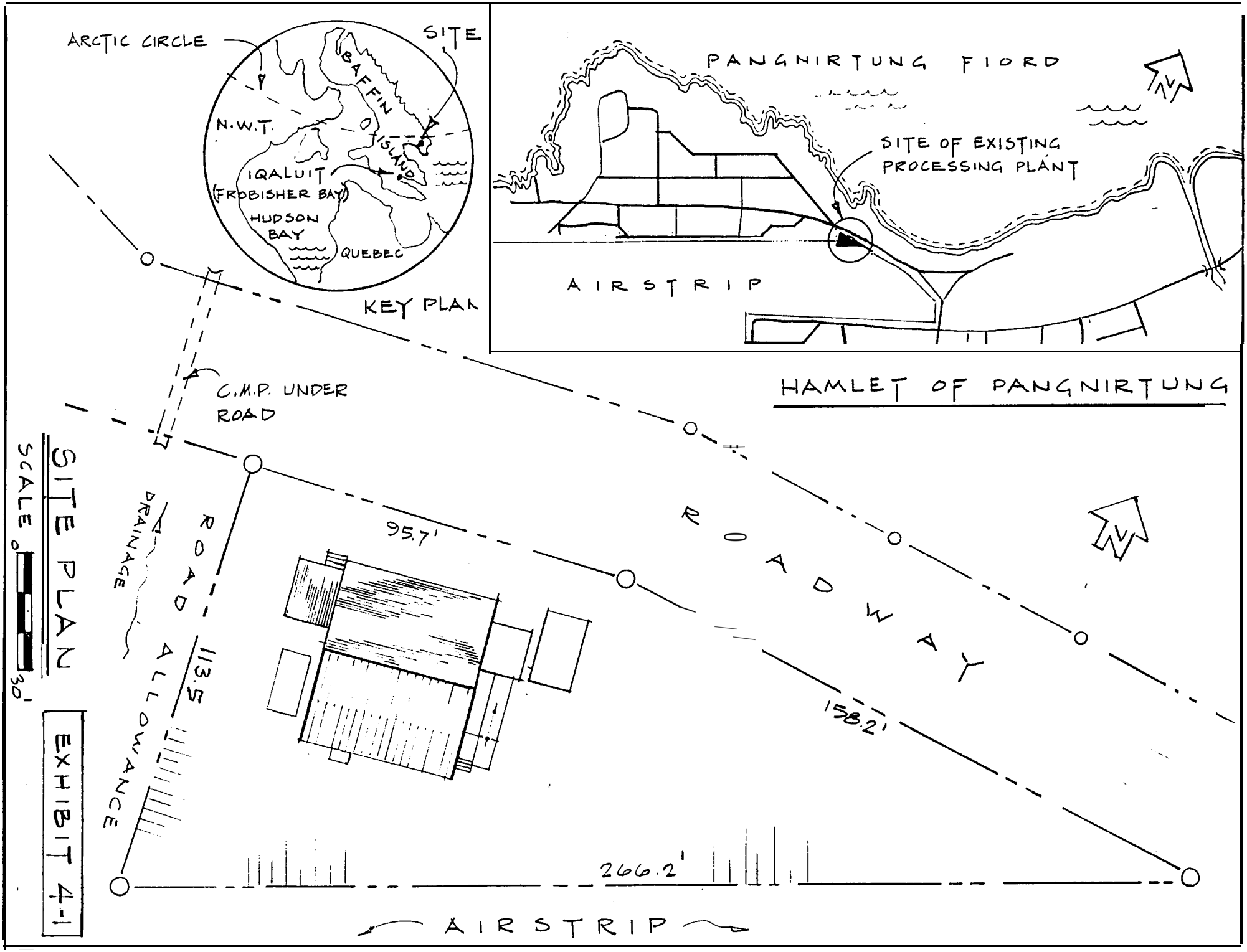
The processing facility consists of two (2) buildings joined together to make up the plant. The original structure consists of pre-manufactured insulated panels made by Bally Cooler Corporation and assembled on-site. Structural steel columns, beams and open web steel joists (OWSJ) support the roof panels. The roof panels are divided by ridges at the seams allowing water to accumulate on the flat part of the roof. This invariably causes roof leaks at numerous times throughout the year.

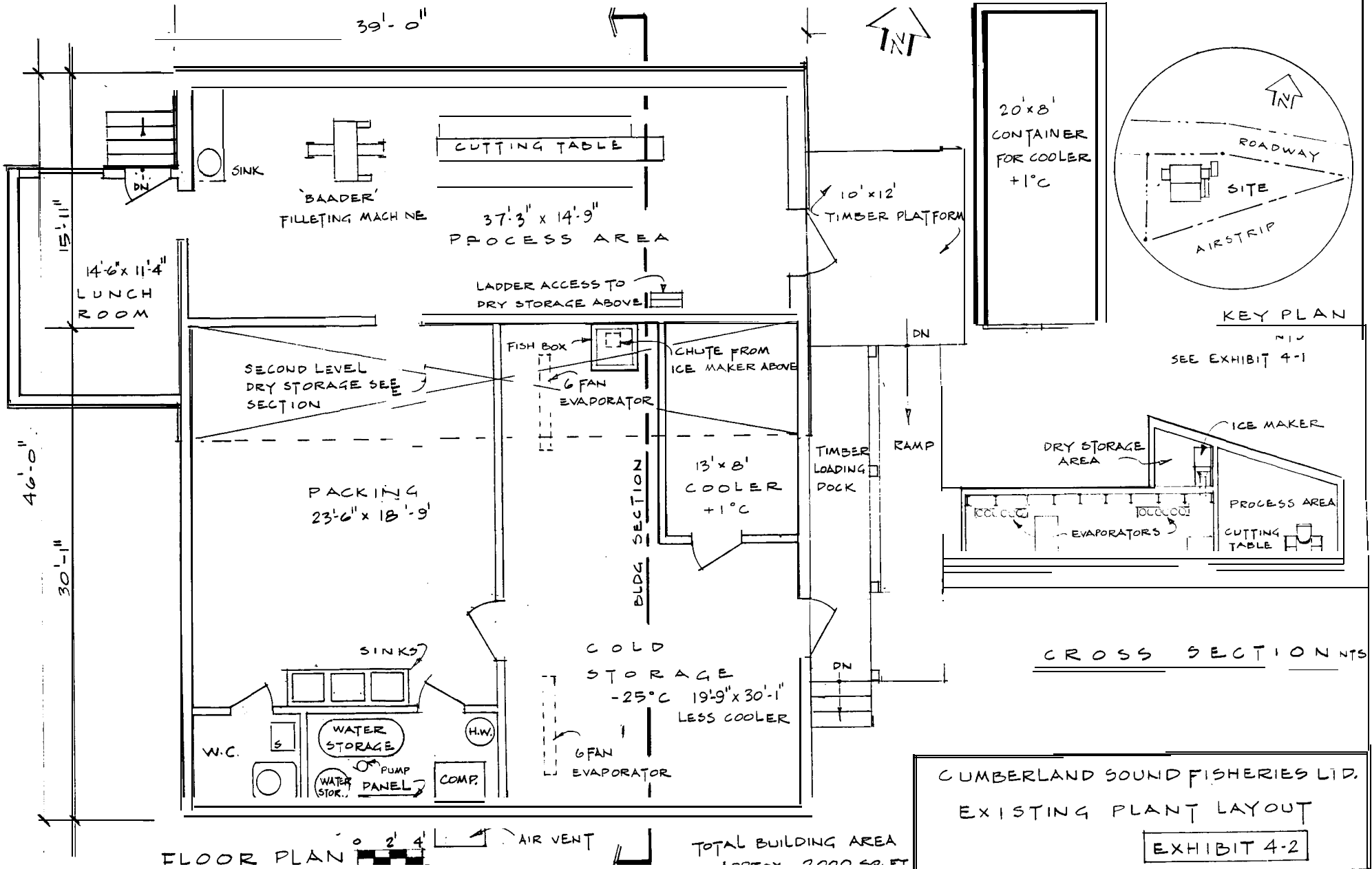
The addition was constructed in the fall and winter of 1989/90 and consists of a timber frame structure with a shed roof pitched away from the Bally Cooler structure. The addition also has a shedded roof office/lunch room attached to it.

The entire structure is supported on timber blocks setting directly on the ground surface. Each support has the ability to be raised or lowered by means of wedges - thus enabling levelling of the structure as required, in the event of frost heave/settlement.

The plant also has a timber shipping/receiving dock complete with a rampway for fish boxes to be brought in to the processing plant. Adjacent to this rampway is an insulated 20 ft. shipping container that was used by CSFL management in 1992 to hold fish received from the fishermen awaiting processing within the plant. The container has been equipped with lights and thermostatically controlled heaters to moderate the temperature of the container to prevent the fish from freezing. Exhibit 4-2 presents a plan and cross section of the existing structure. The building measures approximately 46 ft. x 40 ft. plus the lunch room addition, for a total of roughly 2,000 sq. ft..

Fish processing has been organized by CSFL management to create a general "U-shaped" flow-through pattern. Fish enters the processing plant through the door in the 1989 addition and moves directly into the cutting tables where steaks and fillets are prepared.


ARCTIC CIRCLE
SITE
BAFFIN ISLAND
N.W.T.
IQALUIT (FROBISHER BAY)
HUDSON BAY
QUEBEC
KEY PLAN
PANGNIRTUNG FIORD
SITE OF EXISTING PROCESSING PLANT
AIRSTRIP
HAMLET OF PANGNIRTUNG
C.M.P. UNDER ROAD
ROADWAY
95.7'
158.2'
DRAINAGE
ROAD ALLOWANCE
113.5'
266.2'
AIRSTRIP
SCALE 0 30'
SITE PLAN
EXHIBIT 4-1


39'-0"
IN
20'x8' CONTAINER FOR COOLER +1°C
10'x12' TIMBER PLATFORM
SINK
DN
'BAADER' FILLETING MACHINE
CUTTING TABLE
37'-3" x 14'-9" PROCESS AREA
15'-11"
14'-6"x 11'-4" LUNCH ROOM
LADDER ACCESS TO DRY STORAGE ABOVE
FISH BOX
CHUTE FROM ICE MAKER ABOVE
SECOND LEVEL DRY STORAGE SEE SECTION
6 FAN EVAPORATOR
46'-0"
PACKING 23'-6" x 18'-9"
13'x8' COOLER +1°C
BLDG SECTION
TIMBER LOADING DOCK
RAMP
30'-1"
SINK
COLD STORAGE -25°C 19'-9"x30'-1" LESS COOLER
W.C.
S
WATER STORAGE
PUMP
H.W.
WATER STOR.
PANEL
COMP.
6 FAN EVAPORATOR
AIR VENT
0 2' 4'
FLOOR PLAN
TOTAL BUILDING AREA
IN
ROADWAY
SITE
AIRSTRIP
KEY PLAN
N.T.S.
SEE EXHIBIT 4-1
ICE MAKER
DRY STORAGE AREA
PROCESS AREA
EVAPORATORS
CUTTING TABLE
CROSS SECTION N.T.S.
CUMBERLAND SOUND FISHERIES LTD.
EXISTING PLANT LAYOUT
EXHIBIT 4-2

The fish then travels to the skinning machine (fillets only) and the washing area (both fillets and steaks) before being graded and weighed. Once graded and weighed, the fish are placed in boxes and passed through a doorway leading into the older section of the plant (Bally Cooler). Here, in this structure, sealing of the cartons, strapping and labelling takes place. The finished product is then placed in the cool room within the freezer, awaiting transportation to the airport. The finished product exits the cool room/cold room onto the shipping dock and onto the truck to carry the shipment to the airport. Exhibits 4-3 and 4-4 present some images of the flow-through operation.

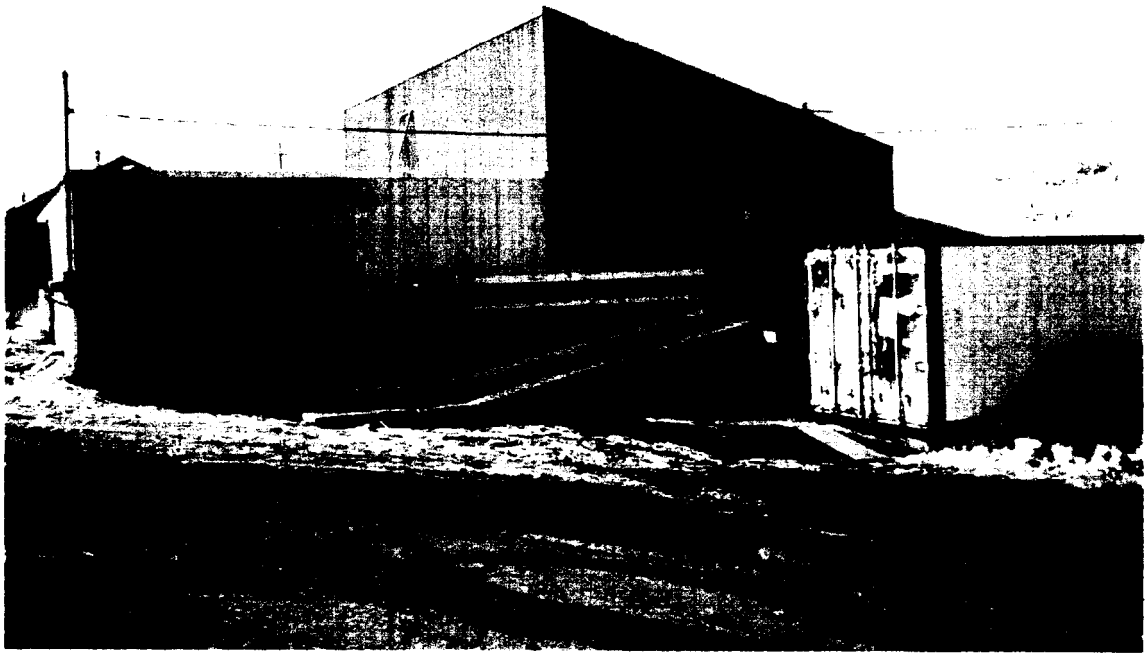
Office and plant administration for Cumberland Sound Fisheries Limited is not located on the premises, but is currently (1992) being housed in an unused day care centre in part of the Hamlet's Community Centre Building. The office is approximately 400 sq. ft. in area and is located approximately 400 ft. from the processing facility.

4.4 Utilities

4.4.1 Water Supply

The Hamlet of Pangnirtung delivers water to the residents of the community with the use of four (4) water trucks, three (3) of which have 1,000 gal. capacity tanks and one (1) 1,200 gal. capacity tank. Water supply for the community is drawn from a large storage reservoir constructed a few years ago, adjacent to the river. The reservoir is topped up during the summer months and water is drawn from it to supply the community's needs for the rest of the year. The capacity of the water storage reservoir is substantial with information indicating a depth of approximately 75 ft. covering several acres. According to officials, the draw-down of the reservoir since October 1991 to May 1992 was roughly 2-3 ft.. In some years, the reservoir has not even been topped up during the summer months as there was still plenty of capacity available for the community's needs.

Normal water delivery hours are between 8:30 a.m. -5:30 p.m., six (6) days a week. After hours deliveries are charged at a flat rate of $25.00 per delivery regardless of quantity of water taken.



EXISTING FACILITY
Showing original community freezer (HTA) on left and 1989 wooden frame addition on right.

Insulated container is used to store fish awaiting processing.

PROCESS ROOM during steaking and filleting operations.

EXHIBIT *4-3*

TURBOT STEAKS being packed in boxes prior to final weighing.

FINAL strapping and labelling of finished product ready for shipping.

EXHIBIT 4-4

The existing facility used by Cumberland Sound Fisheries Limited is limited by the lack of water storage tank capacity within the plant. Consequently, during days of operation the water tanks must be replenished between five (5) and seven (7) times a day - sometimes after the regular delivery hours - adding to cost of operation. It is estimated that the capacity of the tanks inside the plant is somewhere between 400-500 gal..

4.4.2 Power Supply

Electrical power is generated by Northwest Territories Power Corporation by means of four (4) diesel driven generator sets, of which any two (2) will normally carry the entire peak demand for the community.

According to officials, the reliability of electrical service in Pangnirtung has been very good, with very few power outages and then only of limited short duration. Reliability is considered to be excellent. Exhibit 4-5, below, presents the rate schedule applicable for Pangnirtung effective April 1, 1992.

EXHIBIT 4-5
ELECTRICAL POWER RATES

NORTHWEST TERRITORIES POWER CORPORATION		
Rate Schedule: PA-30		Effective: April 1, 1992 Supersedes: October 1, 1990
Community: PANGNIRTUNG		
Domestic Service	**Customer**	**Government Customer**
Monthly Semite Charge	$6.15	$6.15
Monthly Energy Charge First 300 kilowatt hours All remaining kilowatt hours	 29.52¢/kW.h 46.54¢/kW.h	 54.36¢/kW.h 54.36¢/kW.h
Minimum Monthly Bill	$ 6.15	$ 6.15
Commercial Service	**Customer**	**Government Customer**
Monthly Demand Charge First 5 kilowatts or less All remaining kilowatts	 $24.60 $ 4.92/kW	 $24.60 $ 4.92/kW
Monthly Energy Charge	46.53¢/kW.h	49.01¢/kW.h
Minimum Monthly Bill	$24.60	$24.60

Cumberland Sound Fisheries Limited, to date, has not had to pay any electrical power bills for the operation of the processing facility. (CSFL paid electrical charges last year, 1991, for a small trailer/office building that had its own separate electrical service entrance and meter.) Although the power usage is metered for the existing process plant, the actual consumption records were not readily available. It is understood that the charges for electrical consumption are paid for by the Department of Public Works, NWT. It is difficult to estimate, with accuracy, the consumption of power or the value of this assistance to CSFL. The building is electrically heated, hot water is provided electrically, and the refrigeration equipment for the freezer and cool rooms is all powered by electricity. The power consumption becomes further complicated since the Hunter and Trappers Association (HTA) keeps the refrigeration plant operating all year round. The electrical entrance to the facility is 100 amps three-phase 208 volts and 120/240 volts single-phase.

4.4.3 Sewage Collection

Sewage generated by domestic use is directed to an insulated storage tank which is pumped out by the Hamlet of Pangnirtung. sewage collection vehicles. There are three (3) trucks, two (2) each with 750 gal. capacity and one (1) of 1,000 gal. capacity. The Municipality has standardized the connection to be a 3“ diameter quick disconnect coupling.

Another separate storage tank (larger capacity) is used for the wash water generated from the processing of fish and clean-up of plant and equipment, including floor drains. Again, this tank is pumped out by the Hamlet of Pangnirtung personnel on a regular basis.

Sewage disposal for the entire town is by means of dumping the sewage on the shoreline of the fiord, approximately 2 miles from the town site. The sewage eventually finds its way into the fiord and, no doubt, contaminates a certain portion of the salt water area around and near the community.

Currently, there is no charge from the Hamlet of Pangnirtung for sewage collection (similar to water delivery) between the hours of 8:30 a.m. and 5:30 p.m.. However, after hours sewage collection carries a $25.00 flat fee charge for pump-out, regardless of quantity removed from the holding tanks.

4.4.4 Telephone/Fax

CSFL is equipped with both telephone facilities and fax equipment. It is obvious that these requirements are necessary in order to keep contact with the market place, the providers of transportation and others regarding the operation of the turbot fishery.

Over the past number of years, telephone charges have ranged between $2,500-$3,000 per annum.

4.4.5 Fire Protection

The existing plant does not have a sprinkler fire system as central water supply in Pangnirtung is not available. The plant, however, is close to the fire station (within 1,500 ft.) and does carry a number of fire extinguishers and smoke alarm units.

4.4.6 Garbage Collection

The Hamlet of Pangnirtung has regular collection of solid waste materials which are transported from the community approximately two (2) miles up the fiord, incinerated and dumped. The Hamlet has refused to take the fish wastes generated from the plant, although have indicated they are willing to take regular garbage materials such as paper waste, etc..

Cumberland Sound Fisheries Limited has looked after its own waste removal utilizing fish boxes. Fish wastes and other materials are placed in boxes and left outside where the materials freeze solid. The boxes are then loaded on the company's vehicle and hauled to the dump site directly. The material is then dumped in its frozen state, similar to an ice cube being removed from the tray. Paper wastes and other refuse generated from the plant operations is thrown on the truck and taken to the dump site along with the fish wastes as described above.

4.5 Equipment

4.5.1 Processing

Exhibit 4-6 presents a summary of the major process equipment observed during the plant inspection. In general, the equipment has been reasonably well maintained and is in good condition. The cutting table has been put together with various and sundry materials and tables to form a workable and reasonably useful unit. CSFL management is due a lot of credit for ingenuity and imagination with the utilization of the equipment to form a flow-through process operation. Fish processing plants in the southern part of Canada would normally utilize fluming of product along the process tables. Suitable salt water is unavailable due to possible contamination from both sewage and solid waste operations for the

community upstream from the existing process plant site. Further, salt water piping to the plant would be prohibitively expensive and difficult to maintain, particularly during the frigid winter months.

EXHIBIT 4-6
LIST OF MAJOR PROCESS EQUIPMENT

ITEM	NO.	MANUFACTURE	COMMENTS
Pallet Jack	1	Liftrite	5,000 lb Capacity 3' forks
Box Stapler	1		
Strapping Machine	1	Stapack Corp., Japan	
Platform Scales	3	Fairbanks Morse	1,000 lb.
		Howe Richardson	1,000 lb.
		Detecto Scale	1,000 lb.
Skinning Machine	1	Baader	Rebuilt Baader 47
Freezer Trays	Approx 50		18" x 36" x 2", Aluminum
Time Clock	1	Amano	
Vacuum Pack Machine	1	Elpack Ltd.	
Cutting Table	1	Fabricated	8 Cutting Stations, Roller Conveyor not flume, Stainless Steel
Assorted Process Tables	4	Fabricated	Stainless Steel
Fish Storage Boxes	8	Xactic	1,000 lb. Capacity
Tote Boxes	Approx 200		100 lb. Nom Capacity
Ice Machine	1	Hoshizaki Electric	Approx 500 lbs/24 hr
Digital Scale	1	Doran	Model 4100, Suitable for Portions

In addition to the list of major process equipment, other equipment such as knives, hats, boots, aprons, etc., are available for the plant workers.

4.5.2 Unprocessed Product Cooler Storage

The existing plant has two (2) cooler areas designed to keep fish above freezing (+10 C). DFO regulations prohibit the storing of unprocessed fish alongside finished fish products ready for market.

CSFL management (to their credit) utilized an available insulated 20 ft. x 8 ft. shipping container as a holding room for fish received from fishermen awaiting processing in the plant. Due to the extreme cold temperatures experienced during the winter turbot season, it was necessary to provide heaters for this unprocessed fish storage cooler. Thermostatically controlled electric heaters were installed the container which was utilized during the 1992 season, almost on a continuous basis to store fish received from the fishermen.

Exhibit 4-7 presents the process flow diagram showing the path travelled by fish in the three (3) major sections:

- on the ice;
- in the fish processing plant; and
- the transportation link to markets in the southern part of Canada and selected markets in the USA.

PROCESS FLOW DIAGRAM

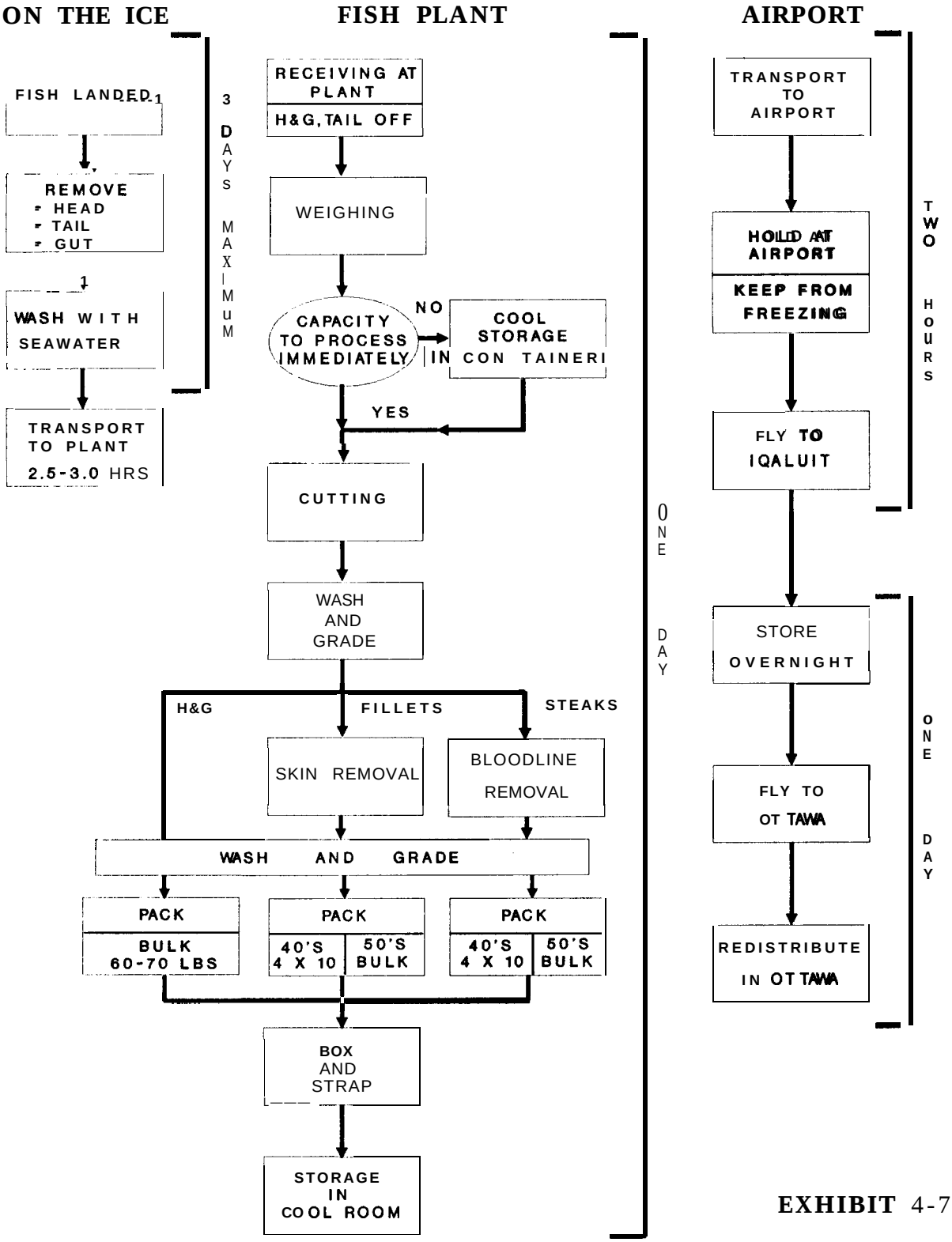
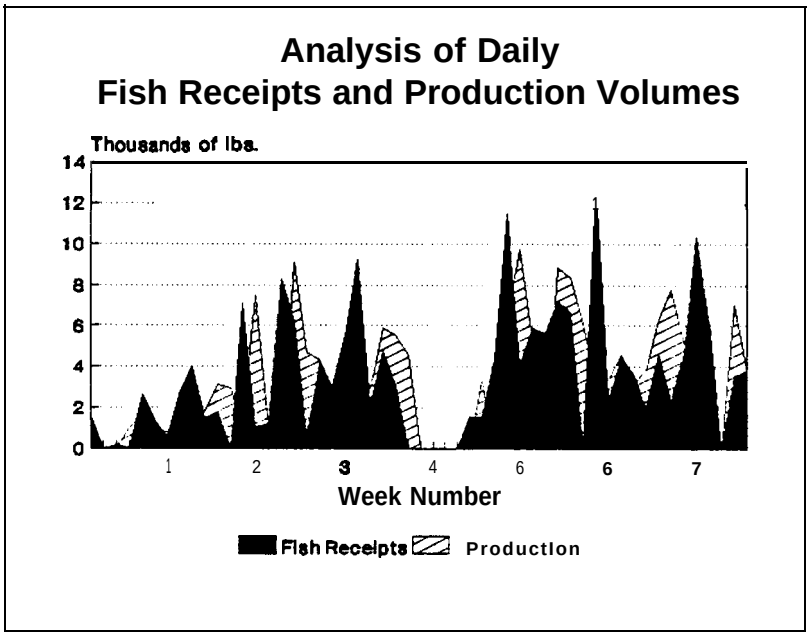


EXHIBIT 4-7

Exhibit 4-8 presents a graph illustrating the volumes of fish received on a daily basis during the 1992 season. Also on this graph is the production report of the amount of fish processed on each of the production days in the 1992 season.

The difference between the two (2) graphs represents approximately the amount of fish required to be stored in this cooler on a daily basis. However, it should be noted that some unprocessed fish was stored in insulated fish boxes within the plant process room itself and chilled with the use of ice produced from the small ice machine.

EXHIBIT 4-8



4.5.3 Freezer Storage

The original HTA cold storage room encompasses an area of 600 sq. ft. (roughly 20' x 30' in dimensions).

CSFL management identified the need of a finished product cooler (+ 10C) and consequently constructed an insulated plywood cooler approximately 13' x 8' (roughly 100 sq. ft.) within the cold storage room. The cold storage room is designed to keep product frozen and was observed at time of inspection to be maintaining temperatures in the -22° C to -25° C range. The refrigeration plant

for the cold storage facility consists of two (2) 5 hp, 208, three-phase Copelametic Hussman compressors, model H545RLK. These compressor/condenser units are located in a small mechanical room immediately outside of the cold storage. There is one (1) evaporator unit for each compressor (2 units in total). Hussman evaporator units model RE1749E with six (6) circulation fans each. It was noted that one (1) evaporator fan was not functioning but all others were performing satisfactorily.

It is understood that the refrigeration system and the cold storage is maintained at this temperature (-200 C ±) throughout the summer months and is utilized by the Hunter and Trappers Association for the storage of country foods (caribou, seal, etc.).

4.5.4 Finished Product Cooler Storage

The temporary plywood constructed cooler within the cold storage contains approximately 100 sq. ft. of space. Since the cold storage is being maintained at -20oC to -25oC, heaters have been installed in this plywood enclosure to raise the temperature to the desired +1oC.

Finished product is stored in this cooler awaiting transfer, by truck, from the plant to the airport.

4.5.5 Transportation/ Materials Handling Equipment

The existing plant has number of roller conveyors for moving fish in boxes from one processing operation to another. In addition, a recently acquired pallet jack and some locally made pallets have made movement of finished product from the final packing and strapping area to the cool room storage area much easier.

Currently, Cumberland Sound Fisheries Limited is using an old half-ton truck to convey the fish from the plant to the airport. The truck is mechanically on its last legs, with problems associated in the transmission, clutch, heating/cooling system, steering, brakes, etc.. Further, the truck has been "overloaded" with approximately 3,000-4,000 lbs. product placed on it to carry up to the airport. This requires offloading the first load of fish at the airport, trying to protect it from freezing, while the truck returns to the plant for a second load of 3,000- 4,000 lbs (each airplane load consists of roughly 6,000 - 9,000 lbs of fish). This type of vehicular transportation is inefficient, requiring much double handling of the fish by hand. It also puts the quality of fish in jeopardy by leaving the first load of fish on the airport ramp while a second load of fish is obtained from the processing plant.

Last year, CSFL acquired an insulated truck body box capable of carrying a full plane load of fish from the plant to the airport. The insulated truck box does have a refrigeration Thermo-King unit installed as part of the box unit. It was the intention of CSFL management to install a heater to maintain the fish at the desirable + 1°C temperature during the transport to and unloading operation at the airport.

This insulated truck box was obtained on the basis of discussions with the Hamlet of Pangnirtung and the Department of Public Works, who agreed to make a surplus truck chassis (previously used for water delivery) available to CSFL. The box has been mounted on the truck chassis. However, despite the efforts of several mechanics and some considerable expense for spare parts, the truck is still not operational. Clearly, something must be done as it is certainly evident that the existing half-ton truck utilized for transportation will not survive another season.

The existing operation utilizes insulated fish boxes (Xactic) as well as fish tote boxes for the movement of unprocessed fish through various stages of the process flow. It appears that, at times, the quantity of boxes is not sufficient for the volume of fish received from the fishermen.

4.6 Regulatory Environment

4.6.1 DFO - Licence

Cumberland Sound Fisheries Limited was granted an exploratory fishing licence (EF-9192-41) for 300 mt of turbot (*Reinhardtius hippoglossoides*) for the 1992 season (valid 01 January 1992 to 01 June 1992). Vessels include snowmobiles and komatiqs. Allowable gear includes longline only, and every fisherman must be issued a sub-licence.

4.6.2 DFO - GMP/QMP

The Department of Fisheries and Oceans Canada is responsible for the inspection and registration of all federally registered fish plants in Canada. The consultant reviewed the records of Cumberland Sound Fisheries Limited plant located in Pangnirtung and found the plant has been given an "A' rating for its compliance with DFO regulations respecting both plant construction and operational procedures. Deficiencies noted refer to the lack of sufficient soap dispensers (this has since been rectified) and leaking ceiling in the boxing area. Overall, the DFO inspection noted "no serious deficiencies". During its engineering inspection of the plant, CFCL staff noted that the quality of

design, layout and construction of the plant, given its initial and "make-do" state, rivalled similar plants in other areas of Canada. It is believed that DFO inspection has taken into account the developmental nature of the CSFL operation and has exercised some latitude in the strict application of the regulations.

In April,1992, it became mandatory for all federally registered plants to implement a Quality Management Program (QMP) according to DFO regulations. CFCL reviewed the quality assurance program (QA) currently in place at CSFL. Cumberland Sound Fisheries Limited has received an "excellent" rating from DFO inspectors for its implementation of its QMP.

The current QA program involves inspections and reporting at various steps in the process flow. The reports currently generated include:

- Raw product inspection report
- Final Product Inspection Report
- Packaging Inspection Report
- Daily Sanitation Inspection Report
- Cool and Cold Storage Temperature Logs
- Incoming Chemical Inspection Reports
- Detailed Plant Inspection Report
- Corrective Action Report
- Regular Meetings

Appendix "A' presents copies of the DFO inspection reports including the QMP rating.

4.6.3 Business Licence

The Hamlet of Pangnirtung charges an annual business licence fee of $50.00. No other regulatory compliance is required.

No municipal taxes or levies are required to be paid by CSFL to the Hamlet.

4.7 Distribution

The Hamlet of Pangnirtung is located on a fiord flowing into Cumberland Sound on the eastern side of Baffin Island, approximately 300 km northeast of Iqaluit. It is accessible by aircraft (all year round except for storm days); sea (summer months only); and by surface (snowmobile - winter months only).

4.7.1 Air

Exhibit 4-9 presents the daily scheduled air service to/from Pangnirtung as provided by First Air. In addition, Air Baffin

services Pangnirtung with a charter service using a twin engine Navajo aircraft with 6-seat capacity. Further, First Air also offers a charter service using the HS748 aircraft to/from Pangnirtung on an "as requested" basis.

EXHIBIT 4-9
AIR SCHEDULES - PANGNIRTUNG - IQALUIT

		M	T	W	T	F	S
Pangnirtung	A	10:50	17:20	15:50	10:50	17:20	10:50
	D	11:20	17:45	16:15	11:20	17:45	11:20
Iqaluit	A	12:10	18:35	17:00	12:10	18:35	12:10
		Direct	Storage Cooler	Direct	Direct	Storage Cooler	Direct
	D	13:40	15:35	14:30 18:35	13:40	13:40	15:30
Ottawa	A	16:35	19:30	19:30 21:30	16:35	16:35	20:30

On Sundays, a flight flies over from Broughton Island, which will land in Pangnirtung if requested by CSFL. This flight arrives in Iqaluit at 12:30 p.m., and requires that the load stay overnight in Iqaluit. All flights out of Pangnirtung are serviced by a Hawker-Siddeley 748, with a total payload capacity of roughly 8,000 lb (3,600 kg) based on approximately eight (8) passengers. With no passengers, the cargo payload capacity is approximately 10,000-11,000 lb. (4,500 - 5,000 kg). The quoted cost for fresh fish Pangnirtung-Iqaluit is $0.80/kg, and Iqaluit-Ottawa is $$0.50/kg (GST not included). Shipments of goods within NWT are subsidized by the GNWT. The current subsidy is 50% of the quoted cost.

4.7.2 Sea

The waters of Cumberland Sound and the Pangnirtung Fiord open up in late June-early July and are free of ice until late September or early October. During this time, the "sea-lift" operation provided by the Ministry of Transport, Canada brings in supplies, building materials, fuels, and other cargo from the southern part of Canada. The vessels usually originate in Montreal and arrive in Pangnirtung during the month of August, occasionally arriving in the first part of September. Many businesses and enterprises make use of this sea shipment to bring in heavy, oversized, or bulk

commodities to save on transportation costs by importing these commodities by air.

The vessels usually return on the southbound trip with very little, if any, cargo; presenting an opportunity to ship product to the southern part of Canada at substantially reduced sea/haulback rates.

4.7.3 Surface

Although possible to bring snowmobiles and possibly track vehicles from other communities to Pangnirtung in the winter months, this form of transportation is not utilized to any significant degree. This is due, in part, to the very cold temperatures and rugged terrain over which the vehicles must pass. Surface transportation does not appear to be a viable means of distribution of finished product produced by Cumberland Sound Fisheries Limited.

5.0 CONSTRAINTS TO PROCESSING CAPABILITY

5.1 Space

The overriding and most important constraint to the production capability of Cumberland Sound Fisheries Limited to produce turbot products for southern markets is the lack of space in a number of areas which are highlighted below. It should be realized that the fishery has been and is still continued to be referred to as an exploratory fishery. However, the volumes of landings for the past two (2) or three (3) years have shown significant increases to the point at which the fishery is becoming a full-fledged industry requiring appropriate infrastructure to meet the ever increasing fish landings and southern markets demand. The following list of areas requiring additional space is presented generally in the order in which the fish progresses through the processing stages.

5.1.1 Receiving, Weighing, Grading of Raw Material

Currently, these operations are conducted outside in all kinds of weather and at all times during the day and evening. With limited daylight during the winter months and with severe cold temperatures, these operations clearly require a more suitable" environment in which to receive the fish from the fishermen. The arrival of fish from the fishermen can, and has in the past, occurred in "fits and starts" with most fishermen wishing to be at home with their families over the weekends. Arrivals at the plant on Thursdays and Fridays can be quite heavy with several fishermen waiting to unload their catch. Adequate space is necessary to streamline and improve the efficiency of these operations.

5.1.2 Holding of Fish Awaiting Processing

Due. to the sometimes group arrivals of fish from the fishermen, matching of processing capacity and fish arrivals is virtually impossible. It is obvious that a holding room cooler, maintained at a temperature of + 10C, is required to act as a buffer to hold and retain fish awaiting processing. The current holding cooler is a makeshift arrangement using a shipping container located outside the plant itself. Existing operations require fish to be taken from the cooler and dragged into the plant for processing. On several occasions, the capacity of the cooler was not sufficient to hold all of the fish received. During such occasions, fish had to be retained within the plant in fish boxes and tote boxes with potential and real threat to reduced quality of product.

5.1.3 Processing Room

The existing processing room allows for one (1) small processing table plus a few assorted tables for washing of fish, grading,

weighing, packing. Capacity is very limited and loss of efficiency occurs when switching from fillet operations to steaking operations. Some equipment has to be moved around and re-positioned to switch from one product to the other. Ideally, it would be advantageous to have two (2) processing lines, one (1) dedicated for filleting operations and one (1) for steaking operations. This would improve efficiency and effectiveness of the plant workers by improving and honing their skills in their specific tasks. Loss of production time would be reduced/eliminated as equipment would not be required to be relocated, moved, or re-positioned. This additional space in this area allows for greater productivity, flexibility and efficiency of the entire operation.

5.1.4 Weighing and Grading

This area is very limited in the existing facility and requires expansion to improve efficiency and flexibility of operations. It is currently impossible, at this stage, to do product such as controlled portions, i.e., 4 or 6 oz portions suitable for catering operations (e.g. airline meals).

5.1.5 Final Packing Area

The current area used for this operation is not sufficient to handle the three (3) primary activities occurring in this operation. Suitable storage area for packaging materials is required so that access to the appropriate pans, boxes, labels, tape, staples, etc., can be obtained readily and easily. Currently, storage of packaging materials is in a second level storage area accessed by a ship's ladder leading into the processing room area. This means that packaging materials must be carried, by hand, down a steep ladder, through the processing room area, and stock-piled in the final packing area. Other areas utilized for storing of packaging materials includes the cold storage room. This is unacceptable, inefficient and costly to operate. Box making is another activity that requires space to store, appropriately, the prepared boxes ready to receive product. The final operation of strapping and palletizing the finished product again requires additional space so that production line flow characteristics can be established to improve efficiency.

5.1.6 Cool Storage For Finished Product

The current 100 sq. ft. of cool storage available for finished product is insufficient to hold the finished product awaiting transport to the airport. A capacity of at least two (2) or three (3) days production is required in the event of difficulties such as failure of the plane's arrival due to weather conditions, inordinate supply of fish that requires processing, or special orders awaiting consolidation with other product mixes.

5.1.7 Washroom Facilities

The current plant has one (1) toilet for all plant workers, both male and female, which at times reaches 25-30 people. Clearly, this is not adequate and is an area where DFO inspection has been somewhat "lenient" in its assessment of the facility. Adequate and separate washrooms for male and female staff and plant workers is required, along with appropriate soap dispensers, hand dips, and other required sanitation practices.

5.1.8 Office and Administration Area

The current operation has these activities located in premises approximately 400 ft. away from the plant operation. Clearly, this is not an effective and efficient method of controlling the operations. Adequate space must be provided for the General Manager, Accountant, Operations Manager, Secretary, as well as files for record storage, office equipment (such as computers, fax machines, photocopy machines, calculators, etc.).

5.1.9 Lunchroom/Change Room Facilities

The current operation has a small lunchroom of inadequate size to permit all workers to sit down during lunch periods. In addition, appropriate facilities are required for plant personnel to change from street clothes to processing apparel, including boots; aprons, gloves, etc.. Currently, these items are stored within the processing area.

5.1.10 Freezer Storage

The existing freezer storage area has been reduced in size by the addition of a cooler as well as large areas used for packaging material storage. Adequate freezer storage is required for the operation to have the ability to freeze product as required based on market conditions, demand for frozen product, and other factors such as portion packs for catering operations.

5.1.11 Exterior Space For Fishermen, Snowmobiles and Komotiqs

The current situation is very congested when two (2) or more fishermen arrive at the plant to offload their fish. In addition to the fishermen' operations, there are deliveries of water by the Hamlet of Pangnirtung, sewage pump-out trucks, loading of CSFL truck for deliveries to the airport, etc.. The existing area is small and congested, and on relatively steep gradient. Adequate space is required for efficient flow-through operations for receiving the fish from fishermen allowing areas for queuing. Separate areas for shipping of finished product, delivery of water and pump-out of sewage is also required to prevent congestion.

5.2 Fresh Water Storage Capacity

The existing facility is severely hampered by the lack of fresh water storage capacity. The existing tankage, roughly 400-500 gal. (1,600-1,800 litres), has to be filled upon average six (6) or seven (7) times per day by the Hamlet. On several occasions, processing of fish had to be stopped awaiting delivery of water to the plant. Clearly, adequate water supply in abundant quantities is required for continuous plant operations without interruption. Further, with the addition of more washroom facilities, larger water storage tank capacity will be required.

Exhibit 5-1 illustrates the existing fresh water storage tanks and a view of the second level storage space for packaging materials.

5.3 **Waste Water Storage And** Pump-Out Capacity

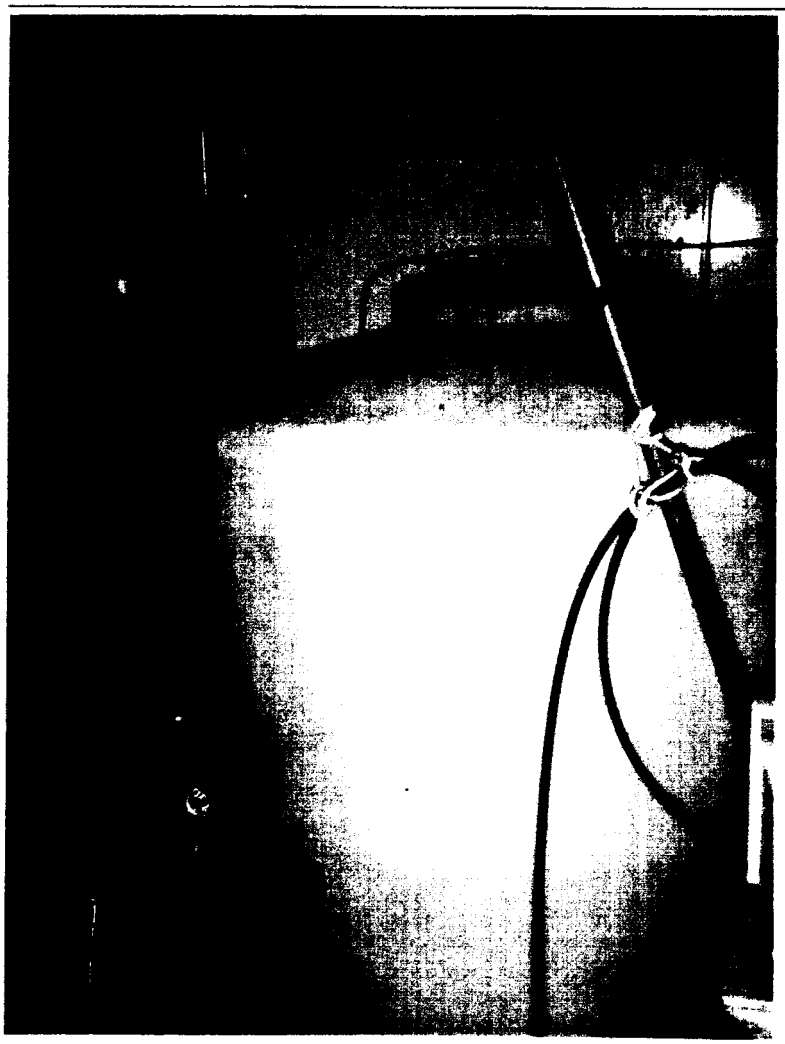
All fish processing operations require large quantities of water for hygienic operations of the processing flow. Cleaning of product, equipment and processing room areas, must be done frequently and thoroughly to ensure sanitary conditions as well as high hygiene standards. The current facility has two (2) separate waste water storage tanks, one (1) for the washroom facilities and one (1) for the waste water generated from processing plant operations (floor drains). On a number of occasions, in the 1992 processing season, operations of the plant had to be suspended awaiting pump-out of these waste water tanks. Further, due to ice build-up in a couple of the areas around the tanks, pump-out was difficult and at times impossible to achieve, forcing the washroom facility to be placed "out-of-order"; clearly this is a major constraint which must be overcome.

5.4 **Truck Capacity to Deliver Finished Product to Airport**

The existing truck will not last another season. It is inappropriate for transporting finished product as it lacks sufficient capacity and is not offering protection of the product from the frigid temperatures. While the insulated box obtained by CSFL is of adequate size and appropriate, it requires a reliable, working truck chassis to transport the fish to the airport.

5.5 **Skilled, Trained Labour For Second Shift**

The 1992 process season used one (1) shift and achieved very high efficiency and product activity rates from the qualified and trained plant personnel. In 1991, a two-shift system was utilized for some of the processing season. Inefficiencies and loss of productivity resulted as new workers, unfamiliar with the processing operation, had to be shown the operations and instructed on what was required.



FRESHWATER Storage tanks require frequent filling (5-6 times per day) by Hamlet Water delivery truck during operation of the plant. (Capacity is approximately 500 gallons.)

SECOND LEVEL storage space for packaging materials. Storing and retrieving materials is by ladder and is considered dangerous and inefficient.

EXHIBIT 5-1

By going to a two-line (steaks and fillets) one-shift system, more plant workers will be required and will require training and experience to gain skill and competence in the processing operations.

5.6 Lack of Local Management Skills

The current General Manager of CSFL is retained on a six-month contract basis. Acting as General Manager, Mr. Paul Comeau has encouraged the employment of local Inuit for training in operations, record keeping, accounting, etc.. Considerable further training will be required in order for a totally Inuit-run operation. In addition, marketing knowledge and expertise is required to secure better market penetration, both in product form and geographical distribution, Acquisition of this type of knowledge and information base will take years for local Inuit to become proficient and knowledgeable in this aspect of the operation.

6.0 OPTIONS AVAILABLE TO OVERCOME CONSTRAINTS

6.1 1993 Turbot Season Options

At this time (end of May 1992 for report writing), there is little available time left to take action in sufficient time to procure the materials, equipment, etc., in time to make the sea-lift shipment to Pangnirtung in August 1992. The activities necessary to be completed in a short order of time include:

- approval of budgets for equipment and material acquisition;
- contact appropriate suppliers;
- obtain quotations;
- select lowest price tenders;
- procure equipment;
- coordinate deliveries to sea-lift operations in Montreal;
- reserve and ensure sufficient cargo space is available on the ship;
- make arrangements for unloading and appropriate storage of equipment and materials in Pangnirtung.

Alternatively, it is possible to fly in some limited items, by air, paying, however, a much higher freight cost.

It is obvious that, for the 1993 turbot season, the existing facility must be utilized once again. Only small modifications/-improvements in the infrastructure can be accommodated given the limited time-frame available for shipping of equipment and materials.

It is understood that Department of Public Works (DPW) who have done the building maintenance work on the facility to date, will again be doing maintenance work in the summer of 1992. One of the key areas is rectification of the sewage collection tank for the washroom facility. Other plumbing activities also appear to require the attention of DPW, as does some levelling of the building using the wedge blocking system.

Other activities that could be considered to be undertaken by DPW forces would be some grading of the site adjacent to the building to ensure proper drainage of run-off waters avoiding the large ice build-up under the building and sewage collection tanks which occurred this year.

In addition to these minor maintenance items, it is considered imperative that a suitable vehicle be made ready to transport fish

from the plant to the airport. This would either involve the acquisition of a new truck chassis, engine and cab, to which can be mounted the CSFL insulated truck box, or appropriate parts and equipment and labour be obtained to make the surplus Hamlet of Pangnirtung vehicle operational (upon which the insulated box is already installed).

It is estimated that a rough budget figure of approximately $25,000 -$30,000 should be allocated for minor improvements for the 1993 turbot season.

6.2 Option "A" Status Quo For 1993 and Beyond

This option would effectively limit any future development of the fishery beyond the 1992 levels of fish landed at Cumberland Sound Fisheries Limited.

6.2.1 Assumptions

This option is based on many assumptions such as the following:

- HTA agreement to make the building available to Cumberland Sound Fisheries Limited for processing fish;
- Department of Public Works to continue to maintain the structure;
- Department of Public Works to pay for the electricity consumption;
- Hamlet of Pangnirtung to issue a Business Licence;
- DFO to approve and licence the processing plant in future years;

6.2.2 Improvements

This option would essentially use the existing facility and existing operation procedures, to try and maintain the same sort of volume throughput being processed by CSFL. This option would most likely involve some changes and some amount of additional equipment to improve the operational characteristics of the facility. It is foreseen that the following list of improvements could be incorporated into this option:

- Re-partition the cold storage room to accommodate a larger finished product cooler (+ 10 C);
- Modify the access doors to/from the cooler/cold storage to accommodate wider pallets. These doors are currently 3 ft. wide and should probably be expanded to 4 ft. or 5 ft. in width;
- Additional water storage tankage to minimize possible down-time of processing due to lack of water;
- Incorporation of additional washroom facilities by sacrificing some space in the packaging area;

- ❑ The location of existing 20 ft. shipping containers adjacent to the structure to provide storage space for packaging materials that could be directly accessed from the final packing area;
- •1 Relocation of the former trailer/office structure, measuring approximately 8 ft. wide by 40 ft. long. It is envisaged that this structure would be "attached" to the processing facility with appropriate doorway entrances to allow management and administrative personnel direct communication with plant operations;
- ❑ Site grading, levelling and provision of drainage facilities to improve access and egress from the site;
- •1 Acquire additional processing equipment including digital scales, processing tables, conveyors, etc., to try to improve efficiency.

It is recognized that many of these improvements could not be coordinated and undertaken in time for the 1993 winter turbot season.

6.2.3 Estimated Costs

Due to the very tight time constraints imposed to prepare this report, it was impossible to get detailed information on costs. However, Canadian Fishery Consultants Limited did contact engineering and construction firms knowledgeable with construction costs in the North in an effort to get an "order of magnitude" estimate of costs. CFCL also used its extensive cost files to prepare estimates.

Based on our findings, CFCL estimated the value of these improvements, assuming the majority of items will not take place until the 1993 construction season. The estimated value of these improvements would be in the $200,000-$250,000 range.

If this option is selected, CFCL recommends a detailed design and costing exercise be carried out to more precisely determine the cost of these capital works.

6.3 **Option "B** New **Facility**

This option involves the construction of a properly designed and thought-out processing facility, designed in full compliance with DFO regulations and standards, with the ability to house all of the operations including administration, processing, packaging and product storage, as well as associated infrastructure and staff amenities. The plant can be designed to accommodate future expansion easily should such expansion be justified at some point in the future. This option is more fully described in the following subsections.

6.3.1 Site

Exhibit 6-1 illustrates the site that has been identified as a possible and suitable location for a new processing facility. It is located on the west side of the river, adjacent to the Pangnirtung Fiord. It is bounded by an old cemetery on its western boundary line. Road access is available to the site. The site is generally level, measuring roughly 110 ft. wide by some 300 ft. in length. It is approximately 10 ft.above high tide level, and according to local residents, is not subject to flooding from either high tides or flows in the river. It is further understood that the northern part of the site has been filled in with granular material over the years.

Exhibit 6-2 presents a view of the site looking from the northern part of the site in a southerly direction towards the town.

The dimensions of the site allow for ample vehicular access, both by snowmobiles and komotiqs for the delivering of fish to the plant, as well as motor vehicles for shipping of product, delivery of water and sewage pump-out operations. It also allows ample space for future 'possible expansion of the plant.

6.3.2 Infrastructure/ Utilities

Waler

The site is located closer to the Hamlet of Pangnirtung water reservoir and, as such, would require less time for delivery of water from the reservoir to the plant's water storage tanks.

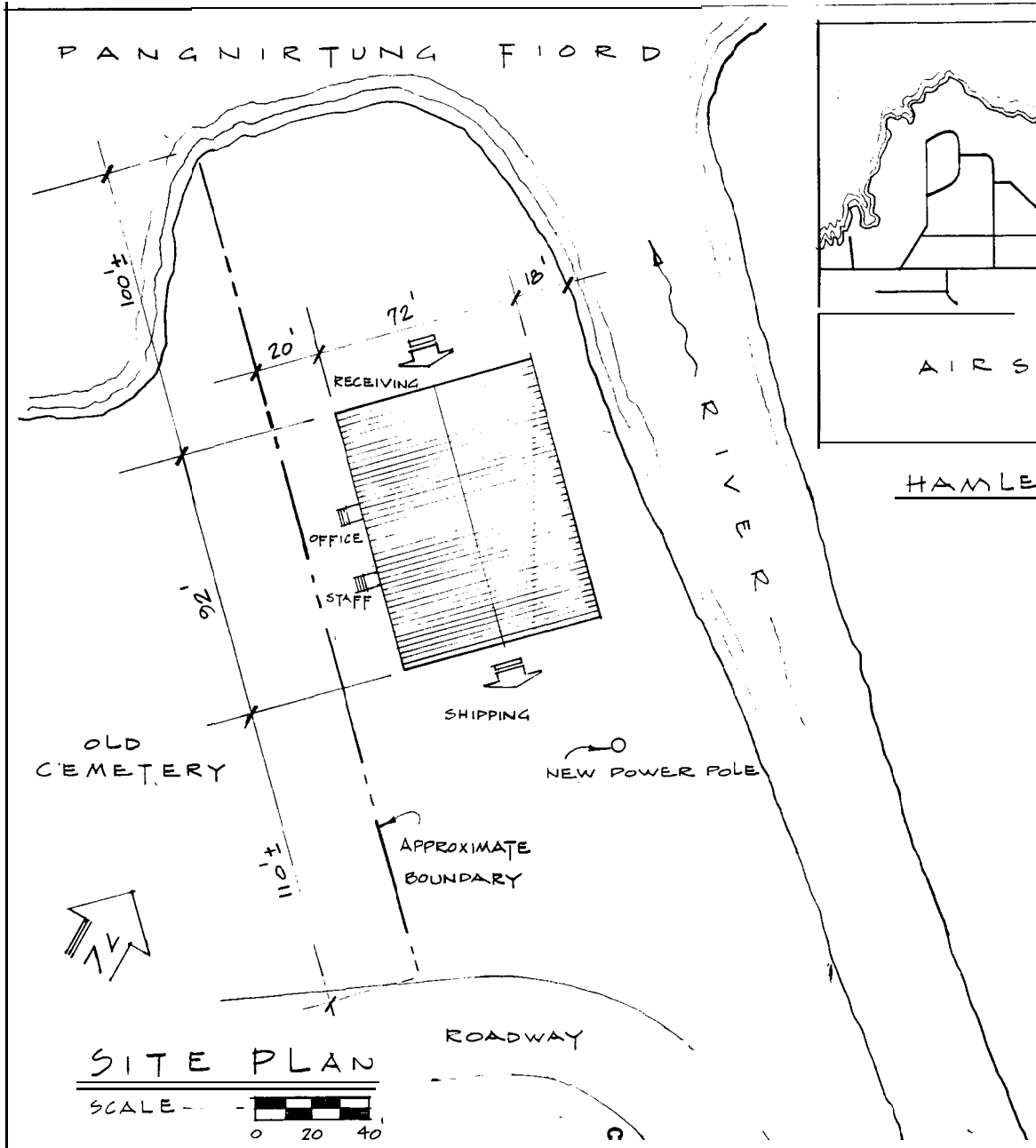
Power

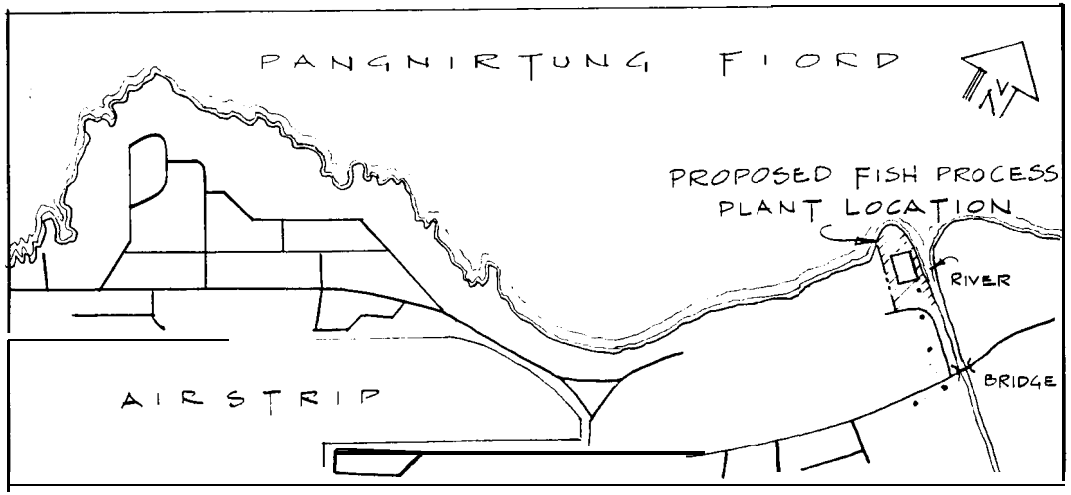
Electrical power is available approximately 500 ft. from the site on the main road leading from Pangnirtung to the water reservoir, the incinerator, and dump site. Four-wire, three-phase power at 4,160 volts is available on these poles. It is estimated that three (3) new poles would be required to bring power to the proposed new processing facility.

Sewage Collection

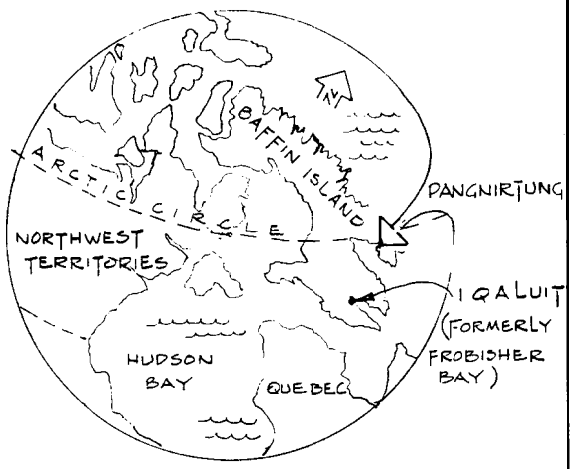
The site is located closer to the sewage dump site, located approximately 1.5 miles in a northeasterly direction from the site. Less travel time will be required for sewage pump-out vehicles to take sewage collected from the facility to the prescribed dump site.

It has been noted that some officials have indicated the possibility of discharging the waste water from the fish operations directly into the fiord/river from the plant. This water consists mainly of





HAMLET OF PANGNIRTUNG NTS



CUMBERLAND SOUND FISHERIES LTD.

PROPOSED NEW PROCESSING FACILITY

EXHIBIT 6-1

View of site identified by Hamlet of Pangnirtung as suitable for proposed new fish plant processing facility.

River is on left. Three-phase electrical power is available on main road approximately 150 meters from site.

EXHIBIT **6-2**

wash water used to wash and clean the fish product and contains small bits and pieces of fish material and other organic materials. Time did not permit verification of this scenario with the appropriate environmental officials. Such waste water discharge is commonly occurring at other fish plants across Canada. In addition, since the Hamlet of Pangnirtung is dumping its sewage into the fiord approximately 1.5 miles north and east of the site, this fish waste water disposal method may marginally reduce the water quality in the fiord.

Domestic sewage would be contained in a storage tank that would be pumped out by the Hamlet vehicles on a regular basis.

Telephone

Telephone lines are available on the power poles as mentioned above, and could be attached to the three (3) new poles that would be carrying electrical power to the site.

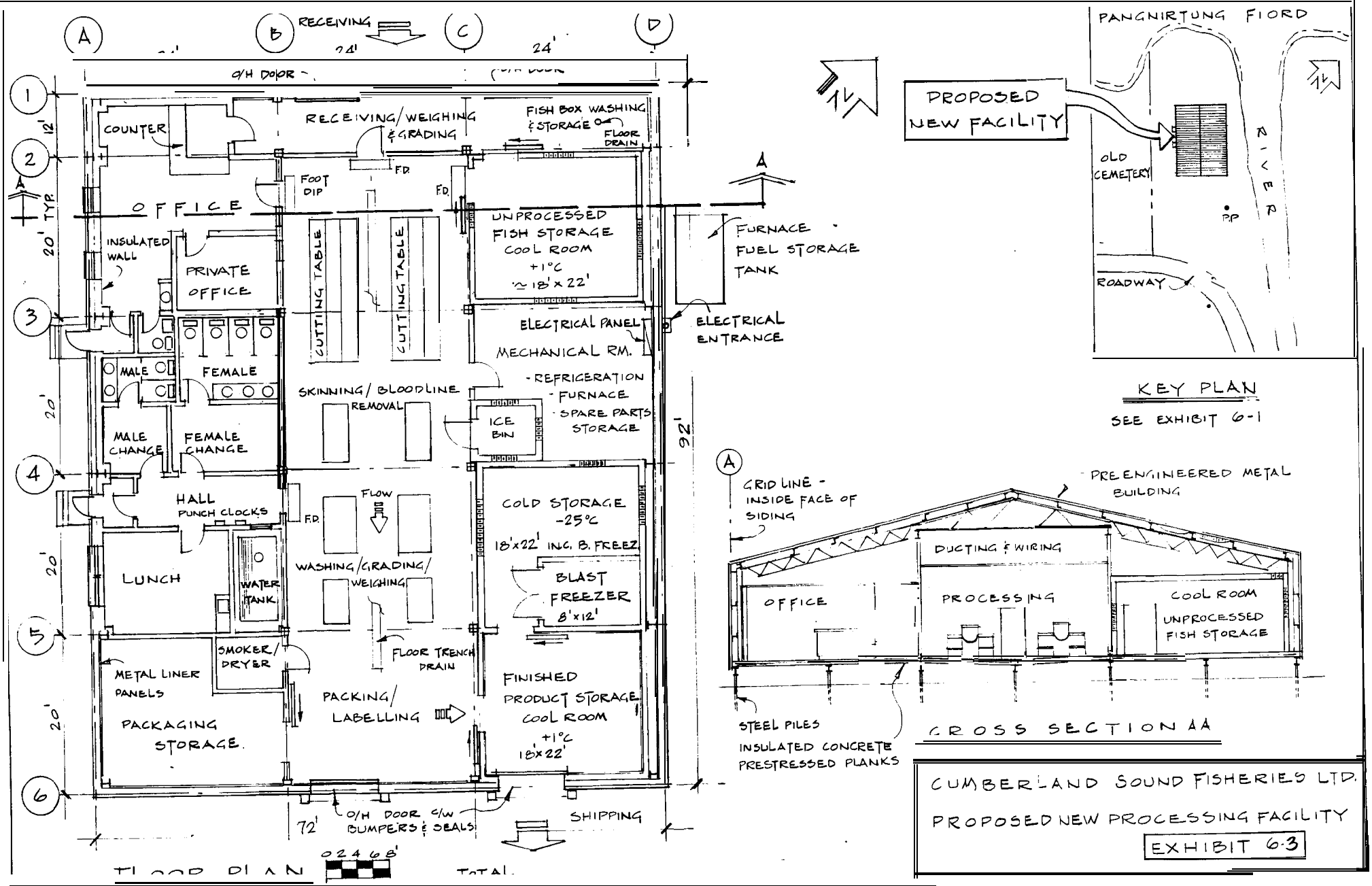
***Solid Waste** Disposal*

Fish wastes and other waste generated at the processing facility will require less transit time from the plant to the prescribed dump site, approximately 1.5 miles away.

6.3.3 Plant Size and Layout

Exhibit 6-3 presents preliminary plant layout designed to suit current and increased volumes of fish which could be expected to be processed in the future. The proposed building is approximately 72 ft. wide x 92 ft. in length, for a total area of roughly 6,600 sq. ft.. This one (1) building houses all of the processing requirements, office, administration, and staff requirements, packaging storage and product storage (both unprocessed and finished).

The intent of the layout and configuration is to have a flow-through type of processing alignment so that fish is received from the fishermen at one end of the building and finished product exits the other end of the building. The building is divided into three (3) primary areas of activity, namely: office administration and plant staff facilities including washrooms, change rooms, lunchroom, etc.,; the second area contains all of the processing activities including cutting tables, skinning machines, wash and grading and weighing, as well as packing, strapping, labelling; the



CUMBERLAND SOUND FISHERIES LTD.

PROPOSED NEW PROCESSING FACILITY

EXHIBIT 6-3

third area includes product storage, both unprocessed as well as finished product storage, in both a fresh and frozen state.

The processing area is capable of very easily handling two (2) complete process lines. This allows flexibility in dedicating one line for steaking operations and the other line for filleting operations. This encourages proficiency from plant workers in their specific areas. Alternatively, depending on market demand, both lines can be switched to a single product production.

The plant layout accommodates all of the mechanical, electrical equipment close to where it is needed. Any future expansion can be easily accommodated by extending the structure in the long direction, either towards the receiving end of the building or the shipping end of the building. Basic plumbing, electrical and other mechanical systems would not require relocation as they are contained in the original central core of the structure. The roof shape and design permits for easy additions without getting into complicated roof framing and drainage difficulties.

Although detailed engineering and geotechnical investigation would obviously be required before final design of such a facility, preliminary work has been developed in an effort to ascertain approximate capital costs for the building.

It is envisaged that the entire structure would be supported on steel piles driven firmly into the permafrost material. The piles would be framed with appropriate steel supports to support the floor and superstructure of the building. It is desirable to have concrete floors in the processing area and in the product storage area where heavy floor loads can be expected due to the considerable weight of fish products. Office, administration and other staff facilities could be constructed of lighter weight materials if deemed appropriate and more economically attractive.

It is envisaged that a pre-engineered metal clad building be erected on the foundation and floor slab with three (3) bays of 24 ft. in width with column spacing at 20 ft. in the opposite direction. This allows large unobstructed areas suitable for processing/storage of fish products. The building would be clad in suitable metal material with steel framing, roof joists and steel columns. Insulation would be expected to be in the range of R40 value for floor, walls and roof. Drop ceilings would be installed in the processing, office and staff facilities areas. This would permit the

attic area for wires, ducting and other electrical and mechanical systems.

The receiving end of the building would be constructed so that grade would be level with the floor of the process building. This will permit easy access and receipt of fish from the fishermen. The shipping end of the building would be approximately 4 ft. above ground level so as to accommodate truck tailgate height for transporting fish to the airport and for other deliveries such as packaging materials from trucks.

6.3.4 Equipment Required

Virtually all of the equipment in the existing facility could be transferred to the new facility and utilized within the plant operations. Additional equipment would include:

- 1 refrigeration equipment
- 1 insulated rooms for
  - unprocessed fish product
  - fresh finished product
  - frozen finished product
  - blast freezer
  - ice storage bin
- 1 additional cutting tables
- 1 washing and grading tables
- weighing scales
- 1 miscellaneous other gear including roller conveyors, etc.
- 1 furnace, including fuel storage tank, ducting, fans, stack, etc.
- 1 large water storage tank including pumps, chlorination, etc.
- large waste water storage tanks
- 1 office and lunchroom equipment
- high pressure cleaning machines
- 1 smoker/dryer equipment (future)
- 1 additional fish boxes, tote boxes, etc.

It is proposed for the storage of both unprocessed and finished product that insulated storage rooms constructed of snap-together insulated panels be utilized. These rooms would be self-standing within the overall outer shell of the structure. This allows greatest amount of flexibility in rearranging, adding to, or changing the shapes of the rooms to accommodate future requirements. This method of cold storage also eliminates the problem of roof leakage and water damage currently being experienced in the exposed Bally Cooler section of the existing plant. Further, by having a

room within the building, heat losses during warmer ambient temperatures are reduced resulting in smaller operating costs.

It is proposed that heating of the structure would be by use of a hot air furnace with associated ducts and circulation fans to maintain appropriate room temperatures. Office, administration and staff amenity space would be heated to normal room temperatures (20°C) while the processing area would be maintained in the 120 C - 15 C range, so as to minimize warming of the fish product. As an energy conservation measure, waste heat from the refrigeration system would be used to supplement the oil-fired furnace heat system.

Electrical requirements for refrigeration equipment and other heavy electrical uses would be most likely at 600 volt, three-phase resulting in reduced costs for electric motors, wiring and switch gear installation. Other voltages such as 208 volt, three-phase as well as 120/240 volt single-phase would also be utilized for other power requirements such as lighting, etc..

6.3.5 Costs of Option "B"

Due to the very tight time constraints in the production of this report, it is impossible to provide accurate capital costs for the proposed new processing facility. However, in an effort to provide some basis for option selection, we include the following information.

CFCL has taken the approach that there are essentially two (2) basic components to the capital costs, namely: the building structure complete with foundation, insulation and basic mechanical/electrical systems; and secondly, all of the equipment, fixtures, mechanical/electrical systems needed to make the plant operational.

Building

For the purpose of this exercise, the building is estimated on a sq. ft. basis, taking into consideration its size, type of construction, etc.. In general, comparative data indicates that pre-engineered buildings are least expensive when large spans are involved, while wood frame construction is least expensive for small spans.

Optimum insulation level based on average indoor temperatures appear to be in the R40 range.

Geotechnical investigation is mandatory and required to determine pile spacing, pile loading, bracing required, and other data influencing the superstructure design and cost considerations.

From discussions with engineers and contractors familiar with construction in the North, it appears that building prices range substantially depending on:

a) workloads in other parts of Canada;
b) workloads in northern communities;
c) the number of interested construction firms;
d) the timing with earlier tender calls receiving better prices;
e) schedule of delivery of materials and availability of meeting the sealift deadlines;
f) the cost of mobilization and maintaining a workforce in the community involved;
g) timing for construction; and numerous other factors.

CFCL received information that buildings can range in price from $180/sq. ft. to $250/sq. ft. complete.

The current economic recession experienced in Canada has generally, across the country, reduced construction prices to levels experienced in the late 1980's. How long these "bargain prices" will remain in effect is subject to question.

CFCL contacted a couple of pre-engineered manufacturing companies that have had experience in the Arctic, (e.g., Honco - Igloolik Arena). Unfortunately, they were unable to respond with a quotation in time for inclusion in this report.

For the purposes of this exercise, we consider it prudent to estimate on the high side pending further detailed preliminary engineering and geotechnical information.

Basic Building Costs: 72' x 92' = 6,624 sq.ft. x $250/sq.ft. = $1.656M.

Equipment

Section 6.3.4 identified the major items of equipment. Based on CFCL cost files and some very quick quotations received from potential suppliers, it is estimated that the installed cost of this equipment in Pangnirtung is as follows:

Equipment Costs: $700,000

cost Summary

Exhibit 6-4 presents a summary of the Option "B" Capital Costs. To the basic building costs has been added an allowance for engineering, inflation for 1993 construction, and a contingency allowance for unforeseen expenses.

EXHIBIT 6-4
COST SUMMARY - OPTION "B"

Basic Building Cost Equipment	$ 1,656,000 $ 700,000
SUBTOTAL	$, 2,356,000
Allowance for Engineering, Inflation and Contingency - 20%	$ 470,000
TOTAL ESTIMATED COST	**$ 2,826,000**

6.4 Option "C"
Expand Existing Facilities

This option was investigated by CFCL with a view to expanding the existing facilities, either on its own site, or moving the entire structure to a new site.

In both cases, this option was deemed to be unacceptable for the following reasons:

- Existing site is too small and too steep to make any meaningful addition to the building without paying a substantial premium for site. grading and other construction difficulties.

- The original cooler building belongs to the HTA and they may not wish to have further alterations or changes carried out.

- Relocation of the existing structure to a new larger, flatter site, would prove costly, as the existing structure would have to be disassembled in parts and reassembled on a new foundation on the new site. Besides the cost of moving the building, HTA may object to relocation of the structure.

- Relocation of the structure would, no doubt, result in building damage which will require additional funds and effort to make good.

- Adding a new structure or addition to the existing facility still leaves a "make-do" facility not suitable for ensuring peak processing efficiency while maintaining high quality standards.

For all of the above reasons, this option was not pursued any further, as it was considered to be inappropriate and not a viable alternative worthy of further consideration.

7.0 COMPARISON OF OPTIONS

Exhibit 7-1 presents, in tabular form, a comparison of Option "A' Status Quo using the" Existing Structure with Minor Improvements, and Option "B" New Processing Facility on a New Site.

A number of items for comparison are identified and comments presented. The exhibit is not intended to be a detailed comparison, but only to highlight factors that should be considered in the evaluation of each option.

As noted in Section 6.0, a third option "C' was investigated and rejected as being impractical, not worthy of further investigation.

EXHIBIT 7-1
CUMBERLAND SOUND FISHERIES LIMITED
MAY 1992

COMPARISON OF OPTIONS		
ITEMS FOR COMPARISON	OPTION "A" STATUS QUO - EXISTING BUILDING, MINOR IMPROVEMENTS	OPTION "B" NEW PROCESSING FACILITY ON NEW SITE
1. Ability to expand operations	▪ Very difficult, if not impossible due to site conditions and building configuration	▪ Proposed facility expands operations/capacity approximately 4 times existing production (with double shift). Future expansion planned for and easy to do.
2. Ability to handle more fish	▪ Limited - second shift operation required - loss of efficiency.	▪ Facility can handle double the 1992 fish volumes with no second shift.
3. Quality of finished products	▪ Good quality due to good management.	▪ Excellent quality due to faster and better handling.

COMPARISON OF OPTIONS (Exhibit 7-1 cont'd)

ITEMS FOR COMPARISON	OPTION "A" STATUS QUO - EXISTING BUILDING, MINOR IMPROVEMENTS	OPTION "B" NEW PROCESSING FACILITY ON NEW SITE
4. Product form variation	▪ Essentially limited to fresh fish market for fillets and steaks. ▪ Limited freezing/freezer capacity. ▪ No room for other product forms or value-added.	▪ Easily capable of frozen product - blast freezer. ▪ Portion products - e.g., airline meals - can be easily accommodated. ▪ Space available for other value-added forms - e.g., smoking, salting.
5. Ability to handle peaks of fish delivery	▪ Very limited - cooler space is limited: ▫ Single processing line ▫ Limited flexibility	▪ Excellent ▫ Large capacity cooler room - double the processing capacity
6. Number of employees	▪ Limited due to space consideration - one shift 26 - two shift + admin. say 45 max.	▪ Two line operation permits more employees to work - single shift -60-70 - double shift - 100+ possible
7. Ownership	▪ Part owned by HTA, part owned by CSFL ▪ HTA may, at any time, wish to suspend fish processing operations in their building.	▪ Completely owned/controlled by CSFL.
8. Ability to handle other fish species - e.g.. scallops - summer fishery - char - summer, etc.	▪ Very limited. ▪ May be impossible if HTA is using facility in summer months for storage of country foods (would not be permitted by DFO).	▪ Process facility easily adaptable to other species. ▪ Would make almost year-round utilization of facility.
9. Training of plant and administrative staff	▪ Limited facility and "make-do" set-up can possibly influence trainees into poor operating and quality control procedures.	▪ Correctly designed facility encourages correct operations procedures for efficiency and quality control.

COMPARISON OF OPTIONS (Exhibit 7-1 cont'd)

ITEMS FOR COMPARISON	OPTION "A" STATUS QUO - EXISTING BUILDING, MINOR IMPROVEMENTS	OPTION "B" NEW PROCESSING FACILITY ON NEW SITE
10. Impact on community	▪ May be continued to be viewed as an experimental fishery - making do with the existing plant. ▪ Could be closed/shut down/abandoned at whim of government. ▪ Stifle fishing effort. ▪ Reduced pride of fishermen/plant workers. ▪ Reduced or limited earning power of fishermen and reduced UIC benefits. ▪ Less money flowing into community and accompanying spin-off benefits.	▪ Seen as an established industry to be proud of. ▪ May encourage fishermen to invest in upgraded gear and equipment, take additional training, and become "more professional" in their enterprise. ▪ A commitment of government and community to create meaningful industry and employment. ▪ May encourage investment/investigation of other fishery species to be processed in the plant.
11. Capacity of plant	▪ 1992- approximately 220 mt. ▪ Future - with improvements and double shifts, say, 300 mt.	▪ Immediate capacity increase of almost 4 times (using double shift) -1992 volume - 700+ mt. ▪ Potential expansion to accommodate maximum allowable landings of turbot as determined by DFO quota (1992 quota - 2,000 ret).
12. Capital cost investment	▪ Existing facility value at replacement cost, say, $750,000, additional improvements $250,000 for a total of $1,000,000.	▪ As per estimate in Section 6.0, with contingency allowance, $2,826,000

COMPARISON OF OPTIONS (Exhibit 7-1 cont'd)

ITEMS FOR COMPARISON	OPTION "A" STATUS QUO - EXISTING BUILDING, MINOR IMPROVEMENTS	OPTION "B NEW PROCESSING FACILITY ON NEW SITE
13. Potential for achieving break-even position	▪ Limited due to inflexibility of facility to produce different product forms for market demands.	▪ Good possibility due to adaptability to produce different product forms/value-added products. ▪ Potential for all year round operations if other fisheries develop.
14. Develop local Inuit management	▪ Limited ability to develop local management to effectively manage CSFL due to lack of proper office/admin facilities adjacent to process plant.	▪ All infrastructure properly in place to develop qualified and competent management for CSFL.

There are additional factors which must be considered, including the socio-economic impact on the community that this fishery has, which is presented in a brief overview form in Section 8.0.

The Government of Northwest Territories has invested time, effort and considerable dollars in the development of this fishery, not only through direct operating subsidies and covering of losses, but also through establishment of training programs at Arctic College, both in Pangnirtung and Iqaluit.

Further, the Government of Northwest Territories may have, as part of its overall development strategy, the desire to have an energetic and growing fishing industry in this part of Baffin Island. It may possibly be utilized as a model for possible other communities to get involved in this type of enterprise. It is beyond the scope of this report to analyze strategic planning and government policy in these matters.

8.0 SOCIOECONOMIC IMPACT'S

8.1 Introduction

A complete socioeconomic impact evaluation was beyond the scope of this report. It is important, however, to note the following comments.

The most recent data from Statistics Canada is based on the 1986 Census. However, the 1991 population figures for Pangnirtung was available. The population in 1986 Census was 1,004, while the corresponding figure for 1991 is 1,130 people. The increase in population over this period is 12.5%. If we assume that ratios and statistics remain constant relative to the population, then we can adjust 1986 data to approximate current conditions. Exhibit 8-1 presents some 1986 Census data and the corresponding adjusted figures. The adjusted figures in Exhibit 8-1 represent the approximate data had the turbot fishery not been developed and CSFL did not come into existence.

EXHIBIT 8-1
CENSUS DATA

	1986	1986 ADJUSTED TO 1991[1]
Population	1,004	1,130
Households	205	230
Labour Force	305	343
Employed	205	230
Unemployed	100	113

[1] Assuming turbot fishery was not developed.

8.2 Employment

The establishment and growth of CSFL has had a significant impact on employment in Pangnirtung. Jobs have been created in fishing, management, processing, repair and maintenance, transportation and marketing.

The total number of individual fishermen who sold fish to CSFL at any time throughout the processing season was 58. An estimate of fishermen who sold fish (turbot and char) to CSFL continually

throughout the season is 45-50. Assuming 45 fishermen throughout the season, the average fisherman's earnings from fishing is approximately $6,300. Some fishermen land more fish than others (mechanical equipment, fishing effort, number of trips, assistant fishermen), and as a result, the range of earnings varied considerable about the mean. The maximum and minimum earnings observed ranged from a few hundred dollars to approximately $15,000 during the season.

The establishment of a winter turbot fishery in Cumberland Sound represents a return to traditional forms of employment for the Inuit. During the 1992 fishing/processing season, Cumberland Sound Fisheries purchased a total of 380,000 lbs of turbot (Head-off, gutted and tail bled) and 8,000 lbs of char from local fishermen. Expenditures on fish purchases totalled $282,250, approximately $272,265 and $12,800 for turbot and char, respectively.

In addition, CSFL employs 30 people, 26 in production and 4 in administration. Thus, approximately 75 people are dependent on CSFL for income. Assuming every employee and fisherman are from separate households, we could say that 75/230 = 33% of households have benefited from CSFL existence.

8.3 Local Spending

Non-fish purchases in the local community include conference expenses, water delivery, spare parts, packaging, plant supplies, electrical power, and freight (two employees are hired by First Air to handle fish). The total estimated non-fish purchases is $20,000.

Payroll expenses include process labour and administration staff. Total payroll for the 1992 season was approximately $157,000 for both process labour and administration-staff.

Exhibit 8-2 presents a summary of dollars injected into the community as a result of CSFL operations.

EXHIBIT 8-2
SUMMARY OF LOCAL SPENDING BY CSFL

SPENDING	$ IN 1992	% OF TOTAL
Fish Purchases from Fishermen	$282,250	61%
Non-Fish Purchases	$20,000	5%
Payroll Expenses	$157,000	34%
TOTAL	**$459,250**	**100%**

The following data puts the information in Exhibit 8-2 in perspective.

EXHIBIT 8-3
COMPOSITION OF COMMUNITY INCOME[1]

SOURCE OF INCOME	DOLLARS		% OF TOTAL
	Nominal[2]	Adjusted for Inflation[3]	
Government	3,299,278	4,173,586	64%
Private	957,375	1,211,079	19%
Transfer Payments	850,306	1,075,638	16%
Other	15,366	19,438	1%
TOTAL	**5,122,326**	**6,479,741**	**100%**

[1] Adapted from C-MAC Business Plan (Nov 4/1990 Draft),
[2] 1986 Census Data
[3] CPI data: 1986 = 100; 1991 = 126.2

Total CSFL spending ($459,250) is approximately 50% of private income in 1986, not accounting for inflation. Assuming private income increased at the same rate as the Canadian CPI, $957,375 would equal $1,211,079. The establishment of CSFL represents 38% of private sector income in 1986.

In addition to local spending, CSFL purchased approximately $230,000 of freight services from First Air, based in Iqaluit.

8.4 Unemployment Insurance

As a result of a recent Revenue Canada ruling, the fishermen fishing the winter turbot can qualify for UIC. In addition, the process labour and administration staff can also qualify. This represents 26 people as process labour, 4 people in administration and 45 fishermen for a total number of people qualifying at 75. With a population of approximately 1,130, these 75 people represent approximately 6% of the total population of Pangnirtung. Seventy-five (75) people represent 22% of the adjusted workforce (343).

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

Our analysis of the Cumberland Sound Fisheries Limited operations indicates that there are three (3) primary areas of focus that must be considered prior to making an investment decision as to the future direction of the company.

The three (3) components considered to be of importance are:

a) Marketing considerations of infrastructure improvement;
b) Socio-economic considerations on infrastructure improvement; and
c) Financial considerations on infrastructure improvement.

The following sections discuss these items briefly. The chapter concludes with a summary of our recommendations.

9.2 Marketing Considerations of Infrastructure Improvement

When comparing Option "A' Existing Facility and Option "B" New Facility, it is important to analyze each with its ability to meet specific market demands.

The existing operation is essentially a fresh fish processing plant subject to the severe time constraints of product shelf-life. As mentioned in Section 3.0, fish buyers/brokers can use this "fresh fish only" production plant to negotiate distress sale prices for the product before the shelf-life time expires. Even with the suggested minor improvements to the existing facility, CSFL will have difficulty in diversifying product mix to more effectively match market demands and improve sales figures.

Option "B' gives CSFL the opportunity to use the "flapgate" approach. This approach essentially permits the processing facility to alter its product mix between fresh, frozen and value-added, much the same way as a flapgate diverts water flow from one channel to another channel. The flapgate control requires current, up-to-date and accurate market information. If the market is strong in fresh product then most, if not all, of the CSFL production in the new facility could be fresh in the form desired. i.e., steaks, fillets, or h&g. If, however, the fresh market prices are softening, then the flapgate can be altered to direct more of the product to frozen forms or IQF individual portions, etc.. The Option "B" facility permits management to maximize their income potential by closely reflecting what the market wants and is willing to pay for.

An essential ingredient as stated above is good market information on a timely and regular basis, so that production changes can be made quickly.

Other market considerations can include establishing a geographically dispersed and diverse product mix so as to minimize the impact of a soft market in any one (1) particular geographical area or in any one (1) particular product form.

9.3 Socio-Economic Considerations on Infrastructure Improvement

The winter turbot fishery has been developed and encouraged by the Government of Northwest Territories for the past five (5) or or six (6) years. During that time, it has evolved from a small trial fishery to an industry which, during the 1992 season landed approximately 900,000 lbs of fish. This volume of product surely cannot be continued to be considered an exploratory or experimental fishery.

The fishermen and plant workers associated with CSFL, as well as the fishermen and people associated with P&L Services Limited, have benefited from the infusion of "new money" into the' community of over $500,000. In addition to this, improved UIC benefits due to the recognition of fishermen by UIC officials adds additional income for the fishermen and the community in total.

The Government of Northwest Territories has encouraged fishermen and others to engage in training courses and to acquire equipment, gear, etc., to pursue the harvesting of this resource. There has been an observable increase in pride and self-esteem throughout the community from fishermen and others engaged in meaningful work and employment opportunities.

The choice of Option "A' would tend to limit and put a cap on any substantial further development of the fishery. Community members may interpret the selection of Option "A' as a "abandonment" of any further development to the fishery. This interpretation may reduce level of interest, level of expenditure in existing fishermen upgrading gear, and may deter potential future fishermen/plant workers from getting involved in the industry.

Selection of Option "B" would send a clear message to the community that the Government considers this fishery to be an industry worthy of future development. A visible new facility will encourage people currently involved in the industry to further

upgrade their equipment/training and entice other members of the community to get involved in the industry.

The introduction of P&L Services Limited into this year's fishery activities represents a major milestone in the development of any resource-based activity. The fishermen, in 1992 the season, had two (2) potential purchasers of their product. If, for some reason or other, P&L Services Limited withdrew from the fishery next year or in subsequent years, Cumberland Sound Fisheries Limited would be faced with a doubling of the fish landings at the processing plant door, or alternatively, fishermen in the community would have to cut back and reduce fishing effort. Selection of Option "A' would most certainly result in reduction of fishing effort, loss of income to the fishermen, as the existing facility could not possibly hope to process anywhere near the total 1992 landings of both CSFL and P&L Services.

Selection of Option "B" would give CSFL management the ability to process a volume of fish equal to all of the 1992 landings of P&L Services Limited as well as maintain its existing 1992 volumes.'

The choice of Options "A' and "B" will have profoundly different effects on the socio-economic impact on the community.

The selection of Option "B" provides the opportunity for CSFL to process product on behalf of P&L Semites Limited or any other potential new entrant into the fishery. This could be a source of added revenue/income.

9.4 Financial Considerations on Infrastructure Improvements

Section 6.0 of this report outlined the capital costs requirements for improvements to the existing facility, Option "A', and building a new facility on a new site, Option "B".

Obviously, the existing structure, as it stands, has an associated value attached. If one considers a replacement value of the existing building, including equipment, to be in the range of $750,000, and if the improvements are executed at cost of between $200,000 and $250,000, we are then looking at a total capital investment approaching $1,000,000.

Option "B" capital costs including allowances for inflation and contingency, and subject to more detailed analysis, engineering design, etc., is estimated to be $2.8 million. The incremental

capital investment of $1.8 million has to be examined in light of the potential of CSFL to get into a break-even situation.

At this stage, it is impossible to estimate with any degree of accuracy what the operating costs will be for the facility, since much detailed engineering work would have to be undertaken. However, it will surely be substantially more than the operating costs of the existing facility. It must be remembered that the existing Facility's power and maintenance is paid for through other government departments and essentially represents a subsidy to the CSFL operation and the Hunter and Trappers Association activities.

Appendix "B" presents the Cumberland Sound Fisheries Limited Statement of Losses and Deficits for the past three (3) years ending May 31. The 1992 estimate of revenue and expenses, although not finalized, appears to show a loss in the range of $150,000. This loss appears to be directly attributable to the inability of the existing facility to change product form, resulting in the distress sale of approximately 45,000 lbs of product, some of which was dumped with zero revenue resulting from it.

CSFL's ability to get into a break-even situation using the existing facility is severely limited due to this inability to shift product form.

The potential for a break-even situation for Cumberland Sound Fisheries Limited is much improved with Option "B" due to its ability to process more fish (more contribution to overheads), diversity of products (ability to maximize sales revenues), hold product in frozen storage (ability to sell when market prices are higher), and potential for additional income as a result of possible new fisheries being developed, e.g., the scallop fishery. In addition, the possibility of processing for other fish companies entering the turbot market, e.g.., P&L Services Limited, provides another potential source of revenue which contributes to operating costs, overheads, etc.. The income earning potential of Option "B" is significantly better than Option "A".

It is probably not realistic for the Government of Northwest Territories and others to anticipate that Cumberland Sound Fisheries Limited can amortize or repay the initial capital investment for the foreseeable future. However, it is reasonable to project that Cumberland Sound Fisheries Limited should be

able to be in a break-even position covering all of their operational and overhead expenses.

9.5 Recommendations

Canadian Fishery Consultants Limited recommends that Option "B", i.e., the construction of a new processing facility on a new site, be selected as the future course and direction of Cumberland Sound Fisheries Limited. It is believed that the benefits to the community, the ability to meet market demands, and the potential for break-even operational status is greatly enhanced with this option. It also appears to be the logical continuation of six (6) years of effort and support by the Government of Northwest Territories in encouraging the development of' the winter turbot fishery.

Exhibit 9-1 presents information on potential implementation timetable to implement this strategy.

Optimistically, the new facility could be ready for the major part of the 1994 winter turbot fishery season. Any delay in reaching a decision or any of the activities required to be completed will delay the completion of the facility until the January 1995 turbot season. Any delays will require Cumberland Sound Fisheries Limited to "make-do" with the existing facility for another year.

It is further recommended that minor equipment changes (upgrade truck chassis, minor modifications to plant equipment and rooms) proceed for the 1993 turbot season. It is estimated that the cost for minor equipment changes to be in the $25,000-$30,000 range. No additional expenditures of a capital nature, other than the minor equipment modifications, should be made on the existing facility.

EXHIBIT 9-1
IMPLEMENTATION TIMETABLE

ACTIVITY	EARLIEST COMPLETION DATE	LATE COMPLETION DATE
1. Completion of CFCL Survey and Future Potential Report	1 June 1992	1 June 1992
2. Northwest Territories Development Corporation Approval of Funding to Proceed with New Facility	1 Sept 1992	1 Apr. 1993
3. Engage Consultants for Pre-engineering & Geotechnical Work	1 Oct. 1992	1 May 1993
4. Design of Facility	1 Feb. 1993	1 Sept 1993
5. Tenders Called and Awarded	1 Apr. 1993	1 Dec. 1993
6. Materials & Equipment On Board Sealift	15 July 1993	15 July 1994
7. Materials On Site in Pangnirtung	15 Aug. 1993	15 Aug. 1993
8. Construction Completed	15 Mar. 1994	15 Mar. 1995

APPENDIX "A"

DFO INSPECTION REPORTS

- GMP
- QMP

Plant Name CUMBERLAND SOUND FISHERIES Location PANGNIRTUNG N.T.

Plant No. ☐☐☐☐☐ Inspection date 92 / 05 / 08 (YY / MM / DD) Reg # ☐☐☐☐ ☑ Inspection

Inspector No. ☐☐ Time Required ☐☐ Photo Yes / (No) • 1 Action Report

V ample Yes (No) PPM CL2 ☐☐☐ Ice sampled Yes (No)

F.I.R. Section	Requirement	Not Comply	NA	Minimum Serious	(Score) (Se)	Minimum Critical	Score (Cr)	Remarks
101	Floors — Wet work area			Not impervious				
(242)	Floors — Clean		0					COFFEE ROOM WET - 3 SQUEEGEE ON ORDER.
102	Floors — Dry work area							
103	Drains — Adequate, Covered			Capacity, rodents				
104	Walls — Wet area							
(135)	Ceilings — Processing area		0					CEILING IN BOILING AREA DRIPPING.
115	Lighting — Adequate, Covered			Unprotected				
105	Ventilation — Adequate			Condensation				
106	Toilets — Types/numbers							
107	Toilet room doors — self closing							
(206)	Toilet facilities maintained		0	Dirty, sewage				
(108)	Handwash facilities — approved		0					DISPENSERS NOT AVAILABLE
(202)	Handwashing - each abscence		0					
137	Hand cover dips — provided			Not provided				
(240)	Handcoverings clean and disinfected		0					
109	Process water — approved/pressure			Insufficient		Unapproved		
136	Hot water — at least 43 c							
(235)	Fish washed — prior to processing		0					COMPLIED WITH
(236)	Ice - approved		0	Handling, containers		Unapproved		
112	Offal containers — approved construction							
(208)	Offal/refuse — removed daily		0					
(209)	Offal containers — approved use		0			Improper use		
(207)	Sewage disposal — approved		0			Contaminates H20		
	Conveyers — approved			Unapproved				
	Conveyor belts — spray/scraper			No spray, scraper				
114	Fish flumes — approved/cleanable			Unapproved				
110	Equipment frames — approved							
111	Tables — approved/cleanable							
138	Processing boards — approved			Unapproved				
139	Other fish contact surfaces			Unapproved				
140, 143, 144	Containers/utensils — approved			Unapproved, broken				
141	Fish tubs/containers — approved							
(243)	Utensils — clean, disinfect, stored		0	Unsanitary, stored?				
(244)	Fish contact equipment — clean		0	Dirty, disinfected?				
(201)	Employee health — satisfactory		0			Problems		NONE NOTED.
(205/203)	No smoking/spitting/fingernail polish		0	Not permitted				
(204)	Garments — clean		0					
(241)	Garments/headgear — worn/proper type		0	Worn in washroom				
(210)	Animals — not allowed		0	None permitted				
(211)	Pest control — adequate/materials		0	Program? chemicals				
(212)	No unnecessary equipment — work area		0					
(213)	Plant surroundings — clean		0					
(214)	Cleaning equipment — available		0	Not available				
(245)	General maintenance — satisfactory		0					
145	Contract freezer — adequate							
146	Blast freezer — adequate							
401	Cold storage — adequate temperature							
214.1	Bivalve mollusks — records kept							

Schedule 1 Deficiencies # Serious _ # Critical _ RATING (A) B C O

Schedule 2 Deficiencies # Serious _ # Critical _ RATING (A) B C D

F.I.R. Section	CORRECTIVE ACTION (please print)	Score (Se) (Cr)	Correction date YY / MM / DD
242	SOAP DISPENSERS & FLOOR SQUIGEE	0	—
108	ON ORDER SINCE EARLY APRIL		
135	CEILING DRIPPING IN BOILING AREA. NO EXPOSED PRODUCT TO BE KEPT IN THIS AREA.	0	—
	NO SERIOUS		
	DEFICIENCIES		

ABOVE DEFICIENCIES ADKNOWLEDGE BY _____ POSITION _____

PS 100 89/10/01 Inspector's Signature T YOUNG

№ 2310

DFO

QMP INSPECTION RATING REPORT

Region: CENTRAL ARCTIC Area: NORTH WEST TERRITORIES

Name of Fish Plant: CUMBERLAND SOUND FISHERIES LTD Registration #: 1744

Type of Operation: FILLETTING/STEAKING/FREEZING - FRESH FISH Last QMP Rating: GOOD

QMP RATING TABLE

	CLASS III	CLASS II	CLASS I
EXCELLENT	0-3	0	0
GOOD	4-5 or	1-2	0
SATISFACTORY	6 or more	3-4	0
FAIL	NA	5 or more	1

Total # of Class II & III deficiencies does not exceed 5.

UNDER REVIEW

#of Class III deficiences 0 #Of Class II deficiences 0 # of Class I deficiences 0

OPERATION'S RATING AS PER DFO REQUIREMENTS

EXCELLENT ☑ GOOD ☐ SATISFACTORY ☐ FAIL ☐

Inspector's signature: (45)

Plant official's signature:

Date: APRIL 07/92

QMP Logo used ? YES

Plant #: 57004

APPENDIX "B"

CUMBERLAND SOUND FISHERIES LIMITED
STATEMENT OF LOSSES AND DEFICITS

CUMBERLAND SOUND FISHERIES LTD.
STATEMENT OF LOSS AND DEFICIT
FOR THE YEAR ENDED MAY 31, 1990

	1990	1989
REVENUE		
Sales	$901,414	$415,269
Cost of sales	977,550	359,127
	(76,136)	56,142
GNWT contributions	18,750	48,947
	(57,386)	105,089
EXPENSES		
Audit and legal	14,383	*3,802*
Administration	-0-	*944*
Advertising and promotion	18,213	*2,752*
Consulting	-0-	*3,057*
Maintenance and repairs	321	*785*
Miscellaneous	(6,824)	*263*
Rent	2,525	1,000
Supplies	6,153	6,416
Telephone	9,184	2,532
Travel	2,403	7,191
Utilities	1,564	540
Depreciation	2,663	673
Insurance	2,560	-0-
Bad debts	5,000	-0-
Interest and bank charges	11,994	-0-
Honorarium	420	-0-
Management fees	14,719	-0-
Vehicle expense	2,248	-0-
	87,526	29,955
INCOME (LOSS) BEFORE INCOME TAXES	(144,912)	75,134
INCOME TAXES (Recoverable)	(16,842)	*16,842*
INCOME (LOSS)	(128,070)	*58,292*
RETAINED EARNINGS BEGINNING OF YEAR	58,292	-0-
INVESTMENT TAX CREDIT	4,050	-0-
RETAINED EARNINGS (DEFICIT) END OF YEAR	$(65,728)	$ 58,292

CUMBERLAND SOUND FISHERIES LTD.
STATEMENT OF LOSS AND DEFICIT
FOR THE YEAR ENDED MAY 31, 1991

	1991	1990
REVENUE		
Sales	$ 493,577	$ 901,414
Cost of sales	468,048	977,550
	25,529	(76,136
GNAT contributions	73,896	18,750
	99,425	(57,386
EXPENSES		
Audit and legal	15,529	14,383
Administration	6,310	-o-
Advertising and promotion	41,768	18,213
Consulting	36,503	-o-
Maintenance and repairs	1,265	321
Miscellaneous	1,158	(6,824)
Rent	2,000	2,525
Supplies	2,580	6,153
Telephone	2,389	9,184
Travel	-o-	2,403
Utilities	1,938	1,564
Depreciation	9,893	2,663
Insurance	7,020	2,560
Bad debts	23,538	5,000
Interest and bank charges	28,857	11,994
Honorarium and board expense	70	420
Management fees	34,870	14,719
Vehicle expense	3,529	2,248
	219,217	87,526
INCOME (LOSS) BEFORE INCOME TAXES	(119,792)	(144,912)
INCOME TAXES (Recoverable)	-0-	(16,842)
INCOME (LOSS)	(119,792)	(128,070)
RETAINED EARNINGS (DEFICIT) BEGINNING OF YEAR	(65,728)	58,292
INVESTMENT TAX CREDIT	-0-	4,050
(DEFICIT) END OF YEAR	$(185,520)	$ (65,728)

APPENDIX "C"

PANGNIRTUNG TEMPERATURE PROFILE

1992

Temperature Data For Pangnirtung

Weekly Averages (Dec. 30th to May 23rd)