Feasibility Analysis of a Publicly Owned Refrigerated Warehouse Facility for the City and Borough of Juneau

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in association with

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EXECUTIVE SUMMARY

The Fisheries Development Committee (FDC) of the City and Borough of Juneau, in an effort to further their goal of revitalizing commercial fisheries in and around the Juneau area, has asked Northern Economics to assess the feasibility of developing a publicly owned privately operated refrigerated warehouse facility. The FDC believes that such a facility may assist local fishers and attract primary and secondary processors to the community.

Currently there are seven shore based processing facilities operating within the City and Borough of Juneau. During the years 1994-1996, the available data shows that total landings to these processors increased from 2.6 million pounds in 1994 to 7.8 million pounds landed in 1996. During the same three years, permit holders residing in Juneau caught an average of 23.6 million pounds with catch in 1996 of 24.9 million pounds. The fact that the catch of Juneau residents far exceeds the amount of landings at area processors indicates that there is potential for growth in landings coming to Juneau. This growth potential would be enhanced with the development of a publicly owned refrigerated warehouse facility.

A telephone survey of potential users was conducted. A conservative estimate of permit holder demand for refrigerated warehouse space indicated that 2.5 million pounds would be stored each year. Annual demand from processors was conservatively estimated to be 2.9 million pounds. Juneau area households indicated that if locker space were available in the refrigerated warehouse facility, 880 households would rent lockers. This equates to approximately 60,000 pounds of storage demand. The total annual demand for warehouse space was estimated to be 5.5 million pounds.

A refrigerated warehouse facility with 12,000 square feet of frozen storage area was designed to meet this demand. The facility would have the ability to store a maximum of 5 million pounds at -20°F, at any given time. In addition the facility would include a blast freezer with a daily capacity to freeze 80,000 pounds. The facility is designed to accommodate expansion in the future with minimal cost increases. The facility would require a minimum of 2.2 acres of land, with good access to electricity, and sewer. Of the potential sites reviewed, it was concluded that locating the facility at the Rock Dump, just south of downtown Juneau, would be preferable. Total cost of the facility, including land, equipment, and contingencies, is estimated at $3.61 million, using an 3 percent annual inflation rate and assuming the facility is built in 1999. Since the facility would be publicly owned, financing is assumed to be through tax-free revenue bonds, with an interest rate of 5.5 percent. Financing charges and interest during construction bring the total financed cost to $3.78 million, which would be repaid over 20 years.

Revenues and operating costs were estimated using a very conservative approach, which assumes an initial storage level of approximately 2.2 million pounds. Storage use is assumed to increase gradually to 5.5 million pounds over 10 years. Revenues are based on prices at cold storage facilities in the Pacific Northwest and a multi-species inventory model in which product enters the facility during harvest periods and leaves the facility during the off-season. Operating costs are based on engineers estimates and costs gathered from the refrigerated warehouse industry. All costs and revenues were adjusted for inflation using a 3 percent annual rate. As modeled, the facility is estimated to break-even at use levels of approximately 4.7 millions pounds, or about 86 percent of the conservative estimate of annual demand. Over the 20-year life of the revenue bond it appears the facility as designed and modeled will be able to generate an internal rate of return of approximately 11 percent. Overall a publicly owned refrigerated warehouse facility in Juneau appears feasible.

Notwithstanding the 11 percent internal rate of return, the facility may have cash flow problems in the early years of operation, particularly if there are several years until use levels reach the break-even point. Cash-flow issues may be mitigated if storage is greater in the early years, or by reducing early-year operating costs. Other mitigation actions might include lease arrangements with potential operators, deferring contributions to equipment replacement, sales, property, and fish tax rebates, or through use of a short-term operating loan from the Juneau Economic Development Council.

1 INTRODUCTION

The Fisheries Development Committee (FDC) of the City and Borough of Juneau, in an effort to further their goal of revitalizing commercial fisheries in and around the Juneau area, has asked Northern Economics to assess the feasibility of developing a publicly owned privately operated cold storage facility. The FDC believes that such a facility may assist local fishers and attract primary and secondary processors to the community.

The FDC has been discussing the development of a publicly owned refrigerated warehouse facility since January 1996. In 1996 a mail survey of fishers, processors, and member of the public in Juneau and in outlying areas was conducted to determine public opinion regarding the development of such a facility. The results of the survey indicated that there was a very strong public sentiment in favor of building a cold storage to which the public could have access.

1.1 ORGANIZATION OF THE DOCUMENT

This study builds upon the work of the FDC and further develops the concept of a publicly owned refrigerated warehouse facility in the City and Borough of Juneau with a preliminary design and feasibility analysis. The document is organized into 6 sections:

- Section 1 contains this introduction and includes a set of terminology definitions.
- Section 2 contains an assessment of the current situation, and provides a history of fish processing as well as a description of current fish processing situation in the City and Borough of Juneau. The section also contains a discussion of the public refrigerated warehouse facilities and their tariffs and a description of area fish hatchery activities. The section then examines participation, catch, and landings in area fisheries
- Section 3 estimates the demand for refrigerated warehouse space from Juneau and the outlying areas. The section examines and estimates demand from fish harvesters, fish processors, and non-commercial user of locker space.
- Section 4 contains a description of a refrigerated warehouse facility designed using the level of estimated demand as a guideline.
- Section 5 discusses potential sources for financing a publicly owned refrigerated warehouse facility.
- Section 6 presents a *pro forma* assessment of the costs and revenues of a publicly owned refrigerated warehouse facility, based on the design and estimated demand of the previous sections along with a series of throughput and revenue assumptions. The *pro forma* examines multiple financing options, and draws conclusions regarding the overall feasibility of the facility.

1.2 DEFINITIONS

In the early stages of conducting this feasibility analysis, it became clear that for many people in Alaska, the term cold storage means a fish processor that freezes fish as compared to a processor that cans or smokes fish. In this sense a cold storage is one type of four varieties of shore-based processors that operate in Alaska. These four different types of processors are listed below:

1) A cannery, which processes and then preserves fish by canning.
2) A smokehouse, which processes and then preserves fish by smoking.
3) A saltery, which processes and then preserves fish with salt.
4) A cold storage, which processes and then preserves fish by freezing.

As used by the FDC however, a cold storage is intended to mean a refrigerated warehouse that maintains temperatures in the range of –20° F., such that frozen products remain frozen and retains it quality. The proposed refrigerated warehouse facility may be associated with a fish processor, or indeed may include a small processing line and/or a blast freezer for custom processing work.

It is possible that the different uses of the term cold storage have led to some confusion. This confusion could have contributed to the overwhelming positive response in the FDC survey to the idea of a privately operated cold-storage facility owned by the City and Borough of Juneau. In order to avoid this confusion of terms, the remainder of this document will use the following definitions: [1]

Raw Product Processing: Raw product processing is the preparation of fish by the removal of unwanted flesh or fluids. Raw product processing includes bleeding, cleaning, heading, gutting, filleting, steaking, mincing, and grinding, but does not include activities that add ingredients to the product or which preserve the fish. Exceptions to this are the heading and gutting of halibut and sablefish on board a vessel prior to delivery, and the cleaning of king salmon in some troll fisheries. These exceptions are made to correspond with Alaska Department of Fish and Game (ADF&G) processing definitions.

Value-Added Processing: Value-added processing is the addition of ingredients to a raw or preserved product that increases its value. By this definition, creating surimi by adding salts and water to minced raw product is value-added processing. Also included under this definition is the packaging of raw or preserved product for delivery to market.

Preservation: Preservation is the process that allows the raw or value-added product to be kept for later use for a period greater than two weeks. Thus freezing, canning, smoking, and salt-curing are all preservation activities. This corresponds to the National Marine Fisheries Service (NMFS) definition of processing.

Fish Buyer: A fish buyer purchases fish directly from fishers and prepares them for immediate resale as fresh product. Preparation before sale may include any level of raw product processing such as bleeding, cleaning, heading, gutting, filleting, etc., but does not include a preservation activity such as freezing, canning, or smoking.

Primary Processor: A primary processor is one that buys raw fish directly from the fisherman or a fish buyers, and then, after raw product or value-added processing, preserves the product for later sale. The preservation activity distinguishes a primary processor from a fish buyer. Primary processors will often have facilities to store some amount of preserved product depending on their mode of operation.

Floating Processor: A floating processor is a primary processor situated on board a vessel. A floating processor is mobile by definition.

Tender Vessel: A tender vessel acts on behalf of a fish buyer or primary processor to take delivery of fish from harvesting vessels closer to the fishing grounds. Once full, the tender vessel delivers the fish to a fish buyer or primary processor.

Secondary Processor: A secondary processor buys already preserved fish and then does further processing, usually value-added processing. An example of this type of value-added processing would be to take frozen headed and gutted product, thaw it, make a fillet, then repackage and freeze it for later sale. Most secondary processors will have facilities to store some amount of preserved product.

Custom Processing: Custom processing is a situation where a fisher delivers fish to a primary processor who processes and preserves the fish for a fee. The fisher retains ownership of the processed fish and is responsible for storing and eventually selling the product. A fisher engaging in custom processing will not receive any payment until the finished product is sold. The primary processor engaging in custom

[1] These definitions are developed and used in this analysis to assure clarity and consistency within the document. They do not necessarily correspond to definitions used by various agencies or by all members of the industry.

processing will receive payment for the processing, but does not own the fish. The primary processor will generally require that the product, once preserved, be moved within a relatively short time period.

Refrigerated Warehouse Facility: A refrigerated warehouse facility is able to store large quantities of frozen product for months at a time at a temperature of approximately –20° F. Primary processors often utilize a refrigerated warehouse facility for storage of their product before it is sold. Secondary processors will often purchase from primary processors out of refrigerated warehouse facilities, rather than from the primary processor directly. Secondary processors will also store their own products in refrigerated warehouse facilities. Other commercial operations also utilize refrigerated warehouses. These include grocery stores, restaurants, cruise ship operators, and other food distributors.

Typically, a refrigerated warehouse facility will charge a set amount per hundredweight (CWT) for each month of storage, and will also charge a handling fee. Frozen product is typically stored on pallets (if boxed) or in totes (if loose). Some refrigerated warehouse facilities offer locker space to non-commercial users. Individual lockers typically range from 3-20 cubic feet. Charges for locker space are generally by the year regardless of usage.

Blast Freezer: A blast freezer forces a stream of air over unfrozen product and will very quickly bring it to temperatures typically as low as –50° F. A blast freezer or some other type of quick-freezing process is necessary to create a food-quality frozen product. Simply placing unfrozen product into a typical refrigerated warehouse storage area at –20° F. will create a lower quality product.

Catch versus Landings: This document differentiates catch from landings. Catch will be used when discussing harvests by fishing vessels. Landings will be used when discussing the amount of deliveries to shore-based processing plants.

City and Borough of Juneau: The City and Borough of Juneau includes the residents of Juneau, Douglas, Auke Bay and any areas within the boundaries of the Borough.

Outlying areas: Outlying areas, as used in this document, include the areas to the West and North of the City and Borough of Juneau up to Skagway, as well as communities on Admiralty Island to the South. The included communities are shown in Table 1. The communities are listed in alphabetical order.

Table 1: Communities Included in the Definition of Outlying Areas.

Angoon	Elfin Cove	Excursion Inlet	Funter Bay	Gustavus	Haines
Hobart Bay	Hoonah	Klukwan	Pelican	Tenakee	Skagway

2 CURRENT SITUATION

This section of the document will provide an assessment of the current situation, and provides a history of fish processing as well as a description of current fish processing activities in the City and Borough of Juneau. The section also contains a discussion of existing public refrigerated warehouse facilities in Sitka and in Washington and discusses their tariffs. Fish hatchery operations in the area are also described. The section then examines participation, catch, and landings in area fisheries as well as expectations for future harvests. The section ends with a discussion of other fishery-related infrastructure.

2.1 HISTORICAL SUMMARY OF FISH PROCESSING IN JUNEAU

The fishing industry in the Juneau area has been home to various fish processors since the 1920's. Hank Benton, a long time employee of the Juneau Cold Storage was contacted and discussed the history of processing in Juneau and Douglas. His comments are paraphrased in the following discussion. According to Benton the Juneau Cold Storage was started and built by Wallace George and another partner in 1927. It was engaged in both primary and custom processing activities. A small number of limited lockers were available for public use.

The processing operation was mainly a hand operation or slime line, and employed up to 75 people during peak seasons including buyers, dock workers, processing and freezer crews, and administrators. The facility processed salmon and halibut into fillets and steaks for freezing. Juneau Cold Storage had the capacity to process 100,000 pounds per day, depending on the size of the fish, (less for pink salmon and more for halibut.) In some years they would process 3-5 million pounds. The facility also did some canning. In later years they lost business to competition in Hoonah, Pelican, and processors in other communities. According to Benton, Juneau Cold Storage could not compete because of the long trip into Juneau from the fishing grounds.

At some point in time, Juneau Cold Storage became a private operation (i.e. they no longer did custom processing) owned by Washington Fish & Oyster Company. The plant was later purchased by Sea-Alaska. In 1985 the plant was shut down, and it burned in 1986.

There was also a small processor and cold storage facility in Douglas at the Douglas Small Boat Harbor. This plant was much smaller than Juneau Cold Storage, but engaged in the same kinds of activities. The Douglas Cold Storage was also destroyed by fire.

2.2 CURRENT PROCESSING ACTIVITIES

This section provides a qualitative assessment of fish processors currently operating plants in the City and Borough of Juneau. The discussion uses the definitions of primary and secondary processors as discussed in Section 1.2. ADF&G differentiates processors by the type of facility indicating whether an operation is an on-shore plant, a restaurant, a market, a catcher/processor vessel, or a vessel which intends to sell unprocessed fish directly to the public. According to State regulations, any fish harvester who engages in raw product processing, as defined in Section 1.2, must file an Intent to Operate as a processor with ADF&G. As noted in the definition section, halibut and sablefish fishers who deliver unpreserved headed and gutted product, as well as troll fishers who clean their king salmon, are not engaged in raw product processing, and do not have to file an Intent to Operate. Vessel owners, who sell fish directly to the public, or to retail or wholesale markets, are required to file an Intent to Operate. This insures that fish-ticket reports are filed indicating total removals, and that raw fish-tax payments will be made.

Table 2 is a list of processing facilities that filed an Intent to Operate with the ADF&G in 1997. The existence of a license does not necessarily mean the processor was active. The list does not include restaurants, catcher/processors, or vessels that sell directly to the public.

Table 2: Permitted Processors Located in the City and Borough of Juneau and Outlying Areas

Processors Located in the City and Borough of Juneau		
Name	**Also Known As**	**Location**
Alaska And Proud Market	Juneau Alaska and Proud	Juneau
Alaska Glacier Seafoods Co		Juneau
Alaska Seafood Co Inc		Juneau
Douglas Island Pink & Chum, Inc.	Gastineau Hatchery and DIPAC	Juneau
Glacier Village Supermarket/Jerry's Meats	Family Grocer Supermarket	Juneau
Glacier Village Supermarket/Super Bear	Superbear Supermarket	Juneau
Horst's Seafood, Inc.		Juneau
Jon-K, Inc.		Juneau
Mitchell, Duff W.	Alaska Food Group	Juneau
Northern Keta Caviar, Inc.		Juneau
Quality Alaskan Seafoods	Alaskan Seafood Company	Juneau
Taku Smokeries Fisheries		Juneau
Source: Intent to Operate File. 1997. Alaska Department of Fish and Game Note: Included all plants, restaurants, or markets that were permitted to operate on October 22, 1997. Does not include fish buyers, floating processors, or harvesters/sellers.		

ADF&G collects information on the amount of fish processed by individual processors. However, due to confidentiality restrictions, obtaining information regarding production by individual processor is not possible. Thus, there is no means, using official published data, to determine whether a processor was active or not. In order to develop an understanding of the magnitude and diversity of the operations in the Juneau area, each processor on the list was telephoned. With the exception of Alaskan and Proud Market, all processors were contacted. The following section describes the operations of the processors who indicated they were actively engaged in processing in the Juneau area. They are listed alphabetically.

2.2.1 Alaska Glacier Seafoods

Alaska Glacier Seafoods is a primary processor focusing on halibut, crab, shrimp, and other species, such as rockfish. Overall it is estimated that they process approximately 250,000 pounds per year. Alaska Glacier Seafoods is currently in an expansion mode, and project they will double their production in the next year. Alaska Glacier Seafoods is located on property adjacent to the landfill at Channel Sanitation, which is considered as a potential site for development of a warehouse facility.

2.2.2 Alaska Seafood Company

Alaska Seafood Company, located in the Lemon Creek area, is currently operating strictly as a secondary processor. According to Dick Hand, the Alaska Seafood Company got its start 10 years ago, when they identified a need to help fishers market their fish. They started as a primary and custom processor with an aim toward providing an avenue for fishers to work closely with processors.

Alaska Seafood now focuses on smoked salmon packed in retort pouches and cans. In addition, they are developing a processed salmon loaf product, which they believe has great potential. Currently, they are using around 250,000 pounds of headed and gutted frozen salmon in their production facilities. However,

if the salmon loaf product lives up to expectations, they hope to increase annual throughput to approximately one million pounds of raw product.

2.2.3 Horst's Seafood, Inc.

Horst's Seafood, Inc. functions both as a primary and secondary processor, buying fish directly from fishers and frozen product from other primary processors. Horst's specializes in smoked product and lox (cold-smoked), and uses halibut, sablefish, and salmon as inputs to production. Production of lox requires use of frozen product in order to kill parasites. Currently the company uses about 15,000 pounds, but would like to expand their operations. They have less than 200 square feet of frozen storage space but are trying to expand with an additional 800 square feet. Horst's sees opportunities with sablefish, halibut, and additional uses of salmon. A refrigerated warehouse facility would increases their ability to operate in the winter months.

2.2.4 Jon-K, Inc.

Jon-K, Inc. is a small operation that serves the freezing and processing needs of a single vessel, owned by the same family. They operate two small blast freezers, and a 10,000-pound capacity modular refrigerated warehouse, augmented with a 20-foot freezer van. Typically they catch and dress their fish on board, then freeze and store the product until they can fill a van. When the van is full, they ship on Alaska Marine Lines to their consumer markets.

2.2.5 Quality Alaskan Seafood

Quality Alaskan Seafood focuses their processing efforts on live crab and other fresh seafood. They have a live crab facility in Juneau and live tanks in Anchorage. They also fillet and vacuum seal fresh halibut and ship it by air their consumers. Because they currently focus on fresh product, their needs for frozen storage are limited to bait. Presently they are using a 40-foot freezer van in the summer months for bait storage. Because of the limited opportunities in the Juneau area, Quality Alaskan Seafoods is considering moving their operations to another location, perhaps somewhere in the Aleutian Chain.

2.2.6 Northern Keta Caviar, Inc.

Northern Keta Caviar processes salmon roe, primarily for the european market. They operate by purchasing salmon roe from a core group of 10 gill-net catcher/processors. They also assist these catcher/processor owners in marketing their headed and gutted salmon. They currently have approximately 600 square feet of frozen storage space, which is augmented with a 20-foot freezer container during the chum season.

2.2.7 Taku Smokeries

Taku Smokeries is the largest primary processor in Juneau. Two years ago, Taku Smokeries stepped up their operations, particularly in the area of sablefish production. Industry sources estimate they purchase something on the order of 5-6 million pounds of raw product per year. Taku has a refrigerated warehouse that can hold 500,000 pounds. They find however that they are often filled to capacity particularly during the summer months.

While Taku is well known for its smoked product, much of their operation in recent years has been in fresh and frozen product. They have been heavily involved in packing fresh chum salmon in ice and shipping it to Bellingham, Washington, where it is processed into fillets and frozen. In recent years, Taku has significantly increased the amount of sablefish it processes.

2.3 REFRIGERATED WAREHOUSE FACILITIES

Presently there are no functioning public refrigerated warehouse facilities in the Juneau area. However, most of the local fish processors maintain limited amounts of refrigerated warehouse space. In addition, there are several small private refrigerated warehouse facilities operating in conjunction with grocery stores and restaurants. Managers of several of these facilities were interviewed, and none thought they would experience any negative or positive consequences with the development of a publicly owned refrigerated warehouse facility.

Northern Sales Company, a distributor of frozen foods, maintains a larger private refrigerated warehouse facility for housing frozen grocery products before distribution. According to Northern Sales' regional manager, they don't see any benefits for their company in the development of publicly owned refrigerated warehouse facility. At the same time Northern Sales does not see any conflicts.

According to industry sources, the fishing and processing industry in the City and Borough of Juneau and outlying areas are currently using refrigerated warehouse facilities located in the Puget Sound area in Washington. Facilities are located in Bellingham, Seattle, Puyallup, Tacoma, and in other communities. In addition, the City and Borough of Sitka owns a public refrigerated warehouse facility. It is currently serving only the local processors and fishing vessels. The following sections describe three refrigerated warehouse facilities and the services they provide. The operations of these companies serve as a model of refrigerated warehouse facilities currently used by the fishing industry.

2.3.1 Bellingham Cold Storage

Bellingham Cold Storage (BCS) located in Bellingham, Washington at Squalicum Harbor is co-located with several large primary and secondary processing plants. BCS offers the following services:

- 1000-foot long deepwater cargo dock
- Rail and truck access
- 60,000 pounds per hour processing and freezing capacity
- Chilled storage space
- 40,000 square feet of dry storage space
- 120,000,000 pounds of frozen storage capacity

2.3.2 SeaFreeze, Inc.

SeaFreeze is located in Seattle, Washington on the Duwamish River. Many Juneau area fishers and processors indicated that they ship their fish, both fresh and frozen to SeaFreeze. There it is processed, reprocessed, frozen and/or stored for delivery to customers. SeaFreeze offers the following services:

- Approximately 350,000 square feet of storage space
- 51,000 square feet of custom processing facilities for filleting, cutting, steaking, dressing, grading, boxing, vacuum packaging, and blast freezing
- Refrigerated docks for truck and railcar loading
- U.S. Department of Agriculture inspection facilities

2.3.3 Sitka Marine Services

Sitka Marine Services is a publicly owned but privately operated refrigerated warehouse facility located in Sitka, Alaska. The 4,000,000 pound capacity facility was built with the idea that it would provide refrigerated warehouse space for the processors operating in the area, as well as opportunities for smaller processors, and fishers wishing to market their own fish. The facility was funded largely with grant monies originating from the Southeast Alaska Economic Fund (SAEF), which were provided to communities adjacent to the Tongass National Forest. Sitka Sound Seafoods currently leases 50 percent of the facility for their exclusive use. Seafood Producers Cooperative (SPC) leases approximately 17 percent of the warehouse for their own use, and operates the remaining 33 percent for the City for public access. Of the portion open to the public, SPC is currently using approximately 50 percent. In essence this means that users other than the two main processors have access to only about 700,000 pounds of storage. Services at the facility are limited to storage, and there is no potential for freezing or processing.

2.3.4 Refrigerated Warehouse Tariffs

Public refrigerated warehouse facilities charge for nearly every service they offer. Tariff schedules are typically specific to individual species and product forms. Table 3 summarizes the tariffs that appear to be relevant to a refrigerated warehouse facility in the City and Borough of Juneau. The average tariff schedule will be used in the pro-forma calculations for similar activities at a publicly owned refrigerated warehouse facility in the City and Borough of Juneau in section 6. Appendix B contains a complete listing of the services and tariffs offered at each of these three facilities.

Table 3: Tariff Summary for Public Access Refrigerated Warehouse Facilities

Type of Service *All service rates are per CWT unless noted.*	**Bellingham Cold Storage**	**SeaFreeze Inc.**	**Sitka Marine Services**
Loading dock charges	$ 0.77	$ 0.83	N/A
Loading dock labor	$ 0.62	$ 1.65	$ 0.60
Forklift labor (per hour)	$ 34.00	$ 44.00	$ 34.00
Hourly labor	$ 25.00	$ 32.00	$ 20.00
Sorting, grading, weighing	$ 4.50	$ 1.16	N/A
Freezing & glazing	$ 7.26	$ 11.40	N/A
Bagging, boxing, vacuum packing, & labeling	$ 7.55	$ 9.38	N/A
Handling frozen product	$ 1.75	$ 1.82	$ 1.69
Long term storage (per month)	$ 1.00	$ 0.98	$ 0.86
Pallet sales (per pallet)	$ 8.50	$ 8.50	Cost + 20%
Tote sales (per tote)	N/A	$ 57.50	Cost + 20%

2.3.5 Additional Comments of Refrigerated Warehouse Operators

Discussions with refrigerated warehouse facility operators also covered other topics relevant to the storage business. These will be doubtless be an important consideration for the development of a refrigerated warehouse in the City and Borough of Juneau. Some of these issues are discussed below.

2.3.5.1 Cost of Operations

Refrigerated warehouse operators are almost unanimous in stating that the cost of energy is one the biggest item in their budgets. However, they also recognize that there is little that can be done to reduce these costs. Several operators indicated that the scale of the operation adds greatly to efficiency, and that many of these economies of scale are found in administrative and office expense savings. More than one operator indicated that administrative and office expenses can be greatly reduced by operating several

separate facilities as profit centers of a single larger operation. One operator indicated that operating two facilities with the administrative staff of the larger operation resulted in total administrative expenses only slightly larger than the original expenses of the larger operation. This operator suggested that the possibility of sharing administrative expenses should be part of the design of the project.

2.3.5.2 Public Access Lockers

In general, operators of refrigerated warehouse facilities have indicated that the cost and logistics of renting out public access locker space is not worth the amount of extra revenue generated. Operators point to the need to have extra staff, larger liability insurance policies, and longer operating hours. These comments notwithstanding, operators indicated that if having public access lockers was the difference in generating public support for the project, then it was probably something that should be considered.

2.3.5.3 Co-location with Fish Processors

Refrigerated warehouse facility operators indicate that there are mutual benefits achieved by co-locating a refrigerated warehouse facility with fish processors and other commercial users of the facility. Reduced transportation costs was the primary benefit sited, although the possibility of lower energy costs was also mentioned. The latter could occur with the development of an energy district, if there were some source of cheaper energy than was available through the local utility.

2.4 Area Hatchery Operations

Hatchery operations are an important contributor to local fishery resources. Additionally, in their cost recovery operations, they may harvest and process substantial quantities of salmon. Some of this product is very likely to find its way into refrigerated warehouse facilities at some point in the marketing chain. There are several hatchery operations in Juneau and the outlying areas that have a great influence on the numbers of salmon harvested and landed. Two of the more important operations are the Douglas Island Pink and Chum Salmon Fish Hatchery (DIPAC), and the Kake Tribal fish hatchery operations

2.4.1 DIPAC

The Douglas Island Pink and Chum Salmon Fish Hatchery (DIPAC) is a non-profit organization dedicated to developing and maintaining local salmon fisheries. Currently most of DIPAC's operations are focused on pink and chum Salmon. They are, however expanding the sockeye salmon hatchery at Snetisham, which is located 40 miles south of Juneau. Rick Focht from DIPAC was contacted and discussed their plans for the future. His comments are paraphrased below.

In the past, most of the production from the Snetisham Hatchery has been used to stock high mountain lakes in the trans-boundary region. However, with their current expansion, they hope to bring production up to 5.5 million smolt per year. Much of the expansion will be dedicated to the development of a common property fishery in and around Port Snetisham. If all goes well, the expansion could result in an annual return of 400,000 – 450,000 adult sockeye by 2001. If each fish weighs five pounds on average, an additional 2,000,000 pounds of round weight harvests could be realized. DIPAC's charter allows them to harvest up to 40 percent of the salmon returns for cost recovery. The remaining 60 percent are left to the commercial recreational and subsistence fisheries.

In recent years, DIPAC has conducted their cost recovery operations in a joint-venture with Trident Seafoods. Trident brings a floating processor into the area to process pink and chum salmon. Trident and DIPAC share harvesting and processing costs as well as any profits or losses from the joint-venture.

According to Focht, DIPAC has no plans to expand the pink and chum operations, and they anticipate that production levels will remain at status quo. Further, DIPAC does not have any specific plans that would

require the use of a refrigerated warehouse facility. However, that is not to say that DIPAC would not use such a facility if it were feasible. Focht went on to say that DIPAC enjoys a lot of public support, and they don't take that support for granted.

2.4.2 Kake Hatchery Corporation

Kake Hatchery Corporation is a non-profit chum salmon fish hatchery. According to Steve Andisen, who represents the non-profit corporation, the hatchery released 65,000,000 chum salmon last year, and is expecting very large returns beginning in the years 1999-2000. While many of these fish are harvested in the Kake area, a large number are harvested by Juneau area fishers as they make their way through Cross Sound and down through Chatham Strait. In 1997, 8,000,000 pounds of chum salmon were harvested in the Kake hatchery cost recovery program.

2.5 Participation in Commercial Fisheries

The Alaska Department of Fish and Game, the Commercial Fishing Entry Commission (CFEC), and the National Marine Fisheries Service (NMFS) all collect and maintain data regarding commercial fisheries. Most of these data are confidential and are only released showing aggregates of three or persons or companies. Given these limitations, the following section provides a reasonably complete assessment of commercial fishing and processing in and around the City and Borough of Juneau.

Table 4 shows the unique number of active permit holders by community in the City and Borough of Juneau and adjacent outlying areas since 1990. On average there have been 369 participants per year living in the City and Borough of Juneau, and 395 living in the outlying areas. Overall there is a downward trend in participation, as indicated by the far right column, which shows the estimated change per year based on a liner regression. In the City and Borough of Juneau, participation has been declining on average by 22 participants per year. Participation in commercial fisheries in outlying areas is also declining, by an average of just over 16 persons per year.

Table 4: Active Permit Holders by Area and Community from 1990-1995

Area	City	1990	1991	1992	1993	1994	1995	Average	Trend
City and Borough of Juneau	Auke Bay	35	39	44	42	33	31	37.33	-1.1
	Douglas	57	61	55	53	44	49	53.17	-2.7
	Juneau	316	315	291	271	244	235	278.67	-18.2
City and Borough of Juneau Total		408	415	390	366	321	315	369.17	-22.0
Outlying Areas	Angoon	76	73	84	69	62	49	68.83	-5.2
	Elfin Cove	28	26	31	28	25	27	27.5	-0.3
	Excursion Inlet	1	2	2	1	1	1	1.33	-0.1
	Funter Bay	2	4	4	4	3	3	3.33	0.1
	Gustavus	24	29	23	27	22	21	24.33	-0.9
	Haines	114	117	114	104	99	117	110.83	-1.4
	Hobart Bay	1			1	1	1	1	
	Hoonah	98	105	98	86	80	72	89.83	-6.2
	Klukwan	1	1	1	1	1	1	1	
	Pelican	54	59	57	56	54	49	54.83	-1.2
	Skagway	6	7	4	1	1	1	3.33	-1.3
	Tenakee	8	12	10	9	8	11	9.67	0.1
Outlying Area Total		413	435	428	387	357	353	395.5	-16.4
Grand Total		821	850	818	753	678	668	764.67	-38.5

Source: Census Area Reports 1990-1995, Commercial Fishing Entry Commission.
Note: The trend in the right-most column is the average change in the number of permit holders from year to year.

Table 5 shows the number of active permit holders, by species, who reside in Juneau and in outlying areas. Together the number of active salmon and halibut permits holders account for approximately 75 percent of the permits by species. The number of active permit holders has declined for every species in each area, save one. Sablefish permit holders residing in the outlying areas are the exception to this rule.[2] In general, the decline in permit holders as a percent of the average over time is greater in the City and Borough of Juneau than in outlying areas. It should be noted that fishers may hold permits in more than one fishery so the total numbers of permits shown in Table 5 exceeds the number of unique permit holders shown in Table 4.

Table 5: Active Permit Holders by Area and Species for 1990 - 1995

Species	Area	1990	1991	1992	1993	1994	1995	Average	Trend
Crab	City and Borough of Juneau	60	55	39	48	43	41	48	-3.5
	Outlying Area	37	47	34	38	35	37	38	-0.9
Crab Total		97	102	73	86	78	78	86	-4.4
Halibut	City and Borough of Juneau	264	281	261	228	184	188	234	-20.1
	Outlying Area	301	331	320	277	241	260	288	-14.8
Halibut Total		565	612	581	505	425	448	523	-34.9
Herring	City and Borough of Juneau	30	30	30	23	25	33	29	-0.2
	Outlying Area	12	15	14	6	5	6	10	-1.9
Herring Total		42	45	44	29	30	39	38	-2.1
Sablefish	City and Borough of Juneau	83	109	81	95	81	78	88	-2.7
	Outlying Area	49	83	55	74	70	70	67	2.4
Sablefish Total		132	192	136	169	151	148	155	-0.3
Salmon	City and Borough of Juneau	305	289	271	262	261	249	273	-10.7
	Outlying Area	349	349	351	333	320	298	333	-10.3
Other	City and Borough of Juneau	53	39	56	52	25	42	45	-2.9
	Outlying Area	38	50	39	44	26	56	42	0.7
Other Total		91	89	95	96	51	98	87	-2.2
Salmon Total		654	638	622	595	581	547	606	-20.9
Grand Total		1,581	1,678	1,551	1,480	1,316	1,358	1,494	-64.9

Source: Census Area Reports 1990-1995, Commercial Fishing Entry Commission.
Note: Fishers may hold permits in more than one fishery so the total numbers of permits shown in this table exceeds the number of unique permit holders shown in Table 4.
The trend in the right-most column is the average change in the number of permit holders from year to year.

[2] Regulations in the sablefish and halibut fishery changed significantly in 1995 with the implementation of the Individual Fishing Quota (IFQ) program. For sablefish the data include limited entry permit holders in the State-water fisheries in Clarence and Chatham Straits, which are not a part of the IFQ program.

Table 6 shows the number of active salmon permit holders by gear, residing in the City and Borough of Juneau and in outlying areas. In Juneau, more than 33 percent of the active permit holders use drift gill nets, outnumbering the users of either power or hand troll permits. In the outlying areas, there is much greater use of troll permits. The number of both hand and power troll permit users exceeds the number of drift gill net permits. The table also shows that the number of active hand troll permit users has declined in both areas, more than any other permit type.

Table 6: Active Salmon Permit Holders by Area and Gear for 1990 - 1995

Area	Gear	1990	1991	1992	1993	1994	1995	Average	Trend
City and Borough of Juneau	Drift Gill Net	103	98	99	94	97	104	99	-0.1
	Hand Troll	89	72	62	63	56	42	64	-8.1
	Power Troll	87	89	82	75	80	74	81	-2.8
	Purse Seine	9	9	8	10	11	12	10	0.7
	Set Gill Net	17	21	20	20	17	17	19	-0.3
City and Borough of Juneau Total		305	289	271	262	261	249	273	-10.7
Outlying Area	Drift Gill Net	96	99	93	83	81	83	89	-3.7
	Hand Troll	134	145	143	130	108	80	123	-11.3
	Power Troll	101	86	99	104	114	120	104	5.3
	Purse Seine	14	13	12	12	12	11	12	-0.5
	Set Gill Net	4	6	4	4	5	4	5	-0.1
Outlying Area Total		349	349	351	333	320	298	333	-10.3
Total Active Salmon Permits		654	638	622	595	581	547	606	-20.9

Source: Census Area Reports 1990-1995, Commercial Fishing Entry Commission.
Note: The trend in the right-most column is the average change in the number of permit holders from year to year.

Table 7 shows the number of permits held by the 88 vessel owners residing in the City and Borough of Juneau and outlying areas who also filed an Intent to Operate as catcher/processors with ADF&G. While no data were available to verify how many of these permits were actually used for harvesting or processing, the numbers serve as an indicator of the level of interest in self-marketing in the area.

Table 7: 1996 Permits of Catcher Processors Residing in Juneau and Outlying Areas

Species	Pots	Gill Net	Purse Seine	Hook and Line	Other Gear	Permits
Crab and Other Species	36	4		64	16	120
Halibut				57		57
Sablefish				25		25
Salmon, All species		67	2	22		91
Grand Total	**36**	**71**	**2**	**168**	**16**	**293**

Sources: Commercial Fishing Entry Commission Permit File 1996.
ADF&G Intent to Operate File, 1996.

2.6 CATCH AND LANDINGS IN COMMERCIAL FISHERIES

The following section provides actual catch and landings data for the City and Borough of Juneau and outlying areas. This document uses the term "catch" when associating fish harvests and area residents and the term "landings" when discussing the reported amount of fish landed at shore-plants in the area. In neither instance do the data include catches or landings made in hatchery cost recovery programs or in research charter operations. Unless otherwise specified, the tables and figures on pages 13-23, were derived from fish-ticket and IFQ landing reports. Data for the tables were compiled by personnel from the Commercial Fishing Entry Commission (CFEC) and the Restricted Access Management Division (RAM) of the National Marine Fisheries Service (NMFS). The untitled compiled reports were supplied by the respective agencies in November and December of 1997.

Table 8 shows the total amount of landings to shore-based processors in the City and Borough of Juneau and in the outlying areas for the years 1994-1996. Processors in the outlying area received significantly more landings than did processors in the City and Borough of Juneau. Processors in the City and Borough of Juneau however have significantly increased their total landings in the years 1995-1996.

Table 9 shows the catch by residents of the City and Borough of Juneau and of the outlying areas. The catch of City and Borough of Juneau residents is significantly greater than the amount of landings within the City and Borough of Juneau, and approximately equal to the catch of residents of the outlying areas.

It should be noted that for both tables:

1) The data for 1994 do not include catch or landings of halibut, nor catches or landings of sablefish from the fisheries managed by NMFS.
2) The 1994 data do include catch and landings of sablefish harvested in the state-water limited entry fisheries that occur in Chatham Strait and Clarence Strait.
3) All reported sablefish and halibut catch and landings are included in the tables for 1995 and 1996.

Table 8: Total Landings by Port in Pounds

Landing Port	1994	1995	1996	Average
City and Borough of Juneau	2,580,140	3,303,474	7,788,317	4,557,310
Outlying Areas	48,853,003	40,039,081	54,103,813	47,665,299
Total	**51,433,143**	**43,342,555**	**61,892,130**	**52,222,609**

Sources: Compiled reports from the CFEC and RAM, 1997.
Note: 1994 data do not include landings of halibut, and only a portion of the landings of sablefish.
Data do not include landings from hatchery cost recovery or research charter operations.

Table 9: Total Catch by Residents in Pounds

Area of Residence	1994	1995	1996	Average
City and Borough of Juneau	20,078,132	25,667,500	24,943,816	23,563,149
Outlying Areas	20,701,879	22,958,207	22,583,378	22,081,155
Total	**40,780,011**	**48,625,707**	**47,527,194**	**45,644,304**

Sources: Compiled reports from the CFEC and RAM, 1997.
Note: 1994 data do not include catch of halibut, and only a portion of the catch of sablefish.
Data do not include catch from hatchery cost recovery or research charter operations.

Table 10 shows the catch by vessels whose owners also indicated their Intent to Operate as catcher/processors to the State of Alaska. These catches are a subset of the catches shown in Table 9 and were not necessarily processed by the catching vessels. Estimates of the amount of actual processing undertaken by these vessels were not available. The catches in Table 10 are best used as an indication of the magnitude of the harvest of fishers who have an interest in processing and marketing their own catch. It should also be noted that the estimates of landings shown in Table 9, above, might include some landings of these vessels, but does not include any processing they may have undertaken.

Table 10: 1996 Catch of Catcher/Processors from Juneau and Outlying Areas

Species	Pounds		Individual Salmon Species	Pounds
Salmon, All Species	6,291,003		Salmon, Chum	4,133,500
Halibut	657,347		Salmon, Coho	567,339
Sablefish	282,565		Salmon, Pink	670,366
Crab and Other species	821,633		Salmon, Sockeye	846,173
Grand Total	**8,052,548**		Salmon, King	73,625

Sources: CFEC Fish Ticket Files, 1996, and ADF&G Intent to Operate Files, 1995-1997.

While total catch and landings are important indicators of the demand for refrigerated warehouse space, the determination of monthly flows of product are critical in the assessment of the necessary size of a refrigerated warehouse facility. Figure 1 and Figure 2 show the monthly distribution of the landings and catch specific to processors and residents in the City and Borough of Juneau from Table 9 and10. In Figure 1, it is clear that there was a significant increase in landings in the winter and spring months. Further, because a similar increase in those same months is not seen in the catch of residents it is possible to conclude that much of the processing increase resulted from landings of non-residents. Comparing the shape of the two sets of curves, it is clear that catch by residents occurs during a much narrower time period, primarily in the months of July and August. It is also important to note that the vertical scales of the two figures are quite different. Catch approaches 8,000,000 pounds during peak months, but the landings at processing plants in Juneau reach only as high as 1,400,000 pounds in any given month.

Figure 1: Total Monthly Landings in the City and Borough of Juneau

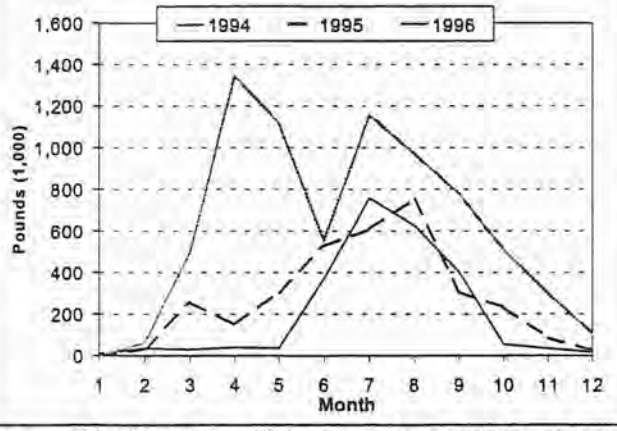
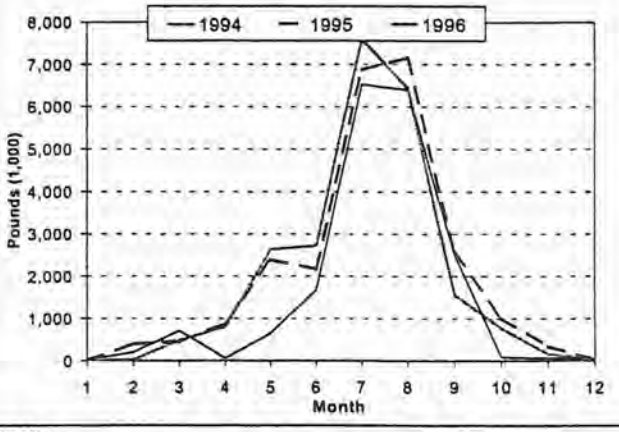


Figure 2: Total Monthly Catch by Residents of the City and Borough of Juneau



Source: Untitled Compiled Reports from CFEC and RAM, 1997.
Note: When comparing these two figures keep in mind that the scales differ significantly.

The next sections of this document examine the catch and landings in the City and Borough of Juneau and outlying areas by species. First, all salmon as a group and then by individual species are examined. This is followed by data reporting catch and landings of halibut, sablefish, and crab and all other species. The latter are examined as a single group.

2.6.1 Salmon

The salmon fisheries in the Juneau area are perceived to be of primary importance to both area processors and fishers. However if comparisons are made between Table 11 and Table 9, it appears that the relative importance of salmon to local processors is declining. Table 9 showed that the landings of all species combined for processors in Juneau increased significantly over the three-year period. But as seen here, the landings of salmon to processors in Juneau have actually declined since 1994. It should be re-iterated that these salmon landings and catch data do not include hatchery cost recovery numbers. Table 12 shows that catch by residents are approximately 10 times greater than actual landings in Juneau. Salmon catches have remained relatively stable over the three-year period.

Table 11: Salmon Landings by Port in Pounds

Landing Port	1994	1995	1996	Average
City and Borough of Juneau	1,802,442	1,183,023	1,665,710	1,550,392
Outlying Areas	42,800,437	20,158,785	39,097,921	34,019,048
Total	**44,602,879**	**21,341,808**	**40,763,631**	**35,569,439**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include landings from hatchery cost recovery or research charter operations.

Table 12: Salmon Catch By Residents in Pounds

Area of Residence	1994	1995	1996	Average
City and Borough of Juneau	14,919,181	14,928,299	15,207,330	15,018,270
Outlying Areas	18,252,922	13,510,316	15,447,081	15,736,773
Total	**33,172,103**	**28,438,615**	**30,654,411**	**30,755,043**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include catch from hatchery cost recovery or research charter operations.

Figure 3 and Figure 4 show monthly landings and catch of salmon. The two figures are strikingly similar with steep peaks during the summer months. The figure showing landings at local processors is slightly broader indicating that the processors take deliveries of salmon over a longer period. Figure 4, showing the catch of residents of the City and Borough of Juneau is actually quite remarkable in that the plots for each year are almost identical to each other. Again it is important to note that the vertical scales of the two figures differ by an order of magnitude.

Figure 3: Monthly Salmon Landings in the City and Borough of Juneau

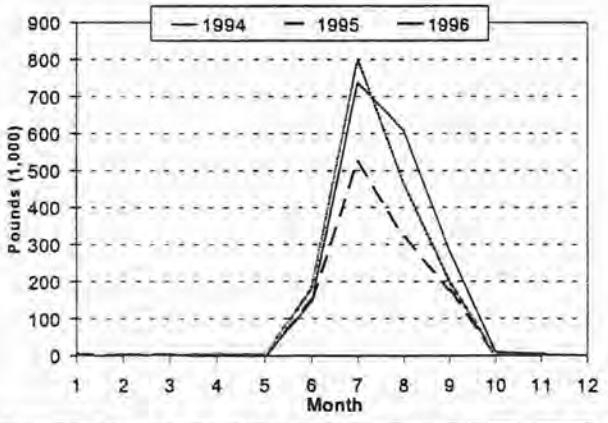
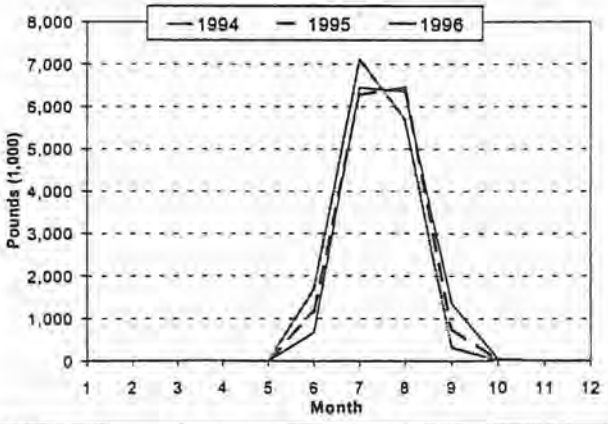


Figure 4: Monthly Salmon Catch by Residents of the City and Borough of Juneau



Source: Untitled Compiled Reports from CFEC and RAM, 1997.
Note: When comparing these two figures keep in mind that the scales differ significantly.

2.6.1.1 CHUM SALMON

As shown in Table 13, chum salmon represent about 50 percent of the salmon processed in the City and Borough of Juneau. Chum salmon processed in outlying areas increased significantly in 1996, while landing remained relatively flat in Juneau. Chum salmon accounted for about 33 percent of the salmon catch of Juneau residents in 1995 and 1996, but only 25 percent of the salmon catch in 1994. Compared to the catch of residents of outlying areas, chum salmon appears to be increasingly important for local harvesters. Figure 5 and Figure 6 show the monthly distribution of landings and catches. While the two figures appear almost identical, the scale for catch by residents in Figure 6 is almost an order of magnitude greater than the scale for processors in Figure 5.

Table 13: Chum Salmon Landings by Port in Pounds

Landing Port	1994	1995	1996	Average
City and Borough of Juneau	907,628	705,300	976,100	863,009
Outlying Areas	9,736,903	9,046,909	16,906,954	11,896,922
Total	10,644,531	9,752,209	17,883,054	**12,759,931**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include landings from hatchery cost recovery or research charter operations.

Table 14: Chum Salmon Catch By Residents in Pounds

Area of Residence	1994	1995	1996	Average
City and Borough of Juneau	3,530,037	5,563,899	6,252,199	5,115,378
Outlying Areas	4,814,557	6,183,060	6,357,077	5,784,898
Total	8,344,594	11,746,959	12,609,276	**10,900,276**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include catch from hatchery cost recovery or research charter operations.

Figure 5: Monthly Chum Landings in the City and Borough of Juneau

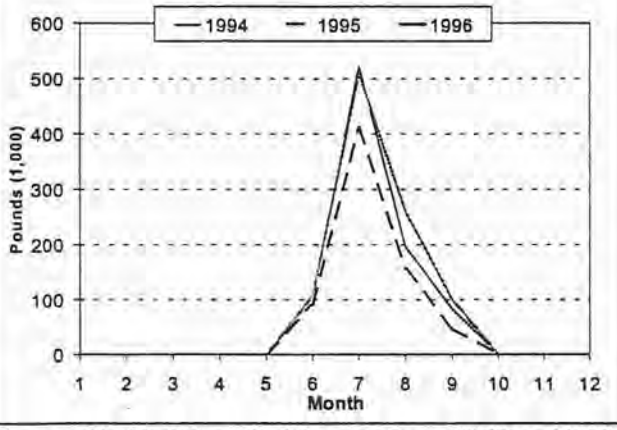
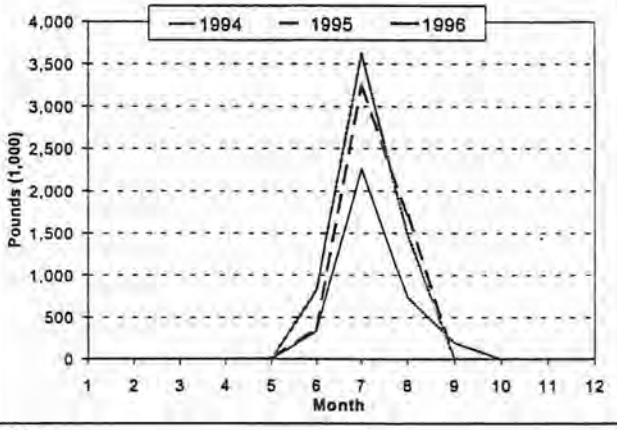


Figure 6: Monthly Chum Catch by Residents of the City and Borough of Juneau



Source: Untitled Compiled Reports from CFEC and RAM, 1997.
Note: When comparing these two figures keep in mind that the scales differ significantly.

2.6.1.2 King Salmon

In terms of volume, king salmon is a relatively minor species in the Juneau area. Except for a significant increase in landings in the City and Borough of Juneau in 1996, both landings and catches have remained relatively stable for both residents and processors in Juneau and the outlying areas. The monthly distribution figures show that king salmon harvests are distributed widely throughout the year, but nevertheless show distinctive peaks in the summer months. It should be noted that the scales in the two figures are significantly different.

Table 15: King Salmon Landings by Port in Pounds

Landing Port	1994	1995	1996	Average
City and Borough of Juneau	47,895	48,579	94,902	63,792
Outlying Areas	396,055	369,762	384,793	383,537
Total	443,950	418,341	479,695	**447,329**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include landings from hatchery cost recovery or research charter operations.

Table 16: King Salmon Catch By Residents in Pounds

Area of Residence	1994	1995	1996	Average
City and Borough of Juneau	251,612	244,165	214,213	236,663
Outlying Areas	289,852	248,205	311,536	283,198
Total	541,464	492,370	525,749	**519,861**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include catch from hatchery cost recovery or research charter operations.

Figure 7: Monthly King Salmon Landings in the City and Borough of Juneau

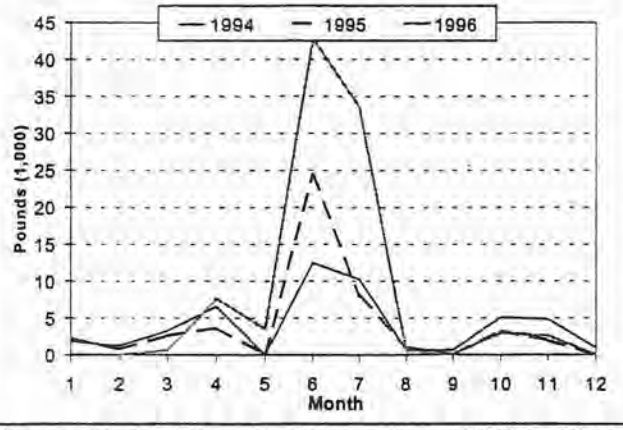
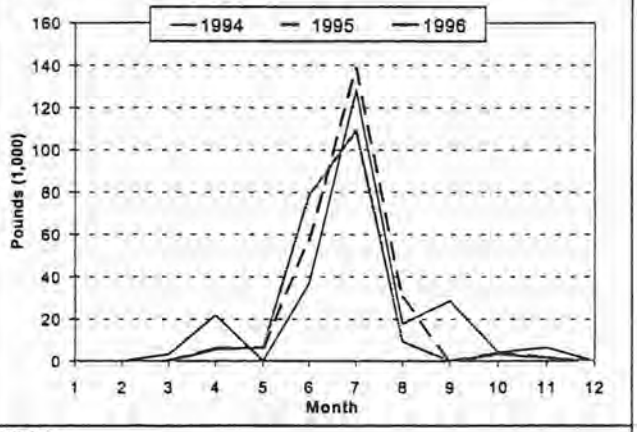


Figure 8: Monthly King Salmon Catch by Residents of the City and Borough of Juneau



Source: Untitled Compiled Reports from CFEC and RAM, 1997.
Note: When comparing these two figures keep in mind that the scales differ significantly.

2.6.1.3 PINK SALMON

It is clear from Table 17 that pink salmon processing in Juneau is only incidental, while in the outlying areas it is a major portion of total salmon landings. Table 18 shows that pink salmon also figures importantly in the salmon harvesting efforts of Juneau area residents. Typically, pink salmon is harvested with purse seines and processed by canning. There are no significant canning operations in Juneau, and an average of only 10 residents, who actively use purse seine permits. It should be noted that the scales in the two figures differ by more than an order of magnitude.

Table 17: Pink Salmon Landings by Port in Pounds

Landing Port	1994	1995	1996	Average
City and Borough of Juneau	181,566	20,585	8,196	70,116
Outlying Areas	23,008,097	6,553,329	16,890,343	15,483,923
Total	**23,189,663**	**6,573,914**	**16,898,539**	**15,554,039**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include landings from hatchery cost recovery or research charter operations.

Table 18: Pink Salmon Catch By Residents in Pounds

Area of Residence	1994	1995	1996	Average
City and Borough of Juneau	4,827,452	4,214,168	4,099,459	4,380,360
Outlying Areas	6,566,721	3,613,662	4,711,252	4,963,878
Total	**11,394,173**	**7,827,830**	**8,810,711**	**9,344,238**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include catch from hatchery cost recovery or research charter operations.

Figure 9: Monthly Pink Salmon Landings in the City and Borough of Juneau

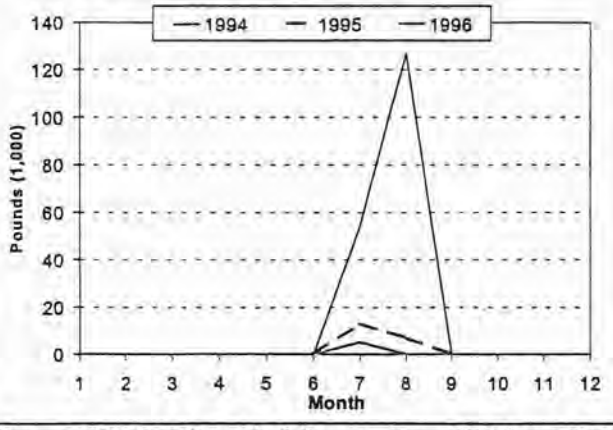
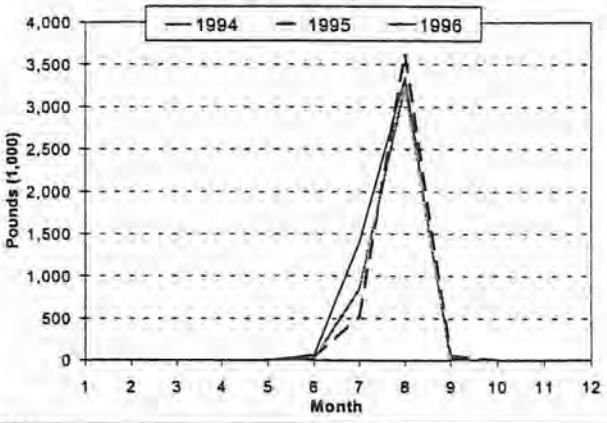


Figure 10: Monthly Pink Catch by Residents of the City and Borough of Juneau



Source: Untitled Compiled Reports from CFEC and RAM, 1997.
Note: When comparing these two figures keep in mind that the scales differ significantly.

2.6.1.4 Sockeye Salmon

Sockeye or red salmon have not been processed in Juneau or in outlying areas to any great extent. However, given the expected increases from DIPAC releases at Snetisham, sockeye salmon could soon be much more important. Landings in Juneau and the outlying areas show a lot of variation in the three years of available data, with 1995 clearly a weak year. Catches of sockeye salmon by Juneau residents do not indicate the same poor showing in 1995. As would be expected both figures showing monthly distribution feature a peak in July, with the scale of catch 10 times the scale of landings.

Table 19: Sockeye Salmon Landings by Port in Pounds

Landing Port	1994	1995	1996	Average
City and Borough of Juneau	219,600	152,814	377,562	249,992
Outlying Areas	1,213,735	696,976	1,395,018	1,101,910
Total	1,433,335	849,790	1,772,580	**1,351,902**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include landings from hatchery cost recovery or research charter operations.

Table 20: Sockeye Salmon Catch By Residents in Pounds

Area of Residence	1994	1995	1996	Average
City and Borough of Juneau	2,571,636	2,984,066	3,299,222	2,951,641
Outlying Areas	1,727,383	1,441,079	1,948,526	1,705,663
Total	4,299,019	4,425,145	5,247,748	**4,657,304**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include catch from hatchery cost recovery or research charter operations.

Figure 11: Monthly Sockeye Salmon Landings in the City and Borough of Juneau

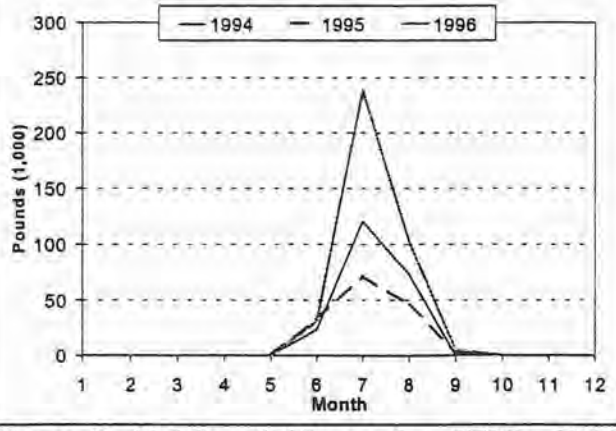
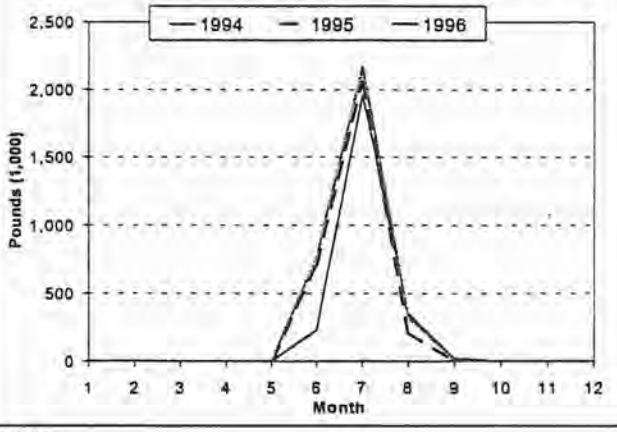


Figure 12: Monthly Sockeye Catch by Residents of the City and Borough of Juneau



Source: Untitled Compiled Reports from CFEC and RAM, 1997.
Note: When comparing these two figures keep in mind that the scales differ significantly.

2.6.1.5 Coho Salmon

Coho or silver salmon landings and catch data show a significant downward trend in total pounds in both areas. Catch by Juneau residents greatly exceeds landings to Juneau area processors. The monthly distribution of coho is relatively wide and later in the year compared to those of other salmon species. Again note that the scales in the two figures are significantly different.

Table 21: Coho Salmon Landings by Port in Pounds

Landing Port	1994	1995	1996	Average
City and Borough of Juneau	445,753	255,745	208,950	303,483
Outlying Areas	8,445,647	3,491,809	3,520,813	5,152,756
Total	**8,891,400**	**3,747,554**	**3,729,763**	**5,456,239**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include landings from hatchery cost recovery or research charter operations.

Table 22: Coho Salmon Catch By Residents in Pounds

Area of Residence	1994	1995	1996	Average
City and Borough of Juneau	3,738,444	1,922,001	1,342,237	2,334,227
Outlying Areas	4,854,409	2,024,310	2,118,690	2,999,136
Total	**8,592,853**	**3,946,311**	**3,460,927**	**5,333,364**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include catch from hatchery cost recovery or research charter operations.

Figure 13: Monthly Coho Salmon Landings in the City and Borough of Juneau

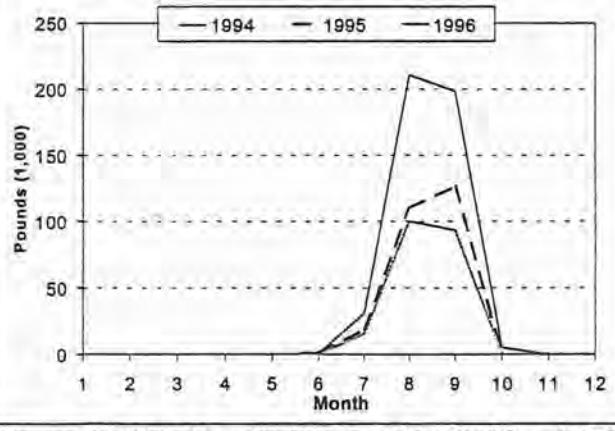
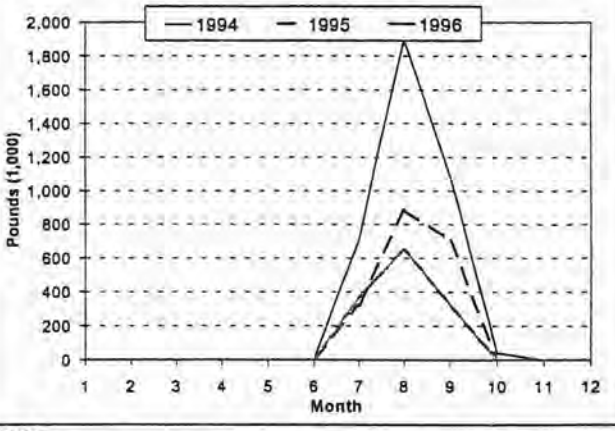


Figure 14: Monthly Coho Salmon Catch by Residents of the City and Borough of Juneau



Source: Untitled Compiled Reports from CFEC and RAM, 1997.
Note: When comparing these two figures keep in mind that the scales differ significantly.

2.6.2 Halibut

Since 1995, halibut fisheries throughout Alaska have been managed under an IFQ management system. The system allocates a percentage of the allowable catch to individual permit holders. The halibut season begins on March 15 and continues through November 15. Prior to 1995, the halibut fishery occurred in frenetic one-day openings during which the entire quota for the area was often harvested. With the implementation of the IFQ system, real time reporting has been developed; thus 1997 data were available for inclusion. Because the new management regime was implemented in 1995, 1994 catch and landings data were not included. As shown in Table 23, processors in Juneau have steadily increased their share of halibut landings relative to processors in the outlying areas. In 1995 halibut landings in the outlying areas exceeded landings in Juneau by more than 5 to 1. By 1997 the ratio has dropped to 1.5 to 1, even though landings in the outlying areas increased by 1.8 million pounds between 1996 and 1997. Harvests by residents of Juneau and of the outlying areas have increased steadily since 1995.

Figure 15 and Figure 16 show the monthly distribution of landings in Juneau and harvests by residents of the City and Borough of Juneau. Both figures show a significant peak of harvests in April, but also show that a relatively steady stream of halibut is harvested and landed throughout the year. In this case the vertical scales of the two figures differ only slightly.

Table 23: Halibut Landings by Port in Pounds

Landing Port	1995	1996	1997	Average
City and Borough of Juneau	998,663	2,592,929	4,667,769	2,753,120
Outlying Areas	5,063,877	5,336,279	7,166,605	5,855,587
Total	**6,062,540**	**7,929,208**	**11,834,374**	**8,608,707**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include landings research charter operations.

Table 24: Halibut Catch By Residents in Pounds

Area of Residence	1995	1996	1997	Average
City and Borough of Juneau	2,739,471	3,514,153	4,571,985	3,608,536
Outlying Areas	3,098,909	3,263,125	3,877,956	3,413,330
Total	**5,838,380**	**6,777,278**	**8,449,941**	**7,021,866**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include catch from research charter operations.

Figure 15: Monthly Halibut Landings in the City and Borough of Juneau

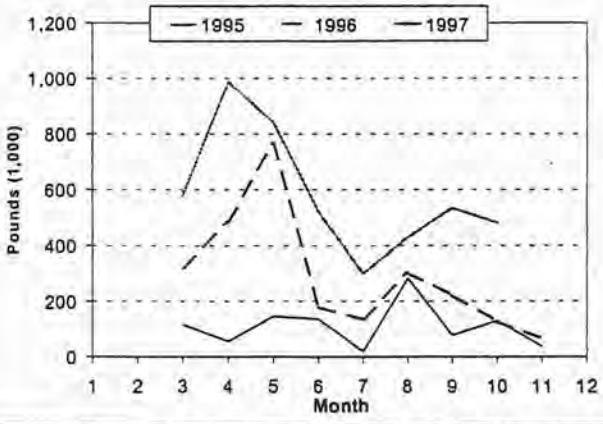
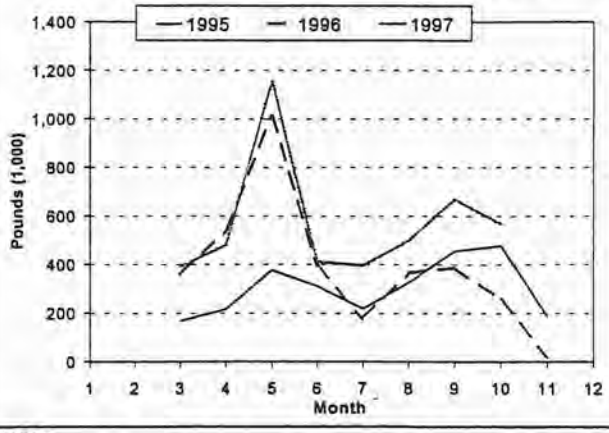


Figure 16: Monthly Halibut Catch by Residents of the City and Borough of Juneau



Source: Untitled Compiled Reports from CFEC and RAM, 1997.

2.6.3 Sablefish

Most sablefish, like halibut, have been managed under an IFQ system since 1995. The IFQ fisheries are open from March 15 through November 15. Unlike halibut however, there are two state-water fisheries managed by ADF&G that take place in the Chatham and Clarence Straits. These fisheries are managed under license limitation programs with season openings set in the fall. The data in the tables and figures includes catch and landings for both the state and IFQ fisheries for the years 1995 and 1996, but do not include the state fisheries for 1997. Catches and landings of sablefish have been declining over the last three years, due to smaller total allowable catch limits (TAC). However in spite of this decline processors in Juneau have increased total landings by over 1 million pounds each year since 1995. Catches by Juneau area residents have followed the downward trend of TAC levels. Unlike halibut and salmon, monthly distributions of sablefish are bi-modal, with a peak in April at the beginning of the season, and another peak in September. The latter corresponds with the openings in the limited-entry state-water fisheries, as well as the increasing seasonal demand in Japan. Note that the scales of the two figures are identical.

Table 25: Sablefish Landings by Port in Pounds

Landing Port	1995	1996	1997	Average
City and Borough of Juneau	378,025	2,085,918	3,109,686	1,857,876
Outlying Areas	11,119,214	8,468,011	5,042,961	8,210,062
Total	**11,497,239**	**10,553,929**	**8,152,647**	**10,067,938**

Sources: Compiled reports from the CFEC and RAM. 1997.

Note: Data do not include landings research charter operations.
1997 data do not include landings from limited entry fisheries in Chatham and Clarence Straits

Table 26: Sablefish Catch By Residents in Pounds

Area of Residence	1995	1996	1997	Average
City and Borough of Juneau	4,190,247	3,522,388	2,263,146	3,325,260
Outlying Areas	4,272,985	2,968,977	2,010,174	3,084,045
Total	**8,463,232**	**6,491,365**	**4,273,320**	**6,409,306**

Sources: Compiled reports from the CFEC and RAM. 1997.

Note: Data do not include catch research charter operations.
1997 data do not include catch from limited entry fisheries in Chatham and Clarence Straits

Figure 17: Monthly Sablefish Landings in the City and Borough of Juneau

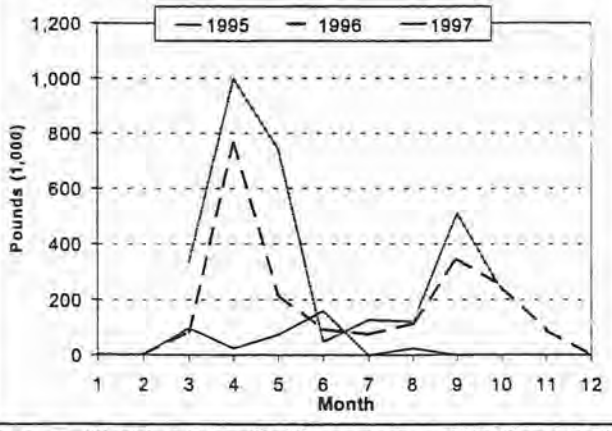
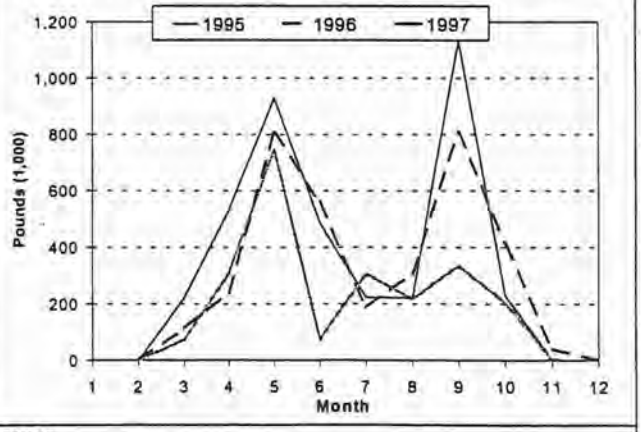


Figure 18: Monthly Sablefish Catch by Residents of the City and Borough of Juneau



Source: Untitled Compiled Reports from CFEC and RAM, 1997.
Note: The scales the two figures are identical.

2.6.4 Crab and Other Species

Harvests of crab and other species have been combined. Reporting of the various species separately is not feasible given the relatively small number of pounds involved and the large number of species. The tables and figures below show that catches of these other species combined are significant, and could potentially be of some importance in the consideration of the feasibility of a refrigerated warehouse facility in the City and Borough of Juneau. Because of the variety of species included, the monthly distribution figures show considerable variation throughout the year. Again it should be noted that the scales in the two figures are significantly different.

Table 27: Crab and Other Species Landings by Port in Pounds

Landing Port	1994	1995	1996	Average
City and Borough of Juneau	658,821	743,763	1,443,760	948,781
Outlying Areas	5,342,503	3,697,205	1,201,602	3,413,770
Total	**6,001,324**	**4,440,968**	**2,645,362**	**4,362,551**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include landings from research charter operations.

Table 28: Crab and Other Species Catch By Residents in Pounds

Area of Residence	1994	1995	1996	Average
City and Borough of Juneau	4,395,899	3,809,483	2,699,945	3,635,109
Outlying Areas	2,175,220	2,075,997	904,195	1,718,471
Total	**6,571,119**	**5,885,480**	**3,604,140**	**5,353,580**

Sources: Compiled reports from the CFEC and RAM. 1997.
Note: Data do not include catch from research charter operations.

Figure 19: Monthly Landings of Crab and Other Species in the City and Borough of Juneau

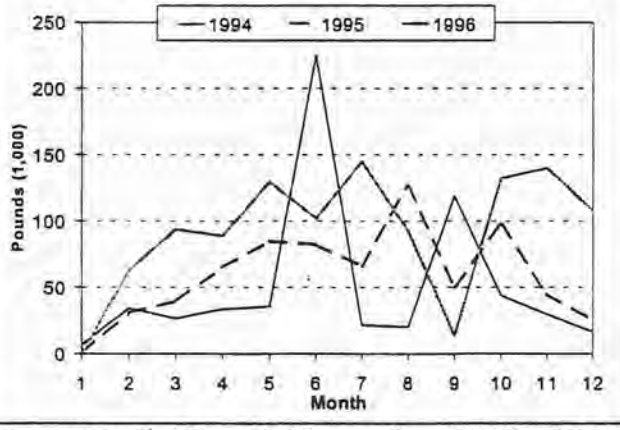
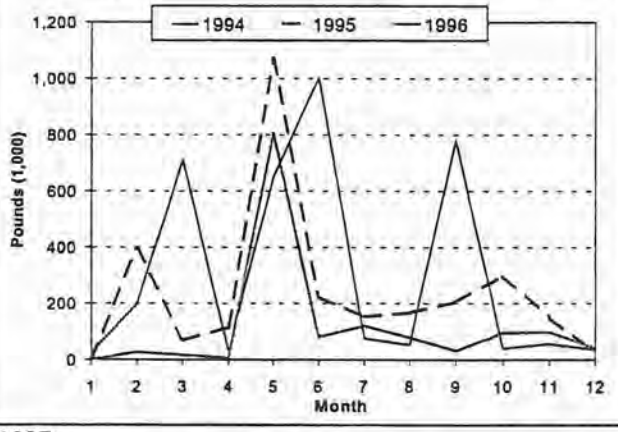


Figure 20: Monthly Catch of Crab and Other Species by City and Borough of Juneau Residents



Source: Untitled Compiled Reports from CFEC and RAM, 1997.
Note: When comparing these two figures keep in mind that the scales differ significantly.

2.6.5 Future Catch Levels

Hal Geiger, ADF&G's Chief Salmon Biometrician, was contacted in August 1997; his comments on future salmon returns are paraphrased below. According to Geiger, projecting future catch levels is not an exact science. There are a lot of things that might indicate lower returns of salmon in the future, but that is not to say there is no upside potential. Few people in 1986 would have projected the returns witnessed in the 1990's. During the 1990's there were almost perfect ocean conditions. The chances that those perfect conditions will continue indefinitely are less likely. Further, much of Southeast and Prince William Sound are dependent on the viability of the hatchery system. Continued subsidies are uncertain. If one throws into the mix global warming and the apparent contraction of adult ranges, it is clear that the down side potential is greater than the upside potential.

Dr. Geiger's comments notwithstanding, there are indications of higher returns for hatchery runs in the City and Borough of Juneau and outlying areas. Rick Focht of DIPAC is predicting sockeye salmon returns in the Snetisham area to increase from next to nothing to 400,000 fish or more in the next three years. Further, Focht has no expectations that chum salmon returns originating from DIPAC will drop in the future. In addition, Steve Andison of Kake Hatchery is projecting increasing chum salmon returns in the near future. Together, it appears the sockeye and chum salmon runs in the Juneau area are more likely to increase than decrease in the future.

For halibut, the future appears relatively bright throughout Alaska. The staff of the International Pacific Halibut Commission (IPHC) is recommending that the Commission increase the setline yields (setline yield is the IPHC equivalent of TAC) in all areas of the state including Area 2C in Southeast Alaska. The recommendations, as seen in Table 29, would increase the total setline yield to 11.8 million pounds, up over 10 percent from the yield adopted for the previous year. Table 29 shows a significant increase in the potential yield estimated from the age selectivity index. It is significantly higher in 1998 than in 1997, an indication that there is a greater level of comfort in the recommended yields. Bob Trumble of the IPHC was contacted on January 8th 1998. Trumble would not be surprised if the setline yield increases over the next few years as the IPHC fully adopts a new biomass estimation methodology. However, Trumble cautions that these yields are at the highest levels in history and that they cannot be expected to continue indefinitely. According to a 1997 document regarding the halibut fishery published by the North Pacific Fishery Management Council (NPFMC), yields are expected to drop back down to levels seen in 1995 within the next 10 years. [3]

Table 29: IPHC Recommendations for Halibut Setline Yields for 1998 in Millions of Pounds

	1997		1998		
Area	**Age Selectivity**	**Adopted**	**Age Selectivity**	**Length Selectivity**	**Recommended**
2A	0.93	0.70	1.05	1.30	0.82
2B	15.99	12.50	15.38	18.29	13.46
2C	**11.41**	**10.00**	**15.48**	**16.29**	**11.80**
3A	33.50	25.00	38.71	62.91	29.57
3B	11.49	9.00	30.99	40.64	16.30
4A	8.34	2.94	11.11	14.57	5.64
4B	8.98	3.48	10.21	13.42	5.70
4CDE Total	7.97	2.58	13.28	17.98	3.00
IPHC Total		**66.20**			**86.29**

Source: http://www.iphc.washington.edu/PAGES/Publications/AnnualMeeting/1998/CatchProposals98.htm

[3] North Pacific Fishery Management Council. *Management Alternatives for the Guided Sport Fishery for Halibut Off Alaska*. August 25, 1997.

Sablefish TACs have been declining over the past several years. That trend will continue in 1998. As seen in Table 30, TACs throughout the Gulf of Alaska are set almost a million pounds less in total for 1998 than they were in 1997. For the East Yakutat/Southeast Outside area, the area most Juneau area fishers utilize, the TAC in 1998 will be 7,697,440 pounds. Table 30 also shows that Allowable Biological Catch (ABC) levels and TACs are set equal to each other. The ABC is the level as determined by the best available data and science. TACs can be set at or below ABC levels. The fact that there is no cushion is an indicator that harvests are set at the highest levels within which fishery scientists are comfortable. (Contrast this with the yields for halibut where there is considerable a cushion between the scientific projections and staff recommendations.) According to Jane DiCosimo, Gulf of Alaska Fishery Management Plan Coordinator for the NPFMC, sablefish stocks are expected to continue to experience moderate declines over the next several years. According to DiCosimo, the rate of decline appears to be leveling off.

Table 30: Total Allowable Catch Levels for Sablefish in the Gulf of Alaska in Pounds

Area	1997 ABC	1997 TAC	1998 ABC	1998 TAC
Western Gulf of Alaska	4,100,556	4,100,556	4,056,464	4,056,464
Central Gulf of Alaska	14,131,486	14,131,486	13,933,072	13,933,072
West Yakutat Area	5,313,086	5,313,086	13,139,416	5,451,976
East Yakutat/Southeast Outside	**8,465,664**	**8,465,664**		**7,687,440**
All Areas of the Gulf of Alaska	**32,010,792**	**32,010,792**	**31,128,952**	**31,128,952**

Source: http://www.fakr.noaa.gov/npfmc/goaspecs.htm
Notes: ABC is allowable biological catch, and TAC is total allowable catch.
The 1998 ABC for West Yakutat and East Yakutat/Southeast Outside was estimated as a single unit.

2.7 City, State, and Federal Government

Several government and other public entities within the City and Borough of Juneau and even within State, and Federal governments will likely play a role in the potential development of a public refrigerated warehouse facility in Juneau. Within the City and Borough of Juneau government, entities certain to play a role in the decision include, the City Assembly, the Finance Department, the Engineering Department, the Juneau Docks and Harbor Department (JDHD), and the Fishery Development Committee. Other quasi-public entities which may play a role include the Juneau Economic Development Council (JEDC), Alaska Electric Light and Power (AELP), Channel Sanitation, Gold-Belt, and possibly the Alaska Economic Development and Export Authority (AIDEA). Involved state agencies might include ADF&G, and perhaps the State Legislature, and the University of Alaska. Involved federal agencies may include the National Marine Fisheries Service, and indirectly the U.S. Congressional Delegation. Many of the agencies and entities mentioned above will enter into the picture during the financing and development phases of the project and will be discussed in Section 5.

The semi-autonomous Juneau Docks and Harbor Department (JDHD) manages dock and harbor facilities in the City and Borough of Juneau. The Department answers to a nine-member board authorized by the Assembly. According to Port Director Joe Graham, The JDHD receives its funding directly from fish-taxes and are expecting $75,000 from this source in 1998. Graham was contacted on January 15, 1998, and his comments are paraphrased. The JDHD also collects wharfage fees for products moving across its facilities and an hourly rate for use of its cranes. Wharfage fees are $0.0011 per pound and cranes may be used for $10/hour. Wharfage fees have not generated much income in the past, but crane rental fees have been generating between $6,000 to $7,000 each year.

There are five public docks in Juneau managed by JDHC.

1) The dock at **Taku Smokeries** is publicly owned but leased long term to Taku Smokeries. The crane on the facility belongs to Taku Smokeries. Persons using the crane have to contract with Taku Smokeries.

2) The **downtown cruise ship facilities** are theoretically open to the public, but rarely if ever used for fisheries operations.

3) The **Douglas Island Small Boat Harbor and Dock** used to have two cranes and a small processing facility. However with the fire in the early part of the decade, the cranes were deemed a liability and were scrapped. There is a capital project under consideration that would include one new crane. The proposed improvement project would also create a three to four acre fill that eventually would be available for development.

4) **Juneau Fishermen's Terminal** also known as the University dock has three cranes for the movement of fishery products. This is where the majority of fish not destined for Taku Smokery are landed. The facility used to have an ice machine designed to support the fishing industry.

5) **Statter Harbor** is located in Auke Bay. It is sometime used for unloading fish, particularly fish harvested in Lynn Canal. Statter Harbor does not have a crane, and fish are moved by hand across the dock.

3 DEMAND FOR A REFRIGERATED WAREHOUSE

Demand for a publicly owned refrigerated warehouse facility may come from several fronts. In this analysis, estimates of demand for public refrigerated warehouse space are generated from three different user groups: harvesters, processors, and members of the public at-large. Demand from each user-group was examined independently, and then combined to generate an estimate of total demand.

3.1 DEMAND FOR REFRIGERATED WAREHOUSE SPACE BY HARVESTERS

Demand for refrigerated warehouse space by harvesters was estimated with the analysis of a telephone survey of Juneau area permit holders.

3.1.1 Survey Methodology

The process by which persons were selected for inclusion in the telephone survey is described below. The survey selection process produced 544 ranked households from which to survey. Households with higher rankings were contacted before households with lower rankings. The selection criteria was developed to favor Juneau households with multiple permits or permit holders, and the types of permits contributing the most to harvests by area residents. Within those guidelines however, the selection process still maintains the randomness necessary for statistical validity. The selection process is documented in the 5 steps below.

1) 1997 Permit and Vessel Files were obtained from the Commercial Fishing Entry Commission and imported into Microsoft Access. The two files were merged, retaining only those permits that listed a current ADF&G vessel number, 21,061 in total. The 6,203 permits which did not list a current vessel number were eliminated from the sample because it was felt they would not be the decision maker in a question to deliver fish to Juneau or to use a cold storage facility.

2) The remaining permits were filtered against a list of communities in the Juneau area, and a list of permit types under which significant amounts of fish are harvested. Only residents of these communities who listed telephone numbers were included. After filtering, the permit list drops to 1,132. The communities include in this final list are shown in Table 32.

Table 31: Communities from Which Fishers Were Sampled

Juneau	North	West			South
Auke Bay	Haines	Excursion Inlet			Tenakee
Douglas	Skagway	Elfin Cove	Funter Bay	Hobart Bay	Angoon
Juneau	Klukwan	Hoonah	Gustavus	Pelican	

The percent of total pounds harvested by residents of the selected communities is 1995 is shown in Table 32. Nearly 98 percent of the catch by resident permit holders were made under the selected types.

Table 32: Percent of Total Landings by Residents of Selected Communities

Permit Type	S01A	S03A	S15B	C61B	B61B	C61A	D09A	K49A	K69A	Total
Percent of Total	25.2%	37.3%	14.0%	8.6%	6.1%	3.5%	1.9%	0.8%	0.5%	97.8%
Source: 1995 Census Report. CFEC. Note: Included permits are defined below as follows: species, gear, and area.										
S01A: salmon, purse seine, S.E.			S03A: salmon. Drift gill net, S.E.				S15B: salmon, power troll, statewide			
C61B: sablefish, longline, statewide			C61A: sablefish, longline, S.E.				B61B: halibut, longline, statewide			
D09A: dungeness crab, pot, S.E.			K49A: king crab, pot, S.E.				K69A: king crab, pot, S.E.			

3) Each of the remaining permits were assigned a weight based on the percent of the total harvest that permit type represented by area of residence. Greater weights were assigned to residents of the City and Borough of Juneau than residents of outlying areas. In addition, each permit was assigned a random number generated by Microsoft Excel. The random number and the weight were then multiplied producing a selection factor.

4) Finally the selection factors were summed over unique telephone numbers. The telephone number with the highest summed selection factor was ranked #1.

5) In the final survey, higher ranked households were telephoned before lower ranked households.

3.1.2 Pre-Tests of the Telephone Survey

Extensive pre-testing of the survey was conducted. Households with rankings less than 250 were used for the various pre-tests. In all, four different forms of the survey were tested.

It was during the pre-testing of the survey, that the need to differentiate between the terms cold storage and refrigerated warehouse facility was discovered. As mentioned in the definition section, many fishers in the Juneau area use the term cold storage to mean a processing plant that freezes product, as opposed to a processing plant that cans product.

The effort to avoid this confusion also contributed to the length of the final survey questionnaire. The survey instrument provided detailed descriptions of primary processing, secondary processing, and custom processing, and in a step-wise manner, elicited responses regarding the demand for refrigerated warehouse space. The final form of the questionnaire is contained in Appendix C.

3.1.3 Survey Results

This section summarizes the findings of the telephone survey of permit holders.

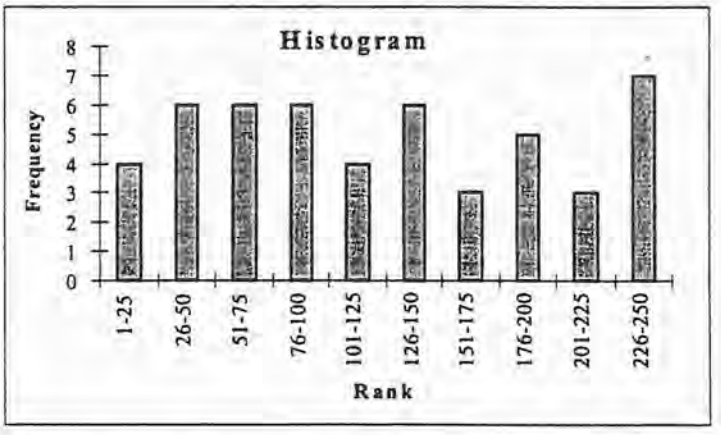
3.1.3.1 Demographics of Survey Respondents

Table 33 provides a breakdown of the rankings of the 50 households contacted, as developed in the sampling methodology. The distribution of respondents across the rankings is relatively equal.

Table 33: Distribution of Survey Respondents Rankings

Rank	*Frequency*
1-25	4
26-50	6
51-75	6
76-100	6
101-125	4
126-150	6
151-175	3
176-200	5
201-225	3
226-250	7

Figure 21: Histogram of Survey Respondents Rankings



The residency of survey respondents is shown in Table 34. Of the 50 survey respondents 33 were from the City and Borough of Juneau and 17 were from outlying areas. Seven of the respondents had filed their Intent to Operate as catcher/processors with ADF&G.

Table 34: Residency of Survey Respondents

CTY	Number	percent
City and Borough of Juneau	**33**	**66%**
Juneau	26	52%
Auke Bay	1	2%
Douglas	6	12%
Outlying Areas	**17**	**34%**
Elfin Cove	2	4%
Gustavus	1	2%
Haines	6	12%
Hoonah	2	4%
Angoon	4	8%
Pelican	2	4%
Total of Survey Respondents	**50**	**100%**

3.1.3.2 Catch Represented by Survey Respondents and their Households.

Survey respondents were asked to list the catch of their top four species in four different time periods, in either 1996 or 1997.[4] These catches are aggregated by species group and shown in Table 35. While respondents were asked to be specific about species, many could not or would not indicate catches of individual salmon and crab species.

Table 35: Reported Catch in Pounds by Survey Respondents

Species	Jan.-April	July-Aug.	May-June	Sept.-Dec.	Total
Crab & Other	110,000	10,000	340,300	93,000	553,300
Halibut	158,000	123,700	138,500	146,000	566,200
Sablefish	150,000	50,000	174,000	249,000	623,000
Salmon		1,478,800	393,000	109,250	1,981,050
Total	**418,000**	**1,662,500**	**1,045,800**	**597,250**	**3,723,550**

3.1.3.3 Survey Highlights

The following provides an overview of survey responses.

- 16 of the survey respondents delivered some of their catch to Juneau.
- 32 of the survey respondents would deliver to processors in Juneau if prices were favorable. Of these, four of the respondents had filed with ADF&G as catcher/processors.
- Nine survey respondents used a custom processor in the past. Two of these nine filed as catcher/processors with ADF&G.
- 23 survey respondents would consider using a custom processor in the future. Five of these 23 have used custom processors in the past and 4 have filed as catcher processors.

[4] In conducting pre-tests it was discovered that many fishers could not specify harvest levels from previous years. Therefore they were asked to discuss landings only in their most recent year of participation.

- 32 survey respondents (or 64 percent) stated that they would consider using a refrigerated warehouse in Juneau.
- 24 of the 32 also said they would deliver to a processor in Juneau if prices were favorable.
- 22 of the 33 Juneau residents would consider using a refrigerated warehouse facility located in Juneau.
- Six of the nine respondents who had used a custom processor in the past would consider using a refrigerated warehouse facility.
- 21 of the 23 respondents who said they would consider using a custom processor also said they would consider using a refrigerated warehouse.
- Six of the seven who had filed with ADF&G as catcher/processors would consider using a refrigerated warehouse in the City and Borough of Juneau.

3.1.3.4 Estimation of Respondent Use of a Refrigerated Warehouse

As noted above 32 (or 64 percent) of the survey respondents said they would consider using a refrigerated warehouse facility if one were located in the City and Borough of Juneau. Given the nature of the telephone survey with the inherent biases, it is unrealistic to assume that 64 percent of all fishers in Juneau and the outlying area would use a refrigerated warehouse. In order to get a more realistic perspective, 95 percent confidence intervals around the proportion were estimated resulting in a lower bound of 51 percent and an upper bound of 78 percent.[5]

The confidence intervals rely on the assumption that the distribution of the sample and the population of permit holders are normal. Further, they assume that there was no bias in answers provided or introduced by the survey instrument. The sample may not have been distributed the same as the population of fishers in the Juneau area, and it is likely there may have been a predisposition to answer positively to this question. Further, the survey methodology is likely to have introduced a bias because it assumes that non-respondents would have answered similarly to respondents. Therefore, caution should be used when applying the proportions and confidence intervals to estimate demand for refrigerated warehouse space.

Table 36 shows the reported catch of all survey respondents compared to the reported catch by the 32 respondents who would consider using a refrigerated warehouse facility. Respondents who said they would consider using a refrigerated warehouse caught 51 percent of the catch reported in the survey.

Table 36: Reported Catch of All Respondents and Potential Warehouse users in Pounds

	Crab & Other	Halibut	Sablefish	Salmon	Total
Total Reported Catch	553,300	566,200	623,000	1,981,050	3,723,550
Catch by refrigerated warehouse users	125,800	392,700	497,000	865,050	1,880,550
% of total by refrigerated warehouse users	23%	69%	80%	44%	51%
Note: Catch estimates of respondents are based strictly on information provided during the survey, and have not been verified against actual catch records.					

[5] Clopper-Pearson confidence intervals for proportions (P_{est}) were estimated for alpha = 0.05. These assume a normal distribution and are calculated as follows: P_{est} +/- z*sqrt[var(phat)], where var(phat) = (N-n)* P_{est} *(1- P_{est})/N/(n-1).

Persons who responded that they would consider using the refrigerated warehouse were asked how much of their catch they would place into storage. Table 38 shows those estimates.

Table 37: Reported Pounds That Potential Warehouse Users Would Place Into Storage

	Crab & other	Halibut	Sablefish	Salmon	Total
Total reported catch of potential refrigerated warehouse users	125,800	392,700	497,000	865,050	1,880,550
Amount potential users would put into a refrigerated warehouse	20,000	128,475	99,625	246,150	494,250
Percent of total catch that would be place into a refrigerated warehouse	16%	33%	20%	28%	26%

Providing a statistically robust estimation of a confidence interval around the proportion of pounds that respondents would place into storage would push the data beyond reasonable expectations. This is primarily a result of the lack of certainty concerning catch levels provided by respondents, and the inability to correlate survey responses to actual catch data.

Rather than provide confidence intervals, the analysis will instead assume a conservative estimate that the lower bound is 25 percent less than the mean or estimated proportion. Thus, since survey respondents who would use the refrigerated warehouse facility stated they would store 26 percent of the their total catch, the analysis will assume that a reasonable lower bound estimate is [(1-25%) × 26% = 20%]. Assumed confidence intervals for the various species are shown in Table 38.

Table 38: Assumed Confidence Intervals around Estimated Refrigerated Warehouse Use

	Crab & other	Halibut	Sablefish	Salmon	Total
Estimated mean of refrigerated warehouse use	16%	33%	20%	28%	26%
Lower Bound (assumed at 75% of mean)	12%	25%	15%	21%	20%
Upper Bound (assumed at 125% of mean)	20%	41%	25%	36%	33%

Table 38 provides upper and lower bounds of the percentage of individual catches that users would consider placing into storage. An equally conservative approach was employed to translate these percentages into an estimate of the total demand from harvesters. The conservative estimate of total demand is shown in Table 40. These estimates, along with estimated demand for storage by processors, and demand for lockers from the public (both of which are calculated in the following sections) will be the basis of the *pro forma* analysis for the proposed refrigerated warehouse.

Table 39: Estimates of Potential Pounds Stored in a Refrigerated Warehouse by Harvesters.

	Crab & other	Halibut	Sablefish	Salmon	Total
Estimated potential demand in pounds	221,877	453,246	255,907	1,640,680	2,571,711
Note: The estimate of total demand is the sum of the demand various species.					

The estimates of total demand in Table 40 are based on the following assumptions and calculations:

1) Only the catch of Juneau residents is considered for input into the facility. This assumption was employed as a means to generate conservative demand estimates, even though 10 of the 17 non-residents said they would consider use of the facility.

2) The lower bound estimates of all parameters will be employed in developing the conservative use estimate.

3) The estimate is calculated by multiplying together the following:

- the lower bound of the overall proportion of respondents (51 percent),
- the lower bound estimate of the proportion of user's catch that would be placed into storage, by species. (12 percent for crab & other 25 percent for halibut, 15 percent for sablefish, 21 percent for salmon, and 20 percent overall), and
- the average of the last three years of catch by species of Juneau residents from the tables in Section 2.6.

The analysis did not attempt to determine the product form or final market for fish placed in storage by harvesters. In the survey several persons indicated they would use the refrigerated warehouse facility to store chum salmon for bait. Others indicated they would target european markets.

3.2 Demand For Refrigerated Warehouse Space From Processors

Demand estimates from processors were based on processors located in Juneau and from processors operating outside of the Borough. In addition to the processors within the City and Borough of Juneau mentioned in Section 2.2, executives from selected processors in the outlying areas were contacted. These included: Alaska Dried Food in Pelican, Rainbow Glacier Seafoods in Haines, and Wards Cove Packing Company in Excursion Inlet. Processors from outside the study area were also contacted, including Sitka Sound Seafoods, Icicle Seafoods, Trident Seafoods, Tyson Seafoods, and Unisea, Inc.

Discussions with these industry members did not follow a standard format, but instead focussed on the pros and cons of the expansion of processing facilities in the City and Borough of Juneau, and the demand for refrigerated warehouse space. During these discussions several issues were raised repeatedly. These are reported in the following sections.

3.2.1 Processor's Need for Refrigerated Warehouse Space

There was nearly unanimous agreement among processors that there is a shortage of refrigerated warehouse space in general, and in particular within the City and Borough of Juneau. This sentiment was voiced by almost all processors contacted, including those that had no specific operating interests in Juneau, as well as those that were opposed to the idea of a publicly owned refrigerated warehouse facility.

Smaller processors in the City and Borough of Juneau all stated that they could use additional warehouse space. In fact, many were already considering adding to their existing space. These processors talked about additions averaging approximately 8,000 cubic feet each, or 40,000 cubic feet overall. This translates to a storage capacity of approximately 0.9 million pounds.[6] Larger processors within the City and Borough of Juneau indicated that a conservative estimate of the additional space they could use would total to 1 million pounds during peak periods in July and August. Finally, processors located in outlying areas indicated that because they lacked sufficient storage space in their own communities, they would use a refrigerated warehouse facility located in the City and Borough of Juneau. Processors in outlying areas also made conservative estimates of their demand and indicated that in total they would use additional storage adequate to hold 1 million pounds during the peak periods of July and August. Adding these three components of processing demand yields a conservative estimate that 2.9 million pounds of additional refrigerated warehouse space could be used during peak periods.

[6] This assumes 23.15 pounds per cubic foot.

3.2.1.1 Species Identified for Storage

Chum Salmon: Processors indicated that chum salmon would be the number one candidate for storage in a refrigerated warehouse facility. Many processors indicated that they believed a viable market for quality chum salmon is developing and will continue to develop, particularly if adequate warehousing facilities are available. Processors indicate that they can currently sell quality fish on the fresh market without difficulty, and that there is also a demand for frozen product. Unfortunately the glut of salmon during the peak periods coupled with the lack of storage precludes the ability to service this market. Processors also indicated that they are currently shipping a lot of fresh chum salmon south, to the Seattle area, where it is processed and frozen. Many indicated that they thought processing and freezing chum locally would be cost efficient, because, given recovery rates, significantly fewer pounds would have to be shipped. None of the processors stated any concerns about the growing chum salmon harvests in the Yukon and Kuskokwim river areas.

Sockeye Salmon: Generally sockeye salmon are sold on the fresh market, but several processors indicated that the enhancement efforts by DIPAC in the Snetisham area could generate a need to freeze greater amounts of sockeye.

Silver and King Salmon: Like sockeye, silver and king salmon are often sold fresh. Because they are harvested during non-peak periods, processors indicated that they were generally able to deal with these species adequately. Nonetheless processors indicated that additional storage would add to their abilities to market these salmon.

Sablefish: Sablefish would appear to be ideally situated for storage in refrigerated warehouse facilities. As mentioned earlier, there are two main fisheries for sablefish, an IFQ fishery in federal waters, and a limited entry fishery in Chatham Strait. Fishing for IFQ fish may occur any time from March 15 through November 15, while the Chatham Strait fishery typically occurs in September. The primary market for sablefish is Japan during the fall and winter months. Several processors in Juneau stated that they believed this market, particularly with an adequate refrigerated warehouse facility, could be further developed.

Halibut: Processors indicated that the IFQ fishery for halibut was leading to a much larger fresh market. However, they noted that the fresh market was centered on smaller fish. If processors are to become more involved in the halibut markets, they need to process, freeze, and store larger fish for use after the IFQ fishery closes in November. A refrigerated warehouse facility would greatly enhance processor's ability to serve this market.

Crab: Although fairly limited, processors believe the crab fishery in the Juneau area would benefit from a refrigerated warehouse facility. The primary benefit would come from the ability to store and distribute bait for the harvest of crab. Some crab, those too weak for transport to live markets, could also be frozen and stored for later sale.

Ice and Bait: Storage of bait for crab fisheries, and for the halibut and sablefish fisheries, would enhance processor's ability to serve their markets. For processors, the ability to service their fleets with ice and bait is crucial to obtaining a supply of raw product. Estimates of the potential demand for bait were not explicitly generated..

3.2.2 Processor's Comments on the Capabilities of the Facility

Blast Freezer: There was a general agreement among processors that, if a publicly owned refrigerated warehouse facility was built, it should have blast freezing equipment. This would enable fishers who were interested in self-marketing to create a quality product. If there was no blast freezer in the facility, then only fish destined for use as lower quality products (such as bait and dog food) could be stored profitably. In addition, many of the smaller processors indicated they would use the freezing equipment to expand their own operations.

Processing Line: In general processors did not endorse the idea that the refrigerated warehouse facility have a custom processing line. They felt that if the need for additional custom processing arose, then the processors themselves could (and should) supply the resources.

3.2.3 Processor's Comments on the Location of the Facility

Co-location with a Processing Facility: Most of the processors contacted thought it would be an ideal situation to be co-located with a refrigerated warehouse facility. One suggested that the refrigerated warehouse facility be located on its own property. Another indicated that they hoped to make a large expansion in Juneau, and would be inclined to locate adjacent to a refrigerated warehouse if possible.

On the Waterfront: In general, processors thought it would be better to locate the facility on the waterfront, particularly if it was to supply ice and bait to harvesters. This sentiment notwithstanding, processors recognized the limited amount of space available near the waterfront, and all agreed that a waterfront location was not mandatory.

Processors also discussed specific sites for the location of the proposed refrigerated warehouse facility:

- **The Rock Dump Site:** The Rock Dump was viewed as a very viable and desirable location by most processors. Processors felt that its location near major shippers would be a benefit, and would likely reduce costs of moving product. It was also felt that there was the potential for the development of a dock at or adjacent to this site. A relatively minor concern was voiced that a majority of the overall harvest comes from north of Gastineau Channel, and that it would be more costly for vessels needing to deliver, if a processor were co-located with a facility at the Rock Dump.
- **Douglas Small Boat Harbor:** Douglas Small Boat Harbor was not viewed as a very viable location. Processors did indicate that, if plans to develop the upland areas came to fruition, then it could become an excellent location.
- **University Dock:** Several processors mentioned that there might be space to build a facility adjacent to the University Dock, also known as Fishermen's Terminal. The area where the University's machine shop is currently located was thought by several to be a prime location for a processor/refrigerated warehouse facility.
- **Channel Drive:** Several processors mentioned that there may be locations on Channel Drive which would be adequate for development, although specific sites were not indicated.
- **Lemon Creek Area:** Several processors mentioned that a location in the Lemon Creek area would be feasible, particularly if cheaper energy costs from the sanitary landfill were available.
- **Berner's Bay:** If future development of the road to Berner's Bay was to occur, then several processors indicated that a location in that area could be viable. It would provide good access to the northern area fisheries, and would provide a good base for future fisheries development.

3.2.4 Processor's Comments on Public Involvement in Private Enterprise

Some processors, both in Juneau and outside the area, expressed concern that a publicly owned refrigerated warehouse facility represented a subsidy of expenses that should properly be borne by private enterprise. This sentiment was usually voiced in conjunction with the conclusion that surely private enterprise would develop such a facility, if indeed one were warranted.

Other processors noted that the entire industry is heavily subsidized through dock facilities, scientific research, and resource management. From this perspective, a publicly owned refrigerated warehouse facility is no different than a public dock.

3.3 Estimated Demand for Public Access Locker Space

Demand for public access locker space was estimated with the use of a telephone survey of residents of the City and Borough of Juneau. A stratified sample of area residents was developed proportional to the population of various areas in the city. A total of 66 households responded to the telephone survey. Respondents were asked whether they would consider renting locker space from a refrigerated warehouse facility in the City and Borough of Juneau. Seventeen of the respondents (or 26 percent of the total) indicated they would consider renting locker space. If the respondent answered positively, they were asked to indicate one of the locker choices shown in Table 40.

Table 40: Choices and Responses for Public Locker Size and Price

Locker Size and Price	Agreed
Locker Space for 100 lbs. @ $80.00 per year. *(3 cubic ft, 15 w. x 9 h. x 37 d.)*	7
Locker Space for 400 lbs. @ $105.00 per year. *(11 cubic ft., 29 w. x 17 h. x 37 d.)*	3
Locker Space for 800 lbs. @ $120.00 per year. *(21 cubic ft. 29 w. x 34 h. x 37 d.)*	2
None of the above, all are too expensive	5
Total number of households that would consider renting locker space	17

A total of 12 (or 18 percent) of the respondents said they would consider renting one of the specified lockers. Confidence intervals at the 95 percent level were estimated around the 18 percent of the household who stated they would rent lockers. A lower bound on the proportion of the households that would rent a locker of at least 3 cubic feet was estimated at 8.8 percent. According to the Juneau City Clerk's office, there are approximately 10,000 households in the City and Borough of Juneau. If 8.8 percent of these households rented lockers, the demand would total 880 lockers. If 880 lockers were built into the proposed warehouse, 2,640 cubic feet or the equivalent of 61,000 pounds of storage space would be required. It should be noted that this estimate relies on assumptions that the sample of households was normally distributed, and that responses were unbiased. While every attempt was made to assure these conditions were met, there are no guarantees of accuracy.

As mentioned in Section 2.3.5.2, lockers are not considered very profitable from the perspective of refrigerated warehouse operators. However, given the estimated demand, space for public access lockers has been added into the total demand for refrigerated warehouse space.

3.4 Estimated Total Demand for Refrigerated Warehouse Space

The estimated total demand for refrigerated warehouse space is the sum of demand from harvesters, processors, and the demand for lockers. Conservative estimates of each of these components have been made in the previous sections and are summarized in Table 41. The total demand is estimated **5,531,000** pounds. This number is an estimate of the total amount of product coming into the refrigerated warehouse facility over the course of the year. Maximum inventory at the facility any given time is likely to be less than this amount. A full inventory model is developed and discussed in section 6.2.

Table 41: Estimate of Total Potential Demand

Component of Demand	Pounds	Cubic Feet	Square Feet
Demand from harvesters	2,570,000	111,025	6,168
Demand from small processors in Juneau	900,000	38,880	2,160
Demand from larger processors in Juneau	1,000,000	43,200	2,400
Demand from processors in outlying areas	1,000,000	43,200	2,400
Demand from non-commercial users	61,000	2,635	146
Total Demand for refrigerated warehouse space	**5,531,000**	**238,941**	**13,275**
Note: Assumes 23.1481 pounds per cubic feet of storage, and that the refrigerated warehouse space will allow product to be stacked up to18 feet. Thus there are 18 cubic feet per square foot of storage space.			

4 DESIGN OF A REFRIGERATED WAREHOUSE FACILITY

Several designs for a refrigerated warehouse facility were considered, pending an estimate of demand. Given the estimated demand for refrigerated warehouse space and a somewhat conservative approach, it was decided that a facility with 12,000 square feet of -20°F storage space would be appropriate. The facility will include a blast freezer and accommodate a maximum of 5 million pounds of frozen product at any given time. This section will discuss the design of the refrigerated warehouse facility by breaking it into component parts. The following components will be discussed in order.

- The basic structure of the facility and preliminary drawings
- The frozen storage area
- The blast freezer
- The potential for expansion of the facility
- Site selection
- Permits and other considerations

4.1 Basic Design and Structure

Overall it is expected that a minimum of 2.2 acres will be required for a feasible development of a refrigerated warehouse facility. This will provide adequate space for the building as designed, and will also provide plenty of parking and truck turn-around area. In addition, 2.2 acres will provide additional area for the facility to expand in the future. Such expansion might include the addition of a small custom processing facility, and/or expansion of storage capacity for an additional 3 million pounds.

From a development perspective it may be wise to consider an even larger land area, perhaps as much as 5 acres in total. This would allow for the co-location of one or more privately owned processing plants adjacent to the refrigerated warehouse facility.

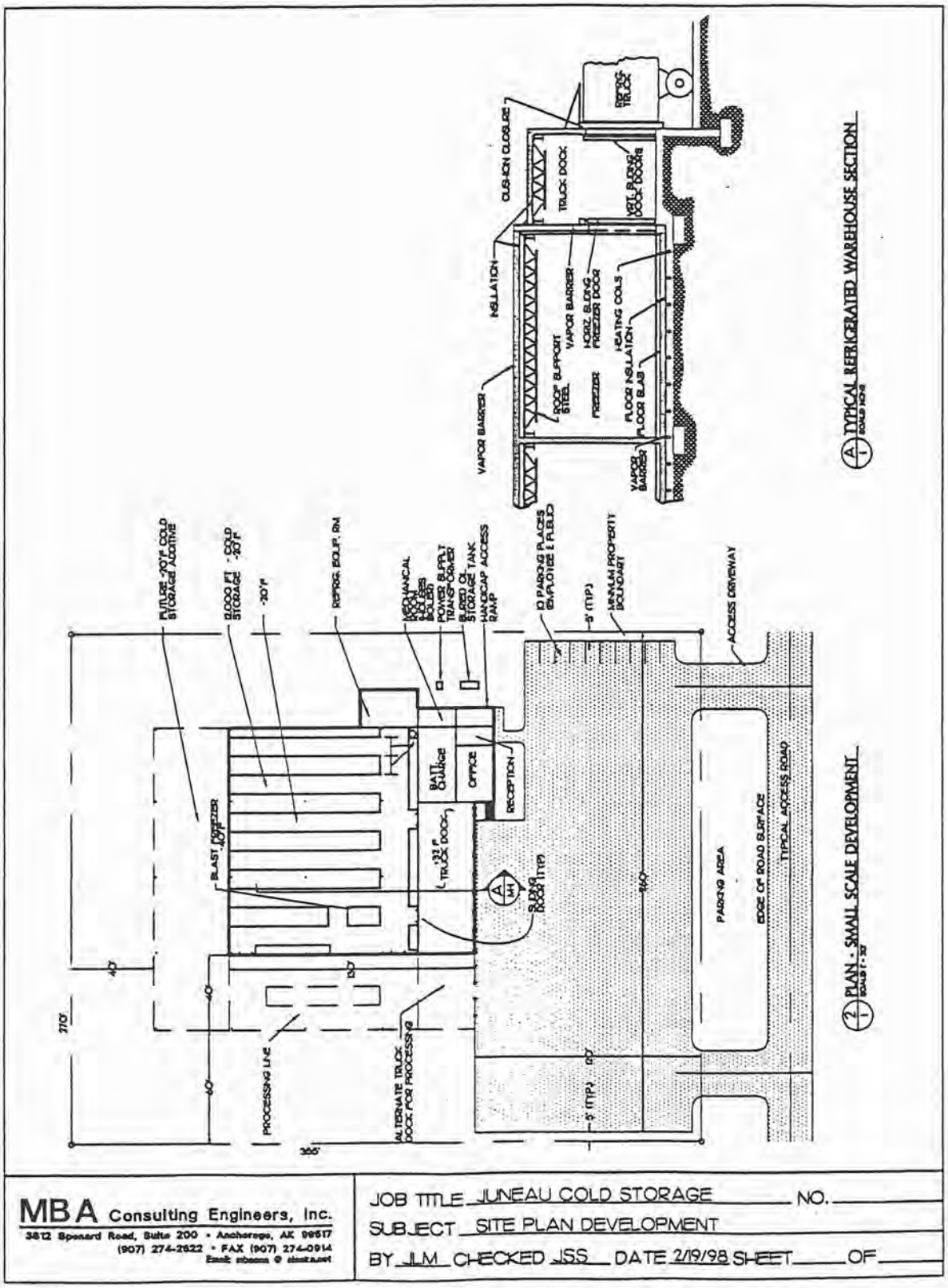
The building itself will be a steel frame 40' x 40' grid span with pre-fabricated insulated metal panels for wall and roof construction. Insulation will be factory-installed polystyrene or urethane with the outer skin also serving as the vapor barrier. The basic building provides for -20°F frozen storage and also the capability of blast freezing with a -40°F blast freezer. The facility also includes 1600 square feet of office space and a cooled truck loading area. A preliminary design is shown in Figure 22.

For the building to operate in an economical manner throughout the year, the floor, wall and roof construction should have good insulating values. Table 42 is a recommendation for the different components of the facility.

Table 42: Recommendations for R-Values for Insulation

Area	Temp Range	Floors**	Wall	Roof
Blast Freezer*	- 40°F to 50°F	20	25	35
Holding Freezer	- 0°F to –20°F	30	40	50
Cooler	32°F to 40°F	20	25	40
*Built within freezer **Underfloor heating and underfloor insulation				

Figure 22: Preliminary Design Plans of the Proposed Refrigerated Warehouse Facility



4.2 Frozen Storage Capacity

The capacity at any given time of the -20°F frozen storage area is 5,000,000 lbs. of frozen halibut, sablefish, and salmon. The basic configuration calls for a 12,000 square foot area with 20-foot clear-heights above the floor. Storage racks will be 15 feet high for totes and/or packaged fish products. Product may be stacked as high as 18 feet, which will allow for circulating cold air in the 2 feet clear of the roof structure.

The 50 tons of refrigerated cooling to maintain -20°F will be accomplished by three 20 ton reciprocating compressors with roof-mounted penthouses holding air blowers and refrigeration coils. Compressor equipment will be located in the refrigeration equipment room.

Energy requirements for the frozen storage area are substantial and are based on the amount of product handled and the amount of product in storage. Addition considerations for energy consumption are outside temperatures, and the operating conditions of the facility as a whole. Calculations of energy use and costs require assumptions regarding overall throughput and storage as well as assumptions regarding energy cost rates. Many of these key assumptions are discussed in Sections 6.2 and 1.1. Tables showing estimated energy consumption, and the associated cost of the electrical power will be provided in those sections.

During the peak usage period of July and August, two persons will be required to work the front office. Two warehousemen will also be required to work in the dock and storage areas. In addition, casual labor could be required during the peak seasons. During the off season months it is felt that one person could potentially handle both the front office and the cold storage warehouse.

A direct digital control (DDC) monitor and alarm system will be provided with remote call-out capability for notification of a major alarm. Periodic refrigeration maintenance would be required twice a season for reliable operation. A sprinkler system is also required for this facility. The design includes a preaction dry-pipe sprinkler system. Water would not flow into the piping until loss of compressed air in the piping and a confirming electrical signal from a smoke detector.

Two standard-height battery-operated forklifts will be required. A battery-charging room for the forklifts is also required.

Designated locations for storage of totes, pallets, carts, and trays will be specified within the refrigerated truck dock and frozen warehouse areas.

4.3 Blast Freezing Capacity

Freezing of raw product will be accomplished with a set of three 20-ton reciprocating two-stage compressors with 3 evaporators within a single blast-freezing unit. As shown in Figure 22, the blast freezer has been located within the frozen storage area, adjacent to the alternate processing area for direct access. The compressor equipment will be located in the refrigeration equipment room. At low loads in the blast freezer one 20-ton unit would operate with hot gas bypass control for low, partial-load, operation.

The capacity of the blast freezer is 80,000 lbs. per day. The blast freezer would need a temperature of -40°F to -50°F with the capacity of 60 tons of cooling for processing 20,000 lbs. every 4 hours at peak project load. The blast freezing equipment has been selected at 20-ton capacity units for more energy efficiency at low loads. At peak loads a loss of one unit would still allow 67 percent of peak load processing.

Energy requirements for the blast freezer are substantial and are based in large part on the amount of freezer throughput. Calculations of energy use and costs require assumptions regarding freezer throughput, and energy cost rates. Many of these key assumptions are discussed in Sections 6.2 and 1.1.

Tables showing estimated kilowatt demand and total kilowatt consumption and the associated cost of electrical power will be provided in those sections.

The blast freezer would not be equipped with automatic product handling. Instead it is envisioned that the two warehouseman working normal periods would also, as part of their duties, be moving product into and out of the blast freezers on carts. During peak period it is assumed that temporary hourly labor or casual labor will be employed on an as needed basis. Wheeled carts with totes and/or trays holding the fish products will be manually pushed into and out of the blast freezer.

4.4 Backup Power Generation

The need for a backup power generation system for the facility was investigated and in the end was not considered necessary. This conclusion was reached after discussions refrigerated warehouse facility operators who indicated that given the insulation of the facility and the mass of frozen product involved, little if any damage could be expected unless outages lasted more than 24 hours. Alaska Electric Light and Power (AEL&P) indicated that while power outages in Juneau do occur, they are of relatively short duration. In 1997, the average length of a power outage was less than three hours.

Notwithstanding the conclusion that a backup a power generation system is unnecessary, an automated system could be added to the facility, if desired, for approximately $60,000 in 1998 dollars.

4.5 Potential For Expansion

Two types of expansions are considered: 1) the addition of a processing unit, and 2) expansion of the frozen storage space. The building is designed to facilitate potential expansion in the future. It is expected that any future expansion would cost only 5 percent more (in real dollars) than building a facility with greater capacity during the initial construction. Designing the facility to accommodate potential expansion is almost always cheaper in the long run, and certainly less risky, than building a facility with potentially unused capacity. This is discussed in more detail in Section 6.8.

4.5.1 Potential for Future Frozen Storage Expansion

The preliminary design plan for the refrigerated warehouse facility includes the potential to expand the -20°F storage area by 60 percent. The future addition of a 160 ft. × 40 ft. area would add 6,400 square ft. of refrigerated warehouse space, which would provide a capacity of approximately 3,000,000 lbs. of storage. It's entirely conceivable that this space could be expanded in stages. A 40' depth would allow expansion of 80, 120 or 160' wide at one time, or in as many as three stages.

The refrigeration equipment for such an expansion could be located in the existing refrigerator equipment room if the addition was 3,200 square feet or less. A larger addition would require an addition to the refrigeration equipment room. A 3,200 square ft. storage addition would increase electrical energy costs by approximately 13 percent per year and would require an additional full-time warehouseman and casual labor during peak periods.

4.5.2 Potential for a Processing Unit

Custom processing capacity has been cited as a potentially important feature of a full-service refrigerated warehouse facility. The design and feasibility of such a processing area is technically beyond the scope of this project. Nonetheless an area of approximately 5,200 square feet for such an expansion has been provided in the preliminary drawing shown in Figure 1. This space can accommodate a separate truck dock and unloading area, as well as a processing line and associated equipment. Contacts were made with suppliers of processing equipment. These suppliers indicated that a simple head and gut processing line, with capacity to process 80,000 lbs. of fish per day, would be relatively inexpensive, on the order of

$200,0000 in 1998 dollars. Appendix E includes two designs supplied by Coastline Equipment, and Flour Metal Fabricators.

4.6 Potential Sites for a Refrigerated Warehouse Facility in Juneau

During the site visit in September 1997, a total of seven sites were identified, and visited. These sites are listed and described below, and shown in Figure 23. Many of these correspond with locations suggested and discussed during conversations with potential users of the refrigerated warehouse facility. The list of sites described in this section is not meant to suggest any order of preference, nor is it assumed that other sites may not be included in later phases of the project.

Site 1 - Channel Marina: This is a relatively constrained site right on the water, midway between Juneau City proper and Lemon Creek. It has water, sewer, and power on the property but appears to have inadequate available land area. The original marina facility recently burned down, and a new warehouse structure is on site.

Site 2A - Channel Sanitation: This site is near the Channel Sanitation incinerator at the landfill. There are two locations possible. Site 2A is located on the landfill and encompasses 43 acres. It is largely underlain by garbage. This uncompressed fill will not likely support a building.

The site is adjacent to the Channel Sanitation's incinerator, which offers a ready source of relatively high-grade heat. It would be nice to be able to purchase this energy from Channel Sanitation and make use of refrigeration machinery that employs heat. Unfortunately, with the size of the refrigeration load (approximately 35 tons), and the extreme cold evaporator temperatures required for refrigerated warehouse storage, it does not appear that a steam based chilling system will be economically feasible.

Site 2B - Industrial Park: This site is situated in the new Lemon Creek Industrial development area. This site would rest on one of the development lots in the area. Flat ground, good subsurface soils, new water, sewer and power services are present. However, many of the lots are already taken and a site of suitable size could not be found in the area.

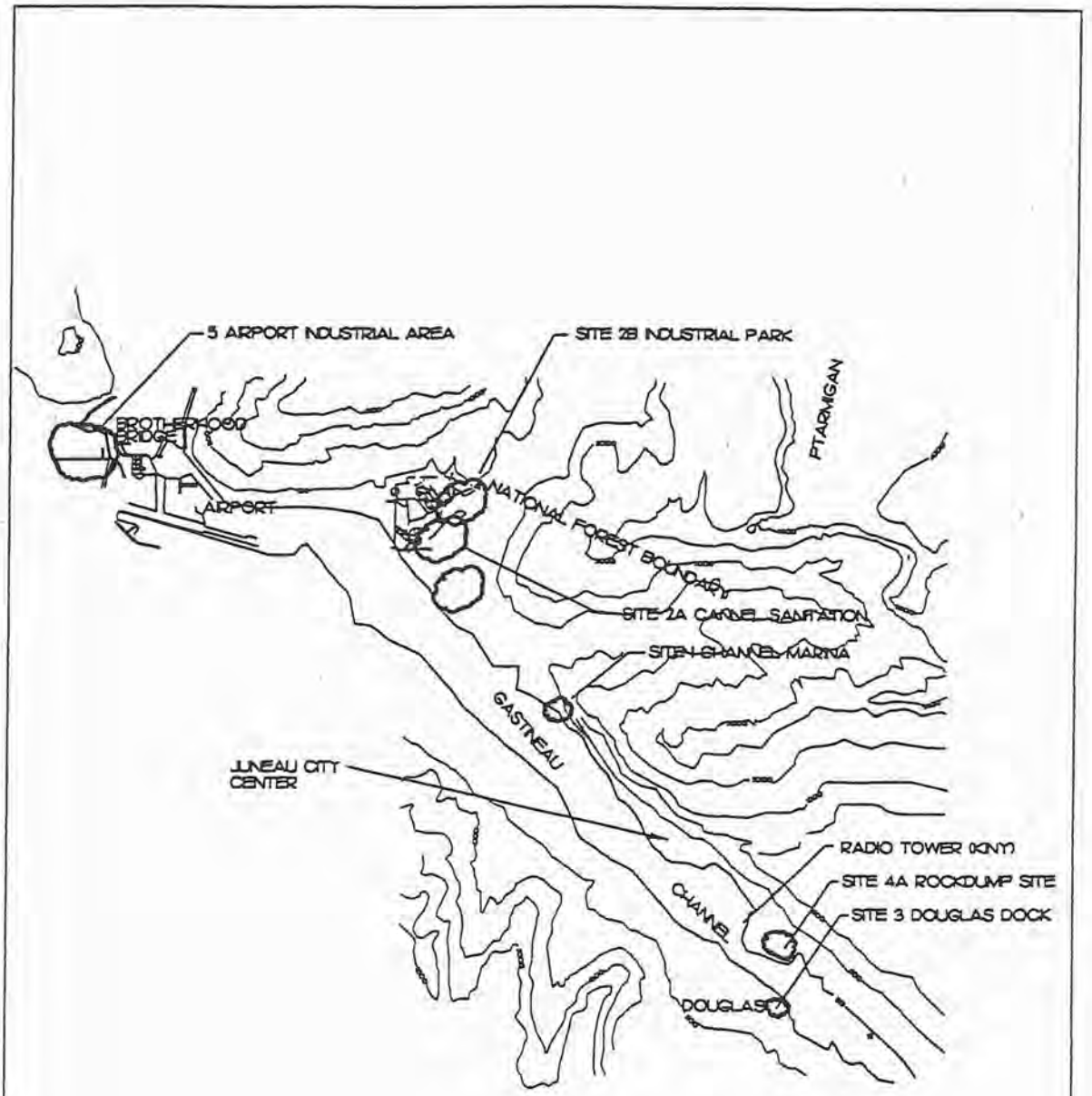
Site 3 - Douglas Dock: This site is an aging dock structure at the mouth of the Douglas Small Boat Harbor. Water access is excellent at this location, but road access is problematic, given its present location in a predominately residential area. There is power, water and sewer available, but the dock structure looks to be deteriorating significantly, and the size of the dock structure is small.

Site 4A - Rock Dump Site: This large, man-made, mine-tailing pile landmass is gradually being employed for industrial development. This site has adequate water, sewer, and power and there appears to be plenty of land available. It is readily accessible via roadway, and there is a private dock nearby.

Site 4B – Small Rock Dump Site: This smaller site is southeast of the Rock Dump Site, situated at the outlet of Snowslide Creek. The landmass is small, approximately 2 acres in size, and is presently being used as a sludge dump site by the water treatment plant. There is no water or sewer at the site.

Site 5 - Airport Industrial Area: A site in this area was vaguely described, but no site was ever pinpointed.

Figure 23: Map of Potential Sites for Location of a Refrigerated Warehouse Facility



4.6.1 Site Selection Process

The needs of the refrigerated warehouse facility should probably drive site selection directly. In order to be a profitable enterprise, the site picked for construction must have attributes that minimize operation expenses. A two-tier evaluation process was used. The first tier examines geographic features and utility availability. The second tier examines compatibility issues.

4.6.1.1 1ST TIER ANALYSIS OF SITES

In the first cut, basic requirements of available land, utilities (power, potable water, and sewer), and terrain were reviewed for each location.

- Typically, it is assumed that the minimum size of the development should be no less than 2.2 acres, and it is probable that a successful private entity would desire additional land surrounding the facility to sub-let, lease or sell to value added businesses that require refrigerated warehouse storage.
- Further, it is presumed that power, potable water, firewater, and sewer must be available, because the development will likely involve processors, which typically require large quantities of water and sewer capacity.
- Finally, adequate and acceptable terrain must be present. The facility requires basically flat land without significant grade from one end of the site to the other.

A yes/no analysis was accomplished, and out of the 7 sites the Channel Sanitation Site and the Rock Dump site were advanced to the 2nd tier analysis. This process narrowed down the field of sites so that a more detailed review of promising sites could be accomplished.

Table 43: 1st Tier Analysis - Based on Pass-Fail Criteria

CRITERIA	1 Channel Marina	2A Channel Sanitation	2B Lemon Creek Industrial Park	3 Douglas Dock	4A Rock Dump Site	4A Small Rock Dump Site	5 Airport Industrial Area
Site has Adequate Size	N	Y	N	N	Y	Y	*
Utilities availability	Y	Y	Y	Y	Y	N	*
Terrain – suitable for use?	Y	Y	Y	N	Y	Y	*
Pass to 2nd tier analysis	N	Y	N	N	Y	N	N
Note: 1. * A site in the Airport Industrial Area was never identified.							

4.6.1.2 2ND TIER ANALYSIS OF SITES

The requirements for the site include:

- Traffic flow - good access to the site in the immediate neighborhood of the property.
- Compatible Use - a general industrial use in the area.
- Access on site -a large enough area of land so that property size can be set roughly square.
- Site Suitability for Building Construction - subsurface soil conditions that are suitable for construction of an industrial building and large parking area.

- Accessibility - to a dock facility for the quick unloading of fish.
- Highway Access - access to a major transportation artery.
- Co-Location Feasibility – sufficient land and effluent discharge capacity for processor co-location.

The two sites were rated on each of the requirements on a scale of one to ten; with ten being the best fit. Table 44 summarizes this analysis and concludes that the Rock Dump Site is the preferred site.

Table 44: 2nd Tier Analysis – Ratings for best site performance

CRITERIA	Maximum Possible Score	2a Channel Sanitation	4a Rock Dump Site
Traffic flow	10	10	10
Compatible Use	10	10	10
Access on site	10	6	10
Site Suitability for building construction	10	1	6
Dock Access	10	0	8
Highway Access	10	4	7
Co-location feasibility	10	5	10
Sub-total – raw scores	70	36	61
Normalized Score (0 to 100, 100 best)	**100**	**51.4**	**87.1**
Note: Selection Criteria Scores are:	Least conducive to planned development = 0 Best fit for planned development = 10		

4.6.2 Discussion of Site Finalists

4.6.2.1 Channel Sanitation Site

There is adequate area for a refrigerated warehouse facility situated adjacent to the Channel Sanitation Incinerator facility. The site is approximately 40 acres in size, with good road access. While there is a significant amount of land area available, the majority is underlain with compressed landfill. In order to construct the refrigerated warehouse facility, this landfill would need to be mined and replaced with competent soils. This would also be the case if value added businesses came into the same area.

There were initial thoughts that locating the refrigerated warehouse facility adjacent to landfill's incinerator could make use of the large amounts of energy in the incinerator exhaust gas stream. The incinerator equipment presently vents all products of combustion to the atmosphere, through a bag house arrangement. There is space in the landfill's incinerator facility for a steam generator, to reclaim some of this heat, but a project has not yet been put together.

The expected lighting and refrigeration electrical demand will not exceed 100 Kwe, under the development presently envisioned. However, it is unlikely that a cost-effective project could be developed to create this 100 Kwe with the waste heat stream from the incinerators at Channel Sanitation. A recent report by Harris Group Engineers, indicates that a full scale power development to make use of this energy will not be economically feasible.

In the context of using the heat to create refrigeration directly, an assessment of available technologies indicated that most direct heat/refrigeration cycles create chilled water effectively, which is very good for building cooling. However, there is no readily available equipment that can create the evaporator temperatures of down to –40°F required for this facility. Given the smaller size of the systems a hybrid was not deemed reasonable.

In the event that a processor co-located with the facility, disposal of effluents from this site could be problematic, and would most likely have to rely on the city's sewage system. This would likely mean higher costs for effluent processing, when compared to a location where effluents could be discharged directly into Gastineau Channel.

The rating for this site (included in Table 44) shows a normalized score of 51.4 out of a possible 100.

4.6.2.2 Rock Dump Site

The analysis indicates that this site is the best candidate of the sites investigated for the refrigerated warehouse facility. The normalized score in Table 44 was 85.0. With over 22 acres, there is plenty of undeveloped land, which could accommodate processors wishing to co-locate with the facility. If processors did co-locate, effluent discharge could be routed into Gastineau Channel. (See the discussion in Section 4.7.1.) Sewer and water are available nearby. There is a private dock on adjacent property for which access can probably be negotiated. There is good access to Thane Road, which is a primary artery. Access to the site does not require transport through residential areas. Subsurface soil conditions are not optimal, but there are indications that the soils will not inhibit construction.

4.7 Permits and Other Considerations

The development of a refrigerated warehouse facility may involve the acquisition of various permits, from processing permits to permits for wastewater effluent discharges. The following section will discuss some of these requirements, but is not intended as a checklist of all necessary permits.

4.7.1 Processing and Environmental Permits

There is some level of debate about whether a refrigerated warehouse facility as proposed and designed in this document would technically be required to file an Intent to Operate as a processor with the State of Alaska. In theory, the facility would not be engaged in raw product processing or fish buying (activities that do require filing), and would not be discharging significant quantities of effluent. However, the application form used to apply for ADF&G processing permits is the same form used to comply with requirements of the Alaska Department of Environmental Conservation (ADEC), Alaska Department of Revenue (ADR), and the U.S. Environmental Protection Agency (EPA).[7] According to ADEC and EPA contacts, it is very likely that the proposed refrigerated warehouse facility will be required to apply for their permits, even if they are not required to do so by ADF&G or ADR.

If one or more processors chose to co-locate with the refrigerated warehouse facility, they would have to file for permits with the agencies listed above. Because processors generate more significant amounts of effluent, their permit applications would be closely scrutinized. According to Jeff Hock of the ADEC, processors would have to develop effluent discharge plans to the satisfaction of ADEC and EPA. Hock indicated that none of the water bodies in the Juneau area are currently listed as threatened. However, if a processor wished to discharge effluents directly into Gastineau Channel, it would be best if it could be accomplished in deeper water where there is more current and mixing in the water column.

4.7.2 Hazard Analysis and Critical Control Point (HACCP) Plans

Since a refrigerated warehouse facility as designed will be involved in manufacturing food for human consumption, it will be required to develop a Hazard Analysis and Critical Control Point (HACCP) plan. Regardless of requirements, it is will be easier and more cost effective to incorporate the HACCP criteria and standards in the planning phases of the project, rather than implementing them retroactively.

[7] The application packet and instructions may be found at the Internet site of ADF&G's Division of Commercial Fisheries at http://www.state.ak.us/local/akpages/FISH.GAME/cfmd/cfmdhome.htm.

HACCP standards have been developed as an effective and rational means of assuring food safety from harvest to consumption.[8] Preventing problems from occurring is the paramount goal underlying any HACCP system.

HACCP is a systematic approach to the identification, evaluation, and control of food safety hazards based on the following seven principles:

Principle 1: Conduct a hazard analysis.
Principle 2: Determine the critical control points (CCPs).
Principle 3: Establish critical limits.
Principle 4: Establish monitoring procedures.
Principle 5: Establish corrective actions.
Principle 6: Establish verification procedures.
Principle 7: Establish record-keeping and documentation procedures.

Under such systems, if a deviation occurs indicating that control has been lost, the deviation is detected and appropriate steps are taken to reestablish control in a timely manner to assure that potentially hazardous products do not reach the consumer.

4.7.2.1 ISO 9000 STANDARDS

ISO 9000 standards are developed by the International Organization for Standardization (IOS) is based in Switzerland, which has over 100 member countries. The IOS creates a variety of standards on products, processes and information technology, through international consensus. The IOS is not an enforcement agency and adherence is voluntary.

ISO 9000 standards are not a requirement of food processing facilities in the United States, but rather are international quality standards. IS0 9000 standards rely on an assurance that each point in the production process is operating under conditions leading to quality products. While ISO 9000 standards are not a requirement, it may make sense to design and develop the refrigerated warehouse, so that is could meet these requirements. This may satisfy particular needs of clientele and may be used as a marketing tool for client activities.

[8] This section is adapted from Hazard Analysis and Critical Control Point Principles and Application Guidelines. August 14, 1997. National Advisory Committee on Microbiological Criteria for Foods. The document can be found at http://www-seafood.ucdavis.edu/guidelines /nacmcf.htm.

5 FINANCING CONSIDERATIONS

Financing a publicly owned refrigerated warehouse facility is to a large degree a matter of political will. If the governing bodies favor the proposal then within the limits of their resources, they are more likely to help find ways to fund the project.

Within the City and Borough Juneau government, entities certain to play a role in the decision include the Assembly, the Finance Department, the Engineering Department, the Juneau Docks and Harbor Department (JDHD), and the Fishery Development Committee. The involvement of other quasi-public entities will depend on the final specifications of the project. Some of these might include the Juneau Economic Development Council (JEDC), the Alaska Economic Development and Export Authority (AIDEA), and the Alaska Commercial Fishing and Agriculture Bank (CFAB). Involved state agencies might include Department of Commerce and Economic Development (DCED) and the Department of Community and Regional Affairs (DCRA), and perhaps the State Legislature.

The following section will discuss several key financing instruments and issues, and will detail the involvement of some of the agencies mentioned above.

5.1 TAX-EXEMPT BONDS

According to Craig Duncan Finance Director of the City and Borough of Juneau, tax-exempt revenue bonds would appear to be a feasible financing option. These loans are currently available at 5.5 percent interest for up to 20 years. There are limits on the amount of financing available. The City's bond counsel would have to make a decision whether or not such a loan would qualify for tax-exempt status. Finally, the ability to actually sell the bonds will depend on the revenue stream of the project.

Another potential tax-exempt bond source would be General Obligation Bonds, which are backed by the full faith and credit of the community. This type of bond issue generally requires a vote of the public and would probably be necessary only if the projected revenues of the facility could not be counted upon to repay the debt.

5.2 SOUTHEAST ALASKA ECONOMIC FUNDS

The Southeast Alaska Economic Fund (SAEF) was established to assist communities dependent on the Tongass National Forest. The City and Borough of Juneau will receive over $4 million from this source. The funds are currently ceded to JEDC, which is authorized to use the funding as a revolving loan fund. JEDC has received approximately $2 million to date, and has about $800,000 available for projects.

According to Charlie Northrup, Executive Director of JEDC, a refrigerated warehouse facility would be a good candidate for assistance, and he could foresee the possibility of providing a loan for operating expenses during the initial years of the project. Such a loan would very likely enhance the marketability of any revenue bonds the city might issue.

5.3 ASSISTANCE FROM THE JUNEAU DOCKS AND HARBOR DEPARTMENT

Joe Graham is the Port Director for the JDHD. According to Graham, the JDHD would look favorably upon a refrigerated warehouse facility as a means to increase fish tax revenue. Currently, the City and Borough of Juneau funds the JDHD with the Borough's share of State fish taxes. Graham also indicated that the Board of Directors might be willing to consider the possibility of providing land for such a facility, particularly if it is developed at the Douglas Small Boat Harbor, once it is dredged and the upland fill areas are stabilized. Graham also indicated there might be a willingness to use at least part of any increases in fish-taxes resulting from the facility to aid in financing if needed.

5.4 Joint Private/Public Ownership

Several processors and even a refrigerated warehouse operator expressed an interest in joint private/public funding of the facility. The particulars of how this could work need to be developed. One possibility that was expressed would involve venture capital from private interests, who would then receive a return on that investment, as the facility became profitable. Such an arrangement could prove beneficial if operating costs in the early years of the project exceed revenues.

Another avenue of joint private/public ownership is the possibility that the administrative burden of the facility be contracted to a larger warehouse operation. According to industry sources this could significantly reduce administrative operating expenses.

5.5 Other Funding Options

The Economic Development Administration (EDA), an office of the U.S. Department of the Commerce, has made loans in the past to organizations around the state for refrigerated warehouse facilities. EDA has had low success with these ventures and may be reluctant to loan more money for additional facilities. EDA is not a potential source of funds unless a strong positive balance sheet can be constructed for the operation, if the project shows that jobs may be saved or added, and all additional criteria for EDA participation are met. EDA officials also commented that DIPAC has already applied for funding from the EDA, and it is therefore less likely that another project in the Juneau area would be considered.

Another potential funding source is the CFAB. CFAB makes loans to fishers and processing plants in the state and might be a logical source of funding since the facility is to be owned by the City and Borough of Juneau. As a member cooperative, CFAB would require that the owner(s) purchase an additional 5 percent of the loan value in CFAB Class B stock. This would increase the cost of debt service for the facility and make it more difficult for the operation to achieve break-even status.

AIDEA would be another potential source of funding. AIDEA funding would most likely be in the form of loan participation.

Possible state funding sources include the DCED and the DCRA. Both have made grants for economic development projects around the state. In addition, the city could approach the legislature directly for a legislative appropriation for part of the capital cost of the project.

Private banks such as the National Bank of Alaska (NBA) are involved in many municipal capital projects throughout the state. Even if the refrigerated warehouse facility shows a deficit, the bank likely would be willing to make the loans toward its development, if the city guaranteed repayment of the loan. Other banks may also be willing to participate, but NBA is used as an example of private-sector financing sources.

6 FINANCIAL *PRO FORMA* OF THE PROPOSED FACILITY

Pro forma estimates of the capital costs, revenues, and operating expenses for the proposed refrigerated warehouse facility have been developed using industry standards, engineer's estimates, and best estimate calculations where necessary. Cost and revenue estimates were developed using the best available current price information and then adjusted for inflation, which is assumed to be 3 percent per year. Since the analysis assumes the facility will be built in 1999 with operations to begin in the year 2000, construction costs are assumed to be 3 percent greater than the cost estimates provided by the engineering study. Annual operating costs and revenues change each year due inflation and due to changes in product flows. The *pro forma* assumes the project is financed with a 20-year tax-free revenue bond at 5.5 percent interest.

6.1 CAPITAL COST ESTIMATE

Table 45 shows the estimated initial costs of a refrigerated warehouse facility as presently designed and built in 1999. The facility contains 12,000 square feet of refrigerated warehouse space estimated to hold a capacity of 5,000,000 pounds. An additional 4,000 square feet for offices and refrigerated dock space is included. The total estimated cost for the refrigerated warehouse facility as designed is $3,782,285 . The cost estimate includes a 10 percent contingency cost to allow for expenses that were inadvertently omitted or understated. The estimate also includes a 2 percent financing charge and interest during construction, both of which are subsumed into revenue bond. Average structural cost for the facility was estimated at $153.10 per square foot. Costs for the insulated warehouse doors were estimated separately. Fees for architects and engineers were added at 7 percent of the structure and door cost. Refrigeration and blast freezing equipment was estimated based on the total refrigerated warehouse space in the facility. It was assumed that 2 forklifts would be required, and that office equipment would cost an average of $10.30 per square foot. Costs of initial supplies of pallets and totes were also included. Site specific land costs for the preferred site at the rock dump, were assumed to be 120 percent of the assessed value per acre. Sewage installation costs were based on a linear foot estimate, and parking lots costs were based on square footage. Overall it is estimated that the facility will cost $0.76 per pound of storage capacity.

Table 45: Estimated Financed Capital Costs of the Refrigerated Warehouse Facility

ITEM	units	# of units	$ per unit	Total cost ($)
Structural costs total	sq. ft.	16,000	153.10	2,449,587
Insulated warehouse doors	doors	9	4,780.92	43,028
Architectural & engineering fees (7% of structure and doors)				174,483
Refrigeration / blast freezing equipment	sq. ft.	12,000	7.73	92,700
Forklifts	units	2	51,500.00	103,000
Office equipment	sq. ft.	1,600	10.30	16,480
Pallets	units	2,000	6.13	12,257
Totes	units	500	41.46	20,729
Land costs	acres	2.2	127,720.00	280,984
Sewage and utility installation	ln. ft.	200	257.50	51,500
Parking lot	sq. ft.	31,200	1.16	36,050
Subtotal of capital costs				3,280,798
Contingency cost at 10% of subtotal				328,080
Interest charges during construction at 5.5% on 50% of subtotal plus contingency				99,244
Finance charge at 2% of subtotal plus contingency and construction interest				74,162
Total Financed Capital Cost				**3,782,285**

6.2 THROUGHPUT AND INVENTORY ASSUMPTIONS

A set of assumptions regarding the number of pounds moving through the refrigerated warehouse facility was developed, creating a hypothetical scenario upon which to base the *pro forma* analysis for revenues and expenses. Assumptions also were made about the timing of product flows and the duration of storage, on a species by species and year by year basis. These kinds of detailed assumptions are necessary because, as described in Section 2.2.6, refrigerated warehouse facilities charge not only for storage, but also for handling as product moves in and out of the facility.

6.2.1 Total Product Into Storage

Total Product Into Storage: The estimated total demand for refrigerated warehouse space (5,531,000 pounds) as calculated in Section 3.4, was used as an estimator for the upper limit of pounds coming into the facility. In an effort to produce a conservative estimate of revenues, the *pro forma* assumes that the total pounds entering the facility ramps up gradually over the initial 10-year period to a level equal to the estimated total demand. A summary of throughput and inventory assumptions (in CWT) for the first ten years of operations is shown in Table 46. Total inventory by month for each of the first ten years (starting in March) is shown in Figure 24. The analysis assumes that during the second ten years the facility will operate at the same level as seen in Year 10, when as shown in Table 46 shows, the total moving into storage is 55,310 CWT. Specific definitions for each of the remaining columns in Table 46 follow.

Total Product Out of Storage: In general the amount of product that leaves the facility cannot exceed the total amount of the product that has come into the facility. The analysis assumes that the longest any product stays in storage is 11 months.

Total Product Handled: This is the sum of the amount of product coming in and the amount of product going out. Total product handled is assumed to increase every year through the ramp-up period.

Maximum Inventory: This is calculated as the maximum inventory at any time during the year. The assumed timing of product flow results in maximum inventories during either October or November. Maximum inventory in the 10th year of operation is 90 percent of the theoretical capacity of the facility.

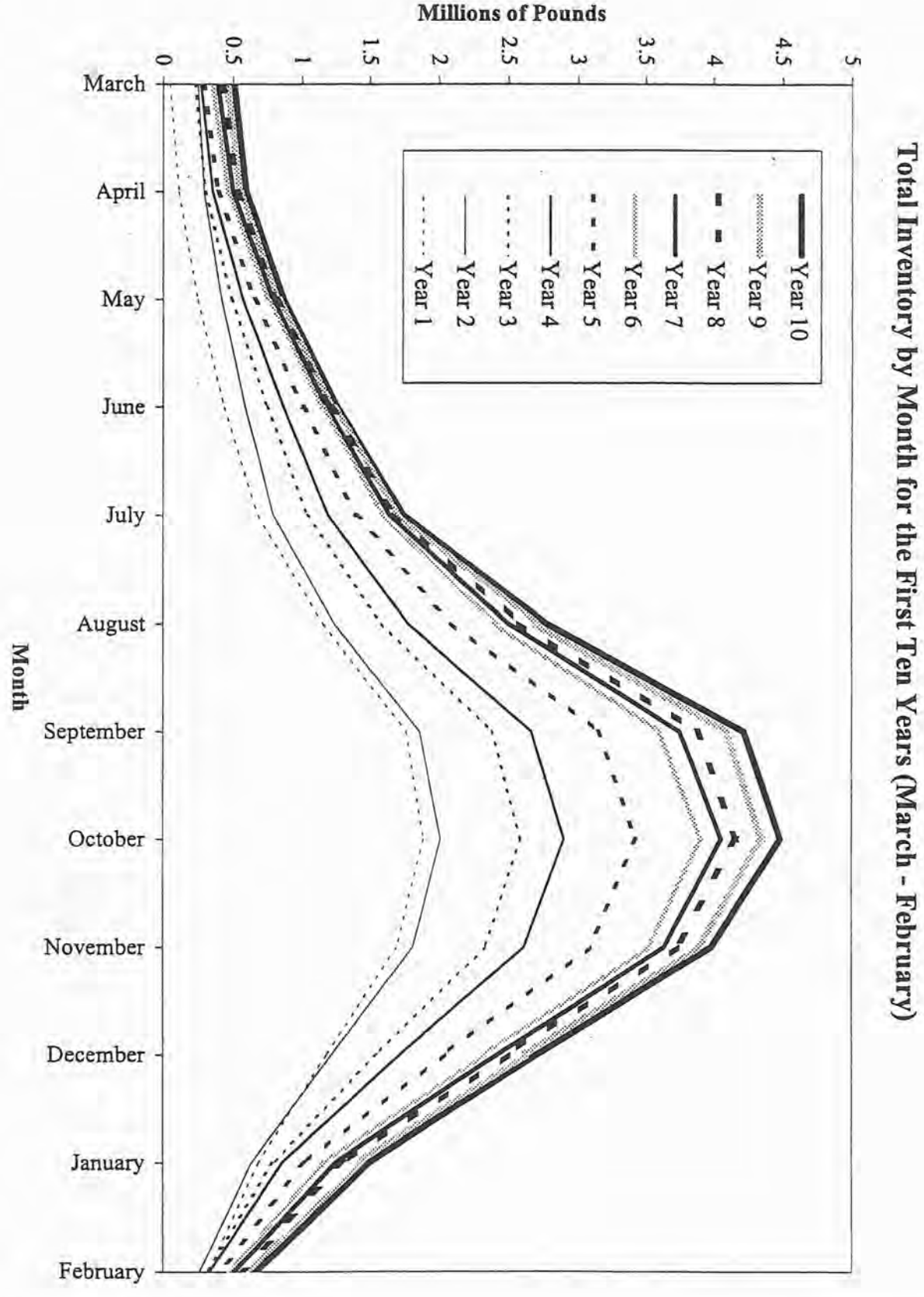
Lockers: Annual locker rentals are assumed to follow a similar but quicker ramp-up over the first four years to a level equal to the maximum demand of 880 lockers as estimated in Section 3.3.

Blast Freezer Throughput: Annual blast freezer throughput is assumed to be a fixed proportion of the total product coming into the refrigerated warehouse facility. The analysis assumes this proportion to be 35 percent. This results in blast freezer throughput of 7,992.6 CWT in the first year of operations, and increases to 19,358.5 CWT in Year 10.

Table 46: Throughput and Inventory (CWT) Assumptions for the First Ten Years of Operations

Operation Year		Total Into Storage	Total Out of Storage	Total Handled	Maximum Inventory	Locker Rentals (#)
Year 1	2000	22,836	11,035	33,871	18,893	220
Year 2	2001	24,069	23,705	47,774	20,145	440
Year 3	2002	31,035	27,727	58,762	25,877	660
Year 4	2003	35,033	33,325	68,358	29,013	880
Year 5	2004	41,347	38,141	79,488	34,305	880
Year 6	2005	47,258	44,395	91,653	39,079	880
Year 7	2006	49,263	48,293	97,556	40,546	880
Year 8	2007	51,015	50,297	101,312	41,655	880
Year 9	2008	53,576	52,293	105,868	43,543	880
Year 10	2009	55,310	54,455	109,765	44,841	880

Figure 24: Total Inventory by Month for the First Ten Years (March - February)



6.3 Revenue Assumptions

The assumed tariffs for various services offered at the refrigerated warehouse facility as designed are shown in Table 47. These tariffs are included to estimate potential revenues, and are not meant to imply a rate structure for the actual facility. The tariffs are based on the averages at refrigerated warehouse facilities in the Pacific Northwest, which were discussed earlier in Section 2.3.4 and Table 3, and are not adjusted for inflation in the table. Within the *pro forma*, tariffs will increase by the inflation rate each year. Table 47 includes a column showing the City and Borough of Juneau sales tax and adjusts the tariffs accordingly. Sales taxes are assumed to be paid by customers and are included as a line item in both the revenue and expense estimates. The tariffs include the assumption that 35 percent of the product moving into the facility will be run through the blast freezer. Further it is assumed that 25 percent of the product that runs through the blast freezer will be washed, sorted, and graded and then packed in boxes. Finally, it is assumed that some customers will choose to purchase pallets and totes for shipping and handling. Revenues on materials are assumed to be 30 percent above the cost of goods sold.

Table 47: Assumed Tariffs Used in the *Pro Forma* Analysis

Item	Usage assumptions	Rate ($ / unit)	Total rate ($ / unit) with 4% sales tax
Freezing & glazing	35% of pounds coming in are frozen	9.33 per CWT frozen	9.703
Wash, & grade	25% of pounds frozen are washed, & graded	2.83 per CWT graded	2.943
Packing & boxing	25% of pounds frozen are packed	8.46 per CWT packed	8.798
Handling/dock fee	100% of pounds coming in	2.58 per CWT moved	2.683
Monthly storage	100% of pounds in storage	0.99 per CWT stored	1.030
Pallets	1 pallet sold for every 5000 lbs. coming in	8.50 per pallet purchased	8.840
Tote	1 tote sold for every 10,000 lbs. coming in	57.50 per tote purchased	59.80
Annual locker fee	All lockers are 3 cubic feet	83.000 per locker rented	86.320

6.4 Operating Expense Assumptions and Estimates

Operating expense assumptions and estimates are discussed in two sections. The first is specific to the cost of energy and the second looks at the remaining expenses and compiles annual operating budgets.

6.4.1 Energy Use and Expense Estimates

Expenses to supply the electricity to the refrigerated warehouse facility are a large portion of the annual operational budget. As mentioned in Section 4, energy expenses for the refrigerated warehouse facility are dependent on the following:

1) Electric rates.
2) The size of the building.
3) The operating environment, e.g. outside temperature, operating hours, daylight hours.
4) The amount of product handled (see Table 46).
5) The amount of product in storage (see Table 46).
6) The amount of product through the blast freezer, assumed to be 35 percent of product moving in.

Alaska Electric Light and Power (AEL&P) supplies electricity to the Juneau area. AEL&P provided estimates of appropriate energy rates for large commercial operations. These rates as of 1997 are shown in Table 48. In the *pro forma* the rates will be adjusted for inflation. AEL&P rates are higher during peak periods, from November to May, than during off-peak periods (June through October). AEL&P will assess large companies a $95 customer charge each month. In addition, they impose a charge based on the highest instantaneous load achieved during the month (demand charge). For example, if during November, the instantaneous load peaks at 47 kilowatts, then the demand charge will be calculated as 47 × $10.61 = $498.67. Finally, AEL&P charges for total energy usage. The energy usage charge has several components, which together add up to the total energy charge as seen in the last row of the table.

Table 48: AEL&P Electric Rates for Large Commercial Operations

	Peak Period Nov-May	Off Peak Period Jun-Oct
Customer Charge	$ 95.00	$ 95.00
Demand Charge (per Kilowatt at peak load)	$ 10.61	$ 6.77
Energy Usage Charges per Kilowatt-hour (kWh)		
Energy Charge	$ 0.046900	$ 0.044000
Power Cost Adjustment	$ 0.003500	$ 0.003500
Regular Cost Charge	$ 0.000297	$ 0.000297
Total Energy Charge per kWh	$ 0.050697	$ 0.047797

Energy expense estimates for selected years are shown in Table 49, and were based on the electric rates shown in Table 48, and the inventory and throughput estimates in Table 46. These expenditures have been adjusted for inflation.

Table 49: Total Estimated Electric Expense for Selected Years

	Year-1	Year-3	Year-5	Year-7	Year-9	Year-11
Total Estimated Electric Expense	$ 34,365	$ 40,385	$ 47,497	$ 54,972	$ 62,394	$ 64,481

6.4.2 Other Operating Expenses

Year-1 operating expenses are shown in Table 51. The assumptions, upon which each expense item is based, are detailed within the table. Many of these assumptions were also discussed in general terms in Section 4, which describes the building design and equipment requirements, and in Table 45, which details the initial capital costs of the facility.[9] Many of the annual operating-expense items are associated with this particular building design and site. Items such as debt service or insurance could change substantially if the design or building site are altered. Other expenses are dependent on the amount of storage and freezer throughput (e.g. utilities and casual labor).

Perhaps the most significant assumption is that 100 percent of the project can be financed with a 20-year tax-exempt revenue bond at 5.5 percent interest. This assumption has been included as a starting point. If it appears that revenues over the life of the project exceed expenses under this assumption, then it may indeed be a feasible financing option. If expenses exceed revenues over the life of the project, then other financing arrangements may be necessary. It should also be noted that it is likely that there will be indirect expenses associated with the project, that are not included in the *pro forma* analysis. These indirect expenses are related to city oversight in the contracting and development process of the facility.

[9] A generalized template for operating expenses was provided by Mr. Dick Fisher, who owns and operates several refrigerated warehouse facilities in Oregon and Washington. Mr. Fisher has expressed an interest in Juneau facility.

Table 50: Operating Expense Assumptions for Year 1

Year 1 operating expense assumptions	Expense ($)
Debt service on $ 3,782,285 @ 5.5%	316,499
Salaries – Warehouse @ 2 full-time	95,481
Salaries – Office @ 2 full-time	63,654
FICA Payroll Taxes – Warehouse	7,304
FICA Payroll Taxes – Office	4,870
Benefits – Warehouse	16,940
Benefits – Office	12,166
Sewer and Water	4,240
Electric	34,365
Garbage: $100 per month	1,273
Insurance: 1% of Building and Equipment	34,377
Maintenance: 1% of Plant & Equipment	34,377
Equipment Replacement Fund: 10% of Equipment	30,575
Property Taxes: 1.15% of Total Capital Cost	44,030
Sales Tax 4% of Sales (are also added to revenues)	16,316
Office Costs	10,609
Permits and Professional Fees	5,305
Phone Costs	10,609
Packing Material (cost of goods sold)	9,328
Pallet and Tote (cost of goods sold)	13,140
Casual Labor	72,315
Subtotal of estimated operating costs	836,905
Contingency operating costs @ 10% estimated annual operating costs	83,691
Total Operating Costs	920,596
Assumptions:	
Cumulative Inflator	106%
Maximum Inventory Level During the Year in pounds	1,889,265
Pounds Through Freezer	799,261

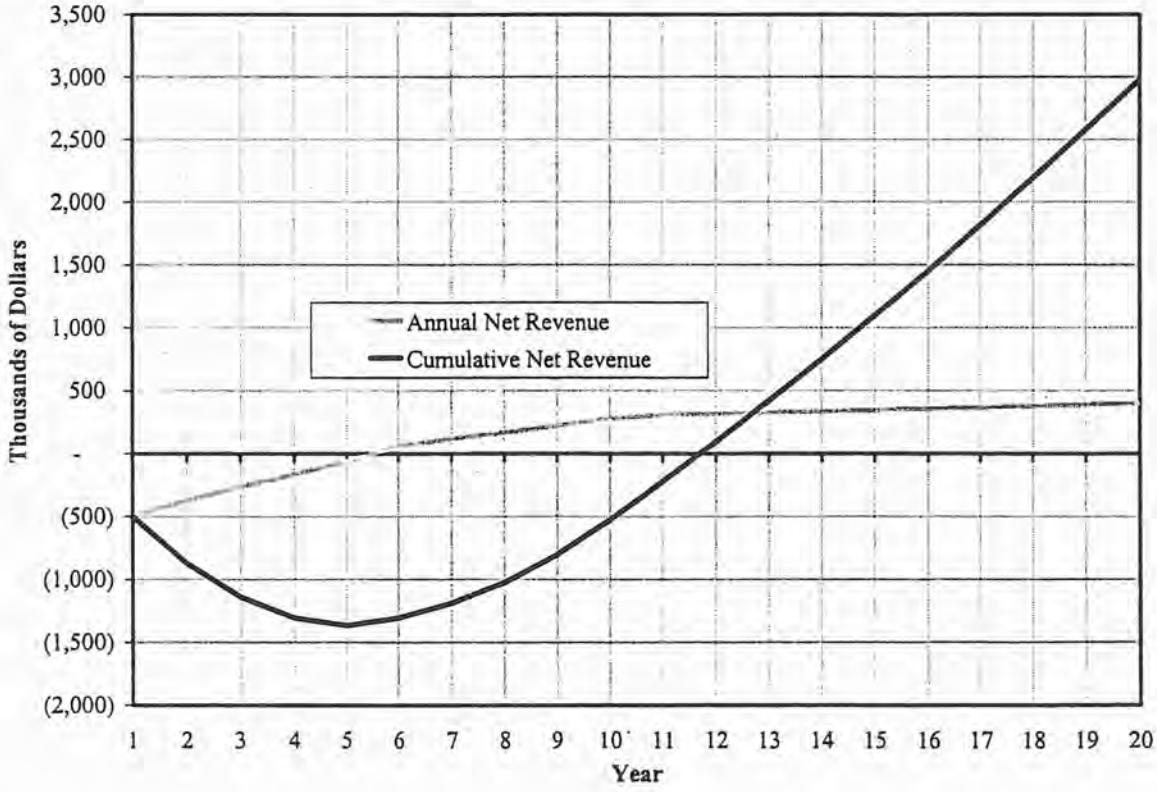
6.5 Net Revenue Projections

Table 51 combines the assumptions regarding inventory, throughput, revenues and expenses to estimate net and cumulative revenues over 20 years. The 20-year revenue stream is also represented graphically in Figure 25. The numbers shown are adjusted for inflation, and are not discounted to present value. As a result of the ramp-up of inventory and throughput, inflation actually improves the bottom line net revenue estimates over time. With the set of assumptions used, net revenues become positive in the sixth year of the project. The cumulative total revenue does not become positive until the 12th year of operation. Over the twenty years depicted, the facility is estimated to accumulate $2,976,469 in net revenues. This represents an internal rate of return of 10.61 percent. It appears that the project will pay for itself in the long run, however, short-run cash-flow problems may need to be addressed with some type of capital contribution, operating subsidy, or other reductions in expenses. Options to improve cash flow will be considered in Section 6.9.

Table 51: Twenty Year Cost and Revenue Projection

Project Year		Total Revenue ($)	Total Costs ($)	Net Revenue ($)	Cummulative Total ($)
Year 1	2000	424,206	920,596	(496,390)	(496,390)
Year 2	2001	575,578	951,318	(375,740)	(872,129)
Year 3	2002	747,215	1,013,479	(266,264)	(1,138,394)
Year 4	2003	896,658	1,061,779	(165,120)	(1,303,514)
Year 5	2004	1,063,288	1,125,438	(62,150)	(1,365,664)
Year 6	2005	1,248,489	1,190,454	58,035	(1,307,629)
Year 7	2006	1,348,636	1,231,843	116,792	(1,190,837)
Year 8	2007	1,436,465	1,272,656	163,809	(1,027,028)
Year 9	2008	1,542,694	1,320,706	221,988	(805,041)
Year 10	2009	1,642,325	1,365,127	277,197	(527,843)
Year 11	2010	1,701,832	1,396,149	305,683	(222,160)
Year 12	2011	1,752,887	1,438,034	314,853	92,693
Year 13	2012	1,805,474	1,481,175	324,299	416,992
Year 14	2013	1,859,638	1,525,610	334,028	751,020
Year 15	2014	1,915,427	1,571,379	344,049	1,095,069
Year 16	2015	1,972,890	1,618,520	354,370	1,449,439
Year 17	2016	2,032,077	1,667,075	365,001	1,814,441
Year 18	2017	2,093,039	1,717,088	375,951	2,190,392
Year 19	2018	2,155,830	1,768,600	387,230	2,577,622
Year 20	2019	2,220,505	1,821,658	398,847	2,976,469

Figure 25: Annual and Cumulative Net Revenue Stream Over 20 Years



6.6 Other Benefits of the Refrigerated Warehouse Facility

In addition to a positive return over the life of the project, the refrigerated warehouse facility is estimated to generate $3,188,802 in sales, property, and fishery business tax revenues for the City and Borough of Juneau. Table 52 shows the projected tax revenues to the City and Borough of Juneau generated by the facility. Annual tax revenues increase from $75,025 in the first year of operations up to $220,220 in the 20th year. Sales taxes are calculated at 4 percent of total revenues. Property taxes are based on a rate of 1.15 percent of the total capital cost before finance charges, and are adjusted to account for inflation. The estimated fish tax is calculated as the difference in fish taxes with and without the refrigerated warehouse facility. The estimates fish tax revenues assume that 25 percent of the pounds coming into the refrigerated warehouse facility would not have been landed in Juneau if the refrigerated warehouse facility did not exist. The estimates of fish tax revenues are also based on the ratio of fish tax revenues to landings in 1995, which as equal to $0.022 per pound[10]. The ratio is adjusted each year for inflation. If a processor chose to co-locate with the facility additional tax revenues would be generated.

Table 52: Projected Annual Tax Revenues to the City and Borough of Juneau

Project Year		Tax Type			Total Tax Revenue	
		Sales ($)	Property ($)	Fish ($)	Annual ($)	Cumulative ($)
Year 1	2000	16,316	44,030	14,680	75,025	75,025
Year 2	2001	22,138	45,350	15,936	83,425	158,450
Year 3	2002	28,739	46,711	21,165	96,615	255,065
Year 4	2003	34,487	48,112	24,608	107,207	362,272
Year 5	2004	40,896	49,556	29,915	120,367	482,639
Year 6	2005	48,019	51,042	35,217	134,279	616,918
Year 7	2006	51,871	52,574	37,814	142,258	759,175
Year 8	2007	55,249	54,151	40,333	149,733	908,908
Year 9	2008	59,334	55,775	43,628	158,738	1,067,646
Year 10	2009	63,166	57,449	46,391	167,006	1,234,652
Year 11	2010	65,455	59,172	47,783	172,410	1,407,062
Year 12	2011	67,419	60,947	49,217	177,583	1,584,645
Year 13	2012	69,441	62,776	50,693	182,910	1,767,555
Year 14	2013	71,525	64,659	52,214	188,397	1,955,953
Year 15	2014	73,670	66,599	53,780	194,049	2,150,002
Year 16	2015	73,670	66,599	55,394	195,663	2,345,665
Year 17	2016	75,880	68,597	57,056	201,533	2,547,197
Year 18	2017	78,157	70,655	58,767	207,579	2,754,776
Year 19	2018	80,502	72,774	60,530	213,806	2,968,582
Year 20	2019	82,917	74,957	62,346	220,220	3,188,802

Notes: 1) Sales taxes calculated at 4% of total revenue.
2) Property taxes calculated at 1.15 % of total capital cost adjusted for inflation.
3) Fish taxes are based on the shared fish tax per pound landed in Juneau in 1995 ($0.025 per pound inflated at 3% per year from 1995), and an assumption that 25% of pounds coming into the facility would have been landed elsewhere if the refrigerated warehouse facility did not exist.

[10] According to *Fiscal Year 1996; Shared Taxes and Fees Annual Report,* published by the Department of Revenue, shared fish taxes to Juneau derived from 1995 landings amounted to $73,273. As shown in Table 8, 3.3 million pounds were landed in Juneau in 1995.

In addition to tax revenues the project is expected to bring at least four full-time permanent jobs and additional part-time employment during peak seasons. Annual wages and salaries range from $167,796 in the first year to $363,706 by Year 11. The construction phase of the project should also generate several temporary construction jobs. If a processor chooses to co-locate with the refrigerated warehouse facility, then these benefits will be even greater.

6.7 Sensitivity Analysis

The *pro forma* estimates are, of course, not guaranteed. Many factors influencing the feasibility of the project could differ from those included in the previous section. This part of the document will examine the sensitivity of the projected revenues to several key variables in the *pro forma*.

6.7.1 Sensitivity to Tariff Rates

The analysis assumed that tariffs are set equal to the average of prices at the two refrigerated warehouse facilities from the Pacific Northwest. Table 53 shows the sensitivity of the projected revenues to changes in tariffs. The table shows the estimated changes over the 20-year period in the internal rate of return (IRR), cumulative net revenue, cumulative tax receipts, and cumulative total return under different tariff assumptions. For simplicity, the analysis of tariff sensitivity does not change the product flow into the facility with changes in tariffs. Of the three facilities examined, tariffs at Sitka Marine Services were the lowest. Using their tariffs where applicable, the facility does not generate a positive net revenue stream over the 20-year period. Using tariffs from Bellingham Cold Storage, or using the average of all three plants, the IRR drops by more than half. If tariffs from SeaFreeze are used, then the IRR increases to over 16 percent. Tax receipts to the City and Borough of Juneau are less sensitive to changes in tariffs.

Table 53: Sensitivity of Revenues and Taxes to Changes in Tariffs

	IRR	Revenue ($)	Taxes ($)	Total Return ($)
Average of Pacific Northwest	10.61%	2,976,469	3,188,802	6,165,271
Average of All	5.15%	1,303,824	3,122,306	4,426,130
Bellingham Cold Storage	4.31%	1,071,232	3,110,587	4,181,819
SeaFreeze Inc.	16.19%	4,881,707	3,267,017	8,148,724
Sitka Marine Services	N.A.	(2,041,466)	2,989,312	947,846

6.7.2 Sensitivity to Inflation Rates

The projected revenue stream generated by the refrigerated warehouse facility is relatively sensitive to assumptions about inflation because a large portion of annual operating cost is the fixed debt service payment. Thus, if tariffs and other costs increase with inflation, annual revenues will increase more than annual costs. The sensitivity of the revenue and tax receipts to the City and Borough of Juneau to inflation are shown in Table 54. The baseline analysis assumes that inflation will continue at three percent for the 20-year period of the analysis. If instead, the analysis assumed there would be no inflation, the refrigerated warehouse facility would still generate an internal rate of return 1.05 percent. If inflation is 1.5 percent (one-half the assumed rate), then the internal rate of return is estimated to be 6.3 percent. Tax receipt estimates are less sensitive to inflation then revenues, but are nonetheless impacted.

Table 54: Sensitivity of Revenues and Taxes to Changes in Inflation Rates

	IRR	Revenue ($)	Taxes ($)	Total Return ($)
3% Inflation	10.61%	2,976,469	3,188,802	6,165,271
No Inflation	1.05%	180,384	2,570,340	2,750,724
1.5% inflation	6.30%	1,407,589	2,856,050	4,263,639
5% inflation	15.56%	5,749,792	3,718,423	9,468,215

6.7.3 Sensitivity to the Ramp-up Period

The analysis uses a conservative assumption that product flow into the facility will ramp up over a period of ten years to 5,531,000 pounds (the level of demand estimated from the survey of users). If the ramp-up period is shorter than projected, then the net revenue over the 20-year period will be greater. Table 55 shows the sensitivity of the 20-year revenue stream to changes in the length of the ramp-up period. If only five years pass until the projected demand level is attained, then the internal rate of return increases to nearly 19 percent.

Table 55: Sensitivity of Revenues and Taxes to Changes in the Ramp-up Period

	IRR	Revenue ($)	Taxes ($)	Total Return ($)
10-year Ramp-up	10.61%	2,976,469	3,188,802	6,165,271
7.5 year Ramp-up	11.92%	3,250,882	3,204,144	6,455,025
5 year Ramp-up	18.99%	4,106,351	3,249,544	7,355,895
2.5 year Ramp-up	31.26%	4,772,226	3,285,187	8,057,413
No Ramp-up	310.01%	5,414,499	3,319,445	8,733,944

6.7.4 Sensitivity to Financing Rates

The analysis assumes that the refrigerated warehouse facility can be financed with a tax-free revenue bond paying 5.5 percent interest. If interest rates increase, or if a tax-free revenue bond is not approved by the City's bond counsel, then debt service payments could increase, reducing the project's return. As seen in Table 56, the internal rate of return for the project decreases roughly 2.5 percentage points for every percentage point increase in interest. The facility is projected to generate a positive return even if the project was financed at 9.5 percent. The table also shows that tax receipts are unaffected by interest.

Table 56: Sensitivity of Revenues and Taxes to Changes in Financing Rates

	IRR	Revenue ($)	Taxes ($)	Total Return ($)
5.5% interest	10.61%	2,976,469	3,188,802	6,165,271
6.5% interest	8.19%	2,305,043	3,188,802	5,493,846
7.5% interest	5.73%	1,604,137	3,188,802	4,792,939
8.5% interest	3.17%	874,840	3,188,802	4,063,642
9.5% interest	0.44%	118,295	3,188,802	3,307,098

6.7.5 Sensitivity to Demand

The analysis made conservative estimates of the demand for refrigerated storage space based on lower bound estimates from the surveys of different user groups. Table 57 shows the impact on revenues and taxes with changes in demand. The table shows that if the maximum demand were assumed to be 4.73 million rather than 5.53 million, then the project would just break even over twenty years. The final row in Table 57 shows the level of demand such that at some point during peak years the 5-million pound storage capacity is reached. At this level of demand the internal rate of return is 17.54 percent.

Table 57: Sensitivity of Revenues and Taxes to Changes in Maximum Demand

	IRR	Revenue ($)	Taxes ($)	Total Return ($)
Maximum Demand is 5,531,000 Pounds	10.61%	2,976,469	3,188,802	6,165,271
Maximum Demand is 4,734,499 Pounds	0.00%	1,073	3,033,146	3,034,218
Maximum Demand is 6,167,366 Pounds	17.54%	5,353,512	3,313,158	8,666,671

6.8 Potential Expansion Costs

As discussed in Section 4.5, the facility is designed to accommodate expansion in the future. In general, it is better from financial and cash flow perspectives to design for the potential to expand, rather than build a facility with unused capacity. An analysis was conducted to estimate the differences in building a larger facility initially, or to expand the facility after 5 years. For both cases, the facility was expanded by an additional 3,200 square feet of frozen storage space; enough to accommodate 1.3 million pounds of frozen product. The analysis assumes that in either case none of the additional space would be needed until the sixth year, and therefore there would be no change in revenues. Table 58 shows the assumptions and results of the assessment. According to the engineers, expanding the facility after construction would add an additional 5 percent to construction costs. With inflation, construction costs would increase to nearly $192 per square foot if undertaken in the fifth year of operation. Thus the nominal cost of expansion later exceeds nearly $130,000, the nominal cost building a larger facility initially. However, the larger facility will mean higher electric bills and additional debt service payments if constructed in the initial development. The total cost of a larger facility initially will be $763,906 compared to $645,229 if the facility is expanded in the fifth year. Over the life of the project, this difference is relatively small. However, the added costs in the early years, with no additional revenue would exacerbate the projected cash flow problems of the facility, and would increase the exposure to risk.

Table 58: Comparison of Potential Expansion Costs

Build a Larger Facility During	Initial Construction	the 5th Year
Additional square feet of storage	3,200	3,200
Cost per square feet of storage	$ 153.10	$ 191.95
Capital cost of expansion	$ 514,637	$ 645,229
Cost of additional electricity in Years 1-5	$ 23,718	$ 0
Additional debt service payments in Years 1-5	$ 225,551	$ 0
Total additional cost in Years 1-5	$ 763,906	$ 645,229
Total additional revenues in Years 1-5	$ 0	$ 0

6.9 Potential Options to Improve Cash Flow and Feasibility

Under the baseline set of assumptions, the refrigerated warehouse facility is projected to experience negative cash flows in the first five years of operations, with losses in the first year of $496,390. The cumulative negative cash flows in those first five years are estimated to exceed of $1.36 million. These negative cash flows are more than made up in later years of the operation. An obvious solution to the short-run cash flow issue is to add more product flow to the model for the earlier years. However, in keeping with a conservative approach, there may be methods to alleviate cash flow problems, without becoming overly optimistic about the amount of use the facility will receive. In this section, several scenarios are developed with an aim toward improving short-run cash flows. The revenue stream shown in Table 51 will be referenced as the baseline case.

6.9.1 Sales, Property, and Fish Tax Rebates

As shown in Table 52, the refrigerated warehouse facility is expected to generate significant tax receipts for the City and Borough of Juneau, even in the early years of operations. Since the facility will be owned by the city, it appears reasonable to assume that those tax receipts could be used to offset negative cash flows. If sales, property and fish taxes generated were rebated to the facility, cash flow would turn positive in Year 5, rather than in Year 6 without the rebates. With tax rebates Year-1 losses are $421,325 and the cumulative negative cash flow goes only as high as $0.94 million; $0.4 million lower than in the baseline case.

Table 59: Six-Year Cash Flow Projections with Tax Rebates

Project Year		Total Revenue ($)	Total Costs ($)	Net Revenue ($)	Cumulative Total ($)
Year 1	2000	424,206	845,571	(421,365)	(421,365)
Year 2	2001	575,578	867,894	(292,315)	(713,680)
Year 3	2002	747,215	916,864	(169,649)	(883,329)
Year 4	2003	896,658	954,571	(57,913)	(941,242)
Year 5	2004	1,063,288	1,005,072	58,216	(883,025)
Year 6	2005	1,248,489	1,190,454	58,035	(824,990)

6.9.2 Juneau Economic Development Corporation Loan

A financing option mentioned in Section 5.2, was assistance from JEDC for a loan to cover some of the operating expenses in the earlier years of the project. Table 60 shows the effect on cash flow during the first six years of operation under a hypothetical JEDC financing scenario. This scenario assumes that JEDC will provide $100,000 for operating costs in each of the first three years at 5.5 percent interest. Repayment of the JEDC loan will begin in Year 4 of operations and continue through Year 8. Under this scenario, cash flow is improved in the first three years but is slightly worse in later years. Net revenues do not become positive until Year 7. Using this financing scenario, the cumulative negative cash flow tops out at $1.24 million and the overall internal rate of return increases to 10.95 percent. It appears that this financing scenario may mitigate some early year cash-flow issues. In addition, there may be other financing possibilities that could be explored through JEDC.

Table 60: Six-Year Cash Flow Projection with JEDC Financing

Project Year		Total Revenue ($)	Total Costs ($)	Net Revenue ($)	Cumulative Total ($)
Year 1	2000	424,206	810,596	(386,390)	(386,390)
Year 2	2001	575,578	841,318	(265,740)	(652,129)
Year 3	2002	747,215	903,479	(156,264)	(808,394)
Year 4	2003	896,658	1,147,874	(251,215)	(1,059,609)
Year 5	2004	1,063,288	1,211,533	(148,245)	(1,207,854)
Year 6	2005	1,248,489	1,276,549	(28,060)	(1,235,914)

6.9.3 Off-Site Administration

Several operators of refrigerated warehouse facilities indicated that administrative expenses for a facility of the size under consideration are relatively high. These operators indicated that if administrative expenses could be shared with another operation, then both facilities could be more profitable. One refrigerated warehouse operator in Washington, indicated that he would consider sharing administrative costs with a facility in the Juneau area, in return for a percentage of gross revenues. A hypothetical scenario, in which administrative costs are shared with an off-site facility, was developed. The scenario assumes that one full-time office job is eliminated, and office supply and phone expenses are reduced by 67 percent. In return, the off-site administrator is paid 5 percent of gross revenues. Table 61 shows the cash flow for the first six years of the project with off-site administration. Cash flow is improved with first year losses declining by over $40,000 compared to the baseline case. Cumulative losses peak at $1.22 in Year 5 under this scenario and the internal rate of return increases 11.69 percent over the 20-year period. Administrative expense sharing, at least as projected in this scenario, should be considered.

Table 61: Six-Year Cash Flow Projection with Administrative Costs Sharing

Project Year		Total Revenue ($)	Total Costs ($)	Net Revenue ($)	Cumulative Total ($)
Year 1	2000	424,206	879,104	(454,898)	(454,898)
Year 2	2001	575,578	915,914	(340,335)	(795,233)
Year 3	2002	747,215	985,176	(237,961)	(1,033,194)
Year 4	2003	896,658	1,039,344	(142,686)	(1,175,880)
Year 5	2004	1,063,288	1,109,720	(46,432)	(1,222,312)
Year 6	2005	1,248,489	1,182,372	66,117	(1,156,196)

6.9.4 Defer Payments for Equipment Replacement

The baseline case assumes that payments are made each year to an equipment replacement fund. Payments are assumed to be 10 percent of total equipment costs. Early year cash flow could be improved by deferring the first five years of those payments to the second five years. Under this scenario, the cumulative cash flow losses drop to $1.19 million compared with $1.36 million in the baseline case.

Table 62: Six-Year Cash Flow Projection with Deferred Payment to Equipment Fund

Project Year		Total Revenue ($)	Total Costs ($)	Net Revenue ($)	Cumulative Total ($)
Year 1	2000	424,206	886,964	(462,758)	(462,758)
Year 2	2001	575,578	916,677	(341,099)	(803,857)
Year 3	2002	747,215	977,799	(230,584)	(1,034,441)
Year 4	2003	896,658	1,025,028	(128,370)	(1,162,811)
Year 5	2004	1,063,288	1,087,585	(24,297)	(1,187,108)
Year 6	2005	1,248,489	1,229,443	19,046	(1,168,061)

6.9.5 Combine Cash Flow Reduction Methods

Several reasonable methods to reduce negative cash flow have been shown above. Combining tax rebates, JEDC financing, off-site administration, and deferred payments to the equipment replacement fund may also be feasible. Table 63 shows the impact on cash flow over the first seven years, if the four methods are combined. In the first year cash flow improves to a -$236,241. Cumulative negative cash flows are highest in the seventh year at -$466,725.

Table 63: Seven-Year Cash Flow Projection with Combined Methods

Project Year		Total Revenue ($)	Total Costs ($)	Net Revenue ($)	Cumulative Total ($)
Year 1	2000	424,206	660,447	(236,241)	(236,241)
Year 2	2001	575,578	687,848	(112,270)	(348,510)
Year 3	2002	747,215	742,880	4,334	(344,176)
Year 4	2003	896,658	981,481	(84,823)	(428,999)
Year 5	2004	1,063,288	1,037,596	25,692	(403,307)
Year 6	2005	1,248,489	1,307,456	(58,967)	(462,274)
Year 7	2006	1,348,636	1,353,088	(4,452)	(466,725)

6.9.6 Reductions in Financed Capital Cost

Cash flow also can be enhanced with reductions in debt service payments. Debt service on the initial financed capital cost is the largest single component of the annual operating budget. For every dollar that the initial financed capital cost is reduced, the debt service decreases by $0.088 cents. Therefore it would appear to be prudent to find ways to reduce the amount financed. Obviously a grant for some portion of initial capital would be desirable. Unfortunately almost all other means of reducing initial financed capital costs, involve increasing operating expenses in some other way. For example, if used refrigerating equipment were purchased at 50 cents on the dollar, the total financing amount would decease by $46,350. This in turn would reduce annual debt service by $4,079. Used equipment however, is probably less reliable than new equipment, and it is likely that maintenance expenses could increase by more than the amount saved.

Reducing the cost of land, which is currently estimated at $272,800, could also reduce initial financed capital cost. The estimated cost of the alternative site at Channel Sanitation is nearly $170,000 less expensive. These savings would translate to a debt service reduction of $14,960 each year. However, the alternative site would involve additional capital cost for mining the landfill, and does not appear to offer the same potential for development or co-location as the Rock Dump Site, which could impact cash flow in terms of revenue generation.

6.9.7 Subsidize Early Year Operating Expenses

Given the assumed scenario of product flow through the proposed refrigerated warehouse facility, it appears likely that early year operating expenses will need to be subsidized. However it should be recognized that the *pro forma* analysis make very conservative assumptions regarding product flow into the facility, well below the capacity of warehouse and the estimated demand. If the City and Borough of Juneau is willing to subsidize expenses by providing a grant in the early years, then the facility would appear to be able to return those subsidies, and more, in later years. It is estimated that a grant of $466,000, in combination with the other cash flow enhancements from Section 6.9.5, would completely eliminate the negative cash flows. This amount could be reduced to $372,000, if such a grant was issued at the beginning of 1999, and it was able to appreciate at 7.5 percent per year.

6.10 Overall Feasibility

The results of the *pro forma* analysis indicate that development of the proposed refrigerated warehouse facility is feasible, notwithstanding early year cash shortfalls. Over the 20-year analysis, it is estimated that the facility will accumulate net revenues of $2,976,469. Additionally, it is estimated that the facility could generate $3,188,802 in tax revenues. The feasibility of the facility could be enhanced if the City and Borough of Juneau is willing to subsidize early year revenue shortfalls with tax rebates or other funds. Under relatively conservative assumptions, it appears that the facility can repay any subsidies, as well as cover its long-term expenses and debt service.

Appendix A: Shore-Based Processors in Outlying Areas

Processors Located in Outlying Areas		
Name	**Also Known As**	**Location**
Wards Cove Packing Company		Excursion Inlet
Icy Passage Fish		Gustavus
Point Adolphus Seafoods		Gustavus
Strawberry Point Seafoods	Salmon River Smokehouse	Gustavus
Alyeska Products		Haines
Bamboo Room Restaurant Inc		Haines
Bell, Clyde And Doris	Bells Seafood	Haines
Dejon Delights		Haines
Haines Fisheries Inc.		Haines
Rainbow Glacier Seafoods Inc		Haines
Saunders, John M	Saunders Seafoods Co	Haines
Wards Cove Packing Company		Haines
Buy N Pack Seafoods Inc		Hoonah
Dignon Company Inc	Hoonah Cold Storage	Hoonah
Pelican Seafoods		Pelican

Appendix B: Tariff Schedules of Selected Public Access Refrigerated Warehouse Facilities

BCS

Seafood Tariff

June 1, 1997

PHONE (360) 733-1640
FAX (360) 671-1259

Only your product

Seafood Tariff

June 1997

Freezing And Handling In/Out *(To Be Frozen)* Gross Weights

	Weekday	Weekend & Holidays	Daily** Storage
Halibut *(Frozen, Glazed weights into BCS totes)*	$6.22 cwt*	$6.79 cwt	$.032 cwt
Salmon, Black Cod	8.30 cwt*	8.90 cwt	.032 cwt
(Frozen, Glazed weights into BCS totes plus washing)			
I.Q.F. Roe Herring into totes	6.29 cwt*	6.70 cwt	.032 cwt
Salmon, Halibut, Other seafood portions *(received on trays stripping not included)*	5.33 cwt	5.89 cwt	.032 cwt
Dogfish in cases	4.24 cwt	4.81 cwt	.033 cwt
Pet Food, Fish Scrap, Bait *(bags or cases)*	1.94 cwt	2.26 cwt	.022 cwt
Other Seafood / Roe in cases	4.99 cwt	5.46 cwt	.033 cwt

**These rates include overtime handling charges*

Handling In/Out *(Received Frozen)* Gross Weights

	Weekday	Weekend & Holidays	Daily** Storage
Halibut, Salmon, Other Fish loose or in BCS wood totes	$2.22 cwt	$2.78 cwt	$.032 cwt
Halibut, Salmon, Other Fish *(in totes)*	1.63 cwt	2.03 cwt	.032 cwt
Halibut, Salmon, Other Fish, Roe *(in cases)*	1.86 cwt	2.33 cwt	.033 cwt
Pet Food, Fish Scrap, Bait *(bags or cases)*	1.28 cwt	1.60 cwt	.022 cwt
Shellfish, in shell 40# and under	1.42 cwt	1.78 cwt	.033 cwt
Shellfish, in shell over net 40# ctn	1.40 cwt	1.75 cwt	.032 cwt
Shellfish Meat, Blocks, Shatter Pack	.50 cwt	.65 cwt	.017 cwt
Whole Crab in cases	1.99 cwt	2.49 cwt	.048 cwt
Surimi in bags or cases *(-20 degree F storage)*	1.16 cwt	1.45 cwt	.027 cwt
Seafood Analogs in cases	1.47 cwt	1.84 cwt	.031 cwt
I.Q.F. Fillets in cases	1.96 cwt	2.35 cwt	.034 cwt

*** Daily storage is charged upon initial receipt of the goods. There is no advance first month storage charge. Billing is on actual days in storage.*

Fresh Fish Processing

Bellingham Cold Storage does not offer custom salmon dressing.
Please contact us if you are looking for custom dressing. We may be able to refer you to sources for this and other custom processing.

Salmon And Black Cod	Net Weights
Wash and Grade	.06 lb
Tote Fresh	.065 lb
Box Fresh	.10 lb

Halibut	Gross Weights
Boat unload, Head, Grade *(reg. time)*	.035 lb
Boat unload, Head, Grade, Wash for freezing *(reg. time)*	.04 lb
Van unload, Grade, Wash for freezing *(reg. time)*	.035 lb
Grade and Wash for freezing *(reg. time)*	.03 lb
Tote Fresh *(net weights)*	.065 lb
Box Fresh *(net weights)*	.095 lb
Minimum Packing Charge	$50.00

Under 5,000 lbs production will be billed at BCS hourly rates.
Single customer requesting processing will be charged a 4 hour minimum charge on small volumes.
Overtime Packing at 1 1/2 times above rates.
Packaging Materials, ice or gel-ice not included in the above rates.

Ice	Regular Time	Overtime
Flake or Crushed Block	32.50 ton	42.50 ton
Flake or Crushed Block *(minimum charge)*	25.00 1/2 ton	30.00 1/2 ton
Gel-Ice	.50 each	

s an icy reception.

Frozen Fish Packing

	Net Weights
Halibut	
Up to 5,000 lbs	Hourly
Over 5,000 lbs	.07 lb
Halibut Trimming, with glaze	.05 lb
Halibut Toting, 5,000 lb. min.	.045 lb
Trim, Spray Glaze, Box, 5,000 lb. min.	.085 lb
Trim, Spray Glaze, Tote, 5,000 lb. min.	.08 lb
Even Weight or Two/Three Fish Cartons, add up to	.02 lb
Excess Halibut Grading, add up to	.04 lb
Minimum Packing Charge	$30.00

Salmon And Black Cod	Export	Domestic
Up to 5,000 lbs.	Hourly	Hourly
5,001 to 10,000 lbs.	.10 lb	.09 lb
Over 10,000 lbs.	.085 lb	.075 lb
Salmon Toting, 5,000 lb min.	.045 lb	.045 lb
Excess Salmon, Black Cod Grading add up to	.04 lb	.04 lb
Under 6 lb fish, Under 100 lb Cartons add up to	.02 lb	.02 lb
Minimum Packing Charge	$30.00	

Other Rates Upon Request

All packing orders below 5,000 lbs will be charged at the current BCS hourly labor rate.
Overtime at 1 1/2 times above rates.
Packaging Materials, ice or gel–ice not included in the above rates.

Services

Rail Car; Load/Unload; Totes and Barrels	*($4.00/ton)*	.20 cwt
Rail Car; Load/Unload; Cases, Bags, Pails	*($8.40/ton)*	.42 cwt
Container; Unloading; Loose Ungraded Halibut		1.00 cwt
Container; Load/Unload; Loose Graded Halibut		.80 cwt
Container; Load/Unload; Shellfish		.50 cwt
Container; Load/Unload; Bags or Cases, non Shellfish		.48 cwt
Truck Reloading, CASH ONLY, $50.00 Minimum		Hourly
Overtime Truck Loading		45.00 hour

Above rates are Regular Time. Overtime rates are additional if not included above.

Labor

Forklift and Driver	34.00 hour
Heavy Duty	25.00 hour
Pump and Operator *(fresh fish)*	20.00 ton
Stencilling or French Marking *(clean cases)*	.30 case
Re–stencilling	Hourly
Physical Transfer of Goods	Hourly
Inspection Fee	Hourly

Above rates are Regular Time. Overtime rates are additional if not included above.

Miscellaneous Charges

Book Transfer, Minimum monthly Storage per Lot, Preparation of Load Plans	10.00 each
Minimum Monthly Storage Charge per Customer	35.00 month
Minimum Monthly Handling Charge *(if handling occurs)*	15.00 month
Over the Dock Charges *($50.00 minimum plus labor)*	17.00 ton
Unreturned Pallets	8.50 each

JAN-16-1998 13:06 ICY STRAIT SEAFOODS, INC. 3 P.05

SEAFREEZE
206 S.W. Michigan St. • Seattle, WA 98106
(206) 767-7350 • Fax No. (206) 763-8514
(800) 767-7350

WAREHOUSING

Seafood Handling and Storage Rates

(All Rates Based on Gross CWT Weights)

	Handling	Storage Per Month	Total
Salmon, Black Cod, Halibut, Swordfish, Other Finfish			
Toted	$1.53	$ .94	$2.47
Boxed - Under 100 lbs	2.18	1.00	3.18
Boxed - Over 100 lbs	1.74	1.00	2.74
Shellfish - King, Tanner, Dungeness			
Bulk Pack - Over 40 lbs	1.76	1.15	2.91
Finished Pack - Under 40 lbs	1.84	1.36	3.20
Whole Cooked	1.85	1.65	3.50
Steaks, Fillets, Portions, and IQF under 50 lbs	1.66	1.12	2.78
IQF Shrimp/Scallops	1.30	1.00	2.30
Block, Shatterpack, Surimi, Bait, Roe	.86	.78	1.64
Imitation Seafood	1.19	.90	2.09

Across Dock Rates - (Same Day Grace Period)

Sorted, Palletized, Unload and Load	$ .68
Sorted, Palletized, Unload or Load To Van Crew Load or Unload	.96
Van Crew Off Load to Van Crew Load	1.65

Minimum Charge of $25.00
Across Dock Notification Must be Given in Advance by Storer

Short Hold Rates

Product on Short Hold will be billed at the applicable handling rate plus $.20 CWT gross weight per day for a maximum stay of 3 business days. Product that stays beyond 3 days will be subject to monthly storage rates.
Minimum Charge of $35.00
Short Hold notification must be given in advance by storer.

Advance Notice Requirements

We require 48 hours advance notice on orders for export containers and railcars. These order requests will be filled on a time/space available basis. For export container shipments or railcar equivalents of (10) ten containers or more, we will require a minimum of (4) four days advance notice. 24 hours notice required for all other shipments, transfers and inspections. Transfers received on the last day of the month will be completed at the discretion of the warehouseman. Every effort will be made to fill all same day orders.

Warehouse Hours

Monday - Friday except holidays: 6:30 a.m. - 10:00 p.m.
After 3:00 p.m. and other than business hours by appointment only.

Rates subject to change without prior notice.

EFFECTIVE APRIL 1, 1998

TARIFF

TOTAL P.05

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SEAFREEZE
206 S.W. Michigan St. • Seattle, WA 98106
(206) 767-7350 • Fax No. (206) 763-8514
(800) 767-7350

PROCESSING

(All Rates Based on Finished Weights)

Finfish Processing	PER POUND		PER POUND
Salmon* and Black Cod		**Halibut**	
Fresh:		Fresh:	
Western Dress, Freeze	$.2260	Heading	$.0165
Wash and Freeze, H&G	.0920	Wash & Freeze	.0660
Western Dress/Layer Ice in Totes	.1450	Wash,Head,Grade,Freeze	.1025
Fresh Packing 100#	.0950	Grade	.0200
Fresh Heading	.0195	Fresh Packing	.0750
Frozen:		Van Unloading	.0200
Domestic Pack 100#	.0775	Frozen:	
Export Pack 100#	.1060	Trim, Grade, Glaze, Tote	.0685
Other Charges		Pack Only (H&G)-Random Wt.	.0475
Fresh /Frozen Excess Grading	.01-.03	Reglaze and Tote	.0350
IQF Fresh Salmon Fillets & Tote	.1600	Regrade	.0200
IQF Fresh Bottom Fish Fillets & Tote	.3200	Trim, Glaze,Pack	.0975
Gill Removing	.0400	**Other Charges:**	
Frozen Salmon Heading	.0300	Layer Icing Into Totes	.0325
Under 4# Fish	.0125	Poke Ice	.0105
Unbagging	.0160	Van Cleaning	Hourly
Packing Under 100#	.0165	Boat De-Icing/Cleaning	Hourly
Boat Unloading	.0185		
Unload Boxed Product	.0068		
Packing In 10# (Fillet Only)	.1600		
Byproduct Disposal	.0250		

Value Added Processing	PER POUND		PER POUND
Salmon Steaking**		**Special Services*****	
Steak, Layer Pack (1)	.31	Case Vac Pac	.10
Steak, Vac Pac, Pack (1)	.38	Apply Labels (More than 1)	.05 ea
Steak, Grade, Layer Pack (2)	.34	Print Label	.10 ea
Steak, Grade, Vac Pac, Pack (2)	.41	Mince From Trim	.16
Tote Roasts, Napes	.10	Vac Pac	Upon Request
Grade Steaks for Size	.03	Portioning	Upon Request
Salmon Filleting		Inspection Services and Glaze Testing	$45/Hr (½ Hr Min.)
Thaw, Machine Fillet, Skin On/Off, Vac Pac or IQF	Upon Request	**Processing Hourly Rate Schedule**	
Halibut Steaking**		Regular time (½ Hour Min.)	$32.00
Steak, Layer Pack (1,3)	.35	Overtime/Weekends (½ Hr. Min.)	$38.00
Steak, Vac Pac, Pack (1,3)	.42		
Steak, Grade, Layer Pack (3)	.38	**Orders Under 5,000 lbs. - Add $.015/Lb**	
Steak, Grade, Vac Pac, Pack (3)	.45	**Minimum Order Charge $45.00**	
Tote Roasts, Napes, Bellies	.10		
Grade Steaks for Size	.03	(1) No Size Grading	
Premium Cut - Add	.03	(2) Size Grading	
		(3) Regular Cut	

50 lb. wet Hook #3 1/0 w/ liner 4 mil

Notes:

Overtime Charged at 1.5 times above rates.

* Salmon grading charges determined as follows:
  - All salmon rates assume minimal grading.
  - Partial grade includes internal quality and two sizes. Full grade includes internal quality, complete size, skin color and external quality per SEAFREEZE grading standards.
  - Organoleptic grading will incur additional charges.
  - Meat color grading will incur additional charges.
  - Size grading may vary by 10%.

** Steaking rates based on portion controlled cutting assuming standard grading.

*** Additional charges for trimming, pinbone removal or small fish.

Rates subject to change without prior notice. Rates do not include cartons, bags, liners, film or other supplies.

Rates on other products/services quoted on request.

gal ice

EFFECTIVE APRIL 1, 1996

TARIFF

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Sitka Marine Services Center

Tariff Schedule

andling and first months storage (received frozen) gross weights.

omment: These rates reflect the receiving dates for products handled by the Center
1/14 rates are for inventory received between the 1st and 14th of a month (full month storage charge).
15/ME rates are for inventory received between the 15th and month end (50% of monthly storage charge).

	WEEKDAY		WEEKEND/HOLIDAY	
	1/14th	15/ME	1/14th	15/ME
Salmon, halibut, black cod, other finfish				
Loose	3.00	2.475	3.55	3.125
Toted	2.40	1.975	2.75	2.325
Boxed over 100 lbs	2.65	2.225	3.09	2.865
Boxed under 100 lbs	3.00	2,560	3.55	3.110
Fillets				
I.Q.F.	2.70	2.250	3.14	2.690
Blocks	1.80	1.425	2.09	1.715
Shellfish				
Whole cooked crab, boxed	3.15	2.400	3.60	2.850
Crab, bulk sections, toted	2.75	2.200	3.20	2.650
Crab, under 50lbs finished	2.95	2.350	3.38	2.780
Crab, over 50lbs finished	2.78	2.205	3.18	2.605
Crab meat, blocks or cans	2.00	1.550	2.40	1.950
Other shellfish, toted	3.00	2,575	3.45	3.025
Bait				
Herring, squid, octopus, toted	2.00	1.625	2.40	2.025
Herring, squid, octopus, boxed	2.25	1.750	2.65	2.150
Othert seafood items				
Surimi in bags or boxes	1.90	1.525	2.18	1.785
Seafood analog, boxed	2.25	1.850	2.60	2.200
Miscellaneous meat, toted	2.00	1.625	2.40	2.025
Miscellaneous meat, boxed	2.65	2.225	3.10	2.675
Other food products				
Meat, poultry, ice cream				
Prepared entries, juice concentrates	2.75	2.175	3.20	2.625

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SITKA MARINE SERVICES CENTER

Storage (monthly)	GROSS WEIGHTS
Salmon, halibut, black cod, other finfish	
Loose	.85 cwt
Toted	.85 cwt
Boxed over 100 lbs	.85 cwt
Boxed under 50 lbs	.88 cwt
Fillets and steaks	.90 cwt
I.Q.F.	.75 cwt
Blocks	
Shellfish	1.50 cwt
Whole cooked crab, boxed	1.10 cwt
Crab, bulk sections toted	1.20 cwt
Crab, under 50 lbs finished	1.15 cwt
Crab, over 50 lbs finished	.90 cwt
Crab meat, blocks or cans	.85 cwt
Other shellfish toted	
Bait	.75 cwt
Herring, squid, octopus, toted	1.00 cwt
Herring, squid, octopus, boxed	
Other seafood items	.75 cwt
Surimi in bags or boxed	.80 cwt
Seafood analog, boxed	.75 cwt
Miscellaneous meat, toted	.85 cwt
Miscellaneous meat, boxed	
Other food products	
Meat, poultry, ice cream	1.15 cwt
Prepared entrees, juice concentrates	

JAN 16 '98 03:57PM P.7

SITKA MARINE SERVICES CENTER

LABOR RATES	REGULAR TIME	OVERTIME
Hourly labor	$20.00/hr	$30.00/hr
Forklift and driver	$31.00/hr	$41.00/hr
Hoist operator ($25.00 minimum)	$31.00/hr	$41.00/hr
Stencilling Cartons	Hourly	
Physical transfer of goods	Hourly	
Inspections	Hourly	
Container loading/unloading ($50.00 minimum)	.60 cwt	
Truck loading/unloading ($50.00 minimum)	.60 cwt	

MISCELLANEOUS CHARGES	
Warehouse receipts (book transfers)	$10.00 each
Minimum charge per lot	$10.00 per month
Minimum charge per customer	$50.00 per month
Preparation of container load plans	$10.00 each
Materials	Cost plus 20%

Appendix C: Questionnaire Used in the Telephone Survey of Permit Holders

A Survey of the Potential Usage of a Refrigerated Warehouse Facility in Juneau

SECTION 1: Introduction

Is ID, name, phone and permits entered on the database?

1 Am I speaking with _____?

If no then ask 1.2:

If yes then continue.

Hello Mr.(s). _____, my name is Jeff Tune, I'm an economist with Northern Economics, and we are conducting a survey of Juneau area fishing vessel owners and permit holders for the Fisheries Development Committee of the City and Borough of Juneau. The committee is working toward their goal of revitalizing commercial fisheries in and around the Juneau area. As a part of their overall objective they have asked Northern Economics to assess the feasibility of developing a publicly owned but privately operated refrigerated warehouse facility with an aim toward attracting primary and secondary processors to the community.

1.1 Would you be able to answer a series of questions to help us understand the needs of the fishing community?

If yes then go to2:

If no then: Thank-you, have a nice day.

1.2 Can I call again later when _____ would be available?

1.3 When would be a good time?

Ok, thank you very much for your assistance.

2 Did you fish commercially as a permit holder or vessel owner in 1996?

3 Did you fish commercially as a permit holder or vessel owner in 1997?

If no to both questions 2 and 3, then: Thank you—Your answer is important because we need to determine the percentage of permit holders who did not fish. Have a nice day.

SECTION 2: Catch

In order to determine how your answers fit in with rest of the Juneau fishing industry, we need to ask a couple of questions regarding your harvests during 1996 and 1997. We are interested not only in the species you target, but also incidental catch that you land. All of your answers will be kept strictly confidential, and will be reported only after aggregation with other respondents.

4 What are your primary target fisheries? You may indicate up to four.

5 Did you make significant landing of other species during these target fisheries?

5.1 If so please identify these other species.

For each of these target species we would like to get an idea of when you made your trips, how many trips you made and, how much you landed in total. We have divided the year into four periods January through April, May through June, July and August, and September through December. Let's look at the first period, then we will look at each of the other periods.

6 Did you make any trips during January through April in which you targeted any of these four species?

6.1 Approximately how many trips for each target species did you make?

6.2 How much of each species, including the incidental species you mentioned, did you land in total during this Period?

6.3 Where were these fish landed?

7 Did you make any trips during May or June in which you targeted any of these four species?

7.1 Approximately how many trips for each target species did you make?

7.2 How much of each species, including the incidental species you mentioned, did you land in total during this period?

7.3 Where were these fish landed?

8 Did you make any trips during July or August in which you targeted any of these four species?

8.1 Approximately how many trips for each target species did you make?

8.2 How much of each species, including the incidental species you mentioned, did you land in total during this period?

8.3 Where were these fish landed?

9 Did you make any trips from September through December in which you targeted any of these four species?

9.1 Approximately how many trips for each target species did you make?

9.2 How much of each species, including the incidental species you mentioned, did you land in total during this period?

9.3 Where were these fish landed?

SECTION 3: Potential Use of A New Primary Processor in Juneau

The next section of our survey will ask whether you would consider changing your fishing operations if an additional primary processor came to the Juneau area. A primary processor is one that buys raw fish directly from the fisherman, and then after processing either sells the product or freezes/cans/ or smokes it for later sale.

10 If an additional primary processor moved to Juneau willing to pay the same price as you are currently getting would you "seriously consider" selling your harvest to them, rather than to your current buyers?

If no then go to question 10.1.

If yes then go to 10.3

10.1 If a primary processor in Juneau paid enough to cover any additional fuel costs to make the run to Juneau, would you "seriously consider" selling your harvest to them, rather than to your current buyers?

If no then go to question 10.2.

If yes then go to 10.3.

10.2 If a primary processor in Juneau paid enough to cover any additional fuel costs to make the run to Juneau, plus a small premium, would you "seriously consider" selling your harvest to them, rather than to your current buyers?

If no then go to question 17.

If yes then go to 10.3.

10.3 Let assume the ex-vessel price in Juneau for *(insert target species 1)* **was** *(insert 5% higher price)*. **Would you land fish in Juneau at that price?**

If yes then continue, if no then go to next species.

10.3.1 Which of the following percentages of your total catch of *(target species 1)* **would you land in Juneau? 25%, 50%, 75%, or 100%**

10.4 Let assume the ex-vessel price in Juneau for *(insert target species 2)* **was** *(insert 5% higher price)*. **Would you land fish in Juneau at that price?**

If yes then continue, if no then go to next species.

10.4.1 Which of the following percentages of your total catch of *(target species 2)* **would you land in Juneau? 25%, 50%, 75%, or 100%**

10.5 Let assume the ex-vessel price in Juneau for *(insert target species 3)* **was** *(insert 5% higher price)*. **Would you land fish in Juneau at that price?**

If yes then continue, if no then go to next species.

10.5.1 Which of the following percentages of your total catch of *(target species 3)* **would you land in Juneau? 25%, 50%, 75%, or 100%**

10.6 Let assume the ex-vessel price in Juneau for (*insert target species 4)* **was** *(insert 5% higher price)*. **Would you land fish in Juneau at that price?**

If yes then continue, if no then go to next section.

10.6.1 Which of the following percentages of your total catch of *(target species 4)* **would you land in Juneau? 25%, 50%, 75%, or 100%**

10.7 Would you need a higher premium for different periods of the year?

SECTION 4: Use of Custom Processing

In the next section of the survey we will be asking about "custom processing." We will use the term custom processing to be a situation where you deliver your fish to a primary processor, whom for a fee will process and freeze your fish. You will still retain ownership of the processed fish and will be responsible for storing and eventually selling the product. When you custom process your fish you will not receive any payment until you sell the frozen product into the market.

11 Are the distinctions between selling your fish to a primary processor and having your fish custom processed clear?

12 Have your ever had a processor do custom processing for you?

If no go to question 14.

If yes then continue.

***13* Where was the custom processor located?**

13.1 What did they charge for custom processing?

13.2 What services did they provide in addition to processing?

13.3 From the trip and target information by time period you provided earlier please indicate the period or periods in which you used custom processors?

13.4 Which target species were those trips made?

13.5 What percentage of your catch from those trips did you custom process?

13.6 On a scale of 1 to 5 where 1 is terrible and 5 is great, how would your score your experiences with custom processing?

14 Would you "seriously consider" having your fish custom processed in the future?

If yes then continue

If no then go to question 16.

15 Lets assume the ex-vessel price for *(insert target species 1)* **you could get from a processor was** *(insert ex-vessel price).* **If you were able to get** *(insert 5% higher price)* **by custom processing would you do it?**

If no then find minimum by increasing price. (How about price of [*insert next higher price*] if you custom processed.)

***15.1.1* Which of the following percentages of your total catch of** *(insert target 1)* **would you have custom processed? 25%, 50%, 75%, or 100%**

15.2 For *(target species 2)* **lets assume the ex-vessel price you could get from a processor was** *(insert ex-vessel price)*. **If you were able to get** *(insert 10% higher price)* **by custom processing would you do it?**

15.2.1 Which of the following percentages of your total catch of *(insert target 2)* **would you have custom processed? 25%, 50%, 75%, or 100%**

15.3 For *(target species 3)* **lets assume the ex-vessel price you could get from a processor was** *(insert ex-vessel price)*. **If you were able to get** *(insert 10% higher price)* **by custom processing would you do it?**

15.3.1 Which of the following percentages of your total catch of *(insert target 3)* **would you have custom processed? 25%, 50%, 75%, or 100%**

15.4 For *(target species 4)* **lets assume the ex-vessel price you could get from a processor was** *(insert ex-vessel price)*. **If you were able to get** *(insert 10% higher price)* **by custom processing would you do it?**

15.4.1 Which of the following percentages of your total catch of *(insert target 3)* **would you have custom processed? 25%, 50%, 75%, or 100%**

Go to section 5.

16 Which one of the following reasons best describes your reason for not using a custom processor in the future?

16.1 Not profitable

16.2 Too much risk

16.3 Too much time involvement

16.4 No market for frozen product

16.5 Other: specify

Continue

SECTION 5: Potential Use of a Refrigerated Warehouse in Juneau

In the next section of the survey we will be using the term "refrigerated warehouse facility". By "refrigerated warehouse" I do not mean a processor like Icicle Seafood or Ward Cove Processing, which buys fresh fish directly from you at an ex-vessel price. Perhaps I can best describe a refrigerated warehouse as being similar to a full-time custom processor with an area for storing frozen product. The facility would have a blast freezer, which will very quickly bring unfrozen product to 50 degrees below zero, creating a "food quality" frozen product. As we are defining the facility, it would have the capability to head and gut fish before freezing, and to box the product after freezing. It would not have additional processing lines that would allow for filleting or other specialized processing. Following the freezing process, the refrigerated warehouse facility would be able to store large quantities of product for months at a time at a temperature of approximately 20 degrees below zero.

Fishermen would be able to use the facility to process, freeze and store fish. For use of the facilities would pay a fee, but would maintain complete ownership and control of the product. The fisherman would only get paid once he or she sells the frozen product to a retailer, wholesaler or a value added secondary processor. Typically, a refrigerated warehouse facility with a processor and blast freezer will charge for processing and freezing and the first month's storage, and then charge at a lower monthly rate for additional storage. For larger quantities, frozen product is typically stored on pallets. Smaller "residential users" would also be able to rent storage space. Individual lockers typically from 10-20 cubic feet may be available.

The difference between a "custom processor" and the refrigerated warehouse facility as we are defining it, is that typically a processor will only act as a "custom processor" as a side-light in addition to their normal processing business, and usually only for very large orders. The facility we are defining will see "custom processing" as a full time business. In this section of our survey we will ask whether you would consider changing your fishing operations if a publicly owned but privately operated refrigerated warehouse facility were built in the Juneau area.

17 If such a facility were built in the Juneau area would you "seriously consider" using it in your commercial fishing operations?

If no then go to question 20, If yes then continue:

18 For which of the your top four species would you consider use of the refrigerated warehouse?

18.1 During which time periods?

19 Let us assume your current ex-vessel price for (*1st target named above*) was *(insert ex-vessel price)*. Further lets assume the refrigerated warehouse would wash, grade, process, freeze and store your fish for 11 cents per pound for the first month, and charge you an additional penny per pound for each additional month your fish were in storage. If you were able to sell *(target species 1)* for *(insert a price 12 cents higher)* after use of the refrigerated warehouse facility, how much of *(target 1)* would you place into storage? 0%, 25%, 50%, 75%, or 100%.

19.1 In other words, if you were able to get *(insert net profit)* **cents more per pound than the ex-vessel price and the cost of freezing and storing at the refrigerated warehouse, you would use the facility?**

19.2 Let us assume your current ex-vessel price for *(2nd target named above)* **was** *(insert ex-vessel price)*. **Further lets assume the refrigerated warehouse would wash, grade, process, freeze and store your fish for 11 cents per pound for the first month, and charge you an additional penny per pound for each additional month your fish were in storage. If you were able to sell** *(target species 2)* **for** *(insert a price 12 cents higher)* **after use of the refrigerated warehouse facility, how much of** *(target 2)* **would you place into storage? 0%, 25%, 50%, 75%, or 100%.**

19.3 Let us assume your current ex-vessel price for *(3rd target named above)* **was** *(insert ex-vessel price)*. **Further lets assume the refrigerated warehouse would wash, grade, process, freeze and store your fish for 11 cents per pound for the first month, and charge you an additional penny per pound for each additional month your fish were in storage. If you were able to sell** *(target species 3)* **for** *(insert a price 12 cents higher)* **after use of the refrigerated warehouse facility, how much of** *(target 3)* **would you place into storage? 0%, 25%, 50%, 75%, or 100%.**

19.4 Let us assume your current ex-vessel price for (4th *target named above)* **was** *(insert ex-vessel price)*. **Further lets assume the refrigerated warehouse would wash, grade, process, freeze and store your fish for 11 cents per pound for the first month, and charge you an additional penny per pound for each additional month your fish were in storage. If you were able to sell** *(target species 4)* **for** *(insert a price 12 cents higher)* **after use of the refrigerated warehouse facility, how much of** *(target 4)* **would you place into storage? 0%, 25%, 50%, 75%, or 100%.**

Go to section 6.

20 Which one of the following reasons best describes your reason for not using a refrigerated warehouse in the future?

20.1 Not profitable

20.2 Too much risk

20.3 Too much time involvement

20.4 No market for frozen product

20.5 Other: specify

SECTION 6: Potential Use of a Refrigerated Warehouse with a new Secondary Processor in Juneau

In this section of our survey we will be using the term "secondary processor" frequently. By secondary processor I mean a processor that buys already frozen fish out of a refrigerated warehouse or from a primary processor and, after thawing does further processing. An example of this type of value added processing would be a "sauced" fillet in a plastic pouch ready for use in a microwave.

21 If a secondary processor willing to pay competitive prices for frozen product moved to the Juneau area, would that change your potential use of a refrigerated warehouse facility?

If no then: Ok that's the end of our survey. We very much appreciate your patience. Thank you very much, and have good day.

If yes then continue:

22 For which of the your top four species would you consider use of the refrigerated warehouse?

22.1 During which time periods?

23 Let us assume your current ex-vessel price for (1st *target named above)* **was** *(insert ex-vessel price).* **Further lets assume the refrigerated warehouse would wash, grade, process, freeze and store your fish for 11 cents per pound for the first month, and charge you an additional penny per pound for each additional month your fish were in storage. If you were able to sell** *(target species 1)* **for** *(insert a price 12 cents higher)* **after use of the refrigerated warehouse facility, how much of** *(target 1)* **would you place into storage? 0%, 25%, 50%, 75%, or 100%.**

23.1 In other words if you were able to get *(insert difference)* **cents more per pound than the ex-vessel price plus the cost of freezing and storage, by selling to a secondary processor after use of the refrigerated warehouse you would use the facility?**

24 Let us assume your current ex-vessel price for (2nd *target named above)* **was** *(insert ex-vessel price).* **Further lets assume the refrigerated warehouse would wash, grade, process, freeze and store your fish for 11 cents per pound for the first month, and charge you an additional penny per pound for each additional month your fish were in storage. If you were able to sell** *(target species 2)* **for** *(insert a price 12 cents higher)* **after use of the refrigerated warehouse facility, how much of** *(target 2)* **would you place into storage? 0%, 25%, 50%, 75%, or 100%.**

25 Let us assume your current ex-vessel price for (3rd *target named above)* **was** *(insert ex-vessel price).* **Further lets assume the refrigerated warehouse would wash, grade, process, freeze and store your fish for 11 cents per pound for the first month, and charge you an additional penny per pound for each**

additional month your fish were in storage. If you were able to sell *(target species 3)* **for** *(insert a price 12 cents higher)* **after use of the refrigerated warehouse facility, how much of** *(target 3)* **would you place into storage? 0%, 25%, 50%, 75%, or 100%.**

26 Let us assume your current ex-vessel price for (4th *target named above)* **was** *(insert ex-vessel price)*. **Further lets assume the refrigerated warehouse would wash, grade, process, freeze and store your fish for 11 cents per pound for the first month, and charge you an additional penny per pound for each additional month your fish were in storage. If you were able to sell** *(target species 4)* **for** *(insert a price 12 cents higher)* **after use of the refrigerated warehouse facility, how much of** *(target 4)* **would you place into storage? 0%, 25%, 50%, 75%, or 100%.**

Ok, that's the end of our survey. We very much appreciate your patience. Thank you very much, and have good day.

Appendix D: Questionnaire Used in the Telephone Survey of Area Residents

A Survey of the Potential Usage of a Refrigerated Warehouse Facility in Juneau By Members of the Public

Enter phone number, first and last name into the database?

1 Am I speaking with _____?

Hello, my name is Michele Dawson, I'm an analyst with Northern Economics, and we are conducting a survey of Juneau area residents for the Fisheries Development Committee of the City and Borough of Juneau. The committee is working toward their goal of revitalizing commercial fisheries in and around the Juneau area. As a part of their overall objective they have asked Northern Economics to assess the feasibility of developing a publicly owned but privately operated refrigerated warehouse facility that would potentially contain frozen food locker space available to the public on monthly basis.

2 Would you be able to answer a few questions to help us understand the needs of the community?

If no then: Thank-you, have a nice day.

3 If there were frozen food locker space available to the public, would you consider using it? *(Check if yes. If no then*: Ok that's the end of our survey.

There are several sites under-consideration. Would you be more or less likely to use the facility if it was located ... *(check if more likely. Any number of sites can be checked.)*

4 Near the Linden Transport Facility just SE of Downtown, off Thane Road.

5 Near Douglas Harbor.

6 On Channel Drive near the Fish Hatchery.

7 Near Costco.

8 By the Airport.

In the facility, storage locker space would be available on yearly basis. Which of the following sizes of frozen food locker space would you see yourself using?

9 Locker Space for 100 lbs. @ $80.00 per year. (3 cubic ft, 15" w. x 9" h. x 37" d.)

10 Locker Space for 400 lbs. @ $105.00 per year. (11 cubic ft., 29" w. x 17" h. x 37" d.)

11 Locker Space for 800 lbs. @ $120.00 per year. (21 cubic ft. 29" w. x 34" h. x 37" d.)

12 None, all are too expensive. ***Check if all are too expensive.***

Ok. That's the end of our survey, thank-you for your time.

Appendix E: Preliminary Designs for Custom Processing Lines.

Figure 26: Design of a Small Scale Head and Gut Processing Line By Coastline Equipment, Inc.

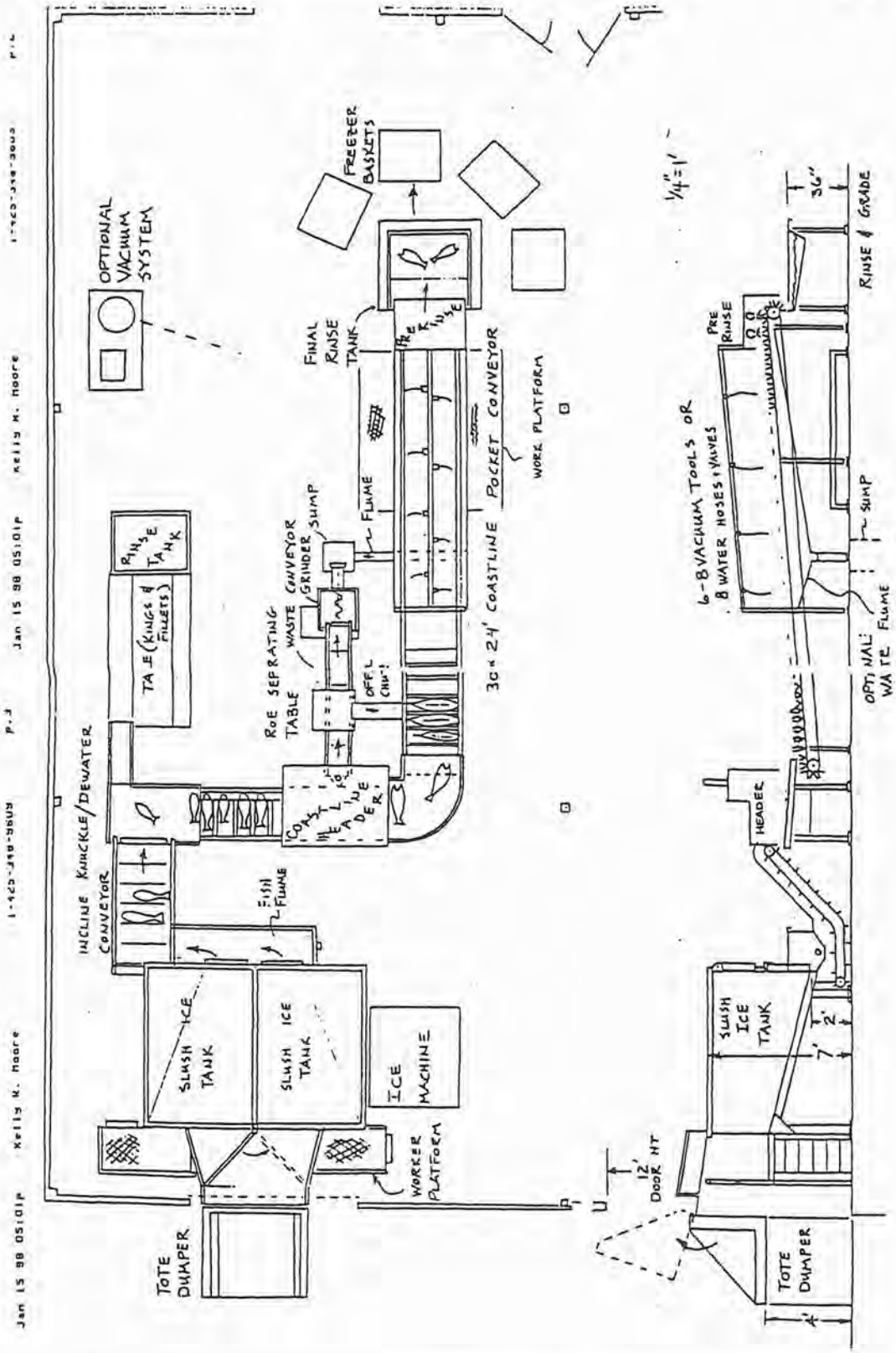

Figure 27: Design of a Small Scale Head and Gut Processing Line By Fluor Metal Fabricators