Design Study Report
Hydro Powered Fish Waste Disposal System

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List of Acronyms

ADEC	Alaska Department of Environmental Conservation
BOD	Biochemical Oxygen Demand
BNM	Broadcast Notice to Mariners
CE	Categorical Exclusion
CFS	Cubic Feet per Second
DO	Dissolved Oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FPS	Feet per Second
FT	Feet
FONSI	Finding of No Significant Impact
HDPE	High Density Polyethylene

HP	Horsepower
HPFWDS	Hydro Powered Fish Waste Disposal System
IN	Inches
ISER	Institute of Social and Economic Research
KPB	Kenai Peninsula Borough
kW	Kilowatt
LED	Light Emitting Diode
LNM	Local Notice to Mariners
NEPA	National Environmental Policy Act
NP	Nationwide Permit
NOI	Notice of Intent
OREI	Offshore Renewable Energy Installations
OSHA	Occupational Safety & Health Administration
PATON	Private Aids to Navigation
PVC	Polyvinyl Chloride
LBS	Pounds
UHMW	Ultra-high Molecular Weight
USCG	United States Coast Guard
USFWS	United States Fish & Wildlife Services
USFS	United States Forrest Service
USGS	United States Geological Survey
UAA	University of Alaska Anchorage
SHRED-3	3-SHRED-Hopper-1800 Waste Shredder

1.1 Executive Summary

The SeaWolf Engineering student team have worked throughout the semester to design a hydro powered fish waste disposal system that is to be placed in the Kenai/Russian River Confluence area in Cooper Landing, Alaska. As the popularity of the sport fishery has grown over time, improper disposal of fish fillet remains has led to an increasing number of human-bear interactions. Several methods of fish waste management have been implemented, but not widely accepted or used by all fishermen. The purpose of this project is to provide a safe, efficient and convenient method for proper fish waste disposal to be utilized by the fisherman of the Russian River and reduce bear-human interactions in the area. The Hydro Powered Fish Waste Disposal System project is sponsored by the University of Alaska Anchorage (UAA), U.S. Forest Service (USFS) and U.S. Fish & Wildlife Service (USFWS).

This capstone course allows students the opportunity to experience real projects in Anchorage while working closely with local professional engineers. The SeaWolf Engineering group simulates an engineering company with the class instructor, Dr. Osama Abaza, as the President and Steve Nuss, P.E. as the Vice President for Water/Waste Water Engineering. Alexandra West and University of Alaska Anchorage (UAA) played the role of the client for the project. The project manager, Nathan Harris, assured timely progress, efficient team communication and leadership. Additionally, the project manager oversaw the technical teams for Hydraulics and Hydrology, Structural and Mechanical Design, and Environmental.

Each technical team leader was responsible for a set of tasks and completion deadlines. The Hydraulics and Hydrology team, consisting of Jennifer Baker and led by Brandi Opsahl, analyzed river and channel characteristics at the site location. With this data, both were able to design the water wheel to meet the power and dimensional requirements. The Environmental Team, also consisting of Opsahl and lead by Baker, investigated sediment transport and conducted biochemical oxygen demand and dissolved oxygen calculations. Additionally, Baker worked closely with USFS and USWFS to identify and initiate the process to obtain all required permits for the project.

The Structural and Mechanical Design team was led by the project manager Nathan Harris and Jennifer Baker. Harris and Baker designed a floating structural frame and anchoring system for the device while maintaining safety and accessibility. Harris also designed the chute and fillet tables that feed the filleted fish remains to the grinding system that eventually discharges the waste into the river. Both the client and the technical teams collaborated to select the appropriate materials for the design that met strength, power and environmental requirements.

2.1 Project Introduction

The project began with the patented idea first presented by Alexandra West in 2011. As a part of an Undergraduate Research Project for the UAA Honors College, West received the U.S. patent number 8,833,682 B2 for her idea of designing a fish waste grinding system that would float in the Kenai/River Confluence area while both providing a safe method for proper fish disposal and also returning nutrients to the ecosystem. West allowed the UAA engineering students to refine the current hydraulic design, create a structural frame and flotation system for the device and investigate the environmental impact.

Pivotal missions of the Hydro Powered Fish Waste Disposal System (HPFWDS) are to reduce bear-human interactions at the popular Russian River sport fishery and maintain the vital balance of nutrients to the watershed that fish waste provides. With the rising popularity of fishing, encounters between bears and facility users have continued to become more commonplace. According to USFWS, the key antagonizing factor driving these bear-human encounters is the build-up of improperly disposed fish waste along the river.

Many efforts to mitigate the bear-human interactions have been made. Initially, hand grinders and fillet tables along the river were installed by USFWS to curtail the build-up of fish waste. These proved unsuccessful due to a perceived lack of convenience by fishermen. Next, a "pack-out" order was established to encourage anglers to pack the whole fish out of the fishery and fillet their catch at home. While this method may reduce bear encounters, it fails to return vital nutrients to the watershed provided by the fish waste. By removing fish waste completely from the river, the essential chemical processes are disturbed and may have a detrimental impact on the environment.

The HPFWDS addresses both of these problems. Fish waste will be ground into an appropriate size and transported downstream thereby reducing fish waste buildup along the banks while maintaining the return of nutrients to the watershed.

Project Location

The proposed project site is located in the Kenai National Wildlife Refuge between the State of Alaska-owned Sportsman's Boat Launch and the privately owned Russian River Ferry.

Figure 1. Project Location (USGS, 2015)

3.1 Project Scope and Approach

The University of Alaska Anchorage and inventor Alexandra West propose to develop the Hydro Powered Fish Waste Disposal System prototype to be placed near the confluence of the Russian and Kenai Rivers. The scope of the project includes the following:

- One pontoon-mounted, 7-foot wide, 15-foot diameter Poncelet undershot water wheel with a nominal production capacity of 10 kilowatts.
- A floating pontoon dock system with a total footprint of 24-feet (long) by 13-feet (wide).
- A mechanical grinder able to produce ½-inch in any direction fish waste "particles".
- A craft-to-shore mooring and anchoring system.
- An electrical power generator and battery system to power the grinder mechanism and water-pumping mechanism.
- Integrated fish cleaning stations with a water supply attached to HPFWDS via waste chute.

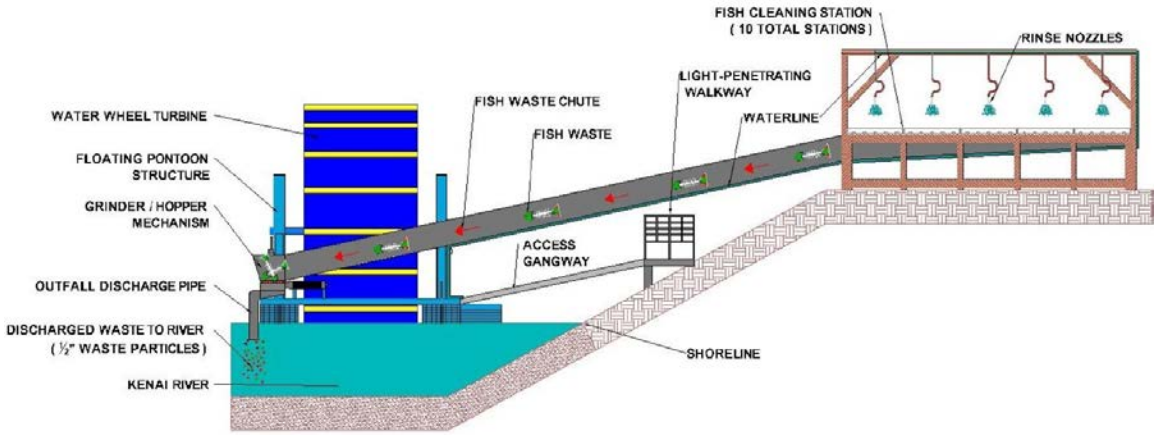


Figure 2. Project Layout

4.1 Hydraulic Analysis

Before designing any of the components, channel flow and depth data for the Kenai River at the proposed location was retrieved from the United States Geological Survey (USGS) website. Since the device would only be in service from July to August, data from 2008-2014 during these three months were used for analysis.

A typical cross section for the river was produced with information from HDR's 1997 *Kenai River Hydraulic Modeling Memorandum* to idealize the channel characteristics at the project site.

Assumptions made for the calculations are as follows:

- Trapezoidal Channel
- Side Slope of 0.25 ft./ft.
- Bed Slope of 0.005 ft./ft.
- Manning's Coefficient, n of 0.035

These assumptions are valid based upon data from the HDR reports provided in the appendices. The channel shape, bed slope, and side slopes were determined based upon cross sectional data from the report. The Manning's Coefficient, n was also determined by HDR.

A sample cross-section of the site location is found below:

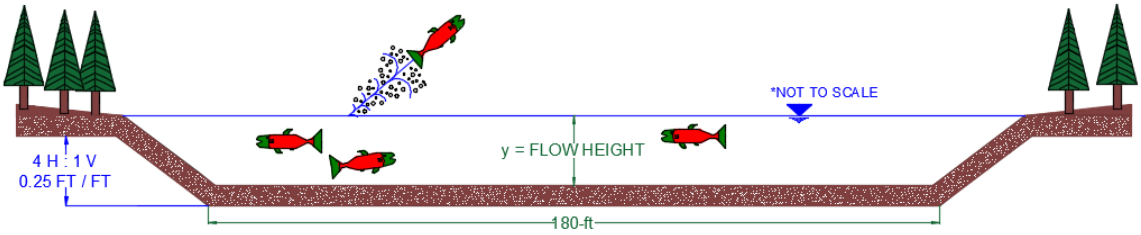


Figure 3. Typical River Cross Section

The flow rate of the Kenai River and the cross-sectional area of the device location were used to calculate the water velocity. The cross-sectional area of the river channel was determined using Manning's Flow Equation where R is the hydraulic radius, S is the channel bed slope, A is the cross-sectional area, V is velocity, and Q is the channel flow rate.

$$Q = VA = \frac{1.49}{n} AR^{2/3} S^{1/2} \qquad (1)$$

By utilizing Excel's Goal Seek function, river flow height and velocity were back calculated from the USGS flow (Q) data and the idealized cross-section. The velocity of the river was determined to be an average of 7 fps. To ensure the validity in assuming 7 fps as the design velocity, descriptive statistics were investigated. After sorting velocity data in ascending order, the minimum, maximum, mean, and standard deviation are presented in the following table.

Table 1. Kenai River Water Velocity Statistics

Water Velocity Statistics	
Total Count	351
Minimum (fps)	6.16
Maximum (fps)	9.64
Mean (fps)	7.63
Standard Deviation	0.74
50th Percentile	7.57
25th Percentile	7.07

Velocities at 6 fps occurred in July and were in the 25th percentile of velocity data for a ten year time period. From these data statistics, we can conclude that 75% of the time, the water velocity will be above 7.07 fps. Therefore, a design water velocity of 7 fps is justified.

5.1 Hydrokinetic Capacity

The Shred-3 Monster Grinder, manufactured by JWC Environmental, is used for waste disposal and requires 3.7 kW of power. However, to be conservative, the wheel was designed to generate 5 kW ensuring that the wheel will continue to meet capacity during low flow events. The reason for choosing the Shred-3 Grinder is due to the fact that it has been previously tested to meet Alaska discharge permit requirements at fish processing facilities in Cordova, Alaska and Adak, Alaska (Norquist Seafood Inc.)

According to JWC Environmental, the SHRED-3 hopper fed grinders satisfy discharge compliance of fish remains. The dual-shaft low-speed, high-torque fish waste grinders have the power and capacity to handle the most difficult fish remains.

6.1 Paddle Wheel Design

Before designing the paddle blades of the water wheel, the overall dimensions were first determined. The design calculations for the dimensions of the water wheel followed the procedure outlined in an article written by Rudy Behrens, owner of FITZ Waterwheel Company, for no-head and, low-head waterwheels. According to Behrens, the available head is the most important variable when designing a water wheel. The head is the difference in water height between the upstream and downstream water surface between any two locations. However, due to the low-head conditions, the head was calculated using the spouting velocity which is the speed of any falling mass equal to the water velocity squared divided by two times the gravitational constant.

$$h = \frac{V^2}{2g} \qquad (2)$$

Behrens suggested using a wheel diameter between 3 to 6 times the head. Although the available head for the location is 0.8 feet., the design head will be 2.5 feet, providing more area and therefore more power generation. The overall diameter of the waterwheel was calculated using 6 times the design head totaling 15 ft. Behren advised against diameters larger than 6 times the head since there would be no improvement in performance past this diameter. The inner, or working diameter, D_w is equal to the overall diameter minus the design head, h.

$$D_w = D - h \qquad (3)$$

The working diameter was determined to be 12.5 ft. The working circumference, C_w is equal to π multiplied by the working diameter.

$$C_w = \pi D_w \qquad (4)$$

Using equation 4, the working circumference was determined to be 39 ft. Behren suggested that the space between paddles had to be smaller than the design head, which is equal to the submerged distance of a paddle wheel. For a head of 2.5 feet, the blade distance was 2.45 feet. The number of paddles was determined by dividing the working circumference by blade spacing.

$$Number\ of\ Paddles = \frac{C_w}{Blade\ Spacing} \qquad (5)$$

The number of required paddle blades is 16, as calculated from equation 5.

The power density equation was used to calculate the total paddle area for the water wheel. Assuming the water density, ρ_w was approximately equal to 1000 kg/m^3, a water velocity of 7 fps, and 5 kW as the power requirement, P, the total area of a single paddle, A_p was determined with the following equation:

$$A_p = \frac{2P}{\varepsilon \rho_w V} \qquad (6)$$

The overall area of a paddle had to be approximately 27 ft^2 to generate 5 kW of power. Since the head is equal to the submerged distance, the width, w was calculated with the following equation:

$$w = \frac{A_p}{h} \qquad (7)$$

For a rectangular, flat-surface paddle with a submerged depth equal to 2.5 feet, the width calculated using equation 7 would have been 11 feet. In order to decrease width while maintaining the required paddle area, the paddles were curved into a semi-cylindrical shape with a radius of 1.25 feet. By choosing to use a curved paddle over its flat rectangular counterpart, the width of the paddle was reduced to 7 feet. The following figure is an example of the proposed paddle wheel dimensions (in inches).

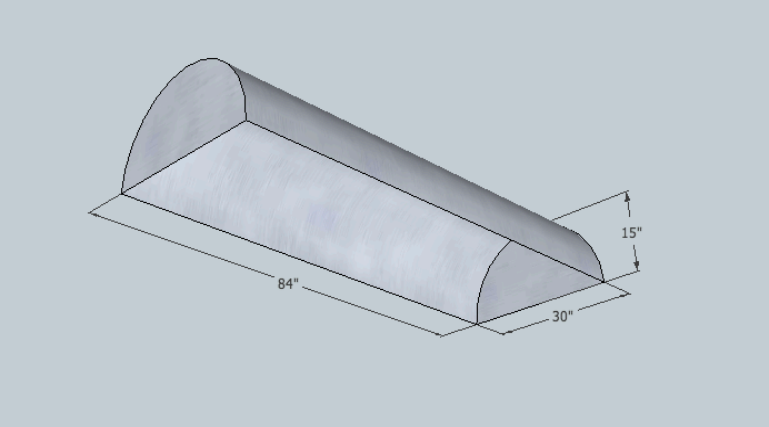


Figure 4. Semi-Cylindrical Paddle Dimensions

An additional benefit of using a curved paddle over a flat paddle is the increase in power efficiency. The efficiency of the water wheel, ε, depends on the both the type and capacity of the system. The chosen system for this design is an undershot wheel where water impacts the blades along the bottom of the wheel and exerts a tangential velocity. While the undershot wheel is considered the least efficient design compared to other water wheels, it has no head requirement. Additionally, undershot wheels are easy to construct and maintain and can operate in a large range of flows. Dr. Gerald Muller, a professor from The Queen's University of Belfast, conducted a study on the design and efficiencies of various water wheels. For a Zuppinger wheel, also known as an undershot wheel, Muller reported efficiencies of 71-76% (Muller, n.d.). Even though the undershot wheel has historically reached a maximum 77% efficiency (Denny, 2005), a conservative efficiency of 40% was used for design in order to account for mechanical and electrical inefficiencies.

In addition to calculating wheel dimensions, Rudy Behrens also suggested a wheel

speed of 67% to 90% of the water velocity to increase efficiency. Using the 7 fps design velocity, 67% of the water speed was 4.7 fps where 90% was 6.3 fps. In an effort to account for low-flow events, the 4.7 fps option was chosen as the efficient speed for the water wheel. Using this speed, the rotational speed, ω of the water wheel was calculated using the following:

$$\omega = \frac{V_{wheel}}{C_w} \qquad (8)$$

Where V_{wheel} is the wheel velocity and C_w is the working circumference calculated previously. For this design, the rotational speed will be 23.55 revolutions per minute (RPM).

7.1 Power Generation

The amount of power that can be obtained depends on the amount of water flow, the height from which the water falls, known as the head, and the efficiency of the wheel. Therefore, the amount of power available from the hydropower wheel is directly related to the flow rate, head and the force of gravity (Zaman & Khan, 2012). The theoretical power output, P_{th} (kW) of the designed wheel was calculated as follows:

$$P_{th} = Qhg \qquad (9)$$

Where Q = design flow (m^3/s)
h = head (m)
g = gravitational constant (9.81 m/s^2)

The design flow, Q, was calculated using the continuity equation, which relates flow rate to the cross-sectional area of the channel to the water velocity. With a velocity of 7 fps and a total paddle area of 27 ft^2, the design flow was calculated to be 123 cfs. The theoretical power output of the designed water wheel, calculated using equation 9, was 26 kW.

However, a more realistic power output of the designed system must contain an efficiency factor, ε. The same efficiency used for determining wheel dimensions was multiplied by the theoretical power output producing 10 kW. Considering that the SHRED-3 Grinder only requires 3.7 kW, the designed water wheel will supply enough power throughout the fishing season. See Figure 5 for a detailed schematic of the Undershot water wheel dimensions.

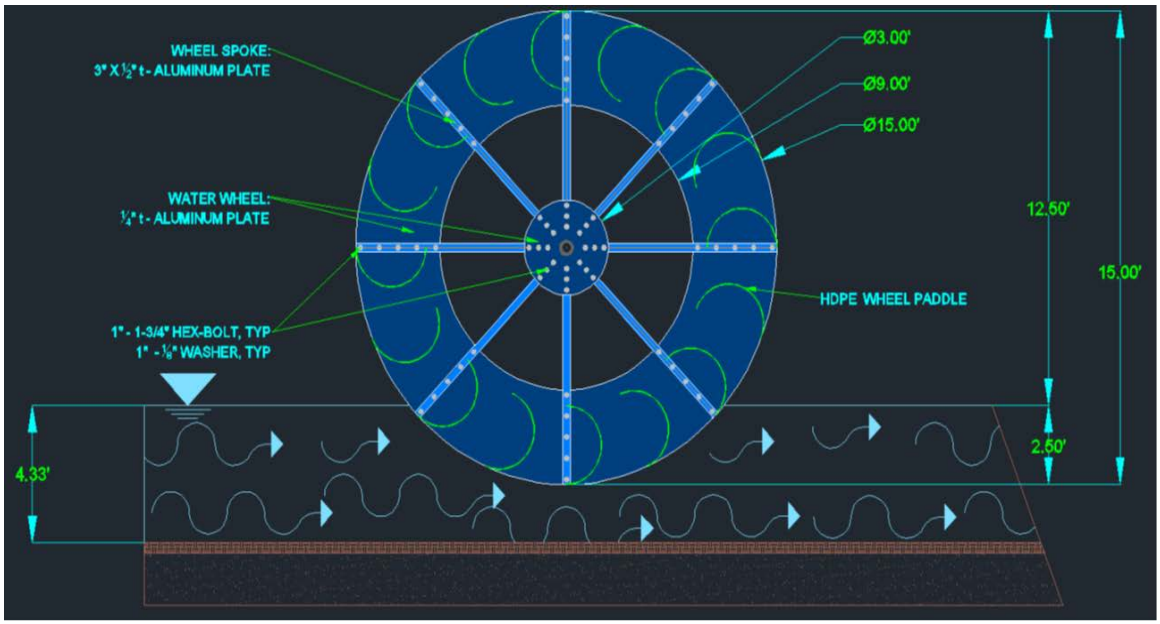


Figure 5. Undershot Water Wheel Dimensions

8.1 Structural Chassis & Flotation

The undershot wheel is supported by an in-water floating pontoon dock structure. The wheel connects to a #4 Standard steel pipe axle that is supported on one side with a spherical self-aligning bearing and the other side with a transmission flange connecting the wheel-axle to the gearbox and generator. The frame is primarily made of 6061 structural marine aluminum closed box beams and 5086 marine aluminum plating, either bolted or welded together. The 6061 and 5086 aluminum types were chosen for this design because of its adequate strength and its lighter weight compared to steel. Furthermore, these particular aluminum alloys are commonly used for marine vessel applications due to resistance to corrosion unlike their steel counterpart. The aluminum plates will be bolted to the frame chassis to form the deck and exterior of the pontoons. The HPFWDS is intended for use during the months from June to August. The device will be deployed at the start of the first annual salmon return and removed for maintenance and storage at the end of the salmon fishing season.

The pontoon floatation system will be constructed from twelve 4-ft long, 2-ft wide, and 2-ft deep heavy-duty dock float units. These floating dock units will slide into the chassis from the bottom side and be bolted to the aluminum structural members. Each pontoon will consist of 5 floating dock units, with two additional units placed under the extra deck area that will be used to access the transmission gearbox, generator, and battery assembly. These extra units are necessary to balance the uneven weight distribution created by the heavy gearbox, and electrical systems.

The entire in-water craft is calculated to have a gross weight of approximately 5,700 pounds (lbs.). The total buoyancy capacity of the craft using 12 4-ft by 2-ft by 2-ft

floating dock units is 10,400 lbs. Given the gross weight of the turbine craft, approximately 55% (about 1-ft) of the pontoon will be submerged.

The entire HPFWDS will have a footprint of 24-feet (length) by 13-feet (width). A key goal of this project was to use as small of a footprint as possible and make deployment and removal an easy process. All features (not including the anchor and mooring equipment, cleaning stations, the fish waste chute and gangways used for access) will be located on the craft, which minimizes the footprint of the device and makes insertion and removal of the device simpler. The entire deck will be enclosed by safety railings with a height of at least 39.5-in (USCG) between both the revolving wheel and the open-water of the river.

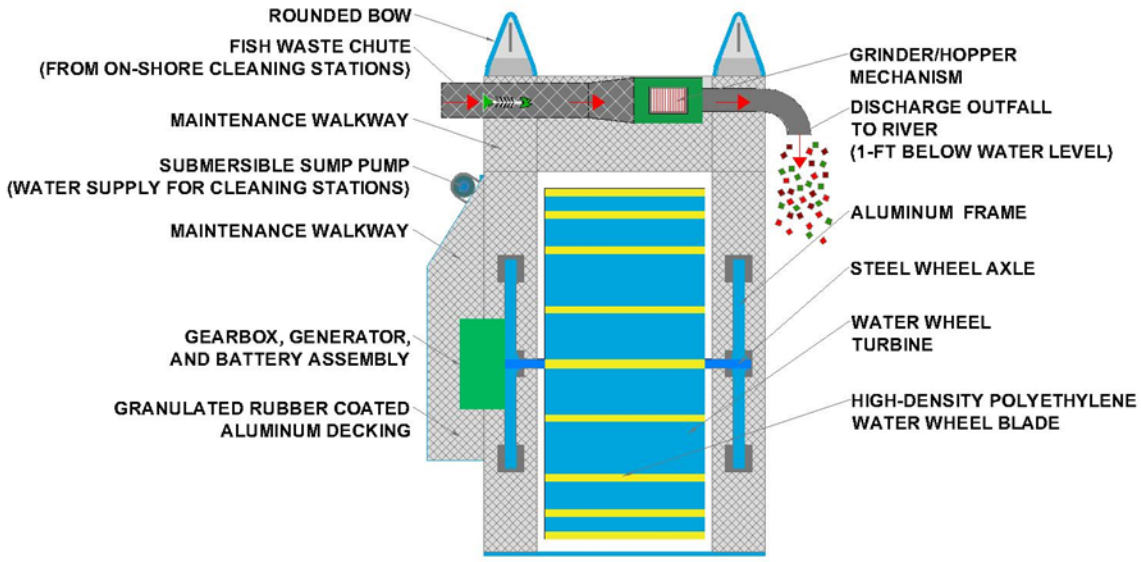


Figure 6. Structural Chassis Layout

9.1 Grinder Selection

Due to the expense of designing a new grinder, the client and technical teams recommend purchasing a grinder from a manufacturer known for meeting discharge permit requirements. The 3-SHRED-Hopper-1800 Waste Shredder (SHRED-3), manufactured by JWC Environmental, has been selected as the grinder of choice for the following reasons:

- The SHRED-3 is currently used to process fish waste by Norquist Seafoods Inc. in both Cordova, AK and Adak, AK. Norquist reports 95% successful compliance rates for the discharge particle size of ½-inch set by the Alaska Department of Environmental Conservation (ADEC).
- The SHRED-3 has a required power-input of only 3.7 kW, which is well below the nominal power output of 10 kW.

- A high thru-put rate of 105 ft^3/hour can process up to 56 fish waste carcasses per minute, assumed to be well above the potential peak-input of salmon waste.
- The SHRED-3 can be equipped with a hopper-style thru-put system which is ideal for varying amounts of fish waste, employs gravity to feed waste into the shredder, and requires low maintenance.

The SHRED-3 discharge pipe will be attached to a custom outfall pipe for waste disposal approximately 1-foot below the surface of the water in order to comply with ADEC discharge permit requirements. The outfall pipe will also be equipped with a separate pipe outlet allowing daily fish waste discharge sampling.

A custom expanded aluminum metal safety cage with a lockable access door will surround the grinder. The cage will prevent any accidental harm to human or wildlife trespassers on the craft. The only intended objects entering the grinding mechanism will be the waste material fed through the hopper via the waste chute.

10.1 Transmission & Power Generator System

The civil design team for SeaWolf Engineering 2015 has outsourced the design of the transmission gearbox and electrical generator system to Devon Jones and Alex Shuckerow of the University of Alaska Mechanical Engineering Department. The mechanical team was given key features and essential design criteria of the water wheel and have been tasked with designing a speed-up gearbox with an appropriate gear ratio for the design power output, a generator equipped to power the grinder, and selection of a battery power supply scheme.

11.1 Water Pumping System

A ½ HP Submersible Sump Pump produced by Dayton Pumps has been selected to pump water from the HPFWDS to the on-shore cleaning station. The pump is rated to produce 30 gallons per minute at a head height of 20-ft and 43-gallons per minute at 15-ft of head. This particular sump pump is also rated to handle up-to ¼-in solids in the influent and has an attached protective screen inlet, which is ideal for using river water as an influent source. Water from the Kenai River will be pumped from the in-water structure to the fish cleaning stations and waste chute onshore via the sump-pump and a 2-inch PVC waterline.

A separate water-use permit will need to be obtained from Division of Mining, Land, and Water. Most of the water used for the fish cleaning station and waste chute is intended to be recycled back to the Kenai River via the fish waste chute and outfall pipe.

12.1 Fish Cleaning Station

The integrated fish cleaning station is key to the success of the HPFWDS for and needs to be easy to access and use. As previously mentioned USFWS and Alaska Department of Fish & Game have tried several methods in the past to convince anglers to properly

dispose of fish waste to mitigate bear-human interactions. However, these attempts did not have the success as intended. The main reason for these failures is that the methods of fish waste disposal were not convenient or easy for fishermen. The installation of convenient, efficient and user-friendly fish cleaning stations will entice anglers to use the HPFWDS and hopefully reduce bear-human interactions as intended.

The fish cleaning station will include ten stations, with five being on either side of the attached fish waste chute that runs to the grinder. Each station will allow the user to fillet their catch and slide the filleted fish remains down the chute and into the grinder. Each station will measure approximately 40-in wide by 30-in deep. The cutting surface will be 3.5-ft above the ground. These dimensions similarly reflect popular styles of fillet tables currently sold. See the figure below for the suggested cleaning station design.

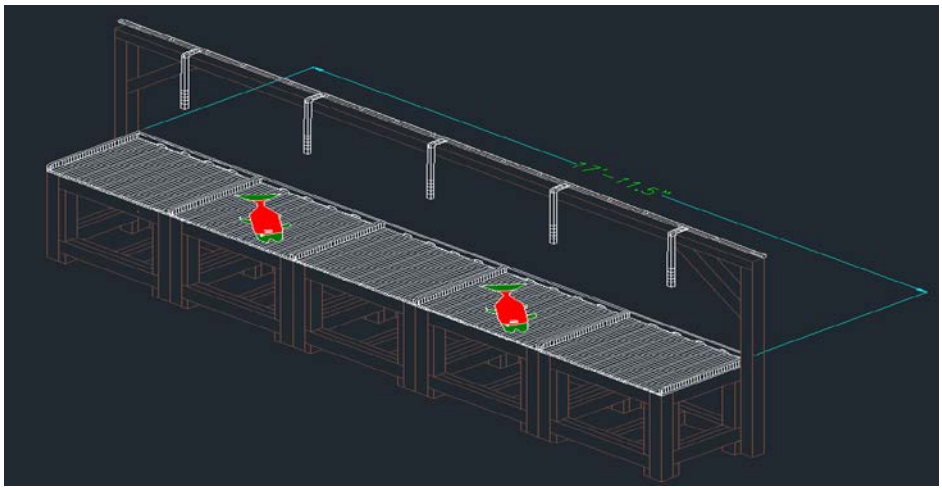


Figure 7. Cleaning Station Layout

The cutting surface of the table is to be made of ¾-in ultra-high molecular weight (UHMW) high-density polyethylene (HDPE). This type of cutting surface is the standard material used in the fish processing industry due its resilient and durable surface. The base of each station is to be constructed from pressure treated lumber for its low cost, simple construction and aesthetic appeal. Selling advertising space on the cutting boards has been discussed as a potential revenue source.

13.1 Fish Waste Chute

The fish waste chute connecting the on-shore fish cleaning station and the in-water craft will also be made of 5086 aluminum plate. The waste chute will be a built-up open C-channel shape having two distinct sections. The channel will approximately measure 24-in by 18-in.

The first section, running the span of the fish cleaning stations, will be centered

between the two opposing faces of the fish cleaning stations. This portion of the waste chute will be fixed and sloped downward towards the water device. The second portion of the fish waste chute will connect the fish cleaning stations to the on-board grinder unit. This section of the chute will be pin-hinge connected at both ends. These connections will allow the fish waste chute to move freely with the varying movement of the in-water craft due to river flow. This portion of the waste chute will have accessible and lockable hinged expanded aluminum safety cage panels from the south-extent of the fish cleaning station to the on-board grinder unit.

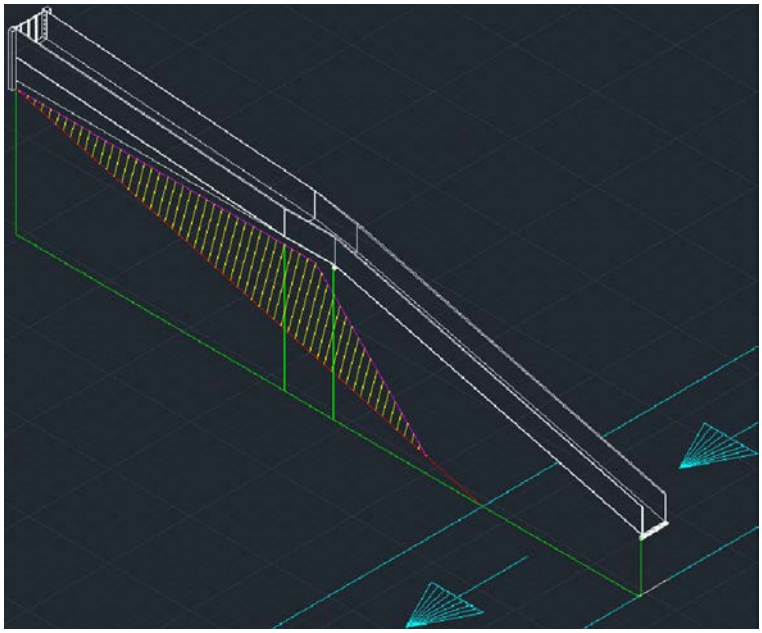


Figure 8. C-Channel Waste Chute

The entire length of the waste chute is to be constructed from anodized 5086 aluminum. This metal treatment is preferred to reduce frictional resistance along the surface and eliminate the potential environmental impact caused by unintended runoff from spray applied low-friction coatings.

14.1 Recommended Electronic Controls

An optional electrical control sensor could be installed on the fish waste chute to regulate the amount of time that the grinder system is in operation. A sensor that monitors motion or weight along the chute would be installed to turn on the grinder in preparation for incoming fish waste. After a significant period of no motion or weight detection on the chute, the grinder mechanism would be powered down to reduce the effects of wear and tear on the grinder system.

A pilot control station would also need to be installed if outboard propulsion is allowed for the HPFWDS craft. This control station could be installed at either of the walkways intended for maintenance use.

15.1 Mooring and Anchoring System

Due to the seasonal freezing of the Kenai River, the HPFWDS will only be deployed during the annual salmon sport fishing season from June through August. The frequency of deployment and removal requires the design of an anchoring system that is easy to utilize and maintain. The design of a user-friendly anchoring method is also vital for preventing high-labor costs associated with setting up the anchors from year to year and potential damages to on-board equipment.

The HPFWDS will be docked to a gangway extending from a light-penetrating walkway along the riverbank. The shore-to-craft gangway serves to rigidly anchor the device so that it remains parallel to the flow line of the river at all times. The structure will also be anchored to the shoreline via 1-inch braided steel cables that are positioned close to the surface level of the river. These steel anchor cables support most of the load created by the interaction of the HPFWDS and the flowing river and will be attached to the front of the HPFWDS craft. The angled steel anchor cables also serve as a way to mitigate and divert buoyant river debris such as fallen tree logs or branches away from the wheel turbine. River debris is a common cause of equipment damage to in-water structures and these anchor cables will assist it mitigating debris damage.

A secondary system of steel cable anchors will be located onshore or to the light penetrating walkway along the riverbank perpendicular to the HPFWDS. These secondary steel cable anchors will be designed to swing the HPFWDS craft into the shoreline in the event that the primary steel cable anchors fail or malfunction. The purpose of the secondary anchor system is to prevent a runaway craft downstream in the event of primary anchor failure.

An above-water anchoring scheme is preferred to a submerged anchor system for several reasons:

1. Having all anchor components above-water makes set-up, maintaining, and repairing the system much easier.
2. An above-water method eliminates the immense down force effect that would accompany a heavy submerged anchor.
3. Having submerged anchor cables increases the likelihood that the anchor cables would become inundated with submerged river debris, which would greatly increase the load on the cable and could cause the cables to fail.
4. Submerged cable line would be very difficult to manually remove debris from.
5. An above-water cable system will divert large profile buoyant debris away from the HPFWG and will make removal of trapped river debris along the cable much easier.
6. An above-water anchor cable method does not impact the river-bottom or salmon spawning environment.

The HPFWDS craft is expected to be anchored such that the center of the water wheel is located approximately 10-feet perpendicular from the northern shoreline of the

Kenai River. This proximity to the shoreline is ideal because accessible gangways can be attached with ease and a majority of the river debris will drift farther south of the HPFWG where the water is moving at a faster velocity.

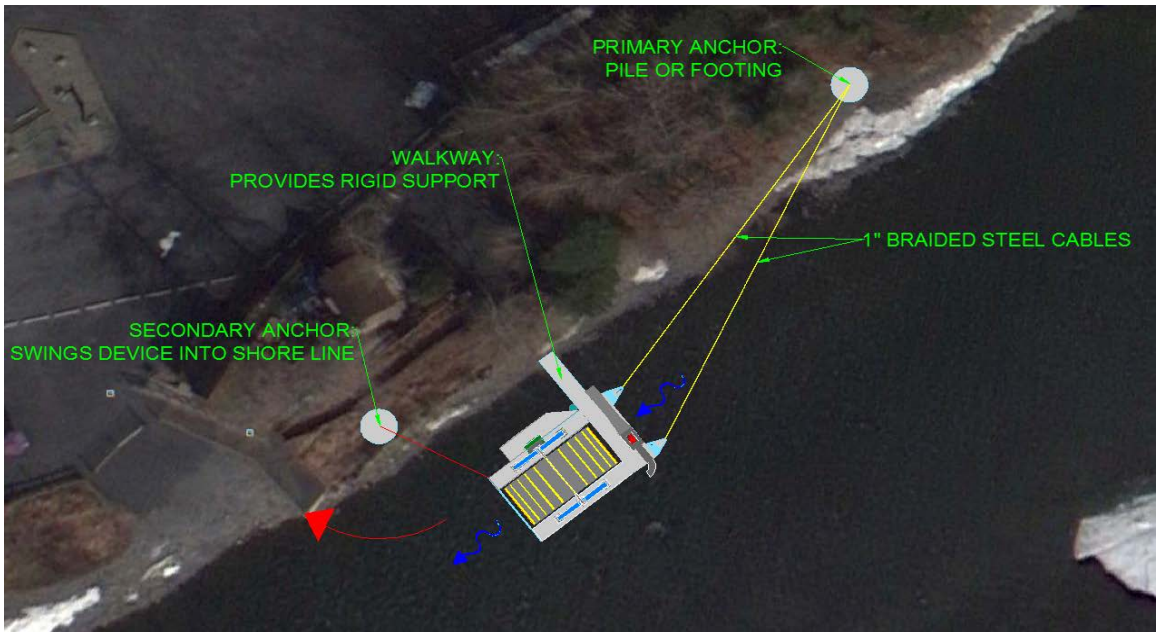


Figure 9. Proposed Anchoring Method

16.1 Propulsion System

An optional outboard boat motor could be mounted to the stern of the HPFWG and a controlled via a station located on the walkways along the bow or port sides to aid in guiding the craft downstream to the desired anchored location. A permit from Alaska Department of Fish and Wildlife will be required for the operation of an outboard boat motor on this portion of the Kenai River.

17.1 Safety

Proposed Daily Monitoring and Inspection Checklist

The following list is a proposed checklist for monitoring, evaluating, and maintaining the HPFWDS prototype once placed in the Kenai River:

- Inspect condition of braided steel cable and anchoring connections.
- Examine anchor piles and surrounding area for evidence of erosion or damage.
- Ensure anchor cables and HPFWDS craft are free of river debris.
- Check operation of wheel turbine, transmission gearbox, and electric power generator.
- Ensure fish waste grinder and attached waste chute are not inundated with built-up fish waste materials or debris.

- Rinse fish cleaning stations to remove remaining fish waste and reduce likelihood of bear attraction.
- Inspect functionality of water pump and integrity of PVC waterlines.
- Examine level and stability of floatation structure and frame.
- Ensure public access to the in-water HPFWDS craft is prevented.
- Check that all signs and markings are present and visible.
- The following items should be monitored to study the effects of the HPFWDS prototype the prototype test period:
    - Boating traffic characterization:
        1. Size of passing boats
        2. Average daily density of boat traffic
        3. Any notable interactions between boat traffic and the HPFWDS
    - Record wildlife interactions with the HPFWDS grinder in addition to the floating structure, anchor locations, waste chute, and fish cleaning stations
    - Maintain logbook of events or feedback involving operation and maintenance
    - Impact of boat traffic and river conditions on turbine wheel efficiency

During the winter season, the device will be removed from the river and placed in storage. Before returning the HPFWDS to service, a detailed inspection of all equipment should be conducted. A detailed review of information collected throughout the first season of use should be conducted once the craft is out of the river for the season.

Signage:

A variety of warning signs will be installed of the HPFWDS and its subsystems. This signage will be in accordance with US Coast Guard and OSHA protocols. Signs will inform the public of the location of the in-water craft and areas that required restricted access. Several signs will be placed on the HPFWDS to warn workers and volunteers of potentially hazardous conditions associated with working around the device and its subsystems. In addition, reflective or LED buoys will be installed on the device and along the anchor cables to warn boat traffic of possible navigation hazards.

Staging and Storage Plan

The HPFWDS will be deployed at the beginning of the salmon sport fishing season on the Kenai River and Russian River. The HPFWDS will remain anchored in the river for the duration of the summer sport-fishing season. Once the fishing season is over, the craft will be removed from the river transported to an offsite storage location. A complete inspection and necessary repairs should be completed before returning the device to service the following year.

18.1 Environmental Concerns

In the United States, fish waste is generally returned to the sea or applicable bodies of water to maintain nutrient levels in the watershed. However, when a large amount of fish waste is discharged into a small body of water, adverse environmental impact may occur due to waste retention. An additional issue encountered with fish processing is the possible intermittent loading and system response. The location and size of the water wheel's outflow pipe was investigated in conjunction to the river velocity to determine load capacity and project future nutrient levels.

Biochemical Oxygen Demand and Dissolve Oxygen

The biochemical oxygen demand (BOD) is the amount of oxygen required for microbial decomposition of organic waste. The current BOD levels were assumed to be negligible for the Kenai River. Excess BOD can deplete the rivers dissolved oxygen (DO) levels resulting in fish suffocation, death of river food supply and disturbance in the river ecology.

The following equation represents the oxygen required for organic material decomposition.

$$CH_2O + O_2 \implies CO_2 + H_2O \qquad (10)$$

In order to determine the impact of the HPFWDS on the river ecosystem the BOD and DO levels must be determined. Utilizing fish harvest data from Alaska Department of Fish and Game for a 10-year time period, the average summer (June through July) harvest of Sockeye salmon was found to be 29,380. From this the average daily catch was found to be 320 salmon/day. To be conservative it is assumed that all salmon caught will be filleted and the fish waste discharged via the disposal system into the river.

From an Institute of Social and Economic Research (ISER) study the average sockeye salmon weight is 8 lbs. The carcass weight is 25% of total weight; the waste to be discharged is 2 lbs. per salmon caught. This results in a waste discharge amount of 640 lbs. per day. From this BOD was determined based upon a BOD production rate of 0.23g/kg fish waste (Islam, Khan, & Tanaka, 2004).

To determine the outfall concentration it was assumed that 1/2-gallon of water per fish caught would be used to wash the waste down the chute to the grinder. From the average harvest data a discharge of 110 mg/L BOD per day was determined. The size of the chute also limits the volume of waste which can be carried to the grinder at a given time as well as capacity of the grinder. Based upon assumptions made the grinder capacity would be met if 56 fish per minute were fed down the chute. This far exceeds the calculated daily loading and anticipated usage of the system.

In order to determine the DO impact on the river the Streeter-Phelps oxygen sag curve equation was used.

$$D = \frac{k_D L_a}{k_R - k_D} e^{-kDt} - e^{-kRt} + D_0 e^{-kRt} \qquad (11)$$

This formula determines dissolved oxygen (D) at any point in the river related to initial dissolved oxygen(D_0), ultimate BOD loading(L_a), deoxygenation constant(k_D), reaeration constant(k_R), and time *(t).*

Equation 12 allows calculation of the reaeration constant at 20 degrees Celsius, where u is the stream velocity, and H is the average flow depth (Davis, Mastin, 2014). This value typically ranges from 0.35 to 0.46 for a large stream with lower velocities.

$$k_{R,20°C} = 3.9 \frac{u^{1/2}}{H^{3/2}} \qquad (12)$$

Equation 13 allows calculation of the deoxygenation rate, where k is the BOD rate constant, u is the average flow velocity, h, the average depth of stream (in length), and η is the bed activity coefficient. This coefficient was assumed to be 0.4. In cases where a river is deep and slow moving it can be assumed that $k = k_d$ but because there is no data for this particular river k_d was calculated to be conservative (Davis & Masten, 2014).

$$k_D = k + \frac{u}{h}\eta \qquad (13)$$

In depth calculations can be found in the appendices.

Previous DO data was collected by Alex West, measured in August 2010 over a period of hours and a couple of days, near Sportsman's Boat Launch for the river and utilized to determine the dissolved oxygen sag for the river and whether the waste loading would be detrimental to the river ecology. From the data the initial concentration of dissolved oxygen is approximately 9.5 mg/L (85% saturation).

The lowest point on the DO sag curve with respect to dissolved oxygen is called the critical point. The critical point indicates the worst conditions in the river with respect to dissolved oxygen. The time to critical point (t_c) can be determined using equation 14.

$$t_c = \frac{1}{k_r - k_d} \ln\left[\frac{k_r}{k_d}\left(1 - D_a \frac{k_r - k_d}{k_d L_a}\right)\right] \qquad (14)$$

As seen in *Figure 8* the critical point occurs at 6 hours and is well above what would be considered a detrimental level to the ecosystem. The DO levels remain in the decomposition zone, never entering a septic zone where fish would be absent with the presence of sludge worms; midge and mosquito larvae.

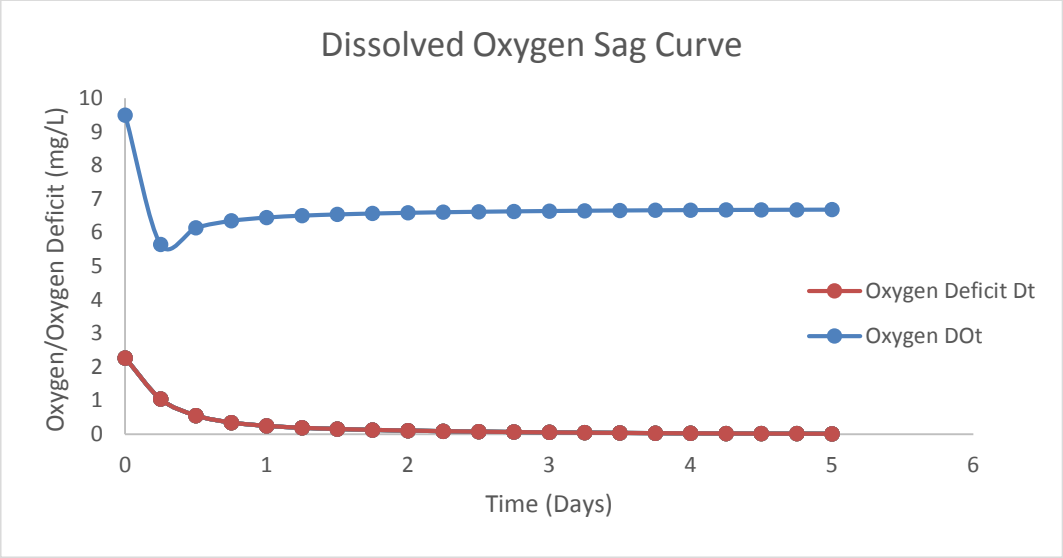


Figure 10. Dissolved Oxygen Sag Curve

It was found that the BOD would not cause significant DO sag at the discharge location of the receiving water body. The critical dissolved oxygen was found to be 5.65 mg/L which is within the acceptable range of 4-5 mg/L sufficient to support aquatic life (Water Research Center, 2014). Thus the project would return nutrients to the river in an acceptable manner, achieving one of the project goals.

Sedimentation Transport

With the discharge of fish waste in ½-inch dimension into the river it is necessary to determine if there will be a build up of waste on the riverbanks and if sliming of the riverbed would occur at and near the location of the discharge at the outfall of the grinder. In order to determine this principles of sediment transport are utilized. From Julien's *Erosion and Sedimentation* the following equation was used to model the movement of fish waste particles in the river.

As the fish waste is discharged dispersion of the particles occurs along the cross-section of the river as well as along the length of the river channel. The settling velocity was used to show that dispersion of the fish waste will occur and the particles will not settle out in one location, thus sliming will not occur on the river bed.

To ensure that no sliming would occur along the Kenai River bed, a simple lab experiment was conducted to determine the mass density of sockeye salmon. Mass density, ρ, is mass divided by volume. While particle mass can be determined using a scale, the volume of the fish sample was determined using Archimedes Principle which states that a submerged object will displace a volume of water equal to the volume of the object. A 50 mL glass beaker was first filled with tap water and recorded as the initial volume. After recording the mass of a ½-inch piece of pressure-cooked

sockeye salmon bones and flesh, the piece was gently lowered into the glass beaker. The final volume was recorded and used to calculate the displacement volume. The salmon was then removed from the water and the water was discarded. The test was repeated with the same ½-inch piece of sockeye salmon with clean tap water for each test.

The calculated mass density of sockeye salmon was 1030 kg/m^3 yielding a specific gravity of 1.03. According to Pierre Julien, author of Erosion and Sedimentation, a particle with a density larger than the surrounding fluid will accelerate in the downward direction until it reaches an equilibrium fall velocity ω_0 (Julien, 2010, p. 94). Assuming clear water conditions, Julien suggested that the fall velocity of natural coarse particles is roughly equal to (Julien, p. 96):

$$\omega_0 = \sqrt{(G-1)gd_s} \qquad (15)$$

Where G is the specific gravity, g is the gravitational constant equal to 32.2 ft./s^2 and d_s is the particle diameter. Using a specific gravity of 1.03, the fall velocity was calculated to be 0.2 fps; much smaller than the 7 fps river velocity.

19.1 Permitting

Due to the nature of this project several permits are required for implementation. State and local agencies must coordinate with the responsible parties of the project to define a clear scope of the project and appropriate timeline for completing the permitting process. Permits and authorizing agencies include but are not limited to:

- AKG – 52000000 Fish Waste Discharge Permit (ADEC)
- Multi Agency Permit Application (Kenai River Center)
    - Kenai Peninsula Borough
    - Alaska Department of Fish & Game
    - Alaska State Parks
    - U.S. Army Corps of Engineers (as a courtesy)
    - U.S. Fish & Wildlife Service
        - Fish Habitat
        - Special Area Permit
- Temporary Water Use Permit (Division of Mining, Land, & Water Use)
- Offshore Renewable Energy Installations Permit (Coast Guard)
- Nationwide Permit (Army Corps of Engineers)
- Special Use Permit – U.S. Forrest Service

In addition as part of the permitting process the project will also have to undergo the National Environmental Policy Act process (NEPA). Once project site selection has been finalized the agency, which owns the land, will be responsible for applying for all the necessary permits and in conjunction with the prime-permitting agency go through the NEPA process. After the project site owner is identified a scoping meeting

should take place to fully identify the depth of the project, all parties involved, and each parties responsible tasks.
Each of the permits is discussed below with reference documents along with the permits can be found in the appendices.

National Environmental Policy Act Process

This project takes place on federal lands and must undergo National Environmental Policy Act (NEPA) process. NEPA requires federal agencies to integrate environmental values into the decision making process by considering environmental impacts of proposed actions and reasonable alternatives to those actions.

To meet NEPA requirements federal agencies prepare a detailed statement known as an Environmental Impact Statement (EIS). EPA reviews and comments on EISs prepared by other federal agencies, maintains a national filing system for all EISs, and assures that its own actions comply with NEPA.

Federal agencies may be required to prepare an EIS in accordance with Section 1502 of the Council on Environmental Quality. The EIS must be filed no earlier than they are transmitted to commenting agencies and made available to the public. Federal agencies file an EIS by submitting the document with *e-nepa*. In addition to the electronic filing agencies should provide a paper copy of the EIS directly to the appropriate EPA Regional Office for review and comment. The minimum time periods are calculated from the date EPA publishes the Notice of Availability in the *Federal Register*. Review periods for submittals are 45 calendar days unless extension is necessary.

This Environmental Impact Statement includes:

- An introduction including a statement of the Purpose and Need of the Proposed Action.
- A description of the Affected Environment.
- A Range of Alternatives to the proposed action.
- An analysis of the environmental impacts of each of the possible alternatives. This section covers topics such as:
    - Impacts to threatened or endangered species
    - Air and water quality impacts
    - Impacts to historic and cultural sites
    - Social and Economic impacts to local communities, including impacts to aesthetics and noise within the affected area
- Cost analysis for each alternative, including costs to mitigate expected impacts to determine if the proposed action is prudent.

The NEPA process has the following routes:

- Proposal: The needs and objectives of a project have been decided, but the project has not been financed.
- Categorical Exclusion (CATEX): The government may exempt an agency from this process. The agency can then proceed with the project and skill the remaining steps.
- Environmental Assessment (EA): The proposal is analyzed in addition to the local environment with the aim to reduce the negative impacts of the development of the area.
- Finding of No Significant Impact (FONSI): Occurs when no significant impacts are identified in an EA. A FONSI typically allows the lead agency to proceed without having a complete EIS.

Environmental Impact Statement:

- Scoping: The first meetings should be held to discuss existing laws, available information, and the research needed. Tasks should be divided up and a lead group selected.
- Notice: The public is notified that the agency is preparing an EIS. The agency should also provide the public with information regarding how they can become involved in the process.
- Draft EIS: The agency prepares a draft EIS with the components as previously mentioned.
- Comment: Affected individuals then have the opportunity to provide feedback through written and public hearing statements.
- Final EIS and Proposed Action: Based on the comments on the draft EIS, the agency finalizes the EIS and announces the Proposed Action.

AKG520000 – Fish Waste Discharge Permit

Alaska Department of Environmental Conservation (ADEC) issues this permit. It is the general discharge permit, which has been administratively extended by the Environmental Protection Agency (EPA). This permit covers shore based facilities and vessels operating within 3 nautical miles of shore and also covers river based facilities.

Before applying for the permit the agency must submit a Notice of Intent (NOI) no less than sixty (60) days before discharge.

For the Hydro Powered Fish Waste Disposal System it is categorized as a shore based facility with headed and gutted discharge. The dimension limit of the discharge is no greater than ½-inch in any direction.

Permit Monitoring Requirements:

- Best Management Practices Plan
- Annual report
- Seafloor (riverbed) monitoring requirements
- Sea surface (river surface) and shoreline monitoring requirements

This permit impacts design by requiring a discharge port no less than 2-inch in diameter for monitoring requirements. Additionally the outfall discharge distance will need a waiver due to not being able to meet the 10-foot requirement below the lowest low mean water level. See Appendices for further detail of permitting requirements.

This permit is submitted to:

Division of Water
Department of Environmental Conservation
555 Cordova St.
Anchorage, AK 99501
Phone: (907) 269-7580
Fax: (907) 334-2415

Multi Agency Permit Application

This application is required for all activities that encompass the Kenai Peninsula Borough (KPB) 50-foot Habitat Protection Area, Floodplain, and any in-water use of anadromous rivers and/or lakes, or activities that take place in wetlands. This permit is available through the Kenai River Center and is distributed to the following agencies:

- Kenai Peninsula Borough
- Alaska Department of Fish & Game
- Alaska State Parks
- U.S. Army Corps of Engineers (as a courtesy)
- U.S. Fish & Wildlife Service

Individual agencies may contact the responsible agency about applications and in some cases additional information or applications may be required. The responsible agency is also required to obtain any additional permitting for the project.

This application pack must include project drawings and description. Complete applications can take thirty (30) days or longer to process and should be accounted for in the project timeline. The permit process begins at the project plant and should occur well in advance. The River Center should be consulted as part of the overall permitting process.

After permits have been received the River Center must be notified:

- Three days before construction begins
- Questions about permit requirements
- If project requires modifications that are not covered under the permit
- If the project cannot be completed by the expiration date of the permit
- If the project is complete
- If the completed project requires maintenance

The permit application can be submitted to:

The Donald E. Gilman River Center
514 Funny River Road
Soldotna, AK 99669
Phone: (907) 260-4882
Fax: (907) 260-5992

Temporary Water Use Permit

This permit is issued by the Alaska Division of Mining, Land, and Water and is required if more than 500 gallons per day in 10 calendar days per year is used. The cleaning system exceeds this limit and therefore requires this permit. It is valid for projects less than 5 years. This application is submitted to:

Water Resources – Anchorage
550 W. 7th Ave., Suite 1020
Anchorage, AK 99501-3577
Phone: (907) 269-8600
Fax: (907) 269-8947

Offshore Renewable Energy Installations (OREI)

The Coast Guard oversees two aspects of OREI installations:

- Reviewing the applicants Navigation Safety Plan to determine if the installation will pose potential adverse impacts to the users of the waterway. This is accomplished by conducting a Risk Assessment. In Alaska, these Risk Assessments are conducted by the USCG Sector Waterways offices. USCG Sector Anchorage is responsible for waterways north of Yakutat including interior river systems.

- Determining if the installation will require Private Aids to Navigation (PATON). PATON includes navigation lights and/or regulatory signs. These are used to warn mariners of the presence of the installation. USCG District 17 Waterways Management Branch is responsible for PATON for the entire state of Alaska.

The Coast Guard distributes navigation safety information to the maritime public regarding OREI in two ways:

- Broadcast Notice to Mariners (BNM)
- Local Notice to Mariners (LNM)

Additional information regarding OREI's potential navigation hazards and mitigation measures can be found in the appendices.

For information about OREI PATON located within the 17th Coast Guard District:

Commander (dpw)
Coast Guard District 17
PO Box 25517
Juneau, Alaska 99802-5517
Attn: PATON Manager
Phone: (907) 463-2272
Fax: (907) 462-2273
D17-PF-D17_LNM@USCG.MIL

For information about Risk Assessments on OREI's located within the 17th Coast Guard District contact the Sector Waterways office:

Commander (spw)
Coast Guard Sector Anchorage
510 L. St. Suite 100
Anchorage, AK 99501
Phone: (907) 271-6700 option 5
Fax: (907) 271-6751
Sector.Anchorage@USCG.MIL

Nationwide Permit

Nationwide permits (NWP) are issued by the Army Corp of Engineers and authorize specific activities in areas under the Corp's Regulatory jurisdiction. These activities are minor in scope and must result in no more than minimal adverse impacts, both individually and cumulatively. This permitting process usually takes 30 to 45 days.

To qualify for NWP authorization, the permittee must comply with general conditions, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Permittees should contact the Corps district office to determine if regional conditions have been imposed on an NWP. Before the project commences a preconstruction form must be submitted in addition to the permit application. This project falls under many categories of the nationwide permit

but the most applicable is category 52 – Water-Based Renewable Energy Generation Pilot Projects. Conditions and further information regarding the NWP can be found in the appendices or by contacting the following office:

US Army Engineer District, Alaska
2204 3rd Street
JBER, AK 99506-0898
Phone: (907) 753-2520

Special Use Permit

This permit is required when a project takes place on National Forest Service land. The special-use authorization is a legal document that allows occupancy, use, rights, or privileges of National Forest Service land. The authorization is granted for a specific use of the land for a specific period of time. The application process is summarized in the permitting appendices.

Other Required Permits

In addition to those permits listed above construction permits and plan review will be necessary for the project. If propulsion is sought for the system permitting will also be required since the Upper Kenai River does not allow motorized water craft.

20.1 Cost Estimate

Table 2. Cost Estimate

Cost Estimate			
Catagory	**Item**	**Quantity**	**Cost**
Permitting			
	AKG 52000000	1	$410
	MAPA	1	$100
	Contingency	1	$2,000
		CATEGORY COST	***$2,510***
Turbine Components			
	Paddle Wheel	1	$5,000
	Frame	1	$6,000
	Flotation	1	$1,300
		CATEGORY COST	***$12,300***
Mechanical Systems			
	Grinder	1	$27,000
	Generator & Batteries	1	$10,000
		CATEGORY COST	***$37,000***
Subsidiary Systems			
	Fillet Stations	1	$2,500
	Sump Pump/Water cleaning System	1	$800
	Anchoring System	1	$10,000
	Chute	1	$500
		CATEGORY COST	***$13,800***
Construction			
	Construction Labor & Equipment		$10,000
		CATEGORY COST	***$10,000***
		TOTAL	**$75,610**

The estimated total cost of fabricating the HPFWDS is $75,610. Permit application costs were obtained from agency websites (ADEC & Kenai River Center) along with contingency for construction and plan review permitting. Price quotes for the aluminum components were given by Alaska Steel Company, a local metal materials vendor. The price quote for the JWC grinder mechanism was given by APSCO LLC., a regional vendor for JWC environmental. The estimated cost of the mechanical components accounts for approximately half of the total cost of fabrication of the HPFWDS. The $27,000 price includes shipping to Anchorage, AK and a 1-year quality assurance warranty from the manufacturer. A Mechanical Engineering Class at the University of Alaska Anchorage is also working to develop several other grinder mechanism prototypes at this time. These student developed grinders should be considered based on effectiveness and cost analysis before purchasing the expensive JWC Environmental Grinder Mechanism.

Subsidiary systems price quotes were given by Grainger Inc. (water pump), Boat Outfitters Inc. (fillet stations), STG Inc. (anchor system) and Alaska Steel Company (waste chute). Construction costs were calculated based on an average hourly labor rate of $25 per hour. This low average hourly labor rate was used because much of the labor associated with the fabrication, construction and design of the HPFWDS is anticipated to come from student and other local volunteers.

21.1 Conclusions and Recommendations

Hydraulics and Hydrology

Since the grinder and the corresponding generator have yet to be finalized, the dimensions of the wheel and its components may need to be reevaluated for power requirements. A smaller grinder with a lower power requirement may be sufficient for this project but was not investigated due to time constraints. However, as the project continues, calculations should be conducted for a smaller grinder and may introduce additional benefits such a lowering total cost, decreasing both wheel and support dimensions and would allow easier transportation of the device.

The water velocity and channel depth data collected from the USGS station in Cooper Landing, Alaska may be different from the final site location that has yet to be solidified. Once a location has been set for the device, water velocity and channel depth data should be collected and compared to the assumptions used for the design calculations.

Structural and Mechanical

Structural Chassis and Floatation:
For the structural chassis and floatation system, a finite element analysis should be conducted before beginning fabrication of the device. A small-scale model of the prototype could also be built for prior testing. The optimal hardware and bolt connection locations should be determined. Determining the required weld strengths at weld connection sites should be calculated.

If a higher priced pre-manufactured pontoon floatation is preferred by the client, a pre-fabricated HDPE cylindrical pontoon should be investigated.

A complete weight distribution analysis should be conducted before construction. This study only accounts for the total weight and buoyancy of the prototype. A more accurate analysis would help to maximize stability and hydraulic profile in the river.

Mooring and Anchor Method:
A final site layout needs to be determined by the cooperating agencies in order to conduct an in depth anchor analysis. This report serves to provide an effective and suitable conceptual method for the mooring and anchor system. Approval of the cable-to-pile connection method is also still pending from the cooperating agencies.

If approval of the conceptual method is granted, a geotechnical report for the pile locations would be needed. An applied load analysis should also be conducted to ensure the to-be-installed light-penetrating walkways can support the load on the gangways from shore to craft due to the river.

Chute:
A final site location needs to be approved before a stress analysis can be performed for the proposed waste chute. The appropriate sized pin-hinges will be a key feature to be designed once the site is picked. A friction test of fish waste along the chute could be conducted to improve the sliding motion along the waste chute surface.

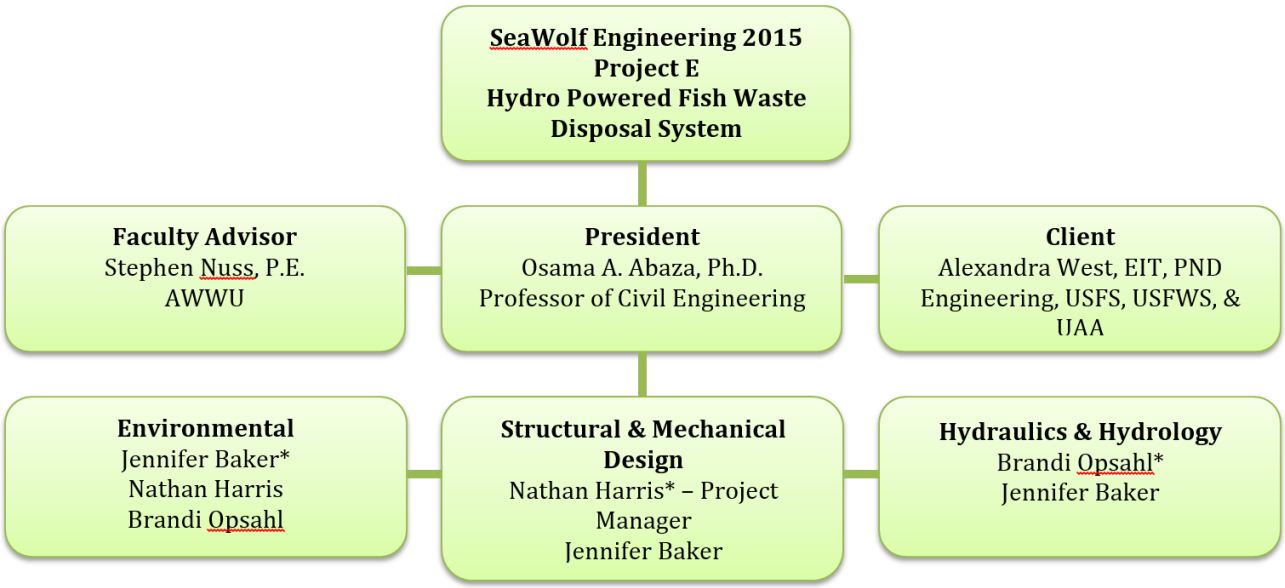
Environmental

As stated previously a final site for the project should be selected. Once this is done the agency which owns the land should commence the permitting process since it can take time. While many permits have been listed for this project it is by no means inclusive.

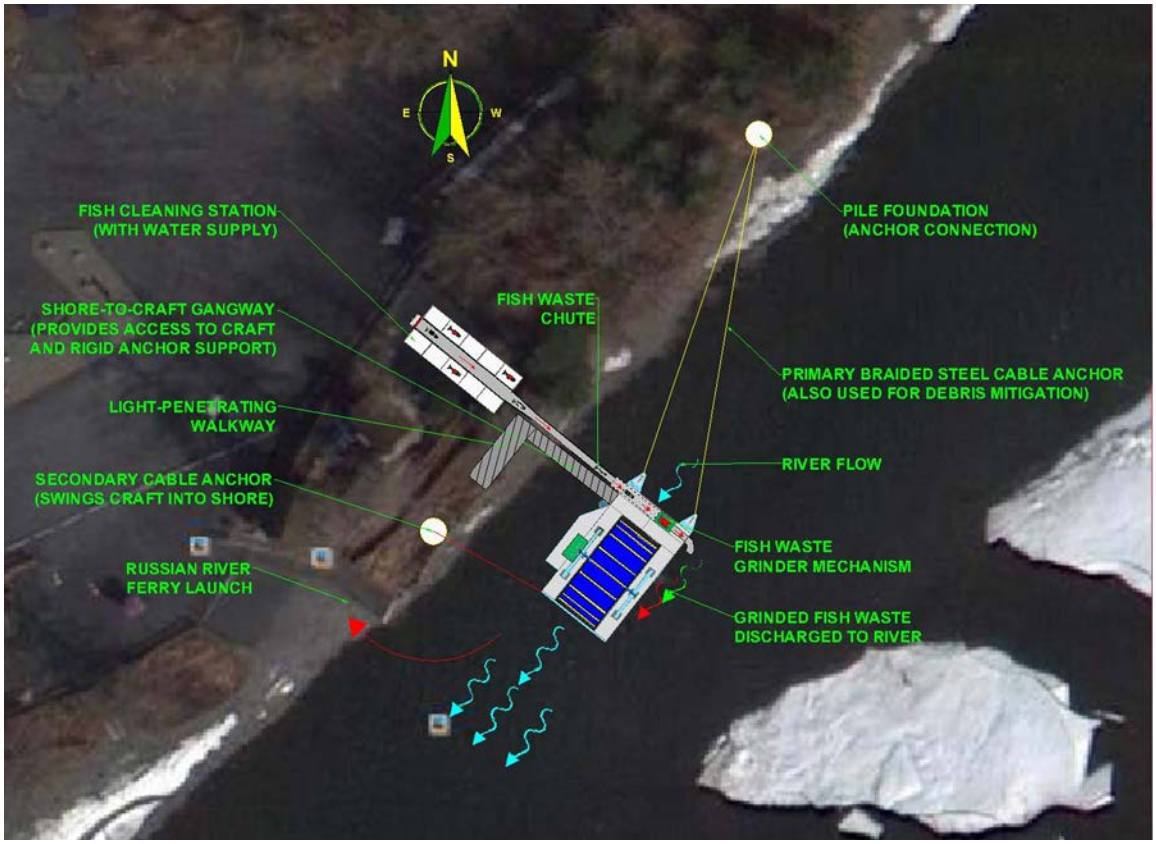
Additionally, a project scoping meeting should be scheduled with all stakeholders present. Other aspects of the design such as what time of site preparation is needed, anchoring method will dictate additional permits required for the project as well as affect project costs.

22.1 Appendix A – Project Team Chart

***Denotes Technical Team Lead**



23.1 Appendix B – Aerial Map



Conceptual site layout for the fillet tables, chute, and Hydro Powered Fish Waste Disposal System.

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25.1 Appendix E – Design Calculations

Channel Velocity Calculations

USGS Flow Data for June - August
Channel Characteristics

Manning's n	0.035	
b	180	ft
m	0.25	ft/ft
S	0.005	ft/ft

Back Calculated from known flow values using goal seek.

Date	y	A	P	B	Q	V
	ft	ft^2	ft	ft	ft^3/s	ft/s
6/2/2008	3.37	609.23	186.95	181.68	3950	6.48
6/3/2008	3.48	628.76	187.17	181.74	4160	6.62
6/4/2008	3.60	650.63	187.41	181.80	4400	6.76
6/5/2008	3.68	664.95	187.58	181.84	4560	6.86
6/6/2008	3.69	668.50	187.62	181.85	4600	6.88
6/7/2008	3.69	668.50	187.62	181.85	4600	6.88
6/8/2008	3.64	658.71	187.51	181.82	4490	6.82
6/9/2008	3.65	659.60	187.52	181.82	4500	6.82
6/10/2008	3.70	669.39	187.63	181.85	4610	6.89
6/11/2008	3.74	677.33	187.72	181.87	4700	6.94
6/12/2008	3.74	677.33	187.72	181.87	4700	6.94
6/13/2008	3.79	685.21	187.81	181.89	4790	6.99
6/14/2008	3.80	686.95	187.83	181.90	4810	7.00
6/15/2008	3.81	689.57	187.86	181.91	4840	7.02
6/16/2008	3.83	693.90	187.91	181.92	4890	7.05
6/17/2008	3.91	707.67	188.06	181.96	5050	7.14
6/18/2008	4.01	725.50	188.26	182.00	5260	7.25
6/19/2008	4.12	745.54	188.49	182.06	5500	7.38
6/20/2008	4.23	765.26	188.71	182.11	5740	7.50
6/21/2008	4.30	779.03	188.87	182.15	5910	7.59
6/22/2008	4.42	799.82	189.10	182.21	6170	7.71
6/23/2008	4.52	819.49	189.33	182.26	6420	7.83
6/24/2008	4.58	830.38	189.45	182.29	6560	7.90
6/25/2008	4.58	829.61	189.44	182.29	6550	7.90
6/26/2008	4.58	828.83	189.43	182.29	6540	7.89
6/27/2008	4.62	837.34	189.53	182.31	6650	7.94
6/28/2008	4.67	845.79	189.62	182.33	6760	7.99
6/29/2008	4.65	842.72	189.59	182.33	6720	7.97
6/30/2008	4.59	831.16	189.46	182.29	6570	7.90
7/1/2008	4.55	823.39	189.37	182.27	6470	7.86
7/2/2008	4.51	816.36	189.29	182.25	6380	7.82
7/3/2008	4.48	810.87	189.23	182.24	6310	7.78
7/4/2008	4.48	811.66	189.24	182.24	6320	7.79
7/5/2008	4.58	828.83	189.43	182.29	6540	7.89
7/6/2008	4.73	856.48	189.75	182.36	6900	8.06
7/7/2008	4.90	888.05	190.10	182.45	7320	8.24
7/8/2008	5.03	910.93	190.36	182.51	7630	8.38
7/9/2008	5.03	912.39	190.38	182.52	7650	8.38
8/1/2008	4.63	838.88	189.55	182.32	6670	7.95
8/2/2008	4.61	834.25	189.49	182.30	6610	7.92
8/3/2008	4.55	824.95	189.39	182.28	6490	7.87
8/4/2008	4.52	818.71	189.32	182.26	6410	7.83
8/5/2008	4.50	814.80	189.27	182.25	6360	7.81
8/6/2008	4.48	811.66	189.24	182.24	6320	7.79
8/7/2008	4.46	807.72	189.19	182.23	6270	7.76
8/8/2008	4.41	799.02	189.10	182.21	6160	7.71
8/9/2008	4.33	783.86	188.92	182.16	5970	7.62
6/2/2009	3.11	563.03	186.42	181.56	3470	6.16
6/3/2009	3.11	563.03	186.42	181.56	3470	6.16
6/4/2009	3.20	577.72	186.59	181.60	3620	6.27
6/5/2009	3.31	597.89	186.82	181.65	3830	6.41
6/6/2009	3.46	625.07	187.12	181.73	4120	6.59
6/7/2009	3.65	660.49	187.53	181.83	4510	6.83
6/8/2009	3.84	695.63	187.92	181.92	4910	7.06
6/9/2009	3.98	719.59	188.20	181.99	5190	7.21
6/10/2009	4.13	747.20	188.51	182.06	5520	7.39
6/11/2009	4.25	769.32	188.76	182.12	5790	7.53
6/12/2009	4.31	779.84	188.88	182.15	5920	7.59
6/13/2009	4.30	779.03	188.87	182.15	5910	7.59
6/14/2009	4.27	773.38	188.81	182.14	5840	7.55
6/15/2009	4.20	761.17	188.67	182.10	5690	7.48
6/16/2009	4.16	752.97	188.57	182.08	5590	7.42
6/17/2009	4.11	744.71	188.48	182.06	5490	7.37
6/18/2009	4.06	734.73	188.37	182.03	5370	7.31
6/19/2009	4.00	723.81	188.24	182.00	5240	7.24
6/20/2009	3.96	716.20	188.16	181.98	5150	7.19
6/21/2009	3.91	706.82	188.05	181.95	5040	7.13
6/22/2009	3.87	699.95	187.97	181.93	4960	7.09
6/23/2009	3.93	711.09	188.10	181.96	5090	7.16
6/24/2009	3.91	708.53	188.07	181.96	5060	7.14
6/25/2009	3.85	697.36	187.94	181.93	4930	7.07
6/26/2009	3.77	681.71	187.77	181.88	4750	6.97
6/27/2009	3.67	663.17	187.56	181.83	4540	6.85
6/28/2009	3.60	650.63	187.41	181.80	4400	6.76
6/29/2009	3.56	644.30	187.34	181.78	4330	6.72
6/30/2009	3.55	642.48	187.32	181.78	4310	6.71
7/1/2009	3.58	647.01	187.37	181.79	4360	6.74
7/2/2009	3.63	656.02	187.48	181.81	4460	6.80
7/3/2009	3.68	665.84	187.59	181.84	4570	6.86
7/4/2009	3.75	678.21	187.73	181.87	4710	6.94
7/5/2009	3.86	699.09	187.96	181.93	4950	7.08

Y (ft)	
Mean	4.365058
Standard Error	0.03587
Median	4.355136
Mode	4.008226
Standard Deviation	0.672031
Sample Variance	0.451625
Kurtosis	-0.11205
Skewness	0.569201
Range	3.167647
Minimum	3.114486
Maximum	6.282133
Sum	1532.135
Count	351

Velocity (ft/s)	
Mean	7.634201
Standard Error	0.039731
Median	7.645819
Mode	7.250201
Standard Deviation	0.744367
Sample Variance	0.554082
Kurtosis	-0.32189
Skewness	0.433004
Range	3.480567
Minimum	6.163055
Maximum	9.643622
Sum	2679.605
Count	351

7/6/2009	4.03	728.86	188.30	182.01	5300	7.27
7/7/2009	4.21	761.99	188.68	182.10	5700	7.48
7/8/2009	4.42	800.61	189.11	182.21	6180	7.72
7/9/2009	4.64	840.42	189.56	182.32	6690	7.96
8/1/2009	6.03	1095.37	192.44	183.02	10300	9.40
8/2/2009	5.73	1040.17	191.82	182.87	9470	9.10
8/3/2009	5.40	978.95	191.13	182.70	8580	8.76
8/4/2009	5.12	928.40	190.56	182.56	7870	8.48
8/5/2009	4.92	892.51	190.15	182.46	7380	8.27
8/6/2009	4.81	870.85	189.91	182.40	7090	8.14
8/7/2009	4.69	850.38	189.68	182.35	6820	8.02
8/8/2009	4.56	825.73	189.40	182.28	6500	7.87
8/9/2009	4.43	802.19	189.13	182.21	6200	7.73
6/2/2010	4.65	841.96	189.58	182.32	6710	7.97
6/3/2010	4.93	893.99	190.17	182.47	7400	8.28
6/4/2010	5.06	917.50	190.43	182.53	7720	8.41
6/5/2010	5.08	921.14	190.48	182.54	7770	8.44
6/6/2010	5.08	921.14	190.48	182.54	7770	8.44
6/7/2010	5.05	914.58	190.40	182.52	7680	8.40
6/8/2010	4.96	898.43	190.22	182.48	7460	8.30
6/9/2010	4.85	879.10	190.00	182.43	7200	8.19
6/10/2010	4.74	859.52	189.78	182.37	6940	8.07
6/11/2010	4.63	838.88	189.55	182.32	6670	7.95
6/12/2010	4.53	820.27	189.34	182.26	6430	7.84
6/13/2010	4.44	803.77	189.15	182.22	6220	7.74
6/14/2010	4.36	790.27	189.00	182.18	6050	7.66
6/15/2010	4.30	778.23	188.86	182.15	5900	7.58
6/16/2010	4.28	774.19	188.81	182.14	5850	7.56
6/17/2010	4.23	765.26	188.71	182.11	5740	7.50
6/18/2010	4.15	751.32	188.56	182.08	5570	7.41
6/19/2010	4.08	738.06	188.41	182.04	5410	7.33
6/20/2010	4.02	728.02	188.29	182.01	5290	7.27
6/21/2010	4.00	724.65	188.25	182.00	5250	7.24
6/22/2010	4.01	726.34	188.27	182.01	5270	7.26
6/23/2010	4.07	736.40	188.39	182.03	5390	7.32
6/24/2010	4.15	750.50	188.55	182.07	5560	7.41
6/25/2010	4.24	766.88	188.73	182.12	5760	7.51
6/26/2010	4.32	782.25	188.91	182.16	5950	7.61
6/27/2010	4.40	797.43	189.08	182.20	6140	7.70
6/28/2010	4.45	806.14	189.18	182.23	6250	7.75
6/29/2010	4.49	814.01	189.27	182.25	6350	7.80
6/30/2010	4.49	814.01	189.27	182.25	6350	7.80
7/1/2010	4.49	814.01	189.27	182.25	6350	7.80
7/2/2010	4.46	806.93	189.19	182.23	6260	7.76
7/3/2010	4.41	798.23	189.09	182.20	6150	7.70
7/4/2010	4.37	791.86	189.01	182.19	6070	7.67
7/5/2010	4.36	788.67	188.98	182.18	6030	7.65
7/6/2010	4.39	795.84	189.06	182.20	6120	7.69
7/7/2010	4.45	806.14	189.18	182.23	6250	7.75
7/8/2010	4.66	845.03	189.62	182.33	6750	7.99
7/9/2010	4.93	893.99	190.17	182.47	7400	8.28
8/1/2010	4.75	860.27	189.79	182.37	6950	8.08
8/2/2010	4.82	873.11	189.93	182.41	7120	8.15
8/3/2010	4.84	876.86	189.98	182.42	7170	8.18
8/4/2010	4.94	895.47	190.19	182.47	7420	8.29
8/5/2010	5.17	937.78	190.66	182.59	8000	8.53
8/6/2010	5.27	956.37	190.87	182.64	8260	8.64
8/7/2010	5.20	942.80	190.72	182.60	8070	8.56
8/8/2010	5.09	923.32	190.50	182.55	7800	8.45
8/9/2010	4.98	902.85	190.27	182.49	7520	8.33
6/2/2011	3.54	639.75	187.29	181.77	4280	6.69
6/3/2011	3.71	671.16	187.65	181.85	4630	6.90
6/4/2011	3.81	688.70	187.85	181.90	4830	7.01
6/5/2011	3.83	692.17	187.89	181.91	4870	7.04
6/6/2011	3.82	690.43	187.87	181.91	4850	7.02
6/7/2011	3.79	685.21	187.81	181.89	4790	6.99
6/8/2011	3.72	673.81	187.68	181.86	4660	6.92
6/9/2011	3.67	663.17	187.56	181.83	4540	6.85
6/10/2011	3.62	654.22	187.46	181.81	4440	6.79
6/11/2011	3.57	645.20	187.35	181.78	4340	6.73
6/12/2011	3.51	635.19	187.24	181.76	4230	6.66
6/13/2011	3.45	624.15	187.11	181.73	4110	6.59
6/14/2011	3.41	616.72	187.03	181.71	4030	6.53
6/15/2011	3.41	616.72	187.03	181.71	4030	6.53
6/16/2011	3.42	618.58	187.05	181.71	4050	6.55
6/17/2011	3.42	617.65	187.04	181.71	4040	6.54
6/18/2011	3.40	614.85	187.01	181.70	4010	6.52
6/19/2011	3.39	613.92	187.00	181.70	4000	6.52
6/20/2011	3.39	613.92	187.00	181.70	4000	6.52
6/21/2011	3.39	612.98	186.99	181.69	3990	6.51
6/22/2011	3.41	616.72	187.03	181.71	4030	6.53
6/23/2011	3.44	621.37	187.08	181.72	4080	6.57
6/24/2011	3.47	626.92	187.15	181.73	4140	6.60
6/25/2011	3.54	639.75	187.29	181.77	4280	6.69
6/26/2011	3.62	654.22	187.46	181.81	4440	6.79
6/27/2011	3.73	674.69	187.69	181.86	4670	6.92
6/28/2011	3.81	688.70	187.85	181.90	4830	7.01
6/29/2011	3.89	704.25	188.02	181.95	5010	7.11
6/30/2011	3.98	719.59	188.20	181.99	5190	7.21
7/1/2011	4.01	725.50	188.26	182.00	5260	7.25
7/2/2011	4.05	733.89	188.36	182.03	5360	7.30

7/3/2011	4.07	736.40	188.39	182.03	5390	7.32
7/4/2011	4.05	732.22	188.34	182.02	5340	7.29
7/5/2011	4.01	725.50	188.26	182.00	5260	7.25
7/6/2011	3.99	721.28	188.22	181.99	5210	7.22
7/7/2011	3.99	722.97	188.23	182.00	5230	7.23
7/8/2011	3.97	718.74	188.19	181.99	5180	7.21
7/9/2011	3.93	711.09	188.10	181.96	5090	7.16
8/1/2011	3.93	711.94	188.11	181.97	5100	7.16
8/2/2011	3.99	722.12	188.22	181.99	5220	7.23
8/3/2011	4.23	766.07	188.72	182.12	5750	7.51
8/4/2011	4.58	829.61	189.44	182.29	6550	7.90
8/5/2011	4.76	863.30	189.82	182.38	6990	8.10
8/6/2011	4.80	869.34	189.89	182.40	7070	8.13
8/7/2011	4.71	852.67	189.70	182.35	6850	8.03
8/8/2011	4.57	828.06	189.42	182.29	6530	7.89
8/9/2011	4.45	805.35	189.17	182.22	6240	7.75
6/2/2012	3.40	614.85	187.01	181.70	4010	6.52
6/3/2012	3.44	622.29	187.09	181.72	4090	6.57
6/4/2012	3.46	625.99	187.14	181.73	4130	6.60
6/5/2012	3.47	627.84	187.16	181.74	4150	6.61
6/6/2012	3.51	634.27	187.23	181.75	4220	6.65
6/7/2012	3.53	637.93	187.27	181.76	4260	6.68
6/8/2012	3.62	654.22	187.46	181.81	4440	6.79
6/9/2012	3.78	683.46	187.79	181.89	4770	6.98
6/10/2012	3.91	706.82	188.05	181.95	5040	7.13
6/11/2012	4.00	723.81	188.24	182.00	5240	7.24
6/12/2012	4.10	743.05	188.46	182.05	5470	7.36
6/13/2012	4.20	760.36	188.66	182.10	5680	7.47
6/14/2012	4.24	768.51	188.75	182.12	5780	7.52
6/15/2012	4.24	766.88	188.73	182.12	5760	7.51
6/16/2012	4.20	761.17	188.67	182.10	5690	7.48
6/17/2012	4.17	755.44	188.60	182.09	5620	7.44
6/18/2012	4.17	754.62	188.59	182.08	5610	7.43
6/19/2012	4.28	775.00	188.82	182.14	5860	7.56
6/20/2012	4.43	802.98	189.14	182.22	6210	7.73
6/21/2012	4.59	831.93	189.47	182.30	6580	7.91
6/22/2012	4.85	878.36	189.99	182.42	7190	8.19
6/23/2012	5.18	938.50	190.67	182.59	8010	8.53
6/24/2012	5.57	1010.19	191.48	182.78	9030	8.94
6/25/2012	5.85	1061.66	192.06	182.93	9790	9.22
6/26/2012	6.03	1095.37	192.44	183.02	10300	9.40
6/27/2012	6.07	1101.90	192.51	183.04	10400	9.44
6/28/2012	6.00	1088.81	192.37	183.00	10200	9.37
6/29/2012	5.88	1067.65	192.13	182.94	9880	9.25
6/30/2012	5.75	1042.87	191.85	182.87	9510	9.12
7/1/2012	5.61	1017.05	191.56	182.80	9130	8.98
7/2/2012	5.46	990.82	191.26	182.73	8750	8.83
7/3/2012	5.33	966.99	190.99	182.67	8410	8.70
7/4/2012	5.21	944.95	190.74	182.61	8100	8.57
7/5/2012	5.10	924.77	190.52	182.55	7820	8.46
7/6/2012	5.11	925.50	190.53	182.55	7830	8.46
7/7/2012	5.25	951.38	190.82	182.62	8190	8.61
7/8/2012	5.40	978.95	191.13	182.70	8580	8.76
7/9/2012	5.43	984.55	191.19	182.71	8660	8.80
8/1/2012	5.11	926.95	190.54	182.56	7850	8.47
8/2/2012	5.09	921.87	190.48	182.54	7780	8.44
8/3/2012	5.10	924.05	190.51	182.55	7810	8.45
8/4/2012	5.03	910.93	190.36	182.51	7630	8.38
8/5/2012	4.88	883.59	190.05	182.44	7260	8.22
8/6/2012	4.71	853.43	189.71	182.36	6860	8.04
8/7/2012	4.60	833.48	189.49	182.30	6600	7.92
8/8/2012	4.52	817.93	189.31	182.26	6400	7.82
8/9/2012	4.44	803.77	189.15	182.22	6220	7.74
6/2/2013	4.29	776.61	188.84	182.14	5880	7.57
6/3/2013	4.39	794.25	189.04	182.19	6100	7.68
6/4/2013	4.46	806.93	189.19	182.23	6260	7.76
6/5/2013	4.46	807.72	189.19	182.23	6270	7.76
6/6/2013	4.43	801.40	189.12	182.21	6190	7.72
6/7/2013	4.40	796.64	189.07	182.20	6130	7.69
6/8/2013	4.38	793.46	189.03	182.19	6090	7.68
6/9/2013	4.48	811.66	189.24	182.24	6320	7.79
6/10/2013	4.64	840.42	189.56	182.32	6690	7.96
6/11/2013	4.90	888.80	190.11	182.45	7330	8.25
6/12/2013	5.18	938.50	190.67	182.59	8010	8.53
6/13/2013	5.34	967.70	191.00	182.67	8420	8.70
6/14/2013	5.42	982.45	191.17	182.71	8630	8.78
6/15/2013	5.46	989.43	191.25	182.73	8730	8.82
6/16/2013	5.57	1010.19	191.48	182.78	9030	8.94
6/17/2013	5.71	1036.11	191.77	182.86	9410	9.08
6/18/2013	5.96	1082.22	192.29	182.98	10100	9.33
6/19/2013	6.18	1121.38	192.73	183.09	10700	9.54
6/20/2013	6.28	1140.65	192.95	183.14	11000	9.64
6/21/2013	6.25	1134.25	192.88	183.12	10900	9.61
6/22/2013	6.18	1121.38	192.73	183.09	10700	9.54
6/23/2013	6.00	1088.81	192.37	183.00	10200	9.37
6/24/2013	5.81	1053.63	191.97	182.90	9670	9.18
6/25/2013	5.67	1029.33	191.70	182.84	9310	9.04
6/26/2013	5.60	1015.68	191.54	182.80	9110	8.97
6/27/2013	5.58	1012.25	191.50	182.79	9060	8.95
6/28/2013	5.58	1012.25	191.50	182.79	9060	8.95
6/29/2013	5.54	1003.99	191.41	182.77	8940	8.90

6/30/2013	5.51	999.15	191.36	182.75	8870	8.88
7/1/2013	5.44	987.34	191.22	182.72	8700	8.81
7/2/2013	5.41	980.35	191.14	182.70	8600	8.77
7/3/2013	5.29	959.21	190.91	182.65	8300	8.65
7/4/2013	5.11	926.22	190.53	182.55	7840	8.46
7/5/2013	4.91	890.28	190.13	182.46	7350	8.26
7/6/2013	4.77	864.06	189.83	182.38	7000	8.10
7/7/2013	4.73	856.48	189.75	182.36	6900	8.06
7/8/2013	4.82	873.86	189.94	182.41	7130	8.16
7/9/2013	4.80	870.10	189.90	182.40	7080	8.14
7/10/2013	4.66	843.49	189.60	182.33	6730	7.98
7/11/2013	4.59	831.93	189.47	182.30	6580	7.91
7/12/2013	4.55	824.17	189.38	182.27	6480	7.86
7/13/2013	4.52	819.49	189.33	182.26	6420	7.83
7/14/2013	4.52	818.71	189.32	182.26	6410	7.83
7/15/2013	4.48	811.66	189.24	182.24	6320	7.79
7/16/2013	4.46	806.93	189.19	182.23	6260	7.76
7/17/2013	4.50	814.80	189.27	182.25	6360	7.81
7/18/2013	4.56	825.73	189.40	182.28	6500	7.87
7/19/2013	4.65	842.72	189.59	182.33	6720	7.97
7/20/2013	4.71	852.67	189.70	182.35	6850	8.03
7/21/2013	4.72	854.96	189.73	182.36	6880	8.05
7/22/2013	4.71	854.19	189.72	182.36	6870	8.04
7/23/2013	4.69	849.62	189.67	182.34	6810	8.02
7/24/2013	4.69	848.85	189.66	182.34	6800	8.01
7/25/2013	4.70	851.91	189.69	182.35	6840	8.03
7/26/2013	4.81	871.60	189.92	182.41	7100	8.15
7/27/2013	4.83	875.36	189.96	182.42	7150	8.17
7/28/2013	4.82	873.86	189.94	182.41	7130	8.16
7/29/2013	4.84	877.61	189.98	182.42	7180	8.18
7/30/2013	4.86	879.85	190.01	182.43	7210	8.19
7/31/2013	4.86	880.60	190.02	182.43	7220	8.20
8/1/2013	4.82	873.11	189.93	182.41	7120	8.15
8/2/2013	4.72	855.72	189.74	182.36	6890	8.05
8/3/2013	4.70	851.91	189.69	182.35	6840	8.03
8/4/2013	4.76	863.30	189.82	182.38	6990	8.10
8/5/2013	4.69	849.62	189.67	182.34	6810	8.02
8/6/2013	4.57	828.06	189.42	182.29	6530	7.89
8/7/2013	4.54	822.61	189.36	182.27	6460	7.85
8/8/2013	4.61	835.80	189.51	182.31	6630	7.93
8/9/2013	4.68	847.32	189.64	182.34	6780	8.00
6/2/2014	3.59	649.72	187.40	181.80	4390	6.76
6/3/2014	3.58	647.92	187.38	181.79	4370	6.74
6/4/2014	3.55	642.48	187.32	181.78	4310	6.71
6/5/2014	3.52	637.02	187.26	181.76	4250	6.67
6/6/2014	3.49	631.52	187.20	181.75	4190	6.63
6/7/2014	3.47	627.84	187.16	181.74	4150	6.61
6/8/2014	3.49	631.52	187.20	181.75	4190	6.63
6/9/2014	3.55	641.57	187.31	181.77	4300	6.70
6/10/2014	3.55	642.48	187.32	181.78	4310	6.71
6/11/2014	3.54	640.66	187.30	181.77	4290	6.70
6/12/2014	3.52	636.10	187.25	181.76	4240	6.67
6/13/2014	3.47	626.92	187.15	181.73	4140	6.60
6/14/2014	3.44	622.29	187.09	181.72	4090	6.57
6/15/2014	3.43	619.51	187.06	181.71	4060	6.55
6/16/2014	3.40	615.78	187.02	181.70	4020	6.53
6/17/2014	3.52	637.02	187.26	181.76	4250	6.67
6/18/2014	3.71	672.04	187.66	181.86	4640	6.90
6/19/2014	3.80	686.95	187.83	181.90	4810	7.00
6/20/2014	3.81	688.70	187.85	181.90	4830	7.01
6/21/2014	3.84	695.63	187.92	181.92	4910	7.06
6/22/2014	3.86	698.22	187.95	181.93	4940	7.08
6/23/2014	3.86	699.09	187.96	181.93	4950	7.08
6/24/2014	3.85	697.36	187.94	181.93	4930	7.07
6/25/2014	3.87	699.95	187.97	181.93	4960	7.09
6/26/2014	3.90	705.10	188.03	181.95	5020	7.12
6/27/2014	3.88	702.53	188.00	181.94	4990	7.10
6/28/2014	3.85	697.36	187.94	181.93	4930	7.07
6/29/2014	3.85	697.36	187.94	181.93	4930	7.07
6/30/2014	3.87	700.81	187.98	181.94	4970	7.09
7/1/2014	3.88	701.67	187.99	181.94	4980	7.10
7/2/2014	3.86	698.22	187.95	181.93	4940	7.08
7/3/2014	3.89	704.25	188.02	181.95	5010	7.11
7/4/2014	3.93	711.94	188.11	181.97	5100	7.16
7/5/2014	4.02	727.18	188.28	182.01	5280	7.26
7/6/2014	4.07	737.23	188.40	182.04	5400	7.32
7/7/2014	4.14	748.85	188.53	182.07	5540	7.40
7/8/2014	4.21	761.99	188.68	182.10	5700	7.48
7/9/2014	4.24	766.88	188.73	182.12	5760	7.51
8/1/2014	3.78	683.46	187.79	181.89	4770	6.98
8/2/2014	3.77	681.71	187.77	181.88	4750	6.97
8/3/2014	3.79	686.08	187.82	181.90	4800	7.00
8/4/2014	3.83	692.17	187.89	181.91	4870	7.04
8/5/2014	4.01	725.50	188.26	182.00	5260	7.25
8/6/2014	4.20	761.17	188.67	182.10	5690	7.48
8/7/2014	4.28	775.80	188.83	182.14	5870	7.57
8/8/2014	4.33	784.66	188.93	182.17	5980	7.62
8/9/2014	4.73	857.24	189.75	182.37	6910	8.06

Mass Density Lab Experiment

Test conducted using 50 mL glass beaker accurate to +/- 10% and mass scale

Submerged object displaces a volume of liquid equal to the volume fo the object. Mass density was determined by first recording the weight of the sample and initial volume of water in the beaker. Fish sample was gently dropped into the beaker and the final volume of water was recorded. The mass divided by the displaced volume of water equaled the mass density of the fish sample.

Test No.	Particle Weight (kg)	Initial Volume (mL)	Final Volume (mL)	Displaced Volume (mL)	Mass Density, ρ_f (kg/cm^3)	(kg/m^3)	ρ_{ave} (kg/m^3)	ρ_w (kg/m^3)	SG
1	0.0201	15	34.5	19.5	0.001031	1030.77	1030.74	1000	1.03
2	0.02	12	31.4	19.4	0.001031	1030.93			
3	0.0202	15	34.55	19.55	0.001033	1033.25			
4	0.0202	8	27.6	19.6	0.001031	1030.61			
5	0.0201	12	31.55	19.55	0.001028	1028.13			

Particle size (ft)	Fall Velocity, ω (fps)
0.042	0.20

Senior Design Group E : Hydro Powered Fish Waste Grinder

Kenai River Channel Characteristics	
Manning's Coefficient, ı	0.035
Wetted Perimeter, b (ft	180
m (ft/ft)	0.25
Slope, S (ft/ft)	0.005
Average Depth, (ft)	4.37

Power Calculation Assumptions	
γ_w (lb/ft^3)	62.4
efficiency, ε	0.4
Power, P (W)	5000
P (ft-lb/s)	3676.47

Sediment Transport Assumptions	
ρ_w (slug/ft^3)	1.93
ρ_w (kg/m^3)	1000
Particle Radius	0.25

Date	Channel Depth, y (ft)	Channel Area, A_c (ft^2)	Flow Rate, Q (cfs)	Water Velocity, V_w (fps)
6/2/2008	3.37	510.71	3950	7.73
6/3/2008	3.48	543.82	4160	7.65
6/4/2008	3.60	582.11	4400	7.56
6/5/2008	3.68	607.89	4560	7.50
6/6/2008	3.69	614.36	4600	7.49
6/7/2008	3.69	614.36	4600	7.49
6/8/2008	3.64	596.58	4490	7.53
6/9/2008	3.65	598.20	4500	7.52
6/10/2008	3.70	615.98	4610	7.48
6/11/2008	3.74	630.61	4700	7.45
6/12/2008	3.74	630.61	4700	7.45
6/13/2008	3.79	645.30	4790	7.42
6/14/2008	3.80	648.57	4810	7.42
6/15/2008	3.81	653.48	4840	7.41
6/16/2008	3.83	661.69	4890	7.39
6/17/2008	3.91	688.06	5050	7.34
6/18/2008	4.01	722.96	5260	7.28
6/19/2008	4.12	763.23	5500	7.21
6/20/2008	4.23	803.89	5740	7.14
6/21/2008	4.30	832.92	5910	7.10
6/22/2008	4.42	877.68	6170	7.03
6/23/2008	4.52	921.12	6420	6.97
6/24/2008	4.58	945.61	6560	6.94
6/25/2008	4.58	943.86	6550	6.94
6/26/2008	4.58	942.10	6540	6.94
6/27/2008	4.62	961.42	6650	6.92
6/28/2008	4.67	980.80	6760	6.89
6/29/2008	4.65	973.74	6720	6.90
6/30/2008	4.59	947.36	6570	6.94
7/1/2008	4.55	823.39	6470	7.86
7/2/2008	4.51	816.36	6380	7.82
7/3/2008	4.48	810.87	6310	7.78
7/4/2008	4.48	811.66	6320	7.79
7/5/2008	4.58	828.83	6540	7.89
7/6/2008	4.73	856.48	6900	8.06
7/7/2008	4.90	888.05	7320	8.24
7/8/2008	5.03	910.93	7630	8.38
7/9/2008	5.03	912.39	7650	8.38
8/1/2008	4.63	838.88	6670	7.95
8/2/2008	4.61	834.25	6610	7.92
8/3/2008	4.55	824.95	6490	7.87
8/4/2008	4.52	818.71	6410	7.83
8/5/2008	4.50	814.80	6360	7.81
8/6/2008	4.48	811.66	6320	7.79
8/7/2008	4.46	807.72	6270	7.76
8/8/2008	4.41	799.02	6160	7.71
8/9/2008	4.33	783.86	5970	7.62
6/2/2009	3.11	563.03	3470	6.16
6/3/2009	3.11	563.03	3470	6.16
6/4/2009	3.20	577.72	3620	6.27
6/5/2009	3.31	597.89	3830	6.41
6/6/2009	3.46	625.07	4120	6.59
6/7/2009	3.65	660.49	4510	6.83
6/8/2009	3.84	695.63	4910	7.06
6/9/2009	3.98	719.59	5190	7.21
6/10/2009	4.13	747.20	5520	7.39
6/11/2009	4.25	769.32	5790	7.53
6/12/2009	4.31	779.84	5920	7.59
6/13/2009	4.30	779.03	5910	7.59
6/14/2009	4.27	773.38	5840	7.55
6/15/2009	4.20	761.17	5690	7.48
6/16/2009	4.16	752.97	5590	7.42
6/17/2009	4.11	744.71	5490	7.37
6/18/2009	4.06	734.73	5370	7.31
6/19/2009	4.00	723.81	5240	7.24
6/20/2009	3.96	716.20	5150	7.19
6/21/2009	3.91	706.82	5040	7.13
6/22/2009	3.87	699.95	4960	7.09
6/23/2009	3.93	711.09	5090	7.16
6/24/2009	3.91	708.53	5060	7.14
6/25/2009	3.85	697.36	4930	7.07
6/26/2009	3.77	681.71	4750	6.97
6/27/2009	3.67	663.17	4540	6.85
6/28/2009	3.60	650.63	4400	6.76
6/29/2009	3.56	644.30	4330	6.72
6/30/2009	3.55	642.48	4310	6.71
7/1/2009	3.58	647.01	4360	6.74
7/2/2009	3.63	656.02	4460	6.80
7/3/2009	3.68	665.84	4570	6.86
7/4/2009	3.75	678.21	4710	6.94

Paddle Wheel Design Calcs		
Design Velocity, V (m/s)	2.13	7.0 (fps)
Paddle Area, A_p (m^2)	2.57	27.66 (ft^2)
Design Head, h_D (ft)	2.5	
Overall Diameter, D (ft)	15	
Working Diameter, D_w (ft)	12.5	
Working Circumference, C_w (ft)	39.25	
Paddle Radius of Curvature, r (ft	1.25	
Paddle Width, w (ft)	7.04	
Space Between Paddles, s (ft)	2.45	
Number of Paddles (round to 16	16.02	
Wheel Speed (ft/min) at 0.67V	281.4	
Circumference Speed (ft/rev)	39.25	
Rotational Speed, ω (rev/min)	7.17	

If you have any questions, please contact:	
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7/5/2009	3.86	699.09	4950	7.08
7/6/2009	4.03	728.86	5300	7.27
7/7/2009	4.21	761.99	5700	7.48
7/8/2009	4.42	800.61	6180	7.72
7/9/2009	4.64	840.42	6690	7.96
8/1/2009	6.03	1095.37	10300	9.40
8/2/2009	5.73	1040.17	9470	9.10
8/3/2009	5.40	978.95	8580	8.76
8/4/2009	5.12	928.40	7870	8.48
8/5/2009	4.92	892.51	7380	8.27
8/6/2009	4.81	870.85	7090	8.14
8/7/2009	4.69	850.38	6820	8.02
8/8/2009	4.56	825.73	6500	7.87
8/9/2009	4.43	802.19	6200	7.73
6/2/2010	4.65	841.96	6710	7.97
6/3/2010	4.93	893.99	7400	8.28
6/4/2010	5.06	917.50	7720	8.41
6/5/2010	5.08	921.14	7770	8.44
6/6/2010	5.08	921.14	7770	8.44
6/7/2010	5.05	914.58	7680	8.40
6/8/2010	4.96	898.43	7460	8.30
6/9/2010	4.85	879.10	7200	8.19
6/10/2010	4.74	859.52	6940	8.07
6/11/2010	4.63	838.88	6670	7.95
6/12/2010	4.53	820.27	6430	7.84
6/13/2010	4.44	803.77	6220	7.74
6/14/2010	4.36	790.27	6050	7.66
6/15/2010	4.30	778.23	5900	7.58
6/16/2010	4.28	774.19	5850	7.56
6/17/2010	4.23	765.26	5740	7.50
6/18/2010	4.15	751.32	5570	7.41
6/19/2010	4.08	738.06	5410	7.33
6/20/2010	4.02	728.02	5290	7.27
6/21/2010	4.00	724.65	5250	7.24
6/22/2010	4.01	726.34	5270	7.26
6/23/2010	4.07	736.40	5390	7.32
6/24/2010	4.15	750.50	5560	7.41
6/25/2010	4.24	766.88	5760	7.51
6/26/2010	4.32	782.25	5950	7.61
6/27/2010	4.40	797.43	6140	7.70
6/28/2010	4.45	806.14	6250	7.75
6/29/2010	4.49	814.01	6350	7.80
6/30/2010	4.49	814.01	6350	7.80
7/1/2010	4.49	814.01	6350	7.80
7/2/2010	4.46	806.93	6260	7.76
7/3/2010	4.41	798.23	6150	7.70
7/4/2010	4.37	791.86	6070	7.67
7/5/2010	4.36	788.67	6030	7.65
7/6/2010	4.39	795.84	6120	7.69
7/7/2010	4.45	806.14	6250	7.75
7/8/2010	4.66	845.03	6750	7.99
7/9/2010	4.93	893.99	7400	8.28
8/1/2010	4.75	860.27	6950	8.08
8/2/2010	4.82	873.11	7120	8.15
8/3/2010	4.84	876.86	7170	8.18
8/4/2010	4.94	895.47	7420	8.29
8/5/2010	5.17	937.78	8000	8.53
8/6/2010	5.27	956.37	8260	8.64
8/7/2010	5.20	942.80	8070	8.56
8/8/2010	5.09	923.32	7800	8.45
8/9/2010	4.98	902.85	7520	8.33
6/2/2011	3.54	639.75	4280	6.69
6/3/2011	3.71	671.16	4630	6.90
6/4/2011	3.81	688.70	4830	7.01
6/5/2011	3.83	692.17	4870	7.04
6/6/2011	3.82	690.43	4850	7.02
6/7/2011	3.79	685.21	4790	6.99
6/8/2011	3.72	673.81	4660	6.92
6/9/2011	3.67	663.17	4540	6.85
6/10/2011	3.62	654.22	4440	6.79
6/11/2011	3.57	645.20	4340	6.73
6/12/2011	3.51	635.19	4230	6.66
6/13/2011	3.45	624.15	4110	6.59
6/14/2011	3.41	616.72	4030	6.53
6/15/2011	3.41	616.72	4030	6.53
6/16/2011	3.42	618.58	4050	6.55
6/17/2011	3.42	617.65	4040	6.54
6/18/2011	3.40	614.85	4010	6.52
6/19/2011	3.39	613.92	4000	6.52
6/20/2011	3.39	613.92	4000	6.52
6/21/2011	3.39	612.98	3990	6.51
6/22/2011	3.41	616.72	4030	6.53
6/23/2011	3.44	621.37	4080	6.57
6/24/2011	3.47	626.92	4140	6.60
6/25/2011	3.54	639.75	4280	6.69
6/26/2011	3.62	654.22	4440	6.79
6/27/2011	3.73	674.69	4670	6.92
6/28/2011	3.81	688.70	4830	7.01
6/29/2011	3.89	704.25	5010	7.11
6/30/2011	3.98	719.59	5190	7.21
7/1/2011	4.01	725.50	5260	7.25

7/2/2011	4.05	733.89	5360	7.30
7/3/2011	4.07	736.40	5390	7.32
7/4/2011	4.05	732.22	5340	7.29
7/5/2011	4.01	725.50	5260	7.25
7/6/2011	3.99	721.28	5210	7.22
7/7/2011	3.99	722.97	5230	7.23
7/8/2011	3.97	718.74	5180	7.21
7/9/2011	3.93	711.09	5090	7.16
8/1/2011	3.93	711.94	5100	7.16
8/2/2011	3.99	722.12	5220	7.23
8/3/2011	4.23	766.07	5750	7.51
8/4/2011	4.58	829.61	6550	7.90
8/5/2011	4.76	863.30	6990	8.10
8/6/2011	4.80	869.34	7070	8.13
8/7/2011	4.71	852.67	6850	8.03
8/8/2011	4.57	828.06	6530	7.89
8/9/2011	4.45	805.35	6240	7.75
6/2/2012	3.40	614.85	4010	6.52
6/3/2012	3.44	622.29	4090	6.57
6/4/2012	3.46	625.99	4130	6.60
6/5/2012	3.47	627.84	4150	6.61
6/6/2012	3.51	634.27	4220	6.65
6/7/2012	3.53	637.93	4260	6.68
6/8/2012	3.62	654.22	4440	6.79
6/9/2012	3.78	683.46	4770	6.98
6/10/2012	3.91	706.82	5040	7.13
6/11/2012	4.00	723.81	5240	7.24
6/12/2012	4.10	743.05	5470	7.36
6/13/2012	4.20	760.36	5680	7.47
6/14/2012	4.24	768.51	5780	7.52
6/15/2012	4.24	766.88	5760	7.51
6/16/2012	4.20	761.17	5690	7.48
6/17/2012	4.17	755.44	5620	7.44
6/18/2012	4.17	754.62	5610	7.43
6/19/2012	4.28	775.00	5860	7.56
6/20/2012	4.43	802.98	6210	7.73
6/21/2012	4.59	831.93	6580	7.91
6/22/2012	4.85	878.36	7190	8.19
6/23/2012	5.18	938.50	8010	8.53
6/24/2012	5.57	1010.19	9030	8.94
6/25/2012	5.85	1061.66	9790	9.22
6/26/2012	6.03	1095.37	10300	9.40
6/27/2012	6.07	1101.90	10400	9.44
6/28/2012	6.00	1088.81	10200	9.37
6/29/2012	5.88	1067.65	9880	9.25
6/30/2012	5.75	1042.87	9510	9.12
7/1/2012	5.61	1017.05	9130	8.98
7/2/2012	5.46	990.82	8750	8.83
7/3/2012	5.33	966.99	8410	8.70
7/4/2012	5.21	944.95	8100	8.57
7/5/2012	5.10	924.77	7820	8.46
7/6/2012	5.11	925.50	7830	8.46
7/7/2012	5.25	951.38	8190	8.61
7/8/2012	5.40	978.95	8580	8.76
7/9/2012	5.43	984.55	8660	8.80
8/1/2012	5.11	926.95	7850	8.47
8/2/2012	5.09	921.87	7780	8.44
8/3/2012	5.10	924.05	7810	8.45
8/4/2012	5.03	910.93	7630	8.38
8/5/2012	4.88	883.59	7260	8.22
8/6/2012	4.71	853.43	6860	8.04
8/7/2012	4.60	833.48	6600	7.92
8/8/2012	4.52	817.93	6400	7.82
8/9/2012	4.44	803.77	6220	7.74
6/2/2013	4.29	776.61	5880	7.57
6/3/2013	4.39	794.25	6100	7.68
6/4/2013	4.46	806.93	6260	7.76
6/5/2013	4.46	807.72	6270	7.76
6/6/2013	4.43	801.40	6190	7.72
6/7/2013	4.40	796.64	6130	7.69
6/8/2013	4.38	793.46	6090	7.68
6/9/2013	4.48	811.66	6320	7.79
6/10/2013	4.64	840.42	6690	7.96
6/11/2013	4.90	888.80	7330	8.25
6/12/2013	5.18	938.50	8010	8.53
6/13/2013	5.34	967.70	8420	8.70
6/14/2013	5.42	982.45	8630	8.78
6/15/2013	5.46	989.43	8730	8.82
6/16/2013	5.57	1010.19	9030	8.94
6/17/2013	5.71	1036.11	9410	9.08
6/18/2013	5.96	1082.22	10100	9.33
6/19/2013	6.18	1121.38	10700	9.54
6/20/2013	6.28	1140.65	11000	9.64
6/21/2013	6.25	1134.25	10900	9.61
6/22/2013	6.18	1121.38	10700	9.54
6/23/2013	6.00	1088.81	10200	9.37
6/24/2013	5.81	1053.63	9670	9.18
6/25/2013	5.67	1029.33	9310	9.04
6/26/2013	5.60	1015.68	9110	8.97
6/27/2013	5.58	1012.25	9060	8.95
6/28/2013	5.58	1012.25	9060	8.95

6/29/2013	5.54	1003.99	8940	8.90
6/30/2013	5.51	999.15	8870	8.88
7/1/2013	5.44	987.34	8700	8.81
7/2/2013	5.41	980.35	8600	8.77
7/3/2013	5.29	959.21	8300	8.65
7/4/2013	5.11	926.22	7840	8.46
7/5/2013	4.91	890.28	7350	8.26
7/6/2013	4.77	864.06	7000	8.10
7/7/2013	4.73	856.48	6900	8.06
7/8/2013	4.82	873.86	7130	8.16
7/9/2013	4.80	870.10	7080	8.14
7/10/2013	4.66	843.49	6730	7.98
7/11/2013	4.59	831.93	6580	7.91
7/12/2013	4.55	824.17	6480	7.86
7/13/2013	4.52	819.49	6420	7.83
7/14/2013	4.52	818.71	6410	7.83
7/15/2013	4.48	811.66	6320	7.79
7/16/2013	4.46	806.93	6260	7.76
7/17/2013	4.50	814.80	6360	7.81
7/18/2013	4.56	825.73	6500	7.87
7/19/2013	4.65	842.72	6720	7.97
7/20/2013	4.71	852.67	6850	8.03
7/21/2013	4.72	854.96	6880	8.05
7/22/2013	4.71	854.19	6870	8.04
7/23/2013	4.69	849.62	6810	8.02
7/24/2013	4.69	848.85	6800	8.01
7/25/2013	4.70	851.91	6840	8.03
7/26/2013	4.81	871.60	7100	8.15
7/27/2013	4.83	875.36	7150	8.17
7/28/2013	4.82	873.86	7130	8.16
7/29/2013	4.84	877.61	7180	8.18
7/30/2013	4.86	879.85	7210	8.19
7/31/2013	4.86	880.60	7220	8.20
8/1/2013	4.82	873.11	7120	8.15
8/2/2013	4.72	855.72	6890	8.05
8/3/2013	4.70	851.91	6840	8.03
8/4/2013	4.76	863.30	6990	8.10
8/5/2013	4.69	849.62	6810	8.02
8/6/2013	4.57	828.06	6530	7.89
8/7/2013	4.54	822.61	6460	7.85
8/8/2013	4.61	835.80	6630	7.93
8/9/2013	4.68	847.32	6780	8.00
6/2/2014	3.59	649.72	4390	6.76
6/3/2014	3.58	647.92	4370	6.74
6/4/2014	3.55	642.48	4310	6.71
6/5/2014	3.52	637.02	4250	6.67
6/6/2014	3.49	631.52	4190	6.63
6/7/2014	3.47	627.84	4150	6.61
6/8/2014	3.49	631.52	4190	6.63
6/9/2014	3.55	641.57	4300	6.70
6/10/2014	3.55	642.48	4310	6.71
6/11/2014	3.54	640.66	4290	6.70
6/12/2014	3.52	636.10	4240	6.67
6/13/2014	3.47	626.92	4140	6.60
6/14/2014	3.44	622.29	4090	6.57
6/15/2014	3.43	619.51	4060	6.55
6/16/2014	3.40	615.78	4020	6.53
6/17/2014	3.52	637.02	4250	6.67
6/18/2014	3.71	672.04	4640	6.90
6/19/2014	3.80	686.95	4810	7.00
6/20/2014	3.81	688.70	4830	7.01
6/21/2014	3.84	695.63	4910	7.06
6/22/2014	3.86	698.22	4940	7.08
6/23/2014	3.86	699.09	4950	7.08
6/24/2014	3.85	697.36	4930	7.07
6/25/2014	3.87	699.95	4960	7.09
6/26/2014	3.90	705.10	5020	7.12
6/27/2014	3.88	702.53	4990	7.10
6/28/2014	3.85	697.36	4930	7.07
6/29/2014	3.85	697.36	4930	7.07
6/30/2014	3.87	700.81	4970	7.09
7/1/2014	3.88	701.67	4980	7.10
7/2/2014	3.86	698.22	4940	7.08
7/3/2014	3.89	704.25	5010	7.11
7/4/2014	3.93	711.94	5100	7.16
7/5/2014	4.02	727.18	5280	7.26
7/6/2014	4.07	737.23	5400	7.32
7/7/2014	4.14	748.85	5540	7.40
7/8/2014	4.21	761.99	5700	7.48
7/9/2014	4.24	766.88	5760	7.51
8/1/2014	3.78	683.46	4770	6.98
8/2/2014	3.77	681.71	4750	6.97
8/3/2014	3.79	686.08	4800	7.00
8/4/2014	3.83	692.17	4870	7.04
8/5/2014	4.01	725.50	5260	7.25
8/6/2014	4.20	761.17	5690	7.48
8/7/2014	4.28	775.80	5870	7.57
8/8/2014	4.33	784.66	5980	7.62
8/9/2014	4.73	857.24	6910	8.06

BOD Calculations

	lbs	kg
Average Weight of Sockeye	8	3.6
Carcass Weight is 25% of Weight	2	0.9

	No.
Total Average Summer Harvest	29380

Months of operation	
June	30
July	31
August	31
Total Days of Operation	92

Average Daily Catch (Count)	319.3478261	**320**
Average Daily Catch Waste (Mass)	288	kg

Assume 1/2 gallon water used/fish for wash water

Average Daily Washwater	160	gal
	605.6	L

BOD for fish waste		0.23	g/kg
Daily BOD		66240	mg
Daily BOD Discharge		109.3791281	mg/L
BOD Rate Constant		0.032	1/day
Waste Flow Rate	Q_w	7.0126E-06	m^3/s
River Flow Rate	Q_r	173.375705	m^3/s
River BOD		0	mg/L
River DO		9.5	mg/L
	D_a	1.66999596	mg/L
	L_0	109.3791281	mg/L
	L_a	4.4241E-06	mg/L

Dissolved Oxygen Calculations

kd		
k	1/day	0.15
u	m/s	2.32
h	m	1.32
η		0.3
kd	1/day	0.677273

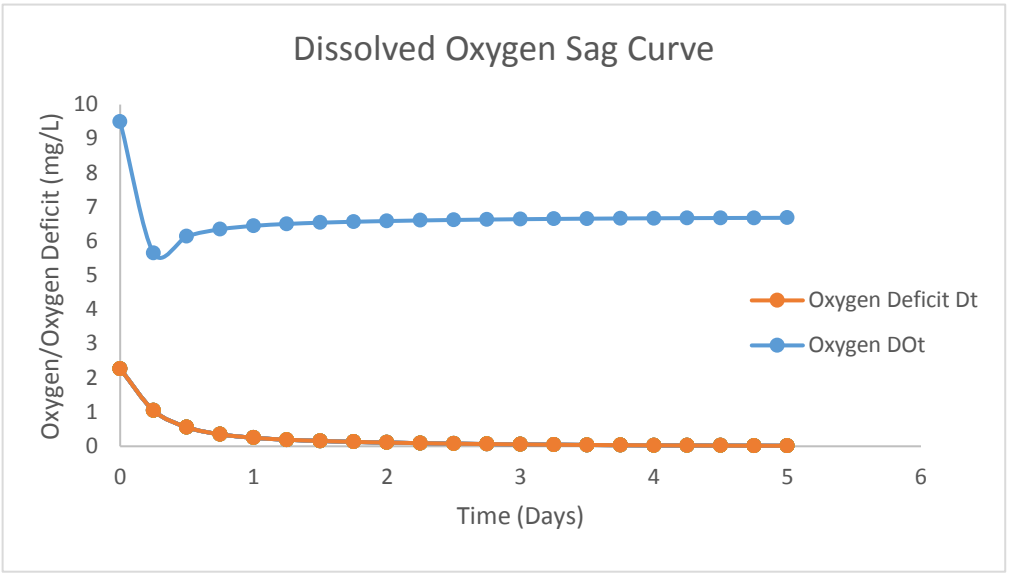
kr		
kr	1/day	3.916947

La		
Qw	m^3/s	7.01E-06
Lw	mg/L	109.38
Qr	m^3/s	173.37
Lr	mg/L	2
La	mg/L	2.000004

Da		
DOs	mg/L	11.77
DOw	mg/L	4
DOr	mg/L	9.5
Da	mg/L	2.27

t Days	Dt mg/L	DOt mg/L	t Days
0	2.27	9.5	0
0.25	1.048552	5.651448	0.25
0.5	0.559259	6.140741	0.5
0.75	0.349715	6.350285	0.75
1	0.249257	6.450743	1
1.25	0.193161	6.506839	1.25
1.5	0.156587	6.543413	1.5
1.75	0.12976	6.57024	1.75
2	0.108634	6.591366	2
2.25	0.091369	6.608631	2.25
2.5	0.077008	6.622992	2.5
2.75	0.064965	6.635035	2.75
3	0.054828	6.645172	3
3.25	0.046281	6.653719	3.25
3.5	0.03907	6.66093	3.5
3.75	0.032983	6.667017	3.75
4	0.027845	6.672155	4
4.25	0.023508	6.676492	4.25
4.5	0.019846	6.680154	4.5
4.75	0.016755	6.683245	4.75
5	0.014145	6.685855	5

DOc mg/L	tc days
5.651448	0.25



Wheel Weight Calculations

Wheel Weight:

Density of 5086 Aluminium Alloy: $\rho_{alum} := 0.0961\ pci$

Outerwheel Plate:

$r_{out} := 7.5\ ft \qquad r_{in} := 4.5\ ft \qquad t := 0.25\ in$

$A_{out} := \pi \cdot (r_{out})^2 - \pi \cdot (r_{in})^2 = 113.097\ ft^2$

$V_{out} := A_{out} \cdot t = 2.356\ ft^3$

$W_{out} := V_{out} \cdot \rho_{alum} = 391.3\ lbf$

Innerwheel Plate:

$r_3 := 1.5\ ft$

$A_{in} := \pi \cdot (r_3)^2 = 7.069\ ft^2$

$V_{in} := A_{in} \cdot t = 0.147\ ft^3$

$W_{in} := V_{in} \cdot \rho_{alum} = 24.454\ lbf$

Wheel Spokes:

$l := 85\ in \qquad w := 2.5\ in \qquad t := 0.5\ in \qquad n_{spoke} := 8$

$V_{spoke} := l \cdot w \cdot t = 0.061\ ft^3$

$W_{spoke} := V_{spoke} \cdot \rho_{alum} = 10.211\ lbf$

$W_{total\_spoke} := n_{spoke} \cdot W_{spoke} = 81.685\ lbf$

Hardware Weight: Assumed

$W_{hw} := 80\ lbf$

Total Weight of 1-Side:

$W_{side} := W_{hw} + W_{total\_spoke} + W_{in} + W_{out} = 577.411\ lbf$

Blade Weight:

Material Densities:

$\rho_{alum} = 0.096\ pci$

$\rho_{HDPE} := 59.3\ pcf$

Aluminum Blades:

$w_{blade} := 7\ ft$ $h_{blade} := 2.5\ ft$ $t_{a\_1} := 0.125\ in$ $t_{a\_2} := 0.0625\ in$

$SA_{blade} := \pi \cdot \left(\frac{h_{blade}}{2}\right) \cdot w_{blade} = 27.489\ ft^2$

$V_{a\_1} := SA_{blade} \cdot t_{a\_1} = 0.286\ ft^3$

$W_{a\_1} := V_{a\_1} \cdot \rho_{alum} = 47.55\ lbf$

$V_{a\_2} := SA_{blade} \cdot t_{a\_2} = 0.143\ ft^3$

$W_{a\_2} := V_{a\_2} \cdot \rho_{alum} = 23.775\ lbf$

HDPE Blades:

$w_{blade} := 7\ ft$ $h_{blade} := 2.5\ ft$ $t_{H\_1} := 0.5\ in$ $t_{H\_2} := 0.25\ in$

$SA_{blade} := \pi \cdot \left(\frac{h_{blade}}{2}\right) \cdot w_{blade} = 27.489\ ft^2$

$V_{H\_1} := SA_{blade} \cdot t_{H\_1} = 1.145\ ft^3$

$W_{H\_1} := V_{H\_1} \cdot \rho_{HDPE} = 67.921\ lbf$ ***Selected Blade Choice***

$V_{H\_2} := SA_{blade} \cdot t_{H\_2} = 0.573\ ft^3$

$W_{H\_2} := V_{H\_2} \cdot \rho_{HDPE} = 33.96\ lbf$

Total Weight of Wheel Structure:

$W_{WHEEL\_TOTAL} := 2 \cdot W_{side} + 16 \cdot W_{H\_1} = 2241.6\ lbf$

Structural Calcs:

Axle Pipe Size Required:

Scenerio 1: Point Load at Center of Pipe

$L := 112\ in$

$F_v := 20000\ \frac{lbf}{in^2}$

$F_b := 37500\ \frac{lbf}{in^2}$

$P_{app} := 2241.6\ lbf$

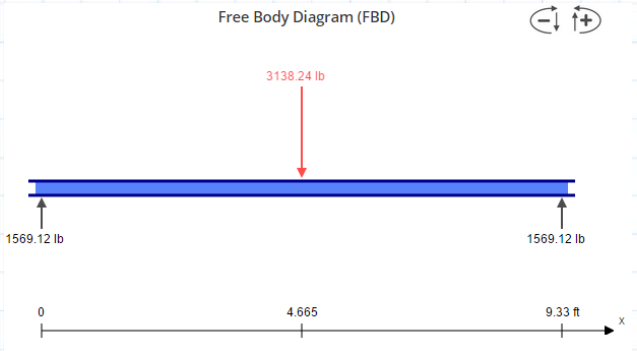
$P_{ult\_1} := 1.4 \cdot P_{app} = 3138.24\ lbf$

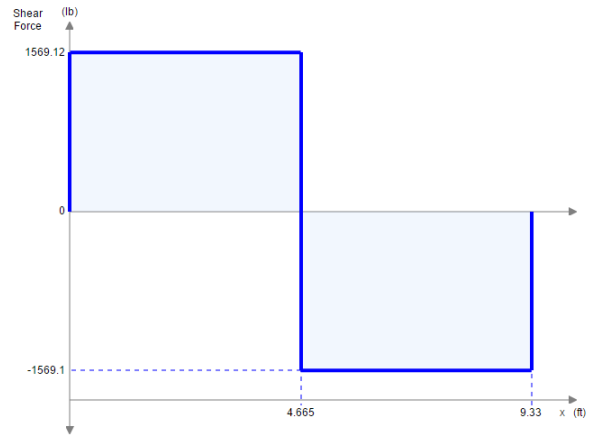
$V_{max} := \left| \left(\frac{P_{ult\_1}}{2} \right) \right| = 1569.12\ lbf$

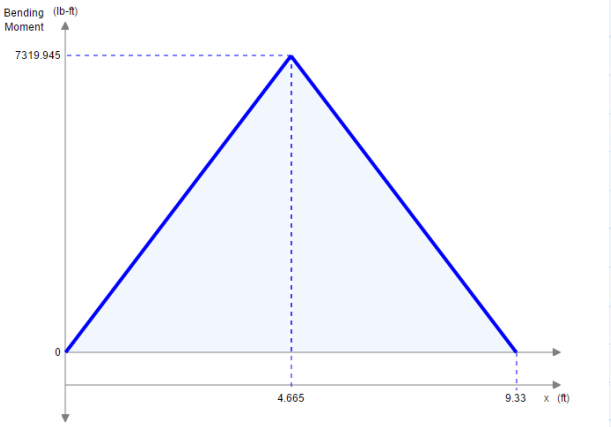
$M_{max} := \left| \left(\frac{P_{ult\_1} \cdot L}{4} \right) \right| = 7322.56\ ft \cdot lbf$

$A_{req} := \frac{(1.5 \cdot V_{max})}{F_v} = 0.118\ in^2$

$S_{req} := \left| \left(\frac{M_{max}}{F_b} \right) \right| = 2.343\ in^3$







Pipe Selection:

***Use MIN #4 Std. Pipe

$A_4 := 2.96\ in^2 > A_{req} = 0.118\ in^2$ OK

$S_4 := 3.03\ in^3 > S_{req} = 2.343\ in^3$ OK

Scenerio 2: Point Loads at Ends of Pipe (Edges of Wheel Structure)

$L := 112\ in$ $a := 14\ in$

$F_v := 20000\ \frac{lbf}{in^2}$

$F_b := 37500\ \frac{lbf}{in^2}$

$P_{app} := 2241.6\ lbf$

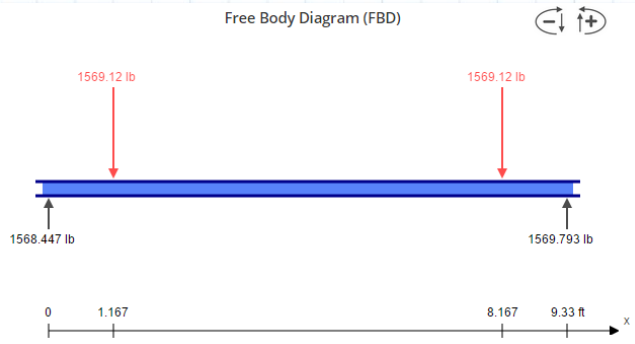
$P_{ult\_1} := 1.4 \cdot P_{app} = 3138.24\ lbf$

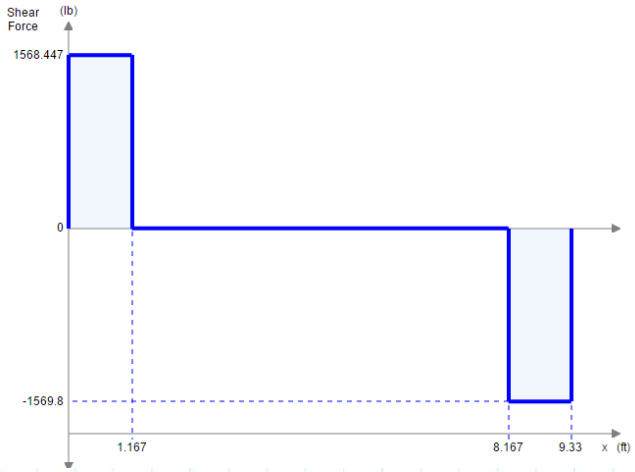
$V_{max} := \left| \left(\frac{P_{ult\_1}}{2} \right) \right| = 1569.12\ lbf$

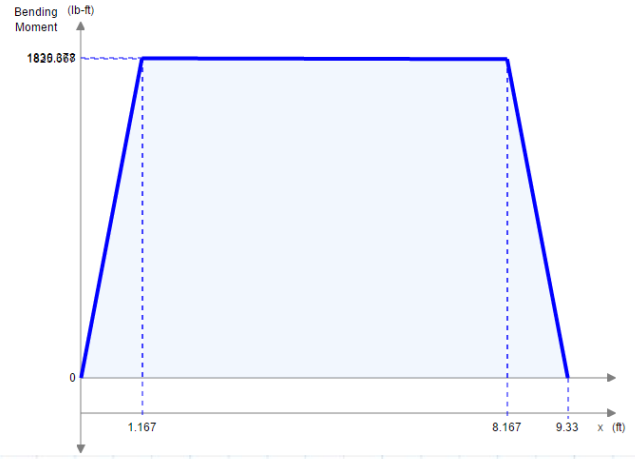
$M_{max} := \frac{P_{ult\_1}}{2} \cdot a = 1830.64\ ft \cdot lbf$

$A_{req} := \frac{(1.5 \cdot V_{max})}{F_v} = 0.118\ in^2$

$S_{req} := \left| \left(\frac{M_{max}}{F_b} \right) \right| = 0.586\ in^3$







Pipe Selection:

***Use MIN #2-1/2 Std. Pipe

$A_{2.5} := 1.61\ in^2$ > $A_{req} = 0.118\ in^2$ OK

$S_{2.5} := 1.01\ in^3$ > $S_{req} = 0.586\ in^3$ OK

Final Pipe Selection: Larger Pipe Governs

Selected Pipe: Use MIN #4 Standard Weight (Std.) Steel Pipe

STRUCTURAL PACKET:

Forces on Wheel and Structure:

Assumptions:

$$\rho_{water} := 62.4 \ \frac{lb}{ft^3}$$

Paddle Dimensions:

$r_{paddle} := 15 \ in$

$l_{paddle} := 84 \ in$

$SA_{paddle} := \pi \cdot r_{paddle} \cdot l_{paddle} = 27 \ ft^2$

$SA_{paddle} := 2 \cdot r_{paddle} \cdot l_{paddle} = 18 \ ft^2$ ***I think rectangular area is preferred

Submerged Structure Dimensions: Area of Pontoons

South Pontoon:

$w_{pontoon\_s} := 28 \ in \quad h_{pontoon\_s} := 18 \ in$

$SA_{pontoon\_s} := w_{pontoon\_s} \cdot h_{pontoon\_s} = 4 \ ft^2$

North Pontoon:

$w_{pontoon\_n} := 58 \ in \quad h_{pontoon\_n} := 18 \ in$

$SA_{pontoon\_n} := w_{pontoon\_n} \cdot h_{pontoon\_n} = 7 \ ft^2$

River Velocity:

$v_{river} := 7 \ \frac{ft}{s}$

Force on Wheel:

$$F_{paddle} := \rho_{water} \cdot SA_{paddle} \cdot \langle v_{river} \rangle^2 = 53508 \ \frac{lb \cdot ft}{s^2}$$

Force on Structure:

$$F_{structure} := \rho_{water} \cdot \langle SA_{pontoon\_n} + SA_{pontoon\_s} \rangle \cdot \langle v_{river} \rangle^2 = 32869.2 \ \frac{lb \cdot ft}{s^2}$$

Total Force:

$$F_{total} := F_{paddle} + F_{structure} = 86377.2 \ \frac{lb \cdot ft}{s^2}$$

Anchor System: Eye Supports

Assumptions: 5086 Aluminum

$f_y := 17\ ksi$ $N_{static} := 2$ $d_{eye} := 2\ in$

$f_u := 38\ ksi$ $N_{fatigue} := 8$ $t := 0.75\ in$

$N_{impact} := 15$ $u := 1$

Tension on Eye Support:

$T_u := F_{total} = 86377.2\ \frac{lb \cdot ft}{s^2}$ *Design for each support to handle total tension

Nominal Yield and Rupture Force Requirment:

$A_g := d_{eye} \cdot t = 1.5\ in^2$

$A_n := min\left(d_{eye} \cdot t, 0.85 \cdot A_g\right) = 1.28\ in^2$

$P_y := A_g \cdot f_y = 820438.2\ \frac{lb \cdot ft}{s^2}$

$P_{tearout} := A_n \cdot f_u = 1558832.7\ \frac{lb \cdot ft}{s^2}$

$P_n := min\left(P_y, P_{tearout}\right) = 820438\ \frac{lb \cdot ft}{s^2}$

Factor of Safety Conditions: Static, Repeat Loading (Fatigue), Impact

$P_{n\_static} := \frac{P_n}{N_{static}} = 410219\ \frac{lb \cdot ft}{s^2}$

***Clarify FS use with Fy and Fu

$P_{n\_fatigue} := \frac{P_{tearout}}{N_{fatigue}} = 194854\ \frac{lb \cdot ft}{s^2}$

$P_{n\_impact} := \frac{P_{tearout}}{N_{impact}} = 103922\ \frac{lb \cdot ft}{s^2}$ > $T_u = 86377\ \frac{lb \cdot ft}{s^2}$

Selected Thickness of Eye Support:

$t = 0.75\ in$

Water Wheel & Power Calculations:

River Characteristics:

$y_d := 4.36\ ft = 1.329\ m$ $w := 1$

$v_{avg} := 7.6\ \frac{ft}{s}$ Assume v = 7 ft/s

$v_{river} := 7\ \frac{ft}{s} = 2.134\ \frac{m}{s}$

Power Requirement:

$P_{required} := 5000\ W = 5\ kW$

Wheel Paddle Area Required:

Assumptions:

$\varepsilon := 0.4$ ***Assumued 40% power transfer efficiency, however curved paddle shape generally yields 60%-70% power transfer efficiency.

$\rho := 1000\ \frac{kg}{m^3} = 62.428\ \frac{lb}{ft^3}$ $g := 9.81\ \frac{m}{s^2} = 32.185\ \frac{ft}{s^2}$

Paddle Area:

$A_p := \frac{\langle 2 \cdot P_{required} \rangle}{\varepsilon \cdot \rho \cdot v_{river}^3} = 27.706\ ft^2$ $A_p = 2.574\ m^2$

Working Cross-Sectional Area:

*Ideal paddle depth is equal to available head, however to reduce wheel width we have chosen a submerged paddle depth of 2.5 ft.

$h_{paddle} := 2.5\ ft$

$A_p = 27.706\ ft^2$

$SA_{paddle} := \pi \cdot \left(\frac{h_{paddle}}{2} \right) \cdot w$

$SA_{paddle} := A_p = 27.706\ ft^2$ **Paddle Area must equal working cross-sectional area.*

$w := \frac{\langle SA_{paddle} \rangle}{\left(\pi \cdot \left(\frac{h_{paddle}}{2} \right) \right)} = 7.055\ ft$ ***Paddle width must be greater than:*** $w = 7.055\ ft$

For chosen paddle depth of: $h_{paddle} = 2.5\ ft$

Actual power realized by water wheel:

$h_{paddle} = 2.5\ ft$

$w_{paddle} := w = 7.055\ ft$

Design Flow 1: Assuming area of flow equals entire cross sectional area of paddle.

$$Q_1 := \langle SA_{paddle} \rangle \cdot \langle v_{river} \rangle = 193.941\ \frac{ft^3}{s}$$

Design Flow 2: Assuming area of flow equals rectangual area of paddle depth by paddle width.

$$Q_2 := \langle h_{paddle} \cdot w_{paddle} \rangle \cdot \langle v_{river} \rangle = 123.467\ \frac{ft^3}{s}$$

Ideal available power: Using Design Flow 1.

$\lambda := 11.8\ ft^2 \cdot \frac{s}{lb}$ **Empirical Index for converting feet and seconds to kW.*

$$P_{1\_ideal} := \frac{\langle Q_1 \cdot h_{paddle} \rangle}{(\lambda)} = 41.089\ \frac{lb \cdot ft^2}{s^2}$$

Ideal available power: Using Design Flow 2.

$$P_{2\_ideal} := \frac{\langle Q_2 \cdot h_{paddle} \rangle}{(\lambda)} = 26.158\ \frac{lb \cdot ft^2}{s^2}$$

Actual power with efficiency factor:

$\varepsilon := 0.4$

$$P_1 := P_{1\_ideal} \cdot \varepsilon = 16.436\ \frac{lb \cdot ft^2}{s^2}$$

$$P_2 := P_{2\_ideal} \cdot \varepsilon = 10.463\ \frac{lb \cdot ft^2}{s^2}$$

Wheel and Paddle Characteristics:

Available head:

$$h := \frac{\left(v_{river}^{(2)}\right)}{2 \cdot g} = 0.761\ ft \quad h = 0.232\ m$$

$h_{paddle} = 2.5\ ft$ *Using paddle height for reduced paddle width.*

Ideal Total Diameter:

$D_T := 6 \cdot h_{paddle} = 15\ ft$ $D_T = 4.572\ m$

Working Diameter & Circumference:

$D_W := D_T - h_{paddle} = 12.5\ ft$ $D_W = 3.81\ m$

$C_W := D_W \cdot \pi = 39.27\ ft$ $C_W = 11.969\ m$

Ideal Paddle Spacing & Number of Paddles:

*Ideal spacing is equal to available head.

$h_{paddle} = 2.5\ ft$

$S_{paddle} := h_{paddle} = 2.5\ ft$ $S_{paddle} = 0.762\ m$

$N_{paddle} := \frac{C_W}{S_{paddle}} = 15.708$ Use N=16 paddles

$N_{design} := 16$ $S_{design} := \frac{C_W}{N_{design}} = 2.454\ ft$

Wheel Velocity:

*Ideal wheel velocity is 67%-90% of river velocity (Assume 67% to be conservative).

$v_{wheel} := (0.67) \cdot v_{river} = 4.69\ \frac{ft}{s}$ $v_{wheel} = 281.4\ \frac{ft}{min}$

$C_W = 39.27\ ft$

$\omega_{wheel} := \frac{\langle v_{wheel} \rangle}{C_W} = 0.119\ \frac{1}{s}$ $\omega_{wheel} = 7.166\ \frac{1}{min}$

Grinder Capacity and Water Pump Requirement:

Givens and Assumptions:

$$V_{thruput\_design} := 105 \ \frac{ft^3}{hr}$$

$$W_{salmon\_waste} := 2 \ lb$$

$$\rho_{salmon} := 64.3 \ \frac{lb}{ft^3}$$

Fish Waste Capacity of Grinder:

$$V_{thruput\_salmon} := \rho_{salmon} \cdot V_{thruput\_design} = 6752 \ \frac{lb}{hr}$$

$$C_{salmon\_waste} := \frac{V_{thruput\_salmon}}{W_{salmon\_waste}} = 3376 \ \frac{1}{hr}$$

$$C_{salmon\_waste} = 56 \ \frac{1}{min}$$

*Grinder can handle approximately 3376 salmon carcasses per hour or 56 per minute.

Water Pump Requirement:

Assumptions:

$$V_{water\_per\_fish} := 0.5 \ gal$$

$$R_{pump\_output} := C_{salmon\_waste} \cdot V_{water\_per\_fish} = 28 \ gpm$$

*Required water output of sump pump is 28 gpm @ assumed 15-ft of head.

Water Wheel Buoyancy Calculations

Physical Atribute	Weight (lb)
Water Wheel Structure	2241.6
Axle	165
Base Frame	1393.64
Walkway	230.02
Grinder	425
Generator	500
Chute	
Water Pump	50
Aluminum Plating	532.18
Hardware	158
TOTAL DEVICE WEIGHT (lb) =	**5695.44**

*ESTIMATED

Dock Float Size	Individual Buoyancy Capacity (lb)	Total Capacity (lb)	% Submerged
24" X 48" X 8"	239	2868	198.6%
24" X 48" X 12"	434	5208	109.4%
24" X 48" X 16"	598	7176	79.4%
24" X 48" X 18"	642	7704	73.9%
24" X 48" X 20"	719	8628	66.0%
24" X 48" X 24"	867	10404	54.7%

Aluminum Base Frame Attribute	Nominal Weight (lb/ft)	Total Length (ft)	# Items (each)	Weight (lb)
8" X 8" X 1/4"	8.928	15.67		139.90
6" X 6" X 1/4"	6.624	21.67		143.54
2" X 2" X 1/4" - Longitudal	2.016	112.83		227.47
2" X 2" X 1/4" - Transverse	2.016	167.83		338.35
2" X 2" X 1/4" - Vertical	2.016	56.5		113.90
2" X 2" X 1/4" - Stiffener	2.016	12.33	1	24.86
4" X 2" X 1/4"	3.168	110.22		349.18
Bearing Plate 14" X 14" X 1/2"	9.408	N/A	6	56.45
			TOTAL (lb) =	**1393.64**

Aluminum Walkway Frame Attribute	Nominal Weight (lb/ft)	Total Length (ft)	# Items (each)	Weight (lb)
2" X 2" X 1/4" - Vertical	2.016	37		74.59
2" X 2" X 1/4" - Transverse	2.016	38.33		77.27
4" X 2" X 1/4" - Longitudal	3.168	24.67		78.15
			TOTAL (lb) =	**230.02**

Hardware	Nominal Weight (lb/item)	# Items (each)	Weight (lb)
Hex-Bolt: D=1", L = 2"	0.79	200	158
		TOTAL (lb) =	**158**

****ESTIMATED

Aluminum Plating	Nominal Weight (lb/SF)	Total Area (SF)	Weight (lb)
5086 Aluminum, t = 1/8" - Deck	1.73	175.65	303.8745
5086 Aluminum, t = 1/16" - Pontoons	0.865	263.94	228.3081
		TOTAL (lb) =	**532.1826**

26.1 Appendix F – Design Drawings

HYDRO POWERED FISH WASTE DISPOSAL SYSTEM

KENAI & RUSSIAN RIVER CONFLUENCE
COOPER LANDING, ALASKA
APRIL 2015

LOCATION OF PROJECT

SHEET INDEX

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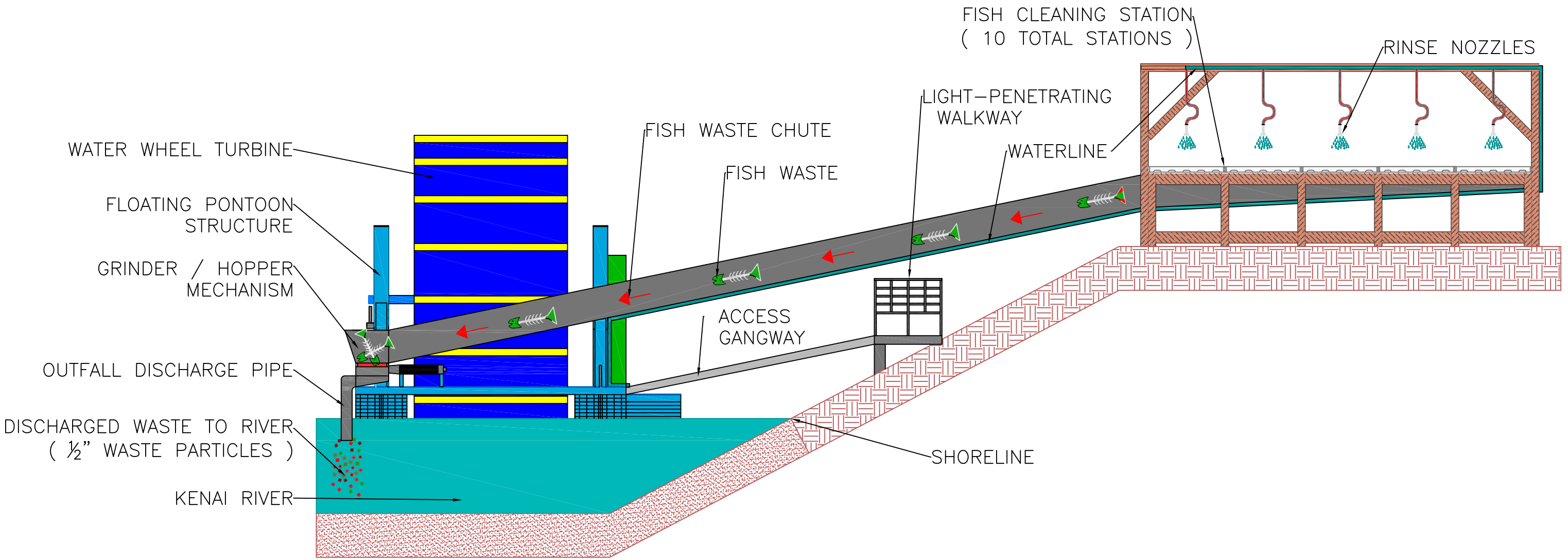
HPFWDS

SHEET_COVER

SIZE	DWG FILE	REV
11X17	HPFWDS_1_SHEET_COVER.DWG	1

SCALE: NTS | NAME: NKH | SHEET: 1/10



SYSTEM CONCEPT MODEL:
FRONT ELEVATION VIEW

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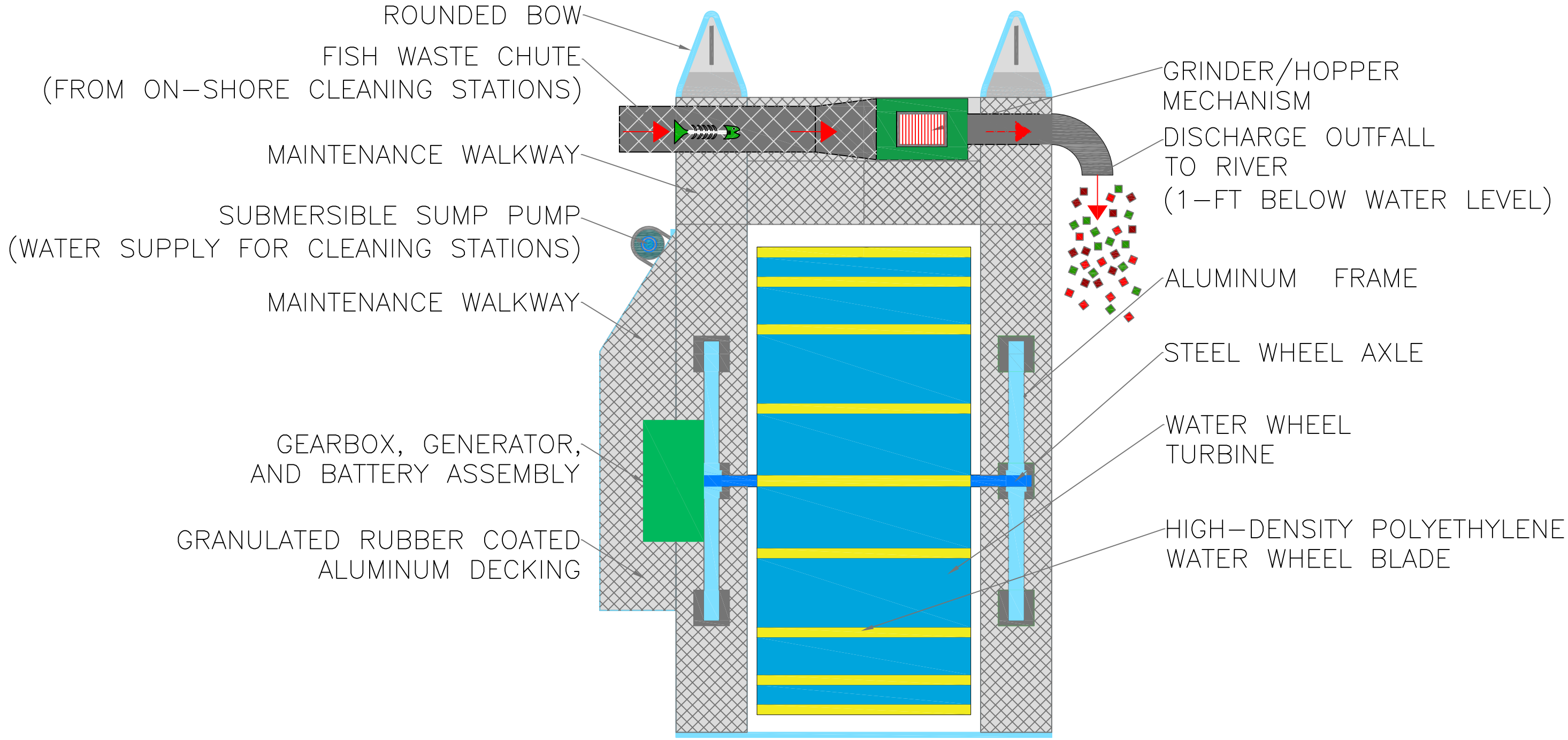
HPFWDS

SYSTEM_CONCEPT

SIZE	DWG FILE	REV
11X17	HPFWDS_2_SYSTEM_CONCEPT.DWG	1

SCALE: NTS | NAME: NKH | SHEET: 2/10

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT



CONCEPT MODEL:
FLOATING-CRAFT PLAN VIEW

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CRAFT_CONCEPT

SIZE	DWG FILE	REV
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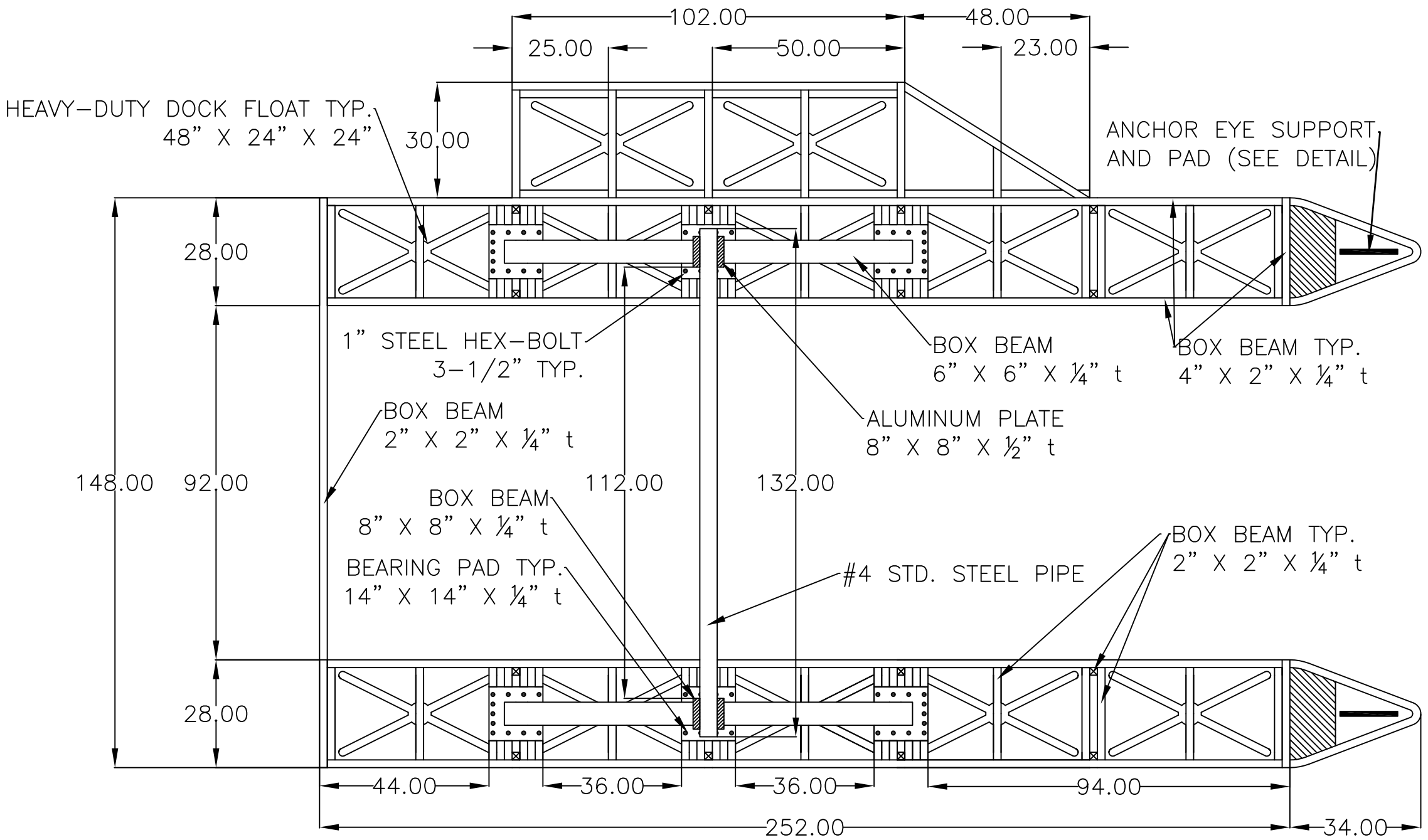
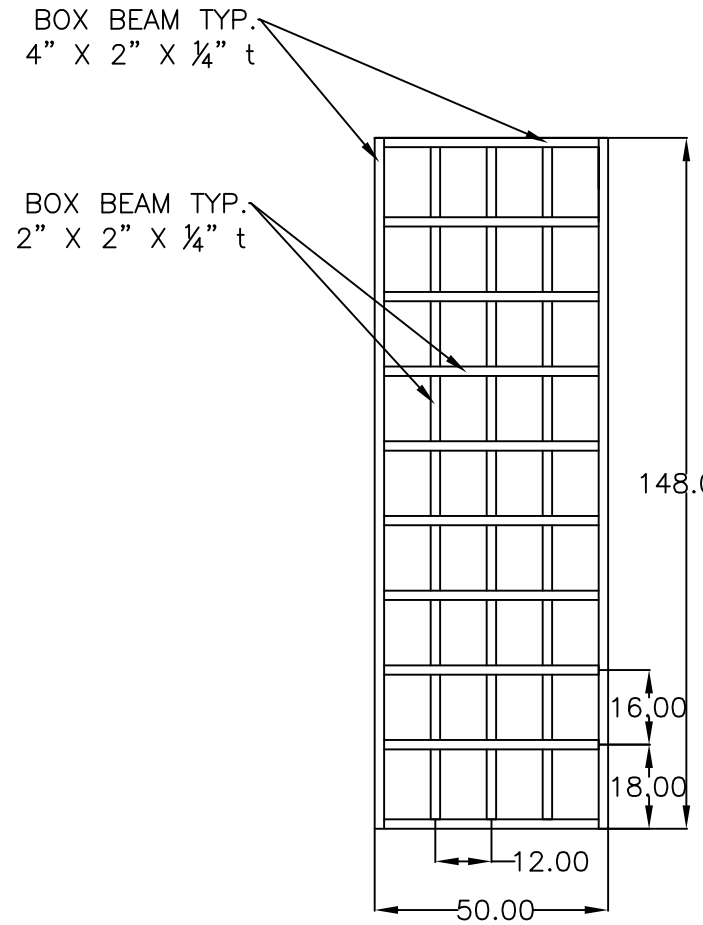


HYDRO POWER FISH WASTE DISPOSAL SYSTEM
FRAME DESIGN:
PLAN VIEW



WALKWAY DESIGN:
PLAN VIEW

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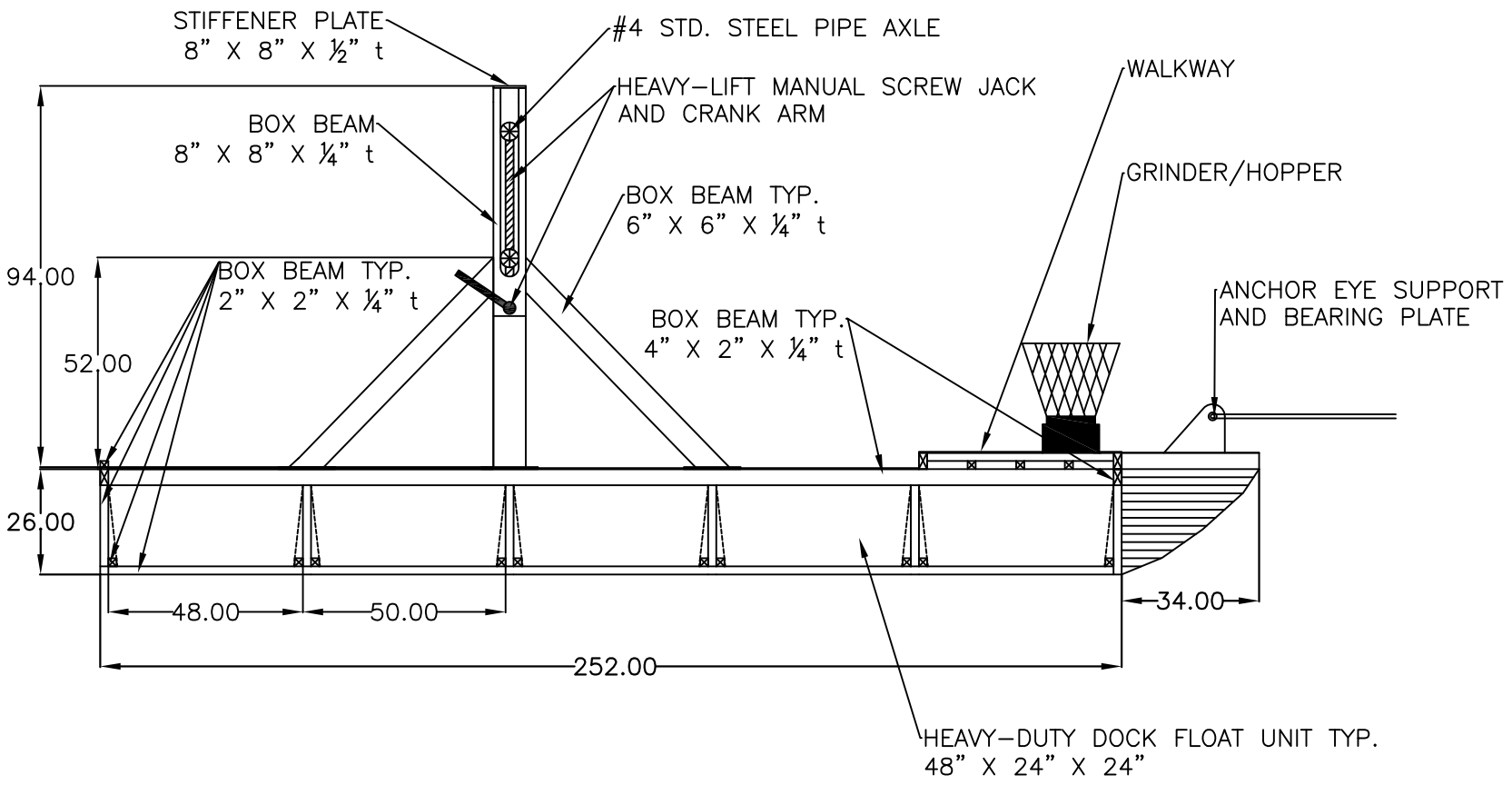
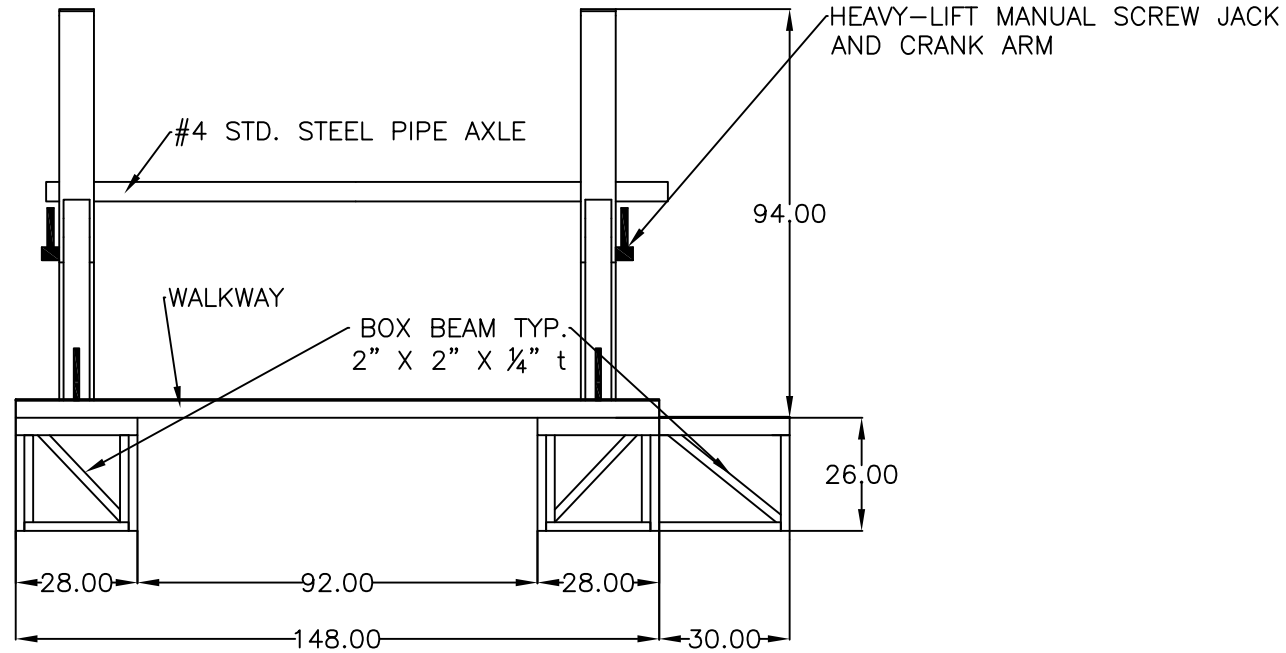
	HPFWDS
	FRAME_PLAN_VIEW
SIZE 11X17	DWG FILE C:/HPFWDS_4_FRAME_PLAN.DWG
REV 2	
SCALE: NTS	NAME: NKH
SHEET: 4/X	

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT





FRAME DESIGN
PROFILE: FRONT

HYDRO POWER FISH WASTE DISPOSAL SYSTEM
FRAME DESIGN
PROFILE: LEFT

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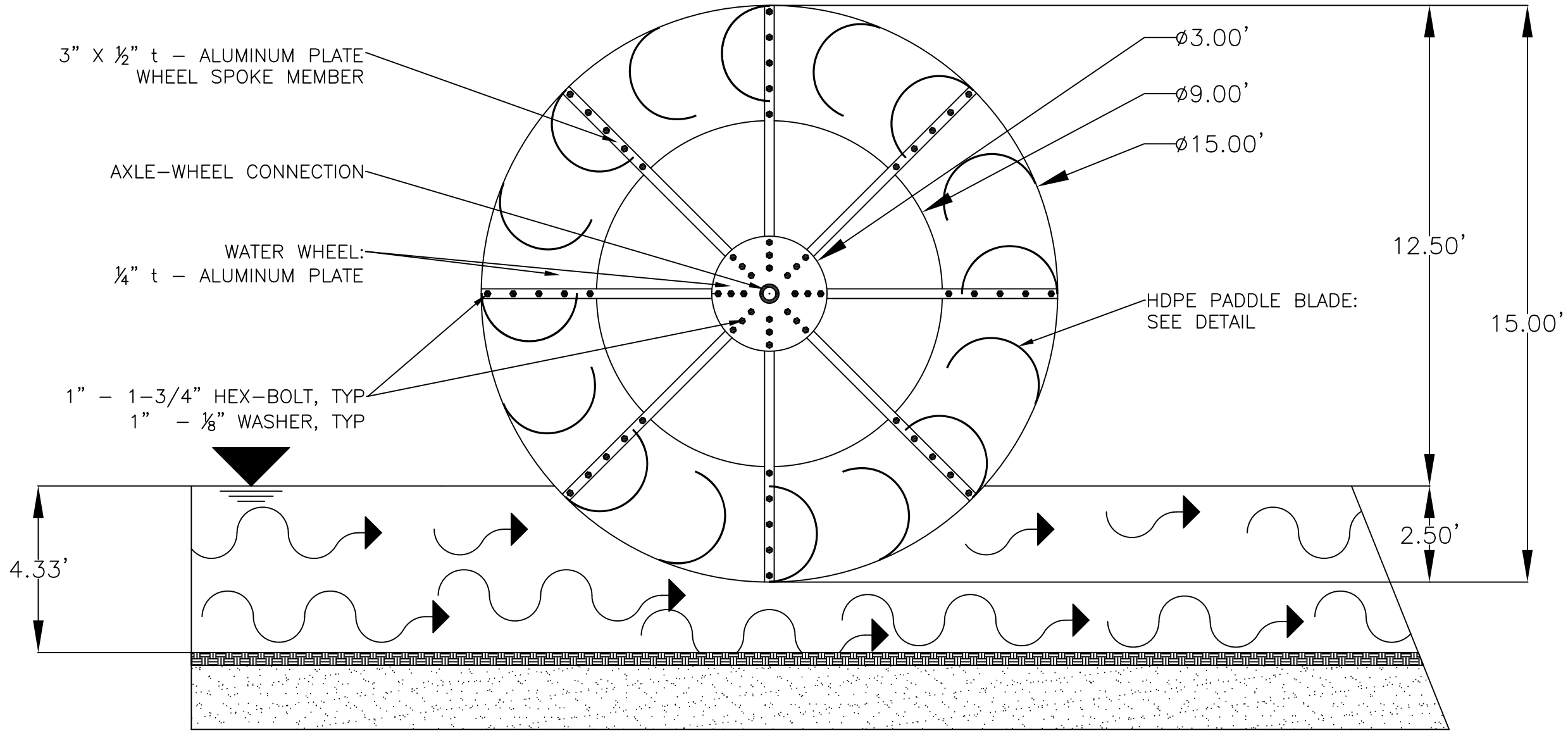
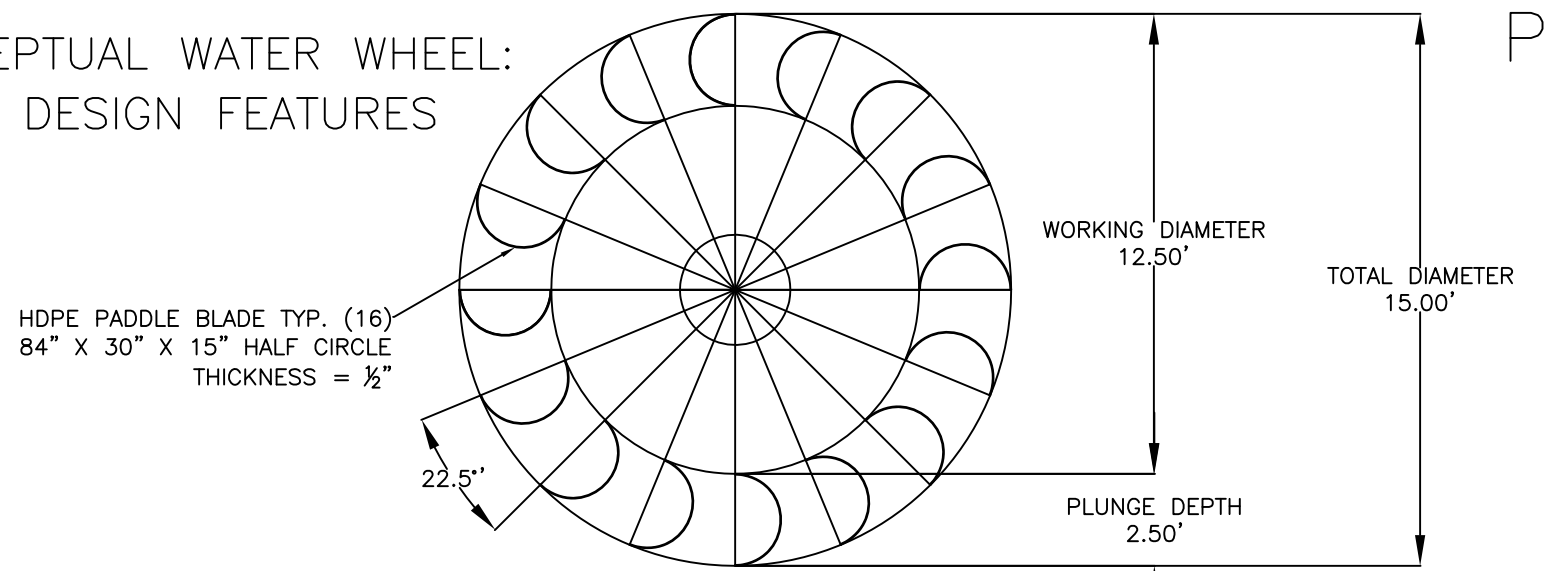
	HPFWDS
	FRAME_PROFILE
SIZE: 11X17	DWG FILE: HPFWDS_5_FRAME_PROFILE.DWG
REV: 2	
SCALE: NTS	NAME: NKH
SHEET: 5/10	

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT



WHEEL DESIGN: PROFILE VIEW

CONCEPTUAL WATER WHEEL: KEY DESIGN FEATURES



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HPFWDS

WHEEL_PROFILE

SIZE	DWG FILE	REV
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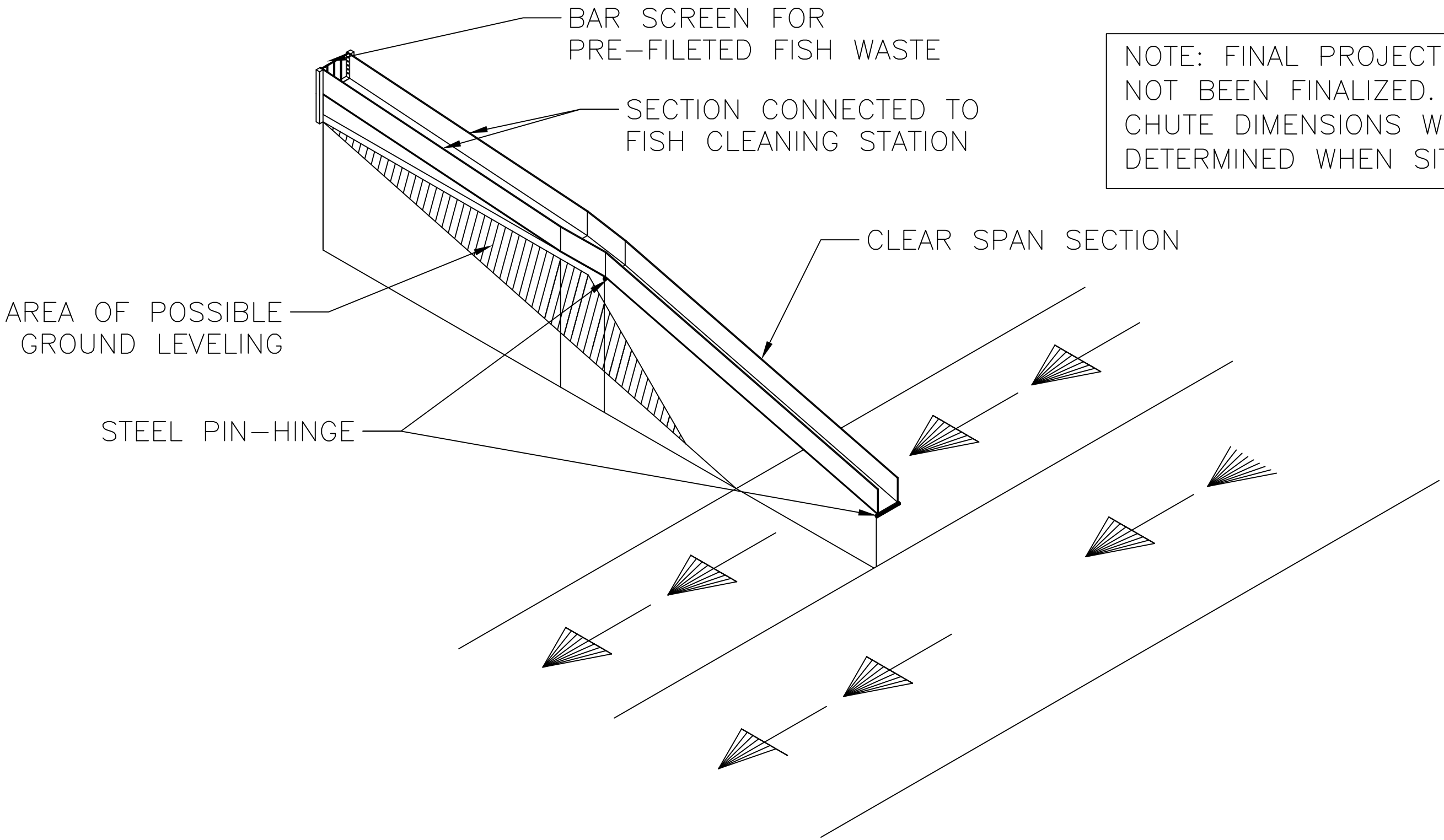
SCALE: NTS | NAME: NKH | SHEET: 6/10

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT



NOTE: FINAL PROJECT SITE HAS NOT BEEN FINALIZED. FISH WASTE CHUTE DIMENSIONS WILL BE DETERMINED WHEN SITE IS CHOSEN.

CONCEPTUAL DESIGN: FISH WASTE CHUTE

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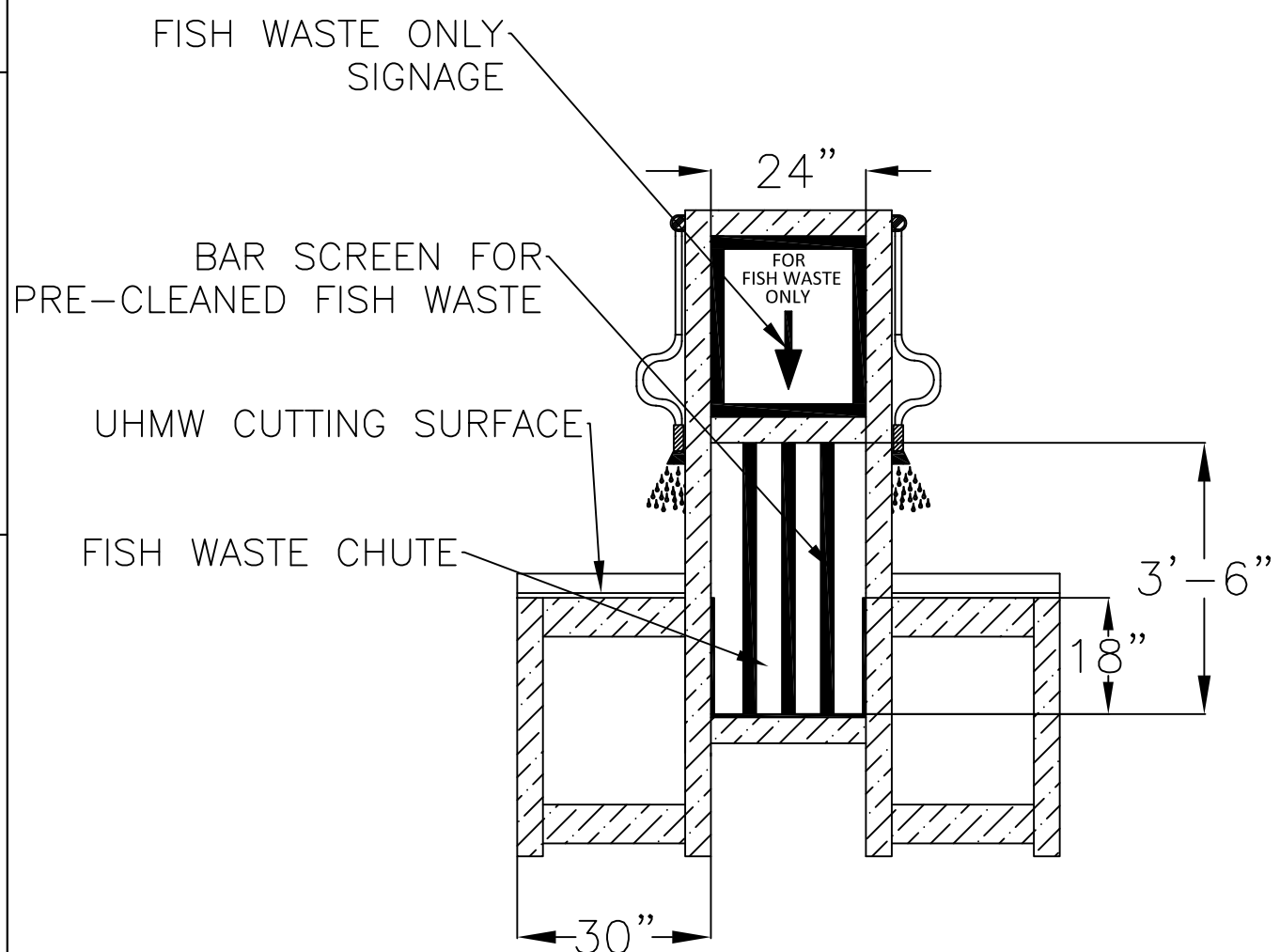
HPFWDS

FISH_WASTE_CHUTE

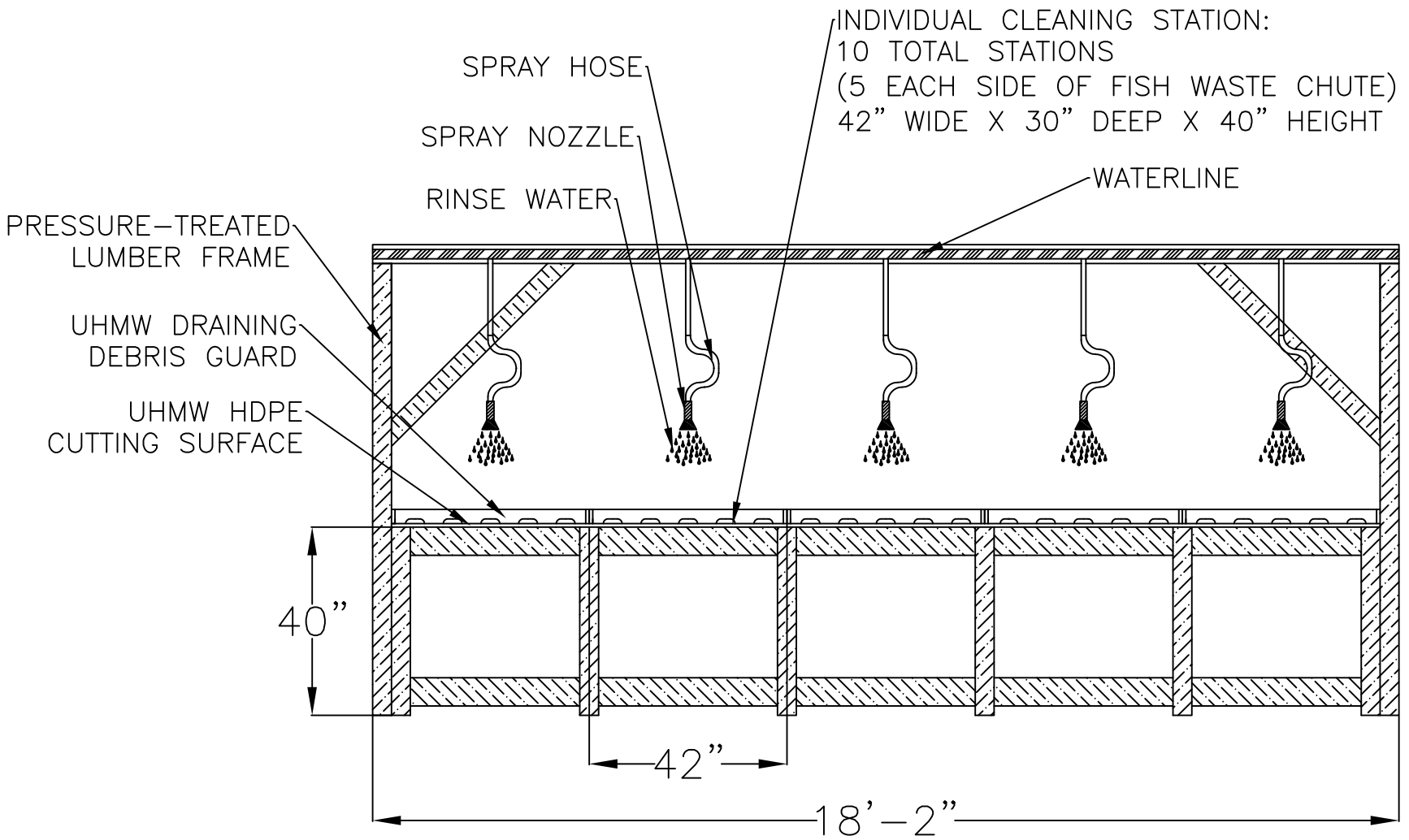
SIZE	DWG FILE	REV
11X17	HPFWDS_7_FISH_WASTE_CHUTE.DWG	1

SCALE: NTS | NAME: NKH | SHEET: 7/10

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT



FISH CLEANING STATION:
REAR VIEW



FISH CLEANING STATION:
SIDE VIEW

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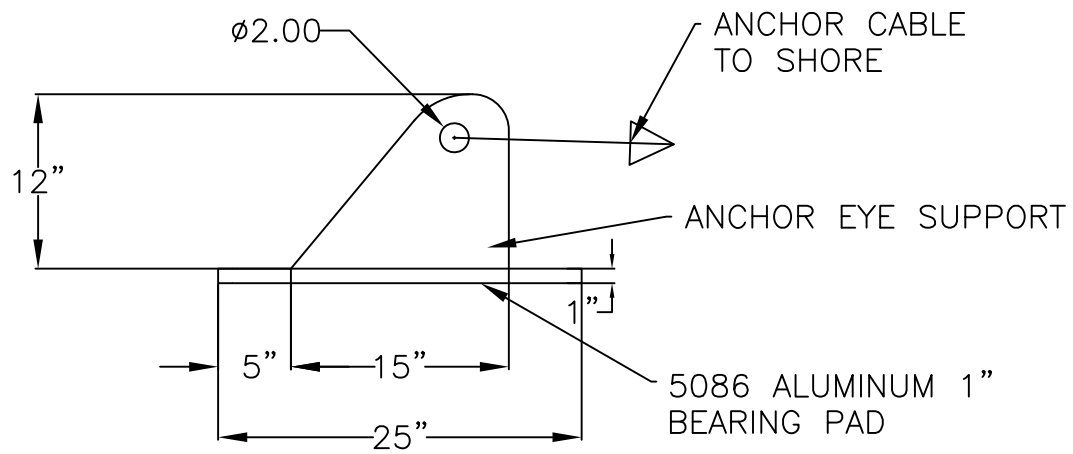
HPFWDS

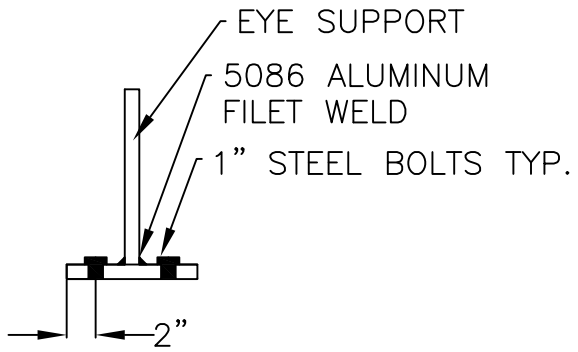
CLEANING_STATION

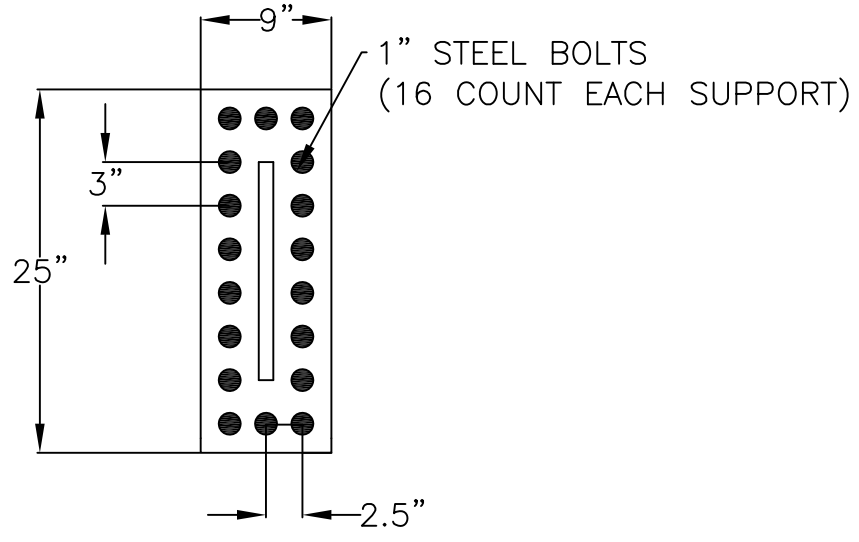
SIZE	DWG FILE	REV
11X17	HPFWDS_8_CLEANING_STAION.DWG	1

SCALE: NTS | NAME: NKH | SHEET: 8/10

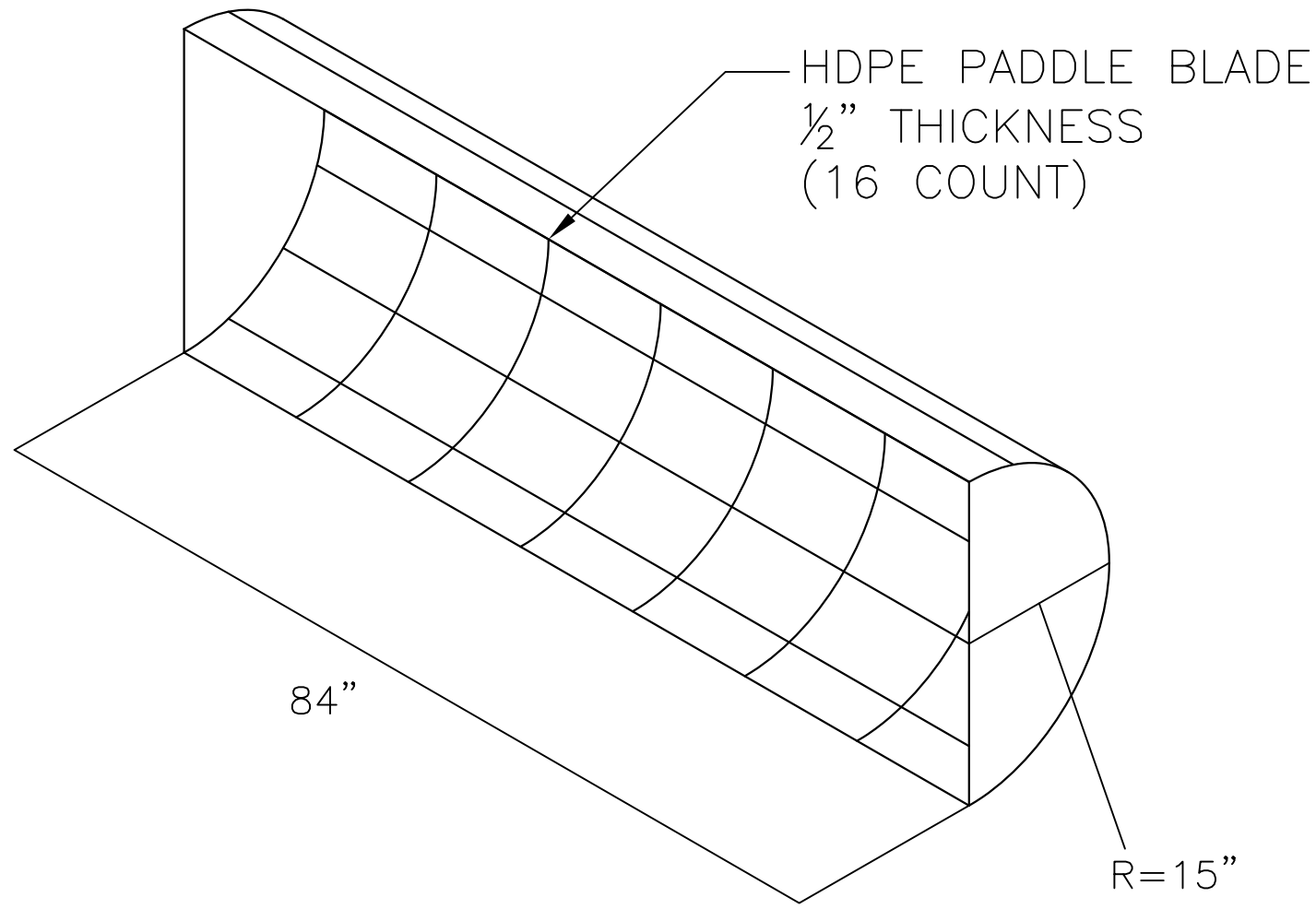
PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT







ANCHOR EYE SUPPORT DETAIL



HDPE PADDLE BLADE DETAIL

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HPFWDS

DETAILS

SIZE	DWG FILE	REV
11X17	HPFWDS_9_DETAILS.DWG	1

SCALE: NTS | NAME: NKH | SHEET: 9/10

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

GENERAL NOTES:

NOTE: ALL METAL BOX BEAMS SHALL BE 6061 STRUCTURAL MARINE GRADE ALUMINUM UNLESS OTHERWISE NOTED.

NOTE: ALL METAL BEARING PADS, DECK PLATING, EYE SUPPORTS AND PONTOON PLATING SHALL BE 5086 MARINE GRADE ALUMINUM UNLESS OTHERWISE NOTED.

NOTE: ALL PADDLE BLADES FOR WATER WHEEL SHALL BE MADE FROM HIGH-DENSITY POLYETHYLENE.

NOTE: ALL WALKWAY AND DECK AREAS INTENDED FOR FOOT TRAFFIC FROM WORKERS SHALL BE COATED WITH AT LEAST ¼" THICK SLIP RESISTANT, GRANULATED RUBBER MARINE SURFACING OR EQUIVALENT.

NOTE: THE TURBINE AXLE SHALL BE CONSTRUCTED FROM A GALVANIZED #4 STANDARD STEEL PIPE (A53) OR EQUIVALENT.

NOTE: THE GRINDER HOPPER AND WASTE CHUTE NOT IMMEDIATELY ADJACENT TO THE CLEANING STATIONS SHALL BE ENCLOSED BY LOCKABLE, ACCESSIBLE AND HINGED EXPANDED ALUMINUM SAFETY SHEET PANELS. EXPANDED ALUMINUM SAFETY SHEET OPENINGS SHALL NOT EXCEED ¾".

NOTE: ALL WALKWAYS AND DECK SPACE SHALL BE ENCLOSED BY MARINE SAFETY RAILINGS. SAFETY RAILING SHALL BE NO LESS THAN 39.5" IN HEIGHT, MUST BE RATED TO WITHSTAND 200 LBS OF FORCE IN ANY DIRECTION, AND RATED TO WITHSTAND 50 LBS/FT OF UNIFORM LOADING.

NOTE: 5086 ALUMINUM PLATING USED FOR THE CONSTRUCTION OF THE FISH WASTE CHUTE SHALL BE ANODIZED OR EQUIVALENT FOR LOW-FRICTION TREATMENT

NOTE: LUMBER USED FOR THE CONSTRUCTION OF THE CLEANING STATIONS SHALL BE PRESSURE-TREATED AND TREATED WITH A WATER RESISTANT SEALANT

NOTE: CLEANING STATION CUTTING SURFACE SHALL BE AT LEAST ¾" THICK AND SHALL BE MADE OF ULTRA HIGH MOLECULAR WEIGHT HIGH-DENSITY POLYTHEYLENE

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HPFWDS

GENERAL_NOTES

SIZE	DWG FILE	REV
11X17	HPFWDS_10_GENERAL_NOTES.DWG	1

SCALE:	NAME:	SHEET:
NTS	NKH	10/10

27.1 Appendix G – Equipment Specifications

MONSTER INDUSTRIAL™

Industrial Shredder Series

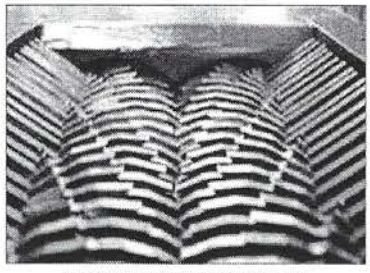
Founded in 1973 JWC Environmental invented our first high efficiency dual-shafted waste shredder. Forty years later we've built and shipped over 35,000 Monster shredders, screens and compaction systems worldwide. Our commitment to quality and reliability have made our shredders legendary in industries such as wastewater, petroleum, agriculture, food processing and manufacturing facilities.

Our line of Hydro shredders are designed to reduce the size of solids in a liquid solution. This protects downstream equipment, such as pumps, centrifuges and heat exchangers. They're also used in wet environments where reducing the size of solids is a must.

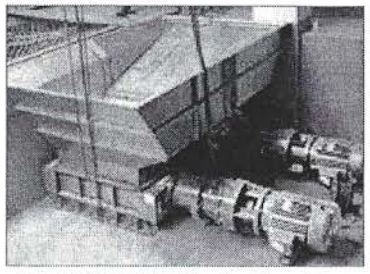
Shred series is built for reducing tough solids in a dry environment. The Shred series is built on a rigid frame with high strength steel cutters and seals – an efficient and economical design.

The unique design of Monster Industrial shredders also makes them incredibly energy efficient. We've received over 70 patents for our innovative shredder technologies and we continue to make improvements every year to cutter materials, seals, motor efficiency and shredder longevity.

JWCE's 150 employees are ready to take on your toughest solids reduction challenge. We will find, or custom design, the Monster Industrial shredder that's just right for your application. Monster Industrial shredders are quick, powerful and reliable. Don't waste it – shred it with Monster Industrial.



A View of The Cutters on the SHRED Series



Dual 7-SHRED-H Series Shredders

Features & Benefits

Dual-Shafted Shredder

- Low-speed, high-torque shredders handle rocks, wood, clothing, plastics, bone and other debris
- Capable of shredding a wider variety of solids than single-shafted machines and macerators

Compact and Efficient Design

- Adapts to many applications with little or no modification
- Custom stainless steel hoppers and conveyors allow easy installation in processing facilities
- 2-HYDRO-IX and 3-HYDRO-IX incorporate easy-to-remove cutter cartridge

Hardened Steel Cutters

- Exclusive process produces cutters with a Rockwell Hardness of 60-65 HRC
- Standard cutters to fit your application: 3,7,11 or 13 tooth
- Custom cutters, as needed

Patented High-Flow Side Rails

- Increases flow capacity and decreases head loss
- Deflects solids into the cutting chamber

Automated Monitoring and Controls

- Auto load sensing and reversals reduce interrupts and optimize the shredder's performance

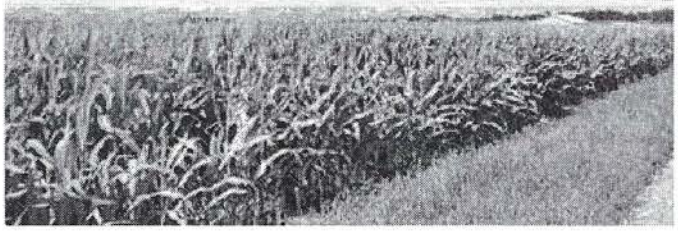
JWC Environmental®

Trust Monster Quality™

www.jwce.com/ind

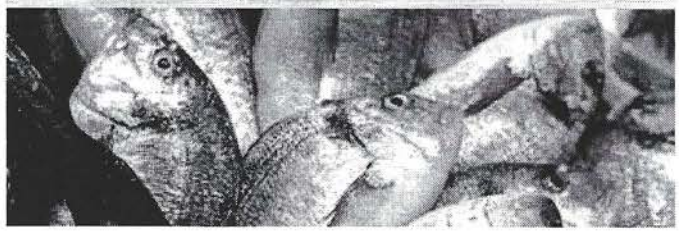
Applications

Agriculture



- Seed Destruction
- Waste to Energy

Marine / Maritime

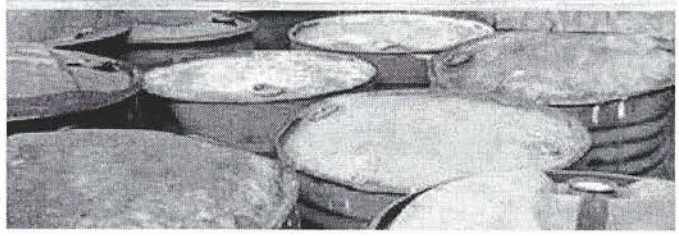


- Fish Waste Disposal
- Solid Waste Volume Reduction
- Chum Processing

Manufacturing

- Product Destruction
- Zero Waste / Recycling

Chemical / Fine Chemical

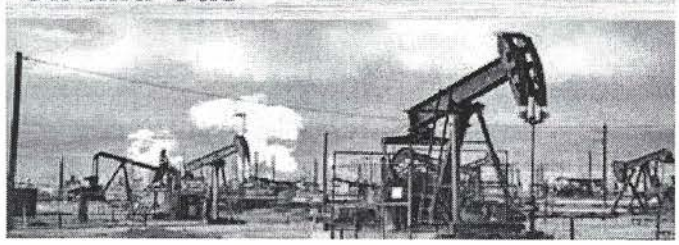


- Product Reclamation
- Wastewater Processing

Organic Destruction

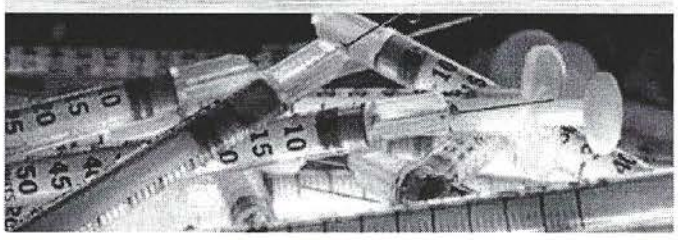
- Solid Waste Reduction
- Waste to Energy

Oil and Gas



- Drilling Mud Recycling
- Tank Bottom Cleaning

Hospitals / Nursing Homes



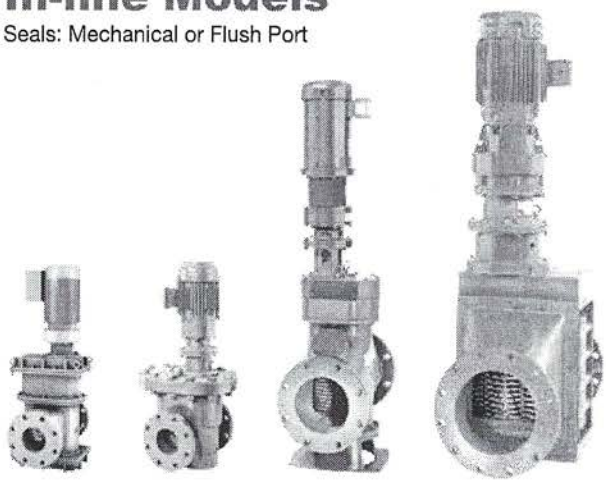
- Sewage Treatment
- Sharps Shredding

Office Buildings / Hospitality

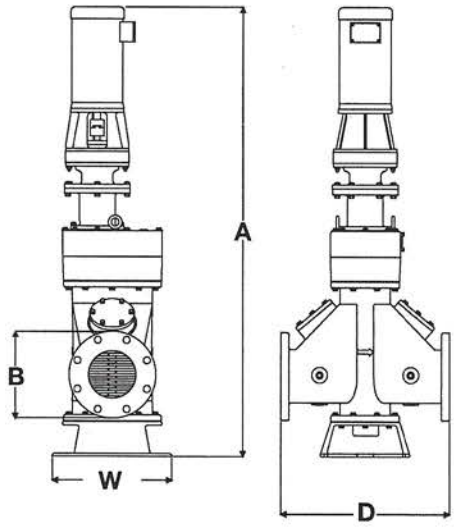
- Wastewater Pump Protection

In-line Models

Seals: Mechanical or Flush Port



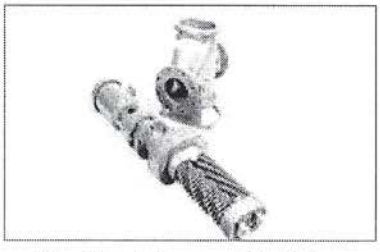
1-HYDRO-I | 2-HYDRO-IX | 3-HYDRO-IX | 4-HYDRO-I



HYDRO-I / IX - Pipeline / In-line Configuration

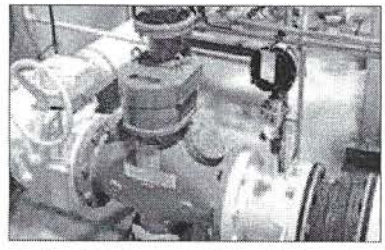
Model In-line Cartridge	Flow Rate* GPM (m^3/h)	Motors hp (kW)	Net Weight lbs (kg)	Dimensions - inches (mm) A	B	D	W
1-HYDRO-I-04	274 (62)	2 (1.5)	200 (91)	33-7/16 (850)	4 (100)	16 (406)	12 (305)
1-HYDRO-I-06	555 (126)	2 (1.5)	209 (95)	33-7/16 (850)	6 (150)	19 (483)	12 (305)
2-HYDRO-IX	265 (60)	3 (2.2)	275 (125)	38-3/4 (984)	4 (100)	13 (330)	16-1/8 (410)
3-HYDRO-I-0804	450 (102)	3-5 (2.2 - 3.7)	380 (172)	47-7/8 (1216)	4 (100)	19-1/4 (483)	12 (305)
3-HYDRO-I-1206	700 (159)	3-5 (2.2 - 3.7)	445 (202)	52-1/8 (1324)	6 (150)	21-1/4 (534)	12 (305)
3-HYDRO-I-1208	1100 (250)	3-5 (2.2 - 3.7)	470 (213)	52-1/8 (1324)	8 (200)	23-1/4 (584)	12 (305)
3-HYDRO-I-1810	1700 (386)	3-5 (2.2 - 3.7)	575 (261)	58-1/8 (1476)	10 (250)	27-1/4 (686)	12 (305)
3-HYDRO-I-2412	2450 (556)	3-5 (2.2 - 3.7)	650 (295)	64-1/8 (1629)	12 (300)	31-1/4 (787)	12 (305)
3-HYDRO-IX-1204	450 (102)	3-5 (2.2 - 3.7)	550 (250)	56-1/4 (1423)	4 (100)	19-1/4 (483)	15-1/4 (387)
3-HYDRO-IX-1206	700 (159)	3-5 (2.2 - 3.7)	560 (254)	56-1/4 (1423)	6 (150)	21-1/4 (534)	15-1/4 (387)
3-HYDRO-IX-1208	1100 (250)	3-5 (2.2 - 3.7)	570 (258)	56-1/4 (1423)	8 (200)	23-1/4 (584)	15-1/4 (387)
3-HYDRO-IX-2410	1700 (386)	3-5 (2.2 - 3.7)	785 (356)	67-3/4 (1727)	10 (250)	27-1/4 (686)	15-1/4 (387)
3-HYDRO-IX-2412	2450 (556)	3-5 (2.2 - 3.7)	810 (367)	67-3/4 (1727)	12 (300)	31-1/4 (787)	15-1/4 (387)
4-HYDRO-I-1812	2700 (613)	5-10 (3.7 - 7.5)	1520 (690)	69-1/4 (1759)	12 (305)	35-1/4 (895)	19-3/4 (502)
4-HYDRO-I-2412	3200 (727)	5-10 (3.7 - 7.5)	1775 (805)	76-1/4 (1937)	12 (305)	35-1/4 (895)	19-3/4 (502)
4-HYDRO-I-2416	4400 (1000)	5-10 (3.7 - 7.5)	1895 (860)	76-1/4 (1937)	16 (406)	43-1/4 (1099)	19-3/4 (502)
4-HYDRO-I-2418	5550 (1260)	5-10 (3.7 - 7.5)	2095 (950)	76-1/4 (1937)	18 (457)	47-1/4 (1200)	19-3/4 (502)
4-HYDRO-I-3220	6860 (1558)	5-10 (3.7 - 7.5)	2610 (1184)	82-3/4 (2102)	20 (508)	51-1/4 (1301)	19-3/4 (502)

** Notes: Flow based on optimum conditions • In-Line unit typically installed prior to suction side of pump • Consult factory for final analysis of application*



IX = Easy to Remove Cartridges

4-HYDRO-I Installed into Pipeline

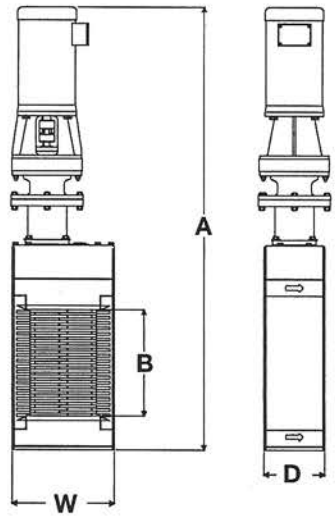


In-line Grinders are Typically Installed on the Suction Side of a Pump

Channel Models

Seals: Mechanical or Flush Port

2-HYDRO-C | 3-HYDRO-C | 4-HYDRO-C



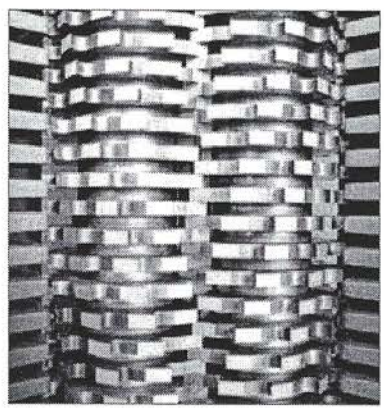
HYDRO-C - Channel Configuration

Model Channel	Flow Rate* GPM (m^3/h)	Motors hp (kW)	Net Weight lbs (kg)	Dimensions - inches (mm) A	B	D	W
2-HYDRO-C-2400	80 (18)	3 (2.2)	225 (102)	38 (965)	4-1/2 (114)	8-1/4 (210)	11-3/4 (298)
3-HYDRO-C-0800	335 (76)	3-5 (2.2 - 3.7)	370 (168)	48 (1218)	8 (203)	7 (178)	11- 3/4 (298)
3-HYDRO-C-1200	490 (111)	3-5 (2.2 - 3.7)	410 (186)	52-1/8 (1320)	12 (305)	7 (178)	11- 3/4 (298)
3-HYDRO-C-1800	740 (168)	3-5 (2.2 - 3.7)	465 (211)	58 (1473)	18 (457)	7 (178)	11- 3/4 (298)
3-HYDRO-C-2400	1000 (227)	3-5 (2.2 - 3.7)	520 (236)	63-3/4 (1600)	24 (609)	7 (178)	11- 3/4 (298)
3-HYDRO-C-3200	1470 (334)	3-5 (2.2 - 3.7)	580 (263)	71-1/2 (1803)	32 (813)	7 (178)	11- 3/4 (298)
3-HYDRO-C-4000	2000 (454)	3-5 (2.2 - 3.7)	650 (295)	79-1/2 (2006)	40 (1016)	7 (178)	11- 3/4 (298)
4-HYDRO-C-1800	915 (208)	10 (7.5)	1175 (533)	69-1/4 (1754)	18 (457)	13-3/8 (340)	19-3/4 (502)
4-HYDRO-C-2400	1440 (327)	10 (7.5)	1365 (619)	75 (1905)	24 (609)	13-3/8 (340)	19-3/4 (502)
4-HYDRO-C-3200	2100 (477)	10 (7.5)	1560 (708)	76-1/4 (1937)	32 (812)	13-3/8 (340)	19-3/4 (502)

** Notes: Flow based on optimum conditions • Consult factory for final analysis of application*

A 3-HYDRO-C Sewage Grinder with Immersible Motor at a Veterinary Clinic

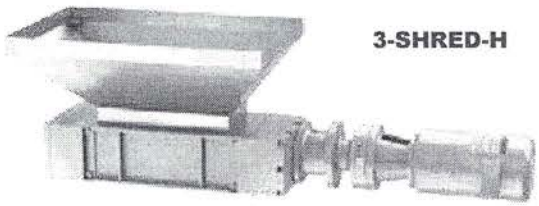
Wet Application 3-HYDRO-C



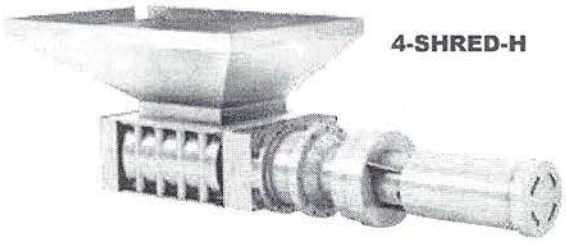
Cutters and Patented Side Rails

Hopper Models

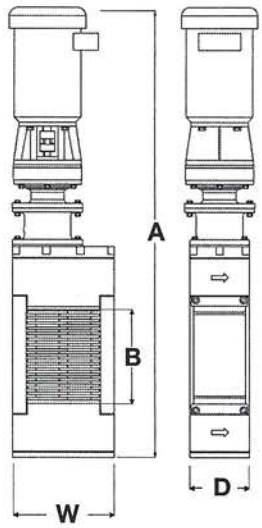
Seals: Mechanical or Flush Port



3-SHRED-H



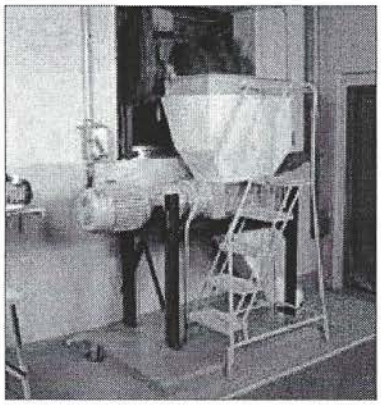
4-SHRED-H



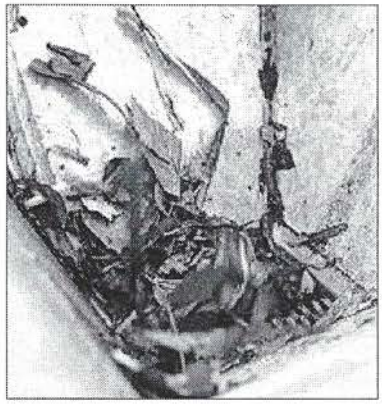
SHRED-H - Hopper Configuration

Model Hopper	Thru-put*** ft³/h (m³/h)	Motors hp (kW)	Net Weight lbs (kg)	Dimensions - inches (mm) A	B	D	W
3-SHRED-H-0800	43* (1.2)	5 (3.7)	330 (150)	47-7/8 (1207)	8 (203)	7 (178)	12 (305)
3-SHRED-H-1200	70* (1.9)	5 (3.7)	370 (168)	52-1/8 (1318)	12 (305)	7 (178)	12 (305)
3-SHRED-H-1800	105* (3)	5 (3.7)	425 (193)	58-1/8 (1470)	18 (457)	7 (178)	12 (305)
4-SHRED-H-1800	190** (5.4)	10 (7.5)	1175 (533)	69-1/4 (1754)	18 (457)	13-3/8 (340)	19-3/4 (502)
4-SHRED-H-2400	271** (7.7)	10 (7.5)	1365 (619)	75 (1905)	24 (609)	13-3/8 (340)	19-3/4 (502)
4-SHRED-H-3200	361** (10.2)	10 (7.5)	1560 (708)	76-1/4 (1937)	32 (812)	13-3/8 (340)	19-3/4 (502)
7-SHRED-H-4000	827** (23.4)	25-50 (18.5-37)	4200 (1900)	123 (3124)	41 (1041)	11-7/8 (302)	27-3/8 (695)

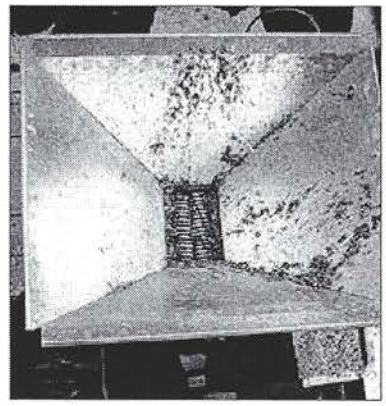
** Gear Ratio 29:1 ** Gear Ratio 43:1 *** Notes: Actual thru-put depends on the type of material to be shredded • Consult factory for final analysis of application*



4-SHRED-H with Custom Hopper and Discharge Chute



Shredding Food Waste



Customized Hopper Variations

Cutter Variations

The 3, 7, 11, and 11 tooth cutters are also available in various widths for finer shredding.

JWC Environmental

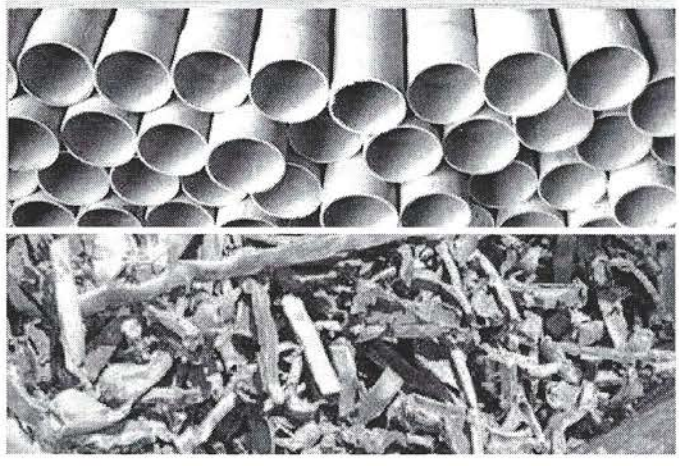
3 Tooth Cutters - Frozen Tuna

What do you do with 300 pounds of frozen tuna and barracuda? You feed it to the 3-SHRED-H and make chum. Even rock solid tuna was no match for the shredding power of our Monster Industrial Shredders.

7 Tooth Cutters - Wood Blocks

No matter the application and items to be shredded- You can count on the versatility and customization of our products. You can see entire 2x4s being shredded on our featured videos. The 7-tooth is now wider increasing the cutting force and decreasing the amount of energy needed to shred.

11 Tooth - PVC Pipe



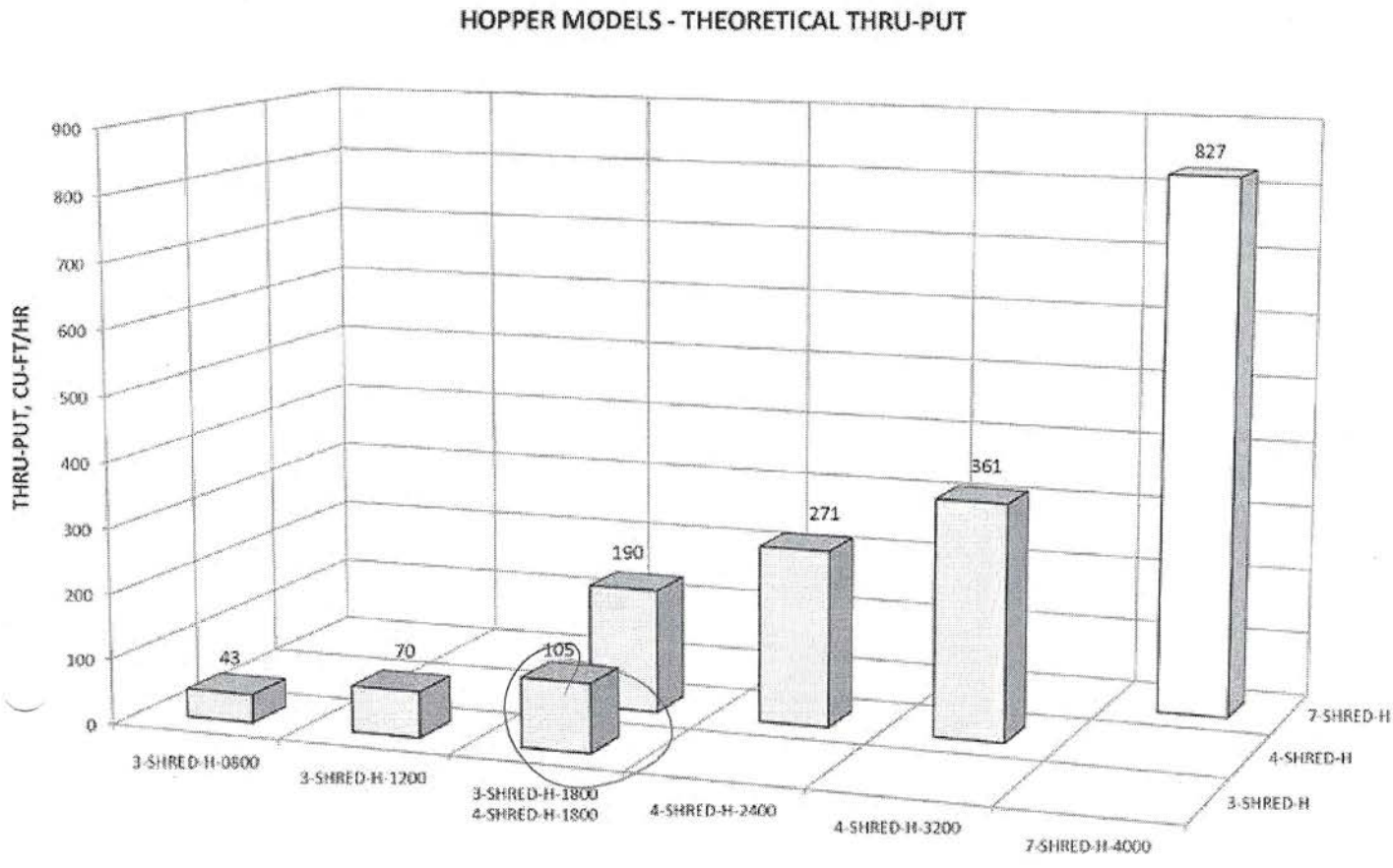
Recyclable materials are in high demand. Plastics need to be broken down before reycling to maximize the dumping space. The 11 tooth cutters make short work of dense plastics like PVC pipe. Make sure to ask for these cutters when customizing your shredder.

13 Tooth - Corn Stalks

Bio-degradable fertilizer and bio-fuels are made from the shredded remains of food waste. 13 tooth cutters coupled with the shredding power our SHRED series makes for extra fine material. The 13-tooth can be made extremely thin to get the finest grind possible. See what it can do for you.

See it in action on our website:
http://www.jwce.com/videogallery/videos

Product Chart



NOTE: ACTUAL THRU-PUT DEPENDS ON DRIVE SELECTION AND TYPE OF MATERIAL TO BE SHREDDED. CONSULT FACTORY FOR DETAILS.

Seal Options

Standard Seal

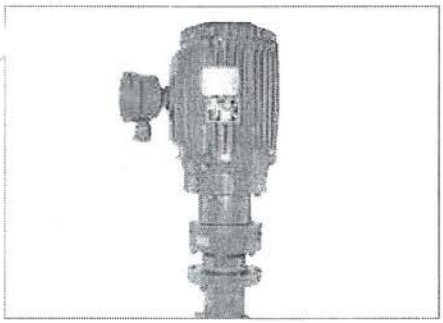
Mechanical Seal Cartridge

Provides liquid protection of the shaft bearings for up to 90PSI (6 bar). No lubrication or flush water is required. The seal is used with the Hydro series hopper fed, pressurized pipe line or channel applications.

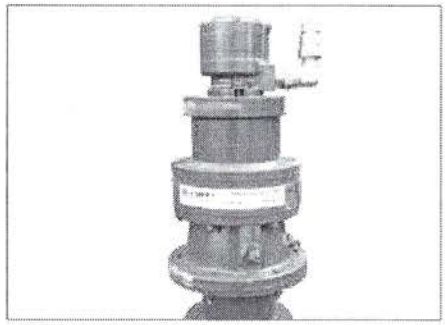
Flush Port Seal

Provides the greatest protection of the shaft bearings when aggresive media is involved in the process. Flush water is provided at the seal faces to wash away particles and destructive media increasing intervals between maintenance. This seal can be used in either hopper fed or pressurized pipe line applications.

Motor Options



Exclusive Immersible Motors



Optional Hydraulic Motors with or without a hydraulic power pack.

Standard Electric Motors

Shredder Options

Cutters
- 7, 11 and 13 tooth variations
- Special: 3-tooth fish shredding cutters
- Optional: extra-hard carburized cutters; stainless steel

Custom Frames
- Stainless steel guide frames attach to pump station or channel walls to make installation easier
- Frame is customized to fit each site and includes: guide rails; shredder support base; subchannel; overflow bar racks and more options

High-tech Controllers
- Model PC2200 standard
- Standard enclosure: NEMA-4x fiberglass, 3 position switch and indicators
- Optional enclosures: NEMA-4x 304 stainless steel; NEMA-4x 316 stainless; NEMA-7 explosion proof

Scrapers
- Integrated steel scrapers increase throughput and help cutters clean-out faster. Improves performance of hopper fed applications.

Motors
- TEFC - Totally enclosed fan cooled electric
- XPFC - Explosion proof fan cooled electric
- XPNV - Exclusive electric immersible
- Available in: 3-50 HP (2.2 - 37 kW)

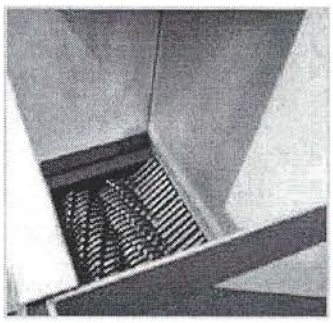
Hydraulic Power Packs
- Available in 5, 10, 15 HP (3.7, 7.5, 11 kW)
- Or, plug into an on-board hydraulic system using JWCE's control valve.

Extended Motor Shaft
- Places motor above highest water level. Available in 6" (150mm) increments: Maximum: 12' (3600mm)

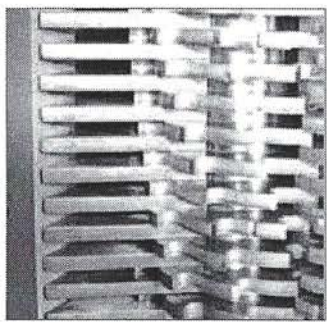
Service Options

JWCE offers several programs to choose from:

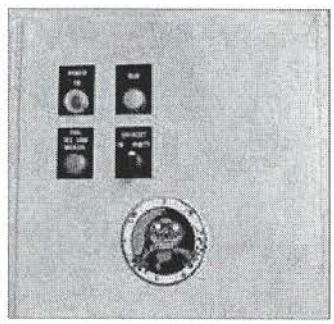
1. **Monster Exchange**: First we send a newly re-conditioned shredder; next, swap the new and old shredders and finally ship the old one back. Free labor with 1 year limited warranty on materials and workmanship.
2. **Factory Repair**: We rebuild your shredder good as new. Free labor, 1 year limited warranty on materials and workmanship.
3. **Parts**: Genuine Monster cutters, shafts and seals make a big difference.
4. **Upgrade**: Move up to the next generation of Monster shredding technology.



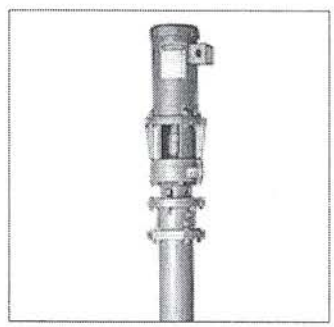
Custom Stainless Steel Hoppers



Scrapers (optional)



High-Tech Controllers



Extended Motor Shaft

Headquarters
290 Paularino Ave.
Costa Mesa, CA 92626 USA
Toll Free: (800) 331-2277
Phone: (949) 833-3888
Fax: (949) 833-8858
jwce@jwce.com

Western Product Support
2600 S. Garnsey St.
Santa Ana, CA 92707, USA
Toll Free: (800) 331-2277
Phone: (949) 833-3888
Fax: (714) 751-1913
jwce@jwce.com

Eastern Product Support
4485 Commerce Dr, Ste 109
Buford, GA 30518, USA
Toll Free: (800) 331-8783
Phone: (770) 271-2106
Fax: (770) 925-9406
jwce@jwce.com

DAYTON SUBMERSIBLE AC PUMPS
SUMP PUMPS

FACT sheet

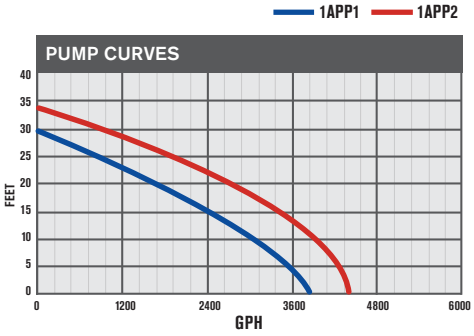
DAYTON AC PUMPS - CAST IRON/STAINLESS STEEL

Dayton AC submersible pumps feature an energy efficient permanent split capacitor (PSC) motor with upper and lower sealed ball bearings and dual carbon/ceramic seals plus a Buna-N seal. They are continuous duty rated and water cooled. Dayton Deluxe Dual Float Controller (D2) is included with the pump. The D2 has two-micro reed floats for added reliability and a protective cage to prevent debris from interferring with floats.

	GALLONS PER HOUR (GPH)			PUMP DIMENSIONS (IN.)			
SKU NO.	HP	FLOW @ 10 FT.	MAX HEAD (FT.)	D	W	H	WEIGHT (LBS.)
DAYTON CAST IRON/STAINLESS STEEL AC PUMPS							
1APP1	1/3	3,000	30	5.25	7.875	13	20
1APP2	1/2	3,900	33	6.25	8.5	13.325	24

	AMPS @ 10 FT.	G/WH @ 10 FT.	ENERGY SAVINGS PER YEAR* ($)
ENERGY EFFICIENCY			
1APP1	4	6.3	55
1APP2	4.3	7.6	62

*Based on an average sump pump run time of five minutes per hour for one year. The estimated industry average of a shaded pole motor is 9.5 Amps for a 1/3 HP pump, and 10.5 for a 1/2 HP pump. Average electric cost per-kilowatt-hour is $0.12.



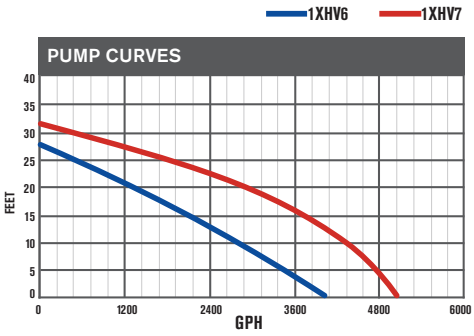
DAYTON AC PUMPS - CAST IRON /CAST ALUMINUM

Dayton AC submersible pumps feature an energy efficient permanent split capacitor (PSC) motor with upper and lower sealed ball bearings and dual carbon/ceramic seals plus a Buna-N seal. They are continuous duty rated and water cooled.

	GALLONS PER HOUR (GPH)			PUMP DIMENSIONS (IN.)			
SKU NO.	HP	FLOW @ 10 FT.	MAX HEAD (FT)	D	W	H	WEIGHT (LBS.)
DAYTON CAST IRON/CAST ALUMINUM AC PUMPS							
1XHV6	1/3	2,770	29	5	7.5	13.75	17
1XHV7	1/2	4,320	31	6.25	10	16.25	28

	AMPS @ 10 FT.	G/WH @ 10 FT.	ENERGY SAVINGS PER YEAR* ($)
ENERGY EFFICIENCY			
1XHV6	3.8	6.1	57
1XHV7	4.8	7.5	57

*Based on an average sump pump run time of five minutes per hour for one year. The estimated industry average of a shaded pole motor is 9.5 Amps for a 1/3 HP pump, and 10.5 for a 1/2 HP pump. Average electric cost per-kilowatt-hour is $0.12.



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How can we improve our Product Images?

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Sump Pump, 1/2 HP, 2" NPT, 36ft Max, Al

DAYTON

Price
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Item # **1XHV7** Mfr. Model # **1XHV7** UNSPSC # **40151512**

Catalog Page # **3673** Shipping Weight **31.45 lbs.**

Country of Origin **China** | *Country of Origin is subject to change.*

Note: Product availability is real-time updated and adjusted continuously. The product will be reserved for you when you complete your order. More

Technical Specs

Item	Submersible Sump Pump
HP	1/2
Switch Type	None
Cord Length	10 ft.
Voltage	115
Amps	4.8
Dia.	10"
Discharge NPT	2"
Height	16-1/4"
Max. Head	36 ft.
Max. Dia. Solids	1/4"
GPM of Water @ 5 Ft. of Head	75
GPM of Water @ 10 Ft. of Head	61
GPM of Water @ 15 Ft. of Head	43
GPM of Water @ 20 Ft. of Head	30
GPM of Water @ 25 Ft. of Head	36
GPM of Water @ 30 Ft. of Head	15
Max. Temp.	104 Degrees F
Min. Sump Pit Dia.	11"
Base Material	Cast Iron
Housing	Aluminum
Top Material	Cast Aluminum
Impeller Material	EP
Duty	Continuous
RPM	3450
Thermal Protection	Yes
Bearing Type	Ball
Shaft Seal	(2) Carbon/Ceramic, (1) Buna N
Mechanical Seal	CRB/CMC
Motor Type	PSC
Shaft Material	SS
Standards	CSA

28.1 Appendix H - Permits

610 University Avenue
Fairbanks, AK 99709-3643
PHONE: (907) 451-2360
FAX: (907) 451-2187
http://www.state.ak.us/dec/

DIVISION OF AIR AND WATER QUALITY
WASTEWATER DISCHARGE PROGRAM

July 12, 2001

Mr. Randall F. Smith
US EPAy, Region 10
1200 Sixth Avenue, OW-130
Seattle, WA 98101

Certified Mail # 7099 3400 0015 5441 1663
Return Receipt Requested

Re: Final Certificate of Reasonable Assurance for NPDES Permit No. AK-G52-0000: General Permit for Seafood Processors in Alaska

Dear Mr. Smith:

In accordance with Section 401 of the Clean Water Act of 1977 and provisions of the Alaska Water Quality Standards, the Department of Environmental Conservation is issuing the enclosed Final Certificate of Reasonable Assurance for the renewal of the NPDES permit for seafood processors operating statewide in Alaska. This Department action represents only one element of the overall project level coastal management consistency determination issued by the Office of Management and Budget under AS 44.19 and 6 AAC 50.070.

Please note that a preliminary version of this certification dated Sepember 29, 2000 excluded those processors operating in Tongass Narrows from the South End of Pennock Island to Mud Bay on the North, as an "at-risk water resource and water body". EPA, ADEC and seafood processors in the Ketchikan area are developing methods that will reduce discharges of offal and to control odors and residues associated with such discharges in Tongass Narrows. Waters on DEC's impaired waterbody list will continue to be excluded under this general permit (see section III C).

Department of Environmental Conservation regulations provide that any person, who disagrees with any portion of the final decision, may request an adjudicatory hearing in accordance with 18 AAC 15.200-920. The request should be mailed to the Commissioner of the Alaska Department of Environmental Conservation, 555 Cordova Street, Anchorage, AK 99501. Please send a copy of any such requests to the undersigned. Failure to submit a hearing request within thirty days of receipt of the final determination letter shall constitute a waiver of that person's right to judicial review of this decision.

By copy of this letter we are advising the Division of Governmental Coordination of our actions and enclosing a copy of the final certification for their use.

Sincerely,

SIGNATURE ON FILE

William D. McGee
Technical Engineer

Enclosure: Final 401 Certificate of Reasonable Assurance: NPDES Permit AK-G52-0000 Seafood Processors in Alaska

cc:

Karlee Gaskill, DNR/DLMW, Anchorage
Don McKay, DFG/DHR, Anchorage
Mayor Weinstein, City of Ketchikan
Charles Blumenfeld, Esq.
Maureen McCrea, DGC, Anchorage
E.C. Phillips, Ketchikan
Sharmon Stambaugh, ADEC, Anchorage
Alan Kukla, DEC, Anchorage
Kenwyn George, ADEC, Juneau
Tom Chapple, DEC, Anchorage
Burney Hill, EPA Region X, Seattle
Gordon Lindquist, Alaska General Seafoods
Ward Cove Packing, Ketchikan
ACMP Reviewers, Coastal Districts (via e-mail from DGC)

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DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Air and Water Quality
Wastewater Discharge Program
610 University Avenue
Fairbanks, Alaska 99709-3643

CERTIFICATE OF REASONABLE ASSURANCE AS MODIFIED ON June 28, 2001 NPDES PERMIT No. AK-G52-0000

A Certificate of Reasonable Assurance, as required by Section 401 of the Clean Water Act, has been requested by the United States Environmental Protection Agency (EPA) general National Pollutant Discharge Elimination System (NPDES) permit which EPA proposes to issue for the seafood processors operating statewide in Alaska.

Public notice of the application for this certification was made in accordance with 18 AAC 15.180.

Water quality certification is required for the proposed activities because the activities will be authorized by an Environmental Protection Agency NPDES permit identified as NPDES Permit No. AK-G52-0000, and discharges may result from the activities. Please note that a preliminary version of this certification dated September 29, 2000 excluded those processors operating in Tongass Narrows from the South End of Pennock Island to Mud Bay on the North, as an "at-risk water resource and water body". EPA, ADEC and seafood processors in the Ketchikan area are developing methods that will reduce discharges of offal and to control odors and residues associated with such discharges in Tongass Narrows. Waters on DEC's impaired waterbody list will continue to be excluded under this general permit (see section III C).

Having reviewed the general NPDES permit prepared by U.S.EPA Region 10 dated 28 June 2001, the Alaska Department of Environmental Conservation certifies that there is reasonable assurance that the proposed activities to be authorized by the general NPDES permit, as well as any discharges which may result, are in compliance with the requirements of Section 401 of the Clean Water Act, the Alaska Water Quality Standards, 18 AAC 70, and the Standards of the Alaska Coastal Management Program (ACMP), 6 AAC 80, provided that the following stipulations of this certification are adhered to. These stipulations are also adopted pursuant to 6 AAC 50 (Project Consistency with the Alaska Coastal Management Program) and are necessary to ensure that projects that are authorized under the permit are consistent with the ACMP.

Through this certification, in accordance with 18 AAC 15.120 ADOPTION OF NPDES PERMITS, the final NPDES permit will constitute the permit required under AS 46.03.100 Waste Disposal Permit, provided that the stipulations of this certification are made part of the general NPDES Permit. The department is specifying the following permit stipulations under authority of AS 46.03.110(d):

I. Mixing Zones

The mixing zone for discharges authorized by the NPDES Permit, Part II, is a cylindrical shape with dimensions described as follows:

i.) Horizontal extent determined by 100 foot radius from Outfall. Extends vertically up to the sea surface.

ii.) Extends vertically down to the seabed.

The mixing zone is a volume of water that surrounds the discharge outfall where the effluent plume is diluted by the receiving water within which the following specified water quality criteria may be exceeded:

18 AAC 70.020(b)(2)

residues
dissolved gas
oil and grease
fecal coliform
pH
temperature
color
turbidity
total residual chlorine

Rationale: In accordance with 18 AAC 70.240, in applying the water quality criteria and limits set by or under 18 AAC 70, Alaska Water Quality Standards, the department will, in its discretion, authorize a mixing zone in a discharge permit or certification, or order. The department reviewed the preliminary final general permit, including the mixing zone provision, to ensure that requirements of 18 AAC 70.015 Antidegradation and 18 AAC 70.24-270 Mixing Zones would be met.

The department finds that the mixing zone authorized in this certification is appropriate and provides reasonable assurance that existing uses in marine waterbodies outside of the mixing zones are maintained and fully protected, provided that all stipulations of the certification are made part of the final general NPDES Permit.

II. Zone of Deposit

The department authorizes a zone of deposit of one (1) acre for each facility authorized by this general permit under the classifications of "Near-shore seafood processor" and "Shore-based seafood processor" in marine waters (includes estuaries and coastal waters). Discharges shall not violate the Water Quality Standards criterion for residues beyond the authorized zone of deposit. In no case may water quality standards be violated in the water column outside of the zone of deposit by any action, including leaching from, or suspension of, deposited materials.

Rationale: In accordance with 18 AAC 70.210, the department will, in its discretion, authorize a zone of deposit in a discharge permit or certification, or order.

The department finds that the size of the zone of deposit authorized for near-shore seafood processors and shore-based seafood processors in marine waters under this certification is appropriate and provides reasonable assurance that existing uses of waterbodies where facilities are authorized under this general permit will be maintained and fully protected, provided that all stipulations of the certification are made part of the final general NPDES Permit.

III. Stipulations to Support Decision for Mixing Zone and Zone of Deposit

A. Authorized Facilities

The categories of dischargers authorized by this certification must meet the requirements of the General NPDES Permit for Seafood Processors in Alaska, Section I. Authorized Facilities .

Rationale: This stipulation is necessary to ensure compliance with the Zone of Deposit water quality standard 18AAC70.210.

B. Authorized Discharges

The authorized dischargers are required to meet the limitations and conditions set forth in the Draft General NPDES Permit for Seafood Processors in Alaska, Section II. Authorized Discharges, with the following additional provisions:

1. The waste load limit is ten million pounds per year of settleable solid processing waste residues within one nautical mile of shore at MLLW, in accordance with the preliminary final NPDES Permit. For mobile facilities, this waste limit applies to each location at which a facility discharges.

2. A waiver from the ten million pounds per year seattleable solid processing waste residues limit for near-shore and shore-based permittees must be approved by ADEC in accordance with the provisions of V.B.1 and V.C.1. of the preliminary final NPDES permit. ADEC may place appropriate conditions or requirements on the permittee under state law before approving a waiver under this section.

3. Sanitary wastewaters may be discharged to septic systems meeting state requirements under 18 AAC 72.

Rationale: The waste load limit stipulation is necessary to provide reasonable assurance for compliance with the Zone of Deposit water quality standard. 18 AAC 70.210(a).

C. Areas Excluded From Authorization Under This General NPDES Permit

The authorized dischargers are required to meet the limitations and conditions set forth in the General NPDES Permit for Seafood Processors in Alaska, Section III. Areas Excluded from Authorization, with the following additional provisions:

1. Exclude fresh water systems, including streams, rivers and lakes.

2. Exclude any waterbody included in ADEC's 1998 (or subsequent revisions) CWA 305(b) report or CWA 303(d) list of waters which are "impaired" or "water quality-limited" for dissolved gas or residues (i.e. floating solids, debris, sludge, deposits, foam or scum.)

3. Exclude any water body that would not meet the minimum requirements for mixing zones size specification under 18 AAC 70.255. "The linear length of all mixing zones intersected on any given cross section of an estuary, inlet, cove, channel or other marine water may not exceed 10 % of the total length of that cross section and the total horizontal area allocated to all mixing zones may not exceed 10 % of the surface area".

Rationale: These stipulations are necessary to ensure compliance with the antidegradation policy (18 AAC 70.015), the mixing zone requirements, (18 AAC 70.255), and the zone of deposit regulation (18 AAC 70.210), of the water quality standards.

D. Application To Be Permitted Under This General NPDES Permit

The authorized dischargers are required to meet the limitations and conditions set forth in the General NPDES Permit for Seafood Processors in Alaska, Section IV. Application To Be Permitted Under This General NPDES Permit, with the following additional provisions:

1. Description of discharges: Sanitary Wastes. For shore-based facilities, identify the municipal system or on-site septic system that accepts the discharge and its design capacity and treatment process. [Section IV.C.1.(g) of the draft permit].

2. Requesting a waiver to discharge in an excluded area:

   a. The request must include a description of how and why the discharges will not cause a violation of State water quality standards, including antidegradation, zones of deposit, and mixing zone, in the receiving waters [18 AAC 70].

b. A waiver must be approved by ADEC for "At-risk water resources and water bodies" and "Degraded water bodies" (Part III.B and III.C) in accordance with the provisions of IV.D. of the general NPDES permit. ADEC may place appropriate conditions or requirements on the permittee under state law before approving a waiver under this section.

Rationale: These stipulations are necessary to ensure compliance with the antidegradation policy (18 AAC 70.015), the mixing zone requirements, (18 AAC 70.255), and the zone of deposit regulation (18 AAC 70.210), of the water quality standards.

E. Categories of Permittees and Requirements

The authorized dischargers are required to meet the limitations and conditions set forth in the General NPDES Permit for Seafood Processors in Alaska, Section V. Categories of Permittees and Requirements, with the following additional provisions:

1. For Offshore and Near-shore seafood processors, any failure of the outfall lines are to be reported to EPA and ADEC in accordance of Part VII.C and summarized in the annual report. [V.A.1.(f.) and V.B.1 (f.) of the draft permit].

2. State water quality standards: Dischargers may exceed Water Quality Standards criteria for residues, dissolved gas, oil and grease, fecal coliform, pH, temperature, color, turbidity, and total residual chlorine within the 100 foot radius mixing zone. Near-shore and shore-based seafood processors may exceed Water Quality Standards criteria for residues within the one acre zone of deposit. Dischargers shall not violate any Alaska Water Quality Standards criteria beyond the 100 foot mixing zone or one acre zone of deposit. [Parts V.A.1.(i.), V.B.1.(k)., and V.C.1.(k). of the general permit].

F. Specific Waste Minimization and Monitoring Requirements

The authorized dischargers are required to meet the limitations and conditions set forth in the General NPDES Permit for Seafood Processors in Alaska, Section VI. Specific Waste Minimization and Monitoring Requirements, with the following additional provision:

BMP Plan Requirements: For facilities discharging upstream of set net fisheries, specific management practices and standard operating procedures shall be developed to eliminate the discharge of waste that collects in setnets.

Rationale: This requirement is necessary to ensure compliance with the state's "Mixing Zones: General Conditions" requirement that the department will reduce in size or deny a mixing zone if the department finds that available evidence reasonably demonstrates that pollutants discharged could preclude or limit established processing activities or commercial, sport, personal-use, or subsistence and shellfish harvesting. 18 AAC 70.250(b)(3).

IV. Recording and Reporting Requirements

The authorized dischargers are required to meet the requirements set forth in the General NPDES Permit for Seafood Processors in Alaska, Section VII. Recording and Reporting Requirements, with the following provision:

> The enclosed forms for Notice of Intent, Annual Report, and Seafloor Survey will be incorporated into the general NPDES permit.

Rationale: Receipt and review of Annual Reports and other permit required submittals are necessary to ensure compliance with the state's antidegradation policy that existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected. 18 AAC 70.015(a)(1).

7-12-2001
Date

SIGNATURE ON FILE
William D. McGee
Technical Engineer

Enclosures: Forms for Notice of Intent, Annual Report, and Seafloor Survey

FACT SHEET

United States Environmental Protection Agency, Region 10
1200 Sixth Avenue, OW-133
Seattle, Washington 98101
(206) 553-1760

Proposed reissuance of a general National Pollutant Discharge Elimination System (NPDES) permit to discharge pollutants pursuant to the provisions of the Clean Water Act, 33 U.S.C. § 1251 et seq. for

SEAFOOD PROCESSORS IN ALASKA.

This fact sheet includes (a) the tentative determination of the Environmental Protection Agency (EPA) to reissue general NPDES permit no. AK-G52-0000, (b) information on public comment, public hearings and appeal, (c) the description of the industry and its discharges, and (d) other conditions and requirements.

Persons wishing to comment on the tentative requirements and conditions contained in the proposed general permit may do so before the expiration date of the public notice. EPA appreciates both supportive and critical comments in this public review and comment period. All persons, including applicants, who believe any condition of a draft permit is inappropriate or that EPA's tentative decision to prepare this draft permit is inappropriate, must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close the public comment period. Any supporting materials which are submitted shall be included in full and may not be incorporated by reference, unless they are already part of the administrative record or are a generally available document or reference. All written comments should be submitted or presented to EPA as described in the public comments section of the attached public notice.

After the expiration date of the public notice, the Director, Office of Water, EPA Region 10, will make a final determination with respect to reissuance of the general permit. EPA is working within a schedule such that permit should become effective on August 5, 2000.

Within 180 days following the service of notice of EPA's final permit decision, any person who filed comments on the draft permit or participated in the public hearing may petition the Court of Appeals to review any condition of the permit decision (40 CFR § 124.19). Persons affected by a general permit may not challenge the conditions of the Permit as a right of further EPA proceedings.

The draft general NPDES permit and fact sheet are on file and may be inspected and copied at the above address any time between 8:30 a.m. and 4:00 P.M., Monday through Friday. Copies and other information may be requested by writing to EPA at the above address to the attention of Alaska Seafood Permit Team, or by calling Florence Carroll at (206) 553-1760, Burney Hill at (206) 553-1761, or Audrey Washington (206) 553-0523.

This material is also available for inspection and copying at the following federal and State offices in Alaska:

USEPA Alaska Operations Office
Federal Building, Room 537
222 West 7th Avenue
Anchorage, Alaska 99513-7588
phone: (907) 271-5083

USEPA Alaska Operations Office
410 Willoughby Avenue, Suite 100
Juneau, Alaska 99801
phone: (907) 586-7619

ADEC Anchorage Office
Air and Water Quality Program
555 Cordova Street
Anchorage, Alaska 99501
phone: (907) 269-7634

ADEC Central Headquarters
Air and Water Quality Program
410 Willoughby Avenue, Suite 105
Juneau, Alaska 99801
phone: (907) 465-5300

ADEC Fairbanks Office
Air and Water Quality Program
610 University Avenue
Fairbanks, Alaska 99709
phone: (907) 451-2360

ADEC Ketchikan District Office
540 Water Street, Suite 203
Ketchikan, Alaska 99901
phone: (907) 225-6200

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I. GENERAL NPDES PERMIT

A. What is the basis for issuance of a general permit

Section 301(a) of the Clean Water Act (CWA, or the Act) provides that the discharge of pollutants to surface waters of the United States is unlawful except in accordance with a National Pollutant Discharge Elimination System (NPDES) permit. EPA's regulations authorize the issuance of general NPDES permits to categories of discharges when a number of point sources discharges:

- involve the same or substantially similar types of operations;
- discharge the same types of wastes;
- are located within a geographic area;
- require the same effluent limitations;
- require the same operating conditions;
- require the same or similar monitoring requirements; and
- in the opinion of EPA, are more appropriately controlled under a general permit than under individual permits [40 CFR § 122.28].

EPA has determined that the owners and operators of seafood processing facilities described in Part I of the draft general NPDES permit AK-G52-0000 (the Permit) are authorized to discharge seafood processing wastes and the concomitant wastes set out in Part II of the Permit to waters of the United States as described in Part III of the Permit, in accordance with effluent limitations, monitoring requirements and other conditions set forth in the Permit.

As provided in 40 CFR §§ 124.8 and 124.56, this fact sheet briefly describes the facilities, discharges and receiving waters covered by the Permit. It also sets forth the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the Permit and its requirements.

EPA has developed the "Ocean discharge criteria evaluation for the general NPDES permit for Alaskan seafood processors" (hereafter, the "Seafood ODCE") to provide more extensive details on certain aspects of Alaskan seafood processors, their effluent discharges and the waters receiving these pollutants (EPA and Tetra Tech 1994a). EPA contracted Tetra Tech to expand model simulations of the deposition of offal discharges on the seafloor in support of permit limits (Tetra Tech 1996). EPA also developed a technical support document to address the issue of potential effects from pollutant discharges permitted under this general NPDES permit on threatened and endangered species (EPA and Tetra Tech 1994b). These technical

support documents provide a significant expansion of this fact sheet as to the scientific basis for the Permit.

Coverage under the Permit will expire five (5) years from the date of issuance.

Like individual NPDES permits, a violation of a condition contained in a general NPDES permit constitutes a violation of the Act and subjects the permittee to the penalties specified in CWA § 309.

B. How to apply for coverage under the general permit

A Notice of Intent (NOI) to be covered under the Permit is required [40 CFR § 122.28(b)(2)(i)]. The requirements are outlined in Part IV of the Permit. A permittee seeking authorization to discharge under the Permit should submit a timely NOI to EPA at least 60 days prior to the desired date of coverage. This time period will allow EPA adequate time to review the application, consult with the applicant, the State and other parties as appropriate, and inform the applicant of its permit determination. An NOI shall include information on the facility, its owners and operators, its process and discharges, and the receiving water in acccordance with Part IV.C of the Permit.

C. What are the requirements of an individual permit

1. How will an individual permit differ from the general permit?

   EPA has determined that the general NPDES permit for Alaskan seafood processing facilities will contain the minimum limitations and requirements for authorization to discharge pollutants from these types of operations. These minimum requirements include best management practices, technology-based effluent limits, water quality-based limits, monitoring of the receiving water, seafloor and shoreline where feasible and appropriate, and reporting of production, discharges and monitoring.

   Individual NPDES permits for Alaskan seafood processing facilities will require at least these minimum permit requirements. Thus, individual permits will require at least a best management practices plan supported by a materials accounting, technology-based effluent limits, site-specific water quality limits on residues and other pollutant discharges, site-specific monitoring of the receiving water, seafloor and shoreline, and reporting of production, discharges and monitoring.

2. When will a general permittee be required to apply for an individual permit [40 CFR § 122.28(b)(3)]

   EPA may require any discharger applying for or covered by a general permit to apply for and obtain an individual permit. In addition, any interested person may petition EPA to take this action. EPA may consider the issuance of individual permits when:

   a. The single discharge or the cumulative number of discharges is/are a significant contributor of pollution;

   b. The discharger is not in compliance with the terms and conditions of the general permit;

   c. A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;

   d. Effluent limitations guidelines are subsequently promulgated for the point sources covered by the general permit;

   e. A Water Quality Management Plan containing requirements applicable to such point sources is approved; or

   f. The requirements in Part I.A of the Permit are not met.

3. How to apply for authorization to discharge under an individual permit [40 CFR § 122.28(b)(3)(G)(iii)]

   Owners or operators covered by a general permit may be excepted from such coverage by applying to EPA for an individual permit. The owner or operator shall submit an application to EPA no later than 60 days after the effective date of the Permit. This application shall include NPDES permit application Forms 1 and 2C, together with the same information as in Part IV.C of this Permit and, if applicable, Part IV.D of this Permit. If the proposed discharge will be to any of the areas excluded from coverage as protected water resources and special habitats, at-risk water resources and waterbodies, degraded waterbodies, and areas covered by other general NPDES permits as listed in Part III this Permit, the application for an individual permit must include information requested in support of a request for a waiver, Part IV.D of this Permit.

II. WHAT FACILITIES, POLLUTANT DISCHARGES AND RECEIVING WATERS ARE COVERED BY THE GENERAL PERMIT

A. Facilities covered by the Permit

EPA is proposing to reissue a general NPDES permit for seafood processing facilities in Alaska. The Permit will authorize discharges from facilities engaged in the processing of fresh, frozen, canned, smoked, salted or pickled seafoods to surface waters of the United States within and continuous to the State of Alaska (the "receiving waters" or "waters of the United States"). The Permit will also authorize discharges from offshore facilities engaged in the processing of seafood paste, mince or meal to waters of the United States more than one (1) nautical mile from the shore of the State of Alaska at mean lower low water (MLLW).

Currently, there were approximately 250 seafood processing facilities permitted under NPDES to discharge effluents in Alaska, of which roughly 80 are onshore facilities and 170 are floating facilities. Seafood processors are generally differentiated from other food processing industries in the Standard Industrial Classification Manual (1987) as "canned and cured fish and seafoods" (SIC no. 2091), "prepared fresh and frozen fish and seafoods" (SIC no. 2092), "animal and marine fats and oils" (SIC no. 2077) and "food preparations, not elsewhere classified" (SIC no. 2099). These facilities may process any of a large number of species of fish and marine invertebrates. A survey of the Alaskan seafood catch indicates that pollock, salmonids, Pacific cod, flatfishes, shellfish and herring comprise the bulk of the biomass processed by Alaska's seafood industry (Tetra Tech 1992). Seafood processors authorized under the current general permit individually discharge from 30,000 to over ten million pounds of waste solids annually; more than half of the facilities discharge less than the estimated median discharge of two million pounds per year. Shore-based seafood processors extend from Dixon Entrance in SE Alaska to Atka in the western Aleutian Islands to Kotzebue Sound in northern Alaska, while mobile floating processors may be found in nearshore and offshore waters across this same range (Figure 1).

Detailed information on the nature of the seafood processing industry and the fisheries which supply it with raw product is provided in the "Seafood ODCE" (EPA and Tetra Tech 1994a) and documents referenced therein.

B. Facilities not authorized by the Permit

The Permit does not authorize discharges resulting from seafood processors producing seafood paste, mince or meal and discharging associate process wastes to receiving waters within one (1) nautical mile of the Alaskan shore at MLLW. Applications for individual NPDES permits will be accepted from these facilities and assigned a high priority for issuance.

The Permit does not require authorization for discharges of seafood processing wastes by operations discharging less than one thousand (1,000) pounds of seafood

waste per day and less than fifteen tons (30,000 lbs) of seafood waste per year. These facilities may apply for and obtain coverage under this Permit.

C. Discharges covered by the Permit

The following effluents are covered by the Permit. Detailed information on the nature of the seafood processor effluents is provided in the "Seafood ODCE" (EPA and Tetra Tech 1994a).

1. Seafood process wastes are authorized for discharge under the Permit. The major pollutants of concern include residues, biochemical oxygen demand, non-petroleum oil and grease, and nutrients. These pollutants come from the waste solids (shell, bones, skin, scales, flesh and organs), blood, body fluids, slime, oils and fats from cooking and rendering operations. Ammonia may be present intermittently in negligible amounts. The color, turbidity, pH and temperature of process waste effluents may also differ from that of the receiving water.

2. Process disinfectants are authorized for discharge under the Permit. Sodium hypochlorite and ammonium chlorides are the primary disinfectants used in the control of microbial contamination of seafood processing equipment and containers. As a result of the periodic use of these disinfectants to sanitize equipment, free chlorine may be present in residual amounts. In addition, iodine disinfectants may be applied alternately.

3. Sanitary and domestic wastes and gray wastewater are authorized for discharge under the Permit. The kitchen, shower, sink and toilet effluents include TSS, BOD, fecal coliform bacteria (FC), and non-petroleum oil and grease. The temperature and pH of sanitary and domestic wastes may also differ from that of the receiving water.

4. Other wastewaters, including cooling water, boiler water, freshwater pressure relief water, refrigeration condensate, water used to transfer seafood to the facility, and live tank water, are authorized for discharge under the Permit. These other wastewater effluents include TSS, BOD, and non-petroleum oil and grease. The temperature and pH of these effluents may also differ from that of the receiving water.

D. Discharges not authorized by the Permit

The Permit does not authorize any pollutants which are not expressly authorized in the Permit. This includes, but is not limited to, petroleum hydrocarbons and toxic pollutants listed in 40 CFR § 401.15.

E. Receiving waters covered by the Permit

The Permit authorizes discharges of specified pollutants to the waters of the United States except those excluded from coverage as protected, special, at-risk or degraded water resources as described in Part II.F below. In general the Permit authorizes seafood processing discharges to marine waters and rivers. Mixing zones of one hundred (100) foot radius are provided for discharges of dissolved oxygen, floating and suspended waste residues, color, turbidity, temperature, pH, fecal coliform bacteria, and total residual chlorine. Zones of deposit of one (1) acre are provided for settleable solid seafood processing waste residues.

F. Receiving waters not authorized by the Permit

Discharges are explicitly not authorized under the Permit to receiving waters which have been identified as protected, special, at-risk or degraded water resources. EPA's assessment of the risk of degradation to resource values and uses in these waters is that the pollutants discharged should be diluted to ambient background concentrations and that new or additional mixing zones and zones of deposit are inappropriate.

Seafood processors discharge wastewaters that contain significant quantities and concentrations of BOD, TSS and other solid residues, oil and grease and nutrients. Potential degradation may affect the water column, seafloor or shore directly or indirectly through burial and smothering, putrification and decay, deoxygenation, nutrient loading and eutrophication, alteration of habitats, aquatic communities and food webs, the promotion of noxious or toxic phytoplankton or bacteria, or other ecological mechanisms (EPA and Tetra Tech 1994a).

The Permit requires that process waste solids shall be ground to 0.5 inch or less prior to discharge; no additional technology-based treatment is required of process wastewaters.

Water quality-based limitations require site-specific analyses of the dispersive and assimilative capacities of a particular receiving water for a particular quantity and quality of a pollutant. Adequate dilution is important to the success of a general NPDES permit in ensuring water quality and protecting the environment in receiving waters. Dilution depends upon the physical and hydrodynamic characteristics of a receiving water. EPA estimates that discharged effluents will be diluted approximately 30:1 at the edge of a circular mixing zone of 100 ft under the worst-case scenarios allowable under the Permit. Dilution of BOD and TSS to background levels to ambient levels under worst-case conditions would be assured within a distance of one (1) nautical mile from the point of discharge.

Furthermore, the evaluation of effluent limitations required to protect water resource quality for marine waters under CWA § 403 involves due consideration of the character and status of receiving waters as an ecosystem and a natural resource with aesthetic, recreational, scientific and economic values [40 CFR Part 125,

subpart M]. The scientific, social and economic considerations are substantial (EPA and Tetra Tech 1994a). If EPA has insufficient information to determine that there will be no unreasonable degradation of the marine environment and finds that reasonable alternatives to discharges do exist (e.g., barging of effluents as per EPA 1975 et al.), then there shall be no discharge of pollutants into the environment [40 CFR § 125.123(c)].

EPA formed a work group for the purpose of consulting with State and federal managers of fish and wildlife, public lands and the environment during 1994 concerning areas meriting exclusion from coverage under the Permit. In a teleconference on March 30, 1994, the work group reached concensus on the excluded areas included in the 1995 Permit and continued within the present 2000 Permit.

It is rational and prudent for EPA to exclude from coverage by a general NPDES permit receiving waters which are protected, special, at-risk or degraded. It is reasonable and responsible of the permitted industry to respect and avoid discharging pollutants to these excluded areas in compliance with the requirements of the Permit.

In consideration of the industry's interest in operating and discharging in some of these areas, EPA has made allowance for the submittal of a request for a waiver under Part III.E of the Permit. The applicant's burden of proof for supporting such a request is substantial. Essentially, an applicant for a waiver to discharge in the following excluded areas must establish a compelling need, such as historical permanent siting, and must demonstrate that the proposed discharge will not degrade or further degrade water resource quality.

A seafood processor wishing to apply for authorization to discharge in the "excluded areas" may choose to apply for an individual NPDES permit. As above, the applicant's burden of proof for supporting such a request is substantial.

The areas excluded from coverage under the Permit include the following protected, special, at-risk or degraded water resources and waterbodies.

1. Protected water resources and special habitats.

    a. Waters within one (1) nautical mile of the boundary of a State Game Sanctuary, Game Refuge or Critical Habitat are excluded from coverage by the Permit.

        The Alaska State Legislature has classified certain areas, designated as a sanctuary, refuge or critical habitat, as being essential to the protection of fish and wildlife habitat [5 AAC Part 95]. The three State sanctuaries are Walrus Islands, McNeil River and Stan Price. The twelve State refuges include Cape Newenham, Izembek, Trading Bay, Susitna Flats, Anchorage Coastal, Goose Bay, Palmer Hay Flats, Minto Flats,

Creamer's Field, Yakataga, Mendenhall Wetlands and McNeil River. The sixteen State critical habitat areas include Egegik, Pilot Point, Cinder River, Port Heiden, Port Moller, Tugidak Island, Kalgin Island, Redoubt Bay, Willow Mountain, Clam Gulch, Anchor River and Fritz Creek, Fox River Flats, Kachemak Bay, Copper River Delta, Dude Creek and Chilkat River. Areal maps and specific information may be obtained by contacting the Alaska Department of Fish and Game at its headquarters or regional offices (ADFG 1991).

b. Waters within one (1) nautical mile of the boundary of a National Park, Monument or Preserve or within any bay, fjord or harbor enclosed by a National Park, Monument or Preserve are excluded from coverage by the Permit.

Congressional mandates and Presidential proclamations have provided that federal parks, monuments and preserves be maintained to provide the scenic beauty and quality of landscapes in their natural state, to protect environmental integrity and habitat for and populations of fish and wildlife, including marine mammals, seabirds and waterfowl, and to provide continued opportunities for wilderness recreational activities [16 U.S.C. § 1 et seq.]. Of the national parks, monuments and preserves in Alaska, only four coastal units (Aniakchak, Glacier Bay, Katmai and Kenai Fjords) are proximal to commercial fisheries.

c. Waters within one (1) nautical mile of the boundary of a National Wildlife Refuge are excluded from coverage by the Permit unless an applicant has obtained written authorization to discharge fish processing waste and other refuse to these waters from the Regional Director of the U.S. Fish and Wildlife Service (USFWS).

National Wildlife Refuges are maintained to protect environmental integrity and populations of fish and wildlife and their habitats, as well as to provide the scenic beauty and quality of landscapes in their natural state and opportunities for wilderness recreational activities [16 U.S.C. § 661 et seq.]. Of the national wildlife refuges in Alaska, six coastal units (Alaska Maritime, Alaska Peninsula, Kenai, Kodiak, Togiak and Yukon Delta) are proximal to commercial fisheries.

d. Waters within three (3) nautical miles of a rookery or major haulout of the Steller sea lion are excluded from coverage by the Permit. These areas are designated by the National Marine Fisheries Service (NMFS) as critical habitat for the Steller sea lion, a "threatened species," pursuant to the Endangered Species Act [ESA, 16 U.S.C. § 1531 et seq.]. They are listed and depicted in 50 CFR Part 226 and § 227.12, the "Seafood ODCE" and "Biological evaluation" (EPA and Tetra Tech 1994a, 1994b).

Pinniped rookeries and haulouts are vulnerable to disturbance and degradation by seafood processor discharges and should be protected [Marine Mammal Protection Act, 16 U.S.C. § 1361 et seq.; 50 CFR § 226]. Rookeries are unique habitats where pinnipeds mate, birth and raise their progeny on a consistent annual basis. Haulouts are areas used for rest and refuge by pinnipeds of all ages and both sexes during the non-breeding season and non-breeding adults and subadults during the breeding season (NMFS 1993; NOAA 1993, FR 58(165):45269-45285).

For regulatory purposes, the waterward boundary of rookeries and haulouts has been defined as MLLW. However, biologically, the boundaries are not easily delineated, for the surrounding nearshore waters are an integral component of these habitats, especially for foraging by post-parturient females and by young animals which are developing swimming and hunting behaviors. Conservation of rookeries, haulouts and foraging areas appears essential to the maintenance of pinniped populations in general, and to the recovery of the "threatened" population of Steller sea lions in particular. Rookeries and major haulouts and adjacent marine waters to a minimum of three (3) nautical miles offshore have been designated as critical habitat for Steller sea lions [FR 58(165):45269-45285; 50 CFR Part 226 and § 227.12].

e. Waters within one (1) nautical mile of a nesting area of a colony of five thousand or more of the following seabirds during the period May 1 through September 30: puffins, auklets, eiders, murres, murrelets, petrels and kittiwakes are excluded from coverage by the Permit.

A rich scientific literature has considered the impacts of seafood waste discharges on the food supply, food web, community composition and interspecies dynamics of seabirds (EPA and Tetra Tech 1994a, 1994b). Seafood wastes as well as offal and garbage favor the expansion of large, opportunistic birds such as gulls to the detriment of smaller seabirds and waterfowl and their nestlings. Spectacled eider, Steller's eider, red-legged kittiwake, marbled murrelet and Kittlitz's murrelet are listed as endangered, threatned or species of concern in Alaskan waters.

f. River segments designated as wild or scenic under the Wild and Scenic Rivers Act [16 U.S.C. § 1271 et seq.] are excluded from coverage under the Permit. Congress has recognized that certain selected rivers possess outstandingly remarkable scenic, recreational, fish and wildlife and other values. Congress has futher declared that rivers designated as wild or scenic and their immediate environs shall be protected for the benefit and enjoyment of present and future generations.

2. At-risk resources and waterbodies.

   a. Areas with water depth of less than ten (10) fathoms mean lower low water (MLLW) that are likely to have poor flushing, including but not limited to sheltered waterbodies such as bays, harbors, inlets, coves and lagoons and semi-enclosed water basins bordered by sills of less than ten (10) fathom depths are excluded from coverage under the Permit. For the purposes of this section, "poor flushing" means average water currents of less than one third of a knot within three hundred (300) feet of the outfall. Currents of one third knot and greater offer significant dispersion and resuspension of seafood process waste residues (EPA and Tetra Tech 1994a).

   b. Lost Harbor, Akun Island is excluded from coverage under the Permit. This harbor has a sill of twelve fathoms which restricts circulation in the enclosed basin of twenty-eight (28) fathoms. EPA has found that this waterbody has been degraded by seafood waste discharges and closed it to further discharges (Findley 1992).

   c. Streams or rivers within one (1) statute mile upstream of a drinking water intake are excluded from coverage under the Permit. This exclusion ensures the protection of drinking water sources from contamination or pollution [18 AAC § 80.020].

   d. Lakes or other impoundments of fresh water are excluded from coverage under the Permit. This exclusion protects aquatic habitat in Alaska's predominantly oligotrophic lakes as well as ensures the protection of drinking water sources [18 AAC § 80.020].

3. Degraded waterbodies.

   a. Akutan Harbor west of longitude 165E46'00" W, Akutan Island, is excluded from coverage under the Permit. This exclusion acknowledges the waterbody's designation as "water quality limited" by seafood waste residues and its susceptibility to further, unreasonable degradation (ADEC 1992 et seq.).

   b. Unalaska Bay south of latitude 53E57'30" N, Wide Bay, Broad Bay, Nateekin Bay, Iliuliuk Bay, Dutch Harbor, Iliuliuk Harbor and Captains Bay, Unalaska Island, are excluded from coverage under the Permit. This exclusion acknowledges south Unalaska Bay's designation as "water quality limited" by seafood waste residues and its susceptibility to further, unreasonable degradation (ADEC 1992 et seq.). It further recognizes that the contiguous waters of Captains Bay, Dutch Harbor, Iliuliuk Harbor and Iliuliuk Bay are impaired by seafood waste residues, sewage and petroleum products and are continuous with south Unalaska Bay. The "Circulation Study of Unalaska Bay and Contiguous Inshore

Marine Waters" (CH2M Hill 1994) demonstrates the interconnected and interdependent nature of the Unalaska Bay watershed and water basin.

c. Any waterbody included in Alaska Department of Environmental Conservation's (ADEC) CWA § 305(b) report or CWA § 303(d) list of waters which are "impaired" by seafood processor discharges or "water quality-limited" for dissolved oxygen or residues (i.e., floating solids, debris, sludge, deposits, foam or scum) are excluded from coverage under the Permit. A technical basis has been developed that State water quality standards are exceeded in certain waterbodies. These waterbodies will not be subjected to the potential of additional environmental insult without site-specific water quality analyses.

4. Waters covered by other general NPDES permits. The Permit does not authorize the discharge of pollutants in areas covered by general NPDES permits AK-G52-7000 (Pribilof Islands) and AK-G52-8000 (City of Kodiak).

III. WHAT EFFLUENT LIMITATIONS ARE REQUIRED BY THE GENERAL PERMIT

A. General approach to determining effluent limitations

Sections 101, 301(b), 304, 308, 401 and 402 of the Act provide the basis for the effluent limitations and other conditions in the draft permit. EPA evaluates discharges with respect to these sections of the Act and the relevant NPDES regulations in determining which conditions to include in the permit.

In general, EPA first determines which technology-based limits apply to the discharges in accordance with the national effluent guidelines and standards (40 CFR § 408). EPA then determines which water quality-based limits apply to the discharges. The permit limits will reflect whichever limits (technology-based or water quality-based) are more stringent.

EPA must also include monitoring requirements in the permit to monitor compliance with effluent limitations. Ambient monitoring may also be required to gather data for future effluent limitations or monitor effluent impacts on receiving water quality and the integrity of the water resource.

The basis for each permit condition is described in more detail below.

B. Technology-based limitations

The Act requires particular categories of industrial dischargers to meet effluent limitations established by EPA. The Act initially focused on the control of "traditional" pollutants (conventional pollutants and some metals) through the use of Best Practicable Control Technology Currently Available (BPT). Permits issued after March 31, 1989, must include any conditions necessary to ensure that the BPT level of control is achieved. BPT limitations are based on effluent

guidelines developed by EPA for specific industries. Where EPA has not yet developed guidelines for a particular industry, permit conditions must be established using Best Professional Judgment (BPJ) procedures (40 CFR §§ 122.43, 122.44 and 125.3).

Section 301(b)(2) of the Act also requires further technology-based controls on effluents. After March 31, 1989, all permits are required by CWA §§ 301(b)(2) and 301(b)(3) to contain effluent limitations for all categories and classes of point sources which: (l) control toxic pollutants and nonconventional pollutants through the use of Best Available Technology Economically Achievable (BAT), and (2) represent Best Conventional Pollutant Control Technology (BCT). BCT effluent limitations apply to conventional pollutants (pH, BOD, oil and grease, suspended solids and fecal coliform). BAT applies to toxic and nonconventional pollutants. Toxic pollutants are those listed in 40 CFR § 401.15. Nonconventional pollutants include all pollutants not included in the toxic and conventional pollutant categories. In no case may BCT or BAT be less stringent than BPT. Like BPT requirements, BAT and BCT permit conditions must be established using BPJ procedures in the absence of effluent limitations guidelines for a particular industry.

1. Process and process-associated wastes

   Alaskan seafood processors of fresh, frozen, canned and cured fish and shellfish are covered by the effluent guidelines and described in 40 CFR Part 408 for "remote" Alaskan locations. EPA evaluated seafood processors across the nation in the early 1970s in order to establish technology-based effluent limitations guidelines (EPA 1975). In consideration of the expense and logistical difficulties associated with much of Alaska, the technology-based limitations for Alaskan seafood processors in remote locations were limited to the requirement that no pollutants may be discharged which exceed 0.5 inch (1.27 cm) in any dimension. EPA's original determination applied more exacting limitations on seafood processors located in the cities of Anchorage, Cordova, Juneau, Ketchikan, Kodiak and Petersburg. The industry appealed this determination for Anchorage, Cordova, Juneau, Ketchikan, and Petersburg, and litigated the issue for nearly a decade. EPA suspended the application of non-remote limitation guidelines to Anchorage, Cordova, Juneau, Ketchikan and Petersburg in 1980 (EPA 1980a, FR 45(98):32675-32676); this suspension remains in effect today.

2. Sanitary wastewaters.

   The Permit requires that sanitary wastewaters shall be treated in wastewater treatment systems which comply with either Section 304(d) or 312 of the Act [40 CFR Part 133].

C. Water quality-based limitations

Section 301(b)(1) of the Act requires the establishment of limitations in permits necessary to meet water quality standards by July 1, 1977. All discharges to state waters must comply with state and local coastal management plans as well as with state water quality standards, including the state's antidegradation policy. Discharges to state waters must also comply with limitations imposed by the state as part of its coastal management program consistency determination and of its certification of NPDES permits under CWA § 401.

The NPDES regulations at 40 CFR § 122.44(d)(1) require that permits include limits on all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality".

Toxicity limits are required whenever toxicity is at a level of concern relative to either a numeric or narrative standard for toxicity. A chemical-specific limit is required whenever an individual pollutant is at a level of concern relative to the numeric standard for that pollutant.

Alaska State Water Quality Standards (18 AAC Part 70) classify fresh waters as Classes (I)(A)(i-iv), (I)(B)(i-ii) and (I)(C) for use in drinking, culinary and food processing, agriculture, aquaculture, industrial water supply, water recreation, and the growth and propagation of fish, shellfish, aquatic life and wildlife. With few exceptions, rivers and lakes are designated for all beneficial uses and the most stringent of the water quality standards for these uses must be met.

Alaska State Water Quality Standards (18 AAC Part 70) marine and estuarine receiving waters as Classes (II)(A)(i-iii), (II)(B)(i-ii), (II)(C) and (II)(D) for use in aquaculture, seafood processing, water recreation, the growth and propagation of fish, shellfish, aquatic life and wildlife, and the harvesting for consumption of raw mollusks and other raw aquatic life. Marine and estuarine waters are designated for all beneficial uses and the most stringent of the water quality standards for these uses must be met.

Alaska State Water Quality Standards provide for the prescription of a mixing zone volume of dilution for an effluent which must be as small as practicable [18 AAC § 70.032]. The water quality criteria of 18 AAC § 70.020(b) and the antidegradation requirements of 18 AAC § 70.020(c) may be exceeded in an authorized mixing zone. However, the standards must be met at every point outside a mixing zone. A circular mixing zone of one hundred (100) feet radius is proposed for marine and estuarine discharges of dissolved oxygen, floating and suspended waste residues, color, turbidity, temperature, pH, fecal coliform bacteria, and total residual chlorine that are authorized under the Permit. A mixing zone of one hundred (100) feet downstream reach is proposed for fresh water discharges of dissolved oxygen, floating and suspended waste residues, color, turbidity, temperature, pH, fecal coliform bacteria, and total residual chlorine that are authorized under the Permit.

Alaska State Water Quality Standards also provide for the prescription of a zone of deposit of substances on the bottom of marine and estuarine waters which must be as small as practicable [18 AAC § 70.033]. The water quality criteria of 18 AAC § 70.020(b) and the antidegradation requirements of 18 AAC § 70.020(c) may be exceeded in an authorized zone of deposit. However, the standards must be met at every point outside a zone of deposit. A one acre (43,560 sq. ft.) zone of deposit is proposed for marine and estuarine discharges of settleable solid seafood processing waste residues that are authorized under the Permit. No zone of deposit is proposed for fresh water rivers or streams above tidally-influenced reaches.

The following discussions are also presented and expanded in the "Seafood ODCE" (EPA and Tetra Tech 1994a).

1. Biochemical oxygen demand (BOD). BOD affects the dissolved gases in the receiving water and may be limited by the applicable State water quality standard. Dissolved oxygen (D.O.) shall be greater than 7 mg/l in fresh waters used by fish and greater than or equal to 5 mg/l to a depth of 20 cm in the interstitial waters of gravel used by fish for spawning. D.O. shall be greater than or equal to 6 mg/l (coastal) or 5 mg/l (estuarine) for a depth of one meter, except when natural conditions cause this value to be depressed, and shall be greater than or equal to 5 mg/l at any point beneath the surface (in both coastal and estuarine waters). The Permit contains provisions that permittees will discharge effluents into hydrodynamically energetic waters with a high capacity of dilution and dispersion. The Permit proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit." Should a discharge contributed to a violation of the State's criteria for dissolved oxygen in the receiving water, EPA has the authority to require a permittee to apply for and obtain an individual permit with site-specific requirements and conditions which would protect water quality.

2. Total suspended solids (TSS). TSS affects the residues in the receiving water and may be limited by the applicable State water quality standard. Residues of scum, solids, debris, sludge or deposits shall not alone or in combination with other substances or wastes cause the water to be unfit or unsafe, or cause leaching of toxic or deleterious substances, or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines. EPA finds that the residue standard requires the authorization of a mixing zone and a zone of deposit. The discharge should not cause a violation of the residue standard under the terms and conditions of the Permit. The Permit contains provisions that permittees will discharge effluents into hydrodynamically energetic waters with a high capacity for dilution and dispersion and will monitor the sea surface, shoreline and seafloor periodically. The Permit proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit."

3. Residues. As above, discharges of settleable solid seafoor processing waste residues is limited by the applicable State water quality standard. Residues of scum, solids, debris, sludge or deposits shall not alone or in combination with other substances or wastes cause the water to be unfit or unsafe, or cause leaching of toxic or deleterious substances, or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines. EPA finds that the residue standard requires the authorization of a mixing zone and a zone of deposit. The discharge should not cause a violation of the residue standard under the terms and conditions of the Permit. The Permit contains provisions that permittees will discharge effluents into hydrodynamically energetic waters with a high capacity for dilution and dispersion and will monitor the sea surface, shoreline and seafloor periodically. The Permit proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit."

   The Permit limits shore-based or near-shore discharges of offal to no more than ten million pounds of settleable solid seafood processing waste residues per year. This effluent limit is based upon WASP modeling of the discharge, dispersion, settlement, accumulation and decomposition of fish offal on the seafloor beneath and surrounding a discharge year, with a margin of safety equal to one-sixth of the estimated loading capacity. The WASP simulation of settleable solid seafood processing waste residues predicts that the continuing annual discharge of twelve million pounds of offal will produce as steady state waste pile of decomposing seafood that is one acre in area; the Surfer contouring model predicts that the waste pile will be just over four feet thick at its cone and will extend to an area of 1.2 acres (EPA and TetraTech 1994a, TetraTech 1996). Based upon the contouring model's predicted "spreading" at the periphery of the waste pile, EPA has determined that a one-sixth margin of safety is appropriate to protect water quality. The permit provides that the effluent limit for discharged settleable solids seafood processing wastes (a.k.a. offal) is equal to 5/6 X 12,000,000 = ten million pounds per year within one nautical mile of shore.

   No limits on waste loads are proposed for discharges of settleable solid processing residues by offshore seafood processors discharging more than one nautical mile of shore.

4. Fecal coliform bacteria (FC). Median concentration shall not exceed 20 FC per 100 ml in fresh water nor exceed 14 FC per 100 ml in marine water. EPA estimates that a dilution of at least 30:1 will be achieved at the edge of the mixing zone and that the discharges will not exceed the applicable standard. The Permit proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit."

5. Oil and grease. The applicable State water quality standard for oil and grease states that the discharge shall not cause a film, sheen, or discoloration on the

surface or floor of the waterbody or adjoining shorelines. Surface waters shall be virtually free from floating oils. Concentrations of animal fats shall not cause deleterious effects to aquatic life. Substances shall not be present or exceed concentrations which individually or in combination impart undesirable odor or taste to aquatic life as determined by either bioassay or organoleptic tests. The Permit proposes a specific limit of "no discharge of floating solids, visible foam or oily wastes which produce a sheen on the surface of the receiving water". EPA estimates that a dilution of at least 30:1 will be achieved at the edge of the mixing zone and that the discharges will not exceed the applicable standard. The Permit further proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit."

6. pH. The State water quality standard for freshwater requires that pH shall not be less than 6.5 or greater than 8.5, and shall not vary more than 0.5 pH unit from the natural conditions. In marine waters, pH shall be no less than 6.5 or greater than 8.5, and no more than 0.1 pH unit from natural conditions. Seafood processor discharges have a pH of approximately 6.6 to 7.0; this pH will be diluted in freshwater and diluted and buffered in marine water. EPA estimates that a dilution of at least 30:1 will be achieved at the edge of the mixing zone and that the discharges will not exceed the applicable standard. The Permit proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit."

7. Temperature. The State water quality standard for freshwater requires that temperature shall be no more than 13**E** C. The standard for marine water requires that temperature shall be no more than 15**E** C and shall not cause the weekly average temperature to increase more than 1**E** C. Normal daily temperature cycles shall not be altered in amplitude or frequency. EPA estimates that a dilution of at least 30:1 will be achieved at the edge of the mixing zone and that the discharges will not exceed the applicable standard. The Permit proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit."

8. Color. The State water quality standard for fresh and marine waters requires that the water not exceed 5 color units. There shall be no detrimental effects on established water supply treatment levels, nor interference with or making the water unfit or unsafe for the use. EPA estimates that a dilution of at least 30:1 will be achieved at the edge of the mixing zone and that the discharges will not exceed the applicable standard. The Permit proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit."

9. Turbidity. The State water quality standard for freshwater requires that the turbidity in the receiving water shall not be increased by more than 5 NTU when the natural turbidity is 50 NTU or less and not more than a 10 percent increase in turbidity when the natural condition is more than 50 NTU except that the maximum increase shall not exceed 15 NTU. The standard for marine water

limits turbidity to no more than 25 NTU; it shall not reduce the depth of the compensation point for photosynthetic activity by more than 10%. EPA estimates that a dilution of at least 30:1 will be achieved at the edge of the mixing zone and that the discharges will not exceed the applicable standard. The Permit proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit."

10. Total residual chlorine (TRC). The State water quality standard requires that TRC shall be no more than 2 ug/l for salmonid fish and no more than 10 ug/l for other aquatic life. EPA estimates that a dilution of at least 30:1 will be achieved at the edge of the mixing zone and that the discharges will not exceed the applicable standard. The Permit proposes that "discharges shall not violate Alaska water quality standards at the edge of the mixing zone or outside the zone of deposit."

D. Summary of effluent limitations and requirements

The discharges of Alaskan seafood processors covered by the Permit will not result in a violation of the Alaska Water Quality Standards, provided that the permittee complies with the limits and conditions proposed in the draft general NPDES permit. The Permit requires that the permittee ensure that seafood waste discharges do not exceed one half inch (1.27 cm) in any dimension, a technology-based requirement commonly known as "grind and discharge." Domestic wastewater effluents must meet national standards for performance for sewage treatment. The Permit requires that the permittee comply with State Water Quality Standards for discharges of dissolved oxygen, floating and suspended waste residues, color, turbidity, temperature, pH, fecal coliform bacteria, and total residual chlorine at the edge of a 100 ft mixing zone. The Permit further limits discharges of settleable solid seafoor processing waste residues to ten million pounds per year and requires compliance with the water quality standard for settleable solid seafood processing residues outside of a one acre zone of deposit.

IV. BEST MANAGEMENT PRACTICES - WHAT, WHY, HOW AND WHEN

It is the national policy that, whenever feasible, pollution should be prevented or reduced at the source, that pollution which cannot be prevented should be recycled in an environmentally safe manner, that pollution which cannot be prevented or recycled should be treated in an environmentally safe manner, and that disposal or release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner [Pollution Prevention Act of 1990, 42 U.S.C. § 13101 et seq.].

The permittee will discharge at the facility in accordance with best management practices which address the provisions of the Pollution Prevention Act.

Best Management Practices (BMPs), in addition to numerical effluent limitations, may be required to control or abate the discharge of pollutants in accordance with 40 CFR

§ 122.44(k). In EPA's reassessment of the effluent limitations guidelines for seafood processors (Jordan 1979; EPA 1980b), in-plant management directed towards total utilization of the raw materials and by-product recovery was recommended as a fundamental and central element of waste reduction. In-plant management of water and materials was found to be central in the waste management efforts in Europe (NovaTec Consultants 1993) and the United States (PPRC 1993). Materials accounting, audits of in-plant utilization of water and materials, and best management practices were repeatedly recommended as the profitable approach to waste management in seafood processing plants at the "Wastewater Technology Conference and Exhibition for Seafood Processors" convened by the Fisheries Council of British Columbia in Vancouver, Canada in February 1994 (e.g., Ismond 1994, Drew 1994, Carlson 1994, Johnson 1994, et al.).

The Permit requires the development and implementation of Best Management Practices which prevent or minimize the generation and release of pollutants to receiving waters. Seafood processors operating and discharging more than one (1) nautical mile from shore are required to implement BMPs which minimize process waste solids and disperse process wastes through mobility. Seafood processors operating and discharging one (1) nautical mile or less from shore are required to develop a BMP Plan which focuses upon the minimization of process waste solids.

The Permit requires than a permittee develop and implement BMPs. A new permittee shall develop and implement a BMP Plan within six (6) months of the date of that permittee's authorization to discharge under this Permit. A continuing permittee shall review the BMP Plan and resubmit certification with the NOI that the BMP Plan has been reviewed and revised as needed.

EPA has developed a general handbook to assist industry in identifying and utilizing BMPs and in developing and implementing materials accounting and BMP Plans (EPA 1993). EPA has developed an industry-specific handbook to assist seafood processors in identifying and utilizing BMPs and in developing and implementing materials accounting and BMP Plans (EPA and Bottomline Performance 1994).

The BMP Plan must be amended whenever there is a change in the facility or in the operation of the facility which materially increases the potential for an increased discharge of pollutants.

V. WHAT MONITORING IS REQUIRED BY THE GENERAL PERMIT

An environmental monitoring program is required to assess the near-field effects of seafood processor the discharges on the water surface, shoreline and seafloor. Monitoring will be conducted periodically in accordance with the perceived risk of a violation of Alaska State Water Quality Standards or an impact on the receiving water resources. In accordance with the recommendations of the National Research Council (NRC 1990), the permit provides goals, objectives and evaluative criteria for the environmental monitoring program during the term of the Permit.

VI. OTHER REQUIREMENTS

A. New source performance standards (NSPS)

Pursuant to CWA § 301, NSPS were promulgated for Alaskan seafood processors [40 CFR Part 408]. NSPS apply to new seafood processors determined to be new sources by virtue of their activities occurring after promulgation of the rule (Dec. 1, 1975). The NSPS for Alaskan seafood processors are based on the same treatment technology as BAT, which consists of the "grind and discharge" provisions described above. Since BAT is based on the most stringent demonstrated technology that is available for treating seafood processor wastes, those processors which are new sources will not be subject to controls more stringent than those applicable to existing seafood processors.

B. National Environmental Policy Act [42 U.S.C. § 4321 et seq.]

The National Environmental Policy Act (NEPA) may require the preparation of an Environmental Impact Statement and consideration of EIS-related permit conditions as provided in 40 CFR § 122.29(c) and 40 CFR Part 6 subpart F [40 CFR § 122.49(g)]. In accordance with these regulations, EPA prepared an Environmental Assessment and determined that the issuance of the general NPDES permit for Alaskan seafood processors would not significantly affect the quality of the human environment within the context of NEPA (EPA 1983, 1994b; EPA and Tetra Tech 1994a).

Pursuant to CWA § 301, new source performance standards were promulgated by EPA in 1975 for categories of discharges covered under the Permit. In accordance with CWA § 511(c)(1), NPDES permits for new sources are subject to the provisions of NEPA. An assessment of potentially significant impacts on the quality of the human environment resulting from operation of a new source is required under NEPA.

Any applicant planning to construct a facility, or to convert a facility not previously permitted and to discharge pollutants regulated under NPDES shall be required to prepare an Environmental Information Document (EID) for use by EPA Region 10. EPA will use the EID to prepare an Environmental Assessment to make a determination of impact in compliance with the National Environmental Protection Act (NEPA). Guidance for preparing the EID can be obtained by contacting the NEPA Compliance Officer in EPA's Office of Water.

Finding of No Significant Impact (FNSI). In compliance with EPA headquarter's guidance for re-issued NPDES permits, the EPA Region 10 NEPA Compliance Program has evaluated the proposed changes to general NPDES permit AK-G52-0000 and balanced the need to re-evaluate the NEPA analysis of preceding NPDES permits for Alaskan seafood processors. EPA Region 10 has determined that the previous Environmental Assessment for seafood processors prepared in July 1994 does not need to be amended with a new NEPA analysis, as the proposed

permit conditions for the re-issued NPDES general permit are not significantly different from the previous permit.

C. Coastal Zone Management Act [16 U.S.C. § 1451 et seq.]

The Coastal Zone Management Act and its implementing regulations [15 CFR Part 930] prohibit EPA from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the State Coastal Zone Management program, and the State or its designated agency concurs with the certification [40 CFR § 122.49(d)]. EPA has considered Coastal Zone Management Plans obtained from this State office and individual Coastal Zone Management districts in the "Seafood ODCE" and determined that the Permit will comply with the State Coastal Zone Management Program (EPA and Tetra Tech 1994a). EPA has submitted the Permit to the State of Alaska, Office of the Governor, Division of Governmental Coordination, to ensure that the Permit complies with the State Coastal Zone Management Program.

D. Ocean Discharge Criteria

The Ocean Discharge Criteria establish guidelines for permitting discharges into the territorial seas, the contiguous zone and the ocean. EPA conducts an Ocean Discharge Criteria Evaluation, or "ODCE," using criteria established in accordance with CWA § 403. EPA decides on the basis of available information whether or not the discharge will cause unreasonable degradation of the marine environment. 40 CFR § 125.121 states "unreasonable degradation of the marine environment" means:

1. Significant adverse changes in ecosystem diversity, productivity, and stability of the biological community within the area of discharge and surrounding biological communities;

2. Threat to human health through direct exposure to pollutants or through consumption of exposed aquatic organisms; or

3. Loss of aesthetic, recreational, scientific or economic values which is unreasonable in relation to the benefit derived from the discharge.

CWA § 403(c) guidelines require that a number of factors be considered in the determination of unreasonable degradation or irreparable harm. These factors include the amount and nature of the pollutants, the potential transport of the pollutants, the character and uses of the receiving water and its biological communities, the existence of special aquatic sites (including parks, refuges, etc.), any applicable requirements of an approved Coastal Zone Management plan, and potential impacts on water quality, ecological health and human health.

After consideration of these factors, EPA has determined that discharges authorized by the Permit and discharged in accordance with the requirements of the Permit will not cause unreasonable degradation of the receiving waters.

Because the discharge consists largely of conventional pollutants in manageable quantities and the areas covered under the Permit are not considered sensitive or unique, unreasonable degradation is not anticipated. Studies of areas severely impacted by seafood processing waste discharges, like Kodiak Harbor, have shown that recovery can occur if proper treatment is implemented and the permit conditions are met; there is no irreparable harm.

Discharges to water resources which are protected, special, at-risk or impaired are not authorized under the Permit. EPA guidance (EPA 1994a) finds that in areas that do not contain sensitive species or unusual biological communities, it may be concluded that discharges containing primarily conventional pollutants and in compliance with permit conditions will not cause unreasonable degradation. The guidance further finds this is especially appropriate where the data indicate that there will be significant mixing with the receiving waters based on the flow of the discharge (i.e. water depth, turbulence). The processing operations covered under the Permit will continue to have little environmental effect, providing appropriate grinding is implemented.

The ODCE guidelines establish a presumption that discharges in compliance with State Water Quality Standards will not cause unreasonable degradation with respect to the pollutants subject to these sections. In general, degradation occurs in processing areas where poor or minimal flushing exists or the cumulative discharges of seafood processors exceed the assimilative capacity of the receiving water. In order to protect water quality, many of the large processors and significant processing areas have been covered under individual permits that contain requirements more stringent than those in the general NPDES permit. These facilities will continue to be regulated under individual NPDES permits.

E. Endangered Species Act [16 U.S.C. § 1531 et al.]

The Endangered Species Act (ESA) and its implementing regulations [50 CFR Part 402] require EPA to ensure, in consultation with the Secretary of the Interior or Commerce, that any action authorized by EPA is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat [40 CFR § 122.49(c)].

A list of endangered and threatened species and species of concern was provided to EPA by the NMFS and USFWS for the State of Alaska. EPA prepared a biological evaluation as required by ESA.

In the case of the "threatened" Steller sea lion, major haulouts as well as rookeries and adjacent nearshore waters have been designated as "critical habitats". The

Permit does not authorize discharges within three nautical miles of rookeries and major haulouts designated as critical habitats by NMFS, the responsible agency.

In the case of the spectacled eider, Steller's eider, red-legged kittiwake, marbled murrelet and Kittlitz's murrelet, critical habitats have not been designated. However, a review of the scientific literature indicates that these and other birds are particularly vulnerable during the nesting period in rookeries (EPA and Tetra Tech 1994a). The Permit does not authorize discharges within one nautical mile of rookeries occupied by five thousand or more seabirds and waterfowl. The Permit prohibits the discharge of petroleum hydrocarbons and any hazardous or toxic materials. The Permit authorizes discharges of seafood processing wastes and prohibits the discharges of petroleum hydrocarbons and any hazardous or toxic materials.

EPA has evaluated other species designated as endangered or threatened and found that the discharges authorized by the Permit will not affect them (EPA and Tetra Tech 1994b).

EPA informally consulted with NMFS and USFWS. The recommended protection measures for the species of concern prohibit alterations of limited, high quality habitat occupied and utilized during mating, birthing and raising young from discharges of pollutants by Alaskan seafood processors. EPA has concluded that the discharges authorized by the Permit are not likely to have an effect on any endangered or threatened species or its critical habitat.

EPA is requesting concurrence from NMFS and USFWS on the draft permit and will consider their comments in the final permit decision. EPA will initiate consultation should new information reveal effects not previously considered, should the activities be modified in a manner beyond the scope of the original opinion, or should the activities affect a newly listed species.

F. Marine Mammal Protection Act [16 U.S.C. § 1361 et seq.]

Section 2 of the Marine Mammal Protection Act finds that marine mammals are resources of great international significance, aesthetic, recreational and economic, and should be protected, conserved and encouraged to develop optimum populations. In particular, efforts should be made to protect the rookeries, mating grounds and areas of similar significance for each species of marine mammal from the adverse effect of man's actions. With the exception of subsistence use for Alaskan natives, a moratorium has been placed on the taking (harass or kill) marine mammals in Alaska.

The Permit provides for "buffer zones" around the rookeries and haulouts of Steller sea lions, northern fur seals and walruses. These protected water resources and special habitats are excluded from coverage under the Permit.

G. **Magnuson-Stevens Fishery Management and Conservation Act** [U.S.C. § et al.]

The 1996 amendments to the Magnuson-Stevens Fishery Management and Conservation Act set forth a number of new mandates for the National Marine Fisheries Service (NMFS), regional fishery management councils, and other federal agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NMFS, are required to delineate “essential fish habitat” (EFH) for all managed species. Federal action agencies that may adversely impact EFH are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond in writing to the fisheries service’s recommendations. The EFH regulations define an *adverse effect* as “any impact which reduces quality and/or quantity of EFH...[and] may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species’ fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions”. NMFS or a Council may recommend measures for attachment to the federal action to protect EFH; such recommendations are advisory, not proscriptive, in nature.

EPA has tentatively determined that the issuance of this permit will cause minimal effects upon EFH species and habitat in the vicinity of seafood processor discharges of processing wastewater and waste solids. The water quality parameters dissolved oxygen, floating and suspended waste residues, color, turbidity, temperature, pH, fecal coliform bacteria, and total residual chlorine may exceed Alaska Water Quality Standards within the State-authorized 100 ft mixing zone. Settleable solid seafood processing waste residues may accumulate as waste piles on the seafloor within the State-authorized one acre zone of deposit. EPA requests that NMFS issue a "general concurrence" for this Permit re-issuance.

A general concurrence identifies specific types of Federal actions that may adversely affect EFH, but for which no further consultation will generally be required. In order to issue a general concurrence, NMFS must determine, after coordinating with the appropriate Fishery Management Council(s) and reviewing public comment, that the actions are (1) similar in nature and similar in their impact on EFH, (2) do not cause greater than minimal adverse effects on EFH when implemented individually, and (3) do not cause greater than minimal cumulative adverse effects on EFH. NMFS requires (1) a written description of the nature and approximate number (annually or by some other appropriate time frame) of the proposed actions, (2) an analysis of the effects of the actions on EFH and associated species and their life history stages, including cumulative effects, and (3) the Federal agency's conclusions regarding the magnitude of such effects.

This fact sheet, the draft permit, and the "Seafood ODCE" (EPA and Tetra Tech 1994a) have been submitted to NMFS for review prior to the public notice period. Additional information will be provided to NMFS as needed during the consultation. Any recommendations received from NMFS regarding EFH will be considered for incorporation into this Permit prior to final issuance of the Permit.

If NMFS, after coordinating with the appropriate Fishery Management Council(s), determines that a General Concurrence is appropriate, it will provide EPA with a

written statement that further consultation is not required for the permitting activities specified in the General Concurrence.

H. Wild and Scenic Rivers Act [16 U.S.C. § 1273 et seq.]

Section 1 of the Wild and Scenic Rivers Act declares that rivers designated as wild or scenic and their immediate environs shall be protected for the benefit and enjoyment of present and future generations. The Permit excludes Alaskan river reaches designated as "wild" or "scenic" from coverage under the Permit.

I. State certification of the Permit

Section 301(b)(1)(C) of the Clean Water Act requires that an NPDES permit contain conditions which ensure compliance with applicable State water quality standards or limitations. The limitations for residues and other pollutants were established pursuant to Alaska State Water Quality Standards. Section 401 of the Act requires that states certify that federally issued permits are in compliance with state law. No permits can be issued until the requirements of CWA § 401 are satisfied.

These are permits for operations discharging to surface waters of the State of Alaska and the United States of America. EPA is requesting State officials to review and provide appropriate certification to this draft general NPDES permit pursuant to 40 CFR § 124.53.

Since State waters are involved in the draft permit, the provisions of Section 401 of the Act apply. Furthermore, in accordance with 40 CRF §124.10(c)(1), public notice of the Permit has been provided to the State of Alaska and State agencies having jurisdiction over fish, shellfish and wildlife resources, and over coastal zone management plans.

J. Presidential oversight of federal regulations [Executive Order 12866]

The Office of Management and Budget has exempted this action from the review requirements of Executive Order 12866 providing for presidential oversight of the regulatory process pursuant to Section 6 of that order.

K. Paperwork Reduction Act [44 U.S.C. § 3501 et seq.]

EPA has reviewed the requirements imposed on regulated facilities in the Permit under the Paperwork Reduction Act. Most of the information collection requirements have already been approved by the Office of Management and Budget (OMB) in submissions made for the NPDES permit program and the previous general NPDES permit for seafood processors in Alaska. EPA has submitted the Permit's requirements for the NOI, waivers, BMP plans, annual reports and monitoring reports to OMB for review and approval.

L. The Regulatory Flexibility Act [5 U.S.C. § 553 et seq.]

After review of the facts presented in the notice of intent, draft permit and fact sheet, the Administrator of EPA certifies, pursuant to the provisions of 5 U.S.C. §605(b), that this general NPDES permit will not have a significant impact on a substantial number of small entities. Moreover, the Permit reduces a significant administrative burden on regulated sources.

VII. REFERENCES

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NPDES Permit No. AK-G52-0000

United States Environmental Protection Agency, Region 10
1200 Sixth Avenue, OW-130
Seattle, Washington 98101

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR

SEAFOOD PROCESSORS IN ALASKA

In compliance with the provisions of the Clean Water Act, 33 U.S.C.A. § 1251 et seq. (hereafter, CWA or the Act), the owners and operators of the seafood processing facilities that are described in Part I of this general National Pollutant Discharge Elimination System (NPDES) permit are authorized to discharge seafood processing wastes and the concomitant wastes set out in Part II of this Permit to waters of the United States, except those excluded from authorization of discharge in Part III of this Permit, in accordance with effluent limitations, monitoring requirements and other conditions set forth herein. The discharge of wastes not specifically set out in Part II of this Permit is not authorized under this Permit.

Upon the effective date of this Permit, it is the controlling document for regulation of seafood processing wastes and other designated wastewaters in the State of Alaska discharged by authorized facilities in accordance with this Permit.

This Permit shall become effective July 27, 2001.

This Permit and the authorization to discharge shall expire at midnight July 27, 2006.

Signed this 18th day of July, 2001.

/s/ Randall F. Smith
Randall F. Smith
Director
Office of Water

A COPY OF THIS PERMIT MUST BE KEPT AT THE FACILITY WHERE THE DISCHARGES OCCUR.

In compliance with the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, the Office of Management and Budget has approved the collection of information requested in general NPDES permit no. AK-G52-0000 (OMB Control No. 2040-0004, 2040-0086 and 2040-0110).

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I. AUTHORIZED FACILITIES

A. Categories of authorized dischargers

Subject to the restrictions of this Permit, the following categories of dischargers are authorized to discharge the pollutants set out in Part II of this Permit once a Notice of Intent has been filed with and a written authorization is received from EPA:

1. Operators of off-shore vessels engaged in the processing of fresh, frozen, canned, smoked, salted or pickled seafood or the processing of seafood mince, paste or meal;

2. Operators of near-shore vessels engaged in the processing of fresh, frozen, canned, smoked, salted or pickled seafood, the processing of unwashed mince, or the processing of meal and other secondary by-products; and

3. Operators of shore-based facilities engaged in the processing of fresh, frozen, canned, smoked, salted or pickled seafood, the processing of unwashed mince, or the processing of meal and other secondary by-products.

Operations which catch and process seafood and which discharge less than one thousand (1,000) pounds of seafood waste per day and less than fifteen tons (30,000 lbs) of seafood waste per calendar year may be but are not required to be covered under this general NPDES permit.

B. Unauthorized dischargers

Shore-based and near-shore seafood processors discharging seafood washed mince or paste process wastes to receiving waters within one (1) nautical mile of shore are not authorized to discharge under this general NPDES permit. These facilities are required to apply for and receive individual NPDES permits.

II. AUTHORIZED DISCHARGES

A. Discharges from seafood processing facilities

This Permit authorizes the discharge of the following pollutants subject to the limitations and conditions set forth herein:

1. **Seafood processing wastewater and wastes**, including the waste fluids, heads, organs, flesh, fins, bones, skin, chitinous shells, and stickwater produced by the conversion of aquatic animals from a raw form to a marketable form.

    a. **Treatment of waste solids**. Permittees shall grind solid seafood processing wastes to one-half inch in any dimension or smaller prior to discharge. This one-half inch grinding requirement does not apply to (1) the calcareous shells

of scallops, clams, oysters and abalones, (2) the calcareous shells (i.e., "tests") of sea urchins, or (3) incidental catches of "prohibited (catch) species" which are neither retained nor processed.

b. **Limit on seafood processing waste residues**. Permittees shall discharge no more than 10 million pounds per calendar year of seafood processing waste residues *(raw, unprocessed product minus finished, processed product*) unless authorized by EPA and the Alaska Department of Environmental Conservation (ADEC).

c. **At-sea discharges**. Permittees are authorized to discharge treated seafood processing wastes, including residues and stickwater, at-sea to receiving waters that are at least one nautical mile from shore as delineated by mean lower low water (MLLW) and that are at least minus 120 feet deep at MLLW. At-sea discharges should occur from vessels underway at speeds exceeding three (3) knots in order to ensure wide dispersion of seafood processing waste residues. The permittee shall notify EPA and ADEC of its plans for transport and disposal prior to discharge. The permittee shall maintain a written log for each at-sea discharge, noting the time, date, amount, nature and location (latitude and longitude in degrees, minutes, and seconds as determined by GPS) of each discharge. The permittee shall also record observations of types and approximate numbers of sea ducks, seabirds, and marine mammals attracted to and congregating in the discharge track.

2. Wash-down water, including EPA-approved disinfectants added to wash-down water to facilitate the removal of wastes and to maintain sanitary standards during processing or to sanitize seafood processing areas.

3. Sanitary wastewater that is indirectly discharged through a local municipal treatment facilities or to septic systems which meet State requirements under 18 AAC 72, or that is treated by a secondary treatment facility or a certified and operable Type I or Type II Marine Sanitation Device prior to discharge.

4. Other wastewater generated in the seafood processing operation, including domestic gray water, seafood catch transfer water, live tank water, refrigerated seawater, cooking water, boiler water, cooling water, refrigeration condensate, freshwater pressure relief water, clean-up water, and scrubber water.

All discharges shall comply with Alaska Water Quality Standards [18 AAC 70] while in the waters of the State of Alaska.

B. Unauthorized discharges

1. The discharge of pollutants not specifically set out in this Part is not authorized under this Permit.

2. This general NPDES permit does not authorize any discharges from facilities that (1) have not submitted a Notice of Intent and received written authorization to discharge under this Permit from EPA or (2) have not been notified in writing by EPA that they are covered under this Permit as provided for in the Code of Federal Regulations (CFR) volume 40, section 122.28(b)(2)(vi).

3. **The discharge of petroleum** (e.g., diesel, kerosene, and gasoline) or hazardous substances into or upon the navigable waters of the U.S., adjoining shorelines, into or upon the waters of the contiguous zone which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the U.S., **is prohibited** under 33 U.S.C.A. § 1321(b)(3). Any person in charge of a vessel, an onshore facility or an offshore facility shall, as soon as he has knowledge of any discharge of oil or a hazardous substances from such vessel or facility, immediately notify the U.S. Coast Guard's Command Center (1-800-478-5555) and ADEC's Oil Spill Prevention and Emergency Response Hotline (1- 800-478-9300) of such discharge.

III. AREAS EXCLUDED FROM AUTHORIZATION UNDER THIS GENERAL NPDES PERMIT

Subject to the waiver provision set out in Part III.E, this Permit does not authorize the discharge of pollutants in the following circumstances:

A. Protected water resources, critical habitats and special areas

This Permit does not authorize the discharge of pollutants into the protected water resources, critical habitats and special areas as listed below and described in the table and figures of the Appendix. [See Appendices A, B and C.]

1. Within one (1) nautical mile of a State Game Sanctuary, State Game Refuge or State Critical Habitat Area.

2. Within one (1) nautical mile of a National Park, Preserve or Monument.

3. Within one (1) nautical mile of a National Wildlife Refuge.

4. Within one (1) nautical mile of a National Wilderness Area.

5. In a river designated as wild or scenic under the Wild and Scenic Rivers Act.

6. Within three (3) nautical miles of the seaward boundary of a rookery or major haul-out area of the Steller sea lion which has been designated as "critical habitat" by the National Marine Fisheries Service (NMFS) and within fishing areas closed by NMFS as critical Steller sea lion habitat.

7. Within one (1) nautical mile of the seaward boundary of a nesting area of a colony of one thousand or more of the following seabirds during the period May 1 through September 30: auklets, cormorants, fulmars, guillemots, kittiwakes, murres, petrels, puffins and/or terns and other local aggregations of seabirds, including non-colony nesting birds such as eiders and murrelets.

8. Within one (1) nautical mile of designated critical habitat for the Steller's eider, including nesting and breeding areas on the North Slope of Alaska and the Yukon-Kuskokwim Delta during the months of May through September and including the wintering range in sixteen (16) coastal Alaskan areas during the months of October through April as set forth in Appendices A, B and C.

9. Orca Inlet. No discharge of uncooked fish processing waste residues may occur during the months of November, December, January, February and March in of Orca Inlet where sea otters, which are protected under the Marine Mammal Protection Act, are attracted to the discharge and waste deposit as a food source.

10. "Living substrates," such as submerged aquatic vegetation, kelp and eelgrass in shallow coastal waters (generally less than minus 60 ft depth MLLW).

B. At-risk water resources and waterbodies

This Permit does not authorize the discharge of pollutants in the following at-risk water resources and waterbodies.

1. Areas with water depth of less than 60 feet mean lower low water (MLLW) that have or are likely to have poor flushing, including but not limited to sheltered waterbodies such as bays, harbors, inlets, coves and lagoons and semi-enclosed water basins bordered by sills of less than 60 feet MLLW depth. For the purposes of this section, "poor flushing" means average currents of less than one-third (0.33) of a knot at any point in the receiving water within three hundred (300) feet of the outfall.

2. Akun Island: Lost Harbor.

3. Lakes, rivers and streams.

C. Degraded waterbodies

This Permit does not authorize the discharge of pollutants into any waterbody included in ADEC's 1998 (or subsequent revisions) CWA 305(b) report or CWA § 303(d) list of waters which are "impaired" or "water quality-limited" for dissolved gas or residues (i.e., floating solids, debris, sludge, deposits, foam or scum).

D. Small waterbodies

Any waterbody that would not meet the minimum requirements for mixing zone size specification under 18 AAC 70.255: “the linear length of all mixing zones intersected on any given cross section of an estuary, inlet, cove, channel or other marine water may not exceed 10% of the total length of that cross section and the total horizontal area allocated to all mixing zones may not exceed 10% of the surface area.” Since the state-authorized mixing zone has a diameter of 200 ft, a bay or channel that is less than 2,000 ft across fails to meet these criteria and is designated as a “small” waterbody excluded from coverage under this Permit.

E. Areas covered by other general NPDES permits

1. This Permit does not authorize the discharge of pollutants to receiving waters adjacent to the City of Kodiak, including Kodiak Harbor, St. Paul Harbor, Gibson Cove, Near Island Channel, Women's Bay, and Woody Island Channel.

2. This Permit does not authorize the discharge of pollutants to the receiving waters within three (3) nautical miles of the Pribilof Islands.

F. Waiver to discharge in the excluded areas

An owner or operator of a seafood processing facility may request a waiver to discharge under this Permit in the excluded areas listed in Parts III.A-D. In order to obtain a waiver to discharge in one or more of these excluded areas, an applicant must submit a timely and complete request for a waiver in accordance with the requirements listed in Part IV.D. Pre-existing, permanent shore-based siting may be considered justification for a waiver.

IV. APPLICATION TO BE PERMITTED UNDER THIS GENERAL NPDES PERMIT

In order to be authorized to discharge any of the pollutants set out in Part II to waters of the United States under this general NPDES permit, one must apply for coverage under this Permit. This general NPDES permit does not authorize any discharges from facilities that have not received authorization from EPA to discharge under this Permit.

A. Submittal of a Notice of Intent to be covered under this general NPDES permit

An applicant wishing authorization to discharge under this Permit shall submit a timely and complete Notice of Intent (NOI) to EPA and ADEC in accordance with the requirements listed herein. [See Attachment B for NOI form.] A qualified applicant will be authorized to discharge under this Permit upon its certified receipt from EPA of written notification of inclusion and the assignment of an NPDES permit number.

1. EPA may notify a discharger that it is covered by this general NPDES permit, even if the discharger has not submitted a Notice of Intent [40 CFR § 122.28(b)(2)(vi)].

2. EPA may require any discharger applying for coverage under this general NPDES permit to apply for and obtain an individual NPDES permit in accordance with 40 CFR § 122.28(b)(3).

3. Any applicant planning (1) to construct a facility or to convert a facility that was not previously permitted as a seafood processor under NPDES and (2) to discharge pollutants regulated under NPDES shall be required to prepare an Environmental Information Document (EID) and submit this EID to EPA Region 10. The EID will include information on the potential effect of the construction and operation on water quality, threatened and endangered species, essential fish and shellfish habitat, and other environmental values. EPA will use the EID to prepare an Environmental Assessment to make a determination of the impacts of the permit action in compliance with the National Environmental Protection Act (NEPA). Guidance for preparing the EID can be obtained by contacting EPA's Office of Water NEPA Compliance Coordinator.

4. An owner of any shore-based or near-shore facility to be constructed after the issuance of this Permit shall submit to the State of Alaska, Division of Governmental Coordination, a Coastal Project Questionnaire to determine if a review is needed for consistency with the Alaska Coastal Management Plan.

5. A permittee authorized to discharge under this Permit shall submit to EPA and ADEC an updated and amended NOI when there is any material change in the information submitted within its original NOI.

6. A permittee shall submit its original Notice of Intent to be covered under this general NPDES permit to:

   U.S. Environmental Protection Agency Region 10
   NPDES Permit Unit OW-130
   1200 Sixth Avenue
   Seattle, Washington 98101

   and, a copy to:

   Alaska Department of Environmental Conservation
   Attention: Air and Water Quality Division
   555 Cordova Street
   Anchorage, Alaska 99501

B. What constitutes a "timely" submittal of a Notice of Intent

1. New permittee. A new permittee not previously authorized to discharge by general NPDES permit no. AK-G52-0000 and seeking coverage under this Permit shall

submit an NOI at least 60 days prior to the commencement of operation and discharge at its facility.

2. Previous permittee. A permittee covered by the 1995 version of general NPDES permit no. AK-G52-0000 for seafood processors who submitted its NOI prior to August 4, 2000, is deemed to have submitted a “timely” NOI. A permittee covered by the 1995 version of general NPDES permit no. AK-G52-0000 who did not submit an NOI prior to August 4, 2000, must submit an NOI to be authorized under this Permit no later than 90 days from the effective date of this Permit.

3. Any discharger who fails to submit an NOI and/or obtain coverage under this Permit and who discharges seafood wastes to receiving waters of the U.S., will be in violation of the Clean Water Act for discharging without an NPDES permit.

C. What constitutes a "complete" submittal of a Notice of Intent

1. Permit information.

   An NOI shall include any NPDES number(s) currently or previously assigned to the facility and the ADEC-EH seafood processor permit number.

2. Operator information. The operator of a facility will be the permitted discharger.

   An NOI shall include the name, complete address and telephone number of the operator of the facility and the name of the operator’s duly authorized representative. If a facsimile machine and/or email address is available at this address, it is useful to provide a FAX number and/or email address.

3. Owner information.

   An NOI shall include the name and the complete address and telephone number of the owner of the facility and the name of the owner’s duly authorized representative. If a facsimile machine and/or email address is available at this address, it is useful to provide a FAX number and/or email address.

4. Facility or vessel information.

   a. An NOI shall include the name, address and telephone number of the facility or vessel. If the name of the facility or vessel has changed, the NOI shall include the previous name(s) of the facility or vessel and the date(s) of these changes during the last five years. If a facsimile machine and/or email address is available at this address, it is useful to provide a FAX number and/or email address.

   b. For near-shore and shore-based facilities or vessels, an NOI shall include a description of the physical location of the facility and its accurate location in

terms of latitude and longitude with a precision of at least 15 seconds of a degree (. 0.25 mile).

An NOI shall also include an area map of the location of the facility or vessel and all outfall(s). This map shall be based upon an official map or bathymetric chart of the National Oceanic and Atmospheric Administration (NOAA) or the U.S. Geologic Survey (USGS) of a scale of resolution from 1:20,000 to 1:65,000.

c. For mobile facilities, an NOI shall include the U.S. Coast Guard (USCG) vessel number, the type, and any former name of the vessel.

5. Facility classification.

An NOI shall include the classification(s) of the facility as one or more of the following categories of seafood processors:

a Off-shore seafood processor: a processor operating and discharging more than one (1) nautical mile from shore at MLLW.

b. Near-shore seafood processor: a processor operating and discharging from one (1) to one-half (0.5) nautical mile from shore at MLLW.

c. Shore-based seafood processor: a processor operating and discharging less than one-half (0.5) nautical mile from shore at MLLW.

6. Projected production information.

An NOI shall include projected production data based upon historical operations and design capacity. Production data includes an identification of the process applied to the product, the name and quantity (in pounds) of the raw product(s) by species, the type(s) and quantity (in pounds) of the finished product(s), and the design capacity of the quantity (in pounds) of each raw product which can be processed in a 24-hour day. The NOI shall also include the projected processing location(s) and number of operating days by month for the facility.

7. Description of discharges.

An NOI shall include information concerning all the discharges from the facility.

a. Sanitary wastes. The NOI shall identify the type of the sanitary wastewater treatment system. For shore-based facilities, (1) identify the municipal system or on-site septic system that accepts the discharge and (2) indicate its design capacity and treatment process. For vessels, identify the type of marine sanitation device (MSD), including the date when the USCG approved

and certified the MSD, when it was installed, its capacity (gal/day) and number of people using the MSD.

b. Seafood processing wastes discharges. An NOI shall include the depth at MLLW and the distance from shore at MLLW of the end of the outfall pipe at which the effluent is discharged, the name and type of grinder used to treat seafood processing wastewater, and the design grinding dimension.

c. Other wastewater. An NOI shall include information on process disinfectants, domestic wastewater, cooling water, boiler water, refrigeration condensate, transfer water, gray water, live tank water and freshwater pressure relief water.

d. Projected maximum quantity. An NOI shall include the projected maximum quantity in pounds (lbs) of seafood processing waste residues which is projected to be discharged on a daily basis and on an annual basis.

8. Receiving water information.

a. An NOI shall include the name(s) of the waterbody(ies) receiving the discharges of the facility and the name of any larger, adjacent receiving waterbody.

b. An NOI shall include information concerning any areas within three (3) nautical miles which are excluded from coverage under this Permit in Part III.

c. For near-shore and shore-based processors, an NOI shall include a bathymetric map of the receiving water within one (1) nautical mile of the discharge.

d. For near-shore and shore-based processors, an NOI shall include information of the average and maximum currents adjacent to the facility and at the point of discharge and the maximum tidal range of these waters.

9. Fueling capability and proximity to fueling stations.

An NOI shall include information about whether a permittee has the capability to refuel fishing vessels and, if so, the volume of its refueling tank.

If a permittee does not have a refueling capability, the NOI should report the location and the estimated distance of the nearest fuel station to the site at which the permittee discharges.

10. Submittals with the NOI.

    Requests for waivers, a bathymetric map showing the facility and the surrounding receiving water to a distance of at least three (3) nautical miles, a diagrammatic map showing the facility and its outfall locations, a best management practices plan certification, a recent seafloor survey, and other pertinent documents must be submitted with the NOI to complete this application. [See Attachment D for seafloor survey form.]

11. Signatory requirements. All permit applications shall be signed as follows:

    a. For a corporation: by a principal corporate officer.

    b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.

    c. For a municipality, state, tribe, federal or other public agency: by either a principal executive officer or ranking elected official.

D. How does an applicant request a waiver to discharge in an excluded area under this general NPDES permit

An applicant who seeks a waiver of one or more of the requirements for discharge location in Part III.A-D must submit a timely and complete request for a waiver in accordance with the following requirements.

1. A Notice of Intent to be authorized to discharge under this general NPDES permit in accordance with the requirements of Parts IV.A-C.

2. A detailed description of the circumstances requiring discharge to the excluded area. This description should address alternatives to discharging within the excluded area.

3. A detailed description of the nature, magnitude and duration of the seafood processing operation and its discharges within the excluded area.

4. A detailed map showing the proposed or existing facility location, outfall location, receiving water bathymetry, surrounding upland topography and any protected water resources, special habitats or areas listed in Part III which are located within three (3) nautical miles of the site or its outfall. This area map of the facility and its outfall(s) shall be based upon an official map or chart of NOAA or USGS of a scale of resolution from 1:20,000 to 1:65,000.

5. A description of how and why the discharges will not cause a violation of state water quality standards, including antidegradation, zone of deposit and mixing zone, in the receiving waters. [see 18 AAC 70]

6. A description of how and why the discharges will not cause a significant degradation of the physical, chemical or biological integrity of the receiving water, especially essential fish and shellfish habitat. Examples of such environmental degradation include but are not limited to persistent seafloor deposits of residues, shoreline deposits of residues, and increased mortality in communities of marine life.

7. A description of how and why the discharges will not harm or impair the reproduction and growth of any threatened or endangered species within three (3) nautical miles of the proposed operation and discharge.

A waiver will not be authorized by EPA until after written concurrence by ADEC and after consultation between EPA and other appropriate federal and state government agencies and tribal governments to determine that the proposed discharge will comply with applicable state and federal laws and regulations, state-approved Coastal Zone Management Plans, and federally-approved tribal Coastal Zone Management Plans. ADEC may place appropriate conditions or requirements on the permittee under State law before approving a waiver under this part.

V. CATEGORIES OF PERMITTEES AND REQUIREMENTS

A. Off-shore seafood processors

(a processor operating and discharging more than one (1) nautical mile from shore at MLLW).

1. Effluent limitations and requirements.

   a. Amount of seafood processing wastes. A permittee shall not discharge a volume or weight of seafood processing waste residues on a daily or annual basis which exceeds the amount reported in the permittee's Notice of Intent to be covered under this Permit.

   b. Collection, conveyance, treatment and limitation of seafood processing wastes. A permittee shall route all seafood processing wastes through a waste conveyance and treatment system. The waste solids discharged from its outfall(s) shall not exceed one-half (0.5) inch in any dimension.

   c. Scupper and floor drain wastes. A permittee shall route all incidental seafood processing waste in scuppers and floor drains through a waste conveyance system to the waste treatment system prior to discharge.

   d. Waste conveyance system. A permittee shall conduct a daily visual inspection of the waste conveyance, including a close observation of the sump or other places of effluent collection for the removal of gloves, earplugs, rubber bands, or other equipment used during the processing of seafood that may inadvertently be entrained in the wastewater. Discharge of such items is

prohibited. Logs of this daily inspection must be kept on-board the vessel. Summaries of any items found and removed shall be submitted with the annual report.

e. Grinder system. A permittee shall conduct a daily inspection of the grinder system during the processing season to confirm that the grinder(s) is (are) (1) operating and (2) reducing the size of the seafood residues to one-half inch or smaller. This will require inspecting the size of the ground residues reduced in grinding. Logs of these daily inspections shall be kept at the facility. Failure of the one-half inch grinding size shall be reported to EPA and ADEC in accordance with Part VII.C and summarized in the annual report.

f. Outfall system. A permittee shall discharge seafood processing wastes to or below the sea surface. A pre-operational check of the outfall system shall be performed at the beginning of each processing season to ensure that the outfall system is operable. Logs of this check must be kept on-board the vessel. Any failure of the outfall system shall be reported to EPA and ADEC in accordance with Part VII.C and summarized in the annual report.

g. Sanitary wastes. A permittee shall route all sanitary wastes through a sanitary waste system that meets the applicable Coast Guard pollution control standards then in effect [33 CFR § 159: "Marine sanitation devices"]. Nonfunctioning and undersized systems are prohibited.

h. Other wastewaters. A permittee shall not discharge any other wastewaters that contain foam, floating solids, grease or oily wastes which produce a scum or sheen on the water surface, nor wastes that deposit residues which accumulate on the seafloor or shoreline. The incidental foam and scum produced by discharge of seafood catch transfer water must be minimized to the extent practicable as described in the best management practices plan of Part VI.A. Wastewaters that have not had contact with seafood are not required to be discharged through the seafood process waste-handling system.

i. State-authorized mixing zone [see 18 AAC 70]. The mixing zone for the discharges authorized in Part II of this permit shall be a cylindrical shape with dimensions described as follows: the horizontal extent determined by a 100-foot radius around the terminus of the outfall, extending vertically up to the sea surface and extending vertically down to the seafloor.

The mixing zone is a volume of water that surrounds the discharge outfall where the effluent plume is diluted by the receiving water and within which the following specific water quality criteria may be exceeded: residues, dissolved gas, oil and grease, fecal coliform, pH, temperature, color, turbidity and total residual chlorine. Discharges shall not violate Alaska Water Quality Standards criteria beyond the 100-foot mixing zone.

j. Monitoring. A permittee shall monitor its processing and discharges to develop and submit a timely, complete and accurate annual report and to detect and minimize occurrences of noncompliance with the limitations and conditions of this permit.

2. Best management practices requirements

During the term of this permit all permittees shall operate in accordance with a Best Management Practices Plan as described in Part VI.A.

3. Annual requirements

During the term of this permit all permittees shall prepare and submit an accurate and timely annual report of noncompliance, production, discharges and process changes as described in Part VI.B.

B. Near-shore seafood processors
(a processor operating and discharging from one (1) to one-half (0.5) nautical mile from shore at MLLW)

1. Effluent limitations and requirements

a. Limit on the amount of seafood processing waste residues. A permittee shall not discharge a volume or weight of seafood processing waste residues on a daily or annual basis which exceeds the amount reported in the permittee's NOI. In no case shall a permittee discharge a wasteload of more than 10 million pounds per calendar year of seafood processing waste residues *(raw, unprocessed product minus finished, processed product*) unless authorized by EPA and ADEC.

A near-shore processor may apply for coverage under this Permit to discharge seafood processing wastes from a shuttle vessel underway at a speed exceeding three knots to an at-sea receiving water that is both (1) more than one nautical mile from shore as delineated at MLLW and (2) in water deeper than minus 120 ft MLLW. In the case of such an application for an additional discharge at-sea, the permittee shall submit an additional NOI which provides information on the proposed discharge in accordance with the requirements of Part IV of the Permit. In the case of authorization to discharge at-sea, the requirements of Part V.A ("Off-shore Seafood Processors") shall apply to the at-sea discharge. Seafood processing wastes discharged at-sea shall not be counted against the limit of 10 million pounds per calendar year.

A permittee may request a waiver to discharge under this Permit in excess of the processing waste limit of 10 million pounds per calendar year by submitting a timely and complete request for a waiver in accordance with the following requirements:

(1) A Notice of Intent to be authorized to discharge under this general NPDES permit in accordance with the requirements of Parts IV.A-C.

(2) A detailed description of the circumstances in support of the waiver request including alternatives to discharging in excess of the 10 million pounds per calendar year.

(3) A detailed description of the nature, magnitude and duration of the seafood processing operation and its discharges.

(4) A detailed map showing the facility location, outfall location(s) (including old abandoned outfalls and those in use), receiving water bathymetry and any protected water resources, special habitats or areas listed in Part II of this Permit which are located within three (3) nautical miles of the site or its outfall.

(5) A description of how and why the discharges do not and will not cause a violation of State water quality standards (including antidegradation, zone of deposit and mixing zone) in the receiving waters [ACC Vol. 18, Part 70].

(6) At least one seafloor survey conducted not longer than one year prior to the date of submittal that gives the areal amount of each previous and current waste deposit and meets the objective in Part VI.C.3.

If a waiver is approved, EPA and ADEC will revoke it by written notice to the permittee if new information is discovered that shows that the discharge is (1) violating State water quality standards or the zone of deposit authorized by ADEC or (2) otherwise degrading waters of the U.S.

A waiver will not be authorized by EPA until after written concurrence by ADEC and after consultation between EPA and other appropriate federal and state government agencies and tribal governments to determine that the proposed discharge will comply with applicable state and federal laws and regulations, state-approved Coastal Zone Management Plans, and federally-approved tribal Coastal Zone Management Plans.

b. Collection, conveyance, treatment and limitation of seafood processing wastes. A permittee shall route all seafood processing wastes through a waste conveyance and treatment system. The waste solids discharged from its outfall(s) shall not exceed one-half (0.5) inch in any dimension.

c. Scupper and floor drain wastes. A permittee shall route all incidental seafood processing waste in scuppers and floor drains through a waste conveyance system to the waste treatment system prior to discharge.

d. Waste conveyance system. A permittee shall conduct a daily visual inspection of the waste conveyance, including a close observation of the sump or other places of effluent collection for the removal of gloves, earplugs, rubber bands, or other equipment used during the processing of seafood that may inadvertently be entrained in the wastewater. Discharge of such items is prohibited. Logs of this daily inspection must be kept on-board the vessel. Summaries of any items found and removed shall be submitted with the annual report.

e. Grinder system. A permittee shall conduct a daily inspection of the grinder system during the processing season to confirm that the grinder(s) is (are) (1) operating and (2) reducing the size of the seafood residues to one-half inch or smaller. This will require inspecting the size of the ground residues reduced in grinding. Logs of these daily inspections shall be kept on-board the vessel. Failure of the one-half inch grinding size shall be reported to EPA and ADEC in accordance with Part VII.C and summarized in the annual report.

f. Outfall system. A permittee shall discharge seafood processing wastes through an outfall line or a through-the-hull port at a depth of three (3) feet or more below the sea surface and to the receiving water at least minus 60 foot depth MLLW. A pre-operational check of the outfall line(s) shall be performed at the beginning of each processing season to ensure that the outfall system is operable. Logs of this check must be kept on-board the vessel. Any failure of the outfall system shall be reported to EPA and ADEC in accordance with Part VII.C and summarized in the annual report.

g. Sanitary wastes. A permittee shall route all sanitary wastes through a sanitary waste system that meets the applicable Coast Guard pollution control standards then in effect [33 CFR § 159: "Marine sanitation devices"]. Nonfunctioning and undersized systems are prohibited.

h. Other wastewaters. A permittee shall not discharge any other wastewaters that contain foam, floating solids, grease or oily wastes which produce a scum or sheen on the water surface, nor wastes that deposit residues which accumulate on the seafloor or shoreline. The incidental foam and scum produced by discharge of seafood catch transfer water must be minimized to the extent practicable as described in the best management practices plan of Part VI.A. Wastewaters that have not had contact with seafood are not required to be discharged through the seafood process waste-handling system.

i. Nuisance discharge. The discharge of seafood processing wastes shall not create an attractive nuisance situation whereby fish or wildlife are attracted to waste disposal or storage areas in a manner that creates a threat to fish or wildlife or to human health and safety.

j. Residues. A permittee shall not discharge seafood sludge, deposits, debris, scum, floating solids, oily wastes or foam which alone or in combination with other substances:

(1) make the water unfit or unsafe for use in aquaculture, water supply, recreation, growth and propagation of fish, shellfish, aquatic life and wildlife, or the harvesting and consumption of raw mollusks or other raw aquatic life;

(2) cause a leaching of deleterious substances;

(3) cause a film, sheen, emulsion or scum on the surface of the water;

(4) cause a scum, emulsion, sludge or solid to be deposited on the adjoining shorelines; or

(5) cause a scum, emulsion, sludge or solid to be deposited on the bottom.

k. State-authorized mixing zone [see 18 AAC 70]. The mixing zone for the discharges authorized in Part II of this Permit shall be a cylindrical shape with dimensions described as follows: the horizontal extent determined by a 100-foot radius around the terminus of the outfall, extending vertically up to the sea surface and extending vertically down to the seafloor.

The mixing zone is a volume of water that surrounds the discharge outfall where the effluent plume is diluted by the receiving water and within which the following specific water quality criteria may be exceeded: residues, dissolved gas, oil and grease, fecal coliform, pH, temperature, color, turbidity and total residual chlorine. Discharges shall not violate Alaska Water Quality Standards criteria beyond the 100-foot mixing zone.

l. State-authorized zone of deposit [see 18 AAC 70]. The ADEC authorizes a zone of deposit of one (1) acre for each facility authorized by this general permit under the classification of near-shore seafood processor in marine waters (includes estuaries and coastal waters).

Discharges shall not violate the Alaska water quality standards criteria for residues beyond the authorized zone of deposit. In no case may water quality standards be violated in the water column outside of the zone of deposit, including leaching from, or suspension of, deposited materials.

m. Monitoring. A permittee shall monitor its processing and discharges to develop and submit a timely, complete and accurate annual report and to detect and minimize occurrences of noncompliance with the limitations and conditions of this Permit.

2. Best management practices requirements.

   During the term of this Permit all permittees shall operate in accordance with a Best Management Practices Plan as described in Part VI.A.

3. Annual reporting requirements.

   During the term of this Permit all permittees shall prepare and submit an accurate and timely annual report of noncompliance, production, discharges and process changes as described in Part VI.B.

4. Seafloor monitoring requirements.

   During the term of this Permit all permittees classified as near-shore seafood processors and discharging to receiving waters of depths of less than minus 120 feet MLLW at a single location for more than seven (7) days within a year shall conduct a seafloor monitoring program as described in Part VI.C. A "single location" refers to the outfall(s) (past and present) of an on-shore facility or the anchorage of a vessel within a circular area with a radius equal to one-half (0.5) nautical mile.

5. Sea surface and shoreline monitoring requirements.

   During the term of this Permit all permittees classified as near-shore seafood processors shall conduct a daily sea surface and a weekly shoreline monitoring program as described below in Part VI.D.

C. Shore-based seafood processors
(a floating or on-shore processor operating and discharging less than one-half (0.5) nautical mile from shore at MLLW)

1. Effluent limitations and requirements

   a. Limit on the amount of seafood processing waste residues. A permittee shall not discharge a volume or weight of seafood processing waste residues on a daily or annual basis which exceeds the amount reported in the permittee's NOI. In no case shall a permittee discharge a wasteload of more than 10 million pounds per calendar year of seafood processing waste residues *(raw, unprocessed product minus finished, processed product*) unless authorized by EPA and ADEC.

      A shore-based processor may apply for coverage under this Permit to discharge seafood processing wastes from a shuttle vessel underway at a speed exceeding three knots to an at-sea receiving water that is both (1) more than one nautical mile from shore as delineated at MLLW and (2) in water deeper than minus 120 ft MLLW. In the case of such an application for an additional discharge at-sea, the permittee shall submit an additional NOI

which provides information on the proposed discharge in accordance with the requirements of Part IV of the Permit. In the case of authorization to discharge at-sea, the requirements of Part V.A ("Off-shore Seafood Processors") shall apply to the at-sea discharge. Seafood processing wastes discharged at-sea shall not be counted against the limit of 10 million pounds per calendar year.

A shore-based permittee may request a waiver to discharge under this Permit in excess of the processing waste limit of 10 million pounds per calendar year at one location by submitting a timely and complete request for a waiver in accordance with the following requirements:

(1) A Notice of Intent to be authorized to discharge under this general NPDES permit in accordance with the requirements of Parts IV.A-C.

(2) A detailed description of the circumstances in support of the waiver request including alternatives to discharging in excess of the 10 million pounds per calendar year per location.

(3) A detailed description of the nature, magnitude and duration of the seafood processing operation and its discharges.

(4) A detailed map showing the facility location, outfall location(s) (including old abandoned outfalls and those in use), receiving water bathymetry and any protected water resources, special habitats or areas listed in Part II of this Permit which are located within three (3) nautical miles of the site or its outfall.

(5) A description of how and why the discharges do not and will not cause a violation of State water quality standards, including antidegradation, zone of deposit and mixing zone, in the receiving waters [18 ACC 70].

(6) At least one seafloor survey conducted not longer than one year prior to the date of submittal that gives the areal amount of any previous and current waste deposits and meets the objective in Part VI.C.3.

If a waiver is approved, EPA and ADEC will revoke it by written notice to the permittee if new information is discovered that shows that the discharge is (1) violating State water quality standards or the zone of deposit authorized by ADEC or (2) otherwise degrading waters of the U.S.

A waiver will not be authorized by EPA until after written concurrence by ADEC and after consultation between EPA and other appropriate federal and state government agencies and tribal governments to determine that the proposed discharge will comply with applicable state and federal laws

and regulations, state-approved Coastal Zone Management Plans, and federally-approved tribal Coastal Zone Management Plans.

b. Collection, conveyance, treatment and limitation of seafood processing wastes. A permittee shall route all seafood processing wastes through a waste conveyance and treatment system. The waste solids discharged from its outfall(s) shall not exceed one-half (0.5) inch in any dimension.

c. Scupper and floor drain wastes. A permittee shall route all incidental seafood processing waste in scuppers and floor drains through a waste conveyance system to the waste treatment system prior to discharge.

d. Waste conveyance system. A permittee shall conduct a daily visual inspection of the waste conveyance, including a close observation of the sump or other places of effluent collection for the removal of gloves, earplugs, rubber bands, or other equipment used during the processing of seafood that may inadvertently be entrained in the wastewater. Discharge of such items is prohibited. Logs of this daily inspection must be kept at the facility. Summaries of any items found and removed shall be submitted with the annual report.

e. Grinder system. A permittee shall conduct a daily inspection of the grinder system during the processing season to confirm that the grinder(s) is (are) (1) operating and (2) reducing the size of the seafood residues to one-half inch or smaller. This will require inspecting the size of the ground residues reduced in grinding. Logs of these daily inspections shall be kept at the facility. Failure of the one-half inch grinding size shall be reported to EPA and ADEC in accordance with Part VII.C and summarized in the annual report.

f. Outfall system. The permittee shall not discharge from a severed, failed or leaking outfall line ten days past its severance, failure or damage unless such damage has been repaired. The permittee shall have replacement parts available on site and shall make every effort possible to repair a damaged outfall line as soon as possible. Failure of the outfall system is to be reported to EPA and ADEC in accordance with Part VII.C and summarized in the annual report. The permittee shall inform EPA and ADEC at least 60 days in advance of any planned relocation of its outfall as in Part VII.H; relocation of an outfall line does not authorize a new zone of deposit.

g. Sanitary wastes. A permittee shall route all sanitary wastes through a sanitary waste treatment system. Nonfunctioning and undersized systems are prohibited. Sanitary wastes must be either:

(1) Discharged to a shore-based septic system or a municipal wastewater treatment system,

(2) Treated prior to discharge to meet the secondary treatment limitations for both biochemical oxygen demands (BOD_5) and total suspended solids (TSS), which are 60 mg/l daily maximum, 45 mg/l weekly average, and 30 mg/l monthly average, or

(3) If a USCG-licensed vessel, treated prior to discharge by a sanitary waste system that meets the applicable Coast Guard pollution control standards then in effect [33 CFR § 159: "Marine sanitation devices"].

h. Other wastewaters. A permittee shall not discharge any other wastewaters that contain foam, floating solids, grease or oily wastes which produce a scum or sheen on the water surface, nor wastes that deposit residues which accumulate on the seafloor or shoreline. The incidental foam and scum produced by discharge of seafood catch transfer water must be minimized to the extent practicable as described in the best management practices plan of Part VI.A. Wastewaters that have not had contact with seafood are not required to be discharged through the seafood process waste-handling system.

i. Nuisance discharge. The discharge of seafood processing wastes shall not create an attractive nuisance situation whereby fish or wildlife are attracted to waste disposal or storage areas in a manner that creates a threat to fish or wildlife or to human health and safety.

j. Residues. A permittee shall not discharge seafood sludge, deposits, debris, scum, floating solids, oily wastes or foam which alone or in combination with other substances,

(1) make the water unfit or unsafe for use in aquaculture, water supply, recreation, growth and propagation of fish, shellfish, aquatic life and wildlife, or the harvesting and consumption of raw mollusks or other raw aquatic life;

(2) cause a leaching of deleterious substances;

(3) cause a film, sheen, emulsion or scum on the surface of the water;

(4) cause a scum, emulsion, sludge or solid to be deposited on the adjoining shorelines; or

(5) cause a scum, emulsion, sludge or solid to be deposited on the bottom.

k. State-authorized mixing zone [see 18 AAC 70]. The mixing zone for the discharges authorized in Part II of this Permit shall be a cylindrical shape with dimensions described as follows: the horizontal extent determined by a 100-foot radius around the terminus of the outfall, extending vertically up to the sea surface and extending vertically down to the seafloor.

The mixing zone is a volume of water that surrounds the discharge outfall where the effluent plume is diluted by the receiving water and within which the following specific water quality criteria may be exceeded: residues, dissolved gas, oil and grease, fecal coliform, pH, temperature, color, turbidity and total residual chlorine. Discharges shall not violate Alaska Water Quality Standards criteria beyond the 100-foot mixing zone.

l. State-authorized zone of deposit [see 18 AAC 70]. The ADEC authorizes a zone of deposit of one (1) acre for each facility authorized by this general permit under the classification of shore-based seafood processors in marine waters (includes estuaries and coastal waters).

Discharges shall not violate the Alaska water quality standards criteria for residues beyond the authorized zone of deposit. In no case may water quality standards be violated in the water column outside of the zone of deposit, including leaching from, or suspension of, deposited materials.

m. Discharge pipe location. A permittee discharging to marine and estuarine water shall discharge its wastewaters at a point at least 10 feet below the surface of the receiving water.

An applicant may request a waiver to this condition by providing a description of the circumstances which make this condition onerous and unnecessary to the protection of State water quality standards. The description must include, at a minimum, site-specific information about receiving water topography and currents, the historic effects of past discharges to water quality, shoreline accumulation and local fisheries, and the costs of a modification of the outfall to comply with this permit condition.

n. Monitoring. A permittee shall monitor its processing and discharges to develop and submit a timely, complete and accurate annual report and to detect and minimize occurrences of noncompliance with the limitations and conditions of this Permit.

2. Best management practices requirements

During the term of this Permit all permittees shall operate in accordance with a Best Management Practices (BMP) Plan as described in Part VI.A.

3. Annual reporting requirements

During the term of this Permit all permittees shall prepare and submit an accurate and timely annual report of noncompliance, production, discharges and process changes as described in Part VI.B.

4. Seafloor monitoring requirements

During the term of this Permit all permittees classified as shore-based seafood processors and discharging to receiving waters of depths of less than 120 ft MLLW at a single location for more than seven (7) days within a year shall conduct a seafloor monitoring program as described in Part VI.C. A "single location" refers to the outfall(s) (past and present) of an on-shore facility or the anchorage of a vessel within a circular area with a radius equal to one-half (0.5) nautical mile.

5. Sea surface and shoreline monitoring requirements

   During the term of this Permit all permittees classified as shore-based seafood processors shall conduct a daily sea surface and daily shoreline monitoring program as described below in Part VI.D.

VI. SPECIFIC WASTE MINIMIZATION AND MONITORING REQUIREMENTS

A. Best management practices plan

1. Applicability. During the term of this Permit all permittees shall operate in accordance with a Best Management Practices (BMP) Plan.

2. Implementation. A newly authorized permittee shall develop and implement a BMP Plan within six (6) months of the date of that permittee's authorization to discharge under this Permit. A previously authorized permittee shall review its BMP Plan and resubmit certification with the NOI that the BMP Plan has been reviewed and revised to meet the requirements of this part.

3. Purpose. Through implementation of a BMP Plan a permittee shall prevent or minimize the generation and discharge of wastes and pollutants from the facility to the waters of the United States. Pollution should be prevented or reduced at the source. Potential pollutants should be recycled in an environmentally safe manner whenever feasible. The discharge of pollutants into the environment should be conducted in such a way as to have a minimal environmental impact.

4. Objectives. A permittee shall develop its BMP Plan consistent with the following objectives.

   a. The number and quantity of pollutants and the toxicity of the effluents that are generated, discharged or potentially discharged from the facility shall be minimized by a permittee to the extent feasible by controlling each discharge or potential pollutant release in the most appropriate manner.

   b. Evaluations for the control of discharges and potential releases of pollutants shall include the following.

      (1) Each facility component or system shall be examined for its pollutant minimization opportunities and its potential for causing a release of significant amounts of pollutants to receiving waters due to the failure or

improper operation of equipment. The examination shall include all normal operations, including raw material and product storage areas, in-plant conveyance of product, processing and product handling areas, loading or unloading operations, wastewater treatment areas, sludge and waste disposal areas, and refueling areas.

(2) Equipment shall be examined for potential failure and any resulting release of pollutants to receiving waters. Provision should be made for emergency measures to be taken in such an event.

c. Under the BMP plan and any Standard Operating Procedures (SOPs) included in the plan, the permittee shall ensure the proper operation and maintenance of the facility and the control of the discharge or potential release of pollutants to the receiving water.

5. Requirements. The BMP Plan shall be consistent with the purpose and objectives in Parts VI.B.3-4.

a. The BMP plan shall be consistent with the general guidance contained in the publication entitled “Guidance Manual for Developing Best Management Practices,” USEPA 1993, or its subsequent revisions.

b. The BMP Plan shall be documented in narrative form, shall include any necessary plot plans, drawings or maps, and shall be developed in accordance with good engineering practices. The BMP Plan shall be organized and written with the following structure:

(1) Name and location of the facility;

(2) Statement of BMP policy;

(3) Materials accounting of the inputs, processes and outputs of the facility;

(4) Risk identification and assessment of pollutant discharges;

(5) Specific management practices and standard operating procedures to achieve the above objectives, including, but not limited to,

(a) the modification of equipment, facilities, technology, processes and procedures;

(b) the improvement in management, inventory control, materials handling or general operational phases of the facility; and

(c) to reduce or eliminate any discharge of wastes that have the potential to collect and foul set or drift nets used in subsistence or commercial fisheries in nearby traditional use areas.

(6) Good housekeeping;

(7) Preventative maintenance;

(8) Inspections and records; and

(9) Employee training.

c. The BMP Plan shall include the following provisions concerning its review:

(1) Be reviewed by the facility manager and appropriate staff; and

(2) Include a statement that the above review has been completed and that the BMP Plan fulfills the requirements set forth in this Permit. The statement shall be certified by the dated signature of the facility manager.

d. Documentation. A new permittee shall submit to EPA written certification, signed by a principal officer or a duly appointed representative of the permittee, of the completion and implementation of its BMP Plan within 30 days of its completion. A continuing permittee shall review its BMP Plan and resubmit certification that the BMP Plan has been reviewed and revised-as-needed with its NOI and in no case later than 90 days after the effective date of this Permit. The resubmittal shall describe all changes made to the BMP Plan. Each permittee shall maintain a copy of its BMP Plan at its facility or on-board the vessel and shall make the plan available to EPA or ADEC upon request. All offices of a permittee which are required to maintain a copy of this Permit shall also maintain a copy of the BMP Plan and make it available to EPA and ADEC inspectors upon request.

6. BMP Plan modification. A permittee shall amend the BMP Plan whenever there is a change in the facility or in the operation of the facility which materially increases the generation of pollutants and their release or potential release to the receiving waters. A permittee shall also amend the Plan, as appropriate, when facility operations covered by the BMP Plan change. Any such changes to the BMP Plan shall be consistent with the objectives and specific requirements listed. All changes in the BMP Plan shall be reviewed by the facility manager.

7. Modification for ineffectiveness. At any time, if a BMP Plan proves to be ineffective in achieving the general objective of preventing and minimizing the generation of pollutants and their release and potential release to the receiving waters and/or the specific requirements above, this Permit and/or the BMP Plan shall be subject to modification to incorporate revised BMP requirements.

B. Annual report

1. Applicability. During the term of this Permit all permittees shall prepare and submit a complete, accurate and timely annual report of incidents of noncompliance, production, discharges, and process changes to EPA and ADEC. [See Attachment C for Annual Report form.]

2. Purpose and objectives. The annual report serves to inform the regulatory agencies of the use and potential degradation of public natural resources by facilities discharging pollutants to these receiving waters under this Permit. The permittee shall provide the following information:

   a. Verification of the permittee's NPDES permit number, facility owner, facility operator, name of the facility or vessel, mailing address, telephone number and facsimile number.

   b. A summary of periods concerning noncompliance with any of the requirements of this Permit between January 1st through December 31st of the previous year, the reasons for such noncompliance, the steps taken to correct the problem and prevent further occurrences.

   c. A summary of information of production and discharge during the previous year, including:

      (1) Dates of operation by month.

      (2) Type and amount (pounds) of raw product per month.

      (3) Type and amount (pounds) of finished product per month.

      (4) Type and amount (pounds) of discharged seafood processing waste residues (raw product minus finished product) per month.

      (5) Annual number of processing days, amounts of raw products in pounds, amounts of finished products in pounds, amount of seafood processing waste residues (raw product minus finished product) discharged in pounds, and compilation of discharge locations.

      (6) Location(s) of discharge, including both the name of the receiving water and the latitude and longitude with a precision of at least 15 seconds of a degree (. 0.25 mile). [If a mobile processor is operating and discharging within three miles of shore for a continuous 24-hour period or more, then the operator shall report the date of discharge, name of the receiving water(s), latitude and longitude, and depth of the water column for each day of such discharge.]

   d. A statement of any changes to a permittee's Notice of Intent to be covered under this Permit (especially process changes, locations and production levels).

e. A report of all on-site incidents of an injured and dead Steller's eider, including petroleum-related incidents and collision-related incidents. The report should include the nature, time, location and result of the collision and any remedial action taken.

3. Signatory requirements. A permittee shall ensure that the annual report is signed by a principal officer or a duly appointed representative of the permittee.

4. Submittal. A permittee shall submit its annual report by February 14th of the year following each year of operation and discharge under this Permit. A permittee shall submit its original annual report to:

U.S. Environmental Protection Agency Region 10
NPDES Compliance Unit (OW-133)
1200 Sixth Avenue
Seattle, Washington 98101

and, a copy to:

Alaska Department of Environmental Conservation
Attention: Air and Water Quality Division
555 Cordova Street
Anchorage, Alaska 99501

C. Seafloor monitoring requirements

1. Applicability. During the term of this Permit all permittees classified as near-shore and shore-based seafood processors and discharging to receiving waters of depths of less than 120 feet MLLW at a fixed location for more than seven (7) days shall conduct a seafloor monitoring program. A "single location" refers to the outfall(s) (past and present) of an on-shore facility or the anchorage of a vessel within a circular area with a radius equal to one-half (0.5) nautical mile.

Permittees are advised that the use of commercial underwater divers in seafloor monitoring is regulated by the terms and conditions of Occupational Safety and Health Administration directive number STD 1-23.2, which provides specific health and safety requirements for diver-based seafloor monitoring surveys. [See: 29 CFR §§ 910.401-1910.441, Subpart T -- Commercial Diving Operations and http://www.osha-slc.gov/SLTC/commercialdiving/index.html .]

2. Purpose. A permittee shall conduct a seafloor monitoring program to determine compliance with the authorized zone of deposit and Alaska water quality standards for deposited residues on the bottom (seafloor). Alaska Administrative Code Chapter 18 § 70.020 states that "(residues) shall not... cause a sludge, solid or emulsion to be deposited... on the bottom." ADEC has authorized a zone of

deposit of one (1) acre for each near-shore and shore-based facility permitted under this Permit in accordance with 18 AAC 70.

3. Objective. The seafloor monitoring program shall determine the areal extent (in square feet) of the deposit of sludge, solid or emulsion. The survey shall use a deposition which is one-half inch or thicker on the bottom (seafloor) as the minimum detection level. In cases of deposition exceeding three-quarters acre (EPA's threshold for concerned interest), the seafloor monitoring program shall also determine the volume and thickness of the deposited seafood processing waste.

    a. Monitoring shall provide an accurate and precise calculation of the area of the deposited seafood processing waste from the facility. The report shall provide the area(s), the field measurements and the calculations of area.

    b. Monitoring shall provide a determination of the outer boundary of the area of the waste deposited on the bottom. All areas of deposited seafood processing waste must be measured and added together to calculate the total area of deposited seafood processing waste. (This will require a transect method capable of measuring lengths greater than 100 meters).

    c. Monitoring shall provide at least five photos of the area(s) of deposited seafood processing waste in the immediate vicinity of the outfall recorded from a distance of two to three (2-3) feet from the surface of the deposit.

4. Schedule and submittal. All permittees required to survey deposited seafood processing waste shall develop and implement a seafloor monitoring survey no later than December 2001 and shall submit the report with the annual report no later than February 14, 2002.

5. Safety. The permittee and the surveyor shall ensure that the seafloor survey is conducted in accordance with OSHA safety and SCUBA diving rules for diving operations as set forth in 29 CFR 1910, subpart T.

6. Tiered monitoring. The monitoring program shall be tiered in levels of increasing complexity which are determined by the area of the deposited seafood processing waste as assessed in the previous seafloor monitoring survey.

a. Tier-one survey. A tier-one survey of the area of the discharge wastepile shall be conducted if the permittee has reasonable assurance from previous surveys that the deposited seafood processing waste is less than one-half acre in area (21,780 sq. ft.) and the discharge pipe during the preceding year of operation and discharge has not been relocated, a new production line has not been added, or production since the previous seafloor monitoring survey has not increased by more than 25%. If the survey finds that the deposited waste exceeds one-half acre, then a permittee shall conduct a tier-two survey no later than December 2002.

The tier-one seafloor survey shall be conducted along two transects. The principal transect shall be oriented along the maximum horizontal dimension of each deposited waste ("the length"). The second transect ("the width") shall be perpendicular to the principal transect and shall cross it at the point where the deposited waste is widest in that direction. The survey shall record and report the measurements of the distances of each transect to the end of the observable deposited waste. This method shall be used in each area or pile of seafood processing waste deposited on the bottom and all measurements shall be added together to calculate the total area of deposit.

Figure 1. Monitoring Approach to a Tier-One Seafloor Survey.

(Tier 1 Figure)

b. Tier-two survey. If a permittee has concluded from previous seafloor monitoring surveys that its deposited seafood processing waste is greater than one-half of an acre in area (21,780 sq. ft.) and less than three quarters of an acre in area (32,670 sq. ft.), then a permittee shall conduct a tier-two survey of the area of its discharge of deposited waste prior to December 2001. If the survey finds that the deposited waste exceeds three quarters of an acre, then a permittee shall conduct tier-three survey immediately but no later than June 2002.

The tier-two seafloor survey shall be conducted along four transects. The principal transect shall be oriented along the maximum horizontal dimension of the deposited waste ("the length"). The second transect ("the width") shall be perpendicular to the principal transect and shall cross it at the point where the deposited waste is widest in that direction. The remaining two transects shall pass through the point where the first two transects intersect and shall be at 45 degree angles to the first two transects. The survey shall record and report the measurements of the distances of each transect to the end of the observable deposited waste. This method shall be used in each area or pile of seafood processing waste deposited on the bottom and all measurements shall be added together to calculate the total area of deposit.

Figure 2. Monitoring Approach to a Tier-Two Seafloor Survey.

(Tier 2 Figure)

c. Tier-three survey. If a permittee has determined from its seafloor monitoring program that its deposited seafood processing waste is equal to or greater than three quarters of an acre in area (32,670 sq. ft.), then a permittee shall conduct a tier-three survey of the area of its deposited waste each year of this Permit or until the deposited waste is less than three quarters of an acre in area.

The tier-three seafloor survey shall be conducted along four transects. The principal transect shall be oriented along the maximum horizontal dimension of the deposited waste ("the length"). The second transect ("the width") shall be perpendicular to the principal transect and shall cross it at the point where the deposited waste is widest in that direction. The remaining two transects shall pass through the point where the first two transects intersect and shall be at 45 degree angles to the first two transects. The survey shall include measurements of the distances from the point where the transects intersect to the end of the observable waste. The survey shall also include measurements of the thickness of each waste deposit at the point where the transects intersect and at the eight points that are half way between the intersection point and the end each transect. This method shall be used in each area or pile of seafood processing waste deposited on the bottom and all measurements shall be added together to calculate the total area of deposit.

Figure 3. Monitoring Approach to a Tier-Three Seafloor Survey.

(Tier Figure 3)

7. Monitoring report. A permittee shall submit a report of the seafloor monitoring survey which describes the methods and results of the survey. The report shall include the seafloor survey form. [See Attachment D for seafloor survey form.]

   a. Methods. A description of the methods including at least the name, address and phone number of the surveyor, the date of the survey, and the observational method and equipment used in the survey.

   b. Results. The report shall include the facility's name and NPDES permit number, the date(s) and times of the survey, the latitude, longitude and location relative to shore markers of the outfall terminus, and the name(s) and phone number(s) of the diver(s). The report shall include a description of the outfall pipe condition, an indication of an active or inactive discharge occurring during the time(s) of the survey, current directions and speeds, observations and photographs of waste residue size in the deposit within 10 ft of the outfall, waste residue distribution pattern, and the type and amount of marine life observed as present on the waste residue deposit or the area surrounding the waste residue deposit. The survey report shall include at least the required dimensions and area of the waste residue deposit(s) in square feet and a map of the configuration of each waste deposit in relation to both the outfall and the bathymetry of the seafloor.

   c. Area. The area of the deposited waste may be calculated by treating each separate waste deposit as the sum of the areas of two parabolas which are joined at a common base (the "width") and which have heights that together equal the "length" of the waste deposit. The calculation of the area of each waste deposit is provided by the equation:

   $$Area = (maximum\ width \times maximum\ length) \times (0.67)$$

   A permittee shall submit a report of the seafloor survey to EPA and ADEC no later than February 14th of the year following the survey, in conjunction with the Annual Report.

8. Signatory requirements. A permittee shall ensure that the monitoring report is signed by a principal officer or a duly appointed representative of the permittee.

9. Modification of monitoring program. The monitoring program may be modified if EPA and ADEC determine that it is appropriate. A modification may be requested by a permittee. The modified program may include changes in survey (1) stations, (2) times, (3) parameters or (4) methods.

10. Request for a waiver. A permittee may request a waiver of the seafloor monitoring requirements. A request for a waiver must provide a detailed description of the circumstances supporting a waiver of monitoring and a demonstration that the discharge meets the Alaska water quality standard for residues that deposit on the bottom.

11. Requirement to apply for an individual permit. EPA, in consultation with ADEC, may require a permittee to apply for an individual NPDES permit if the seafloor monitoring program indicates a probable violation of the Alaska water quality standards for residues in marine waters. EPA has selected three quarters of an acre of deposition from seafood processing waste residues as a threshold for concerned interest which may require a permittee to apply for an individual NPDES permit.

D. Sea surface and shoreline monitoring requirements

1. Applicability. During the term of this Permit all permittees classified as near-shore or shore-based seafood processors (discharging within one (1) nautical mile of shore at MLLW) shall conduct a sea surface and shoreline monitoring program.

2. Purpose. A permittee shall conduct a sea surface and shoreline monitoring program to determine compliance with the authorized mixing zone and Alaska water quality standards for residues in marine waters. Alaska Administrative Code Part 18 § 70.020 states that "(floating solids, debris, foam and scum) shall not... cause a film, sheen or discoloration on the surface of the water... or cause a sludge, solid or emulsion to be deposited... upon adjoining shorelines." ADEC has authorized a mixing zone of 100-foot radius around the end of its seafood processing discharge outfall for each facility permitted under this Permit in accordance with 18 AAC 70.

   A permittee shall also conduct its sea surface monitoring program to identify and determine the numbers of species listed as threatened or endangered under the Endangered Species Act which occur in the vicinity of the effluent plume. [See Appendix D for ESA-listed species, descriptions and pictures.]

3. Objectives.

   a. Monitoring the sea surface will provide daily assessments of the presence and amounts of residues floating on the sea surface during a near-shore or shore-based facility's operation and discharge.

      (1) This monitoring program will inform the permittee of its compliance with the Permit limit for residues on the sea surface and provide a timely basis for correcting violations when they occur.

      (2) The daily monitoring of the sea surface shall record the total number of days for which observations were made and, for each day of observation, the daily incidence of occurrence and estimate any areal extent of contiguous films, sheens or mats of foam within 100-foot radius of the end of the processing waste outfall(s) and, in the case of shore-based facilities, within 100 feet of the seaward physical boundary of the facility (e.g., docks and piers).

(3) The sea surface monitoring shall enumerate the occurrence and numbers of animals identified as Steller's sea lion (*Eumetopias jubatus*), Steller's eider (*Polysticta stelleri*), spectacled eider (*Somateria fisheri)*, or short-tailed albatross (*Phoebastria albatrus*) within the survey area. [See Appendix D.]

(4) The sea surface and shoreline monitoring shall observe and record incidents of injured or dead Steller's eiders in the survey area around the facility, the adjacent shore, and the adjacent receiving water. Monitoring of Steller's eiders will include recording the numbers of injured or dead eiders and their probable cause of their injury or death, including collisions with facility structures (e.g., buildings, lights, poles, power lines, guy wires, vessels, docks and towers). Dead eiders' shall be recovered and kept frozen until they can be transferred to FWS according to the dead and injured eider handling protocol. Any collisions, or suspected collisions between Steller's eiders and processing facilities shall be immediately reported to FWS Anchorage Field Office (1-800-272-4147).

b. Monitoring the shoreline will provide periodic assessments of the presence and amounts of residues deposited upon the shore during a facility's operation and discharge.

(1) This monitoring program will inform the permittee of its compliance with the Permit limit for residues on the shoreline and provide a timely basis for correcting violations when they occur.

(2) The monitoring of the shoreline shall record the total number of days for which observations were made and, for each day of observation, the incidence of occurrence and estimated areal extent of any deposits of seafood waste sludge, solids or emulsions upon the shoreline adjacent to and within 300 ft of the facility and its outfall.

4. Schedule. A near-shore or shore-based permittee shall conduct a sea surface and shoreline monitoring program during each year of coverage under the permit in accordance with the frequency of observations required above in Parts V.A-C.

5. Monitoring reporting. A permittee shall submit a brief report of the monitoring survey which describes the methods and results of the survey. The description of the methods shall include at least the name, address and phone number of the surveyor(s), the observational method and equipment used in the survey, and the point(s) of observation. The report of positive observations shall include the date and time of observation, an estimate of any area of scum, sheen, film or foam on the sea surface, and/or any area of sludge, solids, emulsion or scum deposited on the shoreline.

A permittee shall submit the report to EPA and ADEC no later than February 14th of the year following the survey. It is recommended that this report be submitted with the annual report of production and effluent monitoring.

A permittee shall report noncompliance with the Permit limit on residues to EPA by telephone (206-553-1846) and to ADEC (907-269-7523 within 24 hours from the time a permittee becomes aware any such violation.

6. Signatory requirements. A permittee shall ensure that the monitoring report is signed by a principal officer or a duly appointed representative of the permittee.

7. Modification of monitoring program. The monitoring program may be modified if EPA and ADEC determine that it is appropriate. A modification may be requested by a permittee. The modified program may include changes in survey (1) stations, (2) times or (3) parameters.

8. Request for a waiver. A permittee may request a waiver of the sea surface and shoreline monitoring requirements. A request for a waiver must provide a detailed description of the circumstances supporting a waiver of monitoring and a demonstration that the discharge meets the Alaska water quality standard for residues. Individual monitoring days may be waived due to conditions (e.g., weather or sea state) which make this monitoring hazardous to human health and safety.

9. Requirement to apply for an individual permit. EPA, in consultation with ADEC, may require a permittee to apply for an individual NPDES permit if the sea surface and shoreline monitoring program indicates a probable violation of the Alaska water quality standards for residues.

VII. RECORDING AND REPORTING REQUIREMENTS

A. Records contents. All effluent monitoring records shall bear the hand-written signature of the person who prepared them. In addition, all records of monitoring information shall include:

1. Date, exact place and time of sampling or measurements,

2. Names of the individual(s) who performed the sampling or measurements,

3. Date(s) analyses were performed,

4. Names of the individual(s) who performed the analyses,

5. Analytical techniques or methods used, and

6. Results of such analyses.

B. Retention of records. A permittee shall retain records of all monitoring information, including but not limited to, all calibration and maintenance records, copies of all reports required by this Permit, a copy of this Permit, and records of all data used to complete the application for this Permit, for a period of at least five years from the date of the sample, measurement, report or application, or for the term of this Permit, whichever is longer. This period may be extended by request of EPA or ADEC at any time.

C. Twenty-four hour notice of noncompliance reporting.

1. A permittee shall report the following occurrences of noncompliance to EPA by telephone (206-553-1846) and to ADEC (907-269-7523) within 24 hours from the time a permittee becomes aware of the circumstances:

   a. any discharge(s) to the receiving waters not authorized for coverage under this Permit including, but not limited to, waters described in Part III, listed in Appendices A or B, or depicted in Appendix C;

   b. any noncompliance that may endanger health or the environment;

   c. any unanticipated bypass that results in or contributes to an exceedance of any effluent limitation in this Permit;

   d. any upset that results in or contributes to an exceedence of any effluent limitation in this Permit; or

   e. any violation of a maximum daily discharge limitation for any of the pollutants listed in this Permit.

2. A permittee shall also provide a written submission within five days of the time that a permittee becomes aware of any event required to be reported under subpart 1 above. The written submission shall contain:

   a. a description of the noncompliance and its cause;

   b. the period of noncompliance, including exact dates and times;

   c. the estimated time noncompliance is expected to continue if it has not been corrected; and

   d. steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance.

3. EPA may, at its sole discretion, waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the NPDES Compliance in Seattle, Washington, by telephone, (206) 553-1846.

4. Reports shall be submitted to the addresses in Part VI.B of this Permit.

D. Other noncompliance reporting. A permittee shall report all instances of noncompliance, not required to be reported within 24 hours, with the annual report.

VIII. COMPLIANCE RESPONSIBILITIES

A. Duty to comply. A permittee shall comply with all conditions of this Permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification, or for denial of a permit renewal application.

B. Penalties for violations of permit conditions.

1. Civil and Administrative Penalties. Pursuant to 40 CFR Part 19 and the Act, any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed the maximum amounts authorized by Section 309(d) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $27,500 per day for each violation).

2. Administrative Penalties. Any person may be assessed an administrative penalty by the Administrator for violating section 301, 302, 306, 307, 308, 318 or 405 of this Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Pursuant to 40 CFR 19 and the Act, administrative penalties for Class I violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $11,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed $27,500). Pursuant to 40 CFR 19 and the Act, penalties for Class II violations are not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act (28 U.S.C. § 2461 note) as amended by the Debt Collection Improvement Act (31 U.S.C. § 3701 note) (currently $11,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed $137,500).

3. Criminal Penalties:

   a. Negligent Violations. The Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of $2,500 to $25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or

subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both.

b. Knowing Violations. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

c. Knowing Endangerment. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than $1,000,000 and can be fined up to $2,000,000 for second or subsequent convictions.

d. False Statements. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

C. Need to halt or reduce activity not a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit.

D. Duty to mitigate. A permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this Permit that has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper operation and maintenance. A permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by a permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this Permit.

F. Bypass of treatment facilities.

1. Bypass not exceeding limitations. A permittee may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2 and 3 of this Part.

2. Notice.

   a. Anticipated bypass. If a permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.

   b. Unanticipated bypass. A permittee shall submit notice of an unanticipated bypass as required under Part VII.F ("Twenty-four hour notice of noncompliance reporting").

3. Prohibition of bypass.

   a. Bypass is prohibited and EPA or ADEC may take enforcement action against a permittee for a bypass, unless:

      (1) The bypass was unavoidable to prevent loss of life, personal injury or severe property damage;

      (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment shall have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

      (3) A permittee submitted notices as required under paragraph 2 of this Part.

   b. EPA and ADEC may approve an anticipated bypass, after considering its adverse effects, if EPA and ADEC determine that it will meet the three conditions listed above in paragraph 3.a of this Part.

G. Upset conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if a permittee meets the requirements of paragraph 2 of this Part. No determination made during administrative review of claims that noncompliance was caused by upset and before an action for noncompliance, is final administrative action subject to judicial review.

2. Conditions necessary for a demonstration of upset. To establish the affirmative defense of upset, a permittee shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   a. An upset occurred and that a permittee can identify the cause(s) of the upset;

   b. The permitted facility was at the time being properly operated;

   c. A permittee submitted notice of the upset as required under Part VII.F ("Twenty-four hour notice of noncompliance reporting) and

   d. A permittee complied with any remedial measures required under Part VIII.D ("Duty to Mitigate").

3. Burden of proof. In any enforcement proceeding, a permittee seeking to establish the occurrence of an upset has the burden of proof.

H. Planned changes. A permittee shall give notice to EPA and ADEC as soon as possible of any planned physical alterations or additions to the permitted facility whenever:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source as determined in 40 CFR § 122.29(b); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Permit.

   A permittee shall give notice to EPA and ADEC as soon as possible of any planned changes in process or chemical use whenever such change could significantly change the nature or increase the quantity of pollutants discharged.

I. Anticipated noncompliance. A permittee shall also give advance notice to EPA and ADEC of any planned changes in the permitted facility or activity that may result in noncompliance with this Permit.

IX. GENERAL PROVISIONS

A. Permit actions. This Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by a permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

B. Duty to reapply. If a permittee intends to continue an activity regulated by this Permit after the expiration date of this Permit, a permittee must apply for and obtain a new permit. The application shall be submitted to EPA at least 60 days before the expiration date of this Permit. Receipt of a timely Notice of Intent will administratively extend authorization to discharge until a new permit is reissued.

C. Duty to provide information. A permittee shall furnish to EPA and ADEC, within the time specified in the request, any information that EPA or ADEC may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. A permittee shall also furnish to EPA or ADEC, upon request, copies of records required to be kept by this Permit.

D. Incorrect information and omissions. When a permittee becomes aware that it failed to submit any relevant facts in a permit application, or that it submitted incorrect information in a permit application or any report to EPA or ADEC, it shall promptly submit the omitted facts or corrected information.

E. Signatory requirements. All applications, reports or information submitted to EPA and ADEC shall be signed and certified.

1. All permit applications shall be signed as follows:

   a. For a corporation: by a principal corporate officer.

   b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.

   c. For a municipality, state, tribe, federal or other public agency: by either a principal executive officer or ranking elected official.

2. All reports required by this Permit and other information requested by EPA or ADEC shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to EPA and ADEC, and

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, position of equivalent

responsibility, or an individual or position having overall responsibility for environmental matters for the permittee. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to authorization. If an authorization under subpart 2 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of subpart 2 must be submitted to EPA and ADEC prior to or together with any reports, information or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this Part shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

F. Availability of reports. Except for data determined to be confidential under 40 CFR § 2, all reports prepared in accordance with this Permit shall be available for public inspection at the offices of the state water pollution control agency and EPA and ADEC. As required by the Act, permit applications, permits and effluent data shall not be considered confidential.

G. Inspection and entry. A permittee shall allow EPA, ADEC, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon a permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this Permit; and

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

H. Oil and hazardous substance liability. Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve a permittee from any responsibilities, liabilities or penalties to which a permittee is or may be subject under Section 311 of the Clean Water Act or under the Oil Pollution Act.

I. Property rights. The issuance of this Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

J. Severability. The provisions of this Permit are severable. If any provision of this Permit or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Permit, shall not be affected thereby.

K. Transfers. This Permit may be automatically transferred to a new permittee if:

1. The current permittee notifies EPA at least 60 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between them; and

3. EPA does not notify the existing permittee and the proposed new permittee of its intent to modify, or revoke and reissue the permit.

   If the notice described in subpart 3 above is not received, the transfer is effective on the date specified in the agreement mentioned in subpart 2 above.

L. State laws. Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve a permittee from any responsibilities, liabilities or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Act.

M. Re-opener clause.

1. This Permit shall be modified or, alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2) and 307(a)(2) of the Act, as amended, if the effluent standard, limitation or requirement so issued or approved:

   a. Contains different conditions or is otherwise more stringent than any condition in this Permit; or

   b. Controls any pollutant or disposal method not addressed in this Permit.

This Permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

2. This Permit may be reopened to adjust any effluent limitations if future water quality studies, waste load allocation determinations, or changes in water quality standards show the need for different requirements.

X. DEFINITIONS and ACRONYMS

AAC means Alaska Administrative Code.

ADEC means Alaska Department of Environmental Conservation.

ADFG means Alaska Department of Fish and Game.

ADGC means State of Alaska, Division of Governmental Coordination.

At-sea means a receiving water that is both (1) more than one nautical mile from shore and (2) in water deeper than minus 120 ft MLLW.

BMP means best management practices.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility. [See Part IV.G.]

CFR means the Code of Federal Regulations.

Cooling water means once-through non-contact cooling water.

CWA means the Clean Water Act.

Daily discharge means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Discharge of a pollutant means any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source".

Domestic wastes means materials discharged from showers, sinks, safety showers, eye-wash stations, hand-wash stations, fish-cleaning stations, galleys and laundries.

EPA means the United States Environmental Protection Agency.

Excluded area means an area not authorized as a receiving water covered under this general NPDES permit, as described in Part III.A-D, listed in Appendix A or B, or depicted in Appendix C.

Garbage means all kinds of victual, domestic and operational waste, excluding fresh fish and part thereof, generated during normal operation and liable to be disposed of continuously or periodically except dishwater, gray water and those substances that are defined or listed in other Annexes to MARPOL 73/78.

Gray water means galley, bath and shower wastewater.

Living substrate means intertidal and seafloor communities of benthic plants (e.g., macro-algae and kelp) and animals (e.g., mussels, tube-building polychaete worms, and erect bryozoans) in dense aggregations. The Habitat Conservation Division of NMFS may be contacted at 907-271-5006 (Anchorage) or 907-586-7235 (Juneau) for further guidance on and the known locations of living substrates and other Habitat Areas of Particular Concern listed under the Essential Fish Habitat section of the Magnuson Fishery Conservation and Management Act.

Marine sanitation device includes any equipment for installation on board a vessel which is designed to receive, retain, treat or discharge sewage, or any process to treat such sewage.

Maximum means the highest measured discharge or pollutant in a waste stream during the time period of interest.

MLLW means mean lower low water.

mg/l means milligrams per liter.

Mince means finely chopped seafood, particularly fish.

Mixing zone means the area adjacent to a discharge or activity in the water where a receiving water may not meet all the water quality standards; wastes and water are given an area to mix so that the water quality standards are met at the mixing zone boundaries.

Monthly average means the average of *daily discharges* over a monitoring month, calculated as the sum of all *daily discharges* measured during a monitoring month divided by the number of *daily discharges* measured during that month.

MSD means marine sanitation device.

NMFS means United States National Marine Fisheries Service.

NOI means a "Notice of Intent," that is, an application, to be authorized to discharge under a general NPDES permit. [See Attachment B for NOI form.]

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water. In the case of seafood processing wastes discharged in remote locations of Alaska, EPA Region 10 has determined that the calcareous shells of scallops, clams, oysters and abalones and the calcareous tests of sea urchins are not pollutants which must be ground to one-half inch prior to discharge.

Pollution means the man-made or man induced alteration of the chemical, physical, biological or radiological integrity of the water.

Prohibited (catch) species means those species identified in 50 CFR § 679.21(b)(1), including salmon, herring, crab and halibut, that are prohibited to be retained by groundfish trawl fishing vessels. Any such species inadvertently taken in connection with groundfish fishing operations are required to be sorted and all prohibited (catch) species or parts thereof are to returned to the sea immediately, with a minimum of injury [50 CFR § 679.21(b)(ii)].

Sanitary wastes means human body waste discharged from toilets and urinals.

Seafood means the raw material, including freshwater and saltwater fish and shellfish, to be processed, in the form in which it is received at the processing plant.

Seafood process waste means the waste fluids (including stickwater), organs, flesh, bones and chitinous shells produced in the conversion of aquatic animals from a raw form to a marketable form.

Seafood process waste residue means the floating solids, debris, sludge, deposits, foam, and scum produced in the processing of raw seafood to finished product.

Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

Sewage means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes.

Single location means either the outfall(s) (past and present) of an on-shore facility or a circular anchorage area of radius equal to or less than one-half (0.5) nautical mile of a vessel.

Unwashed mince means minced fish which is neither washed nor dewatered and is frozen into blocks.

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. [See Part IV.H.]

U.S.C.A. means United States Code Annotated.

USFWS means United States Fish and Wildlife Service.

Washed mince means minced fish which is washed, dewatered and frozen into blocks. "Surimi" is included in this classification.

Water depth means the depth of the water between the surface and the seafloor as measured at mean lower low water (0.0).

Zone of deposit (ZOD) means the total area of the bottom in marine or estuarine waters in which the Alaska Department of Environmental Conservation has authorized the deposit of substances in exceedance of the water quality criteria of 18 AAC 70.020(b) and the antidegradation requirement of 18 AAC 70.015.

APPENDIX A

ALPHABETICAL LISTING OF RECEIVING WATERS EXCLUDED FROM COVERAGE UNDER GENERAL PERMIT AK-G52-0000

Code to Acronyms used for Status: NM = national monuments, NM&p = national monuments and preserves, NP = national parks, Np = national preserves, NP&p = national parks and preserves, NWA = national wilderness area, NWR = national wildlife refuges, SBN = seabird nesting areas, SCHA = state critical habitat areas, SECH = Steller's eider critical habitat, SGR = state game refuge, SGS = state game sanctuary, SSCH = Steller sea lion critical habitat, W&SR = wild and scenic river, WQ-ar = water quality at-risk, WQ-lim = water quality limited

Receiving Waters	Location	Status	Excluded Area
Admiralty Island, rivers and coastal waters	Admiralty Island, SE Alaska	NM	Admiralty Island Nat'l Monument
Akutan Harbor, west of 165°46'00"W	Akutan Island	WQ-lim	Akutan Harbor, west
Alagnak River	Nushagak-Bristol Bay lowland	W&SR	Alagnak River W&SR
Alatna River	Central Brooks Mountains Range	W&SR	Alatna River W&SR
Aleutian Islands, coastal waters	Bering Sea and north Gulf of Alaska	NWR	Alaska Maritime NWR
Alinchak Bay	Alaska Peninsula	NWR	Alaska Peninsula NWR
Alitak Bay	Kodiak Island	NWR	Kodiak NWR
Amber Bay	South-central Alaska Peninsula	NM&p	Aniakchak Nat'l Monument/Preserve
Anchor River	East of the City of Anchor Point	SCHA	Anchor River-Fritz Creek SCHA
Aniakchak Bay	South-central Alaska Peninsula	NM&p	Aniakchak Nat'l Monument/Preserve
Aniakchak River	Aleutian Mountains Range	W&SR	Aniakchak River W&SR
Baird Inlet	West Alaska	NWR	Yukon Delta NWR
Ban Bay	Afognak Island	NWR	Kodiak NWR
Baranof	Tongass Nat'l Forest, SE Alaska	NWA	South Baranof NWA
Big River wetlands, north Redoubt Bay	West of the City of Nikiski	SCHA	Redoubt Bay SCHA
Captains Bay	Unalaska Island	WQ-lim	Captains Bay
Chagvan Bay	South of the City of Good News	SGR	Cape Newenham SGR
Chagvan Bay	South of City of Good News	NWR	Togiak NWR
Charley River	Yukon-Tanana uplands	W&SR	Charley River W&SR
Chichagof-Yakobi	Tongass Nat'l Forest, SE Alaska	NWA	West Chichagof-Yakobi NWA
Chilikadrotna River	Central Brooks Mountains Range	W&SR	Chilikadrotna River W&SR
Chilkat River wetlands	Adjacent Klukwan, north of City of Haines	SCHA	Chilkat River SCHA
Chiratna Bay	North coast of Cook Inlet	NP&p	Lake Clark Nat'l Park/Preserve
Chuck River	Tongass Nat'l Forest, SE Alaska	NWA	Chuck River NWA
Cinder River delta and tidal flats	SW of the City of Pilot Point	SCHA	Cinder River SCHA

Cold Bay, outer	Alaska Peninsula	NWR	Alaska Peninsula NWR
Cold Bay, inner	SW terminus of Alaska Peninsula	NWR	Izembek NWR
Cook Inlet shoreline near Kasilof	South of the City of Kasilof to Happy Valley	SCHA	Clam Gulch SCHA
Copper River delta	SE of the City of Cordova	SCHA	Copper River Delta SCHA
Corner Bay			
Coronation Island	Tongass Nat'l Forest, SE Alaska	NWA	Coronation Island NWA
Cross Sound	North Alexander Archipelago	NP&p	Glacier Bay Nat'l Park/Preserve
Cube Cove			
Dixon Harbor	North Alexander Archipelago	NP&p	Glacier Bay Nat'l Park/Preserve
Dude Creek off Icy Passage	West of the City of Gustavus	SCHA	Dude Creek SCHA
Egegik Bay, southwest	West of the City of Egegik	SCHA	Egegik SCHA
Endicott River	Tongass Nat'l Forest, SE Alaska	NWA	Endicott River NWA
Etolin	Tongass Nat'l Forest, SE Alaska	NWA	South Etolin NWA
Fox River delta at head of Kachemak Bay	NE of the City of Homer	SCHA	Fox River Flats SCHA
Fritz Cove	City of Juneau	SGR	Mendenhall Wetlands SGR
Fritz Creek	East of the City of Anchor Point	SCHA	Anchor River-Fritz Creek SCHA
Gibson Cove	City of Kodiak	WQ-ar	Gibson Cove
Glacier Bay	North Alexander Archipelago	NP&p	Glacier Bay Nat'l Park/Preserve
Goose Bay	North of the City of Anchorage	SGR	Goose Bay SGR
Hagemeister Strait	Adjacent to City of Togiak	NWR	Togiak NWR
Hallow Bay	South base of Alaska Peninsula	NP&p	Katmai Nat'l Park/Preserve
Hamilton Bay			
Hazen Bay	West Alaska	NWR	Yukon Delta NWR
Herendeen Bay, south	Alaska Peninsula	NWR	Alaska Peninsula NWR
Herring Bay	City of Sitka	WQ-lim	Herring Bay
Hobart Bay			
Hooper Bay	West Alaska	NWR	Yukon Delta NWR
Icy Bay, north	NW of the City of Yakutat	NP&p	Wrangell-St. Elias Nat'l P&p
Isabella River wetlands	City of Fairbanks	SGR	Creamer's Field SGR
Isembek Lagoon	NW terminus of the Alaska Peninsula	SGR	Izembek SGR
Izembek Lagoon	NW terminus of the Alaska Peninsula	NWR	Izembek NWR
Jacksmith Bay	Quinhagak	NWR	Togiak NWR
Jamestown Bay	Near Cannon Island	WQ-lim	Jamestown Bay
John River	Central Brooks Mountains Range	W&SR	John River W&SR
Kachemak Bay	Adjacent to Cities of Homer and Seldovia	SCHA	Kachemak Bay SCHA
Kaliakh River delta	West of Cape Yakataga	SGR	Yakataga SGR
Kamishak Bay	South base of Alaska Peninsula	NP&p	Katmai Nat'l Park/Preserve

Kamishak Bay, inner tidal flats	SE base of the Alaska Peninsula	SGR	McNeil River SGR
Kangirlvar Bay	West Alaska	NWR	Yukon Delta NWR
Karta	Tongass Nat'l Forest, SE Alaska	NWA	Karta NWA
Katmai Bay	South base of Alaska Peninsula	NP&p	Katmai Nat'l Park/Preserve
Kazakof Bay			
Kiliuda Bay	Kodiak Island	NWR	Kodiak NWR
Kinak Bay	South base of Alaska Peninsula	NP&p	Katmai Nat'l Park/Preserve
King Cove	City of King Cove	WQ-lim	King Cove
Knik River tidal flats	NE of the City of Anchorage	SGR	Palmer Hay Flats SGR
Knik Shoal	City of Anchorage	SGR	Anchorage Coastal Area SGR
Kobuk River	Central Brooks Mountains Range	W&SR	Kobuk River W&SR
Kokechik Bay	West Alaska	NWR	Yukon Delta NWR
Kootznoowoo	Tongass Nat'l Forest, SE Alaska	NWA	Kootznoowoo NWA
Koyukuk River, north fork	Eastern Brooks Mountains Range	W&SR	North Fork Koyukuk River W&SR
Kuiu	Tongass Nat'l Forest, SE Alaska	NWA	Kuiu NWA
Kukak Bay,	South base of Alaska Peninsula	NP&p	Katmai Nat'l Park/Preserve
Kulukak Bay	East of City of Twin Hills	NWR	Togiak NWR
Kupreanof Strait	Afognak Island	NWR	Kodiak NWR
Kuskokwin River delta	West Alaska	NWR	Yukon Delta NWR
Kuskokwin Bay, southern	South of the City of Good News	SGR	Cape Newenham SGR
Little Kamishak River, lower	East base of the Alaska Peninsula	SGS	McNeil River SGS
Lituya Bay	SE Alaska	NP&p	Glacier Bay Nat'l Park/Preserve
Lost Harbor	Akun Island, east Aleutian Islands	WQ-ar	Lost Harbor
Maurelle Islands	Tongass Nat'l Forest, SE Alaska	NWA	Maurelle Islands NWA
McNeil River, lower	East base of the Alaska Peninsula	SGS	McNeil River SGS
Misty Fiords	Tongass Nat'l Forest, SE Alaska	NWA	Misty Fiords NWA
Misty Fjiords	Tongass Nat'l Forest, SE Alaska	NM	Misty Fjiords Nat'l Monument
Mulchatna River	Alaska Mountains Range	W&SR	Mulchatna River W&SR
Nelson Lagoon	City of Port Moller	SCHA	Port Moller SCHA
Noatak River	Eastern Brooks Mountains Range	W&SR	Noatak River W&SR
Nuka Bay	South Kenai Peninsula	Np	Kenai Fjords Nat'l Preserve
Nushagak Bay, west	West of City of Clarks Point	NWR	Togiak NWR
NW Gastineau Channel	City of Juneau	SGR	Mendenhall Wetlands SGR
Ocean Bay	Kodiak Island	NWR	Kodiak NWR
Olga Bay	Kodiak Island	NWR	Kodiak NWR
Pack Creek, lower, off north Windfall Harbor	E Admiralty Is., SE Alaska	SGS	Stan Price SGS
Paint River	SE base of the Alaska Peninsula	SGR	McNeil River SGR

Paint River, lower	East base of the Alaska Peninsula	SGS	McNeil River SGS
Palma Bay	SE Alaska	NP&p	Glacier Bay Nat'l Park/Preserve
Petersburg Creek	Tongass Nat'l Forest, SE Alaska	NWA	Petersburg Creek NWA
Pleasant Islands	Tongass Nat'l Forest, SE Alaska	NWA	Pleasant Islands NWA
Point HcCartney			
Popof Strait	City of Sand Point	WQ-lim	Popof Strait
Port Moller, south	Alaska Peninsula	NWR	Alaska Peninsula NWR
Port Moller	City of Port Moller	SCHA	Port Moller SCHA
Port Heiden	North-central Alaska Peninsula	SCHA	Port Heiden SCHA
Pribilof Islands, coastal waters	Bering Sea	NWR	Alaska Maritime NWR
Prince of Wales	Tongass Nat'l Forest, SE Alaska	NWA	South Prince of Wales NWA
Rowan Bay	Kuru Island	WQ-lim	Rowan Bay
Russell Fiord	Tongass Nat'l Forest, SE Alaska	NWA	Russell Fiord NWA
Saginaw Bay			
Salmon River	Baird Mountains	W&SR	Salmon River W&SR
Salt Lake Bay			
Scammon Bay	West Alaska	NWR	Yukon Delta NWR
Schulze Cove			
Security Cove	South of City of Platinum	NWR	Togiak NWR
Silver Bay	City of Sitka	WQ-lim	Silver Bay
Sitkalidak Strait	Kodiak Island	NWR	Kodiak NWR
Sitkinak Bay	Trinity Islands	NWR	Kodiak NWR
Skilak Lake	NW Kenai Peninsula	NWR	Kenai NWR
Stikine-LeConte	Tongass Nat'l Forest, SE Alaska	NWA	Stikine-LeConte NWA
Susitna River tidal flats	West of the City of Anchorage	SGR	Susitna Flats SGR
Swamp Creek wetlands in Cook Inlet	SW Kalgin Island	SCHA	Kalgin Island SCHA
Tanana River wetlands	West of the City of Fairbanks	SGR	Minto Flats SGR
Tebenkof Bay	Tongass Nat'l Forest, SE Alaska	NWA	Tebenkof Bay NWA
Thorne Bay	Prince of Wales Island	WQ-lim	Thorne Bay
Tinayguk River	Central-eastern Brooks Mountains Range	W&SR	Tinayguk River W&SR
Tlikakila River	Southern Alaska Mountains Range	W&SR	Tlikakila River W&SR
Togiak Bay, mouth of	Walrus Islands and Summit Island	SGS	Walrus Islands SGS
Togiak Bay	Adjacent to City of Togiak	NWR	Togiak NWR
Tolstoi Bay			
Tracy Arms	Tongass Nat'l Forest, SE Alaska	NWA	Tracy Arm-Fords Terror NWA
Trading Bay	SW of the City of Anchorage	SGR	Trading Bay SGR
Tugidak Island coastal water	Tugidak Island, southwest of Kodiak Island	SCHA	Tugidak Island SCHA

Tugidak Bay	Trinity Islands	NWR	Kodiak NWR
Turnagain Arm, south shore	NW Kenai Peninsula	NWR	Kenai NWR
Turnagain Arm tidal flats, northern	City of Anchorage	SGR	Anchorage Coastal Area SGR
Tustumena Lake	NW Kenai Peninsula	NWR	Kenai NWR
Tuxedni Bay	North coast of Cook Inlet	NP&p	Lake Clark Nat'l Park/Preserve
Two Arm Bay	South Kenai Peninsula	Np	Kenai Fjords Nat'l Preserve
Twelve Mile Arm			
Udagak Bay	Unalaska Island	WQ-lim	Udagak Bay
Uganik Bay	Kodiak Island	NWR	Kodiak NWR
Ugashik Bay	West of the City of Pilot Point	SCHA	Pilot Point SCHA
Unalaska Bay, south	Unalaska Island	WQ-lim	Unalaska Bay, south
Uyak Bay	Kodiak Island	NWR	Kodiak NWR
Ward Cove	City of Ketchikan	WQ-lim	Ward Cove
Warren Island	Tongass Nat'l Forest, SE Alaska	NWA	Warren Island NWA
West Port Fredrick			
Willow Creek tributaries	NW of the City of Palmer	SCHA	Willow Mountain
Yakutat Bay, west	NW of the City of Yakutat	NP&p	Wrangell-St. Elias Nat'l P&p
Yukon River delta	West Alaska	NWR	Yukon Delta NWR

APPENDIX B

CATEGORICAL LISTING OF AREAS EXCLUDED FROM COVERAGE UNDER GENERAL PERMIT AK-G52-0000

Excluded Area	Receiving Waters	Location
STATE GAME REFUGES (SGR; see Appendix C, Figure 1)		
Anchorage Coastal SGR	Knik Arm, Turnagain Arm; N Cook Inlet	City of Anchorage
Cape Newenham SGR	Chagvan Bay; S Kuskokwin Bay	South of the City of Good News
Creamer's Field SGR	Isabella River wetlands	City of Fairbanks
Goose Bay SGR	Goose Bay, Knik Arm; N Cook Inlet	North of the City of Anchorage
Izembek SGR	Isembek Lagoon; SE Bristol Bay	NW terminus of the Alaska Peninsula
McNeil River SGR	Paint River and Kamishak Bay	SE base of the Alaska Peninsula
Mendenhall Wetlands SGR	NW Gastineau Channel	City of Juneau
Minto Flats SGR	Tanana River wetlands	West of the City of Fairbanks
Palmer Hay Flats SGR	Knik Arm; N Cook Inlet	NE of the City of Anchorage
Susitna Flats SGR	N Cook Inlet	West of the City of Anchorage
Trading Bay SGR	Gompertz Channel, Trading Bay	SW of the City of Anchorage
Yakataga SGR	Tsiu River delta; N Gulf of Alaska	West of Cape Yakataga
STATE CRITICAL HABITAT AREAS (SCHA; see Appendix C, Figure 2)		
Anchor River-Fritz Creek SCHA	Anchor River and Fritz Creek	East of the City of Anchor Point
Chilkat River SCHA	Chilkat River	North of the City of Haines
Cinder River SCHA	Cinder River delta, E Bristol Bay	SW of the City of Pilot Point
Clam Gulch SCHA	Cook Inlet	South of the City of Kasilof
Copper River Delta SCHA	Copper River delta; N Gulf of Alaska	SE of the City of Cordova
Dude Creek SCHA	Dude Creek, Icy Passage	West of the City of Gustavus
Egegik SCHA	Egegik Bay and E Bristol Bay	West of the City of Egegik
Fox River Flats SCHA	Fox River delta, Kachemak Bay	NE of the City of Homer
Kachemak Bay SCHA	Kachemak Bay	Adjacent to the City of Homer
Kalgin Island SCHA	Swamp Creek wetlands; Cook Inlet	SW Kalgin Is.
Pilot Point SCHA	Ugashik Bay and E Bristol Bay	West of the City of Pilot Point

Port Heiden SCHA	Port Heiden and E Bristol Bay	North-central Alaska Peninsula
Port Moller SCHA	Port Moller and Nelson Lagoon	City of Port Moller
Redoubt Bay SCHA	Big River wetlands, Redoubt Bay; Cook Inlet	West of the City of Nikiski
Tugidak Island SCHA	NW Gulf of Alaska	Trinity Islands, SW of Kodiak Is.
Willow Mountain SCHA	Willow Creek tributaries	NW of the City of Palmer

STATE GAME SANCTUARIES (SGS; see Appendix C, Figure 3)

McNeil River SGS	Kamishak Bay; NW Cook Inlet	SE base of the Alaska Peninsula
Stan Price SGS	Windfall Harbor; Seymour Canal	E Admiralty Is., SE Alaska
Walrus Islands SGS	Togiak Bay; N Bristol Bay	Walrus Is. (a.k.a. Round Is.), Crooked Is., High Is., Summit Is., Black Rock the Twins

NATIONAL PARKS, PRESERVES AND MONUMENTS (NP, Np, NM; see Appendix C, Figure 4)

Admiralty Island Nat'l Monument	Rivers and coastal waters of national monument	Admiralty Island, SE Alaska
Aniakchak Nat'l Monument and Preserve	Aniakchak Bay, Amber Bay	South central Alaska Peninsula
Glacier Bay Nat'l Park and Preserve	Glacier Bay, Cross Sound, Dixon Harbor, Palma Bay, Lituya Bay; N Gulf of Alaska	North Alexander Archipelago, SE Alaska
Katmai Nat'l Park and Preserve	Katmai Bay, Kinak Bay, Kukak Bay, Hallow Bay, Kamishak Bay	S base of Alaska Peninsula
Kenai Fjords Nat'l Preserve	Nuka Bay, Two Arm Bay	S Kenai Peninsula
Lake Clark Nat'l Park and Preserve	Chiratna Bay, Tuxedni Bay	N coast of Cook Inlet
Misty Fiords Nat'l Monument		Tongass Nat'l Forest, SE Alaska
Wrangell-St. Elias Nat'l Park and Preserve	N Icy Bay, W Yakutat Bay; N Gulf of Alaska	NW of the City of Yakutat

NATIONAL WILDLIFE REFUGES (NWR; see Appendix C, Figure 5)

Alaska Maritime NWR	Bering Sea, N Gulf of Alaska	Aleutian Islands and Pribilof Islands
Alaska Peninsula NWR	S Port Moller and S Herendeen	Alaska Peninsula

	Bay and the coastal waters from NE Cold Bay to Alinchak Bay	
Izembek NWR	Cold Bay, Izembek Lagoon	SW terminus of Alaska Peninsula
Kenai NWR	S Turnagain Arm; N Cook Inlet	Kenai Peninsula
Kodiak NWR	Kiliuda Bay, Sitkalidak Strait, Alitak Bay, Sitkinak Strait, Olga Bay, Uyak Bay, Uganik Bay;	Kodiak Is., Afognak Is. and Trinity Islands
	Ban Bay; W Gulf of Alaska	
Togiak NWR	Jacksmith Bay, Goodnews Bay, Chagvan Bay, Hagemeister Strait, Togiak Bay, Kulukak Bay, Nushagak Bay; N Bristol Bay	Surrounding the City of Togiak
Yukon Delta NWR	Scammon Bay, Kokechik Bay, Hooper Bay, Hazen Bay, Baird Inlet; E Bering Sea	Yukon River delta, Kuskokwin River delta, Nunivak Is.

NATIONAL WILDERNESS AREAS (NWA; see Appendix C, Figure 6)

Chuck River NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Coronation Island NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Endicott River NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Karta NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Kootznoowoo NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Kuiu NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Maurelle Islands NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Misty Fiords NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Petersburg Creek NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Pleasant Islands NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Russell Fiord NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
South Baranof NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
South Etolin NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
South Prince of Wales NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Stikine-LeConte NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Tebenkof Bay NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Tracy Arm-Fords Terror NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
Warren Island NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska
West Chichagof-Yakobi NWA	Rivers and coastal waters of NWA	Tongass Nat'l Forest, SE Alaska

STELLER SEA LION ROOKERIES, HAUL-OUT AREAS AND CRITICAL HABITAT (SS; see Appendix C, Figure 7)
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SEA BIRD NESTING AREAS (SBN; see Appendix C, Figure 8)

STELLER'S EIDER CRITICAL HABITAT (SECH; see Appendix C, Figure 9)

ALASKA RIVER SEGMENTS DESIGNATED UNDER THE WILD AND SCENIC RIVERS ACT

Alagnak River	Riverine waters	Nushagak-Bristol Bay lowland
Alatna River	Riverine waters	Central Brooks Mountains Range
Aniakchak River	Riverine waters	Aleutian Mountains Range
Charley River	Riverine waters	Yukon-Tanana uplands
Chilikadrotna River	Riverine waters	Central Brooks Mountains Range
John River	Riverine waters	Central Brooks Mountains Range
Kobuk River	Riverine waters	Central Brooks Mountains Range
North Fork Koyukuk River	Riverine waters	Eastern Brooks Mountains Range
Mulchatna River	Riverine waters	Alaska Mountains Range
Noatak River	Riverine waters	Eastern Brooks Mountains Range
Salmon River	Riverine waters	Baird Mountains
Tinayguk River	Riverine waters	Central-eastern Brooks Mountains Range
Tlikakila River	Riverine waters	Southern Alaska Mountains Range

IMPAIRED OR WATER QUALITY-LIMITED WATERS LISTED BY ADEC IN EITHER ITS CWA §305(b) REPORT OR §303(d) LIST

Akutan Harbor, west	Waters of the bay west of 165°46'00"W	Akutan Island
Unalaska Bay, south	Waters of Unalaska Bay from the southwest point of Amaknak Is. at Arch Rock west to the western point of Captains Bay at 53°52'45"N, 166°34'33", west along shore to Devilfish Point, north to the southern tip of Hog Is., east to	Unalaska Island

	shore of Amaknak Is. at northern end of airstrip at 53°54'16"N, 166°33'09"W, south along the shore of Amaknak Is. to the point of origin	
Captains Bay	All of the waters of the bay to the bridge separating Iliuliuk Harbor and a line at the mouth of the bay between Arch Rock point and the point of land at 53°52'45"N, 166°34'33"W	Unalaska Island
Udagak Bay	Waters of the bay from a line between 53°44'32"N, 166°19'14"W and 53°44'32"N, 166°19'14"W	Unalaska Island
Gibson Cove	Gibson Cove	City of Kodiak
Herring Bay	Herring Bay	City of Sitka
Jamestown Bay	Jamestown Bay	Near Cannon Island
King Cove	King Cove	City of King Cove
Popof Strait	Popof Strait	City of Sand Point
Rowan Bay	Rowan Bay	Kuru Island
Silver Bay	Silver Bay	City of Sitka
Thorne Bay	Thorne Bay	Prince of Wales Island
Ward Cove	Ward Cove	City of Ketchikan

ATTACHMENT A: Table of Conditions pursuant to Selected Other Authorities

Table of Conditions Required by Other Federal Agencies pursuant to Selected Other Authorities

NMFS = National Marine Fisheries Service
FWS = U.S. Fish and Wildlife Service

Condition	Agency	Authority
Any seafood processing facility discharge which results in the harassment of a marine mammal is a 'taking' in violation of the Marine Mammal Protection Act (MMPA), unless specifically authorized by the National Marine Fisheries Service or the U.S. Fish and Wildlife Service.	NMFS and FWS	Marine Mammal Protection Act
All seafood processors that are authorized under this Permit and that provide refueling to vessels shall ensure that the refueling nozzles or valves at their facility are equipped with functional automatic back pressure shutoff nozzles or valves as required by 33 CFR 154.500 which prevent accidental spills during refueling due to overfilling of the receiving tank or to loss of operator control of the refueling hose.	FWS	Oil Pollution Act and Endangered Species Act

NOTICE OF INTENT

to be covered under

APDES GENERAL PERMIT AK-G52-0000

for

SEAFOOD PROCESSORS IN ALASKA

(See Part IV.C. of the Permit, reissued 2001)

Please submit this NOI to:

Department of Environmental Conservation
Division of Water

555 Cordova Street
Anchorage, AK 99501

Submittal of this document constitutes notice that the party identified in Section 1 intends to be covered by the APDES general permit authorizing discharges from seafood processing activities in Alaska and obligates the permittee to comply with the terms and conditions of the permit.

Please fill in all information. Attach supplemental information sheets as appropriate.

SECTION 1 - PERMIT INFORMATION

APDES PERMIT NO. **AK-G52 -**	ADEC Number (Seafood Processor License)

SECTION 2 - OPERATOR INFORMATION (Part IV.C.2)

Company Name	
Address	Phone
City/State/Zip	FAX
Representative/Title	E-mail

SECTION 3 - OWNER INFORMATION (Part IV.C.3)

Owner Name	
Address	Phone
City/State/Zip	FAX
Representative/Title	E-mail

SECTION 4 - FACILITY or VESSEL INFORMATION (Part IV.C.4)

Facility/Vessel Name		No of Employees
Address		Phone
City/State/Zip		FAX
Latitude and Longitude of Discharge(s)		
Previous facility/vessel name(s)		
Type of vessel	USCG no.	Vessel length

SECTION 5 - FACILITY CLASSIFICATION (Part IV.C.5; Check each that applies)

☐	Offshore floating seafood processor: operating and discharging between 1 and 3 nautical mile from shore at MLLW
☐	Nearshore floating seafood processor: operating and discharging from one (1) to one half (0.5) nautical mile from shore at MLLW
☐	Shore-based seafood processor: operating and discharging less than one half (0.5) nautical mile from shore at MLLW (Includes vessels that meet discharge location criteria)

SECTION 6 - PROJECTED PRODUCTION INFORMATION (Part IV.C.6; Check all that apply)

☐	Whole	☐	Head-on & Gutted	☐	Headed & Gutted	☐	Fillets	☐	Cured, salted or smoked
☐	Canned	☐	Fish meal	☐	Surimi, fish paste	☐	Mince, dry/ washed	☐	Mince, wet/ unwashed
☐	Roe	☐	Crab: whole, pieces	☐	Shrimp, scallops, clams, oysters, snails, urchins, cucumbers (circle appropriate items)	☐	Other (identify):		

Catch Processed (by type, e.g., cod, pollock, salmon)	Finished Product (by type, e.g., fillets, surimi, canned)	24-hour Design Capacity in lbs of processing raw product	Location (Lat/Long or ADF&G areas)	Anticipated Processing Activity -- Number of days per month											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

SECTION 7 - RECEIVING WATER INFORMATION (Part IV.C.7)

Name(s) of waterbody(ies) receiving discharges of the facility

Name of any larger, adjacent receiving waterbody(ies)

List any areas within three (3) nautical miles of operation which are excluded from coverage under the General Permit (e.g., Parks, Preserves, Refuges, Critical Habitats etc.)

Nature of Receiving Water: Discharge is to marine water ☐ Discharge is to fresh water ☐ Discharge is to estuary or tidal tributary ☐

Attention: Nearshore and Shore-based Processors must submit a bathymetric map of the receiving water within one (1) nautical mile of the discharge showing the location of the facility and all discharge point(s)

SECTION 8 - DESCRIPTION of DISCHARGES (Part IV.C.8)

Sanitary Wastes

☐	Package Treatment Plant	☐	Municipal System
☐	On-site septic system	☐	Community Septic system
☐	USCG Approved System (MSD) Type:		Capacity (gals/day):

Seafood Processing Wastes

Outfall depth: ft.	Outfall distance from shore: ft.	Water depth at outfall: ft.
Vessels indicate the range of water column depths at which vessel discharges processing wastes:		to ft.
Grinder - Type/Name:	Grinds seafood wastes to:	inch width

Other Wastewaters (Check all that apply)

☐	Process disinfectants	☐	Transfer water
☐	Cooling water	☐	Gray water
☐	Boiler water	☐	Live tank water
☐	Cooking water	☐	Air scrubber water
☐	Refrigerated seawater	☐	Other (name):

Projected Maximum Quantity in lbs of Process Waste Solids that are Discharged

Specific Species Processed	TOTAL DAILY Amount of Solids Discharged	TOTAL ANNUAL Amount of Solids Discharged
	lbs.	lbs.
	lbs.	lbs.
	lbs.	lbs.

SECTION 9 - REFUELING CAPABILITY and PROXIMITY TO FUELING STATIONS (Part VI.C.9)

Does your facility/vessel refuel fishing vessels? Yes ☐ No ☐ If yes, what is the capacity of your refueling tanks?	If no, what is the location and distance to the nearest refueling station?

SECTION 10 - SUBMITTALS (Part IV.C.10; to be attached to this NOI) * shore-based & near-shore processors only

☐	Letter certifying that the facility has developed and operates in accordance with a Best Management Practices Plan
☐	Location Map showing the location of the facility in the context of the coastal area of Alaska *
☐	Bathymetric Map of Receiving Water showing facility, outfall and water depths within one mile of the discharge *
☐	Waiver Request (for seafloor survey, discharging to excluded areas (Part III.A,B,C), if applicable

SECTION 11- SIGNATURE and CERTIFICATION (Part IV.C.11)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature Principal or Partner	Title/Company
Print Name	Date

Alaska Department of Environmental Conservation

Storm Water eNOI System
Frequently Asked Questions

This document contains answers to frequently asked questions (FAQs) related to the Storm Water eNOI system (online applications). The Water Online Application System (OASys) is an internet-based system for submitting online questionnaires, applications, and reports to the Division of Water for loans, grants, permits and registrations. Access to OASys is provided through myAlaska, the State of Alaska's system for Secure Single Sign-on. In addition to authentication, myAlaska also provides secure electronic signature, and storage of the final e-signed document (Copy of Record). Electronic payment is provided to OASys by DEC's Online Payment Center (OPC). OPC allows for payment of an application fee either by credit card or bank transfer when the application requires it.

If you have questions about the **ADEC eNOI System**, please contact Teri Buck at 269-8117 or teri.buck@alaska.gov

If you have questions about the **Construction General Permit (CGP)**, please contact William Ashton at 269-6283 or william.ashton@alaska.gov

If you have questions about the **Multi-Sector General Permit (MSGP)**, please contact William Ashton at 269-6283 or william.ashton@alaska.gov

A. Frequently Asked Questions- eNOI System Overall

Q1: How do I use the Water Online Application System?
A1: If you do not already have a myAlaska account, you must first enroll in myAlaska. Once you have a myAlaska account, go to the OASys Homepage and click 

.
After logging into myAlaska, you will be taken to the OASys "Welcome" page. The OASys Welcome page provides access to all currently available submittals. Locate your submittal type using the Water Program named tabs ("**Storm Water**" tab or "**Permits**" tab). Click on the application name to create a new submittal.

A User Guidance document for each type of submittal may be found under "Quick Links", to assist with specific steps and process required.

Q2: In order to file an eNOI, do I have to be an Alaskan resident?
A2: You do NOT have to be an Alaskan resident to file an eNOI. You DO need to have a myAlaska account and anyone can create a myAlaska account.

Q3: Can I make a change to my eNOI after I log out?
A3: You can continue to make changes to the application *until* the application has been e-signed or the signature page has been printed.

Q4: What type of files can I attach to my eNOI application?
A4: The following types of files can be attached to an eNOI application: (.jpg, .doc, .pdf, .png, .tif, .gif). If your file is not in this list, contact DEC.Water.OPAHelp@alaska.gov for assistance.

Q5: If I assign an "Alternate Signer/Payer", can I still sign or pay for the application?
A5: When you assign an Alternate for signing or paying the application, you are "extending" that right to the individual, however you still retain the right to either sign or pay for the application.

Q6: What does the alternate signer/payer need?
A6: The alternate signer/payer will need a validated myAlaska account to access the application. They will receive an email from the Online Application System with instructions to either sign or pay. In order to e-sign, their myAlaska account must be validated. If their myAlaska account is *not* validated, they will need to print, sign and submit a signature page. Instructions for submitting the signature page are included on the page.

Q7: How do I "void" an eNOI application I started, but no longer need or entered in error?
A7: OASys system users can now void their own applications which have the status, "Completed". To void the application, open the submittal, go to the Overview page and select the "Void" option at the bottom of the page. **(*Note: submittals that have been signed and paid for, status is "submitted", cannot be voided)***

Q8: Who receives the final email with the completed NOI form and Acknowledgment Letter from the eNOI system?
A8: The completed NOI Form and Acknowledgment Letter are sent to the eNOI applicant in a final confirmation email sent to their myAlaska email account.

Q9: How do I access the completed NOI form and/or the Acknowledgment Letter if I didn't get the final confirmation email from the Online Application System?

A9: The completed NOI Form and Acknowledgment Letter can be accessed by the public on ADEC's Water Permit Search the day following a complete submittal of the application (signed and paid).

Q10: Can I add additional recipients of the final email with the important attachments?

A10: We currently cannot add additional recipients for this confirmation email.

Q11: I do not want the final email to go to my personal email account (ex: Yahoo, Gmail).

A11: If you prefer that the final email go to your work email account, you can change the email address associated with your myAlaska account by signing into myAlaska and clicking on "**Profile**" under the Main Menu. When you are finished submitting eNOIs, you can change your email address back to your personal email account.

Q12: The "NOI Certifier" for our projects is often unavailable to e-sign the eNOI. Can he/she create a business myAlaska account that can be used by them or their delegate for e-signing these eNOI applications?

A12: No, a DEC Water validated myAlaska account that is approved for e-signing should never be shared. If the NOI Certifier (signatory official) has delegated the authority to sign permit applications/reports, the delegate must be approved to e-sign in the Online Application System by requesting DEC Water Validation.

Q13: If I want to submit a hardcopy NOI instead of using the eNOI system, where can I download a hardcopy of the NOI forms?

A13: Forms related to CGP, MSGP, Excavation Dewatering, and Hydrostatic Aquifer Pump Testing are currently available at:
http://dec.alaska.gov/water/wnpspc/stormwater/Forms.htm

Note: If you use a hardcopy, mail the completed form and a check payable to the "State of Alaska" for the General Permit Authorization Fee (**$490** for CGP, **$530** for MSGP, **$830** for Excavation Dewatering, and **$350** for Hydrostatic Aquifer Pump Testing) to the address below:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

B. Frequently Asked Questions- CGP eNOI

Q14: When does coverage under the Construction General Permit (CGP) begin?
A14: Coverage begins seven **(7) calendar days** after acknowledgment of receipt of the permittee's completed (signed and paid) CGP NOI is posted on ADEC's Storm Water Permit Search. For additional information, see Part 2.3 of the Construction General Permit.
(NOTE: variable processing times can occur for both hardcopy CGP NOI forms and CGP eNOI applications.)

Q15: How do I determine who the various contacts are for my CGP eNOI application? (Operator, Billing contact, SWPPP contact, and Certifier)
A15: Refer to **Sections II, III, and VIII** of the instructions pages in the CGP NOI form.

Q16: Who can sign (certify) a CGP eNOI application?
A16: The same criteria for signing a hardcopy CGP NOI form apply to signing an electronic CGP NOI. Refer to **Section VIII** of the instructions pages in the CGP NOI form for more information.

Q17: How do I pay the *one-time* $490 fee for the CGP eNOI?
A17: For those who submit an eNOI there is a step during the eNOI process where payment is required. You can pay with a *credit card* or *electronic funds transfer* in the Final Step of the online application. ***(Note: Electronic funds transfer may take up to 5 business days to process.)*** For those who submit a hardcopy of the CGP NOI, submit the completed application and a check payable to the "State of Alaska" for the amount of the General Permit Authorization Fee of **$490**.

Q18: What type of files can I attach to my CGP eNOI application?
A18: The following types of files can be attached to a CGP eNOI application: (.jpg, .doc, .pdf, .png, .tif, .gif). If your file is not in this list, contact DEC.Water.OPAHelp@alaska.gov

Q19: How soon after signing and paying for the CGP eNOI can I find out whether the application has been approved?
A19: With the eNOI system, CGP NOI coverage begins **(7) calendar days** after acknowledgment of receipt of the permittee's completed NOI is posted on ADEC's Storm Water Permit Search. If your eNOI application status does not appear to reflect the status you are expecting, contact DEC.Water.OPAHelp@alaska.gov for assistance. ***(NOTE: variable processing times can occur for both hardcopy CGP NOI forms and CGP eNOI applications.)***

Q20: When should I modify my CGP Notice of Intent with a CGP NOI Modification form?
A20: Please use the CGP eNOI Modification or the hardcopy CGP NOI Modification form to *update or correct* information on your NOI. This includes the Owner/Operator address and contact information, the Site Information, start or end dates, small changes to the number of acres to be disturbed and SWPPP location and contact information. For more information, see page one of CGP NOI Modification form.

Q21: How do I modify a CGP NOI?

A21: The CGP eNOI Modification form allows operators to electronically file the CGP Notice of Intent Modification form. For additional information, see the "Step-by-Step" guidance document. A hardcopy CGP NOI Modification form can be completed and submitted to the address below:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Q22: When must I submit a CGP Notice of Termination (NOT) instead of a CGP NOI modification form?

A22: Examples of when you must submit a CGP NOT include: when the owner/operator has changed, and during significant changes in the land area disturbed. For more information, see page one of CGP NOI Modification form.

Q23: How do I terminate a CGP NOI?

A23: The CGP eNOI Termination form allows operators to electronically file the CGP Notice of Termination form. For additional information, see the "Step-by-Step" guidance document. A hardcopy CGP NOT form can be completed and submitted to the address below:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Q24: Do you have a list of useful website links?

A24: Below is a list of useful and relevant Storm Water CGP links:

Construction (AKR100000) General Permit:
http://dec.alaska.gov/water/wnpspc/stormwater/docs/Final_2011_ACGP_(20110519)_w_app.pdf

CGP eNOI application guidance document:
http://dec.alaska.gov/water/OASysHelp/attachments/CGP_eNOI_guidance.pdf

DEC's Water Online Application System (including eNOIs):
http://dec.alaska.gov/water/oasys/index.html

Storm Water Homepage (take a look at the APDES eNOI link, etc.):
http://dec.alaska.gov/water/wnpspc/stormwater/index.htm

C. Frequently Asked Questions- MSGP eNOI

Q25: When does coverage under the Multi-Sector General Permit (MSGP) begin?

A25: Coverage begins **seven (7) calendar days** after acknowledgment of receipt of the permittee's completed (signed and paid) MSGP NOI is posted on ADEC's Storm Water Permit Search website. For additional information, see Part 2.4 of the Multi Sector General Permit.

(NOTE: variable processing times can occur for both hardcopy MSGP NOI forms and MSGP eNOI applications.)

Q26: How do I determine who the various contacts are for my MSGP eNOI application? (Operator, Billing contact, SWPPP contact, and Certifier)

A26: Refer to **Sections I, II, V and VI** of the instructions pages in the MSGP NOI form.

Q27: Who can sign (certify) a MSGP eNOI application?

A27: The same criteria for signing a hardcopy MSGP NOI form apply to signing an electronic MSGP NOI. Refer to **Section VI** of the instructions pages in the MSGP NOI form for more information.

Q28: How do I pay the *annual* $530 fee for the MSGP eNOI?

A28: For those who submit an eNOI there is a step during the eNOI process where payment is required. You can pay with a *credit card* or *electronic funds transfer* in the Final Step of the online application. ***(Note: Electronic funds transfer may take up to 5 business days to process.)*** For those who submit a hardcopy of the MSGP NOI, submit the completed application and a check payable to the "State of Alaska" for the amount of the General Permit Authorization Fee of **$530**.

This is a fee that must be paid annually. ADEC will bill the facility in subsequent years for the annual fee.

Q29: What type of files can I attach to my MSGP eNOI application?

A29: The following types of files can be attached to a MSGP eNOI application: (.jpg, .doc, .pdf, .png, .tif, .gif). If your file is not in this list, contact DEC.Water.OPAHelp@alaska.gov

Q30: How soon after signing and paying for the MSGP eNOI can I find out whether the application has been approved?

A30: With the eNOI system, MSGP NOI coverage begins **(7) calendar days** after acknowledgment of receipt of the permittee's completed NOI is posted on ADEC's Storm Water Permit Search. If your eNOI application status does not appear to reflect the status you are expecting, contact DEC.Water.OPAHelp@alaska.gov for assistance. ***(NOTE: variable processing times can occur for both hardcopy MSGP NOI forms and MSGP eNOI applications.)***

Q31: When should I modify my MSGP Notice of Intent with an MSGP NOI Modification form?

A31: Please use the MSGP eNOI Modification or the hardcopy MSGP NOI Modification form to *update or correct* information on your NOI. This includes the Owner/Operator address and contact information, facility/site information, changes to discharge information, and SWPPP contact information. For more information, see page one of MSGP NOI Modification form.

32: How do I modify an MSGP NOI?

A32: The MSGP eNOI Modification form allows operators to electronically file the MSGP Notice of Intent Modification form. For additional information, see the "Step-by-Step" guidance document. A hardcopy MSGP NOI Modification form can be completed and submitted to the address below:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Q33: When must I submit a MSGP Notice of Termination (NOT) instead of a MSGP NOI modification form?

A33: Examples of when you must submit a MSGP NOT include: when the owner/operator has changed, or you have ceased discharges at the facility. For more information, see page one of MSGP NOI Modification form.

Q34: How do I terminate an MSGP NOI?

A34: The MSGP eNOI Termination form allows operators to electronically file the MSGP Notice of Termination form. For additional information, see the "Step-by-Step" guidance document. A hardcopy MSGP NOT form can be completed and submitted to the address below:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Q35: Do you have a list of useful website links?

A35: Below is a list of useful and relevant Storm Water MSGP links:

Multi-Sector (AKR060000) General Permit:
http://dec.alaska.gov/water/wnpspc/stormwater/docs/AKG060000_-_2015_MSGP_Permit.pdf

MSGP eNOI application guidance document:
http://dec.alaska.gov/water/OASysHelp/attachments/MSGP_eNOI_guidance.pdf

DEC's Water Online Application System (including eNOIs):
http://dec.alaska.gov/water/oasys/index.html

Storm Water Homepage (take a look at the APDES eNOI link, etc.):
http://dec.alaska.gov/water/wnpspc/stormwater/index.htm

D. Frequently Asked Questions - Excavation Dewatering eNOI

Q36: When does coverage under the Excavation Dewatering General Permit begin?

A36: Coverage begins after acknowledgment of receipt of the permittee's completed (signed and paid) Excavation Dewatering GP NOI is posted on ADEC's Storm Water Permit Search website. For additional information, see Part 2.0 of the Excavation Dewatering General Permit.

(NOTE: variable processing times can occur for both hardcopy Excavation Dewatering GP NOI forms and Excavation Dewatering GP eNOI applications.)

Q37: How do I determine who the various contacts are for my Excavation Dewatering GP eNOI application? (Applicant, Billing contact, and Certifier)

A37: Refer to **Sections I, II, and VI** of the instructions pages in the Excavation Dewatering GP NOI form.

Q38: Who can sign (certify) an Excavation Dewatering GP eNOI application?

A38: The same criteria for signing a hardcopy Excavation Dewatering GP NOI form apply to signing an electronic Excavation Dewatering GP NOI. Refer to **Section VI** of the instructions pages in the Excavation Dewatering GP NOI form for more information.

Q39: How do I pay the *one-time* $830 fee for the Excavation Dewatering GP eNOI?

A39: For those who submit an eNOI there is a step during the eNOI process where payment is required. You can pay with a *credit card* or *electronic funds transfer* in the Final Step of the online application. ***(Note: Electronic funds transfer may take up to 5 business days to process.)*** For those who submit a hardcopy of the Excavation Dewatering GP NOI, submit the completed application and a check payable to the "State of Alaska" for the amount of the General Permit Authorization Fee of **$830**.

Q40: What type of files can I attach to my Excavation Dewatering GP eNOI application?

A40: The following types of files can be attached to an Excavation Dewatering GP eNOI application: (.jpg, .doc, .pdf, .png, .tif, .gif). If your file is not in this list, contact DEC.Water.OPAHelp@alaska.gov

Q41: How soon after signing and paying for the Excavation Dewatering GP eNOI can I find out whether the application has been approved?

A41: With the eNOI system, Excavation Dewatering GP NOI coverage begins after acknowledgment of receipt of the permittee's completed NOI is posted on ADEC's Storm Water Permit Search. If your eNOI application status does not appear to reflect the status you are expecting, contact DEC.Water.OPAHelp@alaska.gov for assistance. ***(NOTE: variable processing times can occur for both hardcopy* Excavation Dewatering GP *NOI forms and* Excavation Dewatering GP *eNOI applications.)***

Q33: When must I submit an Excavation Dewatering GP Notice of Termination (NOT) form?

A33: You must submit an Excavation Dewatering GP NOT when all dewatering activities have ceased. For more information, see Part 7.0 of the Excavation Dewatering General Permit.

Q34: How do I terminate an Excavation Dewatering GP NOI?

A34: The Excavation Dewatering GP eNOI Termination form allows operators to electronically file the Excavation Dewatering GP Notice of Termination form. Please see Excavation Dewatering GP eNOT guidance document. A hardcopy Excavation Dewatering GP NOT form can be completed and submitted to the address below:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Q35: Do you have a list of useful website links?

A35: Below is a list of useful and relevant Storm Water Excavation Dewatering GP links:

Excavation Dewatering (AKG002000) General Permit:
http://dec.alaska.gov/water/wnpspc/stormwater/docs/AKG002000_Excavation_Dewatering_GP.pdf

Excavation Dewatering GP eNOI application guidance document:
http://dec.alaska.gov/water/wnpspc/pdfs/ExDewatering_eNOI_Guidance.pdf

DEC's Water Online Application System (including eNOIs):
http://dec.alaska.gov/water/oasys/index.html

Storm Water Homepage (take a look at the APDES eNOI link, etc.):
http://dec.alaska.gov/water/wnpspc/stormwater/index.htm

E. Frequently Asked Questions – Hydrostatic Aquifer Pump Testing eNOI

Q36: When does coverage under the Hydrostatic Aquifer Pump Testing General Permit begin?

A36: Coverage begins after acknowledgment of receipt of the permittee's completed (signed and paid) Hydrostatic Aquifer Pump Testing GP NOI is posted on ADEC's Storm Water Permit Search website. For additional information, see Part 2.0 of the Hydrostatic Aquifer Pump Testing General Permit.

(NOTE: variable processing times can occur for both hardcopy Hydrostatic Aquifer Pump Testing GP NOI forms and Hydrostatic Aquifer Pump Testing GP eNOI applications.)

Q37: How do I determine who the various contacts are for my Hydrostatic Aquifer Pump Testing GP eNOI application? (Applicant, Billing contact, and Certifier)

A37: Refer to **Sections I, II, and VI** of the instructions pages in the Hydrostatic Aquifer Pump Testing GP NOI form.

Q38: Who can sign (certify) a Hydrostatic Aquifer Pump Testing GP eNOI application?

A38: The same criteria for signing a hardcopy Hydrostatic Aquifer Pump Testing GP NOI form apply to signing an electronic Hydrostatic Aquifer Pump Testing GP NOI. Refer to **Section VI** of the instructions pages in the Hydrostatic Aquifer Pump Testing GP NOI form for more information.

Q39: How do I pay the *one-time* $350 fee for the Hydrostatic Aquifer Pump Testing GP eNOI?

A39: For those who submit an eNOI there is a step during the eNOI process where payment is required. You can pay with a *credit card* or *electronic funds transfer* in the Final Step of the online application. ***(Note: Electronic funds transfer may take up to 5 business days to process.)*** For those who submit a hardcopy of the Hydrostatic Aquifer Pump Testing GP NOI, submit the completed application and a check payable to the "State of Alaska" for the amount of the General Permit Authorization Fee of **$350**.

Q40: What type of files can I attach to my Hydrostatic Aquifer Pump Testing GP eNOI application?

A40: The following types of files can be attached to a Hydrostatic Aquifer Pump Testing GP eNOI application: (.jpg, .doc, .pdf, .png, .tif, .gif). If your file is not in this list, contact DEC.Water.OPAHelp@alaska.gov

Q41: How soon after signing and paying for the Hydrostatic Aquifer Pump Testing GP eNOI can I find out whether the application has been approved?

A41: With the eNOI system, Hydrostatic Aquifer Pump Testing GP NOI coverage begins after acknowledgment of receipt of the permittee's completed NOI is posted on ADEC's Storm Water Permit Search. If your eNOI application status does not appear to reflect the status you are expecting, contact DEC.Water.OPAHelp@alaska.gov for assistance. ***(NOTE: variable processing times can occur for both hardcopy Hydrostatic Aquifer Pump Testing GP NOI forms and Hydrostatic Aquifer Pump Testing GP eNOI applications.)***

Q42: When must I submit a Hydrostatic Aquifer Pump Testing GP Notice of Termination (NOT) form?

A42: You must submit a Hydrostatic Aquifer Pump Testing GP NOT within thirty (30) days upon completion of hydrostatic or aquifer pump testing. For more information, see Part 7.0 of the Hydrostatic Aquifer Pump Testing General Permit.

Q43: How do I terminate a Hydrostatic Aquifer Pump Testing GP NOI?

A44: The Hydrostatic Aquifer Pump Testing GP eNOI Termination form allows operators to electronically file the Hydrostatic Aquifer Pump Testing GP Notice of Termination form. Please see Hydrostatic Aquifer Pump Testing GP eNOT guidance document. A hardcopy Hydrostatic Aquifer Pump Testing GP NOT form can be completed and submitted to the address below:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Q45: Do you have a list of useful website links?

A45: Below is a list of useful and relevant Storm Water Hydrostatic Aquifer Pump Testing GP links:

Hydrostatic Aquifer Pump Testing (AKG003000) General Permit:
http://dec.alaska.gov/water/wnpspc/stormwater/docs/AKG003000_Hydrostatic_GP_Permit.pdf

Hydrostatic Aquifer Pump Testing GP eNOI application guidance document:
http://dec.alaska.gov/water/wnpspc/pdfs/Hydrostatic_eNOI_Guidance.pdf

DEC's Water Online Application System (including eNOIs):
http://dec.alaska.gov/water/oasys/index.html

Storm Water Homepage (take a look at the APDES eNOI link, etc.):
http://dec.alaska.gov/water/wnpspc/stormwater/index.htm

F. Frequently Asked Questions- myAlaska

Q46: Why does DEC use myAlaska? Is the information in my myAlaska account safe or is it accessible to DEC staff?

A46: DEC uses myAlaska as the personal identity system for many reasons but primarily because of the high number of Alaskan residents that have a PFD/DMV validated account and can therefore "e-sign" an application. Your myAlaska account is not accessible to DEC staff. For more information please see question 36 below. For general information about myAlaska, go to: https://my.alaska.gov/Popups/Help.htm

Q47: How do I submit a NOI if I don't want to use myAlaska?

A47: If you do not want to use myAlaska, then you cannot use the eNOI system. You will need to submit a hardcopy NOI form. Forms related to CGP, MSGP, Excavation Dewatering, and Hydrostatic Aquifer Pump Testing are currently available at: http://dec.alaska.gov/water/wnpspc/stormwater/Forms.htm

If you use this hardcopy, mail the completed form and a check payable to the "State of Alaska" for the amount of the General Permit Authorization Fee (**$490** for CGP, **$530** for MSGP, **$830** for Excavation Dewatering, and **$350** for Hydrostatic Aquifer Pump Testing) to the address below:

Alaska Dept. of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Q48: Do I have to use myAlaska and the eNOI system to complete an NOI for coverage under the CGP or MSGP or Excavation Dewatering or Hydrostatic Aquifer Pump Testing?

A48: You do not have to use the eNOI system to submit an NOI for coverage under the CGP or MSGP or Excavation Dewatering or Hydrostatic Aquifer Pump Testing. A myAlaska account is required to use the eNOI system.

Q49: Once I use my myAlaska account to submit an eNOI are the two linked forever?

A49: Your myAlaska account will always be linked to the eNOI application in the DEC's Online Application System.

Q50: I don't want to use my personal myAlaska account. Can I create a myAlaska account for my work duties?

A50: Think of your myAlaska account as an "electronic driver's license." We encourage people to use their personal account so that they have one account for all business with the State of Alaska, though understand that some prefer not to. If you want, you can create a separate account for use in the Online Application System.

Q51: Several people in my organization work on each application. We'd like to have one shared account for the organization.

A51: We don't currently have a way for one organization to have multiple people accessing the same application, though we do provide the ability for a user to assign an application to another user for signing and/or paying. The myAlaska account is an account for a single user, and should not be shared.

Q52: What do you mean by a "validated account"?

A52: While anyone can create a myAlaska account, for certain activities the Division of Water must confirm your identity and authority to sign on behalf of the organization (applicant or permittee). DEC Water Division currently uses DEC Water Validation to enable e-signing in the Online Application System. Guidance on how to apply for e-signature in OASys can be found at: http://dec.alaska.gov/water/OASysHelp/attachments/dec_water_validation_stepbystep.pdf

Q53: Explain the difference between "validated" myAlaska accounts and "non-validated" myAlaska accounts.

A53: myAlaska accounts can either be "validated" or "non-validated". The validation process confirms your identity (verifies that you are who you say you are). Validated myAlaska account holders can "e-sign" their applications. Currently a myAlaska account is "validated" through the PFD/DMV validation process (which requires you to be an Alaskan Resident). Non-validated myAlaska account holders cannot "e-sign" their accounts. They will need to print and sign the hardcopy signature page, have document notarized, and submit via email, fax or mail.

Q54: How do I get my myAlaska account validated?

A54: Currently you will need to get PFD/DMV validated through myAlaska and the PFD application process. myAlaska can be found at: https://myalaska.state.ak.us/login/login.aspx. The DEC Division of Water is in the process of finalizing the processes to provide a second DEC Water validation method for the eNOI system.

Q55: How does a myAlaska electronic signature work?

A55: A myAlaska electronic signature uses cryptography-based mechanisms to bind the data to be signed with the identity of the signer and the date and time of the signing act. Due to this cryptographic binding, at any time after the signing act an independent third party can confirm non-repudiation (i.e., a person with knowledge of a particular myAlaska user name and password signed it, and no one else could have) and integrity (if any element of the content is changed, the cryptographic mechanism will indicate that a change; i.e., the signature makes the content tamper-evident).

Q56: I am a state/federal agency employee and have concerns about using my personal myAlaska account for work-related business such as the eNOI application. Can I create a separate myAlaska account for my work duties?

A56: Think of your myAlaska account as an "electronic driver's license." We encourage people to use their personal account so that they have one account for all business with the State of Alaska, though understand that some prefer not to. If you want, you can create a separate account but this second account cannot receive a PFD/DMV validation.

Q57: Can multiple users be registered with a single business myAlaska account to submit eNOIs for different offices in the same business or government agency?

A57: Each myAlaska account is a personal account in the same way that a signature belongs to only one person. It cannot be shared by more than one person, and therefore it's not possible to use one account for users in different offices, with different email addresses. In the same way that one person signs a hardcopy application with their personal signature for business purposes, a single person must sign an online application using their own myAlaska account for business purposes.

Q58: When I use my myAlaska account for the DEC eNOI application, does DEC staff have access to my individual account information?

A58: The DEC Online Application System, which hosts the eNOI application, accesses only an applicant's myAlaska account code, name and email address that is associated with their myAlaska account. Only the account code is saved in the Online Application System, therefore ADEC staff does not have access to any additional individual myAlaska account information.

Nationwide Permit General Conditions

1. Navigation
2. Aquatic Life Movements
3. Spawning Areas
4. Migratory Bird Breeding Areas
5. Shellfish Beds
6. Suitable Material
7. Water Supply Intakes
8. Adverse Effects from Impoundments
9. Management of Water Flows
10. Fills Within 100-Year Floodplains
11. Equipment
12. Soil Erosion and Sediment Controls
13. Removal of Temporary Fills
14. Proper Maintenance
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16. Wild and Scenic Rivers
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19. Migratory Bird and Bald and Golden Eagle Permits
20. Historic Properties
21. Discovery of Previously Unknown Remains and Artifacts
22. Designated Critical Resource Waters
23. Mitigation
24. Safety of Impoundment Structures
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26. Coastal Zone Management
27. Regional and Case-by-Case Conditions
28. Use of Multiple Nationwide Permits
29. Transfer of Nationwide Permit Verifications
30. Compliance Certification
31. Pre-Construction Notification

C. Nationwide Permit General Conditions

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR §§ 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR § 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. Navigation.

(a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see Section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8 Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization and storm water management activities, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity,

and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.

13. Removal of Temporary Fills. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16 Wild and Scenic Rivers. No activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species.

(a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed.

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA. Federal permittees must provide the district engineer with the appropriate documentation

to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address ESA compliance for the NWP activity, or whether additional ESA consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed work or that utilize the designated critical habitat that might be affected by the proposed work. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. In cases where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the project, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification the proposed activities will have "no effect" on listed species or critical habitat, or until Section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific regional endangered species conditions to the NWPs.

(e) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the

U.S. FWS or the NMFS, The Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the U.S. FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.noaa.gov/fisheries.html respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for obtaining any "take" permits required under the U.S. Fish and Wildlife Service's regulations governing compliance with the Migratory Bird Treaty Act or the Bald and Golden Eagle Protection Act. The permittee should contact the appropriate local office of the U.S. Fish and Wildlife Service to determine if such "take" permits are required for a particular activity.

20. Historic Properties.

(a) In cases where the district engineer determines that the activity may affect properties

listed, or eligible for listing, in the National Register of Historic Places, the activity is not authorized, until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of Section 106 of the National Historic Preservation Act. Federal permittees must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will review the documentation and determine whether it is sufficient to address section 106 compliance for the NWP activity, or whether additional section 106 consultation is necessary.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the authorized activity may have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer or Tribal Historic Preservation Officer, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of Section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, sample field investigation, and field survey. Based on the information submitted and these efforts, the district engineer shall determine whether the proposed activity has the potential to cause an effect on the historic properties. Where the non-Federal applicant has identified historic properties on which the activity may have the potential to cause effects and so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects or that consultation under Section 106 of the NHPA has been completed.

(d) The district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA Section 106 consultation is required. Section 106 consultation is not required when the Corps determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR §800.3(a)). If NHPA section 106 consultation is required and will occur, the district engineer will notify the non-Federal applicant that he or she cannot begin work until Section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation

specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. If you discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by this permit, you must immediately notify the district engineer of what you have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, and 52 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with general condition 31, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after it is determined that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that

compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment.

(2) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(3) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) – (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area

along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. Where States and authorized Tribes, or EPA where applicable, have not previously certified compliance of an NWP with CWA Section 401, individual 401 Water Quality Certification must be obtained or waived (see 33 CFR 330.4(c)). The district engineer or State or Tribe may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). The district engineer or a State may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the United States authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature: "When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

(Transferee)

(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized work was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the work and mitigation.

31. Pre-Construction Notification.

(a) Timing. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN

and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or in the vicinity of the project, or to notify the Corps pursuant to general condition 20 that the activity may have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or Section 106 of the National Historic Preservation (see 33 CFR 330.4(g)) has been completed. Also, work cannot begin under NWPs 21, 49, or 50 until the permittee has received written approval from the Corps. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Pre-Construction Notification: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) A description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause, including the anticipated amount of loss of water of the United States expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. The description should be sufficiently detailed to allow the district engineer to determine that the adverse effects of the project will be minimal and to determine the need for compensatory mitigation. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the project and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(4) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many waters of the United States. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(5) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse effects are minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(6) If any listed species or designated critical habitat might be affected or is in the vicinity of the project, or if the project is located in designated critical habitat, for non-Federal applicants the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work. Federal applicants must provide documentation demonstrating compliance with the Endangered Species Act; and

(7) For an activity that may affect a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, for non-Federal applicants the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property. Federal applicants must provide documentation demonstrating compliance with Section 106 of the National Historic Preservation Act.

(c) Form of Pre-Construction Notification: The standard individual permit application form (Form ENG 4345) may be used, but the completed application form must clearly indicate that it is a PCN and must include all of the information required in paragraphs (b)(1) through (7) of this general condition. A letter containing the required information may also be used.

(d) Agency Coordination:

(1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

(2) For all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States, for NWP 21, 29, 39, 40, 42, 43, 44, 50, 51, and 52 activities that require pre-construction notification and will result in the loss of greater than 300 linear feet of intermittent and ephemeral stream bed, and for all NWP 48 activities that require pre-construction notification, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (U.S. FWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Office (THPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to telephone or fax the district engineer notice that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure the net adverse environmental effects to the aquatic environment of the proposed activity are minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(3) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(4) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

OMB APPROVAL NO. 0710-0003
EXPIRES: 28 FEBRUARY 2013

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Middle - Last -	First - Middle - Last -
Company -	Company -
E-mail Address -	E-mail Address -
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address-	Address-
City - State - Zip - Country -	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business c. Fax	a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ _____
SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
	Address
15. LOCATION OF PROJECT	City - State- Zip-
Latitude: ◦N Longitude: ◦W	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE

18. Nature of Activity (Description of project, include all features)

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

24. Is Any Portion of the Work Already Complete? ☐ Yes ☐ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address-

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT _____ DATE _____ SIGNATURE OF AGENT _____ DATE _____

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

U.S. Army Corps of Engineers, Alaska District
PRECONSTRUCTION NOTIFICATION FORM

May be used instead of Form ENG 4345 to request verification under a Nationwide Permit (NWP)

Applicant:	Phone:
Address:	Fax:
City, State, Zip:	Cell/Direct Line:
Point of Contact:	e-mail:

Agent:	Phone:
Address:	Fax:
City, State, Zip:	Cell/Direct Line:
Point of Contact:	e-mail:

Location of the Proposed Project Site:

Nearest Waterway:	
Section, Township, Range, and Meridian:	
Latitude and Longitude (Decimal Degrees, NAD-83):	
Nearest City:	Subdivision:
Borough:	USGS Quad(s):
Driving Directions to Site:	

Project Description:

To ensure your project meets the requirements for a NWP, read all of the NWP General Conditions and Regional Conditions, which can be found on our website at http://www.poa.usace.army.mil/reg/Permits.htm#Nationwide Permits
Description of the proposed project, including the area of impacts and the volume of fill material to be used (If there is a NWP that you think would apply to your proposed project, please include that in this section):
Project purpose:
Describe any direct and/or indirect adverse environmental effects that may result from the proposed project:

Do you intend to use any other authorizations for any part of the proposed project or any related activity, for example, a NWP, General Permit (GP), or Individual Permit (IP)?

☐ YES or ☐ NO

If YES, specify what permit type (NWP, GP, IP) and for what aspect of the project:

Will your proposed project result in the loss of greater than 1/10 of an acre of wetlands?

☐ YES or ☐ NO

If YES, describe how you will satisfy the mitigation requirement in Nationwide Permit General Condition 23 (attached). If additional space is needed, please attach sheets.

Are there any listed species or designated critical habitat that might be affected or is in the vicinity of the project, or is the project located in designated critical habitat? Federal agencies must provide the appropriate documentation to demonstrate compliance with the agency's procedures for compliance with the ESA. Information on the location of threatened or endangered species and their critical habitat can be obtained directly from the offices of the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

☐ YES or ☐ NO

If YES, list all species:

Are there historic properties (listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties) that the proposed activity may have the potential to effect? Federal agencies must provide documentation demonstrating compliance with the Section 106 of the National Historic Preservation Act. Assistance regarding information on the location of or potential for the presence of historic resources can be sought from the State Historic Preservation Officer.

☐ YES or ☐ NO

If YES, state which property or properties may be affected and/or attach a vicinity map indicating the location of the historic property or properties.

Will the proposed work involve ground disturbing activities?

☐ YES or ☐ NO

If YES, attach a short narrative describing the topsoil or organic materials (including seed) that you intend to use for rehabilitation. If you intend to use other locally-obtained native materials, identify the source.

Attach the following in addition to the above applicable items:

- Drawings of the site and project plans (For more information on acceptable drawings and plans, please visit our website at http://www.poa.usace.army.mil/reg/permitapp.htm and click on "Guide to Drawings")
- The PCN must include a delineation of wetlands, other special aquatic sites (riffle and pool complexes, sanctuaries and refuges, mudflats, vegetated shallows, and/or coral reefs), and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The applicant may request the Corps to delineate the special aquatic sites and other waters and if the PCN does not include a delineation we will take that to mean you are requesting the Corps for one. In these cases, the PCN will not be considered complete until we complete the delineation.
  Note: If you request a Corps delineation, you may be delayed in receiving authorization for your proposed project.

Application is hereby made for a permit or permits to authorize the work described in this preconstruction notification form.

I certify the information in this preconstruction notification form is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

_____	_____	_____	_____
SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE

NATIONWIDE PERMIT GENERAL CONDITION 23: MITIGATION

The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that adverse effects on the aquatic environment are minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require preconstruction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal, and provides a project-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment. Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in minimal adverse effects on the aquatic environment.

(2) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, wetland restoration should be the first compensatory mitigation option considered.

(3) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2)–(14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(4) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan only needs to address the baseline conditions at the impact site and the number of credits to be provided.

(5) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan.

(d) For losses of streams or other open waters that require pre-construction notification, the district engineer may require compensatory mitigation, such as stream rehabilitation, enhancement, or preservation, to ensure that the activity results in minimal adverse effects on the aquatic environment.

(e) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any project resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to

ensure that a project already meeting the established acreage limits also satisfies the minimal impact requirement associated with the NWPs.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the restoration or establishment, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, riparian areas may be the only compensatory mitigation required. Riparian areas should consist of native species. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to establish a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or establishing a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(g) Permittees may propose the use of mitigation banks, in-lieu fee programs, or separate permittee-responsible mitigation. For activities resulting in the loss of marine or estuarine resources, permittee-responsible compensatory mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(h) Where certain functions and services of waters of the United States are permanently adversely affected, such as the conversion of a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse effects of the project to the minimal level.

52. Water-Based Renewable Energy Generation Pilot Projects. Structures and work in navigable waters of the United States and discharges of dredged or fill material into waters of the United States for the construction, expansion, modification, or removal of water-based wind or hydrokinetic renewable energy generation pilot projects and their attendant features. Attendant features may include, but are not limited to, land-based collection and distribution facilities, control facilities, roads, parking lots, and stormwater management facilities.

For the purposes of this NWP, the term "pilot project" means an experimental project where the renewable energy generation units will be monitored to collect information on their performance and environmental effects at the project site.

The discharge must not cause the loss of greater than 1/2-acre of waters of the United States, including the loss of no more than 300 linear feet of stream bed, unless for intermittent and ephemeral stream beds the district engineer waives the 300 linear foot limit by making a written determination concluding that the discharge will result in minimal adverse effects. The placement of a transmission line on the bed of a navigable water of the United States from the renewable energy generation unit(s) to a land-based collection and distribution facility is considered a structure under Section 10 of the Rivers and Harbors Act of 1899 (see 33 CFR 322.2(b)), and the placement of the transmission line on the bed of a navigable water of the United States is not a loss of waters of the United States for the purposes of applying the 1/2-acre or 300 linear foot limits.

For each single and complete project, no more than 10 generation units (e.g., wind turbines or hydrokinetic devices) are authorized.

This NWP does not authorize activities in coral reefs. Structures in an anchorage area established by the U.S. Coast Guard must comply with the requirements in 33 CFR part 322.5(l)(2). Structures may not be placed in established danger zones or restricted areas as designated in 33 CFR part 334, Federal navigation channels, shipping safety fairways or traffic separation schemes established by the U.S. Coast Guard (see 33 CFR part 322.5(l)(1)), or EPA or Corps designated open water dredged material disposal areas.

Upon completion of the pilot project, the generation units, transmission lines, and other structures or fills associated with the pilot project must be removed to the maximum extent practicable unless they are authorized by a separate Department of the Army authorization, such as another NWP, an individual permit, or a regional general permit. Completion of the pilot project will be identified as the date of expiration of the Federal Energy Regulatory Commission (FERC) license, or the expiration date of the NWP authorization if no FERC license is issued.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 31.) (Sections 10 and 404)

Note 1: Utility lines constructed to transfer the energy from the land-based collection facility to a distribution system, regional grid, or other facility are generally considered to be linear projects and each separate and distant crossing of a waterbody is eligible for treatment as a separate and complete linear project. Those utility lines may be authorized by NWP 12 or another Department of the Army authorization.

Note 2: An activity that is located on an existing locally or federally maintained U.S. Army Corps of Engineers project requires separate approval from the Chief of Engineers under 33 U.S.C. 408.

Note 3: If the pilot project, including any transmission lines, is placed in navigable waters of the United States (i.e., section 10 waters) within the coastal United States, the Great Lakes, and United States territories, copies of the pre-construction notification and NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration, National Ocean Service, for

charting the generation units and associated transmission line(s) to protect navigation.

Note 4: For any activity that involves the construction of a wind energy generating structure, solar tower, or overhead transmission line, a copy of the PCN and NWP verification will be provided to the Department of Defense Siting Clearinghouse, which will evaluate potential effects on military activities.

Forest Service Special-Uses Program

The Forest Service manages over 192 million acres of national forests and grasslands that comprise the National Forest System (NFS). Today, our growing population and mobile society have created a demand for a variety of uses of these federal lands. Often these diverse needs require specific approval. The Forest Service provides services that support our national policy and federal land laws. The Agency's special-uses program authorizes uses on NFS land that provide a benefit to the general public and protect public and natural resources values. Currently there are over 74,000 authorizations on the NFS lands for over 180 types of uses.

Each year, the Forest Service receives thousands of individual and business applications for authorization for use of NFS land for such activities as water transmission, agriculture, outfitting and guiding, recreation, telecommunication, research, photography and video productions, and granting road and utility rights-of-ways. The Forest Service carefully reviews each application to determine how the request affects the public's use of NFS land. Normally, NFS land is not made available if the overall needs of the individual or business can be met on nonfederal lands.

·What are special-use authorizations?

A special-use authorization is a legal document such as a permit, term permit, lease, or easement, which allows occupancy, use, rights, or privileges of NFS land. The authorization is granted for a specific use of the land for a specific period of time.

·When do I need an authorization?

1. If you will need to occupy, use, or build on NFS land for personal or business purposes, whether the duration is temporary or long term.

2. If there is a fee being charged or if income is derived from the use.

3. If an activity on NFS land involves individuals or organization with 75 or more participants or spectators.

Application Process

·Is my proposal appropriate?

1. Your request must be consistent with laws, regulations, orders, policies of NFS lands, other federal laws, and applicable State and local health and sanitation laws.

2. Your request must be consistent or made consistent with the standards and guidelines in the applicable Forest Land and Resource Management Plan.

3. Your request must not pose serious or substantial risk to public health or safety.

4. Your request must not require exclusive or perpetual right of use or occupancy.

5. Your request does not unreasonably conflict or interfere with administrative uses, other scheduled or authorized existing uses, or use of adjacent non-NFS lands.

6. The proponent must not owe any fees to the Forest Service from a prior or existing special-use authorization.

7. No gambling or providing of sexually oriented commercial services can be authorized on NFS land, even if permitted under state law.

8. No military or paramilitary training or exercises by private organizations or individuals can be authorized on NFS land, unless it is federally funded.

9. No disposal of solid waste or storage or disposal of radioactive or other hazardous substances can be authorized on NFS land.

·How do I apply?

1. Contact a Forest Service office and request an application. Application information is also available on the special uses home page at http://www.fs.fed.us/recreation/permits

2. Prior to submitting the proposal, you are required to arrange a preapplication meeting at the local Forest Service office where the use is being requested. A staff member will discuss your proposal, potential land use conflicts, application procedures and qualifications, probable time frames, fees, bonding requirements, additional coordination with other agencies, environmental reports, and field reviews.

3. Most commercial uses require additional information with the application. You may need business plans, operating plans, liability insurance, licenses/registrations, or other documents. A commercial use is when an applicant intends to make use of NFS lands for business or financial gain.

4. Complete and submit the application form, including supporting documents, to the local Forest Service office. An incomplete proposal could delay the processing.

·How do I answer all the questions?

Name and Address - Include the full name(s) to be used. If the application includes real property, the name(s) on the legal document must match the application.

Applicant's Agent - This person must be at least 21 years old and may or may not be the same as the applicant. Documentation should be included to verify that this person may sign on behalf of the applicant.

Project Description - Include enough detail to enable the Forest Service to determine feasibility, environmental impacts, benefits to the public, the safety of the request, lands to be occupied or used, and compliance with applicable laws and regulations.

Environmental Protection Plan - Include proposed plans for environmental protection and rehabilitation during construction, maintenance, removal, and reclamation of the land.

Map - Provide a detailed map (U.S. Geological Survey quadrangle or equivalent) or plat (survey or equivalent) showing the requested use in relation to NFS land, identification of applicant's property (if applicable), scale, map legend, legal description, and a north arrow.

Technical and Financial Capability - Provide documentation to assure the Forest Service you are capable of constructing, operating, maintaining, removing the use off NFS land, and reclaiming the land after the authorization terminates.

Alternatives - You must first consider using nonfederal land. Lower costs or fewer restrictions are not adequate reasons for use of NFS lands. Provide alternative locations for the proposal in your application.

·What does an authorization cost?

Cost Recovery Fees – An assessment of fees to recover agency processing costs for special use applications and monitoring costs for special use authorizations. These fees are separate from any fees charged for the use and occupancy of NFS lands.

Land Use Fees - This is an annual rental fee based on the fair market value for the uses authorized and is payable in advance. Fees are established by appraisal or other sound business management principles.

Other Associated Costs - You may be responsible for providing information and reports necessary to determine the feasibility and environmental impacts of your proposal; compliance with applicable laws and regulations; and terms and conditions to be included in the authorization.

Your local Forest Service office:

Obtaining a Special-Use Authorization with the Forest Service

The Application Process

U.S. Department of Agriculture
Forest Service

Primary Licensing Agency

The Federal Energy Regulatory Commission (FERC) has exclusive jurisdiction to issue licenses and exemptions from licensing for the construction and operation of hydropower projects under the Federal Power Act, including hydrokinetic devices in U.S. waters from the shoreline onto the Outer Continental Shelf (OCS) and including rivers. FERC will work with other Federal agencies and States to develop or review any necessary analyses, including those under the National Environmental Policy Act, related to those actions.

FERC will not issue preliminary permits for hydrokinetic projects on the OCS. Additionally, FERC will not issue a license or exemption for an OCS hydrokinetic project until the applicant has first obtained a lease, easement, or right-of-way from the Minerals Management Service for the site.

The FERC pilot project licensing process for hydrokinetic projects is contained on their website. FERC encourages developers to first seek a preliminary permit which would be issued for three years and give the developer priority to study a project at the specified site for the duration of the permit. A pilot project license is not a pre-requisite to applying for a standard or build-out license.

The preliminary permit process and pilot project license are elements of a larger process towards licensing. Since July 23, 2005, the Integrated Licensing Process (ILP) has been the default process and approval by FERC has been required to use the Alternative Licensing Process (ALP). Regulations on the ILP are found at 18 CFR part 5.

For more information on Coast Guard involvement in the development of REIs please contact—

Commandant (CG-5413)
ATTN: Navigation Standards Branch
U.S. Coast Guard
2100 2nd St. SW, STOP 7581
Washington, DC 20593-7581
or 202-372-1566

For questions about this brochure, contact—

PCCI, Inc.
300 North Lee Street, Suite 201
Alexandria, VA 22314
Phone: 703-684-2060
Fax: 703-684-5343
http://www.pccii.com

Marine and Hydrokinetic Renewable Energy Devices

Potential Navigational Hazards and Mitigation Measures

Development of this brochure was funded by the Department of Energy (DOE) as a guide for developers and regulators of Marine and Hydrokinetic Renewable Energy devices. It may also be a useful resource for developers and regulators of other Renewable Energy Installations (REI).[1]

[1] REI is a broad term used by the Coast Guard that also includes offshore wind farms and solar energy devices on the navigable waters, as well as offshore thermal energy conversion projects.

Potential Navigational Hazards and Mitigation Measures

The U.S. Coast Guard (USCG) and other agencies will participate in the National Environmental Policy Act review process conducted by the primary licensing agency. That participation will include advice on potential navigational hazard issues that may result from a proposed REI and possible mitigation for those issues.

To assist developers and regulators understand the safety of navigation issues, a more comprehensive report has been developed to identify the areas of concern and discuss possible strategies to mitigate those concerns and is available online at—

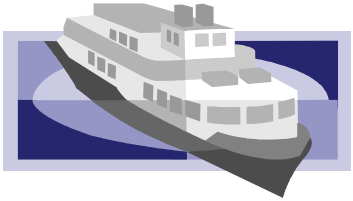
http://www.osti.gov/ *or*
http://www.pccii.com/index.cfm?sectionid=36&ProjectID=41

USCG Concerns over Hazards

The USCG's concerns[2] over possible hazards that result from an REI may vary, depending on the project phase. These phases include: design, construction, transportation to and from the site, installation, operations and finally decommissioning. For each of these phases the USCG requests developers to consider potential navigational impacts of the installation, including—

- Platform, Stationkeeping, Device, Mooring, Transmission Cable and other design considerations
  - Visual Navigation and Collision Avoidance
  - Effects on Communications, Radar and Positioning Systems
- Site and Waterway considerations
  - Effects upon Tides, Tidal Streams, and Currents
  - Effects upon seafloor soil movement
  - Effects of varying weather and sea state
  - Effects of ice where applicable

[2] These concerns are included in USCG policy guidance: Navigation and Vessel Inspection Circular 02-07, which is available online at—
http://www.uscg.mil/hq/cg5/NVIC/pdf/2007/NVIC02-07.pdf



- Maritime Traffic and Vessel Considerations
  - Traffic Survey Recommendations
  - Risk of Collision, Allision, or Grounding
  - REI Structure Clearances and Response to allision
  - Access to and Navigation Within, or Close to, the REI
- USCG Mission Considerations
  - Recommended design requirements, operational requirements, and operational procedures for installation shutdown in the event of a Search and Rescue (SAR), Pollution, or Homeland Security Operation
  - Recommendation to work with the USCG to assess likely impacts on USCG SAR, Marine Environmental Protection (MEP) and Homeland Security missions

Key Mitigation Measures

Consultation with Stakeholders

Developers should schedule meetings/events with stakeholders to understand siting conflicts. These meetings/events should begin early and continue through the licensing or permitting process.

Navigation Studies and Risk Assessment

A key mitigation measure involves undertaking the requisite navigational studies and evaluating the navigational risk of proposed projects. These studies will be required to provide the information necessary for environmental assessments, environmental impact statements and permit applications.

Based on the results of navigation studies and risk assessment, a developer may want to consider mitigation measures, including alternative siting and incorporating stakeholder concerns.

It is the responsibility of the developer to fund or provide the studies and analysis to support recommendations for their installation.

IALA Recommendation O-139

Another key mitigation measure involves incorporating the marking schemes in International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendation O-139 (2008)[3] in developers' proposals, with the realization that the USCG may modify an initial marking scheme proposal, based on its review of traffic, risk and other factors.

Private Aids to Navigation (PATON)

The U.S. Aids to Navigation System is administered by the USCG. It consists of federal aids operated by the USCG, by the other armed services, and private aids to navigation operated by other persons.

The U.S. System is consistent with the IALA Maritime Buoyage System, but as of 2009, its regulations do not incorporate specific IALA recommendations for PATON covering offshore wave and tidal energy devices. USCG policy guidance recommends incorporating the marking schemes in IALA Recommendation O-139 as providing an equivalent level of safety and environmental protection to marking schemes specified in USCG regulations.

[3] http://site.ialathree.org/pages/publications/documentspdf/-doc_225_eng.pdf

FH#_____
(Office Use Only)

ALASKA DEPARTMENT OF FISH AND GAME
FISH HABITAT PERMIT APPLICATION
SPECIFIC INSTRUCTIONS

NOTE: Provide as much information as possible. If you need assistance, please contact the nearest ADF&G Division of Habitat office. The ADF&G reserves the right to require additional information for the proper protection of fish and game.

Step A: Provide your name, address, and telephone number and the name, address, and telephone number of the contractor who will be doing the work, if known.

Step B: Describe the type of project (e.g., bridge, culvert, utility line placement, impoundment structure, bank stabilization, channelization, low water crossing, log removal, etc.) and the purpose of the project. A brief description of alternatives considered would be useful but is not required. Attach additional sheets as necessary. Back to Form

Step C: **1.** Name of the waterbody in or adjacent to which the project will occur.

2. For Anadromous Stream numbers, refer to the Atlas to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes.

3. a. Provide plans (or field sketch) showing the following as a minimum: access to the site, plan view showing all project features and dimensions, or crossing/fording sites; material removal plans should also include, at a minimum, the following: 50' contour lines; nearby watercourses and lakes; location of facilities (i.e., screening, washing, and crushing plants, and commercial and private buildings); aliquot parts identified in order they are to be mined; site where fuel will be stored; a cross section view of the material site showing current land and water elevations and bank slopes and final excavation grades and slopes; and project expansion sites (scale no greater than 1 in. = 400 ft.)

b. Provide specifications, if available; and

c. Provide a current aerial photograph, if available. Back to Form

Step D: Indicate the time of year when project construction will occur. Is the project temporary or permanent?

Step E: 1. Provide information if applicable on how you will divert the stream.

2. Indicate if channelization will occur.

3. Provide information, if applicable, on how you will alter or modify the banks of the stream.

4. List all vehicles or equipment by type and size that will be used in the stream.

5. Provide information, if applicable, on what type and amount of material will be removed from the floodplain, bed, stream, or lake.

6. Provide information, if applicable, on any material you will deposit in the floodplain, stream, or lake.

7. Provide information, if applicable, on any blasting you intend to do in the floodplain, stream, or lake.

8. Indicate if temporary fills will be required.

9. Indicate if ice bridges will be required.

Step F: What precautions will be taken to insure that fish and other aquatic organisms are protected from adverse impacts? Outline plan for restoring, rehabilitating, or re-vegetating the site if channel or bank alterations occur. What precautions will be taken to maintain State Water Quality Standards? Back to Form

Step G: Provide the waterbody characteristics at the site of the project.

Step H: Provide available hydraulic information for the types of projects indicated. For information on selecting a culvert size that will ensure fish passage, consult ADF&G permitters or references available at Division of Habitat offices.

FH#_____
(Office Use Only)

GENERAL WATERWAY/WATERBODY APPLICATION
ALASKA DEPARTMENT OF FISH AND GAME
Division of Habitat
Office Locations

A. APPLICANT

1. Name: _____

2. Address (Mailing): _____
   Email Address: _____
   Telephone: _____ Fax: _____

3. Project Coordinator/Contractor:
   Name: _____
   Address: _____
   Email Address: _____
   Telephone: _____ Fax: _____

B. TYPE AND PURPOSE OF PROJECT: _____

_____

_____

_____

_____

_____

_____

C. LOCATION OF PROJECT SITE

1. Name of River, Stream, or Lake: _____
   or Anadromous Stream No: _____

2. Legal Description: Township _____ Range _____
   Meridian_____ Section _____ USGS Quad Map _____

3. Plans, Specifications, and Aerial Photograph. See specific instructions

D. **TIME FRAME FOR PROJECT**: _____ TO _____ (mm/dd/yy)

E. **CONSTRUCTION METHODS**:

1. Will the stream be diverted? ☐ Yes ☐ No

   How will the stream be diverted? _____

   How long? _____

2. Will stream channelization occur? ☐ Yes ☐ No

3. Will the banks of the stream be altered or modified? ☐ Yes ☐ No

   Describe: _____

4. List all tracked or wheeled equipment (type and size) that will be used in the stream (in the water, on ice, or in the floodplain): _____

   How long will equipment be in the stream? _____

5. a. Will material be removed from the floodplain, bed, stream, or lake? ☐ Yes ☐ No

      Type: _____

      Amount: _____

   b. Will material be removed from below the water table? ☐ Yes ☐ No

      If so, to what depth? _____

      Is a pumping operation planned? ☐ Yes ☐ No

6. Will material (including spoils, debris, or overburden) be deposited in the floodplain, stream, or lake? ☐ Yes ☐ No

   If so, what type? _____

   Amount: _____

   Disposal site location(s): _____

7. Will blasting be performed? ☐ Yes ☐ No

   Weight of charges: _____

   Type of substrate: _____

8. Will temporary fills in the stream or lake be required during construction (e.g., for construction traffic around construction site)? ☐ Yes ☐ No

9. Will ice bridges be required? ☐ Yes ☐ No

F. **SITE REHABILITATION/RESTORATION PLAN**: On a separate sheet present a site rehabilitation/restoration plan. See specific instructions

G. **WATERBODY CHARACTERISTICS**:

Width of stream: _____ Depth of stream or lake: _____

Type of stream or lake bottom (e.g., sand, gravel, mud): _____

Stream gradient: _____

H. **HYDRAULIC EVALUATION**:

1. Will a structure (e.g., culvert, bridge support, dike) be placed below ordinary high water of the stream? ☐ Yes ☐ No

   If yes, attach engineering drawings or a field sketch, as described in Step B.

   For culverts, attach stream discharge data for a mean annual flood (Q=2.3), if available.

   If applicable, describe potential for channel changes and/or increased bank erosion:

   _____

2. Will more than 25,000 cubic yards of material be removed? ☐ Yes ☐ No

   If yes, attach a written hydraulic evaluation including, at a minimum, the following: potential for channel changes, assessment of increased aufeis (glaciering) potential, assessment of potential for increased bank erosion.

I HEREBY CERTIFY THAT ALL INFORMATION PROVIDED ON OR IN CONNECTION WITH THIS APPLICATION IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

_____ _____

Signature of Applicant Date

FH #_____
(Office Use Only)

ALASKA DEPARTMENT OF FISH AND GAME
SPECIAL AREA PERMIT APPLICATION

(For approval of a project or activity within a State game refuge, game sanctuary, or critical habitat area)
Pursuant to 5 AAC 95

A. APPLICANT

Name: _____

Company: _____

Address: _____

City/State/ZIP: _____

E-Mail: _____

Telephone: _____ Fax: _____

Name of Responsible Party in the Field: _____

B. LOCATION OF PROJECT SITE:

Name of Special Area: _____

Specific Project Location: _____

Township	Range	Meridian	Section(s)
USGS Map			
Latitude		Longitude	(NAD 83)

Is the project on: State Land Private Land Federal Land
Municipal Land Ownership Unknown Other _____

Water bodies crossed or otherwise affected: _____

C. DESCRIPTION OF THE PROJECT OR ACTIVITY

On separate, attached sheets provide complete plans and specifications and all other details necessary to fully describe the scope of the proposed project or activity. Include, at a minimum, the following information:

- The purpose of the project or activity.
- The timeframe for the project or activity, including the specific time periods for any inwater work or other activities which may disturb fish or wildlife.

- A description of construction methods, types, and quantities of equipment and number of people involved.
- A description of water use including methods of withdrawal, rate of withdrawal, and the total quantity of water required.
- A list of fill and excavation quantities, including the types of material and the source.
- A map and description showing how access will be gained to the project area (use USGS 1:63,360 scale maps where available).
- A detailed map or plan view, drawn to scale, and any cross-sectional views necessary to show project features and local topography including the location of all facilities and project dimensions.
- A current aerial photograph of the project location (if available).

D. OTHER PERMITS

Identify other state or federal permits or authorizations obtained or for which you have applied:

_____

_____

MITIGATION: As a condition of project approval, applications will be required to compensate fully for damage to fish and wildlife and their habitat by employing the most appropriate techniques. Where determined necessary by the department, a mitigation plan pursuant to 5 AAC 95 will be required.

I HEREBY CERTIFY THAT ALL INFORMATION PROVIDED ON OR IN CONNECTION WITH THIS APPLICATION IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

_____ _____

Signature of Applicant Date

_____

Name of Applicant (please print)

SUBMIT APPLICATION BY MAIL OR IN PERSON TO THE NEAREST DEPARTMENT OF FISH AND GAME, DIVISION OF HABITAT OFFICE.

ANCHORAGE
333 Raspberry Rd, Ste 2068
Anchorage, AK 99518

CRAIG
PO Box 668
Craig, AK 99921

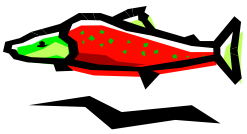
DOUGLAS (JUNEAU)
PO Box 110024
Juneau, AK 99811-0024

FAIRBANKS
1300 College Rd
Fairbanks, AK 99701

SOLDOTNA (KENAI)
514 Funny River Rd
Soldotna, AK 99669

MAT-SU/PALMER
1800 Glenn Highway, Ste 4
Palmer, AK 99645

Multi-Agency Permit Packet



RIVER CENTER

This Packet Contains:

- ☑ River Center Multi-Agency Permit Application
- ☑ Site Plan Instructions & Checklist with Examples and Drawing Paper

Notes:

Please answer all questions completely. If a question does not pertain to your activity, write "N/A".

- This application will be distributed to multiple agencies including the Kenai Peninsula Borough, Alaska Department of Fish & Game, Alaska State Parks, U.S. Army Corps of Engineers, and the U.S. Fish & Wildlife Service. Individual agencies may contact you about your application. In some cases, additional information or applications may be required. You are responsible for obtaining other required permits for your activity.

- Project drawings and descriptions are an important part of your application. Please draw carefully and be sure to include the information outlined in the Site Plan Instructions & Check List. Site plan examples and paper are provided.

- Complete applications can take 30 days or longer to process. Be sure to plan your projects accordingly.

- For complete instructions on completing this application, visit our web site at www.kenairivercenter.org/application

RETURN COMPLETED PERMIT APPLICATIONS TO:

RIVER CENTER
514 FUNNY RIVER ROAD
SOLDOTNA, AK 99669
(907) 260-4882 fax:(907) 260-5992
KenaiRivCenter@borough.kenai.ak.us
website: www.borough.kenai.ak.us/river-center

Multi-Agency Permit Application

RIVER CENTER

Please answer all questions completely.

Applicant Information:

Name:

_____

Owner? ☐ **Yes** ☐ **No**

Mailing Address:
(permits will be mailed to this address)

_____

_____

Phone (Home/Work): _____
Cell Phone: _____
Fax: _____

E-Mail: _____

Agent Information:

Name:

_____

Mailing Address:

_____

_____

Phone (Home/Work): _____
Cell Phone: _____
Fax: _____

E-Mail: _____

Project Location:
Please complete all information including the legal description of the property or site location. This information can be found on your tax bill or by visiting the KPB Assessing Department website at www.borough.kenai.ak.us/assessingdept/default.htm.

Waterbody Name: _____

River Mile: _____ ☐ Right or ☐ Left bank (looking downstream)

Subdivision: _____ Lot: _____ Block: _____

Township: _____ Range: _____ Section: _____

KPB Parcel Number: _____ Physical Address: _____

Directions to the site: _____

_____

Please Complete the Following:

1) This activity is a: ☐ new project ☐ modification, addition, repair, or replacement to an existing project

2) What is the purpose of this project? _____

_____

Multi-Agency Permit Application – Page 2

3) Provide a detailed description of your entire project and all related activities. Attach additional pages if needed.
Please be sure that your description contains all of the following:

- ☐ The location and dimensions of all existing and proposed development, including buildings, roads/driveways, pathways, building pads, accessory structures, and fill, as well as the location of any water bodies.
- ☐ The type(s) and amount(s) of fill material to be used for the project. Include the location/source of the fill material.
- ☐ The measurements of all new development, including platforms, walkways, structures, and bank restoration techniques. Please include measurements from water bodies and lot lines.
- ☐ The area and volume of material to be dredged and the location of the disposal site.
- ☐ A description of the waterbody, including wetlands to be filled. Include the types and volumes of each type of fill material.
- ☐ A description of construction methods and types of equipment to be used.
- ☐ If you are withdrawing water from a waterbody, a description of water use including location, methods of withdrawal, rate of withdrawal, and the total quantity of water required.
- ☐ If fuel storage is required for your project, indicate the location, quantities, and types of fuel.
- ☐ If vegetation or trees must be cleared as a result of your project, indicate the location, amount, and type of vegetation to be cleared.
- ☐ The type(s) and amount(s) of material that will be excavated for the project. Include the location the excavated material will be placed.

_____

_____

_____

_____

_____

_____

_____

_____

4) Proposed project start date: _____ Proposed project end date: _____

Estimated number of actual construction days: _____

5) If this project is within the limits of an incorporated city, please indicate city:_____

6) Is the project located within 50 feet of ordinary high water (OHW) or mean high water (MHW) of a stream or waterbody? ☐ Yes ☐ No ☐ Not sure where OHW or MHW line is

Multi-Agency Permit Application – Page 3

7) Does any portion of the project cantilever or extend **over** the OHW or MHW of the stream or waterbody?
☐ Yes ☐ No ☐ Not sure where OHW or MHW line is

8a) Does any portion of the project extend **below** the OHW or MHW of the stream or waterbody?
☐ Yes ☐ No ☐ Not sure where OHW or MHW line is

8b) Will a structure (e.g., culvert, bridge support, dike) be placed below OHW, MHW, or High Tide Line (HTL) of the waterbody?
☐ Yes ☐ No

9) Will material be extracted or dredged from

☐ Floodplain of a river, lake, or ocean

☐ Tidal or non-tidal waters

If you checked one of the above boxes, what type of material? _____
What amount of material? _____
Where will the material be deposited? _____

10) Will material (including spoils, debris or overburden) be deposited in a

☐ Mapped floodplain or velocity zone of a river, lake or ocean

☐ Tidal or non-tidal waters

If you checked one of the above boxes, is the fill temporary ☐ or permanent ☐?
If temporary, how long will it be in place? _____
What type of material is it? _____ Amount? _____
Identify the location(s) of any deposited material on the attached top-view site plan drawing.

11) What is the surface area (in acres) that would be filled, excavated, or dredged of any waters, including areas below the HTL or MHW of tidal waters, below the OHW of non-tidal waters and/or wetlands adjacent to tidal or non-tidal waters? _____

12a) List all motorized equipment to be used in this project, including access route to site and any stream or water-body crossings:

_____

_____

12b) How long will motorized equipment be used **below** OHW, MHW, or the HTL?_____

13) Are there any threatened or endangered species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work? ☐ Yes ☐ No If yes, list all species:

_____

Multi-Agency Permit Application – Page 4

14) Are there any historic properties that may be affected by the proposed work? ☐ Yes ☐ No If yes, state which property or properties may be affected and/or attach a vicinity map including the location of the historic property or properties.

_____

15) Is any portion of the work already complete? ☐ Yes ☐ No If yes, describe the completed work:

_____

_____

16) Will utility systems, including water, electric, gas, etc. be developed? ☐ Yes ☐ No If yes, describe:

_____

_____

Application Checklist

☐ Are pages 1 through 4 completely filled out? If a question does not pertain to your activity, write 'N/A'

☐ Did you include a detailed project description?

☐ Did you complete the Top View & Elevation/Side View drawings? Be sure to review the instructions for site plans and make sure all relevant information is included.

☐ Did you include your permit fee (if applicable)? If your project is within State Park Boundaries or cantilevers over a State Park (which includes the Kenai River) a $100 fee is required at the time of application. Make checks payable to 'State of Alaska.' If you are not certain if a fee is required, contact State Parks at the River Center at (907) 714-2470.

☐ Did you sign your application? If you have designated an agent to work the agencies on your behalf, they must also sign the application.

Application is hereby made for a permit or permits to authorize the work described in this application form. I certify the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

X _____ _____

Signature of Applicant Date

If you designated an agent, both the applicant and agent must sign this application.

X _____ _____

Signature of Agent Date

Site Plan Instructions & Checklist

RIVER CENTER

Directions:

PLEASE INCLUDE ALL OF THE FOLLOWING INFORMATION. IF THIS INFORMATION IS NOT PROVIDED, YOUR APPLICATION MAY BE RETURNED TO YOU.

- Print your name, date of drawing, the number of the sheet and total number of sheets in the set (e.g. Sheet 1 of 2), as well as the KPB Parcel No. on all pages.

- Indicate the scale of your drawing and show a North arrow. The scale need not be the same for every drawing.

- Submit one original set of drawings on 8 ½ x 11 paper. Provide as much detail as you can; however, please submit the fewest number of sheets necessary to adequately show the proposed activity. Please include photos of the project site if available.

- The **TOP VIEW** drawing should show your project in relation to:
  - the distance from ordinary (or mean) high water of the stream;
  - property lines and any adjacent streets by name;
  - any nearby structures, such as houses, outbuildings, fences, etc.;
  - any easements and/or location of any nearby utilities;
  - the location of any material to be deposited in a river, floodplain or wetland.

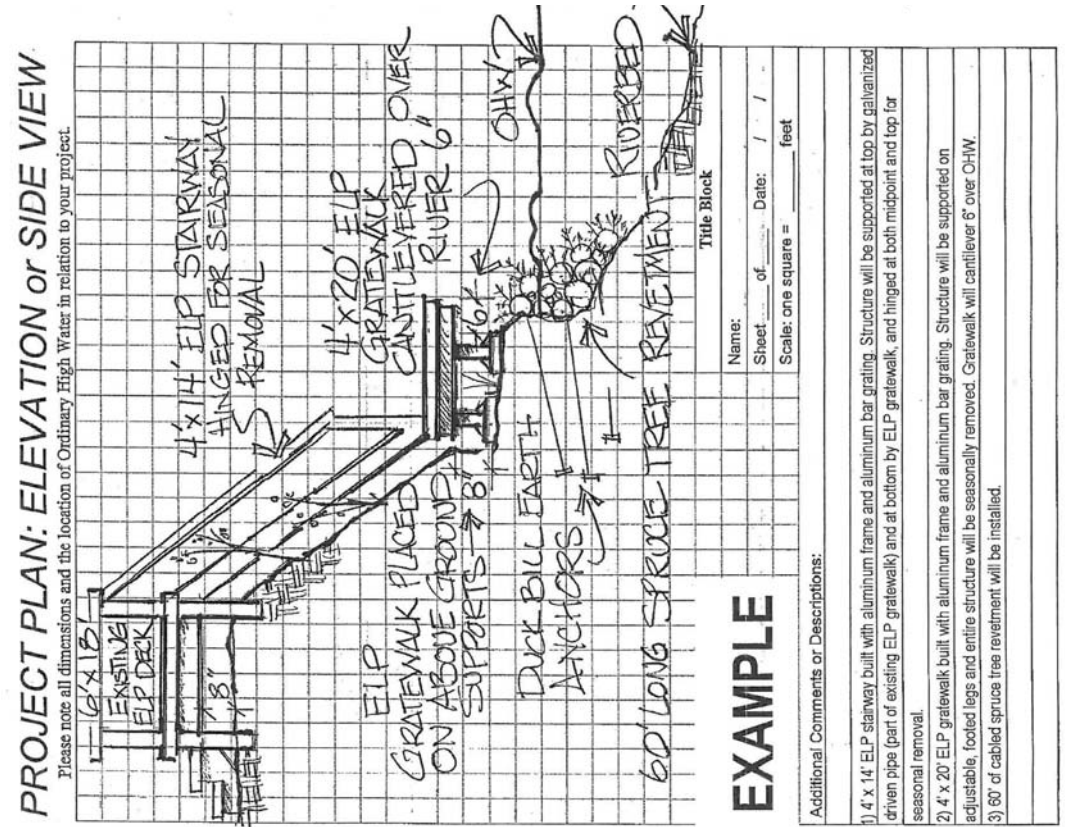
- The **ELEVATION OR SIDE VIEW** drawing should show your project in relation to:
  - elevations above ground level
  - In non-tidal areas, show the Ordinary High Water Line.
  - In tidally influenced areas show the High Tide Line and Mean High Water Mark at the project site.
  - Show the distance from the above water lines

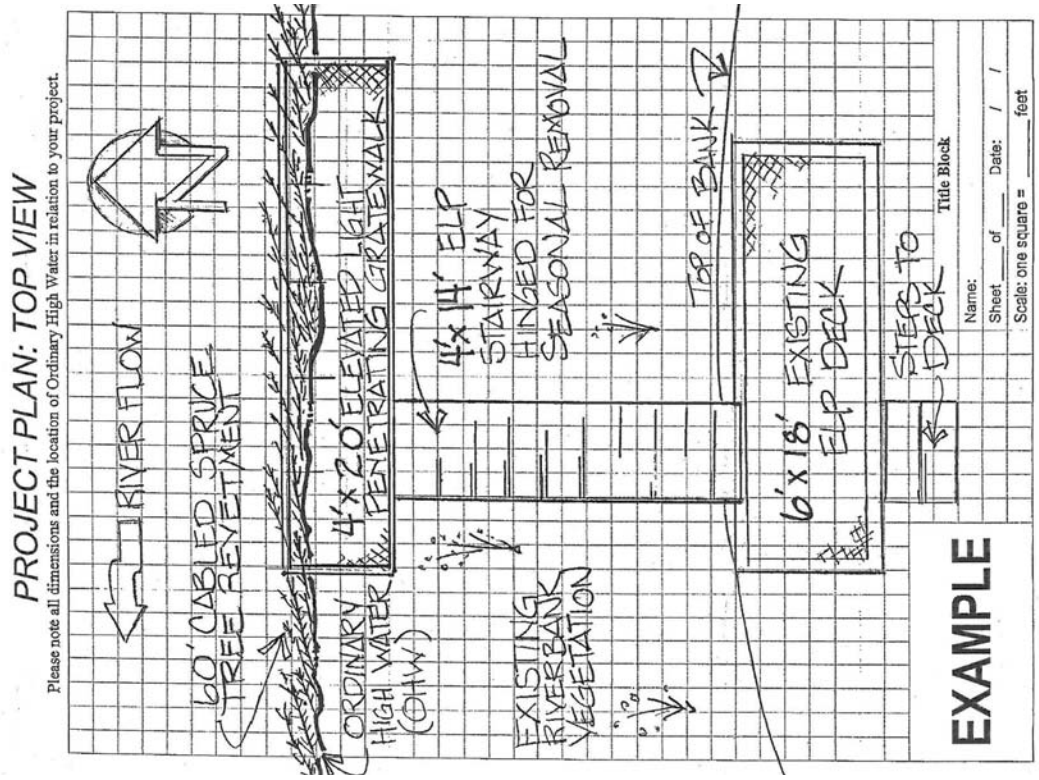
- Be sure to include all dimensions, types, and quantities of materials used on the project.

- All structures and other objects on your site plan should be clearly defined as either existing structures or proposed structures.

PLEASE SEE EXAMPLES

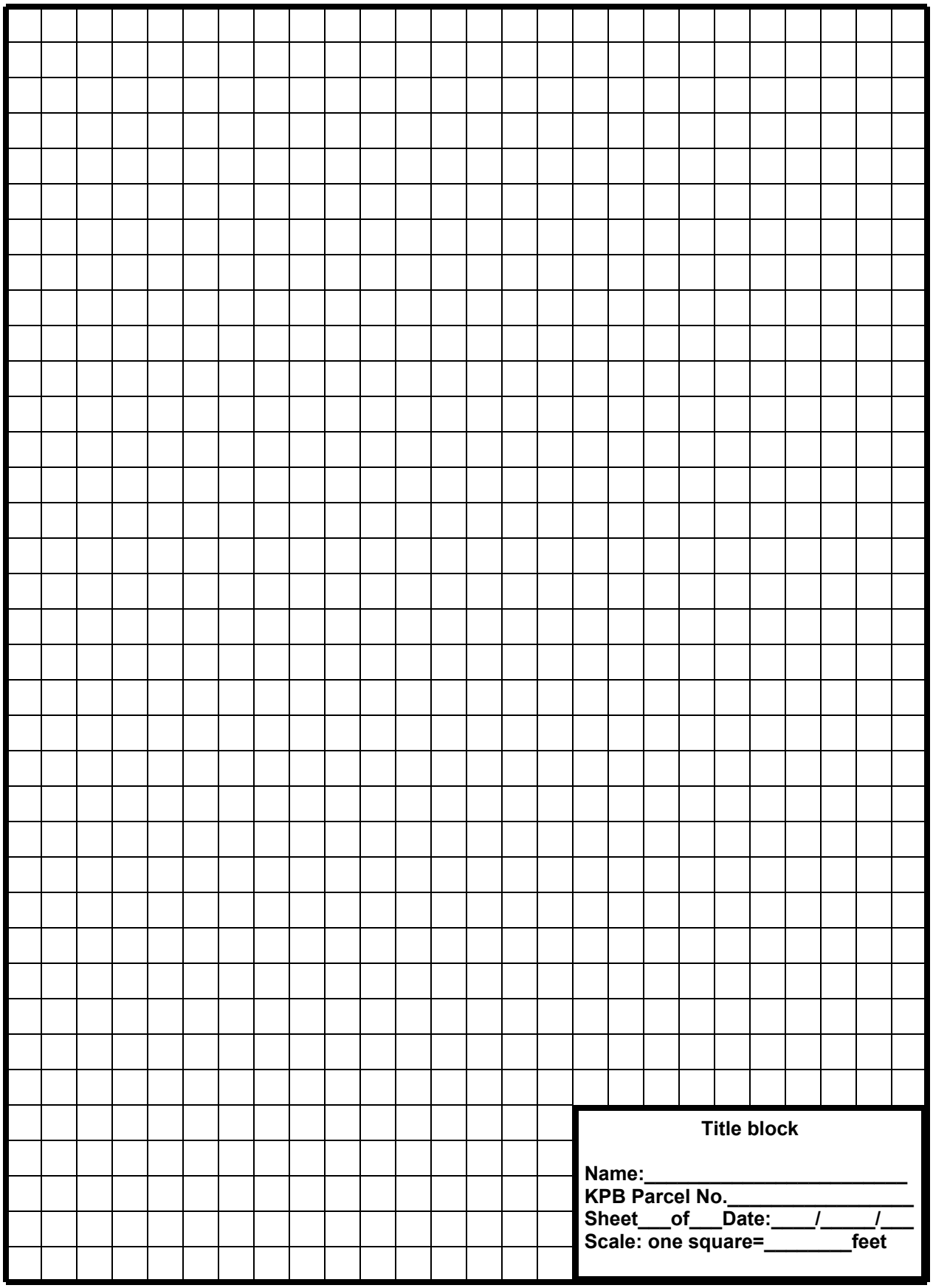
Site Plan Examples



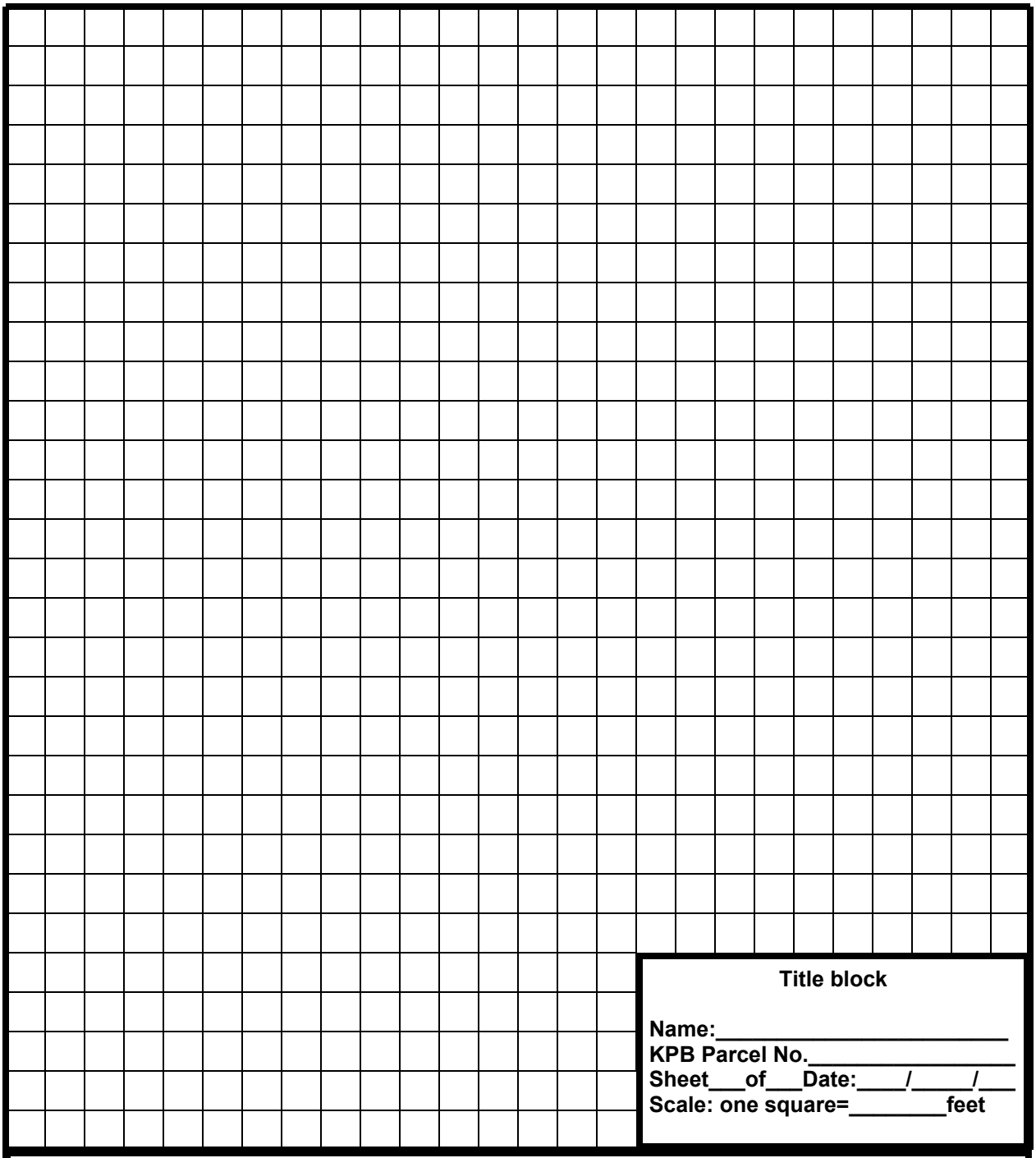


For additional site plan examples, please visit www.kenairivercenter.org/application

SITE PLAN: TOP VIEW



SITE PLAN: ELEVATION OR SIDE VIEW



Title block

Name:_____
KPB Parcel No._____
Sheet___of___Date:____/_____/___
Scale: one square=_____feet

Additional Comments or Descriptions:

Fill in the form online by clicking in the appropriate field and typing. Print the completed application and mail in one signed copy of the form with fees and supporting documents.

You will not be able to save your data entry online, so print an extra copy for yourself.

Print

DIVISION OF MINING, LAND AND WATER
WATER RESOURCES SECTION
www.dnr.state.ak.us/mlw/water/index.htm

Anchorage Office 550 West 7th Avenue, Suite 1020 Anchorage, AK 99501-3562 (907) 269-8600 Fax: (907) 269-8947	Juneau Office PO Box 111020 400 Willoughby Avenue Juneau, AK 99811-1020 (907) 465-3400 Fax: (907) 586-2954	Fairbanks Office 3700 Airport Way Fairbanks, AK 99709-4699 (907) 451-2790 Fax: (907) 451-2703	***For ADNR Use Only*** ***Date/Time Stamp***
For ADNR Use Only ***TWUP #***	***For ADNR Use Only*** ***CID #***	***For ADNR Use Only*** ***Receipt Type WR***	

APPLICATION FOR TEMPORARY USE OF WATER

INSTRUCTIONS

1. Complete one application for each project including up to five water sources (incomplete applications will not be accepted).
2. Attach legible map that includes meridian, township, range, and section lines such as a USGS topographical quadrangle or subdivision plat. Indicate water withdrawal point(s), location(s) of water use, and point(s) of return flow or discharge (if applicable).
3. Attach sketch, photos, plans of water system, or project description (if applicable).
4. Attach driller's well log for drilled wells (if available).
5. Attach copy of ADNR fish habitat permit (if applicable).
6. Attach completed Coastal Project Questionnaire (if applicable - see page 4).
7. Submit non-refundable fee (see page 4).

APPLICANT INFORMATION

Project Name

Organization Name (if applicable)

Agent or Consultant Name (if applicable)

Individual Name (if applicable)

Individual Co-applicant Name (if applicable)

Mailing Address | City | State | Zip Code

Daytime Phone Number

Alternate Phone Number (optional)

Fax Number (if available)

E-Mail Address (optional)

PROPERTY DESCRIPTIONS

Location of Water Use

Project Area (e.g. milepost range, place name, survey number)	Meridian	Township	Range	Section	Quarter Sections	
					¼	¼
					¼	¼

Location of Water Source

Geographic Name of Water Body or Well Depth	Meridian	Township	Range	Section	Quarter Sections	
					¼	¼
					¼	¼
					¼	¼
					¼	¼
					¼	¼

Location of Water Return Flow or Discharge (if applicable)

Geographic Name of Water Body or Well Depth	Meridian	Township	Range	Section	Quarter Sections	
					¼	¼
					¼	¼

METHOD OF TAKING WATER

Pump	Pump Intake _____ Inches	Hours Working _____ Hours/Day
	Pump Output _____ GPM	Length of Pipe _____ Feet (from pump to point of use)
Gravity	Pipe Diameter _____ Inches	Length of Pipe _____ Feet (take point to point of use)
	Head _____ Feet	
Ditch	L _____ H _____ W _____ Feet	Diversion Rate _____ ☐ GPM or ☐ CFS
Reservoir	L _____ H _____ W _____ Feet	Water Storage _____ Acre-feet
Dam	L _____ H _____ W _____ Feet	Water Storage _____ Acre-feet

AMOUNT OF WATER

Purpose of Water Use	Quantity of Water			Season of Use	
	Maximum Withdrawal Rate	Total Daily Amount	Total Seasonal Amount	Date Work Will Start	Date Work Will be Completed
Project Totals				Total years needed: _____	

PROJECT DESCRIPTION

What alternative water sources are available to your project should a portion of your requested diversion be excluded because of water shortage or public interest concerns?

Are there any surface water bodies or water wells at or near your site(s) that could be affected by the proposed activity? If yes, list any ground water monitoring programs going on at or near the sites, any water shortages or water quality problems in the area, and any information about the water table, if known.

Briefly describe the type and size of equipment used to withdraw and transport water, including the amount of water the equipment uses or holds.

Briefly describe what changes at the project site and surrounding area will occur or are likely to occur because of construction or operation of your project (e.g. public access, streambed alteration, trenching, grading, excavation).

Briefly describe land use around the water take, use, and return flow points (e.g. national park, recreational site, residential).

Will project be worked in phases? State reason for completion date.

Briefly describe your entire project:

_____

_____

_____

(Attach extra page if needed.)

11 AAC 93.220 sets out the required information on the application and authorizes the department to consider any other information needed to process an application for a temporary use of water. This information is made a part of the state public water records and becomes public information under AS 40.25.110 and 40.25.120. Public information is open to inspection by you or any member of the public. A person who is the subject of the information may challenge its accuracy or completeness under AS 44.99.310, by giving a written description of the challenged information, the changes needed to correct it, and a name and address where the person can be reached. False statements made in an application for a benefit are punishable under AS 11.56.210.

SIGNATURE

The information presented in this application is true and correct to the best of my knowledge. I understand that no water right or priority is established per 11 AAC 93.210-220, that the water used remains subject to appropriation by others, and that a temporary water use authorization may be revoked if necessary to protect the water rights of other persons or the public interest.

_____ _____

Signature Date

_____ _____

Name (please print) Title (if applicable)

REFERENCES

Measurement Units

GPD = gallons per day
CFS = cubic feet per second
GPM = gallons per minute
AF = acre-feet
AFY = acre-feet per year (325,851 gallons/year)
AFD = acre-feet per day (325,851 gallons/day)
MGD = million gallons per day

Conversion Table

5,000 GPD=	30,000 GPD=	100,000 GPD=	500,000 GPD=	1,000,000 GPD=
0.01 CFS	0.05 CFS	0.2 CFS	0.8 CFS	1.5 CFS
3.47 GPM	20.83 GPM	69.4 GPM	347. 2 GPM	694.4 GPM
5.60 AFY	33.60 AFY	112.0 AFY	560.1 AFY	1120.1 AFY
0.2 AFD	0.09 AFD	0.3 AFD	1.5 AFD	3.1 AFD
0.01 MGD	0.03 MGD	0.1 MGD	0.5 MGD	1.0 MGD

Fee required by regulation 11 AAC 05.010(a)(8)

- **$350** for all uses of water from up to five water sources

Make checks payable to "Department of Natural Resources".

Coastal Zone

If this appropriation is within the Coastal Zone, and you are planning to use more than 1,000 GPD from a surface water source or 5,000 GPD from a subsurface water source, you need to submit a completed Coastal Project Questionnaire with this application. For more information on the Coastal Zone, contact the Office of Project Management and Permitting; Anchorage 269-7470, Juneau 465-3562, www.dnr.state.ak.us/acmp/.