ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET – PRELIMINARY DRAFT

Permit Number: **AKG521000**

Onshore Seafood Processors Wastewater Discharge General Permit

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Wastewater Discharge Authorization Program

555 Cordova Street

Anchorage, AK 99501

Public Comment Period Start Date: preliminary draft
Public Comment Period Expiration Date: preliminary draft
Alaska Online Public Notice System

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Proposed issuance of an Alaska Pollutant Discharge Elimination System (APDES) permit for:

ONSHORE SEAFOOD PROCESSORS WASTEWATER DISCHARGE GENERAL PERMIT

The Alaska Department of Environmental Conservation (the Department or DEC) proposes to issue an APDES general permit (permit) to operators of seafood processors and operators of onshore facilities that discharge seafood processing and fish waste to coastal and fresh water systems. The permit authorizes and sets conditions on the discharge of pollutants from authorized onshore facilities to waters of the United States (U.S.). In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facilities and outlines best management practices to which each facility must adhere.

This fact sheet explains the nature of potential discharges from onshore seafood processing facilities and those that discharge fish waste and the development of the permit including:

- Information on public comment, public hearing, and appeal procedures
- A listing of proposed effluent limitations and other conditions
- Technical material supporting the conditions in the permit
- Proposed monitoring and reporting requirements in the permit

Public Comment

Persons wishing to comment on, or request a public hearing for the draft permit, may do so in writing by the expiration date of the public comment period.

Commenters are requested to submit a concise statement on the permit condition(s) and the relevant facts upon which the comments are based. Commenters are encouraged to cite specific permit requirements or conditions in their submittals.

A request for a public hearing must state the nature of the issues to be raised, as well as the requester's name, address, and telephone number. The Department will hold a public hearing whenever the Department finds, on the basis of requests, a significant degree of public interest in a draft permit. The Department may also hold a public hearing if a hearing might clarify one or more issues involved in a permit decision or for other good reason, in the Department's discretion. A public hearing will be held at the closest practicable location to the site of the operation. If the Department holds a public hearing, the Director will appoint a designee to preside at the hearing. The public may also submit written testimony in lieu of or in addition to providing oral testimony at the hearing. A hearing will be tape recorded. If there is sufficient public interest in a hearing, the comment period will be extended to allow time to public notice the hearing. Details about the time and location of the hearing will be provided in a separate notice.

All comments and requests for public hearings must be in writing and should be submitted to the Department at the technical contact address, fax, or email identified above (see also the public comments section of the attached public notice). Mailed comments and requests must be postmarked on or before the expiration date of the public comment period.

After the close of the public comment period and after a public hearing, if applicable, the Department will review the comments received on the draft permit. The Department will respond to the comments received in a Response to Comments document that will be made available to the public. If no substantive comments are received, the tentative conditions in the draft permit will become the proposed final permit.

The proposed final permit will be made publicly available for a five-day potential applicant review. The applicant may waive this review period. After the close of the proposed final permit review period, the Department will make a final decision regarding permit issuance. A final permit will become effective 30 days after the Department's decision, in accordance with the state's appeals processes at 18 AAC 15.185 – 18 AAC 15.340.

The Department will transmit the final permit, fact sheet (amended as appropriate), and the Response to Comments to anyone who provided comments during the public comment period or who requested to be notified of the Department's final decision.

Appeals Process

The Department has both an informal review process and a formal administrative appeal process for final APDES permit decisions. An informal review request must be delivered within 15 days after receiving the Department's decision to the Director of the Division of Water at the following address:

Director, Division of Water
Alaska Department of Environmental Conservation
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review. See http://dec.alaska.gov/commish/InformalReviews.htm for information regarding informal reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner
Alaska Department of Environmental Conservation at
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See http://dec.alaska.gov/commish/ReviewGuidance.htm for information regarding appeals of Department decisions.

Documents are Available

The permit, fact sheet and related documents can be obtained by visiting or contacting DEC between 8:00 a.m. and 4:30 p.m. Monday through Friday at the addresses below. The permit, fact sheet and other information are located on the Department's Wastewater Discharge Authorization Program website: http://dec.alaska.gov/water/wwdp/index.htm.

Dept. of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501
(907) 269-6285

Dept. of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
410 Willoughby Avenue, Suite 310
Juneau, AK 99801
(907) 465-5180

Dept. of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
43335 Kalifornsky Beach Rd. - Suite 11
Soldotna, AK 99669
(907) 262-5210

Dept. of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
610 University Ave.
Fairbanks, AK 99709
(907) 451-2183

Dept. of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
1700 E. Bogard Road #B
Wasilla, AK 99654
(907) 376-1850

TABLE OF CONTENTS

TABLES

FIGURES

LIST OF APPENDICES

1.0 General Permit

1.1 Legal Basis for Issuance of an APDES Permit

Section 301(a) of the Clean Water Act (CWA) provides that the discharge of any pollutant is unlawful except in compliance with Sections 301, 302, 306, 307, 318, 402 and 404 of the CWA. CWA Section 402(a) of the CWA allows the Administrator of the Environmental Protection Agency (EPA) to issue a permit for the discharge of any pollutant or combination of pollutants that will meet all applicable requirements under Section 301, 302, 306, 307, 308, and 403 of the CWA or other conditions that are necessary to carry out the provisions of the CWA.

CWA Section 402(b) allows a state to petition EPA to establish and administer a permit program. On October 31, 2008, EPA approved the State of Alaska's application to administer the CWA § 402(b), National Pollutant Discharge Elimination System (NPDES) permitting and compliance program in Alaska as the Alaska Pollutant Discharge Elimination System (APDES) Program. EPA's approval of the state's application delegated the Department to carry out the applicable CWA provisions. The Alaska Department of Environmental Conservation (DEC or Department) has developed regulations, 18 Alaska Administrative Code (AAC) 83 to implement the APDES program. The discharge of any pollutant is unlawful except in accordance with an APDES permit as established in 18 AAC 83.015.

Per 18 AAC 83.205, the Department may regulate categories or subcategories of point source discharges within an area through the use of a general permit when the sources:

- Involve the same or substantially similar types of operations;
- Discharge the same types of wastes;
- Require the same effluent limitations or operating conditions;
- Require the same or similar monitoring requirements; and
- In the opinion of the Department, are more appropriately controlled under a general permit than under individual permits.

NPDES regulations found in Code of Federal Regulations (CFR) 40 CFR 408 establish effluent limitation guidelines (ELGs) for seafood processors under a single category, "Canned and Preserved Seafood Processing Point Source Category". Seafood processing dischargers are further divided into sub-categories when applying the ELGs found in 40 CFR 408 based on seafood species type.

Since the 40 CFR Part 408 regulations were promulgated in the late 1970s, several members of the seafood processing industry petitioned EPA regarding the applicability of Non-Remote standards being applicable to certain community locations (Juneau, Anchorage, Cordova, etc.). In 1980, EPA suspended portions of the applicability of which communities in Alaska had to comply with Non-Remote ELGs. In 2013, EPA announced via the federal register a notice of availability of data (NODA) and information from Alaskan seafood processing facilities and other publicly available sources regarding seafood processing waste disposal practices and options. The NODA provided preliminary results of EPA's analyses of the updated data for the five petition locations, as well as preliminary analysis for possible additional locations being added to the list of Non-Remote locations. The NODA also provided preliminary indications of how these results may be reflected in EPA's final response to petitions submitted in 1980 by certain members of the Alaskan seafood processing industry, and in amended effluent limitations. As published on EPA's website (http://www.epa.gov/eg/alaskan-seafood-processing-effluent-guidelines), EPA discusses plan to issue a final rule, covering the Alaskan seafood processing subcategories, in 2016.

The Department has determined that it is appropriate to issue a general permit for facilities identified in Fact Sheet Part 1.5 because sources are subject to the same water quality-based effluent limitations (WQBELs) and technology-based ELG requirements. A single permit for both Remote and Non-Remote locations provides a permit mechanism should EPA's final rule making transition several currently categorized Remote seafood processing facilities into the Non-Remote category. The permit establishes TBELS in the same manner 40 CFR Part 408 categorizes facilities as Remote vs Non-Remote, then applies WQBELs, operating conditions, and monitoring requirements.

The Department has determined that facilities that grind fish waste (community fish grinders) and discharge to waters of the U.S. should also be provided coverage under this permit due to the similarity in pollutants discharged.

1.2 Individual Permit

An operator authorized to discharge under a general permit may request to be excluded from coverage by applying for an individual permit. This request shall be made by submitting APDES permit application Forms 1 and 2C, along with Form 2M (if requesting a mixing zone) with supporting documentation (e.g., modeling, antidegradation information, etc.) to DEC.

1.2.1 The Department may require any person authorized by a general permit to apply for and obtain an individual permit, or any interested person may petition the Department to take this action. Per 18 AAC 83.215, the Department may consider the issuance of an individual permit when:

1.2.1.1 The discharger is not in compliance with the terms and conditions of the APDES general permit;

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

1.2.1.3 Effluent limitations guidelines (ELGs) are promulgated for point sources covered by the APDES general permit;

1.2.1.4 A water quality management plan containing requirements applicable to a point source is approved;

1.2.1.5 Circumstances have changed since the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or the authorized discharge shall be either temporarily or permanently reduced or eliminated; or

1.2.1.6 The single discharge, or the cumulative number of discharges, is/are a significant contributor(s) of pollutants.

1.3 Permit Issuance History and Coverage Changes

In 1995, EPA issued NPDES general permit AKG520000 for seafood processors operating in the State of Alaska. In 2001, EPA reissued general permit AKG520000. The State of Alaska's accompanying July 2001 CWA Section 401 Certificate of Reasonable Assurance (401 Certification) authorized mixing zones for residues, dissolved gas, oil and grease, fecal coliform bacteria, pH, temperature, color, turbidity, and total residual chlorine (TRC), as well as authorized a Zone of Deposit (ZOD) for residues.

The 2001 AKG520000 permit authorized the discharge of seafood processing wastes and other wastewater discharges from seafood processing facilities into waters of the U.S. At the time of the 2001 permit issuance, approximately 250 permitted seafood processing facilities operated in Alaska. This included about 80 onshore (referred to as shore-based- those located on land or pilings) facilities, and about 70 'shore-based' processing vessels, which were defined as "a processor operating and discharging

less than one-half nautical mile (0.5 nm) from shore at mean lower low water (MLLW)." It is important to note the 2001 AKG520000 permit authorized the discharges from 'shore-based' vessels that discharged within zero to 0.5 nm mile of shore, but not necessarily in association with any land-based or onshore processing facility. In addition to physically shore-based facilities, the AKG521000 permit will provide coverage for those moored or anchored vessels acting as support facilities to an onshore seafood processing facility. Support facility vessels are defined as providing seafood processing services to the onshore facility, or additional freezing capability. Vessels that are 'shore-base' vessels, but not providing support services to an on-shore facility will maintain their 2001 AKG52000 permit administrative extended coverage until a new permit is issued by DEC that provides coverage for these vessels.

The 2001 AKG520000 permit expired on July 27, 2006 and was administratively extended by EPA, in accordance with 40 CFR 40.122.6(a), which states that "when a timely and complete application is received by EPA, and through no fault of the permittee, EPA does not reissue a new permit prior to the expiration date of the existing permit, then the permit remains fully effective and enforceable." In accordance with 18 AAC 83.155, the Department continued the AKG520000 administrative extensions when it received authority to administer the NPDES program in Alaska.

As mentioned earlier on October 31, 2008, EPA approved the State of Alaska's application to administer the NPDES Program in Alaska. During the time between the expiration of AKG520000 (July 27, 2006) and the approval of the State's application, EPA worked on reissuing the 2001 AKG520000 general permit but did not reissue the permit before approving the State's application. Following approval of the State's application, it was decided to separate the AKG520000 permit into multiple state and federal permitting actions. In December 2009, EPA issued NPDES General Permit AKG524000 '*Offshore Seafood Processors in Alaska*' to cover vessels discharging in federal waters 3.0 nm or more (outside State waters) from shore or baseline, whichever is greater. In May 2011, DEC issued APDES General Permit AKG523000 providing discharge coverage for approximately 40 Offshore Seafood Processors discharging in State waters between 0.5 nm to 3.0 nm from shore as delineated by MLLW or baseline, whichever is greater. Nearshore seafood processing vessels that discharge in waters less than 0.5 nm from shore, that do not moor and provide direct support services to an onshore facility will not be covered under the 2016 AKG521000 general permit, but will continue to be authorized to discharge under the 2001 AKG520000 administrative extensions until an appropriate APDES permit is available.

1.3.1 2016 AKG521000 vessel coverage. The 2016 AKG521000 permit provides vessel coverage to barges and vessels that are moored and provide direct support to an onshore facility. Moored processing barges and vessels are those that are moored to a dock, pier or permanent anchors to prevent movement through the processing season. Though mobile barges or vessels, they operate in a similar manner as an onshore processor as their discharges become stationary, occurring in a single location of a waterbody, yet generally support onshore processing activities. The operator of an onshore facility shall submit an updated NOI listing the barges and/or vessels to be covered under the onshore operator's authorization. All barge and vessel discharges covered under the onshore facility's authorization shall be able to meet all permit conditions of the permit. Ensuring permit compliance is the responsibility of the operator of the onshore facility.

1.3.2 Inland Water Discharges. Historically in the AKG520000 permit, these discharges were referred to "At-Sea" discharges, occurring both inside and outside any baselines or closing lines. To try and eliminate confusion between the association of the terms 'territorial sea' and 'At-sea' discharges, the AKG521000 permit will refer to vessel discharges behind baselines and closing lines as Inland water discharges.

The 2016 AKG521000 permit proposes coverage to vessels discharging an onshore operators' wastewater system, if occurring landward of the baselines, and any closing line from which the

Territorial Sea is measured. These baselines and closing lines often appear on charts mapped by the National Oceanic and Atmospheric Administration (NOAA) and are integrated into the Seafood Processors GIS map maintained by the Department.

Discharge or Dumping of fish waste seaward of the territorial baseline, closing lines, or in areas where a baseline has not been established, falls under the legal jurisdiction of the Ocean Dumping Act. Therefore in these areas, applicants wishing to discharge an onshore facility's ground fish waste must contact EPA's Ocean Dumping Management Program for applicable requirements:

EPA Region 10
Ocean Dumping Management Program Coordinator
PO Box 20370
Juneau, AK 99802-0370
Phone #: (907) 586-7622
Fax #: (907) 586-7015

1.3.3 Fresh Water Discharges. The 2001 AKG520000 permit Part III (B)(3) listed lakes, rivers and streams (fresh water systems) as "at risk water resources and waterbodies", yet the 2001 permit allowed facilities located in these fresh water systems to apply for a waiver to discharge to the excluded areas. One of the listed waiver justifications was, "Pre-existing, permanent shore-based siting may be considered justification for a waiver." EPA issued approximately 25 AKG520000 authorizations to pre-existing onshore facilities with discharges to estuarine and fresh water systems. DEC intends to continue to provide coverage to these facilities under the AKG521000, as well as new applicants proposing discharges to estuarine and fresh water systems as long as new facilities meet permit eligibility criteria (see Permit Appendix Table D – D3 Seafood Processing Facilities Discharging to Fresh Waters).

1.3.4 Non-Remote Facilities. The 2016 AKG521000 permit will provide coverage for facility operator previously covered by the March 16, 1998, EPA-issued NPDES permit AKG528000 '*Seafood Processors Operating* S*horebased Facilities in Kodiak, Alaska'*, which authorized discharges from onshore seafood processors and by-product recovery facilities located in Kodiak, Alaska. The permit became effective on May 1, 1998 and expired on April 30, 2003. The 2016 AKG521000 permit has integrated effluent limits and required monitoring established in the 1998 AKG528000 permit. The Department finds that the Non-Remote seafood processing operators qualify for coverage under the general permit under 18 AAC 83.210(h). See http://dec.alaska.gov/Water/WPSdocs/AKG528000_docs.pdf for the AKG528000 permit.

At the time of 1998 AKG528000's issuance, there were ten onshore processing facilities and one by-product recovery facility in operation in the Kodiak area. Currently, eight processing facilities and one by-product recovery facility are in operation. The Department has determined these facilities to be eligible for coverage under the 2016 AKG521000 permit. The existing Kodiak facilities and discharge locations are listed in Appendix D of the permit.

1.3.5 Remote Facilities. The 2016 AKG521000 permit proposes coverage for approximately 80 onshore facilities and several nearshore vessels are currently covered under the administratively extended 2001 AKG520000 permit. Additionally, the 2016 AKG521000 permit proposes coverage to fish waste discharge vessels, some with previous NPDES or APDES permit coverage. The Department proposes to authorize these facilities under AKG521000 as the discharges are all associated within the same 'seafood processing' category as found in 40 CFR Part 408. The Department finds that operators discharging seafood processing and ground fish waste and wastewater qualify for coverage under the general permit consistent with 18 AAC 83.210(h).

1.3.6 Operators previously not required to obtain coverage. Low volume discharges from smaller seafood processing facilities were not required to obtain coverage under the 2001 AKG520000 general permit.

> AKG520000 Section I (A) "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."

These facilities generally produce much less waste and operate for much shorter processing seasons, yet have the same or substantially similar operations and discharges the same types pollutants as a seafood processing facilities previously covered under the 2001 AKG520000 permit. As such, the Department has determined that it is appropriate to provide general permit coverage for smaller volume dischargers that discharge seafood processing or ground fish waste and wastewaters to waters of the U.S.

The volume of fish processed correlates to the pounds of fish waste pollutants discharged to the receiving water; hence, lower volumes of fish processed results in fewer pounds of fish waste pollutants entering the receiving water. A facility that annually discharges 1,000,000 lbs of fish waste generally poses a greater risk (greater pollutant loading) to the receiving water than a facility that discharges 30,000 lbs in the same receiving water. Based on the lower environmental risk posed from smaller volume dischargers, the permit establishes a new permitting regime for low volume seafood processors and/or fish waste producers that discharges less than 30,000 lbs of fish waste annually. These low volume dischargers will be required to meet the same effluent limitations (consistent with ELG mandated technology-based requirements), but with less frequent monitoring compared to previously permitted onshore seafood processing facilities that were required to obtain coverage under AKG520000. However, to ensure the low volume dischargers are in compliance with the CWA and have APDES permit coverage, the Department has included permit coverage for low volume dischargers. Accordingly, the 2016 AKG521000 permit requires facilities that discharge less than 1,000 pounds of seafood waste per day and / or less than 30,000 pounds of seafood waste per year to obtain coverage. For new operators requesting coverage, a complete NOI (Part 1.6) application, including all supplementary documents, shall be submitted to DEC at least 90 days before the expected start of discharge. The Department anticipates that this change will lead to additional facilities requesting coverage, including existing facilities that are not listed in Permit Appendix D, as well as newly constructed facilities.

Under the 2001 AKG520000 permit, community fish waste grinders and outfalls were also not covered dischargers. Communities began using fish grinders to address concerns regarding animals (primarily bears) accessing an easy food source left on the beach during large shore-side fisheries, which creates potential for dangerous animal/human interactions. To decrease the amounts of fish waste (carcasses) left on the beaches, some communities have installed community fish waste grinders where the public is able to bring their fish carcasses and the fish waste is ground to ½ inch, then discharged out an outfall. The 2016 AKG521000 permit proposes coverage for these small volume fish waste discharge systems. Note the permit does not require communities to install community fish waste grinders, but provides coverage for those communities that have installed grinder systems.

All currently existing or known facilities and discharge locations the permit proposes coverage for are listed in Appendix D of the permit.

1.4 Description of Seafood Processing Discharge Facilities (Permit Part 2.0)

Seafood processing facilities and vessels (including barges) are primarily in business to convert raw seafood into a marketable form. Alaska's commercial fishing operations target a number of assemblages including groundfish (e.g., walleye pollock, Pacific cod, sablefish, rockfish species, and other species of flatfish), five species of salmon, herring, and shellfish (e.g., species of crab, shrimp, clams, scallops, abalone, sea urchins, and sea cucumbers).

Seafood processing facilities use a variety of techniques and equipment to produce marketable seafood products. Detailed descriptions of specific seafood processing facilities (e.g., salmon canning, fish meal production) are provided by EPA's Development Document for the Effluent Limitation Guidelines for Seafood Processing Point Source Category (1975) (http://dec.alaska.gov/water/wwdp/seafood/documents.html). The processes involved in the production of marketable seafood products include packaging whole fresh or frozen seafood for shipment, mechanical filleting, deboning processes, and producing surimi and other fish byproducts. Solid wastes remaining after other production steps may be further processed into fish meal, fish oil, or fish hydrolysate, converting much of the solid waste to marketable products. Additionally, since the early 1980s, newer techniques in production lines such as surimi, and salmon byproduct (mince and washed mince) have produced economic gains. New techniques in recent years have also been developed to convert salmon waste to salmon hydrolysate and salmon pet food treats. Salmon hydrolysate is used as dietary supplements, fertilizer, and in pet food. As shown over the previous 30 years, development of new production lines and byproduct production lines such as fish oil, fish oil supplements, and bone meal from fish waste have also proven successful in Alaska.

The quantity and character of the fish wastes generated vary considerably over the course of a year. Waste produced also varies by regions, reflecting the distribution of available fishing stocks, seasonal variation in their abundance, the openings and closings of the fishing seasons, as well as fishing quota allocations that are used to manage stocks. Generally, groundfish and shellfish wastes constitute much of the pollutant discharges in the winter, early spring and autumn with salmon processing wastes occurring in the summer (along with groundfish). Groundfish constitute the largest amount of solid waste discharged on a state-wide basis and regionally constitute the largest volume of discharge from the Bering Sea/Aleutian Island region. The largest volume of waste discharged in all other regions comes from salmon and other finfish fisheries.

The timing of the salmon harvest is closely tied to the period when each salmon species returns to spawn. The fishing season for each salmon species depends on the various management regions around the State and the type of gear used but generally spans the period between June and September. The relatively short salmon fishing seasons and large runs of fish result in short, but intense, periods of fish waste produced in this sector.

Seafood processing / fish waste discharge facilities are divided into categories depending on the location of the facility and their size. These categories include non-remote seafood processing facilities and remote processing facilities as defined by 40 CFR Part 408. In addition, facilities are also classified as either major or minor facilities in accordance with specific rating criteria established by EPA.

Non-remote, seafood processing facilities process raw seafood products into marketable form and are located in "processing or population centers" as described in 40 CFR Part 408. The non-remote facilities are required to meet the Non-Remote technology-based effluent limitations (TBEL) / ELGs. The 2016 AKG521000 permit incorporates the ELGs from 40 CFR Part 408 and includes the application of best professional judgment (BPJ) TBELs to include screening at Non-Remote facilities. The AKG528000, applicable to Kodiak facilities (considered Non-Remote), Permit Part 3.1 required: "Seafood wastes shall not be pulverized, chopped, ground, or otherwise altered prior to screening and discharge through the

facility's outfall." Grinding was not allowed prior to screening because it increases wastewater pollutant loading when fish carcasses are ground (EPA, 1975). The screened waste was then required to be processed into fishmeal or other byproduct production. The AKG528000 permit allowed the operators to use other solid waste discharge methods (e.g., ocean dumping) in order to meet permit limits if the byproduct production facility was overloaded or offline. As of the effective date of the permit, only seafood processing facilities located in the Kodiak area are designated as Non-Remote, (including discharges to Kodiak Harbor, St. Paul Harbor, Gibson Cove, Near Island Channel, Women's Bay, and Woody Island Channel). Additional Non-Remote locations may potentially be designated during the permit cycle based on EPA ELG rulemaking. The permit is structured to accommodate new locations designated as Non-Remote should EPA make new designations.

Remote seafood processing facilities are facilities not located in a "processing center or population center", as defined in 40 CFR Part 408. The TBEL for these facilities requires that a seafood processing facilities grind the seafood processing waste into pieces smaller than 1.27 cm (½-inch) in any dimension prior to discharge to waters of the U.S.

Due to exceeding the previously authorized one acre ZOD size, some Remote facility operators have been required to screen the seafood processing waste in order to provide source control before discharge, and at times required to obtain individual permits. At this time, it is not the Department's intention to provide coverage under the 2016 AKG521000 to individually permitted facilities. Remote facilities with who have installed or have been required to install screening equipment as of the effective date of this permit shall be required to continue screening their seafood processing waste under the AKG521000 general permit. Screening of waste is considered best practicable control technology currently available (BPT), and once installed, the use of BAT screening shall continue to be required for these remote facilities.

1.5 Facility Eligibility (Permit Part 1.1)

Subject to meeting the conditions of the permit, the following categories of facilities are eligible for coverage to discharge the pollutants set out in Permit Part 1.2 after receiving a DEC APDES permit authorization number:

1.5.1 Remote onshore seafood processing facilities by definition are those facilities not located in "a processing center or population center (Non-Remote)" as described in 40 CFR Part 408 that discharge pollutants generated at a seafood processing facility to waters of the U.S. This includes those operators of moored vessels or moored barges acting as support facilities to remote onshore facilities.

1.5.2 Non-Remote onshore seafood processing facilities located in a designated "processing center or population center" as described in 40 CFR Part 408 that discharge pollutants generated at a seafood processing facility to waters of the U.S., including:

1.5.2.1 "Existing Non-Remote seafood processing facilities", those constructed prior to December 1, 1975.

1.5.2.2 "New Non-Remote seafood processing facilities", those constructed after December 1, 1975.

1.5.3 Community, Non-Governmental Organization (NGO), government (federal, state, city or borough owner) or private entity that operates a fish waste grinding facility.

1.5.4 Facilities meeting eligibility defined in Permit Parts 1.1.1 – 1.1.2 whose operators transport and discharge seafood processing or ground fish waste and wastewaters on a vessel as the final step in the onshore facility's wastewater treatment and discharge process. Coverage for seafood processing or ground fish waste discharges are limited to waters located landward from a baseline which the

territorial sea is measured, appearing on charts mapped by the National Oceanic and Atmospheric Administration (NOAA).

1.6 Discharges Authorized (Permit Part 1.2)

The permit proposes to authorize discharge of pollutants to waters of the U.S resulting from seafood processing or fish grinding facilities, subject to the limitations and conditions set forth in the permit, which are clearly identified by the operator in the Notice of Intent (NOI) (Attachment A) form and required attachments. The types of authorized discharges include:

1.6.1 Seafood processing / ground fish waste and effluent discharged into hydrodynamically energetic waters with a high capacity of dilution and dispersion, including:

1.6.1.1 Seafood waste fluids, heads, organs, flesh, fins, bones, skin, chitinous shells, wastewaters produced from the processing of seafood into by-products such as fish oil, fish meal/powder; stickwater and/or wastewaters produced from the processing of seafood mince (washed or unwashed mince used to make human or pet food or other surimi use) and/or paste produced by the modification of the physical condition of fishery resources from a raw form to a marketable form, and

1.6.1.2 Ground fish waste and effluent from community, NGO, government (federal, state, city or borough owner) or private entity grinders, and

1.6.1.3 Process disinfectants used in wash-down water, which include EPA-approved disinfectants added to wash-down water to facilitate the removal of wastes to maintain sanitary conditions during processing, or to sanitize seafood processing areas or fish waste discharge areas.

Seafood Processing waste and effluent, as well as disinfectants pollutants of concern may include residues, pH, oil and grease (O&G), Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), color, ammonia and temperature.

1.6.2 Discharge of "Other Wastewaters", including:

1.6.2.1 Non-process wastewaters include: non-contact cooling water, boiler water, freshwater pressure relief water, refrigeration condensate, continuous exchange live tank water, and other non-process water (except domestic wastewater, or wastewater from processing area floor drains),

1.6.2.2 Process wastewater, such as contact cooking or cooling waters (i.e. retort water, or water used to boil or cool seafood directly). Also including, but not limited to wastewater from floor drains, drains where water or process water has come in contact with seafood/fish loading and unloading areas,

1.6.2.3 Water or ice used for storing seafood and seafood by-products.

The 2016AKG521000 permit proposes to requirements applicable both Remote and Non-Remote facility's "other wastewaters". "Other wastewaters" were regulated differently between NPDES permits AKG520000 and AKG528000. The 2001 AKG520000 stated:

> **AKG520000 (V)(A, B & C)(1)(h)** "Wastewaters that have not had contact with seafood are not required to be discharged through the seafood process waste-handling system."

While the 1998 AKG528000 requirements for non-process waters (other wastewaters) contained this requirement:

> **1998 AKG528000 (2.4)** "Non-process wastewaters include non-contact cooling water, boiler water, freshwater pressure relief water, refrigeration condensate, water used to transfer seafood

to the facility, live tank water, and other non-process water (except wastewater from floor drains). These wastewaters may be discharged without treatment to the receiving water through conveyances, provided that the discharges are in compliance with Alaska State Water Quality Standards."

Most Non-Remote facility operators discharging "other wastewaters" meet TBELs by passing all wastewater through a screening treatment system. To ensure that Non-Remote facilities are meeting the TBELs and WQS, the AKG521000 permit requires all process waters and wastewater discharged outfalls directly (i.e. discharging to waters of the U.S. without passing through the screening system are monitored to meet WQS.

Based on experience implementing the AKG520000 and AKG528000 permits, DEC found operators often made changes to seafood processing line configurations, which caused the plumbing connections to be switched. Non-process drain pipes would be cutoff, reconnected, rerouted or were often left uncapped in processing plants. Then reconnected or rerouted discharges were often found to be connected to seafood processing plant floor clean up drains, loading and unloading areas, seafood and fish transfer areas and processing water drains, discharging directly to waters of the U.S. When DEC made inquiry, operators often could not trace the waste streams leading to these "other wastewater" outfall discharges. Neither the 2001 AKG520000, nor the AKG528000 permit required the operators to identify all outfalls in the NOI. This led to multiple, separate, small outfalls being located under the docks and in facilities as processing lines connections were changed.

The AKG521000 permit has new requirements to assist clarifying what standards apply to "other wastewaters" and requires Best Management Practices (BMP) be developed to assist in meeting effluent limits. The AKG521000 permit contains the requirement that all Remote facility discharges meet the TBEL for Remote facilities found in 40 CFR Part 408, "No pollutants may be discharged which exceed 1.27 cm (0.5 inch) in any dimension." The TBELs found in 40 CFR Part 408 did not establish how this effluent limit had to be met. Most facilities send their seafood waste through a combination of different grinders to meet the 1.27 cm TBEL. Yet, "Other Wastewaters" like live tank waters or catch transfer waters that do come in contact with raw, unprocessed seafood may not contain great amounts of solids. Additionally, the grinding pumps often do not function (grind) well when large hydraulic loads (such as catch transfer flows) are forced through the pump systems. Sending the "other wastewaters" waste stream through the seafood waste-handling system (grinding) is not the only way to meet the 1.27 cm TBEL. As an alternative to meet the dimensional discharge standard the "other wastewaters" could also be passed over a mesh (screened) to remove solids greater than the 1.27 cm in size. Pollutants of concern for "Other Wastewaters" discharges may include ammonia, residues, pH, oil and grease, BOD_5, TSS, color, and temperature.

1.6.3 Discharge of domestic wastewater that is discharged to waters of the U.S. after receiving secondary treatment, or discharge of a vessel's treated sanitary wastewater from a certified and operable Type II Marine Sanitation Device (MSD) and discharge of vessel's graywater.

Pollutants of concern in domestic wastewater and vessel sanitary wastewater discharges may include bacteria, TSS, BOD_5, pH, and temperature.

1.6.4 Discharges of a vessel's fish hold effluent, including catch transfer water, live tank water, refrigerated seawater or brine, discharged to the onshore seafood facility, including those discharges as covered under and in compliance with the 2013 NPDES Large Vessel General Permit (or the most current version).

EPA-issued a nationwide NPDES permit that authorizes the discharge of vessel fish hold water while the vessel was acting in a mode of transportation. The EPA-issued the 2013 Vessel General Permit (VGP) requires that:

> "All reasonable steps shall be taken to prevent the discharge of excess fish hold water and ice while the vessel is stationary at the pier. If large solid pieces of fish waste are contained in the fish hold effluent (e.g., fish heads, internal organs) the fish hold effluent may not be discharged while the vessel is pierside and stationary, unless a physical separation method is used (e.g., ½ inch coarse screens or smaller, a screened hose having ½ inch screen openings or smaller, filters, or other methods to remove large solids).
>
> Solid fish waste shall be disposed of shore-side on land or as required in Permit Part 2.6 (but outside of harbors or other protected and enclosed coastal waters and other areas where EPA has found that such deposits could endanger health, the environment, or ecological systems in a specific location under the Marine Protection, Research and Sanctuaries Act, 33 U.S.C 1412(d)).
>
> Except for APDES discharges from holding tanks for the sole purpose of keeping the catch alive during transit by pumping continuous "once through" ambient water into and through the tank prior to immediate discharge (e.g., crabbing/lobster vessels), if you are unloading your catch at a shore- based seafood processor or other pier and a shore-based discharge facility is available and economically achievable, you shall discharge your effluent (including dirty ice) to that shore-based facility instead of discharging to surrounding waters if:
>
> - Its use is economically achievable, and
> - The facility has a valid NPDES permit, or
> - That facility discharges to an NPDES-permitted sewage treatment facility."

Operators of several large, onshore seafood processing facilities requested that accepted VGP covered fish hold water be an authorized discharge under the onshore AKG521000 permit. Covered operators are may accept fish hold water and discharge, if discharging fish hold wastewater was proven to be economically achievable.

1.7 Discharges Not Covered by the Permit (Permit Part 1.3)

1.7.1 The discharge of any pollutant that is not expressly authorized by the permit is not covered. This includes, but is not limited to:

1.7.1.1 Discharge of non-commingled industrial storm water to waters of the U.S. – These discharges are covered under the APDES Multi-Sector General Permit (MSGP) for Storm Water Discharges associated with Industrial Activity.

1.7.1.2 Discharge of commingled or non-commingled storm water to waters of U.S. associated with construction activity disturbing one acre or more, or that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb one acre or more are covered under the APDES Construction General Permit.

1.7.1.3 Discharge of petroleum (e.g., diesel, kerosene, and gasoline) or hazardous substances into or upon the waters of the U.S. that may affect natural resources belonging to, appertaining to, or

under the exclusive management authority of the U.S. All federal, state and local laws regarding spill notification are still applicable.

1.7.1.4 Discharge by vessel of seafood wastes and wastewaters to the waters of the open seas lying seaward of the baseline from which the territorial sea is measured, appearing on charts mapped by NOAA, or discharge by vessel to territorial seas where no closing baseline has been determined, as provided for in the Convention of the Territorial Sea and the Contiguous Zone (33 USE 1402(b) and 40 CFR 220.2), which discharges are covered by the Ocean Dumping Act.

1.7.1.5 Discharge of screened seafood waste or waste effluent from a Non-Remote facility (trucked, shipped or barged) to a Remote facility for discharge to waters of the U.S.

1.7.1.6 Discharge of processed by-products, food additives (i.e., salts, sugars, sulphates, phosphates), or processed seafood that contains food additives.

1.7.1.7 Discharge of pollutants to waters of the U.S. covered by other general or individual APDES permits.

1.7.1.8 Discharge of pollutants to waters of the U.S. within three (3) nautical miles of the Pribilof Islands.

1.7.1.9 Discharge of uncooked seafood processing pollutants to waters of the U.S. occurring during the months of November, December, January, February and March to Orca Inlet (Cordova Facilities).

1.7.1.10 Discharge of pollutants to waters of the U.S. in the Norton Sound Critical Habitat Area occurring from June 24 to October 31.

1.8 Excluded Area Provisions (Permit Part 1.4)

As provided for in 18 AAC 83.205(d), the Department establishes conditions applicable to general permits for each category of discharger and may establish areas excluded from coverage. Permit Part 1.4 sets conditions applicable to excluded areas. The 2001 AKG520000 permit authorized pollutant discharges from seafood processing facilities to waters of the U.S., except to waters located in or near permit specified excluded areas. In 1994, EPA formed a work group of state and federal managers of fish and wildlife, public lands, and the environment to determine areas meriting exclusion from coverage under the Alaska seafood processors' general permit. The work group reached consensus on the excluded areas, and EPA included the list of excluded areas in the 1995 and 2001 AKG520000 permits. The excluded areas included protected water resources, such as national parks, national wildlife refuges, and critical habitat areas. The permit established 1.0 – 3.0 nm buffer zones around excluded area waters to allow for the dilution of pollutants to ambient levels under worst-case conditions. The permit also excluded discharges to at-risk waters, special waters, and degraded water bodies. These excluded areas from the 2001 AKG520000 permit are being carried forward in the 2016 AKG521000 permit.

In consideration of the seafood processing industry's interest in continuing to operate in some of these areas and to meet future processing needs, EPA made an allowance in the 2001 AKG520000 permit for an operator to apply for a waiver to discharge to a water in an excluded area. The 2001 AKG520000 permit required additional information to be submitted in the form of a waiver request regarding the excluded area, including alternatives to discharging within the excluded area. The permit required EPA and DEC to evaluate the waiver request and work with other federal, state, local and tribal organizations before making a decision to authorize a discharge to an excluded area. An operator also had the choice of applying for an individual permit to discharge in an excluded area.

The 2016 AKG521000 permit continues to provide the case-by-case requests to discharge to excluded areas based on conditions included in the 2001 AKG520000 permit, consistent with Alaska Statute (AS) 46.03.110(d) and 18 AAC 83.205(d) where a general permit clearly identifies the conditions applicable to each category or subcategory of discharges and areas of coverage authorized by the permit. The 2016 AKG521000 permit NOI review process for discharges to excluded area waters or near otherwise excluded areas provides for the same excluded area evaluation approval process as established in the 2001 AKG520000 permit with the exception that the 2016 permit requires that the operator provide written notice to the agency with management authority over of the "excluded area" (e.g.., United States Fish and Wildlife Service (USF&W), Alaska Fish and Game (AKF&G), National Marine Fisheries Service (NMFS), National Park Service (NPS), etc.) and provide the agency with management authority's comments to DEC to inform the authorization decision making process. DEC will take into consideration site-specific requirements or conditions deemed necessary to protect the "excluded areas." DEC will also provide written notice to agencies with management authority over waters listed in the permit as "excluded areas" for those proposed new operators. DEC views the requests to discharge to excluded areas and the approval process as a permit condition added to address excluded areas and is not a "waiver" to exceed water quality standards (WQS), or a waiver to federally established and state adopted ELGs, thus DEC is eliminating confusion by not referring to the request to discharge to these areas as a "waiver" request.

The 2016 AKG521000 permit proposes to continue authorizing previously approved 2001 AKG520000 discharges listed in Appendix D for facilities discharging to "excluded areas." The 2016 AKG521000 permit requires new facilities submit requests to discharge to "excluded area" in compliance with Permit Part 3.1. DEC may require the operator to apply for individual permit coverage if the discharge to the excluded area(s) causes water quality concerns. See Permit Part 3.1 for "excluded area's" applicable Special Conditions for discharges to critical habitat areas. The special conditions were submitted to DEC by agencies with management authority over the excluded areas during the previous permit cycle and as part of the early agency review.

Excluded areas are being carried forward in the 2016 AKG521000 permit. The AKG521000 excluded areas included in Permit Part 1.4 are consistent with the excluded areas identified by the 1994 workgroup as established in the 1995 and 2001 AKG520000 permits. Refinement of the excluded areas through GIS mapping, and updates to endangered and threatened species (ETS) lists, have occurred since the AKG520000 permit was issued. Changes to ETS lists or the available resources to identify various excluded areas are discussed in subparts 1.8.1 - 1.8.5 below. The Excluded Areas include:

1.8.1 **Three nautical miles limits** from critical habitat for Western Steller's sea lions and Pacific walrus at haulouts. Sea lions and Pacific Walrus have high site fidelity, the tendency to return to a previously occupied location, even minor human activity such as sight, sound and odors from humans and machines cause walruses to flee haulout locations. Thus, large buffer zones (3.0 nm) have been established and are needed to provide disturbance protection.

1.8.2 **One nautical mile limits** from State designated Game Refuges, Sanctuaries, Critical Habitat Areas, National Parks, preserves or monuments, National wilderness areas, National wildlife refuges and nesting colonies of 1000 birds or more.

The 2016 AKG521000 permit clarifies ambiguous areas listed in the 2001 AKG520000 permit and pin points new areas that warrant inclusion as sensitive areas and that require site-specific evaluation. Two examples include critical habitat areas identified as Steller eider concentration habitat areas and Western Steller sea lion habitat areas, which were established after the 1994 consensus workgroup decision making process. Additional information on these areas can be found

at the DEC Maps webpage, the DEC Seafood Processing Wastewater Map, and the Alaska Protected Water Maps document, as well as NOAA and U.S Fish and Wildlife mapping websites.

If an operator authorized to discharge to an excluded area, including an existing facility operator listed in Appendix D, proposes a material change to the operation of the facility after an authorization is granted (e.g., a 25 percent increase in the amount of seafood waste proposed to be discharged, change in process that increases seafood processing waste to be discharged, changing the seasonality of processing, changing the type of seafood processed, or adding by-product recovery lines); the operator is responsible for providing information required in Permit Part 3.1 to allow the agency with management authority to evaluate change in proposed discharges to the excluded area. If the agency with management authority of the excluded area does not respond to the information within 30 calendar days, DEC may proceed with a decision regarding the proposed change without waiting for additional agency input. The operator shall submit copies of any special studies required by the agency with management authority, and/or comments provided by the agency to DEC.

The permit proposes removal of Eastern Stellar sea lion critical habitat as previously covered under AKG520000 permit. On November 4, 2013 the NMFS public noticed a final action in the federal register, [Docket No. 110901553–3764–02] titled, 'Delisting of the Eastern Distinct Population Segment (DPS) of Steller Sea Lion under the Endangered Species Act; Amendment to Special Protection Measures for Endangered Marine Mammals.' NMFS made a finding that:

> "Under the authority of the Endangered Species Act of 1973, as amended (ESA), we, NMFS, issue this final rule to remove the eastern distinct population segment (DPS) of Steller sea lion (Eumetopias jubatus) from the List of Endangered and Threatened Wildlife. After receiving two petitions to delist this DPS, we completed a review of the status of the eastern DPS of Steller Sea Lion. Based on the information presented in the Status Review, the factors for delisting in section 4(a)(1) of the ESA, the recovery criteria in the 2008 Recovery Plan, the continuing efforts to protect the species, and information received during public comment and peer review, we have determined that this DPS has recovered and no longer meets the definition of an endangered or threatened species under the ESA: It is not in danger of extinction or likely to become so within the foreseeable future throughout all or a significant portion of its range. This rule also makes technical changes that recodify existing regulatory provisions to remove special protections for the eastern DPS and clarify that existing regulatory protections for the western DPS of Steller sea lions continue to apply. This rule becomes effective on December 4, 2013."

The NMFS final rule resulted in changes to the applicability of the excluded areas from the protection applicable to all Steller sea lion critical habitat to only those areas designated as NMFS critical habitat for the Western DPS (West of 144°, Cape Suckling, AK) Steller sea lion. Based on NMFS rule, the Department is removing the 3.0 nm excluded area designation for the Eastern DPS of the Steller sea lion critical habitat from the 2016 AKG521000 permit. The 2016 permit will maintain the 3.0 nm excluded area provisions for the NMFS designated critical habitat areas for the Western DPS Stellar sea lion. (See Permit Attachment K.)

1.8.3 **Living Substrates**. "Living substrates" have been identified as important marine habitat and are susceptible to impacts from human activities. Installation of seafood processing outfalls and possible subsequent burying of living substrate by seafood processing residues should be minimalized. Thus, the AKG521000 permit will continue to provide areas with living substrates special protection.

1.8.4 **At Risk Waterbodies.** Areas with water depth of less than 10 fathoms (60 feet) at MLLW are excluded from permit coverage if they have or are likely to have less than 0.33 knots average current within 300 feet of the discharge point of seafood waste. In the 2001 AKG520000 permit, waters within 3 nm of the Pribilof Islands were excluded, because fish waste discharged in these waters does not disperse quickly, gets trapped, settles within these areas, and was not decomposing as quickly as modeling predicted. The 2001 AKG520000 permit previously listed Akun Island's Lost Harbor as an "excluded area" because of a vessel's seafood processing waste deposits forming in the deep-water bay, which is mostly enclosed by a shallow sill. The sill was found to limit the flushing that normally occurs with tidal currents. Rather than list a specific harbor from this known residues buildup issue, the 2016 AKG521000 permit has included in Permit Part 1.4.6 At Risk Waterbodies those 'semi-enclosed water basins with depths deeper than the bordering or enclosed sills of less than 10 fathoms as "excluded areas". New facilities will be required to identify if their facility is proposed to be located in an 'At Risk Waterbody' and maybe limited to the amounts of seafood processing solids are allowed to be discharged, dependent on meeting permit conditions.

1.8.5 **Impaired Waterbodies** (Permit Parts 1.4.7 and 3.2) Facility operators proposing to discharge to impaired water bodies where the operator applies to the Department with revisions to a Total Maximum Daily Load (TMDL) for a specified water body, changes to the water use classes and subclasses, revisions to water quality criteria, adoption of site-specific criteria, and / or the reclassification of waters will be required to apply for an individual permit.

If an existing facility operator's receiving water becomes listed as an impaired waterbody (Permit Part 1.4.7) due the actions of the operator during the life of the permit, DEC may request that the applicant perform a site-specific analysis of the assimilative capacity of the receiving water. Based on the results, the Department may develop a TMDL, may propose interim discharge limitations (i.e. limiting amounts of total waste solids that may be discharged), in the authorization. An operator can, or the Department may require the operator to, apply for an individual permit if a new discharge is proposed to an area listed in Permit Part 1.4.7, or if a TMDL is being developed. Discharges will not be authorized for those pollutants for which the waterbody is impaired, except in compliance with Permit Part 3.2 (see Fact Sheet Part 4.3 and 5.1 for more information).

1.9 Requesting Authorization (Permit Parts 1.5)

1.9.1 An operator shall apply electronically or by hard copy for coverage under the permit. It is likely due to the recently EPA promulgated e-Reporting Rule that only electronic submittals will be accepted at some point during the permit cycle; permittees will be notified in advance of this change. A facility operator wishing to apply for new coverage for a seafood processor or fish waste grinding facility shall submit a complete NOI and required attachments 90 days prior to the start of discharge. The 90-day notice is increased from the 60 days specified in the 2001 AKG520000 permit to allow for adequate time for the Department to review the NOI and complete any necessary plan review and approvals that may be required per 18 AAC 72.

1.9.2 The permit supersedes AKG520000 and AKG528000 general permits for onshore seafood processors. The administratively extended coverage under AKG520000 or AKG528000 for facility operators listed in Appendix D, will expire 180 days after the effective date of this permit. Facility operators with AKG523000 coverage, or administrative extended coverage, for vessel seafood processing waste discharge, as listed in Appendix D - Table D2, also will maintain coverage under their current authorizations until 180 days after the effective date of the AKG521000 permit, at which time coverage will expire. All eligible facility operators are required to submit a new NOI (Attachment A) within 180 days of the effective date of the permit to obtain coverage. The

AKG521000 general permit does not authorize any discharges from a facility unless the operator has (1) submitted a NOI as specified and received written authorization from DEC to discharge under the permit, or (2) has been notified in writing by DEC that they are covered under the permit as provided for in 18 AAC 83.210(h).

1.9.3 Operators who have submitted a complete application for coverage under 2001 AKG520000, but have been unable to obtain coverage, will obtain coverage upon the submission of a complete NOI (Attachment A) under the permit.

1.9.4 The permit requires facilities to submit an updated Notice of Transfer (NOT) when the information regarding ownership or operator occurs, or submit a NOI if changes to management, , authorized representative or changes to the plant discharges, production levels, treatment systems, mixing zone or ZOD requests have changed.

1.9.5 The operator may only discharge the pollutants authorized under the permit upon delivery of a written APDES Authorization and the assignment of a site-specific APDES Permit Authorization number. The operator shall retain a copy of the APDES Authorization and the permit, as well as applicable inspection and monitoring records at the facility and/or on-board the vessel, as applicable. Maintenance of records may be kept of electronically, except those requiring hard signature.

1.9.6 Multiple parties may discharge out of a single outfall line, and operate under a single authorization if a single Responsible Party is identified on the NOI. Identification of a single responsible party is required in Permit Part 1.5.10. Many seafood processing facility operators accept seafood waste from outside their facility. Also many communities have installed fish waste grinding stations in order to decrease fish waste being left on the beach and decrease human wildlife interaction. Additionally, many Alaskan communities desire to install a fish waste grinding station to serve not only their community members but also provide a service to small volume seafood processor as a way to decrease overall capital investment costs. In order to eliminate confusion as to which entity is responsible for permit compliance responsibilities when multiple facilities or sources are discharging out a single outfall line, the permit requires a single responsible party to be identified. The owner of the outfall and waste/wastewater treatment system shall be designated as the responsible party, unless otherwise indicated on the NOI and a written agreement between parties is provided to the Department. Additionally, the responsible party is required to provide training to the delivering parties regarding the type of fish waste that is accepted. The responsible party must provide a tracking mechanism to the delivering parties for annual reporting purposes. If the responsible party enters into any agreements with other entities to perform permit responsibilities, a copy of that agreement must be submitted to the Department.

1.10 Requirement to Submit a Complete Notice of Intent (Permit Part 1.6)

1.10.1 An applicant seeking coverage under the permit shall submit a complete and timely NOI (Attachment A) per 18 AAC 83.210(b) to fulfill the duty to apply for a permit. Permit Part 1.6 lists the information that must be included on the NOI. A discharger that fails to submit a NOI in compliance with the requirements of the permit is not authorized to discharge under the general permit unless the Department:

1.10.1.1 Determines, as provided in 18 AAC 83.210(g), that a NOI is not required for coverage under the general permit, or

1.10.1.2 Notifies a discharger that it is covered by a general permit as provided for in 18 AAC 83.210(h).

1.10.2 Engineering Plan Review and Approval – Domestic Wastewater Treatment Systems (Permit Part 1.5.6 and 1.6.13.5)

1.10.2.1 An operator that is constructing, installing, or modifying (except like-and-kind replacement) any part of a domestic wastewater collection, treatment, or disposal system shall obtain the department's approval under the terms and conditions of 18 AAC 72 "Domestic Wastewater System Plan Review" (most current version in effect). The required plans shall accompanied by the appropriate plan review fee required by 18 AAC 72.955. Existing facilities should submit plan review documents at least 90 days prior to when changes are proposed to their domestic waste treatment system. If changes to the domestic waste treatment system occurred after an authorization was issued the operator is required to submit plan review documents with their updated NOI.

Requiring that engineering plans be submitted to the Department is not a new regulatory or permit requirement, as consistency with 18 AAC 72 was required in the 2001 AKG520000 permit. Requiring submitting plan review documents with the NOI is a new permit requirement to ensure facility changes that may affect the authorization are consist with 18 AAC 72.

1.10.3 Engineering Plan Review and Approval - Non-Domestic (Seafood Processing or Fish Waste) Wastewater Systems (Permit Part 1.5.7 and 1.6.13.5)

1.10.3.1 An operator that is constructing, installing or modifying (except like-and-kind replacement) any part of their seafood / ground fish waste discharge treatment system (nondomestic wastewater) shall submit engineering plans to the Department, per 18 AAC 72 "Nondomestic Wastewater System Plan Review" (most current version in effect) and shall obtain the department's approval of the engineering plans submitted. The nondomestic wastewater treatment plans and/or disposal system plans shall be sealed by a registered professional engineer, licensed by the State of Alaska, accompanied by the appropriate fee required by 18 AAC 72.955. Existing facilities should submit plan review documents at least 90 days prior to when changes are proposed to their nondomestic waste treatment system. If changes to the nondomestic waste treatment system occurred after an authorization was issued the operator is required to submit plan review documents with their updated NOI.

Requiring that engineering plans be submitted to the Department is not a new regulatory or permit requirement, as consistency with 18 AAC 72 was required in the 2001 AKG520000 permit. Requiring submitting plan review documents with the NOI is a new permit requirement to ensure facility changes that may affect the authorization are consist with 18 AAC 72.

1.10.4 An operator may only discharge the pollutants authorized under the permit upon delivery of a written APDES Authorization and the assignment of a site-specific APDES Permit Authorization number. When an operator submits an updated NOI, discharge under that updated NOI is not authorized until the operator receives an APDES authorization referencing the new NOI with a new APDES authorization effective date. The operator shall retain a copy of the APDES Authorization and the permit, as well as applicable inspection and monitoring records at the facility and/or on-board the vessel, as applicable. Maintenance of records may be kept of electronically, except those requiring hard signature.

1.10.5 Date of Authorized Discharge

Department is required to specify the date(s) in a general permit when a permittee is authorized to begin discharging, per 18 AAC 83.210(f). Commencement of facility discharges may occur any time after the effective date of the APDES written authorization from DEC. The written authorization will assign the facility an APDES permit number for the site specified in the NOI.

Relocation to another site will require the operator to submit a new NOI at least 90 days prior to commencing discharge from the new site.

1.11 Department Review of the Notice of Intent and Issuance of a Permit Authorization (Permit Part 1.7)

Upon the 2016 AKG521000 permit becoming effective, each facility listed in Permit Appendix D will be required to apply for coverage under AKG521000 within 180 days using the NOI form (Permit Attachment A). Those operators with previous AKG520000 or AKG528000 Administratively Extended coverage will expire 180 days from the effective date of the permit (See Fact Sheet Part 1.9.2). Those facilities, as listed in Permit Appendix D, applying for coverage will have the standard 100 foot mixing zone(s), and will be issued a mapped project area Zone of Deposit (ZOD), as public noticed through the AKG521000 General Permit.

Only facilities meeting the provisions of the permit will be provided a site-specific APDES AKG521000 written authorization. The Department's evaluation will include the facility's NOI, the receiving water characteristics, ensuring that the facility's flow and required receiving water characteristic, along with TMDL status, allow the discharge and authorization of standardized mixing zone and project area ZOD. Transfer of Authorization or Change in Location (Permit Part 1.8)

As found in 18 AAC 83.150, permit coverage for a facility may be transferred from an existing owner to a new owner. The permit authorizes a transfer only for an existing facility located at the site designated in the original NOI. Discharge authorization for a particular existing facility may not be transferred to the same facility operator at a new facility location.

1.12 Continuation of Expired General Permit (Permit Part 1.11)

If the 2016 AKG521000 permit is not reissued prior to the permit's specified expiration date, it will be administratively extended in accordance with 18 AAC 83.155 and remain in force and effect. In order to continue coverage, the operator shall submit an updated NOI to the Department six months (180 days) prior to the expiration of the permit requesting authorization for coverage under a reissued permit. The Department may allow the NOI application to be submitted at a later date, but prior to expiration date. Following an operator's timely and appropriate submittal of a complete NOI and receipt of a DEC APDES administrative extension letter, the operator covered under administrative extension until the permit is reissued or the authorization is terminated.

The permittee is required to abide by all limitations, monitoring, and reporting included in the permit when the permit enters administrative extension until such time the permit is reissued, or a Notice of Termination (NOT) is submitted by the operator and processed by the Department.

If the permit is administratively extended beyond five years, the operator shall be required to reinitiate all of the originally required monitoring schedules established in the permit. If reduction in monitoring, or alternative permit compliance conditions(s) were granted in an APDES authorization prior to administrative extension, the operator shall make a written re-request for the reduction in monitoring or other operating conditions with submittal of the administrative extension NOI application.

1.13 Termination of Permit Coverage (Permit Part 1.12)

If a permittee desires to terminate coverage, the permit requires the permittee to provide notice of termination to DEC within 30 days following cessation of discharges. The notice shall include certification that the facility is not subject to an enforcement action or citizen suit. The notice shall also include any final reports required by the permit.

2.0 Compliance History

The compliance histories of the existing facilities authorized by the 2001 AKG520000 permit and the AKG528000 Kodiak permit were evaluated. Due to the large number of existing authorized facilities, a detailed breakdown of the instances of non-compliance is not provided in the fact sheet. Specific details regarding the compliance history of a specific facility can be found by visiting the EPA's Enforcement & Compliance History Online (ECHO) at http://www.epa-echo.gov/echo/. Permit Appendix D provides a list of facility permit numbers and facility names that can be used to search for summary and detailed information about a specific facility's compliance and enforcement status and history.

3.0 Effluent Limits and Monitoring Requirements

3.1 Basis for Permit Effluent Limits

In general, the CWA requires that the limits for a particular pollutant be the more stringent of either TBEL or water quality-based effluent limits (WQBEL). A TBEL is set according to the level of treatment that is achievable using available technology. For industrial sources, the national ELGs in the form of TBELs are developed based on the demonstrated performance of a reasonable level of treatment that is within the economic means for specific categories of industrial facilities. A WQBEL is designed to ensure that the WQS of the waterbody are met and may be more stringent than a TBEL. The most stringent limitations will be selected as the final limits.

3.2 Effluent and Receiving Water Monitoring

In accordance with AS 46.03.110(d), the Department may specify in a permit the terms and conditions under which waste material may be disposed. Monitoring and waste treatment system inspection requirements established in a permit are required to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and receiving water data to determine if additional effluent limits are required and/or to monitor effluent impact on receiving water quality.

The operator is responsible to conduct the monitoring and report results, in some cases, on discharge monitoring reports (DMR), and in all cases, in an Annual Report to the Department.

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. The operator has the option of taking more frequent samples than required under the permit. If the operator monitors any pollutant more frequently than the permit requires using test procedures approved under 40 CFR Part 136, adopted by reference in 18 AAC 83.010, or as specified in the permit, the results of that additional monitoring must be included in the calculation and reporting of the data reported on the DMR and the Annual Report. All limits that require averaging of measurements shall be calculated using an arithmetic mean unless the Department specifies another method in the permit. Tests shall be conducted using the Department-approved test methods, and sampling results reported even if the method detection limits (MDLs) are less than the effluent limits.

3.3 Domestic Wastewater Discharges (Permit Part 2.1.1)

The 2016 AKG521000 permit proposes to provide coverage to onshore facility's domestic wastewater discharge if it is meets secondary wastewater treatment standards prior to discharge. The domestic wastewater treatment system must be able to meet treatment limitations found in 40 CFR 133, adopted by reference in 18 AAC 83.010. An onshore facility may choose to discharge domestic wastewater to a municipal domestic wastewater treatment facility, or septic system, both of which are not regulated or covered by the AKG521000 permit.

Providing coverage for domestic wastewater discharges is consistent with the requirements included in the 2001 AKG520000 permit. Sanitary wastewater was the term used for the discharge of shower, toilet, and sink wastewater in the NPDES 2001 AKG520000 permit and covered both onshore and vessel wastewater discharge. The 2016 AKG521000 permit proposes to use the term "sanitary wastewater" for vessel discharges (See Fact Sheet Part 4.4.6 for more information), but uses the term "domestic wastewater" and "graywater" for onshore facility domestic wastewater discharges, as defined in 18 AAC 72.990(23).

Discharge 002 – the definitions of domestic wastewater, graywater, and domestic sewage were intermingled 2001 AKG520000 general permit. The APDES AKG521000 permit defines domestic wastewater per state regulation 18 AAC 72.990 (23) *"domestic wastewater" means waterborne human wastes or graywater derived from dwellings, commercial buildings, institutions, or similar structures; "domestic wastewater" includes the contents of individual removable containers used to collect and temporarily store human wastes.* The APDES AKG521000 permit defines graywater per 18 AAC 72.990 (35) *"graywater" means wastewater (A) from a laundry, kitchen, sink, shower, bath, or other domestic source; and (B) that does not contain excrement, urine, or combined stormwater*. These two terms used in the APDES AKG521000 permit are consistent with the definition for "domestic wastewater" found in 40 CFR 122.2 "*domestic sewage" includes waste and waste water from humans or household operations that are discharged to or otherwise enter a treatment work."* The term domestic wastewater is therefore the term used in the AKG521000 permit for regulating an onshore facilities *waterborne human wastes or graywater* wastewater discharges.

The AKG520000 defined "domestic waste" as "materials discharged from showers, sinks, safety showers, eyewash stations, hand-wash stations, fish-cleaning stations, galleys and laundries." The AKG520000 "domestic waste" definition didn't correspond to 40 CFR 122.2 'domestic sewage' either, rather the definition seems to have mixed the Alaska State definition of "graywater" and a federal definition found in 40 CFR 122.2 "graywater" … *For the purposes of this definition, "graywater" means galley, bath, and shower water (*see definition: *sewage from vessels*). Inexplicably, the definition for "domestic waste" in the AKG520000 Alaska Seafood Processors permit actually mirrors the definition of "domestic waste" found in 40 CFR 435.11 Applicable to Offshore Oil & Gas exploration- (j) *Domestic waste means materials discharged from sinks, showers, laundries, safety showers, eye-wash stations, hand-wash stations, fish cleaning stations, and galleys located within facilities subject to this subpart.*

DEC suspects this mixed definition of domestic waste was used in the AKG520000 permit because coverage was provided to both onshore (shore-based) domestic wastewater discharge, and sewage wastewater and graywater discharges from seafood processing vessels. The AKG520000 permit's definition of "sewage" is that found in the Marine Sanitation Devise Standards in 40 CFR 140.1 (a)" *Sewage means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes",* not of that 'domestic sewage' definition found in 40 CFR 122.2.

The ramifications of Alaska's regulation is that per 18 AAC 72.050(a)(3), is that community domestic wastewater treatment works (onshore facility's domestic wastewater discharges to waters of the U.S.) must meet minimum treatment requirements (i.e., secondary treatment as defined in 18 AAC 72.990(59)), unless a waiver from minimum treatment is granted by the Department under 18 AAC 72.060. The permit requires onshore facility graywater discharges (falling under domestic wastewater definition) to meet secondary treatment as defined in 18 AAC 72.990(59).

If the applicant segregates graywater and requests coverage that includes limits less stringent than the minimum treatment requirements of 18 AAC 72.050, the applicant must also obtain a waiver for minimum treatment under 18 AAC 72.060 prior to obtaining authorization for domestic wastewater discharges. Waivers will only be approved if the applicant can demonstrate that public health and the environment are protected.

CWA Part 301 requires a Publicly Owned Treatment Works (POTW) to meet requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as secondary treatment, which all POTWs were required to meet standards by July 1, 1977, with limited exception (e.g., POTWs discharging to marine waters and granted CWA 301(h) waivers).

"Secondary treatment" TBELs for POTWs include limits for BOD_5, TSS, pH and are established in 40 CFR 133.102, adopted by reference at 18 AAC 83.010(e). BOD_5 and TSS effluent limits are based on TBELs meeting federal regulations of 40 CFR 133.100 – 40 CFR 133.105. In addition to the federal secondary treatment regulations in 40 CFR Part 133, the State of Alaska requires maximum daily limits of 60 mg/L for BOD_5 and TSS in its definition of secondary treatment found in 18 AAC 72.990. However, 18 AAC 72 does not specify the percent removal requirements required by 40 CFR 133, so the 2016 AKG521000 permit applies the more stringent 40 CFR 133 requirements.

While an onshore seafood processors' domestic waste treatment systems are not POTWs, the type of treatment technology an operator of a seafood processor would employ to treat domestic wastewater prior to discharging to waters of the U.S is nearly identical to the treatment technology that an operator of a POTW would use. Therefore, the secondary treatment standards directly applicable to POTWs provide the most meaningful limits for controlling the pollutants a seafood processor's domestic wastewater treatment system discharging to waters of the U.S. Accordingly the 2016 AKG521000 permit requires domestic wastewater, not being discharged to an on-site septic or municipal domestic wastewater treatment system, discharged directly to waters of the U.S. to meet secondary treatment standards, found in 40 CFR 133, adopted by reference in 18 AAC 83.010(e), unless a waiver for treatment less than secondary has been approved.

When evaluating the effluent to determine if WQBELs based on chemical-specific numeric criteria or mixing zones are needed, the Department projects the receiving waterbody concentration for each pollutant of concern downstream of where the effluent enters the receiving waterbody. The chemical-specific concentration of the effluent and receiving waterbody and, if appropriate, the dilution available in the receiving waterbody, are factors used to project the receiving waterbody concentration. If the projected concentration of the receiving waterbody at the boundary of the mixing zone exceeds the numeric criterion for a limited parameter, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a WQBELs need to be developed.

Examining individually permitted facilities and facilities authorized under general permits for secondary treatment domestic wastewater plants' effluent sampling results around the State, DEC has determined there is reasonable potential for water quality standards for fecal coliform bacteria, total residual chlorine, and/or pH be exceeded at the chronic mixing zone boundary. Thus, in the AKG521000 permit the Department proposes to apply the WQBELs for fecal coliform, total residual chlorine and pH from domestic wastewater based on state WQS found in 18 AAC 70.020(b). After the application of WQBELs, domestic wastewater discharge facilities are required meet state water quality standards found in 18 AAC 70.020(b) at the boundary of the mixing zone. The AKG52100 permit proposes to authorize a 100 foot standard mixing zone for domestic waste water discharges.

3.3.1 Enterococci Bacteria

Enterococci bacteria are indicator organisms of harmful pathogens recommended by EPA as the best indicator of health risk in marine water used for recreation. In 1986, EPA published Ambient Water Quality Criteria for Bacteria that contained recommended bacteria water quality criteria for primary contact recreational users. The Beaches Environmental Assessment and Coastal Health Act that followed in 2000 required states and territories with coastal recreation waters to adopt bacteria criteria into their WQS that were at least as protective as EPA's 1986 published bacteria criteria by April 10, 2004. Alaska did not adopt the enterococci bacteria into the WQS by the April 10, 2004 deadline; therefore EPA promulgated the 1986 bacteria criteria for Alaskan coastal recreational waters in 2004. Enterococci bacteria monitoring is a new permit requirement based on EPA's promulgation of enterococci bacteria standards for marine waters to protect primary contact recreation. While in the process of promulgating updated recreational bacteria criteria, the Department has currently not adopted the federally established WQS for enterococci bacteria in 18 AAC 70. However, as a delegated program to administer the NPDES program, the Department must apply the federal enterococci bacteria standard, which is codified in 40 CFR 131.41. The 2016 AGK521000 permit requires monitoring the effluent for both fecal coliform and enterococci bacteria to determine the presence of the organisms in the waste stream and at the boundary of the mixing zone. Bacteria monitoring will be required during the months of June through September when the receiving water would most likely be used for primary contact recreation.

3.3.2 Chlorine

Many domestic wastewater treatment plants use chlorine to disinfect wastewater prior to discharge.

The *Water Pollution Control Federation's Chlorination of Wastewater* (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/L total residual chlorine limitation on a monthly average basis. In the absence of new information to indicate TRC technological advances that would alter the WPCF's 1976 conclusions, an average monthly limit (AML) of 0.5 mg/L for TRC and a maximum daily limit (MDL) of 1.0 mg/L for TRC has been applied as a TBEL in the permit for facilities with mixing zones for TRC.

Table 1 below summarizes the domestic wastewater effluent limits and monitoring requirements incorporated into the permit.

Table 1: Domestic Wastewater Discharge Effluent Limits and Monitoring Requirements (Permit Table 2)

EFFLUENT PARAMETER	UNITS	EFFLUENT LIMITS					MONITORING REQUIREMENTS		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Average Monthly Percent Removal	Minimum Daily Limit	Sample Location	Sample Frequency	Sample Type
Flow [a]	mgd	---	---	---	---	---	effluent	daily (5/week)	Measured or estimated [a]
pH Standard pH units (SU)	SU	---	---	8.5	---	6.5	effluent	3/week	grab
Total Residual Chlorine (TRC) [b, c]	mg/L	0.011 (fresh) 0.0075 (marine)	---	0.019 (fresh) 0.013 (marine)	---	---	effluent	3/week	grab
Dissolved Oxygen	mg/L	---	---	17	---	7 (fresh) 6 (marine)	effluent	1/month	grab
5-Day Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	60	85% [e] (minimum)	---	influent and effluent [f]	1/month	grab or composite [g]
	lbs/day [d]	---	---	---					
Total Suspended Solids (TSS)	mg/L	30	45	60	85% [e] (minimum)	---	influent and effluent [f]	1/month	grab or composite [g]
	lbs/day [d]	---	---	---					
Fecal Coliform (FC) Bacteria	FC/100 mL	200	400	800	---	---	effluent	1/month [h]	grab
Enterococci Bacteria	count/ 100 mL	---	---	report	---	---	effluent	1/month [h]	grab

a. Notes:
b. A facility-specific flow limitation based on the hydraulic design capabilities of the facility shall be included as a part of the authorization to discharge.
c. The TRC effluent limits are not quantifiable using EPA-approved standard analytical methods found in 40 CFR Part (most current version), adopted by reference at 18 AAC 83.010 (most current version) and those found in 18 AAC 70. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.
d. Monitoring for chlorine is not required if chlorine is not used as a disinfectant or introduced elsewhere in the treatment process.
e. BOD5 and TSS mass loading limits apply to each discharge. The loading limits are calculated for each facility by the following formula: pounds per day limitation = concentration limit (mg/L) x facility design flow (mgd) x 8.34 (conversion factor). Loading limitations are applicable to the average monthly, average weekly and maximum daily basis.
f. Minimum % Removal = [(monthly average influent concentration in mg/L – monthly average effluent concentration in mg/L) / (monthly average influent concentration in mg/L)] x 100. The monthly average percent removal shall be calculated using the arithmetic mean of the influent value and the arithmetic mean of the effluent value for that month.
g. Influent and effluent samples shall be taken over approximately the same time period.
h. See Permit Appendix C for definition.
i. All fecal coliform and enterococci bacteria average results shall be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of "n" quantities is the "nth" root of the quantities. For example the geometric mean of 100, 200, and 300 is (100 x 200 x 300)1/3= 181.7

3.4 Treated Sanitary and Graywater Discharges from Vessels (Permit Part 2.1.2)

The 2016 AKG521000 permit provides coverage for a vessel's discharge of treated sewage and graywater wastewater discharge from vessels.

A vessel's sanitary waste must be treated prior to discharge by a Type II MSD that meets the applicable Coast Guard pollution control standards in effect [33 CFR Part 159: "Marine sanitation devices"]. Alternatively, a vessel's sanitary wastewater may be discharged to a permitted onshore facility's domestic wastewater discharge system.

Vessels' sanitary (sewage) discharges were not included in the 40 CFR Part 408 TBELs applicable to seafood processors, but were authorized under the AKG520000 permit due a blending of terminology and regulations. The term "sanitary wastes" was introduced in the AKG520000 permit, when referring to a vessel's sewage waste discharges; however, for consistency the AKG521000 will continue to use the term "sanitary wastes" for vessels, but DEC is unable to trace why this definition was introduced. The AKG520000 general permit required sanitary waste to be 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"]. Currently the U.S. Coast Guard requires vessels greater than 19.7 feet in length to have a Type II or Type III MSD.

The 2016 AKG521000 permit requires moored barges and vessel's acting as support facilities and discharging sanitary effluent, to have APDES permit coverage. This permit requirement stems from the moored barge or vessel are acting as an commercial/industrial facility (seafood processing) and not as a transportation vessel, per 18 AAC 83.015 (b)… *exclusion does not apply to (B) other discharges when the vessel is operating in a capacity other than as a means of transportation, including when the vessel is (i) used as an energy or mining facility, a storage facility, or a seafood processing facility; (ii) secured to a storage facility or a seafood processing facility.*

In accordance with 40 CFR 125.3, adopted by reference at 18 AAC 83.010, the Department is applying BPJ to determine that treated sanitary wastewater discharged from a U.S. Coast Guard certified, operable Type II MSD shall serve as the basis for Best Available Technology Economically Achievable (BAT) / Best Conventional Pollutant Control Technology (BCT) effluent limitations for sanitary discharges from a seafood processor vessel when acting as an industrial facility. State regulations established in 18 AAC 72.050 Editor's Note states*: The discharge of domestic wastewater from vessels is regulated by federal standards of performance for marine sanitation devices under 33 U.S.C. 1322 (Clean Water Act, sec. 312)*. The regulatory performance standards for a Type II MSD are located at 33 CFR Part 159. The 2016 AKG521000 permit proposes requiring effluent sampling and analysis of sanitary effluent for suspended solids and bacteria, and that BMPs be developed and implemented, per 18 AAC 83.475, to achieve the effluent limits established by BPJ for vessel's sanitary discharges.

The BPJ determination was based on the following considerations:

- The age of equipment and facilities involved. U.S. Coast Guard regulations require that no person may operate a vessel equipped with a toilet facility unless it is equipped with an operable MSD certified or labeled in accordance with 33 CFR 159. The MSD is required to be operated in such a manner to maintain certification regardless of the age of the equipment.

- Engineering aspects of the application of various types of control techniques. Space on vessels is limited and changes to a MSD system can affect the stability of vessels and require re-licensing of such vessels from the U.S. Coast Guard. Every vessel is required to have a labeled or certified MSD that is tested in accordance with 33 CFR 159.
- Cost Considerations. Since DEC's determination that the currently utilized treatment technology, a Type II MSD, will be utilized as BAT/BCT treatment for these facilities, there is no incremental cost involved in attaining the technology based limits of the permit.

Microbiological sampling. For compliance purposes, microbiological samples (fecal coliform bacteria and enterococci bacteria) are required to be analyzed within 8 hours of sample collection (40 CFR Part 136, Standard Methods, 20th edition. 9060 B. Page 9-21).

Graywater discharges were not included in the 40 CFR part 408 TBELs, but were authorized by the 2001 AKG520000 permit. Graywater discharges and other discharge from vessels have come under increased scrutiny. The 2013 Vessel General Permit (VGP) was issued by EPA to regulate discharges incidental to the normal operation of a vessel. The VGP included limits and controls for various discharges from vessels when acting as a means of transportation and not as an industrial facility, including graywater. The proposed 2016 AKG521000 graywater control measures are modeled after the VGP control measures. Using BPJ, the proposed permit requires the development and implementation of BMPs to control or abate the discharge of graywater from a seafood processing vessels, when acting as an industrial facility.

Table 2 presents the limits and monitoring requirements for each vessel's marine sanitation device outfall/port when sanitary effluent is discharged.

Table 3 presents the monitoring requirements for each vessel's graywater outfall/port when graywater is discharged.

Table 2: MSD System Effluent Monitoring (Permit Table 3)

Parameter	Units	Average Monthly Limit	Sample Location	Sample Frequency	Sample Type
Flow	gallons per day (gpd)	report	effluent	1/Month when Discharging	Measured or Estimated
Total Residual Chlorine [a]	mg/L	report	effluent	1/Month when Discharging	Grab
Total Suspended Solids	mg/L	report	effluent	1/Month when Discharging	Grab
Fecal Coliform (FC) Bacteria [d]	FC/100 mL	report	effluent	1/Month when Discharging	Grab
Enterococci Bacteria [d]	#/100 mL	report	effluent	1/Month when Discharging	Grab

Notes:

a. Monitoring for chlorine is not required if chlorine is not used as a disinfectant or introduced elsewhere in the treatment process.
b. Using EPA-approved standard analytical methods found in 40 CFR Part (most current version), adopted by reference at 18 AAC 83.010 (most current version), DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.
c. Certified Type II Marine Sanitation Devices (MSD) must be operated in accordance with manufacturer's recommended operational procedures.
d. All fecal coliform and enterococci bacteria average results shall be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of "n" quantities is the "nth" root of the quantities. For example the geometric mean of 100, 200, and 300 is $(100 \times 200 \times 300)^{1/3}$= 181.7 FC/100 mL.

Table 3: Graywater System Effluent Monitoring (Permit Table 4)

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	gallons per day (gpd)	effluent	monthly	Measured or Estimated
Fecal Coliform (FC) Bacteria/	FC/100 mL	effluent	1/Month when Discharging	Grab
Enterococci Bacteria	#/100 mL	effluent	1/Month when Discharging	Grab

Note:

a. All fecal coliform and enterococci bacteria average results shall be reported as the geometric mean. When calculating the geometric mean, replace all results of zero (0), with a one (1). The geometric mean of "n" quantities is the "nth" root of the quantities. For example the geometric mean of 100, 200, and 300 is (100 x 200 x 300)1/3= 181.7 FC/100 mL.

3.5 Remote Facilities Requirements (Permit Part 2.2.1)

The 2016 AKG521000 permit contains limits based on both TBELs and WQBELs. The TBELs applicable to the Remote seafood processing industrial sector are found in 40 CFR Part 408 - Canned and Preserved Seafood Processing Point Source Category.

A remote seafood processor is a facility that is not located in a designated processing or population center (40 CFR Part 408). Most seafood processing facilities in Alaska are considered remote, and most existing facilities were previously covered under the 2001 AKG520000 permit.

The permit requires new Remote facilities to install flow meters, install new outfalls at certain depths, perform pre-installation outfall surveys, monitor and report the operability of their seafood waste treatment system and limit their total pounds of seafood waste discharged in Permit Parts1.6 and 2.2.1. The following paragraphs discuss these requirements in more detail.

3.5.1 Outfall Depth and Flow (Permit Part 2.2.1)

The proposed permit requires Remote facilities provide information regarding their discharge flow and their outfall depth. The permit requires the identification of all outfalls, types of waste and wastewater discharged from each outfall, as well as specific outfall terminus depth reporting. The 1994 Seafood Processing Ocean Discharge Criteria Evaluation (ODCE), provided predictions on the formation of deposits on the seafloor in order to project environmental impacts (more information may be found in the 1994 ODCE regarding the environmental impacts of seafood processing waste deposits http://dec.alaska.gov/water/wwdp/seafood/documents.html).

Mixing zone modeling requires certain parameter inputs to assess the mixing behavior and plume geometry of the ground seafood waste discharge (e.g., one input is the outfall depth, hydrodynamics of the water characteristics, pollutant loading, etc.). Previous 2001 AKG520000 permit compliance inspections have often revealed multiple outfalls installed at various facilities, but only one outfall identified on the NOI. In order to accurately model environmental impacts, the correct number and location of outfalls must be identified, along with the associated pollutant loading, flow and depth associated with each outfall.

Additionally, compliance actions have been taken for operators discharging ammonia (a refrigerant often used at seafood processing facilities and also created during the natural decomposition of seafood). See Fact Sheet Part 3.13 for more information regarding ammonia toxicity. Requiring identification of all outfall lines, types of wastewater effluent being discharged and monitored, along with the development and implementation of a robust BMP Plan, should increase operator compliance with permit requirements and ultimately result in increased water quality protection.

3.5.2 Pre-Installation / Pre-Discharge Survey Requirement (Permit Parts 2.2.1 and Permit Appendix I)

The permit includes a new requirement to conduct a pre-biological survey prior to the placement of a new outfall, planned movement or removal of an existing outfall, or the re-startup of an existing facility outfall where no discharge has occurred in the past 12 months. The purpose of the survey is two-fold. First, the survey must demonstrate that the proposed placement of the outfall will not result in the discharge occurring into “living substrate” (see Permit Part 1.4 – Excluded Areas). Second, the survey must record the occurrence and extent of persistent films, foam, scum or sheens (water quality criteria 18 AAC 70.020(b)), the presence and extent of any seafood waste deposits on the seafloor and/or the presence of

any listed endangered or threatened species near the proposed outfall site. The permit does not require the operator to conduct a pre-biological seafloor survey for a facility's approved in-transit vessel area(s) of operation disposal site(s), or for a facility that produces 30,000 pounds or less of seafood processing / fish grinding waste per year.

3.5.3 Waste Treatment System

The TBELs applicable to Remote seafood processing facilities are found in 40 CFR Part 408 - Canned and Preserved Seafood Processing Point Source Category. The regulatory ELGs found in 40 CFR Part 408 for Alaskan seafood processors in remote locations require that no pollutants may be discharged which exceed 1.27 cm (0.5 inch) in any dimension. This technology-based requirement has been incorporated into the permit.

DEC does not require the use or installation of particular technologies. Rather, the CWA requires operators to meet certain performance standards (TBELs) that are based upon the proper operation of pollution prevention and treatment technologies identified by EPA during an effluent guidelines and pretreatment standards rulemaking.

In addition to seafood processors subject to TBELs, the Department finds the performance-based level of pollutant controls applicable to seafood processors is most appropriate pollution control mechanism for facilities discharging ground fish waste. Facilities discharging ground fish waste do not create seafood processing waste as defined in AKG520000, *conversion of aquatic animals from a raw form to a marketable form*, yet ground fish waste from community grinders contain similar types of pollutants from harvesting of seafood and creation of waste carcasses. The 2016 AKG521000 permit proposes ground fish waste dischargers meet same waste treatment requirement of 1/2 inch grind and perform monitoring as described in the permit. Basis for these limits are found in the figure below.

Figure 1. 2001 AKG5200000 Remote Water Quality Effluent Based Limitations-Butchering Processes

Parameter	AKG520000 Section	Effluent Limitation	Basis
Water Quality Standards	(2)(A)	All discharges shall comply with Alaska Water Quality Standards [18 AAC 70] while in the waters of the State of Alaska. (pH shall not be less than 6.5, SU, nor greater than 8.5 SU).	18 AAC 70.020(b) pH
Environmental Effects	V(A-C)(1)(h)	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.	18 AAC 70.020(b) Sediment, Residues

3.5.4 Total Waste Discharge (Pounds) limit (Permit Part 2.2.1.13)

The ten million pound maximum annual permit limit for seafood processing waste discharge has been retained in the 2016 AKG521000 permit based upon previous residue modeling performed. See Fact Sheet Part 5.7 and 5.8 for more information regarding deposits, revised seafloor survey methods and mixing zone study.

The maximum allowed discharge of ten million pounds annually of seafood processing waste has been retained in the 2016 AKG521000 permit based upon previous residue modeling performed. See Fact Sheet Part 4.8.2.4 for more information regarding deposits, revised seafloor survey methods and mixing zone study.

3.5.5 Seafood System Inspection Requirements (Permit Parts 2.2.1)

The permit requires routine inspection of both the outfall and the waste discharge system. DEC experience in performing compliance inspections and sites visits is that operational maintenance issues are often the cause of historical permit violations. Requiring daily and/or weekly inspections of facility waste treatment system lines and outfall lines, yearly and/or biannual inspections of the outfall line, along with the development and implementation of a robust BMP Plan should increase operator compliance with permit requirements.

The 2016 AKG521000 permit proposes the operator inspect the grinder system to evaluate compliance with the grind size requirement to ensure that foreign objects (e.g., ear plugs, plastic, etc.) are not being discharged, and to evaluate the effectiveness of currently established BMPs in place for the maintenance of the grind waste conveyance system. The permit requires that the operator follow the standard grind size sampling and analysis protocol (Permit Appendix H). Modifications to the protocol are allowed, but require written approval from the Department prior to implementation. Taking digital pictures of the grinder, waste and effluent on a monthly basis to document compliance with the grind size limitation is a new permit requirement. The purpose of the monitoring is to confirm permit compliance and implement operational corrections based on BMP Plan requirements and the observations made by operator. Facilities with grind size violations are not required to verbally report the non-compliance event(s) within 24 hours, nor follow-up with a 5 day written report, as the Department does not view single day or single sample grind size violations as a noncompliance event that may endanger health or the environment. Grind size noncompliance events are required to be recorded on the Grinder Logs and submitted as noncompliance occurrences with the Annual Report consistent with 18 AAC 83.455(e) and 18 AAC 83.410(f) and (g).

3.5.6 Spoiled Seafood Discharges –

Fish or other seafood or that is delivered to a remote onshore facility and found to be "spoiled" due to temperature, histamine concentration or decomposition may be discharged if ground to a ½-inch consistent with the Remote TBEL.

The 2016 AKG521000 permit includes new monitoring requirements to monitor the effluent for temperature, pH and ammonia during the discharge of spoiled seafood, refer to

Table 4). During the routine seafood/fish offloading procedures at the dock, the seafood/fish is checked for on-board temperature monitoring, internal temperature of seafood at the time of docking, and amounts of histamine formation and seafood decomposition. Histamine formation and decomposition can occur due to a number of factors, including the seafood delivery vessel or onshore facility having a problems with the refrigeration system. If the seafood/fish does not meet Food and Drug Administration's (FDA) seafood Hazard Analysis and Critical Control Point (HACCP) regulations, the seafood/fish aboard the vessel or at the facility needs to be disposed of. This type of discharge only occurs on rare occasion (2-3 vessels statewide per year). Spoiled seafood waste does not meet the definition of seafood processing waste because it is not seafood that is processed into marketable form, yet the composition of the spoiled, ground, non-processed fish does not vary in its water quality pollutants of concern compared to that of processed fish, except for the possible increased pH, increased ammonia content and/or increased temperature. Facilities operators are encouraged to deliver this type of product to a by-product facility, instead of discharging, if feasible. For more information regarding ammonia toxicity and sampling see Fact Sheet Part 3.14.

Table 4: Required Monitoring during Discharge of Ground, Spoiled Fish* Waste (Permit Table 5)

Effluent Parameter	Units	Sample Results	Maximum Daily Limit	Sample Location	Sample Frequency	Sample Type
Spoiled Fish Discharge Monitoring						
Amount Discharged	lbs [a]	N/A	report	effluent	Once per discharge event	---
Grind Size Compliance Sampling [b]	cm	N/A	1.27	effluent	Once per discharge event	grab
Temperature [c, d]	° C	report	report	effluent	Once per discharge event	grab
pH [c, d]	SU	report	report	effluent	Once per discharge event	grab
Total ammonia [c, d]	mg-N/L	report	report	effluent	Once per discharge event	grab
Ambient Parameter	**Spoiled Fish Discharge Ambient Monitoring**					
pH [d]	SU	report	report	receiving water	within 5 days of discharge	grab
Alkalinity [d]	Mg-$CaCO_3$/L	report	report	receiving water	within 5 days of discharge	grab
Salinity [d]	ppt	report	report	receiving water	within 5 days of discharge	grab
Ambient Temperature [d]	° C	report	report	receiving water	within 5 days of discharge	grab

Notes:

a. lbs = pounds

b. See Permit Appendix H for the sampling and analysis protocol to determine grind size compliance. Exceedances of the 1.27 cm (0.5 inch) limit shall be reported to DEC in accordance with Permit Appendix A, Part 3.5, (Other Noncompliance Reporting).

c. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.

d. Sampling shall be performed midway through the grinding and discharge process, or if discharging to inland waters by vessel, but ground at the facility, the vessel operator shall sample just prior to discharge.

* Spoiled Fish or other spoiled seafood brought the facility, but not processed (not brought to a marketable form - because it is being ground for discharged with no profit), shall count toward total pounds waste discharged.

3.6 Remote Onshore Seafood Processing and Ground Fish Waste and Wastewater Discharges (Permit Part 2.2.2)

The 0.5 inch grind requirement has been retained in the AKG521000 permit, as have the grinder system and waste conveyance daily monitoring, sea/shoreline monitoring and seafloor monitoring requirements. The 0.5 inch grinding requirement does not apply to (1) the calcareous shells of scallops, clams, oysters and abalones; (2) the calcareous shells of sea urchins; or (3) incidental catches of prohibited and by-catch species that are neither retained nor processed.

Monitoring the effluent discharge volume as "daily flow" is a new requirement. This information is being collected to assist DEC in future potential permit limit development and for potential use in mixing zone modeling efforts.

The permit requires operators of remote seafood processing facilities to continue to prepare and submit monitoring reports in the form of Annual Reports that will serve to inform DEC of the seafloor monitoring results, grinder performance, and shoreline monitoring.

Table 5 summarizes the effluent limits and monitoring requirements for a remote onshore facilities that annually discharge 30,001 – 10,000,000 pounds of seafood processing or fish waste.

Table 5: Remote Onshore Seafood Processing Facility Producing 30,001 lbs or greater of Seafood Processing or Fish Waste - Effluent Limits and Monitoring (Permit Table 6)

Effluent Parameter	Units	Effluent Limits				Monitoring Requirements		
		Average Monthly Limit	Minimum Daily Limit	Maximum Daily Limit	Maximum Annual Limit [c]	Sample Location	Sample Frequency	Sample Type
Flow – Daily Discharge	mgd [a]	---	report		---	effluent	daily	measured or estimated
Seafood Processing Waste	lbs [b]	---	30,001		10,000,000 Note c	n/a	daily	calculated
	cm			1.27 cm (0.5 inch)		effluent	daily	grab
Chlorine	µg/l	report	---		---	effluent	monthly	grab
Total Ammonia [d]	mg N/L	report	---	Note e	---	effluent	monthly	grab
pH [d]	S.U.	report	6.5	8.5		effluent	monthly	grab
Temperature [d]	° C	report				Effluent	monthly	grab
Waste Conveyance System	n/a	---	---		---	system [e]	daily	visual
Grinder System [f]	n/a	---	---		---	after treatment	daily	visual/grab
Operational Photos [g]	n/a	---	---		---	system	monthly [g]	digital

Notes:

a. mgd = million gallons per day.
b. lbs = pounds
c. The operator shall not discharge an amount (by weight) of seafood processing waste on an annual basis which exceeds the Department's written authorization.
d. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.
e. See Appendix H for the sampling and analysis protocol to determine grind size compliance.
f. Two pictures per month while discharge is occurring.

3.7 Remote Surimi / Minced Seafood Processing Effluent Limits and Monitoring Requirements (Permit Part 2.2.3)

3.7.1 Explanation of surimi / unwashed mince seafood or washed mince (washed or unwashed collectively referred to as 'mince') seafood processing effluent discharges occurring at Remote Facilities

Surimi is minced fish flesh that is washed to remove most of the lipids, blood, enzymes, and sarcoplasmic proteins and processed to concentrate myofibrillar protein. Surimi and minced seafood product is often stabilized for frozen storage by cryoprotectants (sugars, phosphates and salts). Surimi and minced seafood products have become increasingly popular due to their unique textural properties, storage properties and high nutritional value (Akil et al. 2008; Park and Morrissey 2000; Bourtoom et al. 2009). Surimi processing and minced seafood operations are highly-water intensive, with most of the water use and generation of wastewaters related to the washing or dewatering of the minced seafood. Surimi / minced seafood processing effluent stream contains 0.5-6.0% protein solids. These suspended solids in surimi effluent are primarily composed of sarcoplasmic proteins and other intracellular contents (after removal of the myofibrillar). The surimi / mince effluent containing this protein mix where the proteins have an approximate average molecular mass of 100-500 kilodaltons, or in other words a size equal to approximately 0.15mm or smaller (Wu, T.Y., 2002 and Park, 2005).

A raw material balance shows 50 percent of the fish is lost before washing. An additional 20 percent of the raw material is lost during washing processes, resulting in an approximate surimi yield of 15-20 percent of the raw fish input. Park and Morrissey (2000) found that processing Pacific whiting, Alaskan pollock and shrimp in Oregon, Alaska and Washington generates 20 million tons/year of waste and wastewater.

The generation of wastes and wastewaters from surimi / minced seafood processing comes first from the removal of scales, guts and heads, which can be processed into fish. Second, and more importantly, is the release of blood, fat and intracellular soluble proteins that are leached from the seafood mince during processing. The high TSS and BOD_5 generated during surimi / minced seafood processing is a direct result of the intentional removal of these materials through washing (seafood processing). The quality of the desired final product is directly proportional to the efficiency of the washing process in removing the undesirable components. Since the soluble components can be recovered through several potential methods (e.g., settling, centrifugation, ultrafiltration) for further product recovery and for secondary product use, a significant reduction in waste load has shown to be realized in surimi / minced seafood processing facilities worldwide in Sweden/Denmark, Thailand and the U.S. (Nolsoe et. al (2011), Kanjanapongkul, et. al (2008), Stine, et. al (2011), respectively).

3.7.2 Establishing Effluent Limits and Monitoring for Surimi / Minced Seafood Remote Facilities

EPA has not promulgated ELGs for processing seafood into surimi for either washed or unwashed minced seafood products for remote dischargers. In 1974, EPA established technology-based ELGs in 40 CFR Part 408 for Canned and Preserved Seafood Processing Point Sources. Where national ELGs have not been developed or do not consider specific pollutant parameters in discharges, the same performance-based approach applied to the development of national ELGs can be applied to develop a specific industrial facility effluent limit using BPJ. Per CWA Section 402, developing BPJ permit conditions requires

the permitting authority to consider the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), the cost of implementing these conditions relative to the environmental benefits achievable, and such other factors as deemed appropriate.

EPA considered these factors when developing the Non-Remote case-by-case TBELs during development of the 1998 AKG528000 permit, which authorized surimi / minced seafood discharge. While the 2001 AKG520000 permit for Remote facilities did not authorize the discharge of washed surimi wastewaters within one nautical mile of shore, there are some facilities operating in Remote areas that have (or are looking to) developed surimi / minced seafood processing due to market changes and increased profitability in surimi / minced seafood processing.

The production of a surimi / minced seafood product increases TSS, O&G and BOD_5 loading in receiving waters if not properly treated. Due to the industry's increased production of surimi, and both washed and unwashed mince, the 2016 AKG521000 permit proposes to provide coverage for the discharge of both surimi and minced seafood product (washed and unwashed) wastewater at Remote facilities if the discharge meets the end-of-pipe effluent limits found in Permit Table 7 – the same effluent limits as applied to Non-Remote facilities in the AKG528000 general permit.

To explain the use of the 1998 AKG528000 permit end-of-pipe effluent limits as BPJ for Remote facilities, DEC considered the following. The authorized discharge in the 1998 AKG528000 permit was applicable to the seafood wastewater discharge consisting of a combined butchering waste stream with surimi processing waste stream. To establish the effluent limits for Non-Remote facilities' combined butchering and surimi processing waste streams, EPA exercised BPJ and applied the Alaskan applicable ELGs established in 40 CFR Part 408, as well as the broader application of the non-Alaskan bottom fish ELGs in 40 CFR 408.222-225 to the combined waste stream of butchering and surimi processing waste discharges. Therefore EPA applied multi-species ELG limits found in 40 CFR Part 408 and applied BPJ TBELs for Non-Alaskan Mechanized Bottom Fish (for pollock) ELGs [40 CFR 408.222]; to more accurately reflect end-of-pipe combined waste stream.

The Department has determined that the 1998 AKG528000 TBELs end-of pipe limits established for butchering and processing lines, including the processing of surimi and its wastewater discharges, are directly applicable to Remote facilities discharging a butchering waste stream combined with surimi / minced seafood processing discharges. The Department has evaluated the original BPJ TBELs developed by EPA in relation to age of equipment and current engineering aspects of control techniques, as well as other pertinent considerations.

Not previously discussed in the AKG528000 permit, both salmon and pollock are being used at Remote locations to make surimi / minced seafood products (human, pet food or other surimi/mince seafood types of use). Since this is the case, the AKG521000 permit proposes end-of-pipe effluent limits incorporating the same multi-species TBELs found in AKG528000, and applying the TBELs to Remote facilities incorporating surimi / minced product lines. (see Permit Table 7).

3.7.3 Treatment Technology Development and Compliance

Since the rule making process for the 1974 ELGs found in 40 CFR Part 408, many new wastewater treatment process improvements and technologies have been developed. Applicable treatment technologies to reduce pollutant loading, which can be applied to surimi wastewater treatment, include decreased fish holding times prior to washing in the surimi making process, high speed centrifuges, and decanters, as well as membrane bioreactors (MBR), nano and ultra-filtration processes. During average onshore surimi / minced seafood processing activities, between 40-50% of all protein can be lost during the first two wash cycles, which results in high pollutant loading in the wastewater (Park, 2005). Studies have shown that using nano and ultra-filtration could enable greater than 65% recovery of proteins currently being discharged and that these recovered proteins can be effectively added back to the surimi cake to increase productivity and generate revenue (Afonso, et al. 2004). Through careful O&G capture, the use of the MBR, and/or nano and ultra-filtration processes to capture the proteins lost to the wastewater, in addition to the use of further by-product recovery techniques (fish meal, fish oil and bone meal), the ELGs for wastewater treatment can be met while also improving surimi / minced seafood production levels and increasing economic gains.

EPA stated in the 1998 AKG528000 permit fact sheet that, "Depending on the processing of individual facilities, the surimi and fish powder waste streams are sampled prior to screening and commingling with the final effluent discharge waste stream. The concentrations of TSS and O&G in the surimi and fish powder waste streams can be subtracted from the final effluent waste stream concentrations of TSS and O&G. The purpose of this allowance is to appropriately apply the mechanized or conventional limitations to the final effluent waste stream minus the surimi or fish powder waste streams." This allowed the subtraction of TSS and O&G loadings before compliance with final effluent limits was determined.

It is unclear to DEC why the subtraction of the loading of the surimi waste stream was allowed in the 1998 AKG528000 permit. The Department assumes that during the issuance of the 1998 AKG528000 permit, the surimi line used to be considered a by-product recovery line. As a by-product recovery line, the surimi process would have been viewed as follows: fish are brought into the plant, headed, gutted and filleted, and the rest of the carcass is sent to surimi production. Following this approach, the loading from a by-product recovery line would then be thought of as additional material being "removed" from the filleted carcass, perhaps thought to decrease loading of the waste stream (thereby allowing its loading subtraction) because it was perceived less of the fish was being sent out the outfall line.

Upon reviewing the surimi / minced seafood production lines and conducting literature research, this product does not appear to be processed into surimi as discussed in the paragraph above. The whole fish enters the plant where it is graded. Depending on offered market price, fish often referred to as "number one" fish are headed, gutted and filleted. The carcass is then sent to the fish powder/fish meal plant. If the fillet price is less than the offered surimi product market price, even "number one" fish may be processed into surimi / minced seafood. Fish graded "number twos" and below are most often headed, gutted and the entire rest of the filleted fish meat is sent to surimi the main production line, which then becomes its own butchering line. Filleting and surimi / minced seafood production lines are both then main butchering and processing production lines. As such, the BOD_5, TSS, and

O&G measured from the surimi / minced seafood line's internal outfall contributes loading of the final effluent.

As discussed above, the 1998 AKG528000 relied on a one millimeter (1mm) fine mesh screen size as Best Available Control Technology limitation to control effluent loading originating from production of surimi.

A Remote facility operator choosing to discharge surimi / minced seafood effluent will need to implement 1mm X 1mm screening technologies vs grinding in order to meet end-of-pipe limits as ground seafood processing waste will lead to excessive pollutant loading where the operator would be unable to meet the end-of-pipe limits Table 6 (Permit Table 7). The facility operator may choose a number of treatment approaches to comply with the permit limits.

3.7.4 Allowing Facility Surimi / Minced Seafood Effluent Discharge

The surimi / minced seafood waste stream produced at remote facilities has the same pollutants of concern as the surimi / minced seafood waste stream produced at non-remote facilities and accordingly should be controlled the same. Establishing limits for remote facilities processing surimi / minced seafood is required to control TSS, O&G and BOD_5 associated with this type of production line. Where sampling is required, unless otherwise noted, the operator shall use Department approved standard analytical methods found in 40 CFR Part 136 (most current version), adopted by reference at 18 AAC 83.010 (most current version) and those found in 18 AAC 70 that can analyze the sample parameters using a method detection limit (MDL) less than the effluent limit. The operator shall notify the Department the sample arrived outside hold times. The Collins-Tenney test method is allowed for testing of Oil and Grease. EPA Method 1664 for Oil and Grease has been approved as an alternative test procedure for Region 10. The effluent limits and monitoring are new permit requirements.

The permit proposes a monitoring schedule to collect effluent samples a facility's surimi / minced seafood product line or by-product line. For determining compliance with remote facilities surimi / minced seafood effluent limits (Table 6), the effluent samples must be taken after commingling of all seafood waste streams and prior to discharge to waters of the U.S. If the surimi line / minced seafood line has an individual outfall line, the limits established in Table 6 shall apply end of pipe. Effluent monitoring schedule requirements are found in Table 7. The surimi / mince end-of-pipe effluent limits for TSS, O&G and BOD_5 are new permit requirement for Remote facility operators. Additionally, the monitoring is a new requirements for remote surimi / minced seafood waste stream discharges.

The permit requires internal outfall sampling for the surimi / mince seafood processing line. The internal outfall samples shall be collected as a composite sample during a single surimi / mince processing production cycle, or may be performed as a grab sample. If performed as a grab sample, the sample shall be taken as two different aliquots. The first required aliquot of the internal outfall grab samples (Table 7) shall be collected from the waste stream during discharge of the first half of surimi / mince washing cycle(s). The second required aliquot for the internal outfall grab samples (Table 7) shall be collected during that same surimi process cycle, on the same day, during the waste stream discharge of the surimi / minced seafood's last wash cycle(s) and dewatering. (Permit Part 2.2.3.9.1 and Table 7).

The 2016 AKG521000 permit also includes new requirements to monitor the effluent for temperature, pH and ammonia during the discharge of surimi / minced seafood wastewater. For more information regarding ammonia toxicity and sampling see Fact Sheet Part 3.14.

Table 6 (Permit Table 7) below summarizes the end-of-pipe effluent permit limits for discharges associated with remote surimi / minced fish operations. Table 7 (Permit Table 8) below summarizes the frequency at which samples shall be taken and the sample type.

Table 6: Remote Surimi / Minced Seafood End-of-Pipe Effluent Limits (Permit Table 7)

Seafood Type	Total Suspended Solids (lbs [a]/1000 lbs seafood)		Oil and Grease (lbs/1000 lbs seafood)		BOD_5	
	Monthly Avg	Daily Max	Monthly Avg	Daily Max	Monthly Avg	Daily Max
Crab Meat	5.3	16	0.52	1.6	report	report
Whole Crab/Crab Sections	3.3	9.9	0.36	1.1	report	report
Shrimp	180	270	15	45	report	report
Salmon – Conventional/Hand Butchered	1.4	2.3	0.17	0.28	report	report
Salmon – Mechanized [b] Processing	25	42	10	28	report	report
Bottom Fish [c]	1.1	1.9	0.34	2.6	report	report
Bottom Fish – Mechanized [b] Processing	2.9	5.3	0.47	1.2	7.5	13
Scallops	1.4	5.7	0.23	7.3	report	report
Herring – Frozen Whole	1.6	2.6	0.19	0.31	report	report
Herring Fillet Processing	18	23	7.3	20	report	report
Hand Shucked Clam [d]	17	55	0.21	0.56	report	report
Mechanized [d] Clam Processing	4.4	26	0.092	0.40	5.7	15

Notes:

a. lbs = pounds
b. If 50% or more of the weight of the solid wastes are generated from the use of one or more automated or mechanized method, then select the mechanized limitations for reporting.
c. Bottom fish include flounder (e.g., arrowtooth), rockfish/red snapper, pacific cod, halibut, pollock, black cod/sablefish, grey cod, flatfish/sole, and whitefish
d. Limits and Monitoring only apply to discharges resulting from existing hand-shucked clam processing facilities which process more than 1816 kg (4000 lbs) of raw material per day on any day during a calendar year

Table 7: Remote Surimi / Minces Seafood Effluent (Internal Outfall and Final End of Pipe) Monitoring Requirements (Permit Table 8)

Effluent Parameter	Units	Effluent Result	Sampling Frequency Internal and End of Pipe	Sample Type
Flow - Daily Discharge for internal outfall on day sampled	mgd	report	daily	measured/estimated
Incoming Flow	mgd	report	daily/monthly	measured/estimated
Flow – Daily Discharge end-of-pipe total on day sampled	mgd	report	daily	measured/estimated
Flow – Average Monthly Discharge	mgd	report	monthly	calculated
Raw Product Sent to Surimi / Mince Line [a]	lbs	report	Each single surimi process cycle, then total monthly	measured, calculated for each species
Number of Days Processing [b]	days	report	monthly	measured
Amount of Surimi / Mince Produced	lbs	report	Each single surimi process cycle, then total monthly	measured
BOD_5 [c]	mg/L lbs/1000 lbs [c, d]	report	monthly, Internal and End of Pipe	Internal = Composite or Grab, End-of-pipe = Composite
TSS [c]	mg/L lbs/1000 lbs [c, d]	report	monthly, Internal and End of Pipe	Internal = Composite or Grab, End-of-pipe = Composite
Oil & Grease [c]	mg/L lbs/1000 lbs [c, d]	report	monthly, Internal and End of Pipe	Internal =Grab, End-of-pipe = Grab
Settleable solids	mL/L	report	monthly	8-hr composite [d]
Chlorine	µg/l	report	monthly	grab
Total Ammonia [f]	mg-N/L	report	monthly	grab
pH [f]	SU	report	monthly	grab
Temperature [f]	° C	report	monthly	grab

Notes:

a. The operator shall report the amount in pounds of production of each type of seafood sent to the surimi / minced seafood production line (crab, salmon by conventional/hand butchering processes, salmon by mechanized processing, bottom fish, etc.).

b. The operator shall report the number of days in the calendar month on which each type of surimi / minced seafood processing occurred.

c. Operators shall report the daily and monthly pounds (lbs) BOD5, TSS, and O&G / 1,000 lbs seafood processed for each calendar month.

d. Calculations to determine lbs of pollutant discharge per 1,000 lbs of seafood processed are shown in Permit Appendix E.

e. One grab sample shall be taken during discharge of 1st half of wash cycles, the 2nd grab sample shall be taken during surimi discharge, at the end of the wash cycles.

f. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.

3.8 Remote Fish Meal, Fish Powder, Fish Oil, and Fish Hydrolysate and Other By-product Effluent Discharge Monitoring (Permit Part 2.2.4)

There continues to be increased interest in starting by-product recovery facilities/production lines in Remote locations, in addition to existing remote facilities already using by-product recovery processes for either economic reasons and/or necessary source control. Remote facilities using by-product recovery/productions lines including, but not limited to, fish meal, fish powder, fish oil, and fish hydrolysate have discharges that are similar in nature to the discharges from the non-remote facilities using by-product recovery. Facilities in remote locations are authorized to discharge fish meal, fish powder, fish oil, fish hydrolysate or other by-product effluent or other by-product effluent under the permit if they perform the required effluent monitoring in Table 8 (Permit Table 9).

The 2016 AKG521000 permit includes new monitoring requirements for Remote facilities for effluent TSS, BOD5, O&G, Total Solids, temperature, pH and ammonia during the discharge of fish meal, fish powder, fish oil, fish hydrolysate or other by-product effluents. Water quality pollutants of concern are the same as that of by-products produced at non-remote facilities (BOD_5, TSS, O&G), except for the possible increased pH, increased ammonia content and/or increased temperature. For more information regarding ammonia toxicity and sampling see Fact Sheet Part 3.14.

The 2016 AKG521000 permit requires operators of remote facilities discharging fish meal, fish powder, fish oil, fish hydrolysate or other by-product effluent to perform monitoring (see Permit Table 9) at an internal outfall prior to the waste stream comingling with other waste stream(s). The proposed permit require operators to monitor (see Permit Table 9) for TSS, O&G and other pollutant parameters to characterize the nature of the waste stream. The monitoring of the waste stream on a monthly basis is a new permit requirement. Monitoring the effluent generated by the by-products' production lines will provide data to Department to evaluate the possible pollutant loading effects on water quality. This increased by-product effluent monitoring in remote locations, coupled with mixing zone monitoring, and should assist in developing a better understanding of potential water quality effects from these discharges.

Table 8 (Permit Table 9) below summarizes the frequency at which effluent parameters must be sampled and reported.

Internal outfall monitoring results will be recorded in a per-month table format and submitted with the Annual Report (Permit Part 2.8). The table shall include the date and time of the sample, total daily flow volume for the by-product line on the sampling date, effluent parameters sampled, as well as daily and average monthly sample results.

If discharging directly to waters of the U.S. (i.e. no commingling with other process streams occurs) end of pipe monitoring results shall be recorded on a DMR and submitted monthly. Copies shall be kept at the facility and made available upon request. A summary report of pollutants monitored and sample results shall be submitted with the Annual Report (Permit Part 2.8). If by-product waste streams are commingled with other waste streams, only internal outfall sampling is required, Permit Part 2.2.4.7.

Table 8: Remote Fish Meal, Fish Powder, Fish Oil, Fish Hydrolysate and Other By-product Monitoring Requirements (Permit Table 9) - End of Pipe or Internal Outfall dependent on Facility Design

Effluent Parameter	Units	Effluent Result	Sample Frequency	Sample Type
Flow - Daily Discharge for internal outfall on day sampled	mgd	report	daily	measured/estimated
Incoming Flow	mgd	report	daily/monthly	measured/estimated
Flow – Daily Discharge end-of-pipe total on day sample**d**	mg**d**	report	daily	measured/estimate**d**
Flow – Average Monthly Discharge	mgd	report	monthly	calculated
Number of Days Processing [a]	days	report	monthly	measured
Amount seafood sent to be processed into by-product	lbs	report	daily	measured
	% [b]			
Amount by-product produced	lbs	report	daily	measured
Report amount & how (at-sea, land fill, etc.) wastes are disposed of	lbs	report	total each week	measured
BOD_5	mg/L	report	monthly	8-hr composite [d]
	lbs/1000 lbs of seafood [c]	report		
TSS	mg/L	report	monthly	8-hr composite [d]
	lbs/1000 lbs of seafood [c]	report		
Oil & Grease	mg/L	report	monthly	grab
	lbs/1000 lbs of seafood [c]	report		
Chlorine	µg/l	report	monthly	grab
Total Ammonia [e]	mg-N/L	report	monthly	grab
pH [e]	SU	report	monthly	grab
Temperature [e]	° C	report	monthly	grab

Notes:

a. The operator shall report the number of days in the calendar month on which each type of seafood processing occurred.

b. The operator shall report the amount in pounds of production of each type of seafood sent to the by-product line (crab meat, whole crab or crab sections, salmon by conventional/hand butchering processes, salmon by mechanized processing, bottom fish, herring fillet processing, herring frozen whole, scallops, etc.). The operator is required to report the percentage of total raw pounds processed that is sent to the by product line. In example, if 40,000 lbs of carcasses are produced from filleting, but only 20,000 lbs are sent by-product production, the percent reported would be 50%.

c. Operators shall report the daily and monthly pounds (lbs) BOD5, TSS, and O&G / 1,000 lbs seafood processed.

d. A grab sample may be collected instead of an 8-hour composite sample during periods of intermittent processing where processing alternately ceases and begins again in less than eight hours. If a grab sample is taken it shall be taken midway during the processing.

e. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.

3.9 Remote Onshore Seafood Processor or Ground Fish Waste Discharge Facilities that annually discharge 30,000 pounds or less - Limits and Monitoring (Permit Part 2.2.5)

As discussed in Fact Sheet Part 1.3.6, facilities producing 1 pound to 30,000 pounds per year of seafood processing waste or ground fish waste may obtain permit coverage, as allowed 18 AAC 83.210(g), by the submittal of an NOI and compliance with permit conditions. Discharges from low volume (i.e., 30,000 pounds or less) remote seafood processing facilities are still required to meet the standard of 0.5 inch grind, which is the same 40 CFR Part 408 TBEL required of larger volume (i.e., 30,001 pounds or greater) seafood processors. Low volume seafood processors also have to perform outfall line inspections, waste conveyance system inspections, and grind size inspections. The permit also requires operators discharging under Permit Part 2.2.5 to meet domestic wastewater effluent limits and monitoring, found in Permit Part 2.1.1 should they discharge domestic wastewater directly to waters of the U.S. As discussed in Ocean Discharge Criteria Evaluation for Seafood Wastes for the AKG52000 permit (http://dec.alaska.gov/water/wwdp/seafood/documents.html), the seafood waste deposit modeling performed in 1993 demonstrated that deposits do not begin to form on the seafloor until more than 3.3 million pounds of waste per year are discharged. Through a review of AKG520000 operator's dive surveys, less than five percent of operators discharging, at much greater volumes, formed deposits above the one acre ZOD allowance. While seafood processing deposit formations can be subject to certain site-specific factors, these low volume operator's discharge represents $1/10^{th}$ of the amount of predicted deposit formation Therefore, receiving water monitoring as found in Permit Part 2.7 is not required for the low volume, remote seafood processors or low volume, ground fish waste discharge facilities. The results of future modeling and seafloor surveys may influence future permit changes to expand the authorized pounds of discharge under the low volume, remote category.

Table 9 (Permit Table 10) summarizes the frequency at which samples shall be taken and compliance monitoring.

Table 9: Remote Facilities that Produce 30,000 Pounds or Less of Seafood / Ground Fish Waste
(Permit Table 10)

Effluent Parameter	Units	Effluent Limits			Monitoring Requirements	
		Maximum Daily Limit	Maximum Annual Limit	Sample Location	Sample Frequency	Sample Type
Flow – Daily Discharge	mgd[a]	---	report	effluent	daily	measured/estimated
Flow – Average Monthly Discharge	mgd	report	report	effluent	monthly	measured/estimated
Raw Product Processed	lbs [b]	report	report	n/a	daily	measured [d]
Number of Days Processing	Days	report	report	n/a	monthly	measured
Seafood processing or non-seafood processing Fish Waste discharge	lbs [b]	Notes c, d, e	30,000	n/a	daily	calculated
	cm	1.27 [f]	n/a	effluent	daily	grab
Waste Conveyance System	n/a	n/a	report	system	weekly	visual
Grinder System	n/a	n/a	report	after treatment [g]	weekly [g]	visual/grab
Photos of Grinder Working	n/a	n/a	report	after treatment	2 per month [g]	digital

Notes:

a. mgd = million gallons per day -
b. lbs = pounds. The operator shall report the amount in lbs the type of seafood processed.
c. For accepting offsite, seafood carcass waste, the operator shall provide a method to record (or record themselves) the lbs of waste discharged on a daily basis for the days on which a fish waste discharge occurs.
d. The operator's monthly fish waste report shall record the amount in pounds of fish waste discharged for each type of seafood (crab meat, salmon, bottom fish, or other).
e. The operator shall not discharge an amount (by weight) of seafood processing waste on an annual basis which exceeds the amount in the Department's written authorization.
f. See Appendix H for the sampling and analysis protocol to determine grind size compliance. Exceedances of the 1.27 cm (0.5 inch) limit shall be recorded on a non-compliance log.
g. Two pictures per month while processing is occurring.
h. Monitoring is only required in those months that the seafood processing actually occurs for at least 24 hours during the calendar month.

3.10 Non-Remote Onshore Seafood Processing Facilities *(*Permit Part 2.3*)*

3.10.1 History of Designating "Non-Remote" Facility Locations

EPA published ELGs for the Canned and Preserved Seafood Processing Point Source Category on July 30, 1975 specifying best practicable control technology currently available (BPT), best conventional pollutant control technology (BCT), and new source performance standards (NSPS) for seafood processing activities across the nation. The ELGs are codified at 40 CFR Part 408, adopted by reference at 18 AAC 83.010. The seafood ELGs provided for two primary categories of Alaskan processors, dependent on whether a processor operates at a "remote" or a "non-remote" location.

"Non-remote" facilities are those facilities located in "population or processing centers." The regulations provided a non-exclusive list of Alaskan locations considered to be "non-remote," including Anchorage, Cordova, Juneau, Ketchikan, Petersburg and Kodiak. In "non-remote" locations, the ELGs are based on the screening of the processing solids from the seafood processing wastewaters and disposing of the screened solids by means other than discharging in the facility's effluent.

In 1980, EPA temporarily suspended the original regulations applicable to five "non-remote" locations (Anchorage, Cordova, Juneau, Ketchikan and Petersburg) and published a notice of this suspension in the Federal Register (45 Federal Register 32675, May 19, 1980). In a 1981 response to industry petitions, EPA proposed to grant the petition to reclassify Juneau as "remote" and to deny the petition to delete the locations of Anchorage, Cordova, Ketchikan and Petersburg from the group of "non-remote" ELG subcategories. EPA's 1981 notice stated that the suspension would remain in effect until EPA made a final decision.

The seafood processing facilities in Alaska that are considered "non-remote" are currently limited to those that are located on Kodiak Island, Alaska (including Kodiak Harbor, St. Paul Harbor, Gibson Cove, Near Island Channel, Women's Bay, and Woody Island Channel. Note, it is possible during the permit cycle that additional non-remote designations could be established based on current EPA rule making.

The ELGs subcategories applicable to Alaskan seafood processing include (40 CFR Part 408 subcategory in parentheses): non-remote Alaskan crab meat processing (D), remote Alaskan crab meat processing (E), non-remote Alaskan whole crab and crab section processing (F), remote Alaskan whole crab and crab section processing (G), non-remote Alaskan shrimp processing (I), remote Alaskan shrimp processing (J), Alaskan hand-butchered salmon processing (P), Alaskan mechanized salmon processing (Q), Alaskan bottom fish processing (T), Alaskan scallop processing (AC), and Alaskan herring fillet processing (AE).

The effluent limits from the 1998 AKG528000 permit are provided in following figures.

Figure 2. 1998 AKG528000 Technology Based Effluent Based Limitations –Butchering Processes

AKG528000 Section 3.1									
Type of Seafood	Conventional/Hand-Butchered lbs/1000 lbs				Mechanized lbs/1000 lbs				Basis (40 CFR Part)
	Total Suspended Solids		Oil and Grease		Total Suspended Solids		Oil and Grease		
	Daily Max	Monthly Average	Daily Max	Monthly Aver	Daily Max	Monthly Average	Daily Max	Monthly Average	
Bottom Fish	3.1	1.9	4.3	0.56	22	12	9.9	3.9	408.207/BPJ-408.222 (BCT)
Salmon	2.6	1.6	0.31	0.19	44	26	29	11	408.167/408.177 (BCT)
Herring Frozen Whole	2.6	1.6	0.31	0.19	-	-	-	-	Application of BPJ based off of 408.162
Shrimp	320	210	51	17	-	-	-	-	408.97 (BCT)
Scallops	6.6	1.4	7.7	0.24	-	-	-	-	408.297 (BCT)
Crab, whole/sections	12	3.9	1.3	0.42	-	-	-	-	408.67 (BCT)
Limitations are based upon the raw products processed on the day samples are collected									
Daily discharges shall be calculated as follows:	lbs pollutants = (Flow (mgd)) x (pollutant (mg/L)) x (8.34) total lbs processed during the sampling day = lbs pollutants/1000 lbs raw product								
Solids	Treatment of the butchering waste stream prior to discharge shall be accomplished through the use of fine mesh screening (1mm X 1mm) or equivalent technology. Seafood wastes shall not be pulverized, chopped, ground, or otherwise altered prior to screening and discharge through the facility's outfall.								BPJ-existing technology in place

Figure 3. 1998 AKG528000 Effluent Limitations Applicable to Wastewaters from Surimi Production

Parameter	AKG528000 Section	Effluent Limitation	Basis
Solids	3.2.1	Wastewater shall be treated by fine mesh screening (1mm), or equivalent technology, prior to discharge.	BPJ
Environmental Effects	3.7	There shall be no discharge of floating solids, visible foam, or oily wastes which produce a sheen on the surface of the receiving water. There shall be no accumulation of seafood processing wastes on the shoreline. There shall be no accumulation of wastes on the seafloor of the receiving water.	18 AAC 70.020(b) Sediment, Residues
Water Quality Standards	3.8	Discharges shall be in compliance with the Alaska Water Quality Standards	18 AAC 70.010

Figure 4. 1998 AKG528000 Water Quality Based Effluent Limitations-Fish Meal/Fish Powder Waste Stream

Parameter	AKG528000 Section	Effluent Limitation	Basis
pH	3.3.2	The effluent pH shall not be less than 6.0 standard units nor greater than 9.0 standard units. (Incorrect limitation standards are 6.5-8.5)	18 AAC 70.020(b) pH
Temperature	3.3.4	Temperature shall not exceed applicable water quality criteria established by the Alaska Water Quality Standards (18 AAC 70)	18 AAC 70.020(b) Temperature
Color	3.3.4	Color shall not exceed applicable water quality criteria established by the Alaska Water Quality Standards (18 AAC 70)	18 AAC 70.020(b) Color
Residues	3.3.4	Discharges shall not cause a foam, film, sheen, emulsion, sludge, or solid residue on the surface or floor of the receiving water.	18 AAC 70.020(b) Sediment, Residues
Environmental Effects	3.7	There shall be no discharge of floating solids, visible foam, or oily wastes which produce a sheen on the surface of the receiving water. There shall be no accumulation of seafood processing wastes on the shoreline. There shall be no accumulation of wastes on the seafloor of the receiving water.	18 AAC 70.020(b) Sediment, Residues
Water Quality Standards	3.8	Discharges shall be in compliance with the Alaska Water Quality Standards	18 AAC 70.010

3.11 Non-Remote Effluent Limits (Permit Part 2.3)

The CWA requires particular categories of dischargers to meet TBELs established by EPA (see http://water.epa.gov/scitech/wastetech/guide/index.cfm). ELGs are regulations that establish national technology-based effluent limitations for a specific industrial category or subcategory. Where EPA has not yet developed guidelines for a particular industry or sub-category, permit conditions may be established using BPJ procedures (18 AAC 83.425, 18 AAC 83 Article 5, and 18 AAC 83.010).

When TBELs do not exist for a particular pollutant expected to be in the effluent, the Department shall determine if the pollutant may cause or contribute to an exceedance of a WQS for the waterbody. If a pollutant causes or contributes to an exceedance of a WQS, a WQBEL for the pollutant shall be established in the permit.

Non-Remote seafood processors were previously covered under general permit AKG528000. Most of the 1998 AKG528000 permit effluent limits and monitoring requirements are incorporated in the 2016 AKG521000 permit by applying ELGs established in 40 CFR Part 408 and applying WQBELS for Non-Remote facilities. While some effluent limitation and monitoring requirements have remained unchanged from the 1998 AKG528000 permit, changes from those previously applied requirements are summarized in this section.

The permit retains the requirement for all wastewaters originating from Non-Remote butchering, surimi / minced seafood processing, and by-product production operations to be treated by screening with fine mesh (1mm x 1 mm) screens, or equivalent technology, to minimize the discharge of pollutants (Permit Part 2.3.1). This is a BPJ requirement which has been shown by facilities currently covered under the permit as cost-effective relative to the environmental benefits achieved by the treatment technology.

The 1998 AKG528000 general permit limitation of 1 millimeter (mm) fine mesh screen was developed through the application of BPJ TBELs for the use of

The 1998 AKG528000 Section 3.1 permit contained the following language:

> "Treatment of the butchering waste stream prior to discharge shall be accomplished through the use of fine mesh screening (1 mm) or equivalent technology. Seafood wastes shall not be pulverized, chopped, ground, or otherwise altered prior to screening and discharge through the facility's outfall."

DEC reviewed permit compliance files for the Kodiak facilities. Several of the files contained inspection reports citing the facilities for not complying with a 1mm X 1mm screen size. While the 1998 permit did not state 1mm X 1mm, DEC researched the historical file to understand where the misinterpretation may have originated. In a December 1974 EPA Office of Enforcement report titled 'Evaluation of Waste Disposal Practices of Alaska Seafood Processors' (pg 16) it states: "All wastes shall be collected, without loss through the facility floors, and flumed to a screening device(s) equivalent to an efficiently operated tangential screen with a grid spacing of 1mm(0.040 in) or less." DEC interprets this development document to identify that a tangential screen in mathematical terms would be an "X" "Y" graph, placing a grid on a graph, with 1mm spacing in both directions on the "X" and the "Y" would result in screen holes no greater than 1mm X 1mm. The 1mm by 1mm screening size, or other equivalent technology, is adopted as a new permit requirement.

It is important to note that the permit incorporates the ELG requirements for the Non-Alaskan Conventional and Mechanized Bottom Fish Processing Subcategories and not the ELG requirements for the Alaskan Conventional and Mechanized Bottom Fish Processing Subcategories. When the 1998 AKG528000 became effective on May 1, 1998 (AKG528000 Fact Sheet, Section 6.2.2), the ELG limitations for Alaskan Bottom Fish were based on halibut being the dominant bottom fish species. Because other bottom fish are processed by the Kodiak facilities (e.g., cod, pollock, flounder, rockfish/red snapper, black cod/sable fish, flatfish/sole, and other whitefish species), limitations based on halibut alone do not adequately reflect actual bottom fish processing. The bottom fish species are usually brought to the plant whole, where processing involves more extensive butchering and mechanization. At the time of the 1998 AKG528000 permit issuance, it was determined that ELG requirements for the Non-Alaskan Mechanized Bottom Fish Processing [40 CFR 408.222] subcategory ELGs were more appropriate for Non-Remote seafood processing facilities, and the Department concurs with that determination.

The monitoring frequency for Non-Remote facilities previously operating under the 1998 AKG528000 permit shall maintain a weekly monitoring schedule in the AKG521000 permit. The 2016 AKG521000 permit requires the effluent monitoring results be reported on a monthly DMR, which is consistent with the 1998 AKG528000 permit. A new permit requirement includes that a sampling results summary report be included with the Annual Report.

Permit Parts 2.3.1.12 and 2.3.1.13 clarify that compliance with ELGs for seafood processing operations will be based on effluent pollutant monitoring of the total facility discharge after screening and on the total discharge flow of wastewaters that originate from all seafood processing operations. Additionally, internal outfall monitoring has been required for specific product and byproduct production lines prior to comingling to assist facilities in determining compliance with effluent limits.

Effluent limitations from the ELGs are expressed in terms of pounds of TSS, O&G, or pounds of BOD_5 per 1,000 pounds of seafood processed. If an authorized facility processes more than one

type of seafood, for compliance purposes, effluent limitations shall be calculated as aggregate figures which reflect the commodity mix for the appropriate time period. The end-of-pipe limits are based on and limited to the actual pounds of specific fish or seafood species processed on a daily basis. Permit Appendix E presents sample calculations for determining compliance with the production-based effluent limitations of Tables 11 and 12. The application of the 40 CFR 408.160-167 ELGs into the 2016 AKG4521000 permit are continued from the 1998 AKG528000 permit.

The permit requires new Non-Remote facilities to install flow meters, install new outfalls at certain depths, perform pre-installation outfall surveys, monitor and report the operability of their seafood waste treatment system in Permit Parts 1.6 and 2.3.1. The following paragraphs discuss these requirements in more detail.

3.11.1 Outfall Depth and Flow (Permit Part 2.3.1)

The proposed permit requires Non-Remote facilities provide information regarding their discharge flow and their outfall depth. The permit requires the identification of all outfalls, types of waste and wastewater discharged from each outfall, as well as specific outfall terminus depth reporting.

Previous permit compliance inspections have revealed multiple outfalls installed at various facilities, but only one outfall identified on the NOI. In order to accurately model environmental impacts, the correct number and location of outfalls must be identified, along with the associated pollutant loading, flow and depth associated with each outfall.

Additionally, compliance actions have been taken for operators discharging ammonia (a refrigerant often used at seafood processing facilities and also created during the natural decomposition of seafood). See Fact Sheet Part 3.13 for more information regarding ammonia toxicity. Requiring identification of all outfall lines, types of wastewater effluent being discharged and monitored, along with the development and implementation of a robust BMP Plan, should increase operator compliance with permit requirements and ultimately result in increased water quality protection.

3.11.2 Pre-Installation / Pre-Discharge Survey Requirement (Permit Parts 2.3.1 and Permit Appendix I)

The permit includes a new requirement to conduct a pre-biological survey prior to the placement of a new outfall, planned movement or removal of an existing outfall, or the re-startup of an existing facility outfall where no discharge has occurred in the past 12 months. The purpose of the survey is two-fold. First, the survey must demonstrate that the proposed placement of the outfall will not result in the discharge occurring into “living substrate” (see Permit Part 1.4 – Excluded Areas). Second, the survey must record the occurrence and extent of persistent films, foam, scum or sheens (water quality criteria 18 AAC 70.020(b)), the presence and extent of any seafood waste deposits on the seafloor and/or the presence of any listed endangered or threatened species near the proposed outfall site. The permit does not require the operator to conduct a pre-biological seafloor survey for a facility’s approved in-transit vessel area(s) of operation disposal site(s).

3.11.3 Waste Treatment System

All wastewaters originating from Non-Remote seafood processing operations (including surimi / mince processing and by-product lines) are required to be treated by screening with fine mesh screens equal to1 millimeter (mm) X 1 mm or less, or other equivalent technology.

The permit requires that the screened seafood processing wastes not be pulverized, chopped, ground, or otherwise altered after the processing line, including as waste is move through or under the facility by pump systems. Grinding was not allowed prior to screening because it increases wastewater pollutant loading when fish carcasses are ground. It is analogous to removing slices of

apples from a glass of water, versus remove apple particles that have run through a blender with that same amount of water, separating all the pieces of apple from the a water becomes increasingly difficult.

3.11.4 System Installation and Inspection

The permit proposes Non-Remote (Permit Part 2.3.1) facility operators meet specific requirements applicable to all Non-Remote facilities, whether they are a butchering operation, surimi/ minced seafood production, or by-product facility. The Department has placed the applicable requirements at the beginning Non-Remote section to allow the operators to easily identify the permit requirements.

The permit requires the identification of all outfalls, types of waste and wastewater discharged from each outfall, as well as specific outfall terminus depth reporting. Permit compliance inspections have sometimes revealed multiple outfalls installed at a facility, but only one outfall identified on the NOI. In order to accurately model environmental impacts, the correct number and location of outfalls must be identified, along with the associated pollutant loading, flow and depth associated with each outfall.

Additionally, compliance actions have been taken for operators discharging ammonia (a refrigerant often used at seafood processing facilities), and also created during the natural decomposition of seafood into receiving waters without monitoring in order discharge to meet water quality standards, or providing information on NOI application. Requiring identification of all outfall lines, types of wastewater effluent being discharged and monitored, along with the development and implementation of a robust BMP Plan, should increase operator compliance with permit requirements and ultimately result in increased water quality protection.

The permit requires routine inspection of both the outfall and the waste discharge system. DEC experience in performing compliance inspections and sites visits has found that operational maintenance issues are often the cause of historical permit violations. Requiring daily and/or weekly inspections of facility waste treatment system lines and outfall lines, yearly and/or biannual inspections of the outfall line, along with the development and implementation of a robust BMP Plan should increase operator compliance with permit requirements.

3.11.5 New Permit Limits and Requirements

The 2016 AKG521000 permit includes the previously required AKG528000 monitoring for TSS, O&G. The Collins-Tenney test method is allowed for testing of Oil and Grease. EPA Method 1664 for Oil and Grease has been approved as an alternative test procedure for Region 10. Where sampling is required, unless otherwise noted, the operator shall use Department approved standard analytical methods found in 40 CFR Part 136 (most current version), adopted by reference at 18 AAC 83.010 (most current version) and those found in 18 AAC 70 that can analyze the sample parameters using a method detection limit (MDL) less than the effluent limit. The operator shall notify the Department the sample arrived outside hold times. As a new permit requirement, the AKG521000 permit has effluent limits and monitoring for BOD_5, for specific seafood production lines based existing limits established in the ELGs. A review of 40 CFR Part 408 revealed that BOD_5 effluent limits for new source facilities in Non-Remotes are codified in the ELGs, but were missing from the 1998 AKG528000 permit. It is unclear why the BOD_5 effluent limits were not included in the 1998 AKG528000 permit as the matter was not discussed in the fact sheet. The 2016

AKG521000 permit incorporates the 1998 AKG528000 new source performance effluent standards, along with the new BOD_5 limits and monitoring, for the production lines of Bottom Fish[1]-Mechanized Processing and Mechanized Clam Processing.

Next, a review of the Alaska Department of Fish and Game's Commercial Fisheries Geoduck (Clam) harvest data for 2001 - 2014 shows that the average harvest per diver is 9,500 pounds. The ELG applicable to Clams in 40 CFR 408.230-247 is applicable to processing 4,000 pounds per day. Thus, while one diver may not process that poundage of clams per day, a commercial processor may. The application of the 40 CFR 408.230-247 ELGs into the 2016 AKG521000 permit are new permit effluent limits and monitoring requirements.

A review of the Alaska Department of Fish and Game's Commercial Fisheries Herring harvest data for 2001-2012 shows the average harvest is 60 to 110 million pounds of herring per year. The 1998 AKG528000 permit did not include effluent limits for filleted herring processing, even though a significant amount of the product is processed in Alaska as evident based on review of the Fish and Game data. The inclusion of 40 CFR 408. 310-317 ELGs applicable to Alaska herring fillet are new permit effluent limits and monitoring requirements.

Additionally, Alaska has a substantial amount of herring-frozen whole as part of a subgroup of herring processing methods. This method of processing produces less TSS and O&G effluent loading than filleted herring processing, thereby more applicable effluent limits needed to be applied. In the 1998 AKG528000 permit, EPA applied BPJ with the use of 1mm fine mesh screening as the best available technology to treat the effluent generated from the processing of freezing whole herring. Processing herring frozen whole produces effluent loading similar to processing salmon. Therefore, the EPA applied the Salmon – Conventional / Hand Butchered ELGs (40 CFR 408.160-167) as end of pipe effluent limits for facilities processing herring-frozen whole.

A new permit requirement (Permit Part 2.3.1.8.2) requires operators to identify on their DMRs the applicable effluent limits during each reporting period based on the type of seafood or the commodity mix that was processed during the reporting period and whether the facility is a new or existing facility. Operators must show calculations of effluent limits that reflect the commodity mix when more than one type of seafood has been processed concurrently.

Table 10 (Permit Table 11) summarizes the waste stream effluent limits for an existing Non-Remote facility, which is defined as constructed prior to December 1, 1975. Table 11 (Permit Table 12) summarizes the waste stream effluent limits for a new Non-Remote facility, which is defined as a facility constructed after December 1, 1975. Designated Non-Remote locations are defined in 40 CFR 408. Table 12 (Permit Table 13) summarizes the monitoring schedule requirements for Non-Remote facilities.

[1] The 1998 AKG528000 permit mechanized bottom fish limits where established based on the BPJ application of 40 CFR Part 408, 'Subpart U—Non-Alaskan Conventional Bottom Fish Processing Subcategory', instead of Subpart T – Alaskan Bottom Fish. This was due to the type of fish and treatment system applicable to the processing of pollock, the predominant processed bottom fish species, which more closely resembles the ELGs for the non-Alaskan bottom fish than the Subpart T ELGs, which apply to predominately halibut processing only.

Table 10: Non-Remote Location Existing Source/Facility Butchering Effluent Limits (Permit Table 11)

Seafood Processing Subcategory	AKG52100 0Permit Part	Total Suspended Solids (TSS) (lbs discharged/1000 lbs raw seafood)		Oil and Grease (O&G) (lbs/1000 lbs seafood)		BOD_5 (lbs/1000 lbs seafood)		Rationale (40 CFR Part) BPT/BCT
		30 Day Avg	Daily Max	30 Day Avg	Daily Max	30 Day Avg	Daily Max	
Crab Meat	2.3.2	6.2	19	0.61	1.8	report	report	408.42/408.47
Whole Crab and Crab Section	2.3.2	3.9	12	0.42	1.3	report	report	408.62/408.67
Shrimp	2.3.2	210	320	17	51	report	report	408.92/408.97
Hand-Butchered Salmon	2.3.2	1.6	2.6	0.19	0.31	report	report	408.162/408.167
Mechanized Salmon	2.3.2	26	44	11	29	report	report	408.172/408.177
Bottom Fish (Conventional/Hand Butchered)	2.3.2	1.9	3.1	0.56	4.3	report	report	408.202/408.207
Bottom Fish – Mechanized Processing	2.3.2	12	22	3.9	9.9	report	report	Existing AKG528000 BPJ determination using 408.222
Scallops	2.3.2	1.4	6.0	0.24	7.7	report	report	408.292/708.297
Herring – Frozen Whole	2.3.2	1.6	2.6	0.19	0.31	report	report	Application of 408.162/408.167 Undocumented basis in AKG528000
Herring Fillet Processing	2.3.2	24	32	10	27	report	report	408.312/408.317
Hand Shucked Clam[b]	2.3.2	18	59	0.23	0.60	report	report	408.232/408.237
Mechanized Clam Processing	2.3.2	15	90	0.97	4.2	report	report	408.242/408.247

Notes:

a. Bottom fish include flounder (e.g., arrowtooth), rockfish/red snapper, pacific cod, halibut, pollock, black cod/sablefish, grey cod, flatfish/sole, and whitefish

b. Discharges resulting from existing hand-shucked clam processing facilities which process more than 1816 kg (4000 lbs) of raw material per day on any day during a calendar year and all new sources

c. If 50% or more of the weight of the solid wastes are generated from the use of one or more automated or mechanized method, then select the mechanized limitations for reporting.

The limitations in 40 CFR Part 408.207 for Alaskan Bottom Fish was based on halibut being the dominant bottom fish species. With the introduction of a multitude of other bottom fish being processed, such as cod, pollock, flounder (arrowtooth), rockfish/red snapper, black cod/sable fish, flatfish/sole, and other whitefish species, the limitations based on halibut did not adequately reflect the current processing. The bottom fish species are usually brought to the plant whole, where processing the fish involves more extensive butchering and mechanization; therefore, it has been determined that Non-Alaskan Mechanized Bottom Fish Processing Effluent Guidelines [40 CFR Part 408.222] more accurately reflect current processing operations for bottom fish.

Table 11: Non-Remote Location New Source/Facility Butchering Effluent Limits (Permit Table 12)

Seafood Processing Subcategory	Permit Part	Total Suspended Solids (TSS) (lbs discharged/1000 lbs raw seafood)		Oil and Grease (O&G) (lbs/1000 lbs seafood)		BOD_5		Rationale (40 CFR Part) NSPS
		30 Day Avg	Daily Max	30 Day Avg	Daily Max	30 Day Avg	Daily Max	
Crab Meat	2.3.2	5.3	16	0.52	1.6	report	report	408.45
Whole Crab and Crab Section	2.3.2	3.3	9.9	0.36	1.1	report	report	408.625
Shrimp	2.3.2	180	270	15	45	report	report	408.95
Hand-Butchered Salmon	2.3.2	1.4	2.3	0.17	0.28	report	report	408.165
Mechanized Salmon	2.3.2	25	42	10	28	report	report	408.175
Bottom Fish (Conventional/Hand Butchered)	2.3.2	1.1	1.9	0.34	2.6	report	report	408.205
Mechanized Bottom Fish	2.3.2	2.9	5.3	0.47	1.2	7.5	13	408.225
Scallops	2.3.2	1.4	5.7	0.23	7.3	report	report	408.295
Herring – Frozen Whole	2.3.2	1.6	2.6	0.19	0.31	report	report	408.162
Herring Fillet Processing	2.3.2	18	23	7.3	20	report	report	408.315
Hand Shucked Clam[b]	2.3.2	17	55	0.21	0.56	report	report	408.235
Mechanized[c] Clam Processing	2.3.2	4.4	26	0.092	0.40	5.7	15	408.245

Notes:

a. Bottom fish include flounder (e.g., arrowtooth), rockfish/red snapper, pacific cod, halibut, pollock, black cod/sablefish, grey cod, flatfish/sole, and whitefish.

b. Discharges resulting from existing hand-shucked clam processing facilities which process more than 1816 kg (4000 lbs) of raw material per day on any day during a calendar year.

c. If 50% or more of the weight of the solid wastes are generated from the use of one or more automated or mechanized method, then select the mechanized limitations for reporting.

Table 12: Non-Remote Onshore New and Existing Sources Effluent Monitoring Requirements (Permit Table 13)

Effluent Parameter	Units	Effluent Result	Sample Frequency	Sample Type
Flow - Daily Discharge for internal outfall on day sampled	mgd	report	daily	measured/estimated
Incoming Flow	mgd	report	daily/monthly	measured/estimated
Flow – Daily Discharge end-of-pipe total on day sampled	mgd	report	daily	measured/estimated
Flow – Average Monthly Discharge	mgd	report	monthly	calculated
Raw Product Processed [a]	pounds	report	daily	calculated for each species
Number of Days Processing [b]	days	report	daily, then monthly	measured
Waste Solids Generated	pounds	report	total each week	measured
Report amount & how (inland waters, land fill, etc.) screened wastes are disposed of	pounds	report	daily	measured
BOD_5	mg/L	report	weekly	8-hr composite [e]
	lbs/1000 lbs [c, d]	report		
TSS	mg/L	report	weekly	8-hr composite [e]
	lbs/1000 lbs [c, d]	report		
Oil & Grease	mg/L	report	weekly	grab
	lbs/1000 lbs [c, d]	report		
Settleable solids	mL/L	report	weekly	8-hr composite [e]
Chlorine	µg/l	report	weekly	grab
Total Ammonia [f]	mg-N/L	report	weekly	grab
pH [f]	SU	report	weekly	grab
Temperature [f]	° C	report	weekly	grab
System Inspection Requirements	n/a	report	daily	record of condition

Notes:

a. The operator shall report the amount in pounds of production of each type of seafood produced (crab meat, whole crab or crab sections, salmon by conventional/hand, salmon by mechanized processing, bottom fish, herring fillet processing, herring frozen whole, or scallops).

b. Daily reporting is required, identifying amounts and each type of seafood processed.

c. Calculations to determine pounds of pollutant discharged per 1,000 pounds of seafood processed, as well as calculations necessary to determine compliance with the effluent limitations of Table 10 (Permit Table 11) or Table 11 (Permit Table 12), are shown in Permit Appendix E of this permit. On DMRs, operators shall identify which effluent limitations are applicable based on the amount processed, the type of seafood or the commodity mix that was processed during the reporting period.

d. The operator shall report the pounds TSS and O&G / 1,000 pounds seafood processed on the day of monitoring, as well as the monthly average concentration (in accordance with Permit Appendix E).

e. A grab sample may be collected instead of an 8-hour composite sample during periods of intermittent processing where processing alternately ceases and begins again in less than eight hours. If a grab sample is taken it shall be taken midway during discharge.

f. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.

3.12 Non-Remote Surimi and Minced Seafood Processing. (Permit Part 2.3.3)

3.12.1 See Section 4.7.1 for an explanation of surimi / minced seafood processing waste discharges occurring at Non-Remote Facilities as this narrative of pollutant content in the effluent is the same for both Remote and Non-Remote Facilities.

3.12.2 Establishing Effluent Limits and Monitoring for Surimi / Minced Seafood Non-Remote Facilities

As previously discussed, EPA has not promulgated ELGs for applicable to surimi, or either washed or unwashed minced seafood products. Therefore, EPA had to considered relevant and technical factors when developing the BPJ for the Non-Remote case-by-case TBELs during development of the 1998 AKG528000 permit (See the 1998 AKG528000 General Permit Fact Sheet - Section 6.2.3 of the), applicable to the seafood wastewater discharge consisting of a combined butchering waste stream and surimi processing waste stream.

To establish the effluent limits for Non-Remote facility's combined butchering and surimi processing waste streams, EPA exercised BPJ and applied the Alaskan applicable ELGs established in 40 CFR Part 408, as well as the broader application of the non-Alaskan bottom fish ELGs in 40 CFR 408.222-225 to the combined waste stream of butchering and surimi processing waste discharges. As discussed in Fact Sheet Part 3.7.1, pollock are one type of bottom fish used to make surimi which EPA used BPJ TBELs by applying Non-Alaskan Mechanized Bottom Fish Processing Effluent Guidelines [40 CFR 408.222] to more accurately reflect current processing operations for bottom fish." Since salmon is also being used to make washed and unwashed minced seafood product, the permit proposes end-of-pipe effluent limits in compliance with the Alaska Mechanized Salmon ELG [40 CFR 408.175].

The Department has evaluated the original BPJ TBELs developed by EPA in relation to age of equipment and current engineering aspects of control techniques, as well as other pertinent considerations. The Department determined that the 1998 AKG528000 TBELs end-of pipe limits established for butchering and processing lines, including the processing of surimi and its wastewater discharges, continue to be applicable to Non-Remote surimi / minced seafood processing discharges covered by the 2016 AKG521000 permit. Non-Remote seafood processing facilities that incorporate surimi, unwashed mince or washed mince production lines or by-product production lines (human, pet food or other surimi/mince seafood types of use) are required to meet applicable effluent limits (Permit Table 12).

3.12.3 Treatment Technology Development and Compliance

A Non-Remote facility operator discharging surimi effluent is required through BPJ to implement 1mm x 1mm fine mesh screening technologies (Permit Part 2.3.1) in order to meet end-of-pipe limits (Permit Table 12). The facility operator may choose a number of treatment approaches to comply with the permit limits. Please see Fact Sheet Part 3.11 as the Treatment Technology Development and Compliance Section applicable to all Non-Remote Facilities and production lines.

3.12.4 Allowing Facility Surimi / Minced Seafood Effluent Discharge

The production of a surimi / minced seafood product increases TSS, O&G and BOD_5 loading in receiving waters if not properly treated. Establishing limits for remote facilities processing surimi / minced seafood is required to control TSS, O&G and BOD_5 associated with this type of production line. The effluent limits and monitoring are continued from the AKG528000 permit requirements.

3.12.4.1 The surimi / minced seafood product's wastewater, and/or surimi / minced seafood by-product wastewater line shall be monitored at two sampling locations (internal and end-of-pipe) within the facility:

The permit proposes to continue the AKG528000 internal outfall sampling site to monitor the effluent pollutant loading from Non-Remote facility's surimi / minced seafood product lines or by-products (see Permit Part 2.3.3.5 and Table 13). Internal outfall samples of surimi / minced seafood effluent shall be collected as 2 – aliquots (one mid-cycle and one at the end of the processing cycle) during the surimi/ minced seafood waste stream discharge.

3.12.4.1.1 Sampling required at internal outfall location, shall be performed on the sampling schedule set out in Table 13 (Permit Table 14) prior to commingling any with other wastewater discharge stream(s) to determine surimi / minced seafood production effluent TSS, O&G, and BOD_5 loading. The mass of TSS, O&G and BOD_5 found at the internal outfall sampling shall not be subtracted from the mass of TSS, O&G and BOD_5 in the final facility effluent discharge sample results found from sampling required in Permit Part 2.3.3.7.2.

3.12.4.1.2 The internal sample shall be collected as single production cycle as a composite sample. Or the sampling period shall be set as the first required aliquot for the internal outfall grab samples (Table 13) shall be collected from the waste stream during discharge of the first-half of the surimi / mince washing cycle(s). The second required aliquot for the internal outfall grab samples (Table 13) shall be collected during that same surimi process cycle, on the same day, during the waste stream discharge of the surimi / minced seafood's last wash cycle(s) and dewatering.

3.12.4.1.3 If the minced seafood is not washed, then the internal outfall waste stream sampling shall be collected as an 8-hour composite (or less if the processing cycle is less) prior to commingling.

The permit proposes to continue the AKG528000 end-of-pipe compliance point with the effluent limits established for a combined waste stream. The AKG521000 permit requires the operator to monitor the effluent pollutant such that:

3.12.4.1.4 Sampling period for end-of-pipe monitoring as established in Table 13, shall be collected on the same day as samples taken under Permit Part 2.3.3.8.2 while surimi / minced seafood effluent is being discharged to the waters of the U.S. Results for TSS, O&G and BOD_5 shall be reported separately on the DMR from the internal outfall sample results. Sampling for compliance with combined waste stream effluent limits found in Table 11 shall occur at the last point prior to discharge to waters of the U.S. Depending on the facility design, the effluent limits of Table 11 shall apply at the end of pipe, prior to discharge, whether discharged out a commingled wastewater outfall/port or discharged directly to waters of the U.S.

3.12.4.1.5 If wastewater is not produced during the surimi or minced seafood production or surimi / minced seafood by-product production, effluent sampling under this part is not required.

The 2016 AKG521000 permit includes requirements to monitor the effluent for temperature, pH and total ammonia during the discharge of surimi wastewater. For more information regarding ammonia toxicity and sampling see Fact Sheet Part 3.14

REPEATED FOR EASIER REFERENCE Table 11: Non-Remote Location End-of-Pipe Effluent Limits (Permit Table 12)

Seafood Processing Subcategory	Permit Part	Total Suspended Solids (TSS) (lbs discharged/1000 lbs raw seafood)		Oil and Grease (O&G) (lbs/1000 lbs seafood)		BOD_5		Rationale (40 CFR Part) NSPS
		30 Day Avg	Daily Max	30 Day Avg	Daily Max	30 Day Avg	Daily Max	
Crab Meat	2.3.2	5.3	16	0.52	1.6	report	report	408.45
Whole Crab and Crab Section	2.3.2	3.3	9.9	0.36	1.1	report	report	408.625
Shrimp	2.3.2	180	270	15	45	report	report	408.95
Hand-Butchered Salmon	2.3.2	1.4	2.3	0.17	0.28	report	report	408.165
Mechanized Salmon	2.3.2	25	42	10	28	report	report	408.175
Bottom Fish (Conventional/Hand Butchered)	2.3.2	1.1	1.9	0.34	2.6	report	report	408.205
Mechanized Bottom Fish	2.3.2	2.9	5.3	0.47	1.2	7.5	13	408.225
Scallops	2.3.2	1.4	5.7	0.23	7.3	report	report	408.295
Herring – Frozen Whole	2.3.2	1.6	2.6	0.19	0.31	report	report	408.162
Herring Fillet Processing	2.3.2	18	23	7.3	20	report	report	408.315
Hand Shucked Clam[b]	2.3.2	17	55	0.21	0.56	report	report	408.235
Mechanized[c] Clam Processing	2.3.2	4.4	26	0.092	0.40	5.7	15	408.245

Notes:

a. Bottom fish include flounder (e.g., arrowtooth), rockfish/red snapper, pacific cod, halibut, pollock, black cod/sablefish, grey cod, flatfish/sole, and whitefish

b. Discharges resulting from existing hand-shucked clam processing facilities which process more than 1816 kg (4000 lbs) of raw material per day on any day during a calendar year

c. If 50% or more of the weight of the solid wastes are generated from the use of one or more automated or mechanized method, then select the mechanized limitations for reporting.

Table 13: Non-Remote Location Surimi / Minced Seafood Effluent Monitoring Requirements (Permit Table 14)

Effluent Parameter	Units	Effluent Result	Sampling Frequency Internal and End of Pipe	Sample Type
Flow - Daily Discharge for internal outfall on day sampled	mgd	report	daily	measured/estimated
Incoming Flow	mgd	report	daily/monthly	measured/estimated
Flow – Daily Discharge end-of-pipe total on day sampled	mgd	report	daily	measured/estimated
Flow – Average Monthly Discharge	mgd	report	monthly	calculated
Raw Product Sent to Surimi / Mince Line [a]	lbs	report	Each single surimi process cycle, then total monthly	measured, calculated for each species
Number of Days Processing [b]	days	report	monthly	measured
Amount of Surimi / Mince Produced	lbs	report	Each single surimi process cycle, then total monthly	measured
BOD_5 [c]	mg/L lbs/1000 lbs [c, d]	report	weekly, Internal and End of Pipe	Internal = Composite or Grab, End-of-pipe = Composite
TSS [c]	mg/L lbs/1000 lbs [c, d]	report	weekly, Internal and End of Pipe	Internal = Composite or Grab, End-of-pipe = Composite
Oil & Grease [c]	mg/L lbs/1000 lbs [c, d]	report	weekly, Internal and End of Pipe	Internal =Grab, End-of-pipe = Grab
Settleable solids	mL/L	report	weekly	8-hr composite [d]
Chlorine	µg/l	report	weekly	grab
Total Ammonia [f]	mg-N/L	report	weekly	grab
pH [f]	SU	report	weekly	grab
Temperature [f]	° C	report	weekly	grab

Notes:

a. The operator shall report the amount in pounds of production of each type of seafood sent to the surimi / minced seafood production line (crab, salmon by conventional/hand butchering processes, salmon by mechanized processing, bottom fish, etc.).

b. The operator shall report the number of days in the calendar month on which each type of surimi / minced seafood processing occurred.

c. Operators shall report the daily and monthly pounds (lbs) BOD5, TSS, and O&G / 1,000 lbs seafood processed for each calendar month.

d. Calculations to determine lbs of pollutant discharge per 1,000 lbs of seafood processed are shown in Permit Appendix E.

e. One grab sample shall be taken during discharge of 1st half of wash cycles, the 2nd grab sample shall be taken during surimi discharge, at the end of the wash cycles.

f. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.

3.13 Non-Remote Fish Meal, Fish Powder, Fish Oil, Fish Hydrolysate and Other By-products (Permit Part 2.3.4)

The proposed permit contains effluent limits based the AKG528000 permits developed on case-by-case basis using BPJ applied to Fish Meal and Fish Powder. During the development of the draft 1998 AKG528000 permit and response to comments, EPA found that ELGs had not been developed for Alaskan (or other) Fish Powder processing in 40 CFR Part 408. The AKG528000 permit effluent limits for the Fish Powder processing discharge stream came from the application of BPJ utilizing the ELGs for Fish Meal Processing Subcategory, 40 CFR Part 408.155 standards of performance for new sources. These TBELs are based upon the performance of specific technologies, but do not require the use of any specific technology. The facility can then choose its own approach to comply with permit limitations. In developing BPT-based TBELs, EPA considered the total cost of applying the technologies in relation to the effluent reduction benefits achieved from the technologies; the size and age of equipment and facilities; the processes used; the engineering aspects of applying various types of control techniques; process changes; and non-water quality environmental impacts, including energy.

EPA made a determination in the issuance of the final AKG528000 permit in the Federal Register Vol. 63, No. 61 / Tuesday, March 31, 1998 / pg 15404:

> "Requirements for fish powder in the draft permit were less stringent than is usually required of fish meal production so EPA determined that the production of fish powder and the production of fish meal are essentially the same and has applied the effluent limitation guidelines for fish meal to the two facilities operating fish meal/powder plants, thereby allowing Kodiak Fishmeal Company to be covered by the Kodiak general permit. The draft permit fact sheet had contained the following language, 'The operation of a fish powder processing plant is being done by one facility and is significantly different than the fish meal production done in other facilities where the effluent guidelines [40 CFR Part 408.155] have been applied. EPA does not have the data to support a determination of appropriate technology-based limits for fish powder processing at this time."

This determination lead EPA to limiting fish powder production with the same effluent limits as those that were being applied to fish meal production.

In the AKG528000 Fact Sheet in the Fish Meal Processing Subcategory, notes that 40 CFR Subparts 408.150-157 were the ELGs applied, the introductory applicability section of the regulation reads:

> "The provisions of this subparts are applicable to discharges resulting from the processing of menhaden on the Gulf and Atlantic Coasts and the processing of anchovy on the West Coast into fish meal, oil and solubles."

EPA then applied the BPJ Fish Meal ELGs to the discharge Fish Powder by-product effluent. The Department has reevaluated these BPJ limits to ensure ongoing applicability. EPA considered relevant factors (e.g., age of the equipment, engineering aspects, etc.) when developing TBELs using BPJ during development of the AKG528000 permit. The Department has evaluated the original BPJ TBELs developed by EPA in relation to age of equipment and current engineering aspects of control techniques, as well as other pertinent considerations.

The permit proposes continue to apply these Fish Meal and Fish Powder AKG528000 BPJ TBEL permit limits and proposes to apply the effluent limits applicable to the Fish Meal, Fish Powder (Permit Table 13) to Fish Oil, Fish Hydrolysate discharges as well (see Table 14) . The application of these effluent limits to fish oil, fish hydrolysate discharges are referenced in 40 CFR Subparts

408.150-157, by the regulatory reference in code to fish oils and solubles. Since the rule making process of the 1974 ELGs, many new wastewater treatment process improvements and technologies have been developed. Applicable wastewater treatment technologies that could be utilized for fish meal, fish powder, fish oil, fish hydrolysate and other by-products (by-products) includes multi-sequence batch reactors (SBRs), membrane bioreactors (MBRs), nano and ultra-filtration processes. Through careful oil and grease capture, and use of the treatment technologies discussed, and use of upstream by-product recovery techniques, the ELGs for wastewater treatment can be met while also improving by-product production levels and increasing economic gains.

The 2016 AKG521000 permit adds new internal outfall monitoring requirements for effluent temperature, pH and total ammonia during the discharge by-product wastewaters. Water quality pollutants of concern are the same as that of other processed seafood, except for the possible increased pH, increased ammonia content and/or increased temperature. For more information regarding ammonia toxicity and sampling see Fact Sheet Part 3.14.

The AKG528000 – Section 3.3.7 permit specific internal-outfall-monitoring requirements for stickwater are retained in the AKG521000 permit, and the effluent limits found in Table 14 are applied prior to commingling with other waste streams. If stickwater is discharge directly to waters of the U.S., sampling must be performed when stickwater is being discharged.

As found in, Permit Part 2.3.4 the effluent limitations for the fish meal, fish powder, fish oil, fish hydrolysate waste streams (including any produced stickwater discharges) are being applied if these waste streams are proposed to be discharged directly to the receiving water. The permit requires monitoring the effluent while stickwater is being discharged. The end-of-pipe limitations for the fish meal, fish powder, fish oil, fish hydrolysate waste stream, may become more stringent than in the previous permit, depending on a facilities previous sampling plan, or stickwater disposal mechanisms. The permit requires stickwater to be recycled in an environmentally safe manner whenever feasible. Permit Part 2.11 requires development of BMPs applicable to stickwater.

Permit Part 2.3.4. and Table 14 (Permit Table 15) establish Non-Remote by-product facility effluent limits and Table 15 (Permit Table 16) establishes monitoring schedule by-product effluent discharges. Sampling shall occur before such waste streams are commingled with other wastewaters. Since fish meal, fish powder, fish oil, fish hydrolysate and other by-product production typically occur after filleting, if waste streams are commingled, the sample results of mass of TSS and O&G obtained from sampling the internal outfall (Permit Part 2.3.4.10) shall not be subtracted from the mass of TSS and O&G in the total plant discharge effluent sample before compliance with effluent limitations for butchering waste streams (Permit Part 2.3.2 and Tables 15 or 16) is determined.

It is unclear to DEC why the subtraction of the loading of the by-product waste stream was allowed in the 1998 AKG528000 permit (see AKG528000 – Section 3.3.5). The Department assumes that during the issuance of the 1998 AKG528000 permit, the by-product would have been viewed as follows: fish are brought into the plant, headed, gutted and filleted, and the rest of the carcass is sent to an onsite by-product production line. Following this approach, the loading from a by-product recovery line would then be thought of as additional material being “removed” from the filleted carcass waste loading totals, perhaps thought to decrease loading of the waste stream (thereby allowing its loading subtraction) because it was perceived less of the fish was being sent out the outfall line. The fish processors in Kodiak do not actually have their own, individual on-site by-product facility. Each independently owned facility has a seafood processing butchering lines, possibly integrate surimi / mince processing. Then, after screening their seafood processing waste, ship (i.e. truck) the waste to a completely separate, independent facility (Kodiak Fishmeal

Company). Thus, the AKG521000 end-of-pipe limits (Table 14) being applied is the same limits established in the AKG528000 Non-Remote facilities

Table 14: Non-Remote Fish Meal, Fish Powder, Fish Oil, Fish Hydrolysate and Other By-products Effluent Limits Requirements (Permit Table 15)

Effluent Parameter	Units	Monthly Average Limit	Daily Maximum Limit	Daily Minimum Limit
BOD_5 [a]	mg/L	3.8 [a]	6.7 [a]	-----
	lbs/1000 lbs			-----
TSS [a]	mg/L	1.5 [a]	3.7 [a]	-----
	lbs/1000 lbs			-----
Oil and Grease	mg/L	0.76 [a]	1.4 [a]	-----
	lbs/1000 lbs			-----
Total ammonia [b]	mg-N/L	report	Note c	-----
pH [b]	SU	------	8.5	6.5
Temperature [b]	° C	report	-----	-----

Notes:

a. Example calculations for pounds of pollutant discharge per 1,000 pounds of seafood processed can be found in Permit Appendix E.
b. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.

Table 15: Non-remote Monitoring Requirements for Fish Meal, Fish Powder, Fish Oil, Fish Hydrolysate and Other By-product Waste and Effluent Streams (Permit Table 16)

Effluent Parameter	Units	Effluent Results	Sample Frequency	Sample Type
Flow - Daily Discharge for internal outfall on day sampled	mgd	report	daily	measured/estimated
Incoming Flow	mgd	report	daily/monthly	measured/estimated
Flow – Daily Discharge end-of-pipe total on day sampled	mgd	report	daily	measured/estimate[d]
Flow – Average Monthly Discharge	mgd	report	monthly	calculated
Number of Days Processing [a]	days	report	daily/monthly	measured
Amount of seafood sent to, or brought to By-product line(s)	lbs [b]	report	daily	measured
	%			
Amount by-product produced, per line	lbs	report	daily	measured
Report amount & how (inland waters, land fill, etc.) screened wastes are disposed of, if any	lbs	report	daily, total each week	measured
BOD_5	mg/L	report	weekly	8-hr composite [d]
	lbs/1,000 lbs [c, d]	report	weekly	calculated [b, d]
TSS	mg/L	report	weekly	8-hr composite [d]
	lbs/1,000 lbs [c, d]	report	weekly [c]	calculated [d]
Oil & Grease	mg/L	report	weekly	grab
	lbs/1,000 lbs [c, d]	report	weekly [c]	calculated [d]
Chlorine	µg/l	report	weekly	grab
pH [f]	SU	report	weekly	grab
Temperature [f]	° C	report	weekly	grab
Total Ammonia [f]	mg-N/L	report	weekly	grab

Notes:

a. The operator shall report the number of days in the calendar month on which each type of by-product production occurred.

b. The operator shall report the amount in pounds of production of seafood sent to each by-product line

c. Calculations to determine pounds of pollutant discharge per 1,000 pounds of seafood processed are shown in Permit **(**Appendix E - This calculation shall be based on pounds of seafood sent to the by-product line, which may be after filleting, heading, etc. or may include whole fish weight depending on by-product line.

d. A grab sample may be collected instead of an 8-hour composite sample during periods of intermittent processing where processing alternately ceases and begins again in less than eight hours. If a grab sample is taken it shall be taken midway during the processing.

e. Operators shall report the pounds BOD5, TSS, and O&G / 1,000 pounds seafood processed on the day of monitoring, as well as the monthly average concentration **(**Appendix E) for each calendar month.

f. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.

3.14 "Other Wastewaters" (Permit Part 2.4)

The 2001 AKG520000 permit authorized the discharge of "other wastewaters" and "wash-down water", but it did not limit or require the operator to monitor these outfalls to determine types of pollutants were being discharged.

Based on experience implementing the 2001 AKG520000 and AKG528000 permits, DEC found operators often made changes to seafood processing line configurations, which caused the plumbing connections to be switched. Drain pipes would be cutoff, reconnected, rerouted or were often were left uncapped in or under processing plants. These discharges were often from seafood processing plant floor clean up drains, loading and unloading areas, and containers where seafood and fish transfer and processing waters drains lead to outfalls discharging to waters of the U.S. Neither the 2001 AKG520000, nor the AKG528000 permit required the operators to identify all outfalls in the NOI. This led to multiple, separate, small outfalls being located under the docks and in facilities as processing lines connections were changed. When inquiring, operators often could not trace the waste streams leading to these "other wastewater" outfall discharges.

In the 2001 AKG520000 permit Sections (V)(A, B & C)(1)(h), DEC found that many operators were confused about their obligation to follow permit requirement:

> "Wastewaters that have not had contact with seafood are not required to be discharged through the seafood process waste-handling system."

This led to multiple, separate, small outfalls being located under the docks and under facilities where cross-connected process wastewaters were sometimes discharged directly to the receiving water and not passing through a treatment system. These discharges were often from seafood processing plant floor clean up drains, loading and unloading areas, and containers where seafood and fish transfer and processing waters drains that lead to outfalls.

Monitoring these discharges and requiring BMPs to be written and implemented to control these documented waste streams is a new permit requirement. If an operator is planning on discharging toxic (ammonia, chlorine) and other deleterious organic or inorganic discharges through "other wastewater" outfalls, the facility's BMP Plan shall discuss where in the facility the chemicals or pollutants are found, and facility processes that contribute to pollutant loading. Additionally, the BMP Plan shall discuss which waste streams the chemicals can be found in, the standard operating procedures for how these chemicals are handled, how discharges (e.g., ammonia and chlorine) will be controlled to meet WQS. Note, the permit does not authorize the discharge of spills or other non-monitored, uncontrolled releases.

Ammonia Toxicity of ammonia is temperature and pH dependent in freshwater systems, while the toxicity of ammonia is temperature, pH, alkalinity and salinity dependent in marine systems. Historically, receiving water alkalinity sampling has not been requested. For accurate modeling of ammonia in marine systems, the receiving water alkalinity must be known as the receiving water alkalinity affects the disassociation and therefore the ionization rate of nitrification (total ammonia transitioning to nitrate or nitrites). Therefore, the proposed permit requires the operator to determine average seasonal data for the receiving water temperature, pH, salinity and alkalinity for marine discharges, Permit Part 2.7.5.9. For any required effluent total ammonia sampling, the AKG521000 permit requires the operator to collect samples and analyze effluent for ammonia, temperature and pH from the same grab sample. Additionally, Permit Part 2.7.5.9 requires the operator to perform receiving water sampling and analyze for temperature and pH in fresh water systems. If the average seasonal receiving water quality parameters of temperature, pH, salinity and alkalinity have already been determined from monitoring previously performed by the operator, then the effluent only needs to be analyzed for ammonia, temperature and pH.

Other wastewaters includes noncontact cooling water, retort and boiler water, freshwater pressure relief water, refrigeration condensate, water used to transfer seafood to the facility, live tank water, refrigerated seawater, and clean-up water are proposed for permit coverage. The monitoring requirements found in Permit Table 17 are new permit requirements. The permit proposes to require operators to monitor separate outfalls. If "other wastewaters" represents more than 20% of the total discharge volume out of the main seafood discharge outfall, then the operator shall monitor for temperature and total ammonia prior to commingling. This information is being collected for future potential permit limit development and for potential future mixing zone modeling efforts. The wastewaters listed in this paragraph with the exception of non-contact cooling, retort water and transfer water, have not normally been found to occur in significant amounts and are largely unlikely to impact water quality. The fish old and transfer water may create foam and scum on the surface of the receiving water and increased ammonia concentrations. Remote operators are required to sample "other wastewater" outfalls monthly. Non-Remote operators are required to sample "other wastewater" outfalls weekly. The discharge of non-contact cooling water, retort water, boiler water may have the potential to affect the temperature of the receiving water as well.

Table 16: Other Wastewater Outfalls Monitoring Requirements (Permit Table 17)

Effluent Parameter	Units	Sample Results	Frequency	Sample Type
Flow / Discharge Rate	mgd [a]	report	weekly	measured or estimated
pH [c]	SU	report	monthly	grab
Temperature [c]	° C	report	monthly	grab
Total ammonia [c]	mg-N/L	report	monthly	grab

Notes:

a. mgd = million gallons per day

b. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.

3.15 Storm Water Discharge Requirements for Seafood Processing Facilities (Remote and Non-Remote) (Permit Part 2.5)

Non-commingled industrial storm water discharge coverage is available under the APDES Multi-Sector General Permit (MSGP). The 2015 APDES MSGP contains provisions that require industrial facilities in 29 different industrial sectors to implement control measures and develop site-specific storm water pollution prevention plans (SWPPP) to comply with APDES requirements. APDES MSGP Part 1.2.1. To be eligible to discharge, a permittee shall have a storm water discharge associated with an identified primary industrial activity. The MSGP defines 'Primary Industrial Activity' as including any activities performed on-site, which are identified by a list of primary SIC codes. APDES MSGP lists 'SECTOR U: FOOD AND KINDRED PRODUCTS – U3' with SIC codes as 2091-2099 Miscellaneous Food Preparations and Kindred Products. Seafood Processing falls under Section U3 SIC codes (Frozen, Fresh or Canned).

Seafood processing facility operators discharging non-commingled storm water need to determine if additional coverage is needed under the 2015 APDES MSGP. The permit proposed the operator identify if the operator has MSGP coverage or has certified No Exposure Certificates.

The MSGP specifically states that industrial (seafood processing) discharges (non-storm water) that are mixed with storm water are not covered.

> MSGP Permit Part 1.2.4.1 Discharges Mixed with Non-Storm Water. Storm water discharges that are mixed with non-storm water, other than those non-storm water discharges listed in Part 1.2.3 (*Allowable Non-Storm Water Discharge)*, are not eligible for coverage under this permit.

Thus, the 2016 AKG521000 permit proposes coverage for storm water discharges commingled with seafood processing wastewater or domestic wastewater.

Section 402(p) of the CWA provides the basis for regulating storm water from certain categories of industry described in 40 CFR 122.26(b)(14). The permit proposes specific storm water requirements for seafood processing facilities that commingle their storm water with seafood wastewater and/or domestic wastewater to ensure that those seeking coverage under the permit select, install, implement, and maintain control measures at their industrial site that will be adequate and sufficient to meet WQS. Based on EPA's *1996 Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits (EPA 833-D-96-001)*, DEC determined that control measures when properly selected, installed, implemented, and maintained provide effluent quality that can meet WQS. However, because proper selection, installation, implementation, and maintenance are so critical to the success of control measures, the effectiveness of simply "installing control measures" at seafood processing sites may not provide adequate water quality protection. Unless notified otherwise by DEC, compliance with the storm water permit requirement will be assumed to be as stringent as necessary to ensure that discharges do not cause or contribute to an excursion above any applicable WQS.

DEC has identified five types of activities at seafood processing facilities that have the potential to be major sources of pollutants in storm water. These activities should be developed in the operators SWPPP.

- **Loading and Unloading Operations.** Loading and unloading operations can include pumping of seafood / fish from the vessel (catch transfer water) to the interior of the seafood processing facility, transfer by mechanical conveyor systems, or transfer of totes containing fish and ice, or other containers by forklift, davit, crane or other material handling equipment. Material spills or losses in these areas can accumulate and be washed away during a storm.

- **Outdoor Storage.** Outdoor storage activities include storage of fuels, raw materials, by-products, intermediate products, final products, and process residuals. Materials may be stored in containers, on platforms or pads, in bins. Storage areas that are exposed to rainfall and/or runoff can contribute pollutants to storm water when solid materials wash off or materials dissolve into solution.
- **Outdoor Process Activities.** Although many seafood processing activities are performed indoors, some activities, such as seafood / fish sorting and grading occurs outdoors. Outdoor seafood processing activities can result in liquid spillage and losses of material solids, which makes associated pollutants available for discharge in runoff.
- **Illicit Connections and Non-Storm Water Discharges.** Illicit connections of process wastes or other pollutants to storm water collection systems can be a significant source of storm water pollution. More discussion on "other wastewater" connections can be found in FS Part 1.1. These piping cross-connections in seafood processing facilities may lead facilities to be unable to quality for coverage under the 2015 MSGP. Non-storm water discharges include any discharge from the facility that is not generated by rainfall/snowfall runoff (for example, wash water from industrial processes).
- **Waste Management.** Waste management practices include everything from landfills to waste piles to trash containment. All seafood processing facilities conduct some type of waste management at their site, much of it outdoors, which must be controlled to prevent pollutant discharges in storm water.

The 2016 AKG521000 permit proposes a new permit requirement for commingled storm water discharges. Seafood processing facility operators must develop and implement Storm Water Pollution Prevention Plan (SWPPP) in accordance with two EPA documents. (1) Developing Your Stormwater Pollution Prevention Plan- A Guide for Industrial Operators, (EPA Doc. #: EPA 833-B-09-002, Feb. 2009) and (2) Monitoring of the storm water waste stream shall be performed in accordance with: Industrial Stormwater Monitoring and Sampling Guide (EPA Doc. #: EPA 832-B-09-003, March 2009).

3.16 Onshore facility's vessel Seafood/Fish Waste Effluent Discharge (Remote and Non-Remote) (Permit Part 2.5)

The permit proposes effluent limits for a facility's seafood processing effluent discharges by vessel(s) which are collected by screening or grinding. The 2001 AKG520000 permit and the 1998 AKG528000 permit both authorized at-sea discharges from vessels. In the issuance of the AKG524000 permit, EPA determined that the at-sea discharges to federal waters (i.e. beyond 3.0 nm from baseline) did not fall within the authority of the NPDES AKG524000 permit and that the Ocean Dumping Act provides the authority for these types of discharges. More information can be found in the AKG524000 permit, accompanying Response to Comments document.

The Marine Protection, Research, and Sanctuaries Act of 1972 (.i.e. the Ocean Dumping Act provides per Section 2 of 33 United States Code (U.S.C) 1401 (SEC. 2. 33 U.S.C. 1401) Regulation of dumping and transportation for dumping purposes.

> SEC. 2. 33 U.S.C. 1401 (c) It is the purpose of this Act to regulate (1) the transportation by any person of material from the United States and, in the case of United States vessels, aircraft, or agencies, the transportation of material from a location outside the United States, when in either case the transportation is for the purpose of dumping the material into ocean waters, and (2) the dumping of material transported by any person from a location outside the United States, if the dumping occurs in the territorial sea or the contiguous zone of the United States.
>
> SEC. 3. 33 U.S.C. 1402 (b) ''Ocean waters'' means those waters of the open seas lying seaward of the base line from which the territorial sea is measured, as provided for in the Convention on the Territorial Sea and the Contiguous Zone (15 UST 1606; TIAS 5639).
>
> 33 U.S.C. 1411 (b) Except as may be authorized by a permit issued pursuant to section 102 of this title, and subject to regulations issued pursuant to section 108 of this title, no person shall dump any material transported from a location outside the United States (1) into the territorial sea of the United States, or (2) into zone contiguous to the territorial sea of the United States, extending to a line twelve nautical miles seaward from the base line from which the breadth of the territorial sea is measured, to the extent that it may affect the territorial sea or the territory of the United States.

CWA Section 502(8) defines "territorial seas" to mean the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters (*baseline and any established closing lines),* and extending seaward a distance of three miles, which coincides with the outer boundary and demarcation of State jurisdictional waters. State jurisdictional waters also include those inland waters located landward of baseline and any established closing lines.

DEC intends to authorize the vessel discharge of seafood processing waste and ground fish waste to as a point source as defined by 18 AAC 83, but only if the discharge occurs in inland waters (i.e. landward of mapped baseline(s) and established closing lines). Otherwise, disposal seaward of any baselines and any closing lines, or where no closing lines exist, is regulated by EPA's Ocean Dumping Management Program.

These vessel discharges will be authorized if performed within the confines of the required permit limits and treatment requirements. The Department considers the vessel's discharge, to be the last step in the conveyance of onshore facility's non-domestic wastewater treatment and discharge process. Permit requirements include that each single-area-of-operation (i.e. discharge sites) be located landward of mapped baseline(s) or any closings lines. Vessels discharges must occur in hydro-dynamically energetic marine waterbodies only. DEC will require those vessels listed in

Appendix D – Table D2, formally covered under APDES AKG523000, to apply for coverage under AKG521000. These AKG523000 vessel authorizations are actually associated with an onshore facility seafood processing waste discharge, and are more appropriately covered under the AKG521000 permit. The AKG521000 permit establishes conditions on where and how the vessel may discharge the waste. The permit establishes limits on amounts of seafood waste that may be discharged at each single-area-of-operation based on the 1994 modeling. New permit provisions include the operator identifying GIS mapping of the proposed area(s)-of-operation, providing receiving water flushing characteristics, depth of receiving water, currents, meeting one-half inch grind standard in all dimensions prior to discharge, as well as limiting the department's continuing authorizations based on the vessel's performance results and permit compliance.

3.16.1 Vessel's Single-Area(s)-of-Operation

Seafood processing waste discharges from a vessel while in transit to hydrodynamically energetic waters are assumed to disperse over a large area and are not expected to produce deposits on the seafloor. Further information regarding the formation of deposit can be found in Fact Sheet Part 4.8.

The permit proposes onshore operators apply for authorization for vessels discharging raw, ground seafood waste or ground fish waste. The operator will be required to propose "single-area(s)-of-operation" on their NOI. The operator must map and propose that the outer boundary of each single-area-of-operation is minimally located further than 0.5 nm from shore (i.e. measured from MLLW) and in waters greater in depth than -120 ft. MLLW. Note the allowance of the boundary to be only 0.5 nm from shore, through facility site and vessel inspections it has been found that raw, ground seafood processing waste dissipates quickly behind the vessels and is not spread out great distances across the surface of the water.

Whereas the 2001 AKG520000 permit allowed "At-sea" discharges, it required them to occur a minimum of 1.0 nm from shore. The AKG520000 permit allowed stickwater to be discharged as well as raw, ground seafood processing waste. The 2016 AKG521000 proposes to maintain the 1.0 nm distances for a facility's vessel discharges to inland waters for by-product recovery effluent (i.e. stickwater) or surimi / minced fish wastewater, to include the discharge be to depths greater than -120 feet MLLW. The BOD_5 and TSS loading strengths are much higher in stickwater and surimi / minced fish wastewater, the associated increased distance from shore to provide for adequate mixing.

4.0 Receiving Water Body

4.1 Limits and Monitoring Requirements

Remote facility operators discharging greater than 30,001 pounds per year and Non-Remote location facility operators shall monitor the receiving water as indicated in Tables 18 – 24 to determine compliance with WQS. The Department may require additional receiving water monitoring, which would be listed in an authorization, for site-specific purposes.

4.2 Water Quality Standards

The CWA Section 301(b)(1)(C) requires the development of limits in permits necessary to meet WQS. State regulations at 18 AAC 83.435 require that the conditions in APDES permits ensure compliance with the Alaska WQS, which are codified in 18 AAC 70. The WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy. The use classification system designates the beneficial uses that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use classification of each water body. The antidegradation policy ensures that the beneficial uses and existing water quality are maintained.

Waterbodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230, listed under subpart 18 AAC 70.230(e). Some water bodies in Alaska can also have site–specific water quality criterion per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b).

The receiving waters for the permit include fresh, estuarine and marine surface waters of Alaska, that are designated for all beneficial uses, and the most stringent of the WQS for these uses shall be met. The designated use classes are: water supply (aquaculture, seafood processing, and industrial); water recreation (contact and secondary); growth and propagation of fish, shellfish, and other aquatic life; and harvesting for consumption of raw mollusks or other raw aquatic life.

The receiving waters for the permit are the territorial seas and defined inland waters from shore to and 3.0 nm from shore as delineated by MLLW, baseline(s) or any closing lines, whichever is greatest.

The applicable WQS applied to the permit are in 18 AAC 70, as revised through April 8, 2012, with the exception of the mixing zone sections and residue standards. EPA has not approved the 2006, 2009 or 2012 mixing zone and residues standard revisions. The controlling regulations for mixing zones are 18 AAC 70.240 - 70.270, as revised through June 26, 2003 and the controlling water quality criteria for residues is 18 AAC 70.020(b)(20), as revised through June 26, 2003.

In addition, currently there are no drinking water uses (desalinization facilities) within 1.0 miles of current permitted seafood processors discharging to marine waters. Surface water uses have been identified by the Department both upstream and downstream of seafood processors discharging to fresh waters. The permit requires operators to identify surface water uses (marine and/or fresh water) for the Department to follow up with the DEC Drinking Water Program to identify if the surface water is being used as a drinking water use or other industrial use (such as seafood processing, aquaculture or industrial).

4.3 Receiving Water Quality Monitoring (Permit Part 2.7)

Table 17 (Permit Table 18) provides the WQS that may be exceeded within an authorized mixing zone and the residues standard that may be exceeded within an allowed ZOD. Table 17 also

provides selected portions of the water quality numeric criteria or narrative standard of 18 AAC 70.20(b) for each of the listed WQS.

Table 17: Receiving Water Quality Numeric Criteria and Narrative Standards (Permit Table 18)

Parameter	Numeric Criteria/Narrative Standard for the receiving water
Dissolved gas	For Fresh Water: D.O. must be greater than 7 mg/l in waters used by anadromous or resident fish. In no case may D.O. be less than 5 mg/l to a depth of 20 cm in the interstitial waters of gravel used by anadromous or resident fish for spawning. For Marine Water: The receiving water surface dissolved oxygen shall be greater than 6.0 mg/l for 1 meter depth. Dissolved oxygen shall be greater than 4 mg/l at any point below the surface of the receiving water. Estuaries and tidal tributaries: D.O may not be less than 5.0 mg/l except where natural conditions cause this value to be depressed. In no case may D.O. levels exceed 17 mg/l.
Residues	Floating solids, debris, sludge, deposits, foam, scum or other residues discharged shall not: cause the water to be unfit or unsafe for use, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines, or cause a sludge, solid or emulsion to be deposited beneath or upon the surface water (waters of the U.S.), within the water column, on the bottom, or upon adjoining shorelines.
Fecal coliform bacteria	The fecal coliform median MPN (most probable number) of the receiving water shall not exceed 14 bacteria/100 ml at the boundary of the mixing zone.
Enterococci bacteria	The geometric mean of the receiving water shall not exceed 35 bacteria/100 ml. A single sample maximum of the receiving water shall not exceed 501 bacteria/100 ml.
Oil and grease (polar)	Fresh Water and Marine Water: Total aqueous hydrocarbons (TAqH) in the water column may not exceed 15 µg/l. Total aromatic hydrocarbons (TAH) in the water column may not exceed 10 µg/l. The discharge shall not cause a film, sheen, or discoloration on the surface or floor of the water body or adjoining shorelines. There shall be no concentrations of animal fats in shoreline or bottom sediments that cause deleterious effects to aquatic life. Substances discharged shall not impart undesirable odor or taste to organisms.
pH	The receiving water pH shall be between 6.5 and 8.5 standard units.
Temperature	The receiving water shall not exceed 15º Celsius. This means the discharge temperature may not exceed 15º Celsius (59 º F), this is not mean the discharge can increase receiving water temperature (+15 ºC). The weekly average temperature of the receiving water shall not increase more than 1º Celsius due to effluent discharge.
Color	The receiving water shall be free of substances that produce objectionable color. The receiving water shall not exceed 15 color units.
Turbidity	Fresh Water: May not exceed 5 nephelometric turbidity units (NTU) above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10% increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 25 NTU. Marine Water: The receiving water shall not exceed 25 nephelometric turbidity units (NTU). The discharge may not reduce the depth of the compensation point for photosynthetic activity of the receiving water by more than 10%.
Chlorine, total residual	The receiving water 1-hour average shall not exceed 13 µg/l, and the 4 day average shall not exceed 7.5 µg/l.

4.4 Water Quality Status of Receiving Water

Any part of a waterbody for which the water quality does not or is not expected to meet applicable WQS is defined as a "water quality limited segment" and placed on the state's impaired waterbody list. See State of Alaska DEC Water Quality website for the most recent integrated report (http://www.dec.state.ak.us/water/wqsar/waterbody/integratedreport.htm)

4.4.1 Discharges to Water Quality Impaired Waters

Permit Parts 1.2.1 and 1.4.7 are new requirement that provides improved guidance for new dischargers in complying with 40 CFR 122.4(i). Part 1.2.1 clarifies that, in the absence of information demonstrating otherwise, DEC expects that compliance with the permit will not adversely impact applicable water quality. DEC notes that while Part 1.2.1 is designed to specifically implement 40 CFR 122.4(i), other water quality-based requirements apply to new and existing dischargers. WQBELs are integrated into the permit and applicable to all sources, which are designed to ensure that discharges from both new and existing permittees are controlled as necessary to meet WQS.

In addition, Permit Part 3.2 includes requirements that are designed to comply with 40 CFR 122.4(i) for discharger or proposed discharges to impaired waterbodies. For impaired waters designated pursuant to CWA Section 303(d), the AKG521000 permit proposes that discharges are evaluated consistent with 40 CFR 122.4(i) prior to authorization being issued.

As found in 40 CFR 122.4(i), a permit, or authorization, may not be issued to an owner or operator of a new source or new discharger whose discharge from its construction or operation will cause or contribute to the violation of WQS. The permit requires that the facility's discharges meet WQS. To satisfy the requirements of 40 CFR 122.4(i), Permit Part 3.2 requires that operator may demonstrate that the pollutant for which the waterbody is impaired is not present at the site and retain documentation of this finding with the Authorization and BMP. The operator may also submit data to the Department documenting that the proposed discharge will not cause or contribute to an excursion of WQS because the discharge will meet WQS at the point of discharge, or that there are sufficient remaining waste load allocations available in an approved Total Maximum Daily Load (TMDL). Permit Parts 1.2.1, 1.4.7 and 3.2 apply requirements to new dischargers and existing dischargers, and are implemented to comply with 40 CFR 122.4(i) requirements that address discharges to listed waterbodies.

When a new TMDL is developed, existing dischargers into that water quality limited segment could be subject to compliance controls designed to bring the segment into compliance with applicable water quality standards. These compliance controls could be provided in a permit, formal enforcement action, an approved Total Maximum Daily Load derived waste load allocation, remediation or recovery plan. DEC may propose appropriate limitations and conditions in the authorization mirroring an approved TMDL, such that prohibit the operator from discharging pollutant(s) that will result in further loading of the waterbody for which the waterbody is impaired. The permit may authorize the discharge of pollutants on a case-by-case basis to water quality limited segments, provided the discharger is operating under an appropriate regulatory control. DEC will public notice a proposed decision to authorize the discharge to a listed impaired waterbody prior to issuing a final authorization.

If a waterbody that an existing operator discharges to is listed as impaired during the permit cycle, the operator may submit information to DEC that demonstrates that the discharge has not or is not expected to cause or contribute to an exceedance(s) of water quality standards. Then, DEC will determine 1) whether the discharge is or would cause or contribute to an exceedance or impairment,

and 2) whether the facility may remain covered under the general permit or if an individual permit is needed.

The Department finds when reviewing the most currently EPA approved 303(d) list, there are currently no facilities (See Appendix D) discharging to impaired waterbodies. Historically, facilities previously covered under the AKG520000 whose discharges occurred outside the regulatory requirements of the permit and caused water quality impairments have been required to apply for individual permit coverage. An operator can apply for an individual permit, or DEC may require an operator to apply for an individual permit, if a new discharge is proposed to an impaired waterbody. The Department may also require an operator of an existing facility that discharges to a water quality limited segment to apply for an individual permit. At this time, facilities permitted by an individual permit for discharge to impaired waters as of the effective date of the 2016 AKG521000 will not be granted coverage.

4.5 Sea Surface and Shoreline Monitoring. *(*Permit Part 2.7.2)

An operator of a non-remote facility, or a remote facility that discharges greater than 30,001 pounds of fish waste per year is required to conduct visual monitoring. The permit requires visual monitoring of the receiving water at the point of discharge, the receiving water within an authorized mixing zone, and the receiving water and shoreline within 500 feet of the seaward boundaries (from the facility's parcel lines and shoreline, 500 feet seaward) of the processing facility, including docks and piers while a fish waste or seafood processing waste discharge is occurring. The purpose of the monitoring is to record the occurrence and extent of persistent films, foam, scum or sheens (compliance water quality criteria 18 AAC 70.020(b)); to record the occurrence and numbers of Western Steller sea lions, Steller's eider, Spectacled eider, Northern Sea otter or short-tailed albatross; and record any incidents of injured or dead Steller's eiders and other listed endangered or threatened species. This monitoring is required to be conducted daily while processing is occurring. The monitoring frequency is set the same as the previous 2001 AKG520000 permit, but may be new to AKG528000 operators.

4.6 Seafloor Surveys (Permit Part 2.7.4 and Appendix F)

Operators of a non-remote facility, and operators of a remote facility that discharge greater than 30,001 pounds of fish waste per year are required to perform seafloor surveys. The permit requires the survey be performed within one year of permit coverage and then subsequently, through the remainder of the permit cycle as required in Permit Table 19. Seafloor surveys are conducted to determine compliance with the Remote facility limitation for total aggregate area of continuous seafood deposits of 1.0 acre (see Fact Sheet Part 4.8), as well as other permit provisions. Permit Appendix F contains the Seafloor Survey Protocol and Guidance document, which provides the acceptable protocols for performing seafloor surveys. Seafloor survey results will be used to gather data to determine if additional authorization limitations are needed, to monitor effluent impact on receiving water quality and to inform future permit reissuance decisions. The survey methods described in Permit Appendix F, as well as the frequency, are new permit requirements.

Operators who previously received EPA waivers under AKG520000 Part VI(C)(10) from performing seafloor surveys, the waivers are not continued into the 2016 AKG521000 permit. Those facility operators who received EPA waivers issued to estuarine area, near in in marine tidally influenced systems need to complete the seafood survey, performing observations at MLLW tidal times, documenting seafood waste deposits on the seafloor and/or bedlands at low tide.

Seafloor surveys are conducted to determine compliance with an authorized project area ZOD or compliance with WQS. The permit requires seafloor surveys for the entire project area ZOD or Non-Remote seafloor survey areas (mapped http://dec.alaska.gov/das/gis/apps.htm) to begin being

performed at seafood processing facilities within one year of permit coverage and then as required in Table 18 through the life of the permit.

Table 18: Receiving Water Monitoring (Permit Table 19)

Facility Type	Requirement	Sample Location	Sample Frequency	Sample Type
All Facilities	Outfall System	system	yearly	visual
All Facilities	Waste discharge system	system	daily	visual
All Facilities – sea surface above outfall	Sea Surface	discharge location plus 500 feet of discharge	daily	visual
All Facilities	Shoreline	all parcel's shoreline plus 100 feet from facility's parcel lines	daily	visual
Seafloor Surveys				
Non-Remote facilities survey the mapped seafloor survey area (no authorized project area ZOD) [a]	Photographic Seafloor Survey	discharge area, seafloor survey area mapped as provided in authorization	within one year of obtaining permit coverage	survey
Remote Facilities with a project area ZOD [b]	Photographic Seafloor Survey	project area ZOD mapped seafloor survey area	within one year of obtaining permit coverage	survey
Facilities (Remote or Non-Remote) with Seafloor Survey reporting $\leq$ 0.75 acres of deposits in the Remote project area ZOD [b], or in the Non-Remote mapped seafloor survey area	Dive Seafloor Survey	project area ZOD mapped seafloor survey area	every other year [b]	survey
Facilities (Remote or Non-Remote) with Dive Survey reporting $\geq$ 0.75 acres of deposits in the Remote project area ZOD [b], or in the Non-Remote mapped seafloor survey area	Dive Seafloor Survey	project area ZOD mapped seafloor survey area	annually	survey
Remote Facility or Non-Remote Facility – with a 25% increase in the amount of seafood waste discharge (submit new NOI) [d]	Repeat of Photographic Seafloor Survey	project area ZOD mapped seafloor survey area	within one year of actual increase of production [d]	survey
Installation of a new outfall location, or Facility re-starting production after not operating for more than 18 months.	Pre-Discharge Seafloor Survey [c]	proposed discharge area	prior to discharging	survey

Notes:

a. If no project area ZOD is authorized and a deposit is found to be at least 0.5 inch thick and exceeds 10% of any 3 foot by 3 foot square sample plot within the survey area, an annual surveys will be required and a Remediation Plan will be required.

b. Appendix F – Seafloor Survey Protocol is set up as a two year evaluation, initially. The first survey shall be within one year of coverage. After the Year Two's (and Subsequent) Seafloor Dive Survey of the project area ZOD is completed, the schedule of how often a Dive Survey shall be completed will be determined on the size of the seafloor deposits.

c. See pre-discharge survey protocol, Appendix I

d. 25% increase shall be in comparison to the past 4 year discharge reported on Annual Report. An operator shall identify in their Annual Report if an additional seafloor survey is not performed due to production numbers not increasing as expected.

4.7 Mixing Zone (Permit Part 2.7.4 - 2.7.6)

In accordance with state regulations at 18 AAC 70.240, as amended through June 26, 2003, the Department may authorize a mixing zone (MZ) in a permit to meet WQBELs.

4.7.1 Mixing Zone History.

Mixing Zones were authorized in 2001 AKG520000 permit via the State's CWA Section 401 Certification in Part 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."

Therefore, the Department's CWA Section 401 Certification of the 2001 AKG520000 permit provided a mixing zone, not only for the seafood processing wastewaters and wastes, but also other discharges listed in Part II, such as wash-down water, vessel's sanitary waste discharges, secondary treated (domestic) wastewaters, "other wastewaters" such as domestic graywater, 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.

The AKG520000 Sections V(A)(1)(i), V(B)(1)(k) and V(C)(1)(k) included the CWA Section 401 Certification language:

> "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."

As such, the Department's CWA Section 401 Certification did not simply authorize just a single mixing zone, for only one outfall that would be applied to all facility discharges; or at single location, as vessels move and discharge to different areas. The 2001 AKG520000 permit also contained language in Sections V(A)(1)(h), V(B)(1)(h) and V(C)(1)(h):

> "Wastewaters that have not had contact with seafood are not required to be discharged through the seafood process waste-handling system."

As discussed in Fact Sheet Parts 1.6.2 and 1.1, as a result of the above permit allowance separate "Other Wastewater" outfalls have been observed at seafood processing facilities. The mixing zone(s) provision in the 401 Cert and the AKG520000 permit applied to these discharges.

The AKG521000 permit proposes to continue to apply the 100-foot radius mixing zone for Remote operator's seafood processing outfalls as found in the 2001 AKG520000 permit, as well as apply the standard mixing zone to facilities discharging ground fish waste. Permit Part 1.6.12.2. The Remote operators listed in Appendix D with administratively extended NPDES AKG520000 coverage all have been operating with 100-foot radius mixing zones. Less than 5

% of the operators have submitted receiving water quality sampling results resulting in permit violations and/or water quality violations. Those that did have violations were not operating within the constraints of the 2001 AKG520000 permit requirements.

A Non-Remote facility operator may apply for a mixing zone, except for exceedances for water quality parameters controlled by end-of-pipe EPA established TBELs for oil and grease (O&G - polar) or exceedances of dissolved gas (D.O.). As discussed in Part 3.10, EPA established TBELS applicable to end-of-pipe for O&G as well as TSS.

The Department has determined that, due to the nature of seafood processing wastes discharges, after implementation of technology based requirements, discharges from seafood processing facilities have the "reasonable potential" to cause or contribute to excursions above State WQS for residues, dissolved gas, oil and grease (polar), pH, temperature, color, turbidity and total residual chlorine.

4.7.2 Mixing zones: Department authorization

Consistent with 18 AAC 70.240, the Department is exercising its discretion to issue a mixing zone in a permit and is authorizing a mixing zone to each facility granted a mixing zone in the previous permit. Permit Appendix D lists the facilities with previously authorized mixing zones and the size of the "assigned" mixing zone sizes being publicly noticed through this general permit issuance for each facility with authorized discharges. Mixing zone were also issued to vessels under the AKG520000. For seafood waste discharge operations while in transit, the Department has conducted or participated in several studies regarding the dilution available in a receiving water from various sized cruise ships discharging while in transit. Using information available from these studies (see Permit 2009DB0026 Information Sheet), it is expected that sufficient dilution will be available at the boundary of the mixing zone when a vessel is discharging an onshore facility's ground seafood processing waste. Thus, the permit proposes to continue issuing standard 100 foot mixing zone to vessels acting as support facilities to onshore seafood processors and vessels discharging under Permit Part 2.6. Permit Appendix D also public notices facilities that have applied for coverage after the AKG520000 permit expiration, but have not been able to obtain coverage who will be authorized a standard mixing zone after submitting an NOI that demonstrates the permittee can meet the requirements of the permit. The maximum mixing zone size that the Department will authorize under the permit for each outfall is a circle with a 100 foot radius centered at the outfall pipe or discharge pipe terminus extending vertically up to the surface and down to the seafloor. A smaller mixing zone may be authorized in the written authorization.

The standardized mixing zone is applicable to Remote seafood processing facilities and ground fish waste discharge facilities for the following parameters: dissolved gas (dissolved oxygen), non-petroleum oil and grease (polar), temperature, color, turbidity, residues, fecal coliform bacteria, pH and total residual chlorine. All water quality criteria shall be met at the boundary of the authorized mixing zone, in accordance with 18 AAC 70. Any new mixing zone applications received will be public noticed. The 100-foot radius mixing zone found in the AKG520000 is an existing permit limitation in the administratively extended AKG520000 GP and is retained. The standardized mixing zone will also be applied to vessels discharging onshore facility's ground seafood processing waste (See Appendix D and Permit Part 2.6).

For Non-Remote facilities, the AKG528000 permit required permittees to meet end-of-pipe limitations, therefore, the DEC CWA Section 401 Certification did not authorize mixing zones for these facilities. The 2016 AKG521000 permit proposes monitoring for pollutants (chlorine, ammonia) other than those authorized in the AKG528000. If through effluent sampling and

analysis, or ambient water quality monitoring the operator finds the discharge is not meeting WQS, the operator may apply to the Department for a mixing zone.

4.7.3 Reasonable Potential Analysis and Mixing Zone Modeling

If a facility proposes a mixing zone that has not been public noticed, the permit requires the operator perform reasonable potential analysis and the mixing zone be public noticed. The regulatory conditions found in 18 AAC 70.210-270 require an applicant requesting a mixing zone provide the Department all available evidence reasonably necessary for a decision, including the information and demonstrations required by 18 AAC 70.240 - 18 AAC 70.270 and other information the department determines is necessary to meet the requirements of 18 AAC 70.240 - 18 AAC 70.270. The burden of proof for justifying a mixing zone through demonstrating compliance with the requirements of 18 AAC 70.240 - 18 AAC 70.270 rests with the applicant.

When evaluating the effluent to determine if WQBELs based on chemical-specific numeric criteria are needed, projects the receiving water body concentration for each pollutant of concern downstream of where the effluent enters the receiving water body. The chemical-specific concentration of the effluent and receiving water body and, if appropriate, the dilution available from the receiving water body, are factors used to project the receiving water body concentration. If the projected concentration of the receiving water body exceeds the numeric criterion for a limited parameter, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable WQS, and a WQBEL shall be developed. In order to make a determination regarding issuing a mixing zone, the Department may require the applicant submit Form 2M.

According to 18 AAC 70.990(38), a mixing zone is an area in a water body surrounding, or downstream of, a discharge where the effluent plume is diluted by the receiving water within which specified water quality criteria may be exceeded. Water quality criteria and limits may be exceeded within a mixing zone. A mixing zone can be authorized only when adequate receiving water body flow exists, and the concentration of the pollutant of concern in the receiving water body is below the numeric criterion necessary to protect the designated uses of the water body.

The Department informed EPA and the seafood processing industry that there is necessity to further evaluate the mixing zone size developed for onshore seafood processors found in the State of Alaska’s 2001 AKG520000 CWA Section 401 certification. The 2011 AKG523000 Offshore Seafood Processing permit and fact sheet also identified the need to evaluate the water body mixing characteristics for in-transit and stationary vessels.

The Department received a proposal from representatives of the seafood processing industry to collect the necessary data and perform modeling to evaluate the appropriateness of continuing the 100-foot radius mixing zone, or if alternate mixing zone sizes may be necessary during the permit cycle. Permit Parts 2.7.5 - 2.7.7 are considered special studies, and the monitoring and samples gathered may not be required in the next permit cycle. The Department has determined further effluent monitoring and mixing zone water quality sample collection is necessary to perform an further analysis of the pollutants being discharged in comparison to the boundary of the mixing zone water quality sampling results. An effluent and receiving water monitoring schedule has been established in Permit Parts 2.7.5 - 2.7.6 and Permit Tables 20 - 23. In accordance with AS 46.03.020 (13) and Section 308 of the CWA, DEC has the authority to require the owner or operator of a facility to undertake this type of monitoring, sampling, and reporting activities as codified in 33 U.S.C 1318. Operators may opt out of collecting the samples from their facility outfalls individually if they participate in the Seafood Processing

Work Group Mixing Zone Study. The process as to how to participate in the study will be determined in the proposal put together by the Seafood Processors Work Group.

4.7.4 Mixing Zone Checklist Considerations

Fact Sheet Appendix C, Mixing Zone Analysis Checklist, outlines criteria that is considered when the Department analyzes a request for a mixing zone. These criteria include: the size of the mixing zone, treatment technology, existing uses of the water body, human consumption, spawning areas, human health, aquatic life, and endangered species. All criteria shall be met in order to authorize a mixing zone. The following summarizes the standard 100 foot radius mixing zone proposed in the permit with analysis criteria:

4.7.4.1 Size. In accordance with 18 AAC 70.255, and the currently available data, the Department determined that the size of the standard size mixing zone (100 foot radius) for each facility is as small as practicable. In accordance with 18 AAC 70.245, the Department finds that existing uses of the water body outside the mixing zone are maintained and fully protected so that any discharge will neither partially nor completely eliminate an existing use of the water body outside the mixing zone and will not impair the overall biological integrity of the water body. Operators of new facilities may request and DEC may authorize a mixing zone for fish waste discharges, domestic wastewater discharges or other wastewater discharges. Consistent with the mixing zones public noticed as part of the 2016 AKG521000 permit, the maximum mixing zone size that DEC will authorize for each outfall is a circle with a 100 foot radius extending from the surface down to the seafloor to ensure the water body as a whole is protected. DEC may decrease the allowed 100 foot mixing zone size during review of the submitted NOI to be consistent with 18 AAC 70.255.

4.7.4.2 Technology. In accordance with 18 AAC 70.240(a)(3), the most effective technological and economical methods are used to disperse, treat, remove, and reduce pollutants.

Treatment Technology for Seafood Processing / Ground fish waste – In remote locations, seafood waste is ground meeting the TBEL requirements found in 40 CFR Part 408 as the best available control technology. In non-remote locations, seafood processing waste effluents, through the application of BPJ, are screened to with fine mesh screen with spacing no greater than one millimeter by one millimeter (1mm by 1mm) or less, to meet performance-based effluent limits using methods found to be economically achievable. EPA has promulgated final ELGs specifying the minimum treatment standards for specific methods of processing Alaska seafood. The ELGs are codified at 40 CFR Part 408, adopted by reference at 18 AAC 83.010. These technology-based requirements have been incorporated into the permit. During early draft review of the AKG521000 EPA was concerned that merely the application of the ELGs was not the most robust, effective and economical treatment technologies for seafood processing waste. As the Department discussed in Fact Sheet 1.1, EPA has just recently posted to their website (http://www.epa.gov/eg/alaskan-seafood-processing-effluent-guidelines) the possibility of changes to 40 CFR Part 408 in 2016. DEC does not propose to pre-empt those rule changes prior to EPAs analysis being released as required under CWA section 304(b) which requires EPA to annually review and, if appropriate, revise Effluent Guidelines.

Treatment Technology for Domestic / Sanitary Wastewater. – The 2016 AKG521000 permit allows for discharge of domestic /sanitary wastewater from seafood facilities and their support buildings as the 2001 AKG520000 permit. Sanitary wastewater was the term used for the discharge of shower, toilet, and sink, etc. wastewater in the 2001 AKG520000 permit, covering both onshore and vessel wastewater discharge. The 2016 AKG521000

permit uses sanitary wastewater discharge for vessel discharges, but uses the term "domestic wastewater" for onshore facility domestic wastewater discharge from the definition found in 18 AAC 72.990(23). The two options for discharge of sanitary or domestic wastewater in the 2016 AKG521000 permit are:

These standards have been incorporated along with monitoring to ensure compliance with the permit (See Permit Table 2).

Treatment technology for a vessel's sanitary waste discharge, treated by a Type II MSD prior to discharge by a sanitary waste system that meets the applicable Coast Guard pollution control standards in effect [33 CFR Part 159: "Marine sanitation devices"], or a vessel's may discharge their sanitary wastewater to an onshore facility.

4.7.4.3 Existing Use. Consistent with 18 AAC 70.245, mixing zones will only be authorized if it has been appropriately sized to fully protect the existing uses outside the mixing zone. The permit requires the applicant identify other existing uses within 1.0 nm of the discharge. DEC will review public comment, NOI, GIS file and permit file to determine the existing uses and biological integrity of the water bodies as a whole will be maintained and fully protected. Operators must operate in compliance with the terms of the permit, as required by 18 AAC 70.245(a)(1) and (a)(2). Additional receiving water monitoring will be conducting during the life of the permit to ensure that existing uses will continue to be protected.

4.7.4.4 Human Consumption. In accordance with 18 AAC 70.250(b)(2) and (b)(3), the pollutants discharged cannot produce objectionable color, taste, or odor in aquatic resources harvested for human consumption; nor can the discharge preclude or limit established processing activities or commercial, sport, personal use, or subsistence fish and shellfish harvesting.

4.7.4.5 Spawning Areas. In accordance with 18 AAC 70.255(h), mixing zones will not be authorized in a known spawning area for anadromous fish or resident fish spawning redds.

4.7.4.6 Human Health. In accordance with 18 AAC 70.250 and 18 AAC 70.255, the mixing zone authorized in the permit must be protective of human health.

Seafood / Ground Fish waste – Seafood processing and ground fish wastes are not expected to contain significant quantities of pollutants that may bioaccumulate in aquatic organisms. Fish waste discharges are not expected to result in elevated levels of toxic or carcinogenic pollutants in marine organisms consumed by humans.

4.7.4.7 Aquatic Life and Wildlife. In accordance with 18 AAC 70.250 and 18 AAC 70.255, the mixing zone authorized in the permit shall be protective of aquatic life and wildlife.

Seafood / Ground Fish waste – Impacts from operators discharging in compliance with the requirements of the permit have shown to be localized. Although benthic organisms may be smothered or community composition altered, in residues excursions authorized by a ZOD where seafood deposits are allowed to form, the benthic communities in Alaskan coastal waters would not be expected to decline noticeably. The ZOD is not authorized is for the entire waterbody, just a small portion of the waterbody and the by benthic organisms move and repopulate to varying degrees. Deposition of the majority of discharged solids is expected to be rapid and localized, not creating a barrier to migratory species. Therefore, adverse physical effects to biota from ground seafood discharge should be limited to the nearfield vicinity of the outfall. Within this region, zooplankton and fish

larvae near the discharge may experience altered respiratory or feeding ability due to stress, or clogging of gills and feeding apparatus. Phytoplankton entrained in the discharge plume may have reduced productivity due to decreased light availability. These impacts should result in negligible impacts to populations in the region, as impacts should be restricted to the immediate vicinity of the discharge. Mobile invertebrates, fish, birds, and mammals presumably will avoid the discharge plume if conditions become stressful and therefore be provided a zone of passage and prevent lethality to passing organisms. Additionally, biota may also be attracted to the discharge plume to feed on the discharged particulates, thereby increasing the biodiversity in some areas. Infaunal or sessile organisms near the discharge are not likely to be impacted by the suspended solids and should not result in the permanent or irreparable displacement of indigenous organisms.

4.7.4.8 Endangered Species In accordance with 18 AAC 70.250(a)(2)(D), the authorized mixing zones will not cause an adverse effect on threatened or endangered species.

On July 23, 2012, DEC provided the USFWS a list of existing facilities, discharge locations, discharge amounts, and seafloor survey results of existing seafood processing facilities discharging to sensitive areas. In an August 16, 2012 response, the USFWS indicated that discharges to waters in Kodiak and Chignik harbors could present significant risk to Steller's eiders in those harbors and provided recommendations for incorporation into authorizations for those specific facilities that discharge to those areas. DEC again provided USFWS the opportunity for early draft review October 2015. No further endangered species special considerations were requested beyond using the critical habitat GIS layers in permitting, which DEC WDAP -Seafood and Aquacultural permitting group already utilizes. DEC will continue to access the Sensitive Area Mapping when evaluating NOIs. Authorizations will incorporate site-specific water quality-based requirements where appropriate (Permit Part 3.2). The permit requires an applicant of a new facility or the operator of an existing facility that proposes material changes to contact the agency with management authority over specific endangered species and request the agency provide any recommended water quality-based recommendations to DEC. The permit also requires the applicant to provide copies of any biological surveys, and environmental reports previously performed or required management authority excluded areas. If these documents do not exist, the permit requires the applicant to inform the Department and the agency management authority over the excluded area that such documents do not exist.

4.7.5 Mixing Zone and Ambient Water Quality Monitoring (Permit Part 2.7.5)

The 2001 AKG520000 permit did not require effluent monitoring of the wastewater discharge from a seafood processor to determine compliance with WQS or to validate the general permit-defined standard mixing zone size. Permit Tables 20 - 23 establish required effluent and receiving water monitoring. This monitoring requirement is new to the permit and is required in order to provide monitoring data to ensure compliance with WQS. The monitoring data is also being collected to ensure the Department has the information needed to further refine and validate the standard-size mixing zone.

4.7.6 Facility Effluent Monitoring to assist in Mixing Zone and Ambient Water Quality Sample Study (Permit Part 2.7.6)

Table 19 (Permit Table 20) presents the effluent monitoring requirements. If a facility has not been authorized for a mixing zone, this effluent sampling is still required for each outfall. Monitoring is required twice per year in months that seafood processing actually occurs for at least 24 hours during the month, unless a facility participates in a Seafood Processor's Work Group Mixing Zone Study (Permit Part 2.7.7).

Table 19: Effluent Monitoring Study (Permit Table 20)

Effluent Parameter	Units	Effluent Results	Sample Location	Sample Frequency	Sample Type
Daily Flow	mgd	report	effluent	Performed on sample day	Grab
pH [b]	SU	report	effluent	2 per year [a]	Grab
Temperature [b]	°F	report	effluent	2 per year [a]	Grab
Total ammonia [b]	mg-N/L	report	effluent	2 per year [a]	Grab
Dissolved Oxygen	mg/L	report	effluent	2 per year [a]	Grab
Salinity	mg/L	report	effluent	2 per year [a]	Grab

Notes:

a. Samples shall be taken two times a year while discharge is occurring. For facilities who primarily process salmon, sampling shall occur during peak production times. For facilities operating during Season A (January – April) and Season B (August – December) sampling shall occur during peak production, once during each processing season. One sample during peak production during Season A, and one sample during peak production during Processing Season B, respectively.

b. The effluent ammonia, pH and temperature readings shall be collected and analyzed from the same, single grab sample.

4.7.7 Remote Mixing Zone and Ambient Water Quality Study (Permit Part 2.7.6.6)

Table 20 (Permit Table 21) presents the monitoring requirements for the receiving water where a mixing zone has been authorized. Monitoring is required twice per year in those months that seafood processing occurs for at least 24 hours during the month, unless a facility participates in a Seafood Processor's Work Group Mixing Zone Study (Permit Part 2.7.7). The toxicity of ammonia, and applicable WQS, is temperature, pH, alkalinity and salinity dependent. The permit requires the operator to obtain ten (10) Summer and ten (10) Winter temperature and salinity readings to assist DEC in determining whether future ammonia permit limits are needed for these types of discharges. For more information regarding ammonia toxicity and sampling (see Fact Sheet Part 3.14).

Table 20: Mixing Zone Study - Water Quality Monitoring (Permit Table 21)

Boundary of the Mixing Zone Sampling					
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**	**Sample Results**
Color	Color unit	boundary of MZ	2 per year [a]	grab	report
Turbidity	NTU	boundary of MZ	2 per year [a]	grab	report
Total ammonia	mg-N/L	boundary of MZ	2 per year [a]	grab	report
Dissolved Oxygen	mg/L	boundary of MZ	2 per year [a]	grab	report
pH	SU	boundary of MZ	2 per year [a]	grab	report
Oil and Grease [c]	ml/L	boundary of MZ	2 per year [a]	grab	report
Summer/Winter [b] ambient water body					
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**	**Sample Results**
Temperature	° C	Outside the boundary and influence of the mixing zone 500 feet from the outfall terminus	10 samples Winter/ 10 samples Summer Taken per permit cycle (not per year)	grab	report
pH	SU			grab	report
Salinity [c]	ppt			grab	report
Alkalinity	mg-CaCO3/L			grab	report

Notes:

a. Samples shall be taken two times a year while discharge is occurring. For facilities who primarily process salmon, sampling shall be performed during the month(s) of highest average seasonal discharge. For facilities operating during Season A (January – April) and Season B (August – December) sampling shall occur during peak discharge, once during each processing season. One sample during peak discharge during Season A, and one sample during peak discharge during Processing Season B, respectively.

b. The monitoring is minimally required for a two year cycle.

c. Samples to determine concentrations of total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH) must be collected in marine and fresh waters below the surface and away from any observable sheen.

4.7.8 **Non-Remote Facility Ambient Water Quality Study** (Permit Part 2.7.6.7)

Table 21 (Permit Table 22) presents the water quality monitoring requirements for the receiving water of Non-Remote Facilities. Monitoring is required twice per year in those months that seafood processing occurs for at least 24 hours during the month, unless a facility participates in a Seafood Processor's Work Group Mixing Zone Study (Permit Part 2.7.7). The toxicity of ammonia, and applicable WQS, is temperature, pH, alkalinity and salinity dependent. The permit requires the operator to obtain ten (10) Summer and ten (10) Winter temperature and salinity readings to assist DEC in determining whether future ammonia permit limits are needed for these types of discharges. For more information regarding ammonia toxicity and sampling (see Fact Sheet Part 3.14).

Monitoring shall be performed at a sampling location 100 feet and 500 fee from each outfall/port terminus, unless participating in the Seafood Processors' Work Group Mixing Zone Study (Permit Part 2.7.7). These operators are being required to collect this information to obtain information regarding water quality surrounding these large volume discharges.

Table 21: Non-Remote Ambient Water Quality Monitoring Study (Permit Table 22)

Ambient Water Quality Sampling					
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**	**Sample Results**
Color	Color unit	100 feet from the outfall terminus	2 per year [a]	grab	report
Turbidity	NTU	100 feet from the outfall terminus	2 per year [a]	grab	report
Total ammonia	mg-N/L	100 feet from the outfall terminus	2 per year [a]	grab	report
Dissolved Oxygen	mg/L	100 feet from the outfall terminus	2 per year [a]	grab	report
pH	SU	100 feet from the outfall terminus	2 per year [a]	grab	report
Oil and Grease [c]	ml/L	100 feet from the outfall terminus	2 per year [a]	grab	report
Summer/Winter [b] Ambient Waterbody Sampling					
Parameter	**Units**	**Sample Location**	**Sample Frequency**	**Sample Type**	**Sample Results**
Temperature	° C	Outside the boundary and location of the mixing zone 500 ft from the outfall terminus	10 samples Winter/ 10 samples Summer Taken per permit cycle (not per year)	grab	report
pH	SU			grab	report
Salinity	ppt			grab	report
Alkalinity	mg-CaCO3/L			grab	report

Notes:

a. Samples shall be taken two times a year while discharge is occurring. For facilities who primarily process salmon, sampling shall occur during highest average peak production month. For facilities operating during Season A (January – April) and Season B (August – December) sampling shall occur during peak discharge, once during each processing season. One sample during peak discharge during Season A, and one sample during peak discharge during Processing Season B, respectively.

b. The monitoring is minimally required for a two year cycle.

c. Samples to determine concentrations of total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH) must be collected in marine and fresh waters below the surface and away from any observable sheen.

4.7.9 Mixing Zone Study – Domestic Wastewater Dischargers Bacterial Pollutant Monitoring (Permit Part 2.7.6.8)

Table 22 (Permit Table 20 presents the monitoring requirements for the receiving water where commingled seafood processing waste discharge and domestic wastewater discharge is occurring, or where domestic wastewater/sanitary wastewater is discharged directly to waters of the U.S.. The samples must be able to be analyzed by certified laboratory within required holding times. Commingled outfall samples shall be collected when both waste streams are being discharged. Samples shall be representative of the receiving water. Sample Results shall be submitted with the Annual Report.

Table 22: Mixing Zone Study - Bacterial Pollutant Monitoring - Arriving within 8 hr. holding time (Permit Table 23)

Parameter	Units	Sample Location	Sample Frequency [a, b]	Sample Type	Sample Results
Fecal Coliform (FC) Bacteria/	FC/100 mL	boundary of MZ	2 per year [a]	Grab	report
Enterococci Bacteria	#/100 mL	boundary of MZ	2 per year [a]	Grab	report

Notes:

a. Samples shall be taken two times a year while discharge is occurring. Samples should be taken at least 10 feet below the surface of the water and be performed during the month(s) of highest average seasonal discharge.
b. For a commingled waste stream, monitoring is required when both waste streams are being discharged.

4.7.10 Seafood Processors' Work Group Mixing Zone Study (Permit Part 2.7.7)

The permit requires operators to perform monitoring at the boundary of the mixing zone. Evaluating the pollutant parameters at the boundary of the mixing zone will assist the operator and the Department to determine if the discharge meets the required mixing zone criteria at the compliance point (boundary of mixing zone), and further evaluate the appropriateness of the mixing zone historically authorized as part of the 2001 AKG520000 permit. This is a new permit requirement.

In 2010, a group of Seafood Processors formed a work group and tentatively proposed a plan to conduct seafood mixing zone analyses during the AKG521000 permit cycle. As of October 2014, this work group had expressed a continued interest in performing the study. Permit Part 2.7.7 include requirements, per the Department's authority found in AS 46.03.020(5), for operators to conduct a mixing zone monitoring survey as a required part of the permit. Permit Parts 2.7.6 - 2.7.7 require that operators either 1) individually collect effluent data and mixing zone monitoring data during the permit cycle and submit the data to DEC, or 2) participate in the Seafood Processors' Work Group Mixing Zone Study and submit monitoring data to the mixing zone work group. Results of the monitoring data are to be used for evaluation of water quality and mixing zone sizing. The Work Group's Mixing Zone Study proposal must be submitted to the Department and approved by the Department. DEC encourages the Seafood Processors' Work Group to actively engage DEC throughout the process to ensure objectives, timelines and deliverable content is all understood. The goal of the study is to investigate effluent sampling results, mixing zone water quality monitoring and mixing characteristics that will enable DEC to determine the size and shape of a seafood wastewater mixing zone for the issuance of the next general permit. The study will include achievement of the following objectives:

4.7.10.1 Development of a framework for effluent and mixing zone water quality analysis and modeling,

4.7.10.2 Data requests to operators to acquire previous effluent and/or receiving water sampling data collected, average flows, waste discharge amounts, and seafloor survey results,

4.7.10.3 Compile existing data on the variable types of outfall configuration,

4.7.10.4 Perform of effluent pollutant monitoring, and receiving water monitoring of seafood processing facilities,

4.7.10.5 Development of a scientifically valid sampling plan and Quality Assurance Project Plan,

4.7.10.6 A detailed discussion of how data will be used to meet, test and evaluate the monitoring objectives,

4.7.10.7 Data collection of oceanographic data of current speeds, pollutants of interest including monitoring for discharge-related impacts, chemistry data and density profiles as needed to address existing data gaps, for those parameters listed in Permit Part 2.7.1, as well as other industry known pollutants,

4.7.10.8 Preliminary modeling conducted to evaluate various ranges of estimated dilution ratios and mixing zone sizes, including evaluation of gathered effluent and water quality data, and

4.7.10.9 A summary report of the results of the Mixing Zone Study

DEC will review and approve a work plan from the seafood processors work group prior to work implementation. The mixing zone study work plan must be submitted for DEC approval

within 545 days (approximately 1.5 years) from the effective date of the permit. This will allow a minimum of two years of sampling data to be collected during the 2016 AKG521000 permit cycle and results submitted to the work group for evaluation prior to the draft mixing zone study report due to DEC.

The required objectives, as discussed above, and the approved work plan will require the Seafood Processors' Work Group to obtain water quality sampling data from a minimum of 50% of the authorized operators. The data gathered will be reflective of multiple established discharge scenarios (low discharge pounds per year/low current; low discharge pounds per year/high current or flushing rate; high discharge pounds per year/low current, etc.), as well as develop a sampling plan and perform receiving water quality sampling with the same pollutant parameters required in Permit Part 2.7.6. The Mixing Zone Work Group must analyze the data collected and submit a draft report within 180 days following the completion of sample collection. The report must address the environmental monitoring objectives by using appropriate descriptive and analytical methods to test for and to describe any impacts of the effluent on water quality and/or the benthic community. The report must contain all relevant quality assurance/quality control (QA/QC) information including, but not limited to, instrumentation, laboratory procedures, detection limits/precision requirements of the applied analyses, and sample collection methodology.

DEC will review the draft report in accordance with the environmental monitoring objectives and evaluate it for compliance with the requirements of the permit. If DEC requests revisions to the report, the Work Study Group must complete the revisions and submit the final report to DEC within 60 days of the Department's request. Modifications to the monitoring program may be approved if DEC determines that the modification is appropriate. The modified program may include changes in sampling stations, sampling times, and/or parameters.

4.8 Zone of Deposit (ZOD) Analysis *(Permit Parts 2.7.3 thru 2.7.4)*

4.8.1 Regulatory basis for authorizing a Zone of Deposit

A zone of deposit (ZOD) is defined as a limited area where substances may be allowed to be deposited on the seafloor of marine waters. In accordance with state regulations at 18 AAC 70.210, as amended through June 26, 2003, the Department has authority to authorize a ZOD in a permit. The section of the regulation allows the Department, in its discretion, to issue a permit that allows a deposit of substances on the bottom of marine waters within limits set by the Department. The water quality criteria of 18 AAC 70.020(b) for residues may be greater than zero in a zone of deposit, and the antidegradation requirement of 18 AAC 70.015 may be exceeded within the zone of deposit. However, the WQS shall be met at every point outside the ZOD. In no case shall the WQS be violated in the water column outside the ZOD by any action, including leaching from, or suspension of, deposited materials.

As found in 18 AAC 70.210(b), in deciding whether to allow a ZOD in a permit, the Department considers, as it determines to be appropriate;

4.8.1.1 Alternatives that would eliminate, or reduce, any adverse effects of the deposit - The Department's analysis can be found in FS Part 4.8.6.1 and alternatives are required to be individually identified by the operator in applying for a new project area ZOD;

4.8.1.2 The potential direct and indirect impacts on human health (The Department's analysis can be found in FS Part 4.8.6.4)

4.8.1.3 The potential impacts on aquatic life and other wildlife, including the potential for bioaccumulation and persistence (FS 4.8.2.3);

4.8.1.4 The potential impacts on other uses of the water body (FS 4.8.4.1, 4.8.6.6);

4.8.1.5 The expected duration of the deposit and any adverse effects (FS 4.8.6.7); and

4.8.1.6 The potential transport of pollutants by biological, physical, and chemical processes (FS 4.8.6.9).

4.8.2 ZOD History.

A one-acre ZOD for seafood processing waste was authorized in both the 1995 and 2001 AKG520000 permits via the State's CWA Section 401 Certification for shore-based (onshore) facilities discharging zero to one-half nm from shore, and near-shore vessels discharging one-half to one nm from shore. The Department's 401 Certification of the 2001 AKG520000 permit provided a ZOD for each shore-based processor and each single location where a near-shore (mobile or stationary) processor discharged. The Department's CWA Section 401 Certification did not simply authorize just a single one-acre ZOD that would be cumulatively applied to all discharge locations where shore based vessel or near-shore vessels were authorized to discharge. When EPA incorporated zone of deposit language into the AKG520000 permit it used the following language:

> ***Section V(B)****Near Shore Seafood Processors (1)(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)."*
>
> And,
>
> ***Section V(C)****Shore-based Seafood Processors(1)(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).*
>
> *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."*

But in reviewing the record and the final AKG520000 permit, EPA it did not include the language from the DEC 401 Certification Part III(B)(1), which read:

> *"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." [*Emphasis added*]*

By their nature vessels are mobile facilities, moving to process seafood at the locations that the fisheries openings allow. If a facility was a vessel authorized under the AKG520000 permit, it is unreasonable to think that vessel would operate at only one location, or that one a single, one acre ZOD would be assigned to a vessel no matter where the vessel discharge. Even the AKG520000 permit required that all near-shore and shore-based vessels that discharge at a single location for more than seven (7) days within a year conduct a seafloor monitoring program. A "single location" was defined as 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.

The 2016AKG521000 proposes discontinuing authorizing vessel ZOD's for each single area of operation. Seafood processing waste discharges from a vessel while in transit to hydrodynamically energetic waters are have been modeled to disperse over a large area and are not expected to produce deposits on the seafloor. Discharges to waters deeper than 120 feet are assumed to disperse and any seafood waste on the seafloor is assumed to be less than 0.5 inches thick and covering less than 10% of the bottom within a 3 foot square sample plot. These assumptions based upon the modeling effort performed as part of the AKG523000 permit development are still deemed to be accurate and applicable to vessels discharging an onshore facility's ground seafood processing waste. For processing operations while in transit, the department has conducted or participated in several studies regarding the dilution available in a receiving water from various sized cruise ships discharging while in transit. Using information available from these studies (see Permit 2009DB0026 Information Sheet), it is expected that sufficient dilution will be available at the boundary of the mixing zone when a vessel is discharging an onshore facility's ground seafood processing waste. New permit requirements include maximum amounts allowed to be discharged at each single area of operation, required distances from shore, identify location of single area(s) of operation by GPS location and comparing locations to Excluded Areas restrictions.

4.8.2.1 Continuous, Discontinuous and Trace Coverage

The 2001 AKG520000 permit also did not clearly define what level of seafood processing waste coverage (continuous, discontinuous, or trace) on the seafloor counted towards the maximum one-acre ZOD. This lack of clarification has led to differing agency interpretations as to what constitutes compliance with the one-acre ZOD provision.

Seafloor surveys are used to verify permit compliance by analyzing the size of the seafloor deposits. In the 2001 AKG520000 permit seafloor surveys were only required for onshore (shorebased) facilities to depths of -120ft MLLW; and for near shore facilities if an operator discharged at a single location for more than seven consecutive days in waters less than -120 feet at MLLW. The EPA's response to comments document provided this depth was chosen due to diver safety issues and lack of practical survey methods that do not involve divers performing a seafloor survey in deep water. New technologies have been introduced in recent years to make surveying at deeper depths possible. One of these technologies include underwater Remote Operated Vehicles (ROVs). ROVs are linked to a host ship by a neutrally buoyant tether or, often when working in rough conditions or in deeper water, a load-carrying umbilical cable is used along with a tether management system (TMS). Most ROVs are equipped with at least a video camera and lights. Additional equipment is commonly added to expand the vehicle's capabilities. These may include sonars, magnetometers, a still camera, a manipulator or cutting arm, water samplers, and instruments that measure water clarity, water temperature, water density, sound velocity, light penetration, and temperature.

The 2016 AKG521000 permit proposes to require seafloor survey's in depths beyond -120 feet MLLW due to changes in survey method technology.

4.8.2.2 Listing Waterbodies for Water Quality Concerns

DEC has used 1.5 acres of continuous seafood waste deposits, from two consecutive dive surveys, as the method to establish if a waterbody should be placed on the Category 5/303(d) list for residues if one of the following conditions is met: (1) the operator failed to submit a remediation plan, or (2) a remediation plan has been submitted, but the operator is failing to implement or is not meeting milestones set forth in the approved remediation plan. This method is used to determine if the waterbody had deposits (residues) beyond those authorized in the AKG520000 permit (1.0 acre)

Permits Establish Limits, not Water Quality Standards. The fixed 1-acre ZOD used for previous impairment determinations is a permit limit and not a water quality standard. Alaska's ZOD regulations (18 AAC 70.210) allow the deposition of substances on the bottom of marine waters within limits set by DEC. However, the standards must be met at every point outside the ZOD. DEC specifies the criteria that can be exceeded in a permit, short-term variance, or certification. If a discharger is granted a ZOD within a permit, the permittee can only exceed the criteria that have been identified in its permit, short-term variance, or certification. Permits use the WQS as a basis for setting effluent, ZODs are an Alaska allowed water quality standard (18 AAC 70.210).

A waterbody associated with an Seafood processing facility where there is no currently permitted or active discharge to the water, but where the last known dive survey reported more than 1.0 acres of continuous residues coverage on the marine seafloor, is placed on the Category5/Section 303(d) list.

To have a waterbody be removed from the Category 5/Section 303(d) list and operator must document through two consecutive dive surveys that the total aggregate area of continuous cover has been reduced to less than 1.5 acres to have the waterbody removed from the Category 5/Section 303(d) list. If the total aggregate area extent of continuous cover is not declining in size, DEC will initiate permit modification or TMDL development.

The use of a greater than 1.5 acres of continuous coverage impairment standard for log transfer and seafood processing facilities with ZODs is based on several factors:

Under the AKG521000 Onshore Seafood Processors GP, exceeding the 1-acre continuous-cover threshold triggers the requirement to develop a remediation plan.

It is recognized that excessive residue coverage of more than 1.5 acres that is continuous and in excessive depth accumulations can have adverse impacts. Facilities that are operating under permit conditions with ZODs are accepted as not adversely affecting the biological community or causing irreparable harm.

4.8.2.3 Modeling Seafood Residues Coverage Areas

The 2001 AKG520000 permit had a 10 million pound limit on the amount of seafood processing waste that could be discharged from an onshore or near shore facility. The 10 million pound limit was based upon modeling performed in the 1994 ODCE. The ODCE provided discussion on the modeling performed and basis for the 10 million pound limit for an outfall located approximately six feet above the seafloor forming a 1.0 acre of continuous coverage (ZOD).-The following section provides more information on the transport, persistence, and fate of seafood processing waste that is discharged.

(NOTE: This section is carried forward from the 1994 ODCE developed in support of the initial 1996 AKG520000 permit for seafood processing facilities. The modeling effort is still deemed to be accurate and applicable to formation of seafood waste deposits today.)

4.8.2.4 Conceptual Model of Seafood Waste Discharges

The following is a description of a conceptual model of the most important factors that control the fate, transport, and persistence of seafood processing waste discharges, including the potential adverse environmental impacts associated with the discharge of seafood waste.

Seafood wastewater discharges consist of a combination of dissolved and solid waste particles. The dissolved portion of the waste consists of water soluble organic compounds and soluble nutrients. The liquid portion of the waste may also contain disinfectants used to clean the processing areas. For remote facilities, the solid fraction of the waste is required to be ground to a particle size of 0.5 inch in diameter or less before discharge. The solid fraction consists of a variety of particles ranging from small bits of bone, shell, fat, or flesh to larger fragments of internal organs and fragments of flesh and fat attached to bone, shell, or connective tissue. Thus the solid fraction likely consists of a range of solid particle sizes with chemical compositions and densities that depend on the relative amount of protein, fat, bone, chitin, and connective tissue in each particle.

Once discharged to the receiving water, the rate at which the liquid and solid wastes are dispersed and advected away from the point of discharge will depend on the physical and chemical properties of the discharged waste discussed above, and the physical oceanographic characteristics of the receiving water. These oceanographic characteristics include the location of the discharge in the water column, the presence or absence of density stratification, water depth and bottom topography, and prevailing directions and speeds of wind and/or tidal currents. The solid waste particles will settle to the bottom at a rate that depends on the shape, density, and size of the individual particles. Once deposited on the bottom, periods of high currents or storm induced bottom turbulence can result in the resuspension and transport of deposited seafood waste solids away from the point of discharge.

Following seafood waste's discharge to the receiving water, the particulate and solubles are subjected to chemical and biological transformations that result in the decomposition of the waste materials and the production of bacteria and chemical compounds. The decomposition of the soluble and particulate organic matter consumes dissolved oxygen and results in the production of varying quantities of soluble compounds including carbon dioxide, methane, ammonia, soluble phosphorus, and hydrogen sulfide. Scavenging organisms including fish, crabs, and polychaete worms may also feed on the particulate waste that is suspended in the water column or fresh waste that has accumulated on the bottom.

The environmental effects that may be associated with seafood waste discharge include reduction of water column dissolved oxygen concentrations and reduction of oxygen in sediments affected by decaying waste accumulated on the bottom. Seafood wastes also have the potential to be toxic to marine organisms via the discharge of wastewater containing ammonia and residual chlorine compounds, or other disinfection compounds, and the bacterially mediated production of ammonia and hydrogen sulfide from decaying waste accumulations. If phytoplankton in the vicinity of the waste discharge are nitrogen or phosphorus limited, the additional nutrients supplied by the waste discharge may increase phytoplankton productivity and alter the species composition of the phytoplankton community.

The most important variables that affect the transport, fate, and persistence of seafood processing wastes subsequent to their discharge to receiving waters are 1) the physical

oceanographic characteristics of the receiving water, 2) the distribution and settling velocities of the waste particles, and 3) the loss processes and decay rates of the discharged organic matter. The available information on these variables that is relevant to predicting the transport, fate, and persistence of seafood processing waste discharges to marine waters of Alaska is summarized below.

4.8.2.5 Physical Oceanographic Characteristics of the Receiving Water

Significant physical oceanographic characteristics to consider include water temperature, density stratification, and water circulation in the vicinity of seafood processing discharges. Significant seasonal variation in water temperature and density stratification occur in the Gulf of Alaska and the Bering Sea, especially in coastal waters in the vicinity of large freshwater inputs during winter and spring. Elevated surface water temperatures lower the saturation concentration of dissolved oxygen. Warmer surface waters overlying colder water also result in greater density stratification. Warmer surface waters occur in late summer. Density stratification of the water column can result in the trapping of waste discharges below the water surface which may result in lowered dilution of the wastewater discharge, but prevent the appearance of the wastewater plume (scum, residues, seafood processing oil and grease) on the water surface.

Water circulation results in the advection or transport of discharged wastewater, and when bottom currents (or wind-induced waves) are strong enough, solid wastes that have settled on the bottom may be resuspended and transported away from the discharge. Water circulation occurs through wind and tidal currents. The amount of wind and tidal circulation will vary seasonally, and tidal currents will vary over the course of the day in many coastal areas of Alaska which experience semi-diurnal tides. Wind-driven circulation most strongly influences circulation patterns during winter storms that frequent the Gulf of Alaska and Bering Sea.

Although it would be difficult to classify the marine waters of Alaska into regionally distinct oceanographic regimes, some generalizations were made from the available data on tide ranges and maximum tidal currents. Tide ranges and hence tidal currents are generally highest in the areas of Southeast Alaska, Prince William Sound. Cook Inlet, and Bristol Bay. Diurnal tides range between 10.1 and 28.8 feet at Yakutat and Anchorage, respectively. Maximum tidal current speeds in these areas range from 0.1 to 4.0 mi/hr at Juneau and Anchorage, respectively. The highest tide ranges and tidal currents occur in Cook Inlet, an estuary with one of the greatest tidal amplitudes and currents known.

In the area of the Alaska Peninsula and Aleutian Islands, including the Pribilof Islands and the island of Kodiak, and in the northern portion of the Bering Sea in the vicinity of Kuskokwim Bay, Norton and Kotzebue Sound, the tide range and tidal currents are generally lower. Diurnal tides in these areas range between 2.9 and 10.8 feet at Nome and Port Moller, respectively. The predicted maximum tidal current speed at Port Moller is 1.9 mi/hr.

It should be noted that seafood processing operations that occur at a fixed position (i.e., onshore and anchored floating processors) generally choose to operate in locations that are relatively protected so that fishing and supply vessels can easily dock and transfer catch or load finished products. The locations of seafood processing operations in Alaska can be generally represented by four physical oceanographic environments:

4.8.2.6 Protected bays or harbors with reduced wave action, but possibly significant tidal currents.

4.8.2.7 Nearshore open coastal areas which are affected by wave action depending on the water depth and wind and tidal currents.

4.8.2.8 Rivers or estuary mouths with some wave action and a predominant tidal and freshwater influence.

4.8.2.9 Open water which is affected primarily by wind driven currents, although tidal currents may be important at some locations.

Because stationary operations are typically located in coastal environments with reduced currents and wave action, discharges from these facilities may result in accumulation of solid waste on the bottom in the vicinity of the discharge.

4.8.2.10 Seafood Waste Particle Settling and Resuspension Current Speeds

Seafood waste particle settling velocities and the current speeds required to resuspend deposited waste particles are important factors that affect the fate, transport, and persistence of discharged seafood waste solids. Estimates of these variables for seafood waste solids are summarized below.

Settling Velocities of Seafood Waste Particles. Ground seafood waste that is discharged is required to consist of solid particles that are no larger than 0.5 inch in any dimension. Currently, no studies have been identified that have adequately characterized the particle size distribution of ground seafood waste or the characteristic settling velocities of these particles. However, one study of the open water disposal of ground seafood waste conducted in Chiniak Bay, Kodiak Island, Alaska, provides a first-approximation of the settling velocities of seafood waste particles (Stevens and Haaga 1994). Unground particles (primarily gills, skin, fins, and viscera 2-10 inches in diameter) required approximately 0.5 hr to settle to the bottom at depths of 400 to 500 feet (Stevens and Haaga 1994). Smaller particles (less than 0.5 inch diameter) required more than 1 hr to settle to the bottom. These ranges in settling times and water depths provide approximate bounds for the settling speeds of typical seafood waste particles of 0.098-0.262 foot/sec.

An approximation of the settling velocities of seafood waste particles can also be predicted using the method described by Sleath (1984). This method calculates the settling velocity of a smooth, non-rotating spherical particle of a specific diameter and density in a motionless fluid. The density of a seafood waste particle can be approximated assuming a density of 1.0, 1.5, 0.9, and 3.0 g/m^3 for water, protein, fat/carbohydrate, and bone/chitin, respectively, and a percent water, protein, fat/carbohydrate, bone/chitin content of 75, 15, 7, and 3, respectively (see Table 2.2). These assumptions result in an estimated particle density of 1.13 g/m^3. The calculated settling velocities of spherical particles with diameters ranging from 0.04-0.5 inch and a density of 1.13 g/m^3 are shown in Table 3.1.

These predicted settling velocities are generally much greater than those suggested by the observations of Stevens and Haaga (1994) described above. A spherical particle density that would result in settling velocities that were more consistent with the observations of Stevens and Haaga (1994) is 1.05 g/m^3 (see Steven's and Haaga, Table 3-1). The differences between the predicted and observed settling velocities may be due to 1) differences in particle sizes (the particle size distribution observed by-Stevens and Haaga may have been biased to larger particles), 2) overestimation of actual settling velocities for a given particle density using the method described in Sleath (1984) due to non-spherical particle shapes and greater drag forces of the actual particles, or 3) overestimation of the actual particle densities. The method described by Sleath (1984) has been developed for idealized particles and has been applied most successfully to predicting the settling

velocities of fine mineral particles with relatively small diameters. This method may not be as reliable for the prediction of the settling velocities of relatively large, irregularly shaped organic waste particles.

Resuspension Current Speeds. The settling velocity of the solid waste particles (and the height of the discharge above the bottom) affects the initial areal extent of the deposit of solid waste on the bottom in the vicinity of the discharge. However, in regions that experience high currents it is important to consider the potential for the solid waste particles to be resuspended following deposition. If solid waste is resuspended and transported away from the vicinity of the discharge, the accumulation of solid waste would be less than that predicted based on the settling velocity and decay rate of the waste solids. The potential adverse impacts to benthic communities would also be reduced.

Resuspension and transport of deposited seafood waste solids is possible if the current speeds are sufficiently large. Periodically high current speeds can result from wind, tide, or wave action along the coast. Along the coast of Alaska, the currents in many areas are dominated by semidiurnal tidal currents. These can be approximately represented as a sine wave with amplitude equal to the maximum current speed. Assuming that the maximum current speed exceeds the critical resuspension current speed required to lift waste particles off the bottom, then resuspension and transport of material is possible during a portion of a tidal cycle. The amount of material transported depends on the duration and frequency of occurrence of the critical current speed. The critical current speed depends on the size and density of the waste particles, and the cohesiveness of the waste accumulation on the bottom.

The critical resuspension current speed [i.e., the critical current speed 3.3 feet above the seafloor (U_{100})] can be estimated for a particle of specified diameter and density in a non-cohesive sediment using Shield's diagram (Vanoni 1977) to compute the critical shear velocity u_* and the relation $u_* = (0.003)^{0.5} * U_{100}$ (Sternberg 1972). Critical resuspension current speeds calculated using this method are shown in Table 5 for the same particle sizes and diameters used to estimate settling velocities. These current speeds are necessarily first-approximations because the critical resuspension current velocities predicted using this method do not incorporate the effect of the cohesiveness of the waste solids accumulation which will necessarily resist resuspension and transport (Nowell et al. 1981). Diver observations of where seafood waste piles have accumulated often note a microbial mat over the surface of the pile which may increase the resistance to resuspension of decaying waste (e.g., USEPA 1991). The actual critical resuspension current speeds may likely to be higher than those shown in the Table below.

Estimated settling velocities and current speeds necessary to resuspend different sizes of seafood solid waste particles.

Seafood Waste Particle Diameter (cm)	Settling Velocity[a] (m/sec)		Resuspension Current Speed[b] (m/sec)		
	$\rho = 1.13$	$\rho = 1.05$	$\rho = 1.05$	$\rho = 1.13$	$\rho = 1.4$
For a given particle density in g/cm^2					
0.1	0.017	0.0057	0.07	0.11	0.20
0.2	0.036	0.014	0.08	0.15	0.28
0.3	0.055	0.021	0.09	0.18	0.37
0.318 (1/8 in)	0.058	0.022	0.09	0.19	0.38
0.4	0.072	0.029	0.10	0.22	0.44
0.5	0.089	0.036	0.12	0.25	0.51
0.6	0.105	0.042	0.13	0.28	0.58
0.635 (1/4 in)	0.111	0.045	0.14	0.29	0.60
0.7	0.122	0.049	0.14	0.31	0.64
0.8	0.138	0.055	0.16	0.34	0.70
0.9	0.154	0.062	0.17	0.37	0.76
1.0	0.165	0.068	0.18	0.40	0.82
1.1	0.174	0.075	0.19	0.42	0.86
1.2	0.181	0.081	0.20	0.45	0.90
1.27 (1/2 in)	0.186	0.085	0.21	0.47	0.93
1.3	0.189	0.087	0.22	0.47	0.95

[a] (Stokes fall velocity (Sleath 1984). Assumes a seawater density of 1.025 g/cm^3 and a kinematic viscosity of seawater at 5° C equal to 1.52×10^{-6} m^2/sec

[b] The calculation of the resuspension current speed [i.e., the current speed 1m (3.3 ft) above the seafloor (U_{100}) that is sufficient to cause resuspension of particles] is based on use of Shield's diagram (Vanoni 1977) to compute the critical shear velocity $u_* = (0.003)^{0.5} U_{100}$ (Sternberg 1972).

Although resuspension current speeds are likely to be higher shallow water than in deeper water, it should not be concluded that it would be more advantageous to locate seafood waste discharges in shallow waters. Shallow wastewater discharges will result in relatively lower initial dilution of the soluble portion of the waste due to the limited volume of dilution water available in shallow areas. Discharges in shallow near-shore waters also increase the potential for the surfacing of the waste plume and the accumulation of solids along the shoreline in the vicinity of the outfall.

4.8.2.11 Seafood Waste Decay and Loss Processes

Waste solid and liquid (i.e., particulate and dissolved) organic matter is decomposed by bacteria and eaten by scavenger organisms when released into the environment. The rate of decomposition or decay not only determines the persistence of the released organic matter, but the decay also results in the consumption of oxygen and the release of soluble compounds including nitrogen (e.g., ammonia), phosphorus (as soluble phosphorus), carbon dioxide, hydrogen sulfide, and methane.

Microorganisms mediate the chemical oxidation responsible for the degradation of organic matter. Microorganisms require an electron acceptor to accomplish this reaction, and different electron acceptors yield different amounts of usable energy. In the environment, the degradation of organic matter involves a series of reactions, each successive reaction yielding less energy per unit of carbon oxidized than the previous reaction. Simplified forms of these reactions are presented in Table 6. It is also important to note that the stoichiometry of organic matter, here formulated as $(CH_2O)_x(NH_3)_y(HPO_4)_z$, is much more complex than represented. The organic matter is actually composed of various complex chemicals that may be generally grouped as proteins (amino acids) and soluble material (which contain nitrogen, phosphorus, and sulfur), fats and carbohydrates, and proteinaceous mineral matter that comprises skeletal and connective tissue (e.g., chitin which also contains nitrogen).

Idealized chemical reactions of microbially mediated organic matter decomposition.

Microbially mediated processes:

Aerobic respiration

$(CH_2O)_x(NH_3)_y(H_3PO_4)_z$[a] + $(x+2y)O_2$ --> xCO_2 + $(x+y)(H_2O)$ + $yHNO_3$ + zH_3PO_4

Nitrate Reduction

$5(CH_2O)_x(NH_3)_y(H_3PO_4)_z$ + $4xNO_3$ --> xCO_2 + $3x(H_2O)$ + $xHCO_3^-$ + $2xN_2$+ $5yNH_3$ + $5zH_3PO_4$

Manganese reduction

$(CH_2O)_x(NH_3)_y(H_3PO_4)_z$ + $2xMnO_2$ + $3xCO_2$ + xH_2O--> $xHCO_3^-$+ $2xMn^{2+}$ + yNH_3 + zH_3PO_4

Iron reduction

$(CH_2O)_x(NH_3)_y(H_3PO_4)_z$ + $4xFe(OH)_3$ + $7xCO_2$ --> $8xHCO_3^-$ + $3xH_2O$ + $4xFe^{2+}$ + yNH_3 + zH_3PO_4

Sulfate reduction

$2(CH_2O)_x(NH_3)_y(H_3PO_4)_z$ + xSO_4^{2-} --> $8xHCO_3^-$ + xH_2S + yNH_3 + $2zH_3PO_4$

6. Methane production

$2(CH_2O)_x(NH_3)_y(H_3PO_4)_z^-$ --> xCO_2 + xCH_4 + $2yNH_3$ + $2zH_3PO_4$

7. Fermentation (generalized)

$12(CH_2O)_x(NH_3)_y(H_3PO_4)_z$ --> xCH_3CH_3COOH + xCH_3COOH + $2xCH_3CH_2OH$ + $3xCO_2$ + xH_2 + $12yNH_3$ + $12xH_3PO$

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[a] Theoretical chemical formula for organic matter.

Source: Aller 1982.

A more detailed organic matter composition can be approximated to better describe the amount of nitrogen, phosphorus, and sulfur that is liberated during the organic matter microbial decay process. The relative amount of these elements varies among the various types of organic matter. For example, Vollenweider (1985) described the theoretical stoichiometry of protein, lipid, and chitin with the following chemical formulas:

4.8.2.12 Protein and soluble material: $C_{61}N_{16}H_{100}O_{24}SP$[2]

4.8.2.13 Chitin and connective tissue: $C_{32}N_4H_{56}O_{20}$

4.8.2.14 Fats and carbohydrates: $C_{15}H_{30}O$

All of the sulfur and phosphorus and most of the nitrogen is contained in the protein and soluble fraction of the organic matter.

The rate of decay of organic matter depends on several factors including the composition of the material (i.e., refractory or labile) and decomposition pathways which depend on the chemical (e.g., oxic vs. anoxic) and physical (e.g., temperature and currents) environment. Values of organic matter decay rate constants reported in the literature are extremely variable (see Table 3.3), ranging over five orders of magnitude ($1.6x10^{-6}$ to $1.4x10^{-1}day^{-1}$).

Only one study of the decomposition of discharged seafood waste solids has been identified. In this study Tetra Tech (1986, 1987) developed and calibrated a seafood waste pile decay model to predict the accumulation and decay of solid seafood waste disposed in Akutan Harbor, Alaska. The model assumed that: 1) all of the waste discharged accumulated at the point of discharge (i.e., no losses due to resuspension or slumping and transport) and 2) the decay of the pile was due only to microbial activity (i.e., scavenging by organism was not an important loss process). Decay rates were developed for the aerobic and anaerobic decay of fish and crab composed of protein, fats and carbohydrates, and bone or chitin. The first-order decay rate constants that provided a reasonable fit to the available data on the temporal variability of the waste pile volumes were 0.1, 0.01, and 0.001/day for aerobic decay and 0.01, 0.005, and 0.0005/day for anaerobic decay of protein, fats and carbohydrates, and bone/chitin, respectively (Tetra Tech 1986,1987).

The activity of scavenging organisms may also account for the reduction in the volume of accumulated waste in the vicinity of the discharge. However, no quantitative information regarding the consumption (i.e., loss) rate of seafood waste by organisms has been identified. However, marine organisms such as fish and invertebrates have been observed to feed on recently discharged solid waste particles (Hill, B., 8 June 1994, personal communication; Stevens and Haaga 1994). No quantitative studies regarding the importance of this activity have been identified.

The microbial decomposition process results in the liberation of a number of soluble compounds depending on the supply of electron acceptors (e.g., oxygen, nitrate, and sulfate) and the oxidation reduction state of the environment and the amount liberated depends at least partly on the rate of decay of the organic matter (Froelich et al. 1979; Aller 1982) (See Table 7 for organic material decay rates). The microbially mediated reactions typically proceed in a predictable sequence based on the amount of energy released from the reaction beginning with the aerobic decomposition in the presence of oxygen, nitrate reduction of organic matter using nitrate as an electron acceptor and iron and manganese reduction in the near absence of oxygen, and sulfate reduction, methane production, and fermentation in the absence of oxygen. All of the microbial decay processes result in the liberation of soluble phosphate. Additional biological and chemical reactions can result in the assimilation of the released phosphate or the binding of phosphate to mineral particles. However, several studies have found that the amount of

[2] The elements of the chemical formula are designated by the following symbols: C = carbon, N = Nitrogen, H = hydrogen, O = oxygen, S = sulfur, and P = phosphorus.

phosphorus actually released is typically greater than that predicted using stochiometric models due to the release of mineral-derived phosphates bound to sediments under the near anaerobic conditions typical of organic rich sediments (e.g., Almgren et al. 1975; Froelich et al. 1979). Nitrate and ammonia nitrogen compounds are also released from decaying organic matter, but additional microbial reactions such as assimilation and the transformation of ammonia to nitrate (i.e., nitrification), and nitrate to nitrogen (i.e., denitrification) serve to reduce the amount of ammonia and nitrate release to the overlying water column. The underestimation of the amount of nitrogen compounds released during organic matter decay using stochiometric models has been attributed to the loss of these compounds via nitrification-denitrification (e.g., Almgren et al. 1975). Hydrogen sulfide is also produced from the reduction of sulfate during anaerobic decay of organic matter in the presence of sulfate. However, additional chemical reactions complicate the prediction of the amount of sulfide released from decaying organic matter using simple stochiometric models. These reactions include the rapid oxidation of sulfide (Almgren and Hagstrijm 1974) and the binding of sulfide with mineral particles.

Range of sediment decay constants (K) for organic material.

Day^{-1}	Degraded Substrate	Measurement Method	Location	Reference
$1.6x10^{-6}$ [a]	Refractory organic material	Benthic chamber, core incubator, pore water	Santa Monica Basin, CA	Jahnke 1990
$<8.2x10^{-5}$ [a]	Organic material	^{14}C	Resurrection Bay, AK	Henrichs and Doyle 1986
$>4.1x10^{-4}$ [a]	Labile organic material	Benthic chamber, core incubator, pore water	Santa Monica Basin, CA	Jahnke 1990
$1.2x10^{-3}$ [a]	Labile organic material	^{14}C	Long Island Sound, NY	Turekian et al. 1980
$1.7x10^{-3}$ – $6.0x10^{-3}$ [a]	Organic material	Pore water nitrogen	North Sea	Billen 1982
$2.3x10^{-3}$ [b]	Organic material	^{35}S	Long Island Sound, NY	Westrich and Berner 1984
$2.7x10^{-3}$ [b]	Refractory organic material	^{35}S	Long Island Sound, NY	Westrich and Berner 1984
$2.7x10^{-3}$ [a] – $8.2x10^{-3}$ [a]	Refractory algal material	^{14}C	Resurrection Bay, AK	Henrichs and Doyle 1986
$1.0x10^{-2}$ [c]	--	--		EPA 1982
$2.0x10^{-2}$ [b]	Labile organic material	^{35}S	Long Island Sound, NY	Westrich and Berner 1984
$2.4x10^{-2}$ [a]	Labile algal material	^{35}S	Long Island Sound, NY	Westrich and Berner 1984
$1.4x10^{-1}$ [a]	Labile algal material	^{14}C	Resurrection Bay, AK	Henrichs and Doyle 1986
Range $1.6x10^{-6}$ – $1.4x10^{-1}$				

[a] Total degradation was measured.

[b] Only anoxic degradation was measured.

[c] No experiments were conducted

4.8.2.15 Development of a Numerical Model to Predict Deposition of Seafood Waste

Due to the diversity of Alaskan seafood processing operations and the variety of physical oceanographic conditions, a computer model of seafood processing waste discharges would provide a very useful tool to evaluate the transport, fate, and persistence of discharged seafood waste. The ideal computer model would simulate all of the relevant physical, chemical, and biological processes and provide predictions for all potential adverse impacts on marine and coastal communities including effects on fish, marine birds, and humans. However, due to limitations in the understanding of physical and chemical processes, interactions between chemical and physical processes and biological communities, and limitations in computing power, computer models are typically mathematical simplifications of the most relevant processes and interactions (Thomann and Mueller 1987). The following sections describe the selection and development of a computer model with the capabilities to predict the long-term accumulation of solid waste on the bottom in the vicinity of seafood processors discharging from a fixed location.

4.8.2.16 Model Selection

Two EPA-supported computer models were initially identified that could effectively model the deposition, decay, accumulation, and areal extent of seafood solid waste. The two EPA models identified were the Simplified Deposition Calculation (DECAL) (USEPA 1987) and the Water Quality Analysis Program Version 5.10 (WASP5) (Ambrose et al. 1988). Both models were considered suitable for modeling the deposition, decay, and accumulation of seafood solid waste. However, WASP5 is also capable of modeling water column dissolved oxygen and nutrient-phytoplankton interactions. These additional capabilities of WASP5 as well as the potential to incorporate the influence of relatively complex shorelines and tidally-varying current speeds and directions resulted in the selection of the WASP5 model for use in predicting the areal extent of seafood waste solids accumulation. However, the additional complexity of the WASP5 model results in some sacrifice in ease of use and increases the amount of computing time required to run the model. The original WASP5 computer code also required some modifications to accommodate the prediction of organic solids decay and accumulation.

4.8.2.17 Description of the Modified WASP5 Model

The existing WASP5 and EUTROS (a sub-model component of WASP5) models (version 5.10) were modified by adding three state variables to represent three size classes of seafood waste solids particles. The proportion of solids in each of the three size classes and their settling velocities can be specified in the model. Seafood waste solids are modeled on a dry weight basis with decomposition accounted for in the oxygen balance through a 50 percent carbon:dry weight ratio and a stoichiometric factor of 2.67 g O_2/g C. Additional secondary output variables were added to the EUTROS sub-model to track the dry weight deposition flux of each size class of seafood waste as it passed from the water column to the bottom sediments. Also, additional kinetic constants were added to the EUTROS sub-model to account for the carbon:dry weight ratio and the first-order decomposition rates in the water column and sediment layers.

The current model uses a simple scheme of a steady along-shore net-drift current speed. This is the long-term net transport rate away from the point of discharge. Longitudinal, lateral, and vertical dispersion coefficients are used to approximate the spreading of the waste due to tidal actions. As currently modified, the model does not account for resuspension and transport of deposited waste solids. The potential for resuspension and transport can be assessed using estimates of the resuspension current speeds necessary to

transport deposited solid wastes, and site specific information regarding average maximum current speeds, peak current speeds, and their duration.

The modeling grid system consists of a variably-spaced Cartesian grid system with two water column layers and one benthic layer. In the vicinity of the discharge there are 25 small segments each having a dimension of 60x60 feet which provides a 2.0 acre coverage of fine resolution computational cells (see Figure 3.1). As one moves away from the discharge, the segment sizes become progressively larger. The entire grid system consists of 300 water column segments and 150 benthic segments.

Because WASP5 does not explicitly model the initial dynamics of the buoyant wastewater plume, the waste discharge point source is located between the upper and lower water layers that are simulated in the model. The effect of density stratification on mixing and dilution of the wastewater plume is not considered in the model.

The current version of the model provides predictions of the areal extent and the depth of the seafood waste deposit depending primarily on the horizontal dispersion coefficients, mass emission rate of seafood waste solids (in dry weight), the settling velocities and proportions of solids in each of the three particle classes, the first-order decay rate of waste solids, and the net-drift current speed.

4.8.2.18 Selection of Modeling Case Scenarios

Twelve modeling case scenarios were developed for application of the WASP5 model to assess the potential for accumulation of seafood solid waste under a variety of conditions (Table 8). These scenarios included six simulations for discharges from onshore facilities with discharges located 6.6 feet above the bottom in 50 feet of water. Combinations of low and medium net-drift current speeds [5 and 15 cm/sec (0.10 and 0.29 mi/hr)] and three bottom slopes (0.0, 12.5, and 25 percent) resulted in the six case scenarios modeled for onshore discharges. These scenarios were selected to evaluate the effect of varying slope and current velocities on the model-predicted accumulation of seafood waste solids from onshore facilities.

Summary of WASP5 modeling case scenarios of onshore and off-shore near-surface seafood solid waste discharges.

Case #	Net velocity (cm/sec)	Total depth (m)	Surface layer thickness (m)	Bottom layer thickness (m)	Bottom slope (%)
Onshore discharges					
1	5	15.24	11.24	4.00	0.0 %
2	15	15.24	11.24	4.00	0.0 %
3	5	15.24	11.24	4.00	12.5 %
4	15	15.24	11.24	4.00	12.5 %
5	5	15.24	11.24	4.00	25.0 %
6	15	15.24	11.24	4.00	25.0 %
Near-surface discharges in open ocean					
7	5	15.24	2.00	13.24	0.0 %
8	15	15.24	2.00	13.24	0.0 %
9	5	30.48	2.00	28.48	0.0 %
10	15	30.48	2.00	28.48	0.0 %
11	5	45.72	2.00	43.72	0.0 %
12	15	45.72	2.00	43.72	0.0 %

Six case scenarios were also selected to evaluate the effect of varying current speed and water depth on the model-predicted accumulation of seafood waste solids due to surface discharges from stationary floating processors. These simulations included a discharge 6.6 feet below the water surface in water depths of 50, 100, and 150 feet and a low and medium current speed. The bottom slope in all of these cases was 0.0 percent (i.e., a flat bottom).

For each modeling case scenario, the model was run for varying steady mass emission rates to determine the waste solids mass emission rate that would result in the bottom accumulation 0.4 inch deep or more over a 1.0 acre area at steady-state (i.e., decay losses balanced by waste inputs). Although the WASP5 model has the capability to model time-varying solids mass emission rates, a steady (e.g., annual average) mass emission rate was used to simplify the estimation of the steady-state accumulation of waste solids.

4.8.2.19 Selection of Model Input Variables

Based on the information provided in Section 2.0 on the characteristics and quantity of Alaskan seafood waste and additional information provided above in Section 3.1 the values for several model input variables were selected for use in the modeling case scenarios. These values were considered to be reasonable estimates for a typical seafood processing waste discharge and receiving water characteristics. Because of the limited information for a number of the model variables (e.g., the first-order organic matter decay rate constant), the selection of input values for these variables was necessarily based somewhat on professional judgment. Due to the relative uncertainty of the values selected, the results of the modeling case scenarios should be considered a first-approximation. However, the modeling case scenarios do provide an indication of the relative sensitivity of the model to the factors that are varied in each case. Sensitivity of the model to particular variables will suggest which variables should be the focus of future laboratory or field investigations.

Table below shows the variables that were selected for use in the modeling case scenarios. The rationale for the selection of the values for the proportion of solids in the three size classes and their settling velocities and the first-order waste solids decay rate constant is described below.

Seafood waste accumulation model input variables.

Solids distribution	Settling velocities (m/sec)
60 percent	0.085
20 percent	0.045
20 percent	0.022
Waste solids decay rate constant	0.02/day
Lateral and longitudinal coefficients	$D_x = D_y = m^2/sec$

Solids Distribution and Settling Velocities. The settling velocities of the three particle classes were selected from Table 3.1 and were chosen to approximate the range of settling velocities observed by Stevens and Haaga (1994). For lack of better information the distribution of solids in each of the three particle classes was selected as follows. Sixty percent of the waste solids was assumed to be composed of particles with settling velocities of 0.28 feet/sec. Conceptually these are the waste particles with a diameter of 0.5 inch. Twenty percent of the waste solids were assumed to be composed of particles with settling velocities of 0.15 feet/sec. Conceptually these are particles with a diameter of 0.25 inch. Twenty percent of the waste solids were assumed to be composed of particles with settling velocities of 0.072 feet/sec. Conceptually these particles with a diameter of 0.125 inch.

Waste Solids Decay Rate Constant. Because of the wide range of possible organic matter decay rates, and because of the uncertainty regarding the significance of scavenging of the waste by organisms, the model waste solids decay rate constant was estimated by holding all model variables constant (the low current speed case was used) and comparing the model results to an actual Alaskan seafood waste discharge with a known annual discharge rate and a reasonably well surveyed waste accumulation in the vicinity of the discharge. It was assumed (although no data were available to verify the assumption) that the actual waste accumulation was not affected by resuspension and transport of the waste that had been deposited. The areal extent of the waste accumulation predicted by the model was compared to the observed areal extent of the actual waste accumulation. The model decay rate constant was adjusted until a reasonable agreement was obtained between the bottom coverage predicted by the model and the observed waste coverage.

This comparison process resulted in the estimation of a first-order waste decay rate constant of 0.02 day^{-1} which is within the range of values presented in Table 7.

If field data had been available for the net-drift current speed, waste solids particle distribution, and particle settling velocities for the actual discharge studied, the decay rate could have been estimated more precisely. Nonetheless, the method used to estimate the decay rate likely provided a reasonable estimate of a decay rate constant that has been shown to vary over five orders of magnitude depending on the environment and type of organic matter (see Table 7).

4.8.2.20 Modeling Case Scenario Results

The WASP5 seafood waste accumulation model was run iteratively to predict the steady-state solid waste discharge rate that would produce a bottom accumulation of seafood waste with a depth of 0.4 inch or greater over an area of 1.0 acre (Table 10). These results provide a first-approximation of the annual seafood solid waste discharge rate that would result in a bottom accumulation of seafood waste equal or exceeding the proposed ZOD of 1.0 acre. This iterative process was conducted for each of the twelve case scenarios. The model predictions are based on the assumption that resuspension and transport is negligible. Resuspension and transport of deposited solids may occur at individual facilities if bottom current speeds exceed the critical current speed required to resuspend bottom waste accumulations (see Section 3.1.2). Therefore, the model predictions may be considered conservative estimates of the potential for waste accumulation under the conditions described in the model for the twelve case scenarios. The results for the near-bottom onshore and near-surface floating discharges are summarized and discussed below.

Two estimates of the areal extent of the waste pile have been provided in Table 10. The first areal coverage estimate is based on interpolation of the WASP5 model-estimated waste deposit depths in each modeling cell using the computer program SURFER™. This program creates contour plots of the depth of the waste pile based on the model-estimated waste deposit depths in each WASP5 modeling cell and calculates the area covered by waste deposits 0.4 inch deep or greater (Figure 3-3). The second estimate of the areal extent of the waste pile is based on summing the areas of the WASP5 modeling cells that contain accumulations of seafood waste solids 0.4 inch deep or greater. For example, if the waste accumulation was greater than 0.4 inch in all of the smallest WASP5 modeling cells near the discharge point [i.e., 9, each with an area of 0.08 acre] in the vicinity of the discharge, then the estimated areal coverage of seafood waste solids greater than 0.4 inch

deep would be 0.72 acre. For the near bottom onshore and near-surface modeling case scenarios the two rates are similar, generally within 20 percent.

Summary of WASP5 modeling case scenarios of onshore and offshore near-surface seafood solid waste discharges.

Case #[a]	Net velocity (cm/sec)	Total depth (m)	Bottom slope (%)	Waste solids discharge rate (lb/yr wet weight)	Maximum waste accumulation depth (cm)	Areal Coverage (acres)	
						S[b]	W[c]
Near-bottom onshore discharges							
1	5	15.24	0.0	16,000,000	230	1.0	0.8
2	15	15.24	0.0	12,000,000	133	1.2	1.0
3	5	15.24	12.5	20,000,000	230	1.0	0.8
4	15	15.24	12.5	16,000,000	179	1.3	1.1
5	5	15.24	25.0	20,000,000	288	1.0	0.8
6	15	15.24	25.0	16,000,000	179	1.3	1.1
Near-surface discharges in open ocean							
7	5	15.24	0.0	8,000,000	63.4	1.0	0.8
8	15	15.24	0.0	4,000,000	19.2	1.2	0.6
9	5	30.48	0.0	4,000,000	24.2	1.1	0.9
10	15	30.48	0.0	4,000,000	12.3	1.3	1.0
11	5	45.72	0.0	4,000,000	18.5	1.2	1.2
12	15	45.72	0.0	4,000,000	8.0	1.3	1.0

[a] Case numbers correspond to the case scenarios outlined in Table 3.4

[b] Areal coverage of solid waste estimated by SURFER™

[b] Areal coverage of solid waste estimated using WASP5 output

4.8.2.21 Near-Bottom Onshore Discharges

The first-approximation of the annual near-bottom onshore seafood waste solids discharge that would result in a waste accumulation greater than 1.0 acre in waters with a net-drift current speed of 0.16 feet/sec, a depth of 50 feet, and a flat bottom is 16 million pounds (wet weight) of waste solids. The maximum accumulated solids depth of this pile is predicted to be 7.5 feet. The first-approximation of the amount of seafood waste solids discharge that would result in the accumulation of greater than 1 acre of seafood waste on the bottom in waters with a net-drift current speed of 0.49 feet/sec, a depth of 50 feet, and a flat bottom is 12 million pounds of waste solids. The maximum accumulated solids depth of this pile is predicted to be 4.4 feet. The first-approximation of the amount of seafood waste solids discharge that would result in the accumulation of greater than 1 acre of seafood waste on the bottom in waters with a net-drift current speed of 0.16 feet/sec, a depth of 50 feet, and a sloping bottom (12.5 percent and 25 percent) is 20 million pounds of waste solids (see Cases 3 and 5, Table 10). The maximum accumulated solids depth of these piles are predicted to be 7.5 and 9.4 feet, respectively. The first-approximation of the amount of seafood waste solids discharge that would result in the accumulation of greater than 1 acre of seafood waste on the bottom in waters with a net-drift current speed of 0.49 feet/sec, a depth of 50 feet, and a sloping bottom (12.5 percent and 25 percent) is between 12 and 16 million pounds of waste solids (see Cases 4 and 6, Table 10). The maximum accumulated solids depths of these piles are predicted to be 5.9 feet.

The model predicts that less waste discharge is required to create a 1 acre pile 0.4 inch deep or greater when the current speed is higher because the higher current speed serves to spread the waste over a larger area. The model predicts that the waste accumulation will be relatively deep [i.e., greater than 3.3 feet] because the simulated discharge is 6.6 feet above the sea floor and the waste particles settle rapidly to the bottom in the vicinity of the discharge. The model also predicts that on sloping bottoms, more seafood waste can be discharged than on a flat bottom before a pile greater that 1 acre is created. The model-predicted estimates of the near-bottom onshore waste discharges that would result in a 1 acre waste pile were consistent with the limited data on actual waste pile accumulations in the vicinity of several onshore seafood processing facilities. For example, the maximum areal extent of a waste pile deposit of 0.7 acres, was associated with an annual solids discharge rate of approximately 11.1 million pounds of seafood waste.

4.8.2.22 Near-Surface Floating Discharges in Open Ocean

The first-approximation of the annual near-surface open water seafood waste solids discharge that would result in a waste accumulation greater than 1 acre in waters with a net-drift current speed of 0.16 feet/sec a depth of 50 feet, and a flat bottom is 8 million pounds (wet weight) of waste solids. The maximum accumulated solids depth of this pile is predicted to be 2.1 feet. The first-approximation of the amount of seafood waste solids discharge that would result in the accumulation of greater than 1 acre of seafood waste on the bottom in waters with a net-drift current speed of 0.49 feet/sec, a depth of 50 feet, and a flat bottom is 4 million pounds of waste solids. The maximum accumulated solids depth of this pile is predicted to be 2.1 feet. The first-approximation of the annual near-surface open water seafood waste solids discharge that would result in a waste accumulation greater than l.0 acre in waters with a net-drift current speed of 0.16 or 0.49 feet/sec, depths of 100 or 150 feet, and a flat bottom is approximately 4 million pounds (wet weight) or less of waste solids. The maximum accumulated solids depth of these piles are predicted to be 0.3-0.8 feet.

The model predicts that discharges to near-surface waters will result in areal coverage of 1.0 acre of the bottom with significantly less seafood waste discharged than the near-bottom discharge model cases. These results can be explained by the fact that seafood waste discharges to the near-surface waters are exposed to the currents during settling for a longer time than the near-bottom discharges, and consequently, are dispersed over a larger area. As can be seen from the predictions of the maximum waste accumulation depths, the volume of material that accounts for the 1 acre coverage is much less than for the near-bottom discharges (see Table 10).

4.8.2.23 Modeling Case Scenarios Summary

The modeling results suggest the complexity of the regulation of seafood waste discharges. Tradeoffs are evident between the desire to minimize the appearance of wastewater and waste solids at the water surface, the transport of the waste onshore, and the accumulation of waste solids on the bottom, while also trying to maximize the dispersion and dilution of the waste. For onshore facilities, the seafood waste accumulation model predicts that relatively deep [greater than 3.3 feet] waste deposits will occur when the end of the discharge pipe is 6.6 feet above the bottom. Increasing the net-drift current speed to 0.49 feet/sec spreads the waste over a larger area, increasing the areal coverage of the waste pile. At these current speeds the areal extent of the bottom waste accumulation appears to be controlled primarily by the current speed and not by the amount of the waste discharged. At higher current speeds greater areal coverage of the waste is predicted. On the other hand, the WASP5 seafood waste accumulation model of near-surface discharges from floating facilities predicts relatively shallow deposits [approximately 0.3-0.8 feet deep] for the low and medium (0.16 and 0.49 feet/sec respectively) current speeds modeled. Under these conditions the areal extent of the waste pile greater than 0.4 in deep is controlled primarily by the discharge rate. Greater areal coverage of the waste from near-surface discharges is predicted for lower discharge rates than from near-bottom discharges (see Table 10).

The model predictions discussed above are considered conservative estimates of bottom waste accumulation because the WASP5 model does not consider the resuspension and transport of deposited wastes. Therefore, actual bottom accumulations at facilities where current speeds sufficient to resuspend and transport significant amounts of deposited wastes will tend to be much less than those predicted by the model. A first-approximation of the likelihood that resuspension and transport of deposited seafood wastes may occur can be made by estimating or measuring current speeds in the vicinity of individual facilities and comparing them to the estimated resuspension current speeds in Table 5.

4.8.2.24 Summary

A conceptual model of the fate, transport, and persistence of seafood processing waste was developed that also identified the potential adverse biological effects caused by this discharge. A number of biological, chemical, and physical factors control the fate of the discharged wastes. Biological factors include microbial decay and scavenging of the waste by organisms. Chemical factors include the chemical composition of the waste, particularly the content of protein and soluble organic compounds, fats and carbohydrates, and skeletal and connective tissue. Each of these components has a characteristic chemical composition and decay rate. Physical factors that control the fate, transport, and persistence of the waste include density stratification, storm-, tidal-, and wind-induced currents, and water temperature. Current speed direction and duration strongly influences the transport and dispersion of the waste and critical current speeds can resuspend and

transport waste solids deposited on the bottom. Although simple stoichiometric models of organic matter decay have been used by some researchers to predict the release of soluble compounds to the overlying water due to the microbial decay of organic matter, there are a complex of coupled reactions that complicate the reliability of these simple model predictions. These models typically under-predict the amount of soluble phosphorus released, due to the additional release of mineral-bound phosphorus, and these models over-predict the release of ammonia nitrogen and hydrogen sulfide because of additional microbial processes and chemical reactions that reduce the concentrations of these compounds in the overlying water.

A mathematical model was developed to simulate the discharge and accumulation of solid wastes from discharges near the bottom from onshore facilities, and discharges near the surface from floating processing facilities in open water. Two current speeds (0.16 and 0.49 feet/sec) were simulated. For the simulations of onshore facilities the bottom slope was varied resulting in six case scenarios, and for the floating facilities the water depth was varied which also resulted in six case scenarios. The model was used to provide a first-approximation of the amount of waste solids discharge that would result in an approximately 1 acre bottom deposit of seafood waste. The modeling results indicated that a steady annual discharge from an onshore facility of approximately 12-20 million pounds (wet weight) of solid waste would be required to produce a 1 acre deposit in the absence of significant resuspension and transport of the deposited waste. For a near-surface discharge in 50 feet water depth a steady annual discharge of approximately 8 million pounds would be required to produce a 1 acre deposit. In water depths greater than 50 feet, seafood waste discharges of 4 million pounds or less are predicted to create waste deposits of 1 acre.

4.8.3 Introduction of Project Area ZODs

EPA-issued a NPDES General Permit for Log Transfer Facilities (LTFs) (AKG701000) in 2000, which authorized the discharge of bark and wood debris, under specified terms, to both near shore and offshore marine waters in Alaska within the permit's area of coverage. Permittees authorized by the 2000 LTF General Permit were required to develop and implement Remediation and Pollution Prevention Plans to restrict their discharges to inside the perimeter of a project area ZOD.

The Department certified the 2000 LTF General Permit pursuant to CWA Section 401 on August 24, 1999. DEC's certification included a new project area ZOD provision. The term, project area, meant the entire marine operating area of an LTF, either shore-based or off-shore, including the following components: shore-based log transfer devices; shore-based log transfer, rafting, and storage areas; helicopter drop areas; vessel and barge loading and unloading areas; offshore log storage areas not adjacent to a shore-based LTF; bulkheads, ramps, floating walkways, docks, pilings, dolphins, anchors, buoys and other marine appurtenances; and the marine water and ocean bottom underlying and connecting these features.

The LTF project area ZOD established a one-acre remediation threshold (not a fixed limit) for continuous bark coverage greater than 10 cm deep at any point. If the one acre threshold was exceeded, the state certification triggered requirements for remediation planning. The ZOD for the 2000 LTF permit issuance allowed for the presence of discontinuous and trace cover bark without limits within the project area. DEC's decision to allow the 2000 LTF project area ZOD provision was based on two primary considerations. The first consideration was that the fixed one acre limit for continuous cover bark and wood waste failed to acknowledge that discontinuous (10% to 99% cover) and trace (<10% cover) bark coverage and wood waste was

likely to be found within the operational footprint of a facility. In the evaluation of compliance status of bark residues in the AKG701000 general permit, bark found outside a fixed one acre ZOD would have been a violation of the Alaska WQS and potentially subject to enforcement. By adopting a project area ZOD, DEC allowed for the presence of discontinuous and trace cover bark through a the application of WQS 18 AAC 70.210, which was consistent with the logic that the piles would disperse over time and water quality impacts would be mitigated by natural processes (i.e., current-induced dispersion).

Accordingly, in the 2016 AKG521000 permit the Department will be assigning a project area ZOD for each seafood processing facility or fish waste producing facility producing greater than 30,001 pounds of seafood or fish waste per year, acknowledging that fish waste and seafood processing waste is likely to be found within the operational marine footprint of the facility and not solely isolated to the immediate vicinity of the seafood processing outfall terminus. The entire marine operating area of an onshore or over-water-onshore seafood processing facilities or fish waste producing facility shall include, fish transfer areas (including docking areas where vessels unload their fish, anchor to wait to unload their fish, and clean fish holds), marine areas that encompass a facilities existing, in-use seafood discharge outfalls, as well as outfall lines no longer in use.

DEC recognizes that seafood deposits may be continuous, discontinuous or trace, depending on discharge amounts, the ocean currents, and in the way deposits are dispersed along the ocean floor within the project area ZOD. It is also the intent that seafood processing and fish wastes be dispersed and naturally attenuate along the ocean floor within the project area ZOD. On a large scale, ocean currents are the vertical or horizontal movement of both surface and deep water throughout the world's oceans. On a smaller scale, ocean currents and tides move fish waste in a water body from one location to another, sometimes in short time periods given the nature of the deposit and the ambient velocity of the receiving water. Dive surveys in Alaska have routinely documented the movement of seafood waste deposits, within as little as two months between dive surveys. In some cases, from one dive survey to the next, deposits have increased, decreased and/or disappeared.

Additionally, DEC is proposing a modification to the seafood survey reporting (monitoring and reporting applicable to deposits) requirements in the 2016 AKG521000 permit (Permit Appendix F). The proposed modification would require operators to map and report the total aggregate area of continuous seafood waste deposits coverage within the project area ZOD boundary. The first required mapping of coverage areas includes continuous coverage is defined as 100% coverage of the seafloor by seafood waste deposits within a three foot by three foot individual sample site. Second, discontinuous seafood waste coverage ranging from 99% to 50% at individual sample sites. The third required mapping of coverage areas includes discontinuous seafood waste coverage ranging from 49% to 10% at individual sample site. Coverage of less than 10 % seafood waste, or less than 0.5 inch in thickness, will not be required to be mapped and will be noted as "Trace" on the Seafloor Survey: Transect Data Form (Permit Attachment D). The seafloor survey must also determine the depth of seafood waste deposit piles.

The selection of 50% is based on research results from two studies that have been published that examined the effects of wood waste discharges from pulp mills, not seafood processing facilities. DEC acknowledges that the findings from the two studies are not directly applicable to seafood discharges since the study's subject was wood, not seafood waste. However, at this time, DEC finds the identified wood waste studies to provide the most meaningful corollary to studying seafood deposition in the marine environment until such time monitoring data (seafloor surveys) is collected and analyzed for facilities operating in compliance with required

permit provisions, or new studies are completed or identified that provide useful information on the effects of seafood deposition in the marine environment applicable to the amounts of seafood waste limited by the permit.

The 1984 Kathman study (Effects of Wood Waste on the Recruitment of Potential of Marine Benthic Communities, R.D. Kathman, S.F Cross, and M. Waldichuk, Department of Fisheries and Oceans Fisheries Research Branch, West Vancouver Laboratory, June 1984) found infauna colonization in artificial mixtures of wood waste (not bark) and sediments increased up to 60% for a 20% mixture and just slightly for a 50% mixture. This study concluded that "Species richness increased at 20% but showed a dramatic reduction at 100%. Diversity and evenness were highest at 20%, with slight decrease at 0% and 50%., and a large decrease at 100%. Dominance, the reciprocal of evenness, indicated that only a few species represented the majority of the individuals at the 100% treatment, but that there were no particular species dominant at the other three concentrations."

DEC also reviewed the study titled "Effects of Wood Waste for Ocean Disposal on the Recruitment of Marine Macrobenthic Communities" by E.R. McGreer, R.D. Munday, and M. Waldichuk (Department of Fisheries and Oceans, Fisheries Research Branch, August 1985). This study evaluated the effects of wood waste depth instead of percent volume. The study abstract concluded that "The effect of different thicknesses (1, 5, and 15 cm) of a fine wood waste material upon the recruitment of marine macrobenthic communities was experimentally assessed using in situ settlement trays. A clean marine sediment was used in the experiment as a reference substrate. Differences in species composition and abundance of macrobenthos settling to the reference and 1 cm wood waste substrate compared to the 5 and 15 cm wood substrate were found. Species richness showed a consistent decrease with increasing thickness of wood waste."

While project area ZODs are not a new concept to APDES LTF permitting, project area ZODs and the inspection of the project area ZOD is new to APDES seafood permitting. However, given the operational and discharge similarities between LTFs and seafood processors as well as the natural consequence of tidal action dispersing deposits, the concept of a project area ZOD is a more rational regulatory scheme for both seafood processors and LTFs than the assignment of a simple one acre ZOD. The permit proposes to assign a project area ZOD to each facility covering all areas where the onshore facilities seafood processing activities are occurring.

At times, due to vessels dragging anchor, poor outfall pipe corrosion protection or various harbor projects, outfall pipes are broken, replaced or even moved several hundred feet, which has resulted in a change of the location of the seafood deposits. Additionally, it is common for incoming vessels to unload their catch, and then rinse out their vessel hulls or fish holds while tied to the dock while at the dock. This is due to availability of fresh clean water from the onshore facility, thereby is an inherent part of the onshore facility's seafood processing operations to possibly create deposits near the docks. It is DEC's intent for the operator to perform the seafloor survey on the entire project area ZOD to capture the "operational" deposits discussed above, as well as other areas of deposits, if any. DEC has determined that the project area ZOD approach is an effective way to survey the operational seafood marine footprint from an onshore facility, as well as to allow for seafood waste deposits to disperse without causing a violation of the residue criteria.

Consistent with how DEC interprets the ZOD provisions included in the 2001 AKG520000 permit, the 2016 AKG521000 permit is not increasing the total authorized size of seafood waste/fish waste deposits from the one acre ZOD. The permit proposes to apply count total

aggregate area of continuous coverage to the one acre of allowed deposits in the project area ZOD.

The project area ZOD approach will require the operator to survey a greater area of the seafloor to identify possible areas where deposits may have occurred as a result of the onshore facilities operations, and provide a total areal representation of all deposits in the Seafloor Survey Report in accordance with Appendix F. The total aggregate area of continuous coverage will not include trace coverage areas (less than 10% coverage or less than 0.5 inch in deposit depth), or those discontinuous sample site areas that have less than 100% coverage in an individual sample site when determining when an operator needs to submit a Remediation Plan. Appendix F requires the operator to map the total areal and depth seafood/fish waste deposits; measuring and accounting for all levels of seafood deposits coverage areas (continuous, discontinuous and trace).

DEC has initially assigned project area ZODs for each facility located in marine water bodies (ZODs are not permitted in fresh water per 18 AAC 70.210). DEC's initial project area ZOD mapping approach is a draft mapping of the project area ZOD, which will be refined by the facility operators as they perform the seafloor surveys. Many facilities have not performed a seafloor survey since early in the 2001 AKG520000 permit cycle. Due to ocean currents, dispersion, changes in processing, etc. over the course of the past 14 years, DEC only reviewed those facilities Seafloor Survey Dive Reports from the past five years while performing the initial project area ZOD geospatial mapping. Where deposits were noted in seafloor surveys, DEC has GIS mapped the deposits as close as possible (the prior permit did not require the facility operator to submit the seafood deposits mapping as digital data) reflecting approximate deposit size and location. DEC notes that once the seafloor surveys are performed under the new seafloor survey project area ZOD Protocol Requirements found in Appendix F, a revised size and location of the project area ZOD may occur. The Seafloor Protocol and Guidance document (Appendix F) provides the acceptable protocols for performing seafloor surveys of the project area ZOD. Seafloor survey results will be used for to determine if additional limits are required, to monitor potential effluent impacts on receiving water body quality and to inform future permit decisions.

This proposed seafloor survey modification is intended to gather additional information on discontinuous seafood waste coverage distribution within project area ZODs, given the lack of performance monitoring data and published studies on the effects of discontinuous seafood waste and percentages of coverage of discontinuous seafood waste deposits and their effects on the seafloor. During the early permit development stage of the Permit and Fact Sheet, EPA pointed to observations that benthic studies have shown that discontinuous waste have caused negative impacts to the benthic community. To DEC's knowledge these benthic studies have been performed during the auspices of EPA consent decrees, as part of enforcement actions where the permittee had discharged solids in excess of permit limits, or discharged seafood processing waste not specifically covered by the permit. For these reasons DEC is seeking further information regarding the distribution of amounts and sizes (areal distribution) of seafood wastes and observations made of varying percent coverages (10-49% and 50-99%) of discontinuous waste and any observed short term or long term benthic community effects of permittees discharging in compliance with permit conditions.

If this data gathering efforts provide consistent results, DEC may consider potential modifications to current remediation planning requirements in future permits. Additionally, through more through data gathering DEC will evaluate if both continuous seafood waste deposit cover greater than 1.0 acres, at any point, and; some portion of existing discontinuous seafood waste coverages, should be restricted in size or depth, or percent coverage. If by the

expiration date of the permit, DEC concludes that it is not possible for permittees to consistently discern coverage percentiles and map discontinuous seafood waste deposit coverage areas, or benthic effects are not found from discontinuous seafood waste deposits, this requirement may be deleted from future permits.

All assigned project area ZODs contained in and public noticed through the issuance of the permit shall be integrated into new 2016 AKG521000 permit authorizations without additional public notice. New facility operators that propose to discharge and request a project area ZOD in marine waters of the U.S. after the effective date of the permit shall be public noticed for a minimum of 30 days. The Department will evaluate each application for a ZOD in accordance with DEC's Antidegradation Policy (18 AAC 70.015) and ZOD requirements found in Permit Part 1.6, as the Departmental authority under 18 AAC 70.210 and 18 AAC 70.015(a)(2) allows the Department to issue a ZOD to seafood processors if applicants provides the required information that allows the Department to find the discharge consistent with these requirements. The Department has determined the operator does not have to provide all the analysis points under 18 AAC 70.210(b)(1-6) as (b)(2,3,5 and 6) have been thoroughly discussed in this Fact Sheet Part 4.8.2.3, 4.8.4 and 4.8.6. The permit proposes (Permit Part 1.6.12.4.2) to have operators provide analysis of their own community, waste handling systems and potential by-product markets that would eliminate, or reduce, any adverse effects of the deposit (18 AAC 70.210(b)(1)). Additionally, the permit proposes (Permit Part 1.6.12.4.2) to have the operator provide a list of other known uses (secondary recreation, aquacultural facilities, etc.) within 1.0nm of the proposed discharge in order for the Department to assess the potential impacts on other uses of the waterbody (18 AAC 70.210(b)(4).

4.8.4 Allowance for a ZOD and Authorizing a Project Area ZOD

The Department has determined to authorize a project area ZOD to each facility granted a ZOD in the previous permit, as well as those facilities who have applied for coverage up to the effective date of the permit but have been unable to obtain coverage. Permit Appendix D contains lists of facilities with previously authorized ZODs, along with a link to new mapped project area ZODs.

After completing a review of a NOI, the Department may assign a project area ZOD for resulting deposits of residues from seafood processing and fish waste production activities. Project area ZODs are being assigned to a facility's marine operational area – around docks, where current and previous outfall lines and outfall terminus(s) lie on the seafloor, and thus where seafood waste discharges have occurred in order for the Department to more accurately evaluate cumulative totals of seafood waste deposits. Seafloor survey of the project area ZOD shall be used to determine the depth, total areal cover, including the identification of the outer boundary of continuous coverage, and the outer boundary of discontinuous coverage of seafood processing waste. Within an authorized project area ZOD, the water quality criteria of 18 AAC 70.020(b) for residue and the antidegradation requirement of 18 AAC 70.015 may be exceeded. However, the standards shall be met at every point outside the project area ZOD. In no case shall the WQS be violated in the water column outside the project area ZOD by any action, including leaching from, or suspension of, deposited materials. The written authorization will specify whether a project area ZOD has been authorized and the area of the authorized project Area ZOD. Additionally, the written authorization will specify whether a project area ZOD has been issued for vessel discharge areas, the written authorization will identify each single area of operation location.

Total aggregate area of continuous seafood waste deposits authorized in project area ZOD is limited to a one acre area (Permit Part 2.7.3.3).

When determining whether the general permit defined project area ZOD area is appropriate for a specific receiving area, the Department will include in its consideration the following:

4.8.4.1 The effects that the discharge might have on the uses of the receiving water. –The permit proposes that operators identify other know waterbody uses (secondary recreation, aquaculture, etc.) within 1.0 nm of the proposed discharge. Newly proposed facilities, after the effective date of this permit and those not listed in Appendix D, requesting a project area ZOD will be publically noticed, providing additional public input to uses surrounding the proposed discharge site.

4.8.4.2 The flushing and mixing characteristics of the receiving water. DEC will evaluate the information submitted on the NOI, as well as accessing NOAA maps and current data, and Form 2M data if submitted, to evaluate the flushing effects and mixing characteristics. Additionally, the more robust seafloor monitoring protocol found in Appendix F will provide DEC additional data regarding deposits and their effect on the seafloor.

4.8.4.3 The cumulative effects of multiple ZODs and other inputs affecting the receiving water – Multiple ZODs issued in receiving waters on the lower end of the flush characteristics hydrodynamically energetic waters may have cumulative effects on the seafloor and receiving water. The permit has incorporated seafloor monitoring, sea surface monitoring and WQ monitoring to maintain and collect data regarding multiple dischargers into a single waterbody.

If through the review of a NOI, the Department determines that it has insufficient information to determine whether a Project Area ZOD is appropriate at a discharge location, an operator may be required to submit additional information (see 18 AAC 70.210(b)(1)-(6)) or may be required to submit an individual permit application (see second paragraph, Part 2.7). The burden of proof for providing the required information is on the applicant seeking to establish a ZOD.

If multiple operators request coverage under the permit to discharge in the same area, the cumulative amount of seafood processing waste authorized to be discharged will be evaluated and when appropriate, limitations or prohibitions on the amount of waste authorized to be discharged will be placed in a written authorization for each operator. If a written authorization has been issued that authorizes a discharge to a specific location or operational area and the Department receives a new or updated NOI requesting coverage for another operator in the same area, the Department will determine whether circumstances have changed so that the discharges are no longer appropriately controlled under the general permit before issuing an authorization to the new operator. If the Department determines that the discharges are significant contributors of pollutants, the Department may require that the dischargers apply for and obtain individual permits (see 18 AAC 83.215(a)(5) and (6)).

4.8.5 Project Area ZOD Area Size Determination (Permit Part 1.6.11.3, 2.7.3 – 2.7.4 and Permit Appendix F, Attachment - D)

Consistent with 18 AAC 70.210, the Department has determined that the available information reasonably demonstrates that an allowed deposit(s) with the project area ZOD of a total of one acre area or less of continuous coverage (counted as cumulative coverage areas consisting of a 100% covered three foot by three foot sample site plot with greater than 0.5 inch thickness), for each discharge onshore seafood processing facility's outfall, will protect the existing uses of the receiving water body as a whole. The methods of treatment and dispersal are the most

appropriate and effective, when a seafood processing facility discharges in conformance with the permit requirements, limitations, and conditions.

The permit does not limit the total size of the authorized project area ZOD, rather it limits the total areal size of continuous deposits within to that project area ZOD.

Using data from Seafloor Surveys performed during the permit cycle, and further modeling as discussed in the previous section, the Department will refine the authorized project area ZODs area during the permit cycle and at permit reissuance.

4.8.6 Residues on the Seafloor and Evaluation

This section provides the criteria and information the Department used to evaluate the appropriateness of authorizing the total aggregate area of continuous seafood processing or ground fish waste deposits (residues ZOD) deposits in the AKG521000 permit.

4.8.6.1 Alternatives that would eliminate, or reduce, any adverse effects of the deposit.

The Department considered other alternatives to eliminate or reduce any adverse effects of the deposit. Currently Remote facilities are only required by national technology based standards to grind to ½ in all dimensions, which under some receiving water characteristics may lead to the formation of deposits (residues) on the seafloor. EPA's final determination of which discharge locations are designated as Remote and which discharge locations are designated as Non-Remote. In EPA's 1975 Rule making and subsequent industry petitions for communities to be considered Remote, includes further financial analysis of the economic costs of having to screen seafood wastes and delivering the screened solids to a by-product facility (Fish Meal, Oil, Hydrolysate, etc.). Future EPA rule make may reduce the size of needed ZODs needed in many communities. Yet, a majority of Alaskan communities would maintain their Remote status. Other alternatives considered include the barging of waste to ocean waters, barging by vessel, or conversion of fish waste product to fish meal, fish oil, and by-product recovery. The permit requires that operators discharge seafood ensure that waste is not discharge into poor flushing areas, and requires discharge to hydro-dynamically energetic waters that will ensure dispersion and natural attenuation of the seafood wastes and minimize long term accumulation of these deposits in one area.

The permit also requires that an operator identify and develop markets, to the extent feasible, for the use of seafood processing waste as a product, and not as a waste material to be discharged. This requirement is part of the permit-required BMPs.

Further information regarding adverse impacts of deposits is found below in Fact Sheet Parts4.8.6.2 and 4.8.6.5

4.8.6.2 Reducing the size and long term decreasing adverse impacts.

In 1993, a conceptual model of the transport, fate, and persistence of discharges from seafood processing facilities in Alaska and the potential adverse effects resulting from these discharges was performed in support of the initial 1995 NPDES AKG520000 general permit for seafood processing facilities.

The modeling and impact analysis effort is still deemed to be accurate and applicable to this ZOD evaluation. The1993 analysis is also supported by documents included in the issuance of the 2011 AKG52300 Seafood Processors Offshore permit (AKG523000) and provided the following analysis of "Impacts Associated with Solid Seafood Process Wastes." During discharge of seafood processing waste, biological impacts are most likely to occur as a result of the discharge of seafood waste particulates (both direct and indirect

effects). The following discussion briefly presents the different potential effects of discharges on biota including burial and habitat modification, the alteration of sediment composition, and the chemistry associated with the decomposition of the waste solids.

4.8.6.3 Burial and Habitat Modification

Disposal of seafood waste solids will have the greatest impact on less mobile benthic organisms such as polychaetes and bivalves, and on demersal fish eggs that cannot move away from the accumulating waste. The following section discusses the nature of the solid waste deposition and potential impacts to benthos and demersal eggs.

Settling of seafood discharges on the seafloor occurs at varying rates according to the size of the particles. Once settled, these particles can form organic mats or thick waste piles that can smother the underlying substrate and benthic communities within it. Some waste piles have been recorded to rise 40 feet or more above the seafloor (ADEC, 1998). The degradation of this organic material occurs at varying rates according to different characteristics of the discharge area (i.e. biological, physical, and chemical factors). In one study where salmon waste was widely distributed, the waste was completely absent within 33 days following discharge and no adverse effects on dissolved oxygen concentrations noted (Stevens and Haaga 1994). The accumulation of these deposits in some areas indicates that the rate of discharge exceeds the assimilation capacity of some water bodies and more specifically, the assimilation capacity of the benthic community and other aquatic life that metabolize this material. The permit requires that mobile offshore processors discharge seafood waste in areas with high tidal activity that will ensure dispersion and dilution of the seafood wastes and minimize accumulation of these deposits in one area. If discharge limits are adhered to, the effects on aquatic biota in areas of seafood processing waste discharge should be minimal.

Seafood processing industry representatives met with ADEC and EPA and questioned the environmental benefit of the permit effluent limit requiring grind size of 0.5 inches in all dimensions. The effluent limit was established based on the EPA's national effluent limitation guidelines and is highly unlikely to be changed. However, since the scientific validity of it was questioned, ADEC initiated a research project. One component of this research was to evaluate seafood solid waste impacts on the benthos (Germano and Associates, 2004).

The intent of this study was to see what the impacts are to the surrounding benthos and benthic community from seafood solid wastes deposited in a ZOD. The impacts were evaluated using a Sediment Profile Imaging (SPI) camera. The SPI camera takes an image of the top few inches of sediment. Aquatic life within the sediments was also collected for analysis using a Van Veen grab device. The SPI camera showed where seafood wastes made the sediments anoxic and methane producing with the presence of sulfur-producing bacteria, *Beggiatoa,* indicating anoxic conditions.

For two adjacent processors with relatively small, active discharges located approximately 600 feet apart, the visual ZODs were 0.34 and 0.21 acres. However, the area of *Beggiatoa* was approximately 6.0 to 7.4 acres. The presence of *Beggiatoa* indicates reduced oxygen in the sediments and an adverse effect to the benthos and benthic community outside of the ZOD. Other measures for adverse effects include numbers and kinds of species present.

Immediately adjacent to the smaller active piles both fish and crab forage. The diversity of benthic species was less within the first 200 feet of the periphery of the ZOD compared to

the diversity observed in a distant control site. However, the few opportunistic species that existed in the vicinity of the ZOD occurred in great numbers. At approximately 500 feet or more from the periphery of the active piles more of the normal resident species were recorded and the overall abundance of the opportunistic species was less. The study determined that normal resident species population levels and diversity did not occur until 1,500 feet or more down-current of the periphery of the waste piles.

Two other seafood processors evaluated had larger discharges and inactive waste piles greater than 1 acre in size. Very little to no solid waste discharges had occurred for the 2 years preceding the study. These discharges occurred approximately 1,000 feet apart. In this case, the *Beggiatoa* were observed in 2.8 and 0.5 acres around each waste pile respectively. The areas of reduced oxygen due to *Beggiatoa* were significantly smaller for the inactive waste piles than for the active waste piles. From these results, the authors of the study conclude that biota in sediments will revert to natural conditions within 5-10 years after the cessation of seafood waste disposal (Germano and Associates, 2004).

As stated above, seafood processing wastes can form organic mats within the ZOD, depending on the amount discharged and the biological, chemical, and physical factors affecting decomposition and dispersion of the waste. Depending on the depth of burial, deposits can make the substrate inhospitable, or influence the species composition favoring opportunistic organisms that may out-compete the normal fauna. Algal blooms caused by high nitrogen concentrations can also alter habitat by smothering benthic substrates when they die, and by reducing the available water column or surface aquatic habitat for visual predators, including birds.

4.8.6.4 The potential direct and indirect impacts on human health

Seafood processing discharges are not expected to result in elevated levels of toxic or carcinogenic pollutants in marine organisms consumed by humans.

Eutrophication of marine waters may indirectly result in enhancement of phytoplankton species that are toxic to marine organisms and humans. A separate unrelated toxicity that occurs is Paralytic Shellfish Poisoning (PSP) which is caused by the consumption of shellfish that have concentrated toxins from microscopic algae blooms, composed of such as algae as dinoflagellates, diatoms, and cyanobacteria. Dinoflagellates of the genus Alexandrium (genus) are the most numerous and widespread saxitoxin producers and are responsible for PSP blooms in subarctic, temperate, and tropical locations. The majority of PSP toxic blooms have been caused by the A. tamarense species complex, however, direct links between the occurrence of PSP and eutrophication have not been established. Therefore, the linkage between PSP and seafood processing discharges, while possible, is tenuous. Alterations in phytoplankton species composition is another potential impact of nutrient rich discharges on marine phytoplankton. Concerns regarding alterations in phytoplankton community composition are related to indirect effects resulting from increasing the populations of phytoplankton species that may produce adverse effects on marine organisms and humans. Effects produced by some phytoplankton species include physical damage to marine organisms (e.g., diatom species of *Chaetoceros* that have caused mortality of penned salmon), toxic effects to marine organisms (e.g., a raphidophyte flagellate species of *Hererosigma*), and toxic effects to humans due to the concentration of algal toxins in marine fish and shellfish [e.g., Paralytic Shellfish Poisoning (PSP), Diarrheic Shellfish Poisoning (DSP), Neurotoxic Shellfish Poisoning (NSP), Amnesic Shellfish Poisoning (ASP), and ciguatera] (Taylor 1990; Haigh and Taylor 1990). Concerns regarding toxic phytoplankton have been heightened in recent

years due to suspicions that the frequency of toxic phytoplankton blooms has increased due to human activities, especially due to agricultural runoff and the discharge of municipal and industrial wastewater to marine coastal areas (Smayda 1990; Smayda and White 1990; United Nations 1990; Anderson 1989).

Although there have been several reports linking mortalities of relatively large numbers of marine mammals (e.g., O'Shea et al. 1991; Anderson and White 1989; Geraci 1989; Geraci et al. 1989; Gilmartin et al. 1980), fish and shellfish (e.g., Cosper et al. 1990; Harper and Guillen 1989; Smayda and Fofonoff 1989), and aquatic plants (e.g., Cosper et al. 1990) to the occurrence of toxic phytoplankton in other parts of the U.S., only very recently, 2015, were such episodes of marine mammal deaths directly tied to increase toxic phytoplankton blooms on the coastal waters of Alaska. The occurrence of human intoxication due to PSP has been recorded at locations in southeast and the Aleutian Islands in Alaska (Sundstrom et al. 1990). PSP is caused by the consumption of shellfish that have concentrated toxins from an algae of the species *Protogonyaulax* (Shimizu 1989). However, direct links between the occurrence of PSP and eutrophication have not been established (Anderson 1989). Therefore, the linkage between PSP and seafood processing discharges, while possible, is tenuous.

Although there is a potential for the discharge of seafood processing waste to cause localized changes in phytoplankton species composition, there are no known studies to verify that discharges of seafood processing wastes have produced toxic or harmful phytoplankton blooms. Similarly, while Paralytic Shellfish Poisoning has been documented in Southeast Alaska, there is currently no evidence suggesting a linkage with seafood processing discharges.

4.8.6.5 The potential impacts on aquatic life and other wildlife, including the potential for bioaccumulation and persistence.

The potential adverse effects of seafood processing waste include direct and indirect impacts of the solid and liquid waste discharges to marine organisms. Potential direct impacts of solid waste discharges, including burial of benthic communities, alteration of the sediment texture, and chemical changes within the sediments as a result of decaying organic matter accumulations, are expected to be minimal. The permit limits discharges into areas of poor flushing, those areas with average currents of less than one-third of a knot at any point in the receiving water within 300 feet of the outfall, including the requirement that discharges occur into hydrodynamically energetic waters to minimize the potential of accumulation of seafood wastes. The decay of accumulated solid waste may reduce concentrations of dissolved oxygen in the overlying water column and release potentially toxic decay byproducts like unionized ammonia and un-dissociated hydrogen sulfide. Permitted discharges of seafood waste to oxygenated well-flushed areas at rates consistent with permit limitations are not generally expected to cause levels of dissolved oxygen or toxic substances that could have an adverse effect on marine organisms.

The attraction of marine mammals and birds to seafood processing waste discharges has the potential to create indirect impacts. Prohibition for Excluded areas and required monitoring in the permit are intended to reduce, eliminate and monitoring for these types of potential impacts. In some cases, project area ZODs will extend to the shoreline. It is not the Department’s intent that seafood processing waste be allowed to wash up on the shoreline exposing more marine mammals and birds to seafood processing waste through the project area ZOD. Rather the intent of the project area ZOD is to allow seafood processing wastes to naturally attenuate *at depth*, identify existing areas of seafood

processing waste deposits, for facilities to address the formation of continuous deposits beyond the one acre limit for total aggregate areas of continuous deposits in a remediation plan and updates to their BMP plan. Facilities whose shoreline monitoring reveals deposits forming or landing on the shoreline should take proactive action on investigating the cause of deposits, including outfall inspection and /or replacement, or lengthening; and making changes to facility discharge practices by altering BMP in order to control these types of deposits.

4.8.6.6 The potential impacts on other uses of the water body.

Impacts from any individual seafood processing facility discharging in compliance with the requirements of the permit are likely to be localized. Although benthic organisms may be smothered or community composition altered in localized areas of seafood deposits, the benthic communities in Alaskan coastal waters would not be expected to decline significantly. The AKG521000 permit proposes to require the operator to identify other water uses within one nautical mile

Impacts from toxicity due to anoxic conditions and changes in benthic community structure could be cumulative spatially and over time. Although more complete knowledge would be of value in assessing the magnitude and significance of cumulative environmental impact, available data indicate that unreasonable degradation is not likely to occur in areas of adequate dispersion and dilution. Receiving water body monitoring has been included in the permit cycle to evaluate water body impacts.

4.8.6.7 The expected duration of the deposit and any adverse effect.

The extent of bottom waste accumulation over the long-term depends primarily on the amount of waste discharged, the decay rate of the waste organic matter and the degree of resuspension and transport of the deposited waste.

Settling of seafood discharges on the seafloor occurs at varying rates according to the size of the particles. Once settled, these particles can form organic mats or thick waste piles that can smother the underlying substrate and benthic communities within it. The degradation of this organic material occurs at varying rates according to different characteristics of the discharge area (i.e., biological, physical, and chemical factors). In one study where salmon waste was widely distributed, the waste was completely absent within 33 days following discharge and no adverse effects on dissolved oxygen concentrations noted. The accumulation of these deposits in some water body areas with different flushing characteristics indicates that the rate of discharge exceeds the assimilation capacity of some water bodies and more specifically, the assimilation capacity of the benthic community and other aquatic life that metabolize this material. The permit requires that processors discharge seafood waste in hydro-dynamically energetic waters to assist in dispersion, dilution and assimilation of the seafood wastes and minimize accumulation of these deposits. If discharge limits are adhered to, the effects on aquatic biota in areas of seafood processing waste discharge should be minimal.

Seafood processing industry representatives met with DEC and EPA in 2003 and questioned the environmental benefit of the permit effluent limit requiring grind size of 0.5 inches in all dimensions. The grind size limit is based upon EPA's national ELGs (see AKG520000 Fact Sheet Part 4.3.4) and is unlikely to be changed. However, since the scientific validity of the effluent limitation was questioned, DEC initiated a research project in to evaluate ground up seafood solid waste impacts on the benthos. The study looked at the impacts to the sea floor from four seafood processors' waste discharge along

the coast of Ketchikan, Alaska, from the ZODs out to distances of approximately 500 meters down current and 180 meters perpendicular to the prevailing current from the point of discharge.

A total of four seafood waste deposits were examined. Two of the deposits were not actively receiving solid wastes at time of the study, nor had they been for the two years prior to the study. When they had been discharging, the annual amount discharged was between 7-11 million pounds. Two other deposits were receiving waste at the time of the study, approximately 2-3.5 million pounds of waste annually. Maximum currents around the inactive piles were 3-4 knots, while the maximum current near the active piles were lower and approached two knots. The presence of fish waste on the bottom was readily apparent from all four areas surveyed. The largest area of bottom affected was at the active discharge sites, where the waste piles merged. A more through assessment of the area of seafloor actually affected by the waste discharge was determined from looking at the extent of sulfur-reducing bacterial colonies (Beggiatoa) that had formed around the waste deposits. These colonies were chosen as indicators of low oxygen conditions and representative of areas of stress from organic loading. The area of bottom experiencing adverse effects from excess loading around the two active facilities was cumulatively about 7 acres.

The benthic infaunal community was responding to the fish waste discharge with predictable patterns of successional recovery; there have been numerous studies documenting the response of benthic infauna to organic loading, and both the sediment profile images as well as the results from the bottom grab analysis showed the classic pattern of high densities of opportunistic species nearest to the source of the organic loading. As one moves away from the waste deposits, evidence appears of more mature infaunal communities with a higher frequency of deposit-feeding infauna. The study documented enhanced secondary production and their ready availability as prey items for higher trophic levels.

The study concluded that the strong tidal currents of Tongass Narrows prevents any significant accumulation of fine-grained deposits and that there was little chance of organic material from fish waste accumulating to the point of causing severe sediment oxygen demand and causing either hypoxia or anoxia in the overlying waters. While the sampling stations right under the active discharge points were clearly impacted, there were dense assemblages of opportunistic fauna within 50-100 meters of the discharge deposit centers, following the classic pattern of benthic community response to organic enrichment.

The study also concluded that given the rapid recovery of the benthic community as one moves out from the active piles, it is assumed that the areas of the seafloor closest to the active discharge points that are currently showing adverse effects would readily recover if fish waste discharge was discontinued in the future. The study estimated that if the fish processing operations ceased operations, the effects caused by the waste discharge would disappear over time and the benthic community would recover within 5-10 years with few adverse effects remaining from the point sources of organic loading. (Germano 2004, pg 81).

4.8.6.8 The potential transport of pollutants by biological, physical, and chemical processes.

The extent of the initial accumulation of solid waste on the bottom depends on the height of the discharge above the seafloor, current speed, and the settling velocities of the waste

particles. Soluble wastes from these discharges are expected to be rapidly diluted or degraded by biological, physical, and chemical processes.

Once discharged to the receiving water, the rate at which the liquid and solid wastes are dispersed and advect away from the point of discharge will depend on the physical and chemical properties of the discharged waste and the physical oceanographic characteristics of the receiving water. These oceanographic characteristics include the location of the discharge in the water column, the presence or absence of density stratification, water depth and bottom topography, and prevailing directions and speeds of wind- and tidally-forced currents. The solid waste particles will settle to the bottom at a rate that depends on the shape, density, and size of the individual particles. Once deposited on the bottom, periods of high currents or storm wave-induced bottom turbulence can result in the resuspension and transport of deposited seafood waste solids away from the point of discharge.

Currently, few studies have been identified that have adequately characterized the particle size distribution of ground seafood waste or the characteristic settling velocities of these particles. One study of the open water disposal of ground seafood waste conducted in Chiniak Bay, Kodiak Island, Alaska, provides a first-approximation of the settling velocities of seafood waste particles. Unground particles (primarily gills, skin, fins, and viscera 2-10 inches in diameter) required approximately 0.5 hr to settle to the bottom at depths of 400 to 500 feet. Smaller particles (less than 0.5 inch diameter) required more than 1 hr. to settle to the bottom. These ranges in settling times and water depths provide approximate bounds for the settling speeds of typical seafood waste particles of 0.098-0.262 foot/sec.

The settling velocity of the solid waste particles (and the height of the discharge above the bottom) affects the initial areal extent of the deposit of solid waste on the bottom in the vicinity of the discharge. However, in regions that experience high currents it is important to consider the potential for the solid waste particles to be resuspended and disperse following deposition. If solid waste is resuspended and transported away from the vicinity of the discharge, the accumulation of solid waste would be less than that predicted based on the settling velocity and decay rate of the waste solids, which is why the discharge of seafood processing waste to energetic waters is important. The potential adverse localized impacts to benthic communities would also be reduced.

Following their discharge to the receiving water, the particulate and soluble wastes are subjected to chemical and biological transformations that result in the decomposition of the waste materials and the production of bacteria and chemical compounds. The decomposition of the soluble and particulate organic matter consumes dissolved oxygen and results in the production of varying quantities of soluble compounds including carbon dioxide, methane, ammonia, soluble phosphorus, and hydrogen sulfide. Scavenging organisms including sharks, fish, crabs, and polychaete worms may also feed on the particulate waste that is suspended in the water column or fresh waste that has accumulated on the bottom.

A number of biological, chemical, and physical factors control the fate of the discharged wastes. Biological factors include microbial decay and scavenging of the waste by organisms. Chemical factors include the chemical composition of the waste, particularly the content of protein and soluble organic compounds, fats and carbohydrates, and skeletal and connective tissue. Each of these components has a characteristic chemical composition and decay rate. Physical factors that control the fate, transport, and

persistence of the waste include density stratification, storm-, tidal-, and wind-induced currents, and water temperature. Current speed direction and duration strongly influences the transport and dispersion of the waste and critical current speeds can resuspend and transport waste solids deposited on the bottom.

Computer modeling effort was developed in 1993 to predict the accumulation, persistence, and areal coverage of discharged seafood waste. Multiple computer modeling programs were used to determine the areal extent of the waste pile, Water Quality Analysis Simulation Program version 5.10 (WASP5), SURFERTM and Simplified Deposition Calculation (DECAL). The focus of the transport, fate and persistence analysis was to predict the area covered by a persistent (year-round) accumulation of seafood waste of no more than one acre and the depth of the deposited solids as a function of distance from the discharge point. The WASP5 seafood waste accumulation model was run iteratively to predict the steady-state solid waste discharge rate that would produce a bottom accumulation of seafood waste with a depth of 0.4 inch or greater over an area of one acre. This iterative process was conducted for twelve case scenarios, six for onshore processors discharging near the seafloor and six scenarios for floating processors discharging near the surface in open water within 1.0 mile of shore. The model predictions are based upon the assumption that the resuspension and transport of deposited solids may occur at some discharge locations if bottom current speeds exceed the critical current speeds required to re-suspend bottom waste accumulations. With the assumption that resuspension and transport is negligible, the model predictions may be considered conservative estimates of the potential for waste accumulation under the conditions described in the model for the twelve case scenarios.

Two current speeds (5 and 15 cm/sec, 0.10 and 0.29 knots respectively) and three bottom slopes (0.0, 12.5 and 25 percent) were simulated. For the simulations of the onshore facilities the water depth was varied which resulted in six case scenarios. The model was used to provide a first-approximation of the amount of waste solids discharge that would result in an approximately one acre bottom deposit of seafood waste. The scenario included six simulations for discharges from shore-based facilities with discharge outfall pipe located 6.6 feet above the bottom in 50 feet of water. Six case scenarios were also selected to evaluate the effect of varying current speed and water depth on the model-predicted accumulation of seafood waste solids due to surface discharges from stationary. The scenarios were selected to evaluate the effects of varying slope and current velocities on the mode-predicted accumulation of seafood waste solids from shore-based facilities.

Model predictions were based on decay rates of 0.02 /day and various particle sizes settling velocities of 0.28 ft./sec, 0.15 ft./sec and 0.072 ft./sec, respectively.

A first areal coverage estimate was developed based on interpolation of the WASP model-estimated waste deposit depths in each modeling cell using the computer program SURFERTM. This program creates contour plots of the depth of the waste pile based on the model-estimated waste deposit depths in each WASP5 modeling cell and calculates the area covered by waste deposits 0.4 inch deep or greater.

The second estimate of the areal extent of the waste pile was based on summing the areas of the WASP5 modeling cells that contain accumulations of seafood waste solids 0.4 inch deep or greater.

The first-approximation of the annual near-bottom discharges shore-based solids discharge that would result in deposits greater than one acre was current speed of 0.16 ft./sec, depth of 50 ft. and a flat bottom discharges of 16 million pounds (wet weight) of waste solids.

Next, the current speed increased to 0.49 ft./sec, the other factors remaining the same only allowed 12 million pounds (wet weight) of waste solids discharged. Further modeling was performed with the varying slope to the bottom, with both modeling results concluding that with higher current speeds serves to spread the waste over a larger area.

The model predictions discussed above are considered conservative estimates of bottom waste accumulation because the WASP5 model did not consider the resuspension and transport of the deposited wastes. With future ZOD modeling efforts combing WASP8 with a hydro-dynamic computer modeling system such as the Environmental Fluid Dynamics Code (EFDC Hydro) which is a model that can be used to simulate aquatic systems in one, two, and three dimensions it is DEC goal during the permit cycle to further refine ZOD modeling efforts and compare to data collected during the operators seafloor survey reports.

In early 2014, DEC contracted to have available modeling software evaluated and compared to further gather further information on the formation of ZODs. In the upcoming 2016/2017 fiscal year DEC will likely contract to have further modeling performed and staff trained to complete the newest ZOD formation modeling. Accordingly, during the permit cycle, DEC will continue to rely on the 1993 modeling and the concept of a project area ZOD similar to log transfer/storage ZODs in order to authorize ZODs in the subject permit.

4.8.6.9 Project Area ZOD Area Size Determination (Permit Part 1.8.4, 2.6.5 and Permit Appendix F)

Consistent with 18 AAC 70.210, the Department has determined that the available information reasonably demonstrates that an allowed deposit(s) with the project area ZOD of a total aggregate area of one acre or less of continuous coverage (counted as cumulative coverage areas consisting of a 100% covered three foot by three foot sample site plot with greater than 0.5 inch thickness), for each discharge onshore seafood processing facility's outfall, will protect the existing uses of the receiving water body as a whole. The methods of treatment and dispersal are the most appropriate and effective, when a seafood processing facility discharges in conformance with the permit requirements, limitations, and conditions.

The permit does not limit the total size of the authorized project area ZOD, rather it limits (1.0 acres) the total aggregate area of continuous deposits within to that project area ZOD.

Using data from Seafloor Surveys performed during the permit cycle, and further modeling as discussed in the previous section, the Department will refine the authorized project area ZODs area during the permit cycle and at permit reissuance.

5.0 ANTIBACKSLIDING

5.1 Impaired water bodies and CWA 305(b) lists

The 2001 AKG520000 permit section (III) contained the following language:

"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 subpart 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).*"

The 2016 AKG521000 permit Part 1.4.4 states: "Permit coverage for discharges to waters in the following areas and to waters from of the boundaries of the following areas may be considered:

Permit coverage for facilities in or near listed impaired water bodies (those listed on the State 303(d) list, may be considered, only if new discharger's effluent will not cause or contribute to an exceedance(s) of a WQS for that waterbody area and constituent of concern, and only if in compliance with this permit and those requirements outlined in Part 3.2. Facilities proposing to discharge to impaired water bodies which include the necessity of the facility operator to apply to the Department revisions to a Total Maximum Daily Load (TMDL) for a specified waterbody, changes to the water use classes and subclasses, revisions to water quality criteria, adoption of site specific criteria, and the reclassification of waters shall be required to apply for an individual permit."

The 2001 AKG520000 permit Appendix B listed all waters on the 305(b) and 303(d) waters by entire waterbody name, without distinction as to whether entire waterbody was in fact listed, or just a specific area of the waterbody. Additionally, 2001 AKG520000 Appendix B didn't identify what pollutants the waterbodies were specifically listed for.

The AKG520000 Appendix B list presents several distinct problems, the first problem of identifying entire waterbody as being listed. For example, 2001 AKG520000 permit language specified waters on the 305(b) or 303(d) list "*which are impaired for dissolved gas or residues*" yet, the 1998 Integrated Water Quality Monitoring and Assessment Report (Integrated Report) lists Thorne Bay for 'debris'. Then in the 2002/2003 DEC Integrated Report for Thorne Bay is listed for residues. Further, the DEC 2007 Thorne Bay TMDL identifies: "*These (LTF) facilities ceased operation in 2000 …the State's 2004 303(d) list (issued in 2006) removed the former log storage area from the impaired list but maintained listing of the former log transfer marine area at the head of the bay (ADEC, 2006).*" Following a time sequence, it becomes apparent that an entire bay being listed in 1998 was decreased in area consecutively throughout the years through further refinement.

An additional problem is the 2001 AKG520000 Appendix B list as presented did not identify the pollutant the waterbody was listed for, nor allow an applicant to provide site-specific water quality studies. As has been demonstrated above, a site's 303(d) listing status changes, as well as the pollutant(s) the waterbody was initially listed for (see delisting information for Thorne Bay Hydrogen sulfide in the 1998 Integrated Report). The 2007 Thorne Bay states: "*no future permits to authorize discharge of bark and wood debris in the LTF marine area may be issued by EPA and ADEC, until WQS are met or the TMDL is revised. However, establishment of LTFs at other locations in Thorne Bay is not precluded by the TMDL. An LTF at another location would have to be established through required State and federal permitting processes.*" To completely preclude an applicant from discharging pollutants to a whole waterbody on a 305(b) or 303(d) list does not acknowledge that the water quality may not be affected in every area of the waterbody as a whole, nor if list status has changed. Additionally, the language 'This Permit does not authorize the discharge of pollutants into any waterbody … which are "impaired" or "water quality-limited" for dissolved gas or residues (i.e., *floating solids, debris, sludge, deposits, foam or scum)',* limiting the discharge of any pollutants to waterbodies impaired or water quality limited for dissolved gas or residues errors in two ways. First, it errors in not allowing the applicant to propose wastewater treatment technologies so that the discharge will not contain the pollutant causing the impairment, or other pollutant source reductions that will offset the discharge. Such example of this EPA policy can be found at: http://www.epa.gov/nutrient-policy-data/frequent-questions-nutrient-criteria-implementation. Lastly, in addressing the 2001 AKG520000 permit requirement of not allowing discharges of pollutants into any waterbody included in the CWA 305(b) report listed as 'impaired or water quality limited', the 303(d) list is a subset of the 305(b) inventory of waters. The 303(d) the list is specifically used to identify those specified areas within a waterbody that are impaired or

water quality limited. The 1972 amendments to the CWA Section 305(b) include regulations implementing Section 305(b) that require states to develop an inventory of the water quality of all waterbodies in the state and to submit an updated report to the EPA every two years. This process was established as a means for EPA and the U. S. Congress to determine the status of the nation's waters. In the 1998 and subsequent publications of the Integrated Report, DEC has identified several times where waterbodies were initially listed on the 303(d) list and then placed on the 305(b) category 2 or 3 list. This change from one category to another is done after it is shown that either through natural attenuation, decomposition or faulty initial one-time sampling studies, waterbodies should not have been placed on the 303(d) list, then needed to be removed from the list, due to water quality attainment or improper listing. It is for this reason that is unreasonable to include in the absolute prohibition of discharges to those waters that are on the 305(b) list.

DEC finds that the 2016 AKG521000 permit condition Permit Part 1.4.6 is consistent with 18 AAC 83.480. Removal of the 2001 AKG520000 permit condition was reviewed consistent with application of CWA 402(o)(2)(B)(ii), which allows that if technical mistakes or mistaken interpretations of law were made in issuing the (condition in the) permit under subsection 402(a)(1)(B) are an allowance or cause for modification of a permit condition. Additionally, CWA Section 402(o) is silent on the issue of permit conditions and only addresses backsliding in permit limitations. The 1987 revisions to the CWA Section 402(o) that implement the backsliding evaluation requirements are meant to be used when consideration to revise TBELs based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The Department is not proposing a revision to the TBELs in the 2016 AKG521000 permit. The second situation where backsliding applies is in respect to relaxation of an effluent limitation based on a State standard or WQS. When a general permit applicant seeks authorization from DEC to discharge to a waterbody that may have been previously listed as impaired or water-quality limited, the permit language found in Permit Part 1.4.6 will allow DEC the ability to make a determination if the entire waterbody is listed, or only a small part of the waterbody is listed. DEC will be able to make a decision, if the waterbody was listed for the same type of pollutant for which the applicant is applying. Decide if the operator's proposed discharge will further contribute to listed pollutant loading, or impairment. DEC will evaluate current information from within the department, other agencies, or information supplied by the applicant, to make a decision regarding the applicable discharge. Setting a clear permit path will allow the Department to making a determination whether all the information is accurate and support, or do not support, discharge to the waterbody. The permit requirements, along with required DEC technical review will ensure the applicant is not seeking relaxation of a State WQS, nor that DEC relaxing a WQS, rather the permit change ensures DEC is able to make an accurate application of EPA policy and WQS applicable to the discharge being proposed.

5.2 Surimi / Minced Seafood (washed and unwashed) Wastewater Discharge Allowance

During early agency draft permit review, EPA requested the Department perform an Anti-backsliding analysis on the proposed permit condition of allowing surimi / washed mince effluent discharge from Remote facilities. The Department disagrees that anti-backsliding analysis is necessary and offers the following explanation.

EPA's rational on requesting the anti-backsliding analysis is based on the following final AKG520000 permit conditions:

> Permit Section (I)(A) "Subject to the restrictions of this Permit, the following categories of dischargers are authorized…

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.

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."

The 2001 AKG520000 Fact Sheet (FS) contained the following:

FS Section (II)(A) "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)."

FS Section (II)(B) "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."

EPA's AKG520000 Response to Comments (RTC) document contained the following:

RTC Comment #1: "Trident Seafoods and Pacific Seafood Processors Association comment that EPA should distinguish between the unwashed and pressed fish mince used to produce frozen blocks of fish mince and the washed and pressed mince used to produce surimi in Part I of the permit. There are significant differences in the amounts and concentrations of pollutants (esp. BOD, biochemical oxygen demand) in the associated wastewaters generated in the production of these two products. The organic pollutants contained in the wastewater of unwashed mince is comparable to that of fish filleting and canning operations and should be covered under the Permit."

"Response: EPA acknowledges that there is a difference in the unwashed fish mince product which is pressed and frozen into blocks and the washed, pressed fish mince product which may be used to produce surimi. There is a concomitant difference in the pollutant levels of their respective wastewater: washed mince releases much greater amounts of pollutants than unwashed mince due to the extensive and intimate contact of the wash-water with fish flesh. *EPA has revised the permit at Part X* to include definitions of mince, washed mince, and unwashed mince. *EPA has revised the permit at Part I.B* to clarify that its prohibition of the discharge of mince effluents by near-shore and shore-based processors refers to "washed mince" rather than to unwashed mince. The basis for the prohibition of the discharge of effluents from washed mince is that the high levels of biochemical oxygen demand (BOD) that characterizes this wastewater can

> depress dissolved oxygen in the water column; this impact makes such dischargers strong candidates for individual permits."

The Department reviewed the above conditions and discussion and it became clear that initial publically noticed 2001 AKG520000 draft permit and fact sheet prohibited the discharge of all minced seafood product. Only through public comment were changes made to the AKG520000 permit, yet no effluent limits or monitoring of these types unwashed mince seafood discharges were required in the final AKG520000 permit. Therefore, WQBELs for unwashed mince or washed mince were not established, nor were BPJ TBELS applied. No other effluent limits beyond half-inch grind were applied to the unwashed mince in the AKG520000. Compliance with State WQS was required in the 2001 AKG520000 permit, but compliance with State WQS is also required in the proposed AKG521000.

The 2016 AKG521000 permit proposes to provide discharge coverage for surimi and minced seafood (washed and unwashed) for Remote operators and proposes required effluent limitation and monitoring to the proposed surimi / minced seafood wastewater discharge.

The Clean Water Act Section 402(o) states:

> (o) Anti-backsliding (1) General prohibition
>
> In the case of effluent limitations established on the basis of subsection (a)(1)(B) of this section, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 1314(b) of this title subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

The AKG520000 permit did not establish effluent limitations for unwashed or washed minced seafood. Rather the prohibition of the discharge was simply a condition of the permit. However, anti-backsliding rules are not necessarily applicable to this change in regulating the discharge of surimi / minced seafood, as the previous permit used a discharge prohibition, not an effluent limitation. The Department therefore concludes backsliding, as defined by CWA Section 401(o) "effluent limits which are less stringent", is not occurring due to the Department's application of effluent limits to this discharge, and requiring internal outfall and end-of-pipe monitoring to ensure permit compliance. Applying the permit BPJ TBELs in effluent limits and monitoring to unwashed mince seafood actually results in more stringent permit limits than the AKG520000 permit for this effluent. Remote facilities choosing to discharge surimi / minced seafood will also be subjected to end-of-pipe effluent limits based on BPJ TBELs, possibly requiring screening of final effluent instead of grinding, thereby also decreasing pollutant loading.

CWA Section 402(o)(1) also cross-references CWA Section 303(d)(4), which identifies further requirements for backsliding for water quality-based permits concerning water standards attainment. Importantly, Section 402(o)(3) states that a revised BPJ or water quality-based permit may not violate either applicable national technology-based guidelines or state WQS. The proposed AKG521000 permit does not propose to violate national technology-based guidelines or WQS. Additionally, the proposed permit contains specific 303(d) listed waterbody analysis where during authorization process the Department must ensure that receiving water is not listed for the pollutant proposed to be discharged, and that WQS for that waterbody are attained.

6.0 ANTIDEGRADATION

The Antidegradation Policy of the WQS (18 AAC 70.015) states that the existing water uses and the level of water quality necessary to protect existing uses shall be maintained and protected. This

section analyzes and provides rationale for Department decisions in the permit issuance with respect to the Antidegradation Policy.

The approach used by the Department to implement the Antidegradation Policy is based on the requirements in 18 AAC 70.015 and the Department's July 2010 Interim Antidegradation Implementation Methods (Interim Methods). Using these requirements and policies, the Department determines whether a waterbody or portion of a waterbody is classified as Tier 1, Tier 2, or Tier 3. A higher numbered tier indicates a greater level of water quality protection. At this time, no Tier 3 waters have been designated in Alaska. Accordingly, this antidegradation analysis conservatively assumes that all discharges under the permit will be to Tier 2 waters, which is the next highest level of protection and is more rigorous than a Tier 1 analysis. As a result, any discharges that contribute to degradation to Tier 1 water bodies are not eligible for coverage under the permit and would require individual permit coverage.

The permit authorizes discharges to various marine and fresh waters of the state. These receiving waters are considered tier 2 waters under the permit and tier 2 protection measures are being applied in the permit. Tier 2 waters are waters where the water quality is better than the criteria applicable for existing uses and "fishable/swimmable" uses (#2 above). A tier 2 antidegradation analysis was performed. The department will allow a reduction in water quality, in its discretion, for a zone of deposit under 18 AAC 70.210, a mixing zone under 18 AAC 70.240, or another purpose as authorized in a department permit. Before allowing a reduction in water quality, the department must determine that five criteria are satisfied [18 AAC 70.015(a)(2)(A-E)]. The Department's findings are as follows:

6.1 18 AAC 70.015 (a)(2)(A).

6.1.1 Allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located.

Based on the evaluation required per 18 AAC 70.015(a)(2)(D), the Department has determined that the most reasonable and effective pollution prevention, control, and treatment methods are being used.

According to a report released by the 2013 Alaska Seafood Marketing Institute, seafood processing jobs in Alaska contributed a combined value of seafood exports and the retail value of Alaska seafood sold in the U.S. totaled of an estimated $6.4 billion. The Alaska seafood industry directly employed 63,100 workers in Alaska in 2011 making it the state's largest private sector employer. Total direct and secondary economic output in the U.S. stemming from the Alaska seafood industry was estimated at $15.7 billion. Seafood processing facilities provide a service to communities throughout the areas where they are located. Many subsistence fishers are also commercial fishers, and their commercial catch provides income adequate for subsistence fishing: gas, nets, boats, and other gear. Fishing and fish processing are the economic backbone of many villages, towns, and communities in Alaska. Many fishing vessels from outside Alaska fish within Alaska waters and sell their catch to processors located in Alaska. These local processors provide jobs for local workers. Seafood production in Alaska is also important to interstate commerce as seafood caught in Alaska is sold to buyers from the lower 48 states, as well as international commerce as it is sold to other countries.

Over half of the nation's commercially harvested fish come from Alaska, nearly four times the amount than the next largest seafood producing state, without increased or continued Alaska seafood processing prices for seafood will continue to increase.

Eight of Alaska's ports consistently rate in the top 30 U.S. ports in terms of volume or value of seafood delivered. The City of Unalaska – Port of Dutch Harbor has ranked as the top port in the

nation for 22 years in terms of seafood pounds harvested, landing 706 million pounds in 2011 and was second in the nation in terms of value at $207 million.

Approximately 5.35 billion pounds of fish and shellfish worth over $3.0 billion were harvested in Alaska waters in 2011, putting Alaska in first place for value of landings.

Bristol Bay's sockeye fishery typically supplies almost half of the world's wild sockeye salmon. Bristol Bay's 2010 sockeye salmon harvest of 28.6 million fish was the 11th largest since 1959. The ex-vessel value was worth $165 million, greater than the total value of fish harvests in a combined 41 states.

In terms of value of landings nationwide in 2011, Alaska led with $2.3 billion, distantly followed by Maine with $527 million.

Fishing is the core economy for much of coastal Alaska where fish harvesting and processing often provide the only significant opportunities for private sector employment and where fisheries support sector businesses provide property and sales tax as the largest source of local government revenues. Seafood harvesting and processing jobs provide more than 50 percent of the private sector employment in coastal Alaska.

Issuance of the permit will allow existing seafood processing facilities to continue to operate, allow new seafood processing facilities to begin operations, and regulate seafood processing and fish waste discharges to prevent nuisance conditions and undesirable deposits from fish processing activities. Permit authorized discharges are necessary to allow facilities to operate, resulting in minimal localized lowering of water quality through mixing zones (MZ). Mixing zones allow seafood processing waste that occurs during the filleting and processing of fish to dissipate or deposit within a regulated project area ZOD. The localized lowering of water quality is temporary and limited due to natural attenuation and dispersion of seafood processing waste.

The Department concludes that the operation of the facilities and their discharges authorized by the permit accommodates important economic and social development for the State of Alaska. The Department finds that the requirements of this part of the antidegradation analysis have been met.

6.2 18 AAC 70.015 (a)(2)(B).

6.2.1 Except as allowed under this subsection, reducing water quality will not violate the applicable criteria of 18 AAC 70.020, or 18 AAC 70.235, or the whole effluent toxicity limit in 18 AAC 70.030.

Pollutants of concern in fish waste are primarily the biological wastes generated by processing raw seafood into a marketable form, chemicals used for cleaning processing equipment and fish containment structures to maintain sanitary conditions, and refrigerants that leak from refrigeration systems used to preserve seafood. Biological wastes are primarily fish parts: heads, fins, bones, and entrails. The chemicals used for cleaning are primarily disinfectants, which shall be used in accordance with EPA specifications. Refrigerants used are usually ammonia and Freon. Monitoring for ammonia is a new permit requirement to ensure WQS are being met.

The permit requires seafood processing operations to establish BMP Plans to minimize the production of waste and minimize the discharge of pollutants to waters of the U.S. The permit places limits and conditions on the discharge of pollutants to waters of the U.S. The permit limits and conditions are established after comparing and applying TBELs and WQBELs, and applying the more restrictive of these limits in the permit to ensure WQS are met.

Discharges from a seafood processing facility and fish waste producing source shall meet all water quality criteria at the boundary of an authorized mixing zone. Within this mixing zone the water

quality criteria may be exceeded for dissolved gas, non-petroleum oil and grease (polar), pH, temperature, color, turbidity, residues, fecal coliform bacteria and total residual chlorine. The discharge of seafood waste shall meet water quality criteria at the boundary of a project area ZOD. Within each project area ZOD the water quality criteria and antidegradation requirements for residues may be exceeded. The Department will review monitoring information submitted by permittees during the permit cycle to ensure water quality criteria are being met.

The Department concludes that the reduction in water quality will not violate the criteria of 18 AAC 70.020, 18 AAC 70.235, or 18 AAC 70.030 outside of the authorized mixing zone or project area ZOD; therefore, the Department finds that the requirements of this part of the antidegradation analysis have been met.

6.3 18 AAC 70.015(a)(2)(C).

6.3.1 The resulting water quality will be adequate to fully protect existing uses of the water.

The permit places limits and conditions on the discharge of pollutants to waters of the U.S under the jurisdiction of the State of Alaska. The limits and conditions are established after comparing TBELs and WQBELs and applying the more restrictive of these limits in the permit to ensure the existing uses of the waterbody as a whole are maintained and protected. The permit requires monitoring of the waste discharge, the receiving water, and the seafloor where appropriate. The results of the monitoring, must be submitted to the Department. The Department will perform permit compliance inspections of permitted facilities to meet Department goals.

In order to secure long-term water quality protection to fully protect existing uses, to ensure that seafood process facilities and fish waste producing facilities provide for the protection or attainment of existing and designated uses in State waters, facilities shall implement BMP Plans. The permit requires operators to establish BMPs to minimize the production of waste and to minimize the discharge of pollutants to waters of the U.S.

In compliance with 18 AAC 70.210, the water quality criteria of 18 AAC 70.020(b) and the antidegradation requirement of 18 AAC 70.015 may be exceeded within an authorized ZOD. However, the standards must be met at every point outside the boundary of the ZOD or mixing zone (18 AAC 70.210 and 18 AAC 70.240-270). In no case may WQS be violated in the water column outside the Project Area ZOD or mixing zone by any action, including leaching from, or suspension of, deposited materials. The project area ZODs and mixing zones are sized to ensure that the existing uses of the waterbody as a whole are maintained and protected.

The Department concludes that the discharges authorized under the terms and conditions of the permit will be adequate to fully protect the existing uses of the water The Department finds that the requirements of this part of the antidegradation analysis have been met.

6.4 18 AAC 70.015(a)(2)(D).

6.4.1 The methods of pollution prevention, control, and treatment found by the Department to be most effective and reasonable will be applied to all wastes and other substances to be discharged.

The permit requires operators of seafood processing facilities to follow prescribed BMPs minimize pollutant discharges and to comply with 40 CFR Part 408, Canned and Preserved Seafood Processing Point Source Category. The ELGs found in 40 CFR Part 408 requires remote seafood processors to meet the following: “No pollutants may be discharged which exceed 1.27 cm (0.5 inch) in any dimension.” This limitation is included as a permit condition. As part of the ELG process, EPA prepared a report in support of 40 CFR Part 408, titled ‘Development Document for

the Seafood Processing Industry Point Source Category.' EPA concluded in the development document in Section IX (page 438), "There is substantial evidence that processors in isolated and remote areas of Alaska are at a comparative economic disadvantage to the processors located in population or processing centers regarding attempts to meet the effluent limitations (screening of waste). The isolated location of some Alaskan seafood processing plants eliminates almost all waste water treatment alternatives because of undependable access to ocean, land, or commercial transportation disposal methods during extended severe sea or weather conditions, high fuel and energy costs, and the high costs of eliminating the engineering obstacles due to adverse climatic and geologic conditions." (EPA 1975).

The ELGs found in 40 CFR Part 408 requires non-remote facilities apply the BPT limits based on screening the wastewater to one millimeter (hereinafter this process is referred to as ''screening'') or less, to meet the mass-based effluent limitations for TSS, O&G, BOD_5 and an allowable range for pH. Non-remote facilities are those located in ''processing centers.'' The non-remote ELGs provide a non-exclusive list of locations that the non-remote ELGs apply, which through several iterations of regulatory suspensions, or court actions, currently only include processing areas in Kodiak; however, it is possible that additional non-remote designations will be made during the permit cycle, which the permit is equipped to handle. The 1998 AKG528000 permit incorporated these non-remote TBELs, as does the 2016 AKG521000 permit. The Department finds that the application of the non-remote TBELs should be applied to remote facilities processing surimi (washed or unwashed mince), and remote facilities should monitor their waste streams for the pollutants if they produce other seafood processing by-products (fish oil, fish meal, fish hydrolysate, etc.).

"Other wastewaters" authorized by the 2001 AKG520000 permit generated in the seafood processing operations included: domestic graywater, seafood catch transfer water, live tank water, refrigerated seawater, cooking water, boiler water, cooling water, refrigeration condensate, freshwater pressure relief water, clean-up water, storm water and scrubber water. The 2016 AKG521000 permit continues authorizing these other wastewaters as long as they are discharged through an authorized outfall meeting permit depth requirements and the operator performs monitoring to ensure WQS are met.

Domestic Wastewater covered in the 2016 AKG521000 permit allows for the discharge of onshore domestic and vessel's sanitary wastewater from seafood facilities and their support buildings, support vessels, as was found in the 2001 AKG520000 permit. Sanitary wastewater was the term used for the discharge of shower, toilet, and sink, etc. wastewater in the AKG520000 permit, covering both onshore and vessel wastewater discharge. The AKG521000 permit uses sanitary wastewater discharge for vessel discharges, but uses the term "domestic wastewater" for onshore facility domestic wastewater discharge from the definition found in 18 AAC 72.990(23). The options for sanitary or domestic wastewater discharge are: 1) discharge of secondary treated domestic wastewater to waters of the U.S. meeting the standards in 40 CFR 133; or 2) sanitary waste discharges from a vessel treated prior to discharge by a Type II Marine Sanitation Device (MSD) sanitary waste system that meets the applicable Coast Guard pollution control standards in effect [33 CFR Part 159: "Marine sanitation devices"], or a vessel's sanitary wastewater may be discharged to an onshore facility domestic wastewater handling system.

The methods of prevention, control, and treatment DEC finds to be most effective are the practices and requirements set out in the permit; the Department finds that the requirements of this part of the antidegradation analysis have been met.

6.5 18 AAC 70.015(a)(2)(E).

6.5.1 All wastes and other substances discharged will be treated and controlled to achieve (i) for new and existing point sources, the highest statutory and regulatory requirements; and (ii) for nonpoint sources, all cost-effective and reasonable BMPs.

The applicable "highest statutory and regulatory treatment requirements" are defined in 18 AAC 70.990(30) (as amended June 26, 2003) and in the July 14, 2010, DEC guidance titled Interim Antidegradation Implementation Methods. Accordingly, there are three parts to the definition, which are:

Any federal technology-based effluent limitation guidelines (ELG) identified in 40 CFR subpart 125.3 and 40 CFR subpart 122.29, as amended through August 15, 1997, adopted by reference;

Minimum treatment standards in 18 AAC 72.040; and

Any treatment requirements imposed under another state law that is more stringent than a requirement of this chapter.

The first part of the definition includes all federal technology-based ELGs. The permit requires operators of seafood processing facilities to follow prescribed BMPs and to comply with 40 CFR Part 408, Canned and Preserved Seafood Processing Point Source Category. The ELG sets standards of performance for existing and new sources.

The second part of the definition in 18 AAC 70.990(B) (2003) appears to be an error, as 18 AAC 72.040 describes discharges to sewers and not minimum treatment. The correct reference appears to be the minimum treatment standards found at 18 AAC 72.050, which refers to domestic wastewater discharges only. The authorized domestic wastewater discharge is in compliance with the minimum treatment standards found in 18 AAC 72.050 as reflected by the permit limits specifying secondary treatment standards for discharges to receiving waters.

The third part of the definition includes any more stringent treatment required by state law, including 18 AAC 70 and 18 AAC 72. The correct operation of equipment, visual monitoring, and implementing BMPs, as well as other permit monitoring requirements, will control the discharge and satisfy all applicable federal and state requirements.

The Department concludes that all wastes and other substances discharged will be treated and controlled to achieve the highest statutory and regulatory requirements and the Department therefore finds that the requirements of this part of the antidegradation analysis have been met.

7.0 OTHER PERMIT REQUIREMENTS

7.1 Quality Assurance Project Plan

The operator is required to develop procedures to ensure that the monitoring data submitted are accurate and to explain data anomalies if they occur. The operator is required to develop and implement or update the Quality Assurance Project Plan (QAPP) within 90 days of the effective date of permit coverage. Additionally, the operator must submit a letter to the Department within 120 days of the effective date of the permit stating that the plan has been implemented within the required time frame. The QAPP shall consist of standard operating procedures the operator must follow for collecting, handling, storing and shipping samples; laboratory analysis; and data reporting. The QAPP shall be retained on site and made available to the Department upon request.

7.2 Best Management Practices (BMPs) Plan

In accordance with AS 46.03.110 (d), the Department may specify in a permit the terms and conditions under which waste material may be disposed of. The permit requires the operator to develop a BMPs Plan in order to prevent or minimize the potential for the release of pollutants to waters and lands of the State of Alaska through plant site runoff, spillage or leaks, or erosion. The permit contains certain BMP conditions that must be included in the BMP Plan. The permit requires the operator to develop or update and implement a BMP Plan within 90 days of the effective date of authorization. The BMP Plan must be kept on site and made available to the Department upon request.

BMPs, in addition to numerical effluent limitations, may be required to control or abate the discharge of pollutants in accordance with 18 AAC 83.475. National policy requires 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, and that discharge or release of the pollution into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner. EPA's reassessment of the ELGs for seafood processors (Jordan 1979; EPA 1980b) recommended in-plant management directed towards total utilization of the raw materials and by-product recovery as a fundamental and central element of waste reduction. Materials accounting, audits of in-plant utilization of water and materials, and BMPs 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 (Ismond 1994).

The permit requires the development and implementation of BMPs that prevent or minimize the generation and release of pollutants to receiving waters.

A newly permitted operator shall develop and implement a BMP Plan within 60 days of the date of operator authorization to discharge under the permit. A previously permitted operator shall review and update the BMP Plan and resubmit written certification with the NOI that the BMP Plan has been reviewed and revised as needed, and that that the Plan has been implemented.

EPA developed a general handbook to assist industry in identifying and using BMPs and in developing and implementing materials accounting and BMP Plans (EPA 1993). EPA also developed an industry-specific handbook to assist seafood processors in identifying and using BMPs and in developing and implementing materials accounting and BMP Plans (EPA and Bottomline Performance 1994). These documents are still available for operators' during facility specific BMP Plan development.

The BMP Plan must be amended whenever a change in the seafood processor or in the operation of the seafood processor occurs that materially increases the potential for an increased discharge of pollutants.

7.3 Standard Conditions

Permit Appendix A contains standard regulatory language that must be included in all APDES permits. These requirements are based on the regulations and cannot be challenged in the context of an APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

8.0 OTHER LEGAL REQUIREMENTS

8.1 Ocean Discharge Criteria Evaluation

The Ocean Discharge Criteria establish guidelines for permitting discharges into the territorial seas, the contiguous zone, and the ocean.

EPA regulations, 40 CFR 122(b) and adopted by reference at 18 AAC 83.010(C)(8), state that discharges found to be in compliance with CWA section 303 water quality standards will be presumed to also be in compliance with CWA section 403 ocean discharge criteria. As such, EPA itself equated ocean discharge criteria with WQS, a fact it emphasized when promulgating ocean discharge criteria rules in 1980: "the similarity between the objectives and requirements of [state water quality standards] and those of CWA section 403 warrants a presumption that discharges in compliance with these [standards] also satisfy CWA section 403." (Ocean Discharge Criteria, 45 Fed. Reg. 65,943 (proposed Oct. 3, 1980) (codified at 40 CFR Part 125)). As with any permit, the CWA requires the general permit to contain TBELs, as well as limits and conditions necessary to meet applicable state WQS. State WQS apply in the territorial seas, defined in the CWA section 502(8) as extending three miles from the baseline (Pacific Legal Foundation v. Costle, 586 F.2d 650, 655-656 (9th Cir. 1978); Natural Resources Defense Council., Inc. v. U.S. EPA, 863 F.2d 1420, 1435 (9th Cir. 1988)). Unlike ocean discharge criteria, however, state WQS trigger additional requirements under the CWA, such as state certification requirements under CWA Section 401, WQBELs requirements under section 302, and total maximum daily load (TMDL) requirements under CWA section 303.38. Specifically, state WQS established pursuant to CWA section 303 are designed to preserve the quality of waters under State jurisdiction, including the territorial seas, and compliance with these standards should ensure protection of the uses for which the waters are designated with respect to pollutants for which standards have been established. The State of Alaska WQS protect all uses, and the permit requires authorized discharges to be in compliance with WQS. Therefore discharges in compliance with this permit shall be presumed not to cause unreasonable degradation of the marine environment, for any of the pollutants or conditions specified.

8.2 Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with NOAA's NMFS and the USFWS if their actions could beneficially or adversely affect any threatened or endangered species. As a state agency, DEC is not required to consult with these federal agencies regarding permitting actions, yet voluntarily engages these agencies during both permit development stage as well as the public comment periods. The permit has integrated specific monitoring and permit requirements (Permit Part 3.1 and 3.2) for those seafood processing facilities located near critical habitat areas. The permit requires an applicant of a new facility or the operator of an existing facility that proposes material changes to a facility located in or near Excluded Areas that includes endangered and threaten species critical habitat areas (1.0-3.0 nm, as applicable) Excluded Areas?? to contact the agency with management authority over an endangered species and provide any recommended water quality based recommendations from the agency to DEC. Permit Appendices J and K go into further details regarding lists of the endangered, threatened, proposed and candidate species in Alaska.

8.3 Marine Mammal Protection Act

Section 2 of the Marine Mammal Protection Act finds marine mammals to be resources of great international significance, aesthetic, recreational and economic value 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 Alaska Natives, a moratorium has been placed on the taking (harass or kill) of marine mammals in Alaska.

The permit establishes buffer zones around the rookeries and haul outs of Western Steller's sea lions and walrus.

The permit prohibits discharge of uncooked seafood processing waste during the months of November, December, January, February, and March in Orca Inlet where sea otters, which are protected under the Marine Mammal Protection Act, in which some studies suggest are attracted to the discharge and waste deposit as a food source.

8.4 Essential Fish Habitat

Essential fish habitat (EFH) includes the waters and substrate (sediments, etc.) necessary for fish from commercially-fished species to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) does require a state agency to determine if there is an adverse effect or consult with NMFS regarding EFH, DEC voluntarily engages with NMFS to secure a listing of EFH as part of the permitting process. During permitting under the AKG523000 Offshore seafood permit, NMFS and the Alaska Department of Fish and Game provided comment that anchoring and discharge of seafood waste should not occur onto "living substrates" such as submerged aquatic vegetation, kelp, or eelgrass. This recommendation has been directly incorporated into Permit Part 3.1. Additionally a pre-discharge survey has been required in Permit Part 2.2.1 and 2.3.1, respectively and Permit Appendix I to assist the operator and DEC in determining that the permit requirements are being met. Additionally, the draft permit, draft fact sheet, and other supporting documents will be provided to NMFS and the ADF&G during the public notice period. DEC will review any conservation recommendations provided by NMFS and ADF&G and consider any recommendations for incorporation in the permit.

EFH is identified in Alaska in fishery management plans developed by the North Pacific Fishery Management Council and approved by the Secretary of Commerce. EFH descriptions are comprised of text and maps, with textual descriptions being the ultimate determination of the limits of EFH. EFH is the general distribution of a species described by life stage. General distribution is a subset of a species population and is 95 percent of the population for a particular life stage. General distribution is used to describe EFH for all stock conditions because the available higher level data are not sufficiently comprehensive to account for changes in stock distribution over time. DEC has determined that fish waste discharges could occur to the following EFH areas:

- Bering Sea and Aleutian Island (BSAI) Groundfish
- Gulf of Alaska (GOA) Groundfish
- Bering Sea and Aleutian Island King and Tanner (BSAI) Crab
- Alaska Scallops
- Alaska Stocks of Pacific Salmon

8.5 Permit Expiration

The permit will expire five years from the effective date of the permit, but may be administratively extended.

9.0 References

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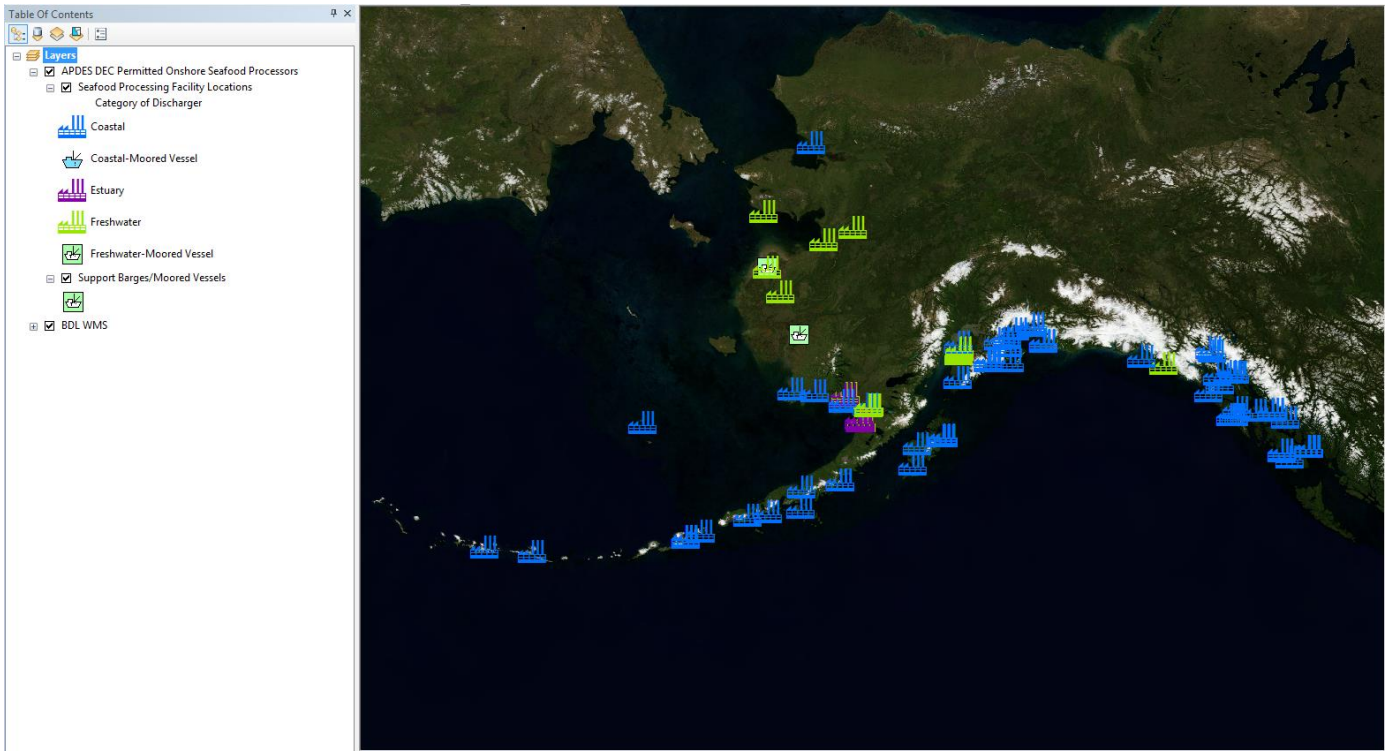
FACILITY INFORMATION

Appendix A

FACILITY INFORMATION

Figure 1: Statewide Map of Seafood Processing Facility Locations



Permit Table D1 Seafood Processing Facilities General Information Discharging to Marine / Estuarine Waters

Old Tracking Number (Link to NOI)	Facility Name The facilities listed below may be authorized with the submittal of an NOI with parameters listed.	Receiving Water (Link to Map)	Discharge amount as Authorized under AKG520000 (Pounds)	Depth of Discharge (Feet MLLW))	Assigned Mixing Zone Size (Radius in Feet)	Assigned Project Area ZOD or Mapped Seafloor Survey (Yes/No)	Sensitive Water body (Table D4)
AKG520090	Alaska General Seafoods Ketchikan Plant (Major)	Tongass Narrows	Solids shipped to another operator	68	100	Yes	No
AKG520168	Alaska General Seafoods Naknek Plant (Estuarine)	Naknek River	9,900,000	1.5 ft	100	Yes	No
AKG520528	Alaska Glacier Seafoods Juneau Plant	Auke Bay	Solids discharged by vessel 2,743,000	10	100	No ZOD	No
AKG520402	Alaska Omega Nutrition Nikiski Plant	Nikishka Bay	5,000,000	20	100	Yes	No
AKG528434	Alaska Pacific Seafoods Kodiak Plant (Non-Remote) (Major)	Near Island Channel	Solids discharge At –Sea only when Fish Meal Plant Inoperable	63	No MZ	NO ZOD Yes Seafloor Survey Area	Yes
AKG520056	Alaska Seafood Holdings Hoonah Plant	Port Frederick	430,000	80	100	Yes	No
New, Applied with NOI	Alaska Wild Seafoods, LLC	Orca Inlet	18,000	25	100	Yes	No
AKG520337	Atka Pride Seafoods Atka Plant	Bering Sea	4,330,000	30	100	Yes	Yes
AKG520506	Bering Pacific Seafoods False Pass Plant	Isanotski Strait	5,070,000	60	100	Yes	Yes
AKG520166	Big Creek Fisheries Big Creek Plant (Estuarine)	Big Creek	1,300,000	15 ft	100	Yes	No
Applied with a New NOI	Bristol Bay Borough Naknek Grinder (Estuarine)	Naknek River	30,000	0-5 ft	100	Yes	No

Permit Table D1 Seafood Processing Facilities General

Information Discharging to Marine / Estuarine Waters

Old Tracking Number (Link to NOI)	Facility Name The facilities listed below may be authorized with the submittal of an NOI with parameters listed.	Receiving Water (Link to Map)	Discharge amount as Authorized under AKG520000 (Pounds)	Depth of Discharge (Feet MLLW))	Assigned Mixing Zone Size (Radius in Feet)	Assigned Project Area ZOD or Mapped Seafloor Survey (Yes/No)	Sensitive Water body (Table D4)
AKG520518	City of Homer Port and Harbor Fish Grinder	Kachemak Bay	2,000,000	28	100	Yes	Yes
AKG520536	Coffee Point Seafoods Egegik Large Plant (Estuarine)	Egegik River	630,000	10 ft	100	Yes	No
AKG520358	Coffee Point Seafoods Egegik Small Plant (Estuarine)	Egegik River	60,000	10 ft	100	Yes	No
AKG520524	Copper River Seafoods Cordova Plant	Orca Inlet	4,060,400	37	100	Yes	No
AKG520138	Copper River Seafoods Naknek Plant (Estuarine)	Naknek River	5,500,000	0-15 ft	100	Yes	No
AKG520482	Copper River Seafoods, Port of Kenai Plant (Estuarine)	Kenai River	500,000	10 ft	100	Yes	No
AKG520478	Double E Foods Pacific Star Seafoods Kenai Plant (Estuarine)	Kenai River	6,030,000	10 ft	100	Yes	No
AKG520445	E.C. Phillips & Son Craig Plant		Solids shipped to Ketchikan	N/A	N/A	N/A	No
AKG520001	E.C. Phillips & Son Ketchikan Plant	Tongass Narrows	9,441,000	42	100	Yes	No
AKG520037	Ekuk Fisheries Ekuk Plant	Nushagak Bay	2,000,000	23	100	Yes	No
AKG528834	Global Seafoods Kodiak Plant (Non-Remote)	St Paul Harbor	Solids discharge At –Sea only when Fish Meal Plant Inoperable	60	No MZ	NO ZOD Yes Seafloor Survey Area	Yes

Permit Table D1 Seafood Processing Facilities General Information Discharging to Marine / Estuarine Waters

Old Tracking Number (Link to NOI)	**Facility Name** The facilities listed below may be authorized with the submittal of an NOI with parameters listed.	**Receiving Water (Link to Map)**	**Discharge amount as Authorized under AKG520000 (Pounds)**	**Depth of Discharge (Feet MLLW))**	**Assigned Mixing Zone Size (Radius in Feet)**	**Assigned Project Area ZOD or Mapped Seafloor Survey (Yes/No)**	**Sensitive Water body (Table D4)**
New, Applied with NOI and APDES Application	Goodnews Bay Regional Salmon Processing Plant	Kuskokwim Bay	4,000,000	60	100	Yes	Yes
AKG520048	Great Pacific Seafoods Kenai Plant (Estuarine)	Kenai River	8,000,000	12 ft	100	Yes	No
AKG520160	Great Pacific Seafoods Whittier Plant	Passage Canal	4,384,000	20	100	Yes	No
New, Applied with NOI	Haines Packing Company	Letnikof Cove	98,000	60	100	Yes	No
New, Applied with NOI	Hollis Bay Seafoods	Hollis Anchorage	45,000	30	100	Yes	No
New, Applied with NOI	Hydaburg Specialty Seafood Processing Plant	Sukkwan Strait	16,500	40	100	Yes	No
AKG520495	Icicle Seafood Egegik Plant (Estuarine)	Egegik River	3,610,000	4-15 ft	100	Yes	No
AKG520246	Icicle Seafood – Gordon Jenson Support - Illuiliuk Bay Facility	Illuiliuk Bay	10,000,000	15’	100	Yes	No
AKG520047	Icicle Seafood Larsen Bay Plant	Larson Bay	10,000,000	30	100	Yes	Yes
AKG520303	Icicle Seafoods Petersburg Plant (Major)	Wrangell Narrows	*20,000,000 *Consistent with EPA’s December 2001 Authorization	24	100	Yes	No

Permit Table D1 Seafood Processing Facilities General Information Discharging to Marine / Estuarine Waters

Old Tracking Number (Link to NOI)	Facility Name The facilities listed below may be authorized with the submittal of an NOI with parameters listed.	Receiving Water (Link to Map)	Discharge amount as Authorized under AKG520000 (Pounds)	Depth of Discharge (Feet MLLW))	Assigned Mixing Zone Size (Radius in Feet)	Assigned Project Area ZOD or Mapped Seafloor Survey (Yes/No)	Sensitive Water body (Table D4)
AKG520488	Icicle Seafoods Seward Plant (Major)	Resurrection Bay	10,000,000	126	100	Yes	No
New, Applied with NOI	Icicle Seafoods Wood River Plant (Estuarine)	Wood River	10,000,000	9 ft	100	Yes	No
AKG520487	Inlet Fish Producers Kasilof River Plant (Estuarine)	Kasilof River	5,000,000	10 ft	100	Yes	No
AKG520480	Inlet Fish Producers Kenai River Plant (Estuarine)	Kenai River	8,000,000	10-12 ft	100	Yes	No
AKG528353	International Seafoods Alaska Kodiak Plant (Non-Remote)	Near Island Channel	Solids discharge At –Sea only when Fish Meal Plant Inoperable	36	No MZ	NO ZOD Yes Seafloor Survey Area	Yes
AKG520073	Keku Seafoods LLC Kake Plant	Keku Strait	572,000	102	100	Yes	No
AKG528234	Kodiak Fishmeal Company Kodiak Plant (Non-Remote) (Major)	Gibson Cove	Solids discharge At –Sea only when Fish Meal Plant Inoperable	52	No MZ	NO ZOD Yes Seafloor Survey Area	Yes
AKG520467	Leader Creek Fisheries Naknek Plant (Estuarine)	Naknek River	3,475,000	8 ft	100	Yes	No
AKG520112	North Pacific Seafoods Pederson Point Plant	Naknek	4,550,000	0	100	Yes	No

Permit Table D1 Seafood Processing Facilities General Information Discharging to Marine / Estuarine Waters

Old Tracking Number (Link to NOI)	Facility Name The facilities listed below may be authorized with the submittal of an NOI with parameters listed.	Receiving Water (Link to Map)	Discharge amount as Authorized under AKG520000 (Pounds)	Depth of Discharge (Feet MLLW))	Assigned Mixing Zone Size (Radius in Feet)	Assigned Project Area ZOD or Mapped Seafloor Survey (Yes/No)	Sensitive Water body (Table D4)
AKG520039	North Pacific Seafoods Red Salmon Naknek Plant (Estuarine)	Naknek River	9,200,000	1.7 ft	100	Yes	No
AKG520065	North Pacific Seafood Sitka Plant (Major)	Sitka Harbor Channel	5,400,000	38	100	Yes	No
AKG520055	North Pacific Seafoods Togiak Plant (Estuarine)	Togiak River	3,475,000	10 ft	100	Yes	Yes
New, Applied with NOI	Northern Fish Alaska, LLC dba Prime Select Seafoods	Orca Inlet	1,150,000	30	100	Yes	No
AKG520036	Ocean Beauty Seafoods Alitak Plant	Lazy Bay	9,835,000	45	100	Yes	Yes
AKG520494	Ocean Beauty Seafoods Cordova Plant (Major)	Orca Inlet	9,950,000	30	100	Yes	No
AKG520059	Ocean Beauty Seafoods Excursion Inlet Plant	Excursion Inlet	*16,565,600 *Consistent with EPA's May 2002 Authorization	58	100	Yes	Yes
AKG528493	Ocean Beauty Seafoods Kodiak Plant (Non-Remote) (Major)	St Paul Harbor	Solids discharge At –Sea only when Fish Meal Plant Inoperable	30	No MZ	NO ZOD Yes Seafloor Survey Area	Yes

Permit Table D1 Seafood Processing Facilities General Information Discharging to Marine / Estuarine Waters

Old Tracking Number (Link to NOI)	Facility Name The facilities listed below may be authorized with the submittal of an NOI with parameters listed.	Receiving Water (Link to Map)	Discharge amount as Authorized under AKG520000 (Pounds)	Depth of Discharge (Feet MLLW))	Assigned Mixing Zone Size (Radius in Feet)	Assigned Project Area ZOD or Mapped Seafloor Survey (Yes/No)	Sensitive Water body (Table D4)
AKG520092	Ocean Beauty Seafoods Naknek Plant (Estuarine)	Naknek River	7,687,860	25 ft	100	Yes	No
AKG520477	Ocean Beauty Seafoods Petersburg Plant (Major)	Wrangell Narrows	9,654,500	35	100	Yes	No
AKG528835	Pacific Seafoods Kodiak Plant (Non-Remote)	St Paul Harbor	Solids discharge At –Sea only when Fish Meal Plant Inoperable	20	No MZ	NO ZOD Yes Seafloor Survey Area	Yes
AKG520481	Pacific Star Seafoods Kenai River Plant (Estuarine)	Kenai River	2,250,000	12 ft	100	Yes	No
AKG520525	Pacific Sun Products Ketchikan Plant	Tongass Narrows	600,000	45	100	Yes	No
AKG520040	Pelican Seafoods Shorebased Plant	Lisianski Inlet	45,000	40	100	Yes	Yes
AKG520012	Peter Pan Seafoods Dillingham Plant (Estuarine)	Nushagak River	7,670,000	10 ft	100	Yes	No
AKG520014	Peter Pan Seafoods Port Moller Plant	Port Moller	4,000,000	10	100	Yes	Yes
AKG520244	Peter Pan Seafoods Valdez Plant (Major)	Valdez Bay	10,000,000	212	100	Yes	No
AKG520474	Polar Seafoods Seward Plant (Major)	Resurrection Bay	8,000,000	85	100	Yes	No
New, Applied with NOI	Premier Harvest LLC Adak Plant	Sweeper Cove	170,000	65	100	Yes	No

Permit Table D1 Seafood Processing Facilities General Information Discharging to Marine / Estuarine Waters

Old Tracking Number (Link to NOI)	Facility Name The facilities listed below may be authorized with the submittal of an NOI with parameters listed.	Receiving Water (Link to Map)	Discharge amount as Authorized under AKG520000 (Pounds)	Depth of Discharge (Feet MLLW))	Assigned Mixing Zone Size (Radius in Feet)	Assigned Project Area ZOD or Mapped Seafloor Survey (Yes/No)	Sensitive Water body (Table D4)
AKG520355	Resurrection Bay Seafoods Seward Plant	Resurrection Bay	1,176,440	95	100	Yes	No
AKG520412	Sassco Taku Fisheries-Smokeries Juneau Plant	Gastineau Channel	1,397,936	70	100	Yes	No
New, Applied with NOI	Sea Aleutian Seafoods	Captains Bay	400,000	60	100	Yes	Yes
New, Applied with NOI and APDES Application	Sea Level Seafoods Wrangell Plant	Wrangell Harbor	1,980,000	79	100	Yes	No
AKG520101	Seafood Producers Cooperative Sitka Plant (Major)	Sitka Harbor Channel	4,105,000	16	100	Yes	No
New, Applied with NOI	Silver Bay Seafoods Craig Plant	Klawock Inlet	6,601,500	90	100	Yes	No
New, Applied with NOI	Silver Bay Seafoods Naknek Plant (Estuarine)	Naknek River	10,000,000	30 ft	100	Yes	No
AKG520547	Silver Bay Seafoods SMCIP Sitka Plant	Silver Bay	9,535,000	210	100	Yes	Yes
AKG520042	Silver Bay Seafoods Valdez Plant (Major)	Valdez Bay	9,000,000	180	100	Yes	No
AKG520485	Snug Harbor Seafoods Kasilof Plant (Estuarine)	Kasilof River	180,000	10	100	Yes	No

Permit Table D1 Seafood Processing Facilities General Information Discharging to Marine / Estuarine Waters

Old Tracking Number (Link to NOI)	Facility Name The facilities listed below may be authorized with the submittal of an NOI with parameters listed.	Receiving Water (Link to Map)	Discharge amount as Authorized under AKG520000 (Pounds)	Depth of Discharge (Feet MLLW))	Assigned Mixing Zone Size (Radius in Feet)	Assigned Project Area ZOD or Mapped Seafloor Survey (Yes/No)	Sensitive Water body (Table D4)
AKG520483	Snug Harbor Seafoods Kenai River Plant (Estuarine)	Kenai River	1,195,000	>10 ft	100	Yes	No
New, Applied with NOI	Tonka Seafoods – Petersburg (Mitkof)	Wrangell Narrows	1,000,000	32	100	Yes	No
AKG520053	Trident Seafoods Chignik Production	Anchorage Bay	9,108,000	60	100	Yes	Yes
AKG520103	Trident Seafoods Chignik Support Plant	Anchorage Bay	6,072,000	48	100	Yes	Yes
AKG520493	Trident Seafoods Cordova North Plant (Major)	Orca Inlet	5,000,000	18	100	Yes	No
AKG520491	Trident Seafoods Cordova South Plant (Major)	Orca Inlet	10,000,000	22	100	Yes	No
AKG520002	Trident Seafoods Ketchikan Cannery (Major)	Tongass Narrows	Screening, not grinding. No solids discharge out outfall, hydrolysate plant and Ocean Dumping	95	100	Yes	No
AKG528833	Trident Seafoods Kodiak Plant (Non-Remote) (Major)	Near Island Channel	Solids discharge At –Sea only when Fish Meal Plant Inoperable	30	No MZ	NO ZOD Yes Seafloor Survey Area	Yes

Permit Table D1 Seafood Processing Facilities General Information Discharging to Marine / Estuarine Waters

Old Tracking Number (Link to NOI)	Facility Name The facilities listed below may be authorized with the submittal of an NOI with parameters listed.	Receiving Water (Link to Map)	Discharge amount as Authorized under AKG520000 (Pounds)	Depth of Discharge (Feet MLLW))	Assigned Mixing Zone Size (Radius in Feet)	Assigned Project Area ZOD or Mapped Seafloor Survey (Yes/No)	Sensitive Water body (Table D4)
AKG528110	Trident Seafoods Kodiak AFS Plant (Non-Remote)	Near Island Channel	N/A	60	No MZ	NO ZOD Yes Seafloor Survey Area	Yes
AKG520003	Trident Seafoods Naknek North Plant (Estuarine)	Naknek River a	10,000,000 [b]	32 ft	100	Yes	No
AKG520476	Trident Seafoods Petersburg Plant (Major)	Wrangell Narrows	2,030,000	22	100	Yes	No
AKG528825	Trident Seafoods Pillar Mountain Operation (Major)	St Paul Harbor	N/A	48	No MZ	NO ZOD Yes Seafloor Survey Area	Yes
AKG520058	Trident Seafoods Wrangell Plant	Wrangell Harbor	8,323,000	76	100	Yes	No
AKG520070	Yakutat Seafood Yakutat Plant	Monti Bay	1,800,000	42	100	Yes	No

Notes:

a. Tidally influenced/ Estuarine Waters
b. EPA consent decree may influence authorized discharge amount

Permit Table D2 Seafood Processing Vessels General Information

Old Authorization Number	Facility with Vessel Discharge	*Existing Authorized Discharge (Pounds) *(as of the effective date of this permit)	Receiving Water	Depth of Receiving Water
AKG523037 AKG520528	Alaska Glacier Seafoods Juneau Plant (Remote) (no vessel name, office nickname 'Gut Dumper')	2,236,000 lbs	Auke Bay	162 ft
AKG523058	Bering Select LLC – Lady Gundy	3 – single areas of operation, 3,000,000 lbs each	Unalaska Bay	280-290 ft
AKG523035	Copper River Seafoods Togiak Plant- Tonsina	5,280,000 lbs per site	Togiak Bay	4-18 ft
AKG523059	Copper River Seafoods Togiak Plant – Capt Atkins	5,280,000 lbs per site	Togiak Bay	4-18 ft
AKG523043 AKG520047	Icicle Seafoods Larson Bay – F/V Viking Queen	4,000,000 lbs	Larson Bay	324-516 ft
AKG523044 AKG520488	Icicle Seafoods Seward Plant – F/V Viking Queen	4,000,000 lbs	Resurrection Bay	248-852 ft
AKG523045 AKG520048	Icicle Seafoods Egegik - – F/V Viking Queen	4,000,000 lbs	Kvichak Bay Nushagak Bay	58-72 ft 48-52 ft
AKG523030 AKG520246	Icicle Seafoods Gordon Jensen - Iluiliuk Bay – Viking Queen	4 - – single areas of operation, 10,000,000 lbs each	Unalaska Bay	252-750 ft
AKG523057 AKG520065	North Pacific Seafoods Sitka Plant – Hula Girl Vessel	5,455,000 lbs	Sitka Sound	444 ft
AKG523061	Silver Bay Seafoods Valdez Plant Nushagak Spirit Gurry Vessel	6,000,000 lbs. per site	Prince William Sound	1200 ft
AKG523062	Silver Bay Seafoods Valdez Plant Bering Beauty Gurry Vessel	6,000,000 lbs. per site	Prince William Sound	1200 ft
AKG523041	Trident Seafoods Cordova Plant – Mud Bay Vessel	10 Million lbs total per site	Simpson Bay	504-624 ft
AKG523051	Trident Seafoods Cordova Plant –Alaska Pacific Vessel	10 Million lbs total per site	Simpson Bay	504-624 ft
AKG523055	Trident Seafoods Cordova Plant - Coghill Vessel	10 Million lbs total per site	Simpson Bay	504-624 ft
AKG523060	Wild Premium Salmon LLC	30,000 lbs.	Egegik River	0-14 ft

Permit Table D3 Seafood Processing Facilities General Information Discharging to Fresh Waters

Old Authorization Number	Facility Name	Receiving Water	Previous Maximum Discharge (Pounds	Depth of Discharge (Feet MLLW)	Allowed Mixing Zone	Allowed Zone of Deposit Allowed?	Sensitive Water body (See Table D4)
AKG520229	Boreal Fisheries St Marys Plant	Yukon River	40,000	30 ft	Yes	No	Yes
AKG520516	City of Kaltag Plant	Yukon River	30,000	10	Yes	No	Yes
AKG520174	Kwik Pak Fisheries Emmonak Plant	Yukon River	1,500,000	15 ft	Yes	No	No
AKG520495	Mystic Salmon LLC Dry Bay Plant	Alsek River	600,000	7 ft	Yes	No	No
AKG520531	Norton Sound Economic Development Nome Plant	Snake River	111,000	12 ft	Yes	No	No
AKG520508	Norton Sound Seafood Unalakleet Plant	Unalakleet River	405,000	16 ft	Yes	No	Yes

Permit Table D4: Sensitive Waters

Facility Name	Receiving Water (Click to view map)	**In a Sensitive Areas or within 1 nm Including:** State Game Refuge or Critical Habitat, National Parks, Preserve, Monuments, Wilderness, Wildlife Refuge, Critical Habitat or Nesting Area for Sea Birds or Eiders, Eider Concentration Areas, Critical Habitat for Sea Otters or Polar Bears **Water Quality Limited Areas:** (including Category 5/Category 4b/Section 303d)
Alaska Pacific Seafoods Kodiak Plant (Non-Remote)	Near Island Channel	Kodiak NWR, Steller's Eider Concentration area Alaska SW DPS Sea Otter CHA
Atka Pride Seafoods Atka Plant	Bering Sea	Alaska Maritime Wildlife Refuge, Alaska SW DPS Sea Otter CHA
Bering Pacific Seafoods False Pass Plant	Isanotski Strait	Alaska Peninsula National Wildlife Refuge (NWR) Alaska Maritime NWR
Coastal Villages Seafoods Platinum Plant	Kuskokwim Bay	Steller's Eider Concentration Area Goodnews Bay Spring/Summer
City of Homer Port and Harbor Fish Waste Grinding Facility	Kachemak Bay	Steller's Eider Concentration area Homer Spit/Winter, Kachemak Bay for Sea Otter CHA,
City of Kaltag Plant	Yukon River	Innoko National Wildlife Refuge
Global Seafoods Kodiak Plant (Non-Remote)	St Paul Harbor	Kodiak NWR, Steller's Eider Concentration area Alaska SW DPS Sea Otter CHA
Icicle Seafood Larsen Bay Plant	Larson Bay	Sea Otter CHA, Alaska NWR
International Seafoods Alaska Kodiak Plant (Non-Remote)	Near Island Channel	Kodiak NWR, Steller's Eider Concentration area, Alaska SW DPS Sea Otter CHA
Kodiak Fishmeal Company Kodiak Plant (Non-Remote)	Gibson Cove	Kodiak NWR, Steller's Eider Concentration area, Alaska SW DPS Sea Otter CHA
North Pacific Seafoods Togiak Plant	Togiak River	Togiak National Wildlife Refuge (NWR)

Permit Table D4: Sensitive Waters

Facility Name	Receiving Water (Click to view map)	**In a Sensitive Areas or within 1 nm Including:** State Game Refuge or Critical Habitat, National Parks, Preserve, Monuments, Wilderness, Wildlife Refuge, Critical Habitat or Nesting Area for Sea Birds or Eiders, Eider Concentration Areas, Critical Habitat for Sea Otters or Polar Bears **Water Quality Limited Areas:** (including Category 5/Category 4b/Section 303d)
Norton Sound Economic Development Nome Plant	Unalakleet River	Spectacled Eider Critical Habitat- Norton Sound
Ocean Beauty Seafoods Alitak Plant	Lazy Bay	Kodiak National Wildlife Refuge (NWR), Alaska SW DPS Sea Otter CHA
Ocean Beauty Seafoods Excursion Inlet Plant	Excursion Inlet	Glacier Bay NP and Preserve
Ocean Beauty Seafoods Kodiak Plant (Non-Remote)	St Paul Harbor	Kodiak NWR, Steller's Eider Concentration Area Alaska SW DPS Sea Otter CHA
Pacific Seafoods Kodiak Plant (Non-Remote)	St Paul Harbor	Kodiak NWR, Steller's Eider Concentration area, Alaska SW DPS Sea Otter CHA
Pelican Seafoods Shorebased Plant	Lisianski Inlet	Tongass National Forest Wilderness Area
Peter Pan Seafoods Port Moller Plant	Port Moller	Stellar Eider Port Moller winter 126-1000, Alaska SW DPS Sea Otter CHA
Premier Harvest LLC Adak Plant	Kuluk Bay	Alaska SW DPS Sea Otter CHA, Alaska Maritime National Wildlife Refuge,
Sea Aleutian Seafoods	Captains Bay	Steller's Eider Concentration area, Alaska NWR, Alaska SW DPS Sea Otter CHA
Silver Bay Seafoods SMCIP Sitka Plant	Silver Bay	Total Maximum Daily Loads in the waters of Silver Bay, Alaska
Trident Seafoods Chignik Production	Anchorage Bay	Steller's Eider Concentration area, Alaska NWR
Trident Seafoods Chignik Support Plant	Anchorage Bay	Steller's Eider Concentration area, Alaska NWR
Trident Seafoods Kodiak Plant (Non-Remote)	Near Island Channel	Kodiak NWR, Steller's Eider Concentration area, Alaska SW DPS Sea Otter CHA
Trident Seafoods Kodiak AFS Plant (Non-Remote)	Near Island Channel	Kodiak NWR, Steller's Eider Concentration area , Alaska SW DPS Sea Otter CHA

Permit Table D4: Sensitive Waters

Facility Name	Receiving Water (Click to view map)	**In a Sensitive Areas or within 1 nm Including:** State Game Refuge or Critical Habitat, National Parks, Preserve, Monuments, Wilderness, Wildlife Refuge, Critical Habitat or Nesting Area for Sea Birds or Eiders, Eider Concentration Areas, Critical Habitat for Sea Otters or Polar Bears **Water Quality Limited Areas:** (including Category 5/Category 4b/Section 303d)
Trident Seafoods Kodiak Pillar Mountain Operation (Non-Remote)	St Paul Harbor	Kodiak NWR, Steller's Eider Concentration area, Alaska SW DPS Sea Otter CHA

Project Area Zone of Deposit Public Notice Instructions

The Project Area Zone of Deposit (ZOD) map can be accessed using the following links:

The web map is posted in these two locations online:

The Public Notice webpage: http://dec.alaska.gov/water/wwdp/PublicNotice.htm

and

The ADEC Online Web Gallery: http://dec.alaska.gov/das/GIS/apps.htm

How to use the Map

Select 'Open', then in 'Map Viewer'.

An error box may appear that indicates that one or more layers are not responding, or not loading. Click 'OK' to continue loading map.

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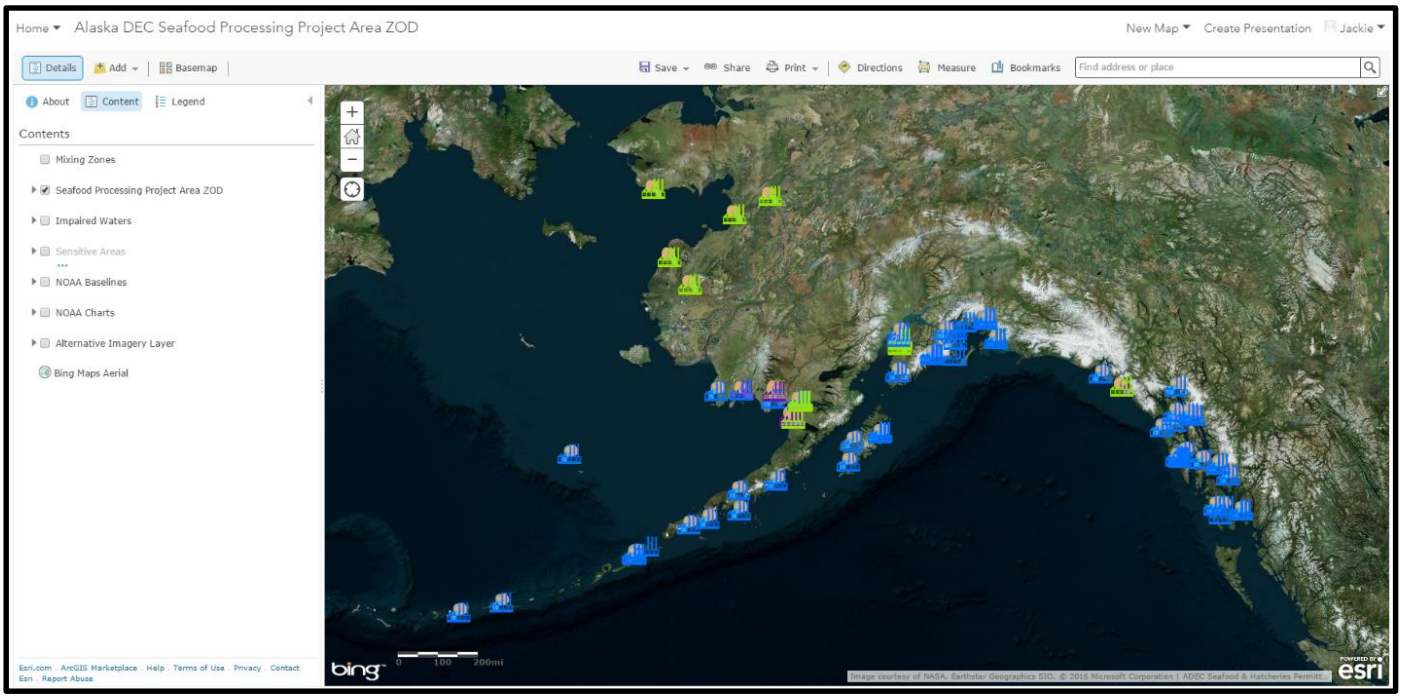
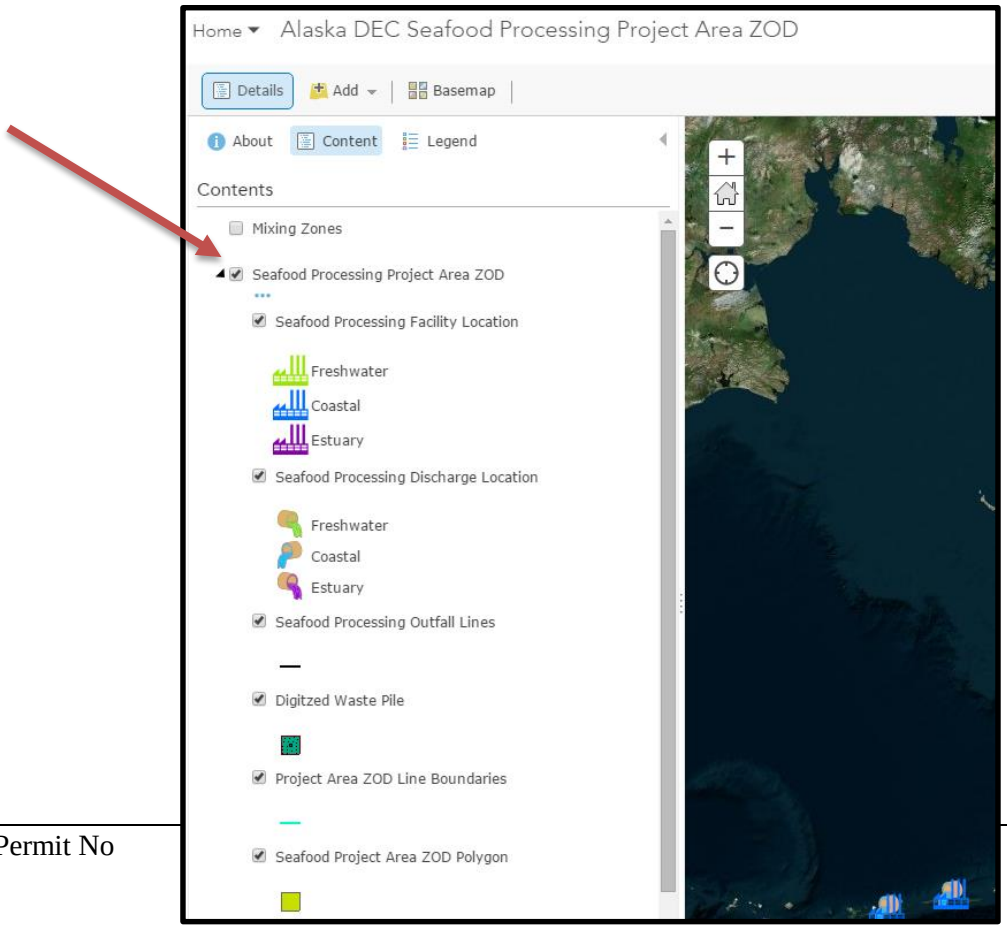
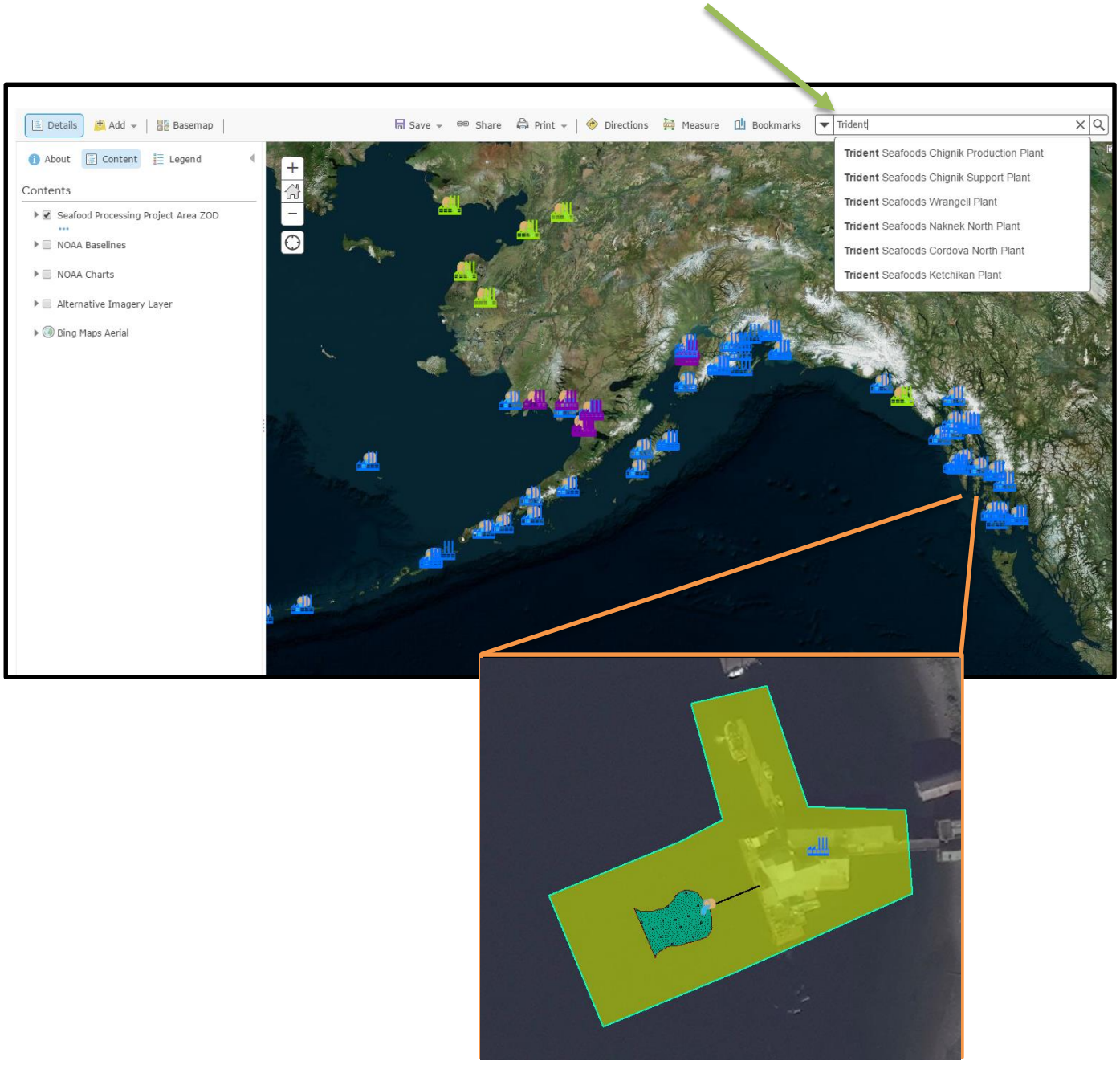
The Seafood Processing Project Area ZOD map will open to look like this:



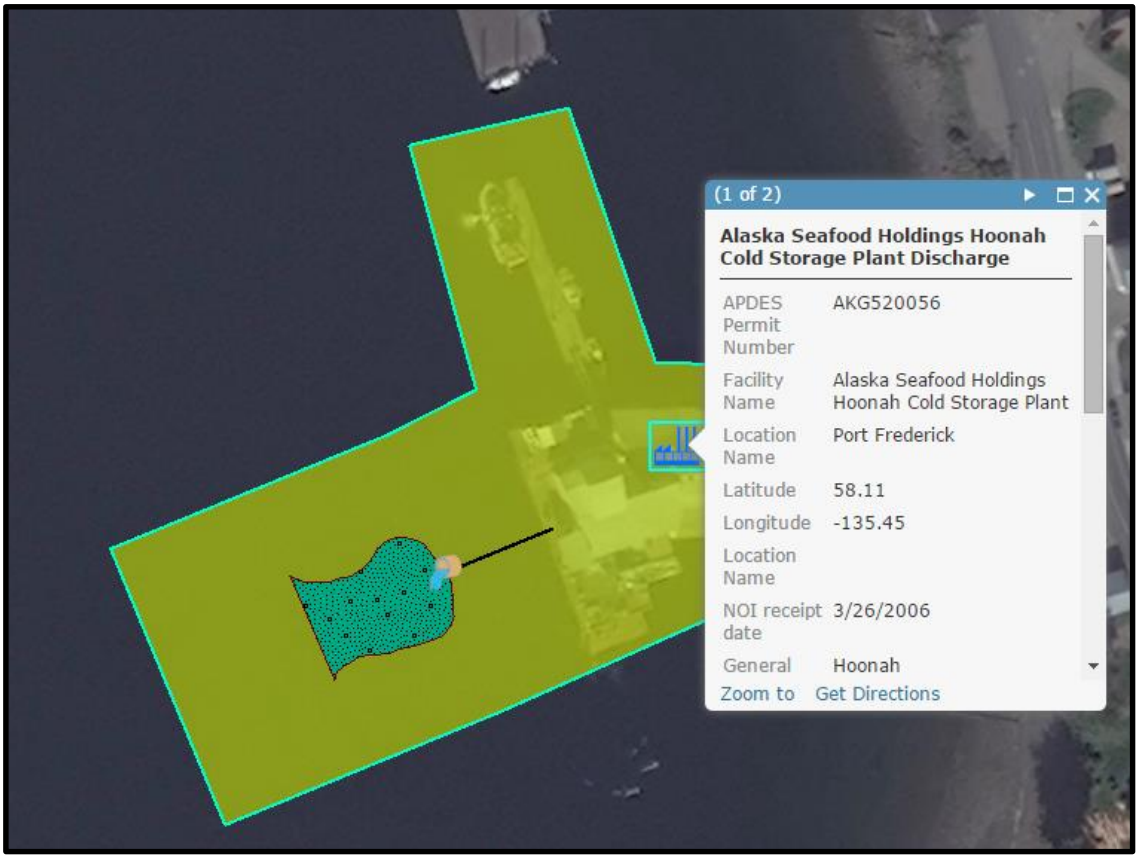
Under 'Content', select the 'Seafood Processing Project Area ZOD' dataset to expand the data tree. Click on each individual file to further expand and view the symbology.



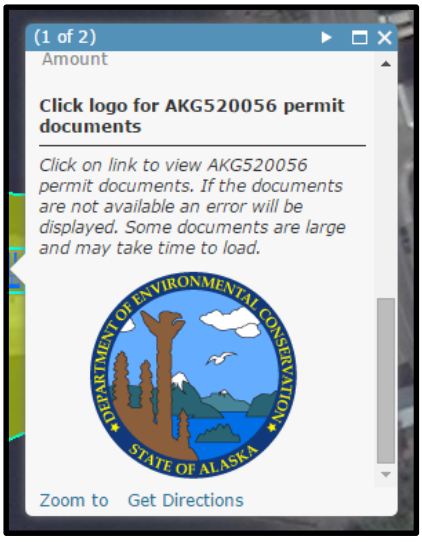
To look up your facility and review your assigned Project Area Zone of Deposit (ZOD), type your facility name into the scroll bar and choose your facility when the search returns your results. You can search both by facility name, or type in the location of your facility. When you select your facility, it should zoom you to your location.



Click on any of the symbology or shapes on the map to verify that you are on the correct facility. A pop-up with the feature attributes should come up when the feature is selected.

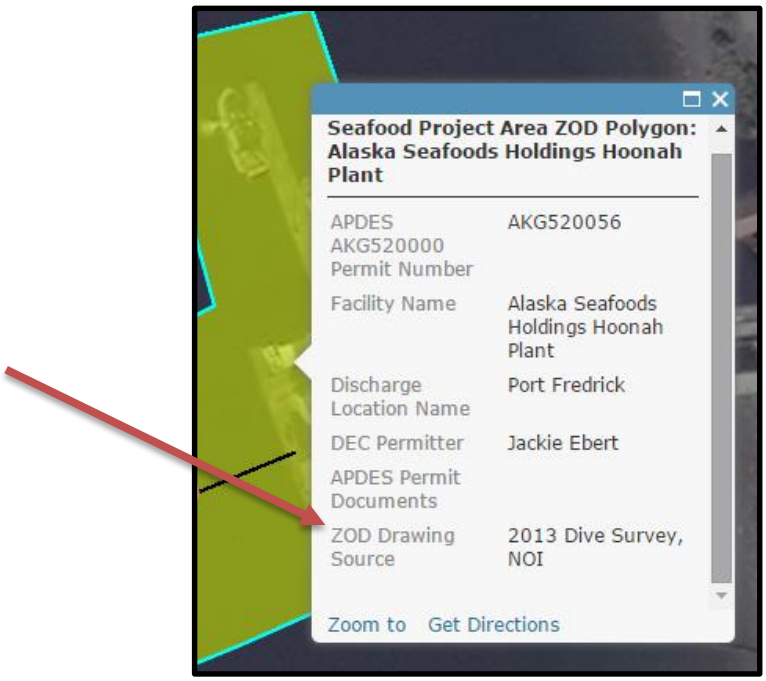


You can then scroll down in the pop-up box and find the permit information for that facility. Click on the state seal and it should link you to the State of Alaska's online water permit search, where you can download specific permit documents, including each facility's Notice of Intent and current authorization package.



How to Review your Project Area Zone of Deposit

Once you navigate to your facility and Project Area Zone of Deposit (ZOD), select the Project Area ZOD (there is a polygon and a line file) and view the information associated with your facility and Project Area ZOD assignment. The 'ZOD Drawing Source' lists what was used to delineate and draw the Project Area ZOD polygon and line file, and the outfall line location.



Written comments must be submitted within 30-days of the issuance of this public notice. Please direct written comments and requests to the attention of the permit writer at the address or email shown on Page 1 of the permit's Public Notice document.

MIXING ZONE ANAYLSIS CHECKLIST

Appendix B

Mixing Zone Authorization Checklist

based on Alaska Water Quality Standards (2003)

The purpose of the Mixing Zone Checklist is to guide the permit writer through the mixing zone regulatory requirements to determine if all the mixing zone criteria at 18 AAC 70.240 through 18 AAC 70.270 are satisfied, as well as provide justification to authorize a mixing zone in an APDES permit. In order to authorize a mixing zone, all criteria shall be met. The permit writer shall document all conclusions in the permit Fact Sheet; however, if the permit writer determines that one criterion cannot be met, then a mixing zone is prohibited, and the permit writer need not include in the Fact Sheet the conclusions for when other criteria were met.

Criteria	Description	Resources	Regulation	MZ Approved Y/N
Size	Is the mixing zone as small as practicable? - Applicant collects and submits water quality ambient data for the discharge and receiving water body (e.g. flow and flushing rates) - Permit writer performs modeling exercise and documents analysis in Fact Sheet Appendix C – Table C-2 Reasonable Potential Determination at in this Part 5.2.3 Mixing Zone Analysis - describe what was done to reduce size.	Yes, See Technical Support Document for Water Quality Based Toxics Control •Fact Sheet, Appendix C •Permit Part 2.8.4 Fact Sheet 5.6 • EPA Permit Writers' Manual	18 AAC 70.240 (a)(2) 18 AAC 70.245 (b)(1) - (b)(7) 18 AAC 70.255(e) (3) 18 AAC 70.255 (d)	Y

Technology	Were the most effective technological and economical methods used to disperse, treat, remove, and reduce pollutants? **If yes**, describe methods used in Fact Sheet at Part 4.7 Mixing Zone Analysis.	Yes, See Fact Sheet 4.7.4.2	18 AAC 70.240 (a)(3)	Y
Low Flow Design	**For river, streams, and other flowing fresh waters.** - Determine low flow calculations or documentation for the applicable parameters. Justify in Fact Sheet	Fact Sheet Part 4.7.2, Permit Part 1.6, Form 2M if other than standard selected	18 AAC 70.255(f)	Y
Existing use	Does the mixing zone…			
	(1) partially or completely eliminate an existing use of the water body outside the mixing zone? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.3	18 AAC 70.245(a)(1)	Y
	(2) impair overall biological integrity of the water body? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.7	18 AAC 70.245(a)(2)	Y
	(3) provide for adequate flushing of the water body to ensure full protection of uses of the water body outside the proposed mixing zone?	Yes, Fact Sheet Part 4.7.3 and Permit 1.6	18 AAC 70.250(a)(3)	Y

	If no, then mixing zone prohibited.			
	(4) cause an environmental effect or damage to the ecosystem that the Department considers to be so adverse that a mixing zone is not appropriate? **If yes, then mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.5, 4.7.4.7	18 AAC 70.250(a)(4)	Y
Human consumption	Does the mixing zone…			
	(1) produce objectionable color, taste, or odor in aquatic resources harvested for human consumption? **If yes, mixing zone may be reduced in size or prohibited.**	No, Fact Sheet Part 4.2, Permit Part 2.7.1	18 AAC 70.250(b)(2)	Y
	(2) preclude or limit established processing activities of commercial, sport, personal use, or subsistence shellfish harvesting? **If yes, mixing zone may be reduced in size or prohibited.**	No, Fact Sheet Part 4.7.4.3	18 AAC 70.250(b)(3)	Y
	Does the mixing zone…			

Spawning Areas	(1) discharge in a spawning area for anadromous fish or Arctic grayling, northern pike, rainbow trout, lake trout, brook trout, cutthroat trout, whitefish, sheefish, Arctic char (Dolly Varden), burbot, and landlocked coho, king, and sockeye salmon? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.5	18 AAC 70.255 (h)	Y
Human Health	Does the mixing zone…			
	(1) contain bioaccumulating, bioconcentrating, or persistent chemical above natural or significantly adverse levels? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.4, Permit Part 3.2 Special Conditions	18 AAC 70.250 (a)(1)	Y
	(2) contain chemicals expected to cause carcinogenic, mutagenic, tetragenic, or otherwise harmful effects to human health? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.4		Y
	(3) Create a public health hazard through encroachment on water supply or through contact recreation? **If yes, mixing zone prohibited.**	No, Fact Sheet Parts 4.7.4.4	18 AAC 70.250(a)(1)(C)	Y
	(4) meet human health and aquatic life quality criteria at the boundary of the mixing zone?	Yes, Fact Sheet Parts 5.6.7, 5.7, 5.8.1.3, 5.8.5.5.2	18 AAC 70.255 (b),(c)	Y

	If no, mixing zone prohibited.			
	(5) occur in a location where the Department determines that a public health hazard reasonably could be expected? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 3.3, Permit Part 5.0	18 AAC 70.255(e)(3)(B)	Y
Aquatic Life	Does the mixing zone…			
	(1) create a significant adverse effect to anadromous, resident, or shellfish spawning or rearing? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.5	18 AAC 70.250(a)(2)(A-C)	Y
	(2) form a barrier to migratory species? **If yes, mixing zone prohibited.**	No, Fact Sheet Parts 4.7.4.5, 8.2, 8.4		Y
	(3) fail to provide a zone of passage? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.5, 8.2, 8.4		Y
	(4) result in undesirable or nuisance aquatic life? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.5, 8.2, 8.4	18 AAC 70.250(b)(1)	Y
	(5) result in permanent or irreparable displacement of indigenous organisms? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.5, 8.2, 8.4	18 AAC 70.255(g)(1)	Y

	(6) result in a reduction in fish or shellfish population levels? **If yes, mixing zone prohibited.**	No, Fact Sheet Part 4.7.4.5, 8.2, 8.4	18 AAC 70.255(g)(2)	Y
	(7) prevent lethality to passing organisms by reducing the size of the acute zone? **If no, mixing zone prohibited.**	Yes, Fact Sheet 4.7.4.5, 8.2, 8.4	18 AAC 70.255(b)(1)	Y
	(8) cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? **If yes, mixing zone prohibited.**	No, Fact Sheet Parts, 4.7.4.5, 8.2, 8.4, Permit 5.2, 5.7	18 AAC 70.255(b)(2)	Y
Endangered Species	Are there threatened or endangered species (T/E sp) at the location of the mixing zone? If yes, are there likely to be adverse effects to T/E spp based on comments received from USFWS or NOAA. If yes, will conservation measures be included in the permit to avoid adverse effects? **If yes, explain conservation measures in Fact Sheet. If no, mixing zone prohibited.**	Applicant or permit writer requests list of T/E species from USFWS prior to drafting permit conditions. Response received from USFWS dated Aug. 16, 2012 and October 2015.	Program Description, 6.4.1 #5 18 AAC 70.250(a)(2)(D)	Y