ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET – PRELIMINARY DRAFT

General Permit Number: **AKG523000**

Offshore 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: DRAFT

Public Comment Period Expiration Date: DRAFT

Alaska Online Public Notice System

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Reissuance of an Alaska Pollutant Discharge Elimination System (APDES) general permit:

OFFSHORE SEAFOOD PROCESSORS WASTEWATER DISCHARGE GENERAL PERMIT

The Alaska Department of Environmental Conservation (DEC or the Department) proposes to reissue APDES general permit AKG523000, the Offshore Seafood Processors Wastewater Discharge General Permit. The permit authorizes and sets conditions on the discharge of pollutants from seafood processing and inland waters discharge vessels in Alaska discharging from the shore to 3.0 nautical miles (nm) from shore (as delineated by mean lower low water (MLLW)) or to the baseline. 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 vessels and outlines best management practices to which the permittees must adhere.

The permit authorizes seafood processing waste and wastewater discharges to navigable waters of the U.S. located in the State of Alaska's jurisdiction but not in designated Excluded Areas unless specifically authorized. These Excluded Areas include a buffer around protected water resources such as national parks, national wildlife refuges, critical habitat areas, and sea lion haul outs. The permit allows discharge of pollutants to the Excluded Areas only in accordance with the conditions, monitoring requirements, and effluent limitations in the permit and site-specific conditions and requirements listed in Permit Part 1.7.

This fact sheet explains the nature of potential discharges from vessel operations and the permit development, including:

- Information on public comment, public hearing, and appeal procedures,
- A listing of effluent limitations and other conditions,
- Technical material supporting the conditions in the permit, and
- 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 technical contact at the address 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 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 process at 18 Alaska Administrative Code (AAC) 15.185.

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.

Informal Reviews and Adjudicatory Hearings

A person authorized under a provision of 18 AAC 15 may request an informal review of a contested decision by the Division Director in accordance with 18 AAC 15.185 and/or an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340. See DEC's "Appeal a DEC Decision" web page https://dec.alaska.gov/commish/review-guidance/ for access to the required forms and guidance on the appeal process. Please provide a courtesy copy of the adjudicatory hearing request in an electronic format to the parties required to be served under 18 AAC 15.200. Requests must be submitted no later than the deadline specified in 18 AAC 15.

Documents are Available

The permit, fact sheet, application, 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, application, and other information are located on the Department's Wastewater Discharge Authorization Program website: https://dec.alaska.gov/water/wastewater/.

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street **Anchorage**, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program **Mail**: P.O. Box 111800 **In Person**: 410 Willoughby Avenue, Suite 303 **Juneau**, AK 99811-1800 (907) 465-5180
Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 610 University Avenue **Fairbanks**, AK 99709 (907) 451-2183	

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1.0 GENERAL PERMIT

1.1 Legal Basis for Issuance of an APDES General Permit

Section 301(a) of the Clean Water Act (CWA) provides that the discharge of any pollutant to waters of the U.S. is unlawful except in compliance with Sections 301, 302, 306, 307, 318, 402, and 404 of the CWA. In addition, as established in Alaska Administrative Code (AAC) 18 AAC 83.015, the discharge of any pollutant to surface water designated as waters of the U.S. in Alaska is unlawful except in accordance with an Alaska Pollutant Discharge Elimination System (APDES) permit.

Per 18 AAC 83.205, the Alaska Department of Environmental Conservation (DEC or 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.

The Department determined that it is appropriate to issue a general permit for seafood processing vessels, as identified in Part 1.5, because the sources have substantially similar operations, discharge the same types of wastes, are subject to the same water quality-based effluent limitations (WQBELs) and technology-based effluent limitations (TBELs), and have similar monitoring requirements.

1.2 Individual Permit

A permittee 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.

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 APDES individual permit when:

- The discharger is not in compliance with the terms and conditions of the APDES general permit.
- A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source.
- Effluent limitations guidelines are promulgated for point sources covered by the APDES general permit.
- A water quality management plan containing requirements applicable to a point source is approved.
- 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 has either temporarily or permanently been reduced or eliminated.

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

1.3 Permit Issuance History and Coverage Changes

In 2001, the Environmental Protection Agency (EPA) reissued a general permit for seafood processors operating in the State of Alaska (AKG520000). The permit authorized four categories of dischargers: offshore processors (1.0 nautical miles [nm] to 12.0 nm), nearshore processors (0.5 nm to 1.0 nm), shore-based processors (0.0 nm to 0.5 nm), and "At-Sea" discharges (greater than 1.0 nm from shore). The permit expired on July 27, 2006 but was administratively continued.

In 2008, EPA proposed to issue a general permit for seafood processors discharging from one-half nm (0.5 nm) to twelve nm (12.0 nm) from shore. The AKG524000 permit proposed to authorize three of the four categories previously authorized by AKG520000: offshore processors, nearshore processors, and "At-Sea" discharges. EPA public noticed the draft permit September 26, 2008 through December 10, 2008.

On October 31, 2008, EPA approved Alaska's application to administer the National Pollutant Discharge Elimination System (NPDES) program. The administration of APDES permitting for the seafood sector transferred to DEC during the public comment period for the draft AKG524000 permit. Following the close of the AKG524000 permit's public comment period and review of the comments received, DEC decided to issue a separate APDES Offshore Seafood Processors General Permit (AKG523000) for discharges to State jurisdictional waters. The Department used the draft AKG524000 permit and comments received during the public comment period in 2008 for the development of the AKG523000 permit.

On May 23, 2011, DEC issued APDES AKG523000 Offshore Seafood Processors General Permit (GP). The permit was applicable to vessels discharging seafood processing waste 0.5 nm to 3.0 nm from shore or to the baseline, authorizing two of the four categories previously authorized by the AKG520000 permit: offshore and nearshore processors and referred to both as offshore processors. The May 2011 Offshore Seafood Processors GP stipulated that in order to obtain approval to discharge seafood processing waste into Excluded Areas waters, a permittee must either apply for coverage under an individual permit or submit a permit modification to the Offshore Seafood Processors GP. Appendix H of the May 2011 permit required an operator to submit additional information to DEC for evaluation. After review of the submitted information, DEC could propose to modify the Offshore Seafood Processors GP to authorize a discharge to an otherwise Excluded Area.

During the comment period for a permit modification, the U.S. Fish and Wildlife Service (USFWS) provided information on potential impacts to species protected under the Endangered Species Act and recommended measures to be included in the permit to protect aquatic resources. DEC reviewed the suggested protective measures and developed site-specific requirements to protect the aquatic resources in addition to the existing May 2011 permit requirements. In response to the USFWS comments, Appendix H was modified to include additional site-specific requirements applicable to AKG523000 written authorizations in Excluded Areas. After the public comment period closed, the 2012 AKG523000 Offshore Seafood Processors GP Modification became effective September 21, 2012.

After the 2012 AKG523000 permit became effective, DEC reviewed several AKG523000 Notices of Intent (NOIs) with permit modification requests to discharge pollutants to Excluded Areas. DEC reviewed the requests and decided to authorize the discharge of pollutants to the Excluded Areas, in accordance with the conditions, monitoring requirements, and effluent limitations of the Offshore Seafood Processors GP and site-specific requirements listed in the permit Appendix H.

In 2018, DEC reissued APDES general permit AKG523000 to Offshore Seafood Processing vessels. The reissued AKG523000 permit provided coverage to seafood processing vessels discharging while stationary and/or in-transit between 0.25 nm to 3.0 nm from shore, and to inland waters discharge vessels that discharge a seafood processor's seafood processing waste and wastewater to inland waters of the U.S. behind the baseline and between 0.25 nm to 3.0 nm from Alaska's shores. The 2018 Offshore Seafood Processors general permit also provided coverage to seafood processing vessels discharging stationary between shore (0.0 nm) and 0.25 nm from shore, but only if the processing vessel demonstrated previously-installed and existing permanent anchoring infrastructure present at the time of general permit issuance or could demonstrate that discharges were necessary for the protection of the vessel and crew during adverse weather or sea conditions. The reissued AKG523000 permit went into effect January 1, 2019 and expired December 31, 2023, at which time it was administratively extended until the next permit reissuance.

1.3.1 Inland Waters Discharges

The 2001 AKG520000 permit allowed seafood processing facilities to transport their seafood processing waste and discharge it by vessel "At-Sea." These "At-Sea" discharges were authorized to occur inside and outside of baselines or closing lines, as long as the discharges were located one mile or greater from shore.

In issuing the AKG524000 permit, EPA determined that the "At-Sea" discharges to federal waters (i.e., beyond 3.0 nm or the baseline) did not fall within the authority of the NPDES Program and that the Ocean Dumping Act provides the authority for these types of discharges. More information can be found in the AKG524000 permit and accompanying Response to Comments document.

The permit proposes to authorize in-transit vessel discharges behind baseline or closing lines, defining these discharges as inland waters discharges. Inland waters discharges will be authorized while discharging at least 0.25 nm from shore as delineated by mean lower low water (MLLW), except to Excluded Areas described in Permit Part 1.4. Generally, the baseline consists of the mainland low-water line and any offshore islands and additional features that are applicable to the U.S. coast, such as river mouths, bays, and enclosed harbors from which the breadth of the territorial sea is measured. An interactive map depicting Alaska's baseline plus additional boundary lines is available at Alaska DEC Seafood Processing GIS Map. The map is provided for information purposes only. The U.S. Baseline Committee makes the official determinations of baseline.

1.3.2 Limitations on Vessel Coverage

The AKG523000 permit proposes coverage for in-transit and stationary vessels discharging seafood processing waste between 0.25 nm from shore to 3.0 nm from shore measured at MLLW. Discharge from shore to 0.25 nm from shore will only be authorized for stationary processing vessels, and only for circumstances as described in the subsequent paragraphs. Normally, processing vessels follow the fisheries, moving from waterbody to waterbody. However, some processing vessels and moored barges provide direct support to an onshore seafood processing facility by providing processing services or additional freezing capability. Direct support vessels and moored barges remain stationary, moored to a dock, pier, or permanent anchor to prevent movement, with discharges occurring in the same location throughout the season. These direct support vessels and moored barges are covered under the AKG521000 Remote Onshore Seafood Processors in Alaska general permit. Processing vessels

that propose to discharge shore or dockside independent of a processing facility will not be covered by the AKG523000 general permit.

Stationary processing vessels discharging seafood processing waste to waters of the U.S. measured from shore (0.0 nm at MLLW) to 0.25 nm from shore measured at MLLW will be covered by the AKG523000 general permit. However, the Department will only authorize this category of discharger if the processing vessel can demonstrate previously-installed and existing permanent anchoring infrastructure is present at the time of general permit issuance or can demonstrate that discharges are necessary for the protection of the vessel and crew during adverse weather or sea conditions. DEC reviewed foam and scum noncompliance notifications as well as Sea Surface Logs from the Annual Reports submitted during the 2011-2016 permit cycle as well as from the 2018-2023 permit cycle. DEC found that multiple violations of mixing zone boundaries occurred for foam and scum, reporting ranges of 500-2500 feet. Thus, if anchored within 0.25 nm of the shoreline, the vessel's foam/scum could reach the shoreline. During the 2011-2016 permit cycle, DEC also received numerous complaints documenting seafood processing waste washing up on shorelines adjacent to locations where seafood processing vessels were anchored within 0.5 nm of shore. The Department notes that while offshore seafood processors are required to meet the same treatment requirements as onshore facilities, they have the following difference. Onshore facilities discharge through an underwater outfall pipe that must reach a depth of 60 feet MLLW or deeper, whereas seafood processing vessels discharge seafood processing waste at or below the sea surface. When discharge within 0.25 nm from shore does occur, the vessel must keep record on a vessel log, including the daily discharge coordinates, daily amount of discharge, and the circumstances requiring discharge at that location.

DEC determined that it is appropriate to issue an APDES general permit for operators of large mobile vessels that discharge seafood processing waste and wastewaters between shore and 3.0 nm from shore as delineated by MLLW or baseline and that discharge more than 1,000 pounds of seafood processing waste per day or more than 30,000 pounds of seafood processing waste per calendar year. Operators of vessels that discharge less than 1,000 pounds of waste per day and less than 30,000 pounds per calendar year do not operate their vessels in a similar manner as the larger vessels that are authorized under the permit, nor does a small processing or discharge vessel require the same effluent conditions, operating conditions, and monitoring requirements as a large processing or discharge vessel. Therefore, DEC determined that coverage under this general permit is not appropriate for those vessels.

DEC intends to issue an APDES general permit in the future for small processors that discharge less than 1,000 pounds per day and 30,000 pounds per calendar year of seafood processing waste. The timing of this issuance will be determined as part of the DEC Continuing Planning Process and the development of the Permit Issuance Plan. An operator of a small processing or discharge vessel may elect to submit a Notice of Intent (NOI) for authorization under the AKG523000 permit while waiting for issuance of an APDES small processing vessel general permit. Submitting an NOI and receiving a discharge authorization requires the operator to comply with all conditions and requirements of the AKG523000 permit.

If the Department determines that a discharge from a small processing or discharge vessel is a significant source of pollution, the Department will notify the operator that APDES permit authorization under the AKG523000 general permit is required.

1.4 Description of Seafood Processing Facilities and Vessels

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 species of fish and marine invertebrates, including groundfish (e.g., walleye pollock, Pacific cod, sablefish, rockfish species, and other flatfish species); five species of salmon; herring; and shellfish (e.g., crab, shrimp, clams, scallops, abalone, sea urchins, and sea cucumbers).

Seafood processing facilities and vessels 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 in EPA's "Development Document for Effluent Limitation Guidelines and New Source Performance Standards for the Fish Meal, Salmon, Bottom Fish, Clam, Oyster, Sardine, Scallop, Herring, and Abalone Segment of the Canned and Preserved Fish and Seafood Processing Industry Point Source Category" (1975). Seafood processing can include packaging whole fresh or frozen seafood for shipment, mechanical filleting, deboning processes, and the production of washed and unwashed mince and/or paste products and other seafood byproducts. Solid and liquid wastes remaining after production may be further processed into fish meal, fish oil, fish hydrolysate, or other byproducts. Additionally, since the early 1980s new seafood processing techniques have been introduced into facility and vessel production lines, such as surimi and salmon byproduct (unwashed mince and washed mince and/or paste). New techniques in recent years have further been developed to convert salmon waste to salmon hydrolysate, salmon pet food treats, and other animal food supplements. 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 seafood waste have also proven successful in Alaska.

On any particular vessel, the quantity and character of the seafood processing waste varies considerably over the course of a year. Seafood waste produced varies by region, reflecting the distribution of available fishing stocks, the openings and closings of the fishing seasons, and fishing quota allocations used to manage stocks. Generally, groundfish and shellfish wastes constitute the majority of the discharges in the winter, early spring, and autumn, and salmon processing wastes constitute the majority of discharges in the summer. On a statewide basis, groundfish constitute the largest volume of seafood waste discharged. When broken down by region, the largest volume of waste comes from the Bering Sea/Aleutian Island area, and 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 seafood waste produced in this sector.

Seafood processing operations that occur at a stationary position, such as an anchored floating processor, generally occur 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 facility and vessel operations in Alaska can be generally represented by four physical oceanographic environments:

- Protected bays or harbors with reduced wave action, but possibly significant tidal currents.
- Nearshore open coastal areas, which are affected by wave action depending on the water

depth, wind, and tidally driven currents.

- River or estuary mouths with some wave action and a predominant tidal and freshwater influence.
- Open water which is affected primarily by wind-driven currents, although tidal currents may be important at some locations.

1.5 Eligibility (Permit Part 1.1)

Subject to meeting the conditions of the permit, the following categories of seafood processors and discharge vessels are eligible for coverage to discharge the pollutants set out in Permit Part 1.2 after receiving an APDES permit authorization including an authorization number:

1.5.1 **Offshore Seafood Processing Vessels discharging between shore (0.0 nautical miles (nm)) and 0.25 nm from shore.** Stationary seafood processing vessels that discharge seafood processing waste and other wastewater pollutants to waters of the U.S. between shore and 0.25 nm from shore as delineated by MLLW and are engaged in the processing of fresh, frozen, canned, smoked, salted, or pickled seafood or the processing of unwashed mince. This type of authorization is conditioned on the language in Part 1.3.2.

1.5.2 **Offshore Seafood Processing Vessels discharging over 0.25 nm and less than 1.0 nm from shore.** In-transit or stationary processing vessels that discharge seafood processing waste and other wastewater pollutants to waters of the U.S. over 0.25 nm and less than 1.0 nm from shore as delineated by MLLW and are 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 byproducts. See Permit Part 2.1.2.3 for restrictions. High levels of biochemical oxygen demand (BOD) in washed mince waste streams can depress dissolved oxygen (DO) in the water column.

1.5.3 **Offshore Seafood Processing Vessels discharging between 1.0 nm and less than 3.0 nm from shore (or between 1.0 nm from shore and the baseline).** In-transit or stationary processing vessels that discharge seafood processing waste and other wastewater pollutants to waters of the U.S. between 1.0 nm and less than 3.0 nm from shore as delineated by MLLW (or between 1.0 nm from shore and the baseline) and are engaged in the processing of fresh, frozen, canned, smoked, salted, or pickled seafood; the processing of seafood mince or paste; or the processing of meal and other secondary byproducts.

1.5.4 **Inland Waters Seafood Waste Discharge Vessels.** In-transit vessels (not processors) that discharge a seafood processor's seafood processing waste and wastewater pollutants to inland waters of the U.S. **behind the baseline**, as follows:

1.5.4.1 Between 0.25 nm and less than 1.0 nm from shore, as delineated by MLLW. Waste streams from the following activities can be discharged: the processing of fresh, frozen, canned, smoked, salted, or pickled seafood; the processing of unwashed mince; or the processing of meal and other secondary byproducts. See Permit Part 2.1.2.3 for restrictions.

1.5.4.2 Equal to or greater than 1.0 nm from shore, as delineated by MLLW. Waste streams from the following activities can be discharged: the processing of fresh, frozen, canned, smoked, salted or pickled seafood; the processing of seafood mince or paste; or the processing of meal and other secondary byproducts.

1.6 Discharges Covered (Permit Part 1.2)

1.6.1 Seafood processing waste and wastewaters, which includes the water, waste fluids, heads, organs, flesh, fins, bones, skin, and stickwater produced by the conversion of seafood from a raw form to a marketable form. This includes ice and water used to transfer seafood (catch transfer water) to the vessel.

Seafood processing, as defined, does not include gutting, gilling, or icing fish or decapitating shrimp while on a fishing vessel, on the fishing grounds, if done solely to maintain product quality or prevent loss from decomposition.

Discharges shall be into waters with a high capacity of dilution and dispersion. It is difficult to classify the marine waters of Alaska into regionally distinct oceanographic regimes due to the wide variety of oceanographic characteristics that occur. The permit uses the term hydrodynamically energetic waters to describe the appropriate discharge locations for seafood processing waste. Hydrodynamically energetic waters are those locations where ocean currents, tidal cycles, etc. will disperse the seafood processing waste before settling, resuspend and disperse waste during high current events, or facilitate the decay and decomposition of the seafood processing waste.

Pollutants of concern associated with seafood processing wastewater discharges include: residues, BOD, total suspended solids (TSS), and non-petroleum oil and grease (O&G). These pollutants result from waste solids (bones, skin, scales, flesh, and organs), blood, body fluids, slime, stickwater, and oils and fats from byproduct operations. Ammonia may be present due to natural degradation processes and the use of quaternary ammonia cleaning compounds. Other regulated parameters include pH and temperature.

1.6.2 Washdown water, including cleaning agents used in seafood processing.

The permit authorizes the discharge of washdown water, including disinfectants added to washdown water to meet applicable state and federal sanitation standards by facilitating waste removal while processing or sanitizing seafood processing areas where the permittee follows the manufacturer's recommended use and disposal recommendations.

In addition to the pollutants of concern listed in Part 1.6.1, free chlorine may be present in residual amounts from periodic use of common disinfectants.

1.6.3 "Other Wastewaters" generated as part of the normal seafood processing operation, including non-process wastewaters. "Other Wastewaters" includes cooling water, boiler water, freshwater pressure relief water, refrigeration condensate, refrigerated seawater, cooking water, scrubber water, drinking water backwash, and live tank water.

Pollutants of concern for "Other Wastewaters" discharges may include: ammonia, chlorine, residues, pH, non-petroleum O&G, BOD, Settleable Solids, TSS, color, and temperature. A specific "Other Wastewaters" pollutant discussion can be found in Part 3.1.3.3.

1.6.4 Treated Sanitary Wastewater. The permit authorizes the discharge of the vessel's treated sanitary wastewater from a certified and operable Type II Marine Sanitation Device (MSD) and discharge of the vessel's graywater.

Pollutants of concern in vessel sanitary wastewater discharge may include: bacteria, TSS, BOD, pH, and temperature.

1.7 Prohibited Discharges (Permit Part 1.3)

The discharge of any pollutant to waters of the U.S. that is not identified in a NOI submitted to the Department, and expressly authorized in Permit Part 1.2, is not covered. Unauthorized discharges include, but are not limited to:

1.7.1 Interim, Finished, or Unused Products

DEC has been made aware through review of Ocean Dumping, at-sea disposal logs, and noncompliance notifications that additives or other products other than raw or cooked seafood wastes have been disposed of in State waters. The discharge or disposal of these chemicals, food (e.g., sugars, salts) or food additives, and processed byproducts (e.g., oils, hydrolysates, etc.) can severely alter the chemistry of the receiving water and are not authorized under the permit. The discharge of seafood processing interim or finished byproducts results in very high BOD and chemical oxygen demand (COD) pollutant loading. The restriction does not apply to byproduct effluents meeting the terms of the permit.

Chemicals/additives used in the seafood processing lines (those not actively used in production or disinfection) such as sodium hydroxide, hydrochloric acid, aldehydes, or ketones may not be poured directly into wastewater discharge lines. Unmonitored and/or untreated discharges of these chemicals can lead to violations of water quality standards (WQS).

1.7.2 Spoiled Seafood Waste

If a vessel delivers fish or other aquatic animals or plants to the permittee, or the permittee experiences a refrigeration system failure, and raw or processed seafood/plant products are "spoiled" due to temperature, histamine concentration, or decomposition, these materials are prohibited from being discharged. The accumulation of lactic acid in postmortem fish tissue leads to a pH decline.

1.7.3 Hazardous or Toxic Substances

The WQS for toxic and other deleterious organic and inorganic substances for marine water uses are codified in 18 AAC 70.020(b) and as found in *Alaska WQC Manual for Toxic and Other Deleterious Organic and Inorganic Substances*, as amended through December 12, 2008. The permit requires compliance with these WQS; therefore, any toxic or hazardous substance discharges that may impair or violate WQS, or cause nuisance conditions, are prohibited.

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

1.7.4 Solid Phase Wastes

The permit does not allow discharge of solid-phase wastes with no liquid content. These wastes are more appropriately discharged under the Ocean Dumping Act.

1.8 Excluded Areas Provisions (Permit Part 1.4)

As provided for in 18 AAC 83.205(d), the Department establishes conditions applicable to a general permit for each category of discharger and may establish areas excluded from coverage.
Permit Part 1.4 identifies areas that are considered Excluded Areas under the general permit. In 1994, EPA formed a working group of state and federal fish and wildlife, public lands, and environmental managers to determine areas meriting exclusion from coverage under the Alaska seafood processors' general permit. The working group reached consensus on a list of Excluded Areas, and EPA included the list 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 (CHAs). The permit established 1.0 nm to 3.0 nm buffer zones around most Excluded Area waters. The permit also excluded discharges to Wilderness Areas, State Parks and conservation areas, at-risk waters, and certain special waters. The Excluded Areas from the 2018 AKG523000 general permit are being carried forward in the permit. Refinement of the location of the Excluded Areas through Geographic Information System (GIS) mapping and updates to endangered and threatened species (ETS) lists occurred in the 2018 AKG523000 permit issuance. Changes to ETS lists and the available resources to identify various Excluded Areas are discussed below.

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 a permittee to apply for a waiver to discharge to a water in an Excluded Area. As mentioned earlier, the 2012 AKG53000 permit modification required additional information to be submitted in the form of a special request to discharge to the Excluded Area, including the permittee providing alternatives to discharging within the Excluded Area. The permit required DEC and the agency with management authority over the Excluded Areas to evaluate the discharge request before DEC made a decision to authorize a discharge to an Excluded Area.

The 2018 AKG523000 permit continued to allow case-by-case requests to discharge to Excluded Areas based on conditions included in Permit Part 1.7, consistent with 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 2018 AKG523000 permit carried forward the Excluded Area discharge evaluation and approval process as established in the 2012 AKG523000 permit modification. There was a new requirement that DEC would public notice the draft authorization when a new discharge to an Excluded Area under the AKG523000 permit was proposed. DEC's intent was to take into consideration agency or public recommended site-specific conditions provided during the public notice period. DEC views a request to discharge to an Excluded Area and the approval process as a permit condition added to the AKG523000 permit to address issues raised during the 1994 Seafood Processors Work Group and during the 2001 AKG520000 draft permit development. DEC does not consider the approval to be a waiver to exceed WQS or a waiver to meeting established effluent limitations guidelines (ELGs). Thus, DEC is eliminating confusion by not referring to the request to discharge to these areas as a waiver request. The 2026 AKG523000 permit carries forward the draft authorization public notice requirement for Excluded Areas new discharge requests.

The 2026 AKG523000 permit includes continuation of previously-approved 2018 AKG523000 discharge authorizations listed in Permit Appendix D – Table D2 for permittees discharging to Excluded Areas. The AKG523000 permit requires that a new permittee submit a request to discharge to an Excluded Area in compliance with Permit Part 1.7. DEC may require the permittee to apply for APDES individual permit coverage if the discharge to the Excluded Area causes water quality and/or habitat protection concerns. The special conditions applied to Excluded Areas discharges were submitted to DEC by agencies with management authority over the Excluded Areas during the previous AKG520000 and AKG523000 permit cycles.

If a permittee that is authorized to discharge to an Excluded Area, including existing permittees and locations listed in Permit Appendix D - Table D2, proposes a material change to the seafood processing lines or a change in location(s) (Permit Part 1.7.2.2) after the initial authorization is granted, the permittee is responsible for providing information required in Permit Part 1.7.2 to DEC to evaluate the proposed change. As applicable, Permit Part 1.7.4 conditions will be added as Excluded Area APDES authorization requirements.

Excluded Areas in the AKG523000 permit include:

1.8.1 One nautical mile limit

A one nautical mile limit is set from State Designated Game Refuges and Sanctuaries; State Designated CHAs; Federal Designated Critical Habitat; National Parks, Preserves or Monuments; National Wilderness Areas; National Wildlife Refuges; and nesting colonies of 1,000 birds or more.

The AKG523000 permit clarifies ambiguous areas listed in the 2001 AKG520000 permit and identifies new areas that warrant inclusion as sensitive areas and that require site-specific evaluation. Two examples include CHAs identified as Steller's 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 on the Alaska DEC Seafood Processing GIS Map as well as National Oceanic and Atmospheric Administration (NOAA) and USFWS mapping websites.

The 2018 permit removed Eastern Stellar sea lion critical habitat as previously covered under the AKG520000 permit. On November 4, 2013, National Marine Fisheries Service (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."

1.8.2 Three nautical mile limit

A three nautical mile limit is set from rookeries and haul outs for Western Steller sea lions and Pacific walrus. Sea lions and Pacific walrus have high site fidelity and the tendency to return to a previously occupied location. Even minor human activity, such as sight, sound, and odors from humans and machines cause the animals to flee from haul out locations. Thus, the buffer zones have been established to provide disturbance protection.

1.8.3 Special Water Resources

1.8.3.1 Orca Inlet. No discharge of uncooked seafood processing pollutants to Orca Inlet may occur during the months of November, December, January, February, and March. Sea otters, which are protected under the Marine Mammal Protection Act, are attracted to the discharge and waste deposit as a food source.

1.8.3.2 Norton Sound Critical Habitat. No discharge of pollutants to waters in the Norton Sound CHA may occur from June 24 to October 31.

1.8.3.3 No discharge of pollutants may occur to Kodiak Harbor, St. Paul Harbor, Gibson Cove, Near Island Channel, Women's Bay, and Woody Island Channel.
Discharges to these waterbodies are covered under the AKG528000 "Seafood Processors Operating Onshore Facilities in Kodiak, Alaska," which authorizes discharges from onshore seafood processors and byproduct recovery facilities located in Kodiak, Alaska. The AKG528000 permit applies 'Non-remote' location permit conditions to these waterbodies, which are therefore not appropriated covered under the AKG523000 permit. For more information regarding Non-remote facilities and permit requirements, see the AKG528000 general permit and accompanying Fact Sheet.

1.8.3.4 Within 300 feet of Living Substrates.
"Living substrates" have been identified as important marine habitat and are susceptible to impacts from human activities. Discharging seafood processing waste and possible subsequent burying of living substrate by seafood processing residues must be minimized. Living substrates include submerged aquatic vegetation, kelp, and eelgrass in shallow coastal waters (generally less than 60 feet at MLLW).

1.8.3.5 The territorial seas surrounding St. Paul Island and St. George Island (The Pribilof Islands).
In the 2001 AKG520000 permit, waters within 3.0 nm of the Pribilof Islands were considered "At Risk Waterbodies" because seafood waste discharged in these waters did not disperse quickly, got trapped, settled within these areas, and did not decompose as quickly as modeling predicted.

1.8.3.6 The Aleutian Islands Coral Habitat Protection Areas.

1.8.4 At Risk Waterbodies

Areas with a water depth of less than 60 feet at MLLW are excluded from permit coverage if the areas have or are likely to have less than 0.33 knots average current within 300 feet of the discharge point for seafood waste. The 2001 AKG520000 permit listed Akun Island's Lost Harbor as an Excluded Area because of vessel 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. The AKG523000 permit continues to list "At Risk Waterbodies" as Excluded Areas, defining the waterbodies as "sheltered waterbodies and semi-enclosed water basins with depths deeper than the bordering or enclosed sills." Permittees shall identify on their NOI if the permittee is proposing to discharge to an "At Risk Waterbody" and are responsible to prove adequate flushing for each proposed discharge location.

1.8.5 Degraded Water Resources

Any discharges to a waterbody included in DEC's most recent EPA-approved *Integrated Water Quality Monitoring and Assessment Report* of waters which are impaired or water quality-limited are considered Excluded Area discharges.

1.9 Requesting Authorization (Permit Part 1.5)

A permittee shall apply electronically or by other approved means for coverage and authorization under the permit. A permittee wishing to apply for new coverage for a seafood processing vessel shall submit a complete NOI and required attachments at least 90 days prior to the start of discharge.

Permittees with administratively continued AKG523000 authorization listed in Permit Appendix D are not required to submit a new NOI application by the effective date of this permit, unless the originally submitted NOI on file requires modification.

The AKG523000 general permit does not authorize any discharges from a permittee unless the permittee has submitted a complete NOI as specified and has received DEC's written authorization to discharge under the permit or has been notified in writing by DEC that the permittee is covered under the permit as provided for in 18 AAC 83.210(h). The permittee 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. Relocation to a new site(s) or other material operational changes will require the permittee to submit an updated NOI at least 30 days prior to the proposed change. The permittee shall retain a copy of the APDES authorization and the permit, as well as applicable inspection and monitoring records, on the vessel or electronically but available upon request.

DEC will allow a permittee to use multiple inland waters discharge vessels under a single authorization number but only if there is a single area of operation (as tracking multiple vessels and multiple discharge locations would be impracticable for both permittees and the Department) and if the waste discharged comes from a single onshore processing facility (as otherwise waste and wastewater monitoring would not be representative of all of the waste discharged).

Only vessels meeting the provisions of the permit will be provided an APDES AKG523000 written authorization. The Department's evaluation will include reviewing the vessel's NOI, the required attachments, the receiving water characteristics, and the cumulative monitoring results.

Providing Notice. The following draft authorizations under the permit will be noticed in accordance with 18 AAC 83.120 requirements:

- Proposed discharges into Excluded Areas waters listed in Permit Parts 1.4.1 – 1.4.5 other from the vessels listed in Permit Appendix D - Table D2, and with operational changes as described under Permit Part 1.7.2.2.
- Proposed mixing zone requests with dimensions or parameters different from those of the standard mixing zone described under Permit Part 2.3.1.3.

1.10 Requirements to Submit a Complete Notice of Intent (Permit Parts 1.6 and 1.7)

An applicant seeking coverage under the permit shall submit a complete and timely NOI (Permit Attachment A, A-1, and A-2, if necessary), per 18 AAC 83.210(b), to fulfill the duty to apply for a permit. Permit Part 1.6 contains a list of required submittals. A discharger that fails to submit a complete NOI in compliance with the requirements of the permit is not authorized to discharge under the general permit unless the Department determines that a NOI is not required for coverage under the general

permit, as provided for in 18 AAC 83.210(g), or the Department notifies a discharger that it is covered by a general permit as provided for in 18 AAC 83.210(h).

DEC requires previous permit information, permittee information, billing contact information, and owner information in order to accurately maintain permit records.

1.10.1 Production Capacity Information.

DEC requires permittee production capacity and discharge amounts to determine whether the proposed discharge will fit under the permit requirements. There are two reasons the Department is requesting this type of information. First, to review cumulative discharges to waterbodies and approved discharge sites, which increase the probability that a greater than 1.0-acre deposit of seafood waste will form on the seafloor if the total cumulative seafood waste discharge is greater than 10 million pounds per year to a single waterbody. This assumption is based on the modeling and previous seafloor surveys discussed in Part 4.4.3**.**

The second reason DEC requires this information is for reviewing discharges to Excluded Areas (Permit Part 1.4). If requesting to discharge waste to Excluded Areas, permittees are required to submit the proposed amount of seafood waste to be discharged to DEC. Should the permittee request an increase in discharge allowance, the permittee shall submit the proposed increase on an updated NOI and go through public notice for the change. Further discussion of Excluded Areas is found in Part 1.8.

1.11 Notice of Intent Review and Permit Authorization Process (Permit Part 1.8)

Only permittees meeting the provisions of the permit will be provided a written authorization. The Department's evaluation will include review of the applicant's NOI and the receiving water characteristics of the proposed discharge locations as part of the decision-making process. Permittees are no longer required to identify whether proposed discharge locations overlap with others' approved locations. The Department will do that and limit discharges or add monitoring as deemed necessary.

Permittees will receive the standard 100-foot radius mixing zone(s) (Permit Part 2.3.1.3) and 1.0-acre zone of deposit (ZOD) allowance (Permit Part 2.3.3.3) if the Department determines it appropriate.

At the completion of the Department's NOI review process, DEC will either:

- Prepare and transmit a written authorization, which will include whether a mixing zone has been authorized and the size and included parameters; the size of any authorized ZOD; and the maximum amount (pounds) of seafood processing waste that can be discharged per year.
- Find the NOI incomplete and notify the applicant of needed revisions or updates to the NOI submittal; or
- Deny coverage under the general permit and require the applicant to submit an APDES individual permit application.

In determining the appropriateness of granting an authorization, whether a mixing zone is appropriate at the proposed discharge location(s), and whether a ZOD is appropriate at the proposed discharge location(s), the Department will evaluate the information provided by the applicant, including whether:

- The discharge is to a water in an Excluded Area (Permit Parts 1.4.1 – 1.4.5).
- Multiple permittees are proposing to discharge to the same or in close proximity to the same receiving water.

The amount of seafood processing waste discharge authorized may be limited by the conditions at the proposed discharge location. When determining whether to limit the amount of discharge authorized, the Department will consider the following:

1. The effects that the discharge might have on the uses of the receiving water;
2. The flushing and mixing characteristics of the receiving water;
3. The results of previous seafloor surveys indicating the location and size of seafood waste deposits, if any;
4. Available effluent monitoring results showing whether the proposed waste or wastewater treatment system is able to meet the requirements of the permit; and
5. Compliance with permit requirements, including receiving water monitoring.

1.12 Transfer of Authorization or Changes in Operations (Permit Part 1.9)

As found in 18 AAC 83.150, the permit requires the submittal of a Name Change/Notice of Transfer form when the information regarding ownership or permittee changes and requires submittal of an updated NOI if changes to authorized representative(s) or vessel discharges, production levels, and/or treatment systems occur.

The permit allows a Name Change/Notice of Transfer form only for the discharge locations(s) and/or areas of operation currently authorized on the APDES authorization. A permittee's existing authorization may not be transferred to the new permittee proposing new discharge location(s) or area(s) of operation without the submittal of an updated NOI.

Authorizations are also specific to the inland waters discharge vessel(s) listed on the authorization for each individual area of operation. An operator may notify DEC of a change in or addition of a vessel by submitting a vessel change or addition form (Permit Attachment F).

1.13 Continuation of an Expired General Permit (Permit Part 1.10)

The permit expires five years after the effective date. If the AKG523000 permit is not reissued prior to the permit's specified expiration date, it will be administratively continued in accordance with 18 AAC 83.155 and remain in force and effect for those permittees who have applied for continued coverage. In order to continue coverage, the permittee shall submit an updated NOI to the Department 90 days prior to the expiration of the permit requesting authorization for coverage under a reissued permit. Following a permittee's timely and complete NOI submittal, and receipt of a DEC APDES administrative continuation letter, the permittee is covered under administrative continuation until the permit is reissued or the authorization is terminated.

New applicants that intend to seek coverage under the general permit before or during administrative continuation may do so by submitting a complete NOI to the Department.

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

If the permit is administratively continued, the permittee shall continue or reinitiate all of the originally required monitoring schedules established in the permit.

1.14 Termination of Permit Coverage (Permit Part 1.11)

If a permittee wants to terminate coverage, the permit requires the permittee to provide a NOT to DEC within 30 days following cessation of discharges.

2.0 COMPLIANCE HISTORY

The compliance histories of the existing operators authorized by the 2018 AKG523000 permit were evaluated. Various instances noncompliance with the grind size requirement and effluent monitoring, and violations of the residues standard (floating foam, scum, residues), were reported during the permit term.

Due to the large number of existing authorized vessels, a detailed breakdown of the instances of noncompliance is not provided in this Fact Sheet. Specific details regarding a vessel's compliance history can be found by visiting the EPA's Enforcement and Compliance History Online (ECHO) database. Permit Appendix D provides a list of permit numbers that can be used to search.

3.0 EFFLUENT 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 TBELs or WQBELs. A TBEL is set according to the level of treatment that is achievable using available technology. For industrial sources, 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 of either TBELs or WQBELs will be selected as the final permit limitations.

3.1.1 Technology-Based Effluent Limits

The CWA requires particular categories of industrial dischargers to meet TBELs established by EPA. The CWA initially focused on the control of traditional pollutants (i.e., conventional pollutants and some metals) through the use of best practicable control technology currently available (BPT). For conventional pollutants (i.e., pH, BOD, TSS, O&G, and fecal coliform), CWA Section 301(b)(1)(E) requires the imposition of effluent limitations based on best conventional pollutant control technology (BCT). For nonconventional and toxic pollutants, CWA Section 301(b)(2)(A), (C), and (D) require the imposition of effluent limitations based on best available technology economically achievable (BAT). Where EPA has not yet developed guidelines for a particular industry, permit conditions may be established using Best Professional Judgment (BPJ) procedures (18 AAC 83.425 and 18 AAC 83.010).

For New Sources, defined in 18 AAC 83.990, CWA Section 306 requires the imposition of effluent limitations for conventional and toxic pollutants based on new source performance standards (NSPS), no later than the effective date of such standards.

3.1.1.1 Seafood Processing Waste

EPA has promulgated final ELGs specifying BCT, BPT, and NSPS for specific categories of Alaska seafood processing. The ELGs are codified at 40 CFR Part 408, adopted by reference at

18 AAC 83.010. The ELGs are applicable to the following seafood processing industries: crab meat processing, whole crab and crab section processing, shrimp processing, hand-butchered salmon processing, mechanized salmon processing, bottom fish processing, scallop processing, and herring fillet processing (40 CFR Part 408, Subparts E, G, J, P, Q, T, AC, AE). Seafood processors processing fresh, frozen, canned, and cured fish and shellfish are covered by the ELGs established at 40 CFR Part 408 for remote Alaskan locations, meaning those not located in population or processing centers as described in 40 CFR Part 408.

BPT, BCT, and NSPS 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 TBEL has been incorporated into the permit.

The permit does not require specific treatment types (e.g., grinder specifications) to meet the 0.5 inch or smaller in any dimension performance standard. Rather, the permit requires that seafood processing waste solids be ground or treated by other methods to 0.5 inch or smaller in any dimension prior to discharge. The grinder system or other treatment method must be designed to reduce seafood processing wastes to 0.5 inch or smaller in any dimension prior to discharge.

3.1.1.2 Sanitary Wastewaters

The AKG520000 general permit required sanitary waste to be treated prior to discharge by a sanitary waste system meeting the applicable Coast Guard pollution control standards then in effect (33 CFR Part 159 "Marine Sanitation Devices (MSDs)." 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 2026 AKG523000 permit continues the 2018 AKG523000 permit coverage of sanitary wastewater treated prior to discharge by a Type II MSD sanitary waste system and in accordance with U.S. Coast Guard regulations at 33 CFR Part 159. A vessel’s sanitary wastewater may also be disposed to an onshore domestic wastewater treatment system.

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 BAT/BCT effluent limitations for sanitary discharges from a seafood processing vessel when acting as an industrial facility. The 2026 AKG523000 permit proposes continuing effluent sampling and analysis of sanitary effluent for flow and total residue chlorine and requiring that Best Management Practices (BMPs) be developed and implemented (consistent with 18 AAC 83.475).

The BPJ determination was based on the following considerations:

3.1.1.2.1 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 Part 159. The MSD is required to be operated in such a manner to maintain certification regardless of the age of the equipment.

3.1.1.2.2 Engineering aspects of the application of various types of control techniques. Space on vessels is limited and changes to a MSD system can affect vessel stability and require relicensing of such vessels from the U.S. Coast Guard.

3.1.1.2.3 Cost Considerations. Since DEC determined 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 TBEL.

3.1.1.2.4 Microbiological monitoring. For compliance purposes, microbiological samples (fecal coliform bacteria and enterococci bacteria) were required to be analyzed within eight hours of sample collection under the 2018 AKG523000 permit. Bacteria monitoring was removed from the 2026 AKG523000 permit (for sanitary wastewater and graywater) because meeting the hold time required for valid analysis was found to be impracticable for permitted vessels during the last permit term.

3.1.1.3 Graywater

Graywater discharges were not included in the 40 CFR Part 408 TBELs but were authorized by the 2001 AKG520000 permit. EPA's Vessel General Permit (VGP) regulates discharges incidental to the normal operation of a vessel. The VGP includes limitations and controls for various discharges from vessels when acting as a means of transportation and not as an industrial facility, including graywater. The 2011 and 2018 AKG523000 permit graywater control measures are modeled after the VGP control measures, and the 2026 AKG523000 permit continues those measures and also continues to require the development and implementation of BMPs to control or abate the discharge of graywater from seafood processing vessels when acting as an industrial facility.

3.1.2 Water Quality-Based Effluent Limits

Regulations at 18 AAC 83.435 prohibit conduct that causes or contributes to a violation of WQS and require that permits include terms and conditions to ensure that WQS are met, including operating, monitoring, and reporting requirements. Permits must include WQBELs for pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state WQS, including state narrative criteria for water quality."

The permit may authorize exceedances of numeric or narrative WQS within an authorized mixing zone or in an authorized ZOD.

The permit requires that discharges meet all WQS at the boundary of an authorized mixing zone, at every point outside an allowed ZOD, or in the receiving water at the point of discharge if neither a mixing zone nor a ZOD is authorized.

3.1.2.1 Reasonable Potential Analysis

The Department used the process described in the Technical Support Document for Water Quality-Based Toxics Control (EPA, 1991) and DEC's *APDES Permits Reasonable Potential Analysis and Effluent Limits Development Guide* (June 30, 2014) to evaluate the AKG523000 permittees' effluent from the previous permit term. Discharge Monitoring Reports (DMRs) and Annual Reports from January 2019 to December 2024 were reviewed to identify pollutants with reasonable potential to exceed the WQS. The monitoring results revealed the presence of

ammonia above WQS. Therefore, ammonia was selected for reasonable potential analysis (RPA).

When evaluating the effluent to determine whether WQBELs based on chemical-specific numeric water quality criteria (WQC) are needed, the Department projects the receiving waterbody concentration for pollutants 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 from the receiving waterbody, are factors used to project the receiving waterbody concentration. If the projected concentration of the receiving waterbody exceeds the numeric WQC 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 must be developed.

The Department may authorize a small volume of receiving water to provide dilution of the effluent; this volume is called a mixing zone. Mixing zone allowances will increase the allowable mass loadings of the pollutant to the waterbody.

3.1.2.1.1 Total Ammonia

Alaska WQS at 18 AAC 70.020(b)(23) state that the concentration of toxic substances in water may not exceed the numeric WQC in the *Alaska WQC Manual*. Total ammonia is the sum of ionized (NH4+) and un-ionized (NH3) ammonia. Temperature, pH, and salinity affect which form, NH4+ or NH3, is present. NH3 is more toxic to aquatic organisms than NH4+ and predominates with higher temperature and pH. Excess ammonia in receiving waters can lead to DO depletion, eutrophication, and toxicity to aquatic organisms.

DEC used the 85th percentile of pH and temperature in available receiving water data to determine waterbody-specific acute and chronic ammonia WQC for stationary vessel discharge locations. The RPA of the effluent data indicated that there is reasonable potential for ammonia to exceed WQC at the end of pipe, so WQBELs were developed for ammonia. The WQBELs for each waterbody are listed below in Table 1 and will be included as limits in the 2026 AKG523000 discharge authorizations.

See Appendix B for details on reasonable potential determination and Appendix C for details on permit limit derivation.

Table 1: Total Ammonia Water Quality-Based Effluent Limits

Discharge Location	Permitted Vessel	Parameter	Units [a]	Daily Maximum	Monthly Average	WQC
Akutan Harbor	AKG5230009 Trident Independence	Total Ammonia	mg-N/L	9.6	3.8	16.3 (acute) 2.5 (chronic)
Bristol Bay (Clark's Point, and Naknek Y)	AKG5230009 Trident Independence	Total Ammonia	mg-N/L	8.5	3.3	7.1 (acute) 1.1 (chronic)

Footnotes:

a. Units: mg-N/L = milligrams nitrogen per liter

3.1.3 Other Effluent Limitations and Requirements (Permit Part 2.1.2)

The discharge of seafood processing waste as covered by the permit is not expected to result in a violation of the WQS provided that the permittee complies with the limits and conditions in the permit, including the following:

3.1.3.1 Seafood Processing Waste Limitations

Limitations Based on Waste Type:

The permit prohibits discharges resulting from the production of washed mince and/or paste or stickwater to receiving waters within 1.0 nm of shore at MLLW. Stickwater is the effluent produced by fishmeal/fish oil production. The basis for the restriction is that process wastes and wastewaters from washed mince and/or paste and fishmeal/fish oil production result in high pollutant loading of BOD. The high levels of BOD can depress DO in the water column and on the seafloor. Additionally, these effluents often result in pH, ammonia, and temperature discharge levels beyond applicable WQS and require further distance from shore for adequate flushing to meet WQS at the boundary of the mixing zone. From shore to 0.5 nm from shore, the discharge of other byproduct effluent (such as bones from hydrolysate production) is also prohibited. The AKG520000 and the 2011 and 2018 AKG523000 permits all prohibited these types of discharge within 1.0 nm of shore, and the 2026 AKG523000 permit continues that prohibition.

Limitations Based on Waste Weight:

The maximum amount (by weight) of seafood processing waste discharge authorized may be limited by the conditions at the proposed discharge location or area of operation. The Department will evaluate the potential impacts of the projected maximum amount of seafood processing waste to be discharged from a permittee's AKG523000 NOI for each discharge location or area of operation. The written authorization will include any specific limitations or conditions.

The permittee shall not discharge an amount (by weight) of seafood processing waste on a daily or annual basis which exceeds the projected amount on the NOI or the (possibly more restricted) amount authorized in the written authorization.

Waste deposits are not expected while a vessel is processing in transit, or into water depths exceeding 120 feet. When determining whether to limit the amount of discharge, the Department will consider the factors listed in Part 1.11.

Limitations Based on Area of Operation and/or Discharge Location

An area of operation is an area where a seafood processing vessel or an inland waters discharge vessel does not anchor but processes and/or discharges while in transit. While there is no size restriction for an area of operation for an in-transit processing vessel, the maximum size of each area of operation for inland waters discharge vessels shall not be greater than 2.0 square nm.

The Department requires the 2.0-nm area of operation size restriction in order to manage where inland waters discharge vessels are authorized to discharge within a waterbody. Often, multiple inland waters discharge vessels will seek authorization to discharge into the same area of the waterbody. In order to review the cumulative impact to the waterbody and manage overlapping discharge areas between different permittees, the Department restricts the area of operation size.

During the 2011-2016 permit cycle, the Department became concerned with overlapping discharge locations and area of operations and the potential cumulative impacts to waterbodies given multiple requests to potentially discharge large volumes of waste. The Department will determine whether a requested discharge location or area of operation overlaps with other permittees' requested or authorized locations. If so, additional monitoring may be required in the written discharge authorization, in accordance with Permit Part 2.1.1.10.

3.3 Million Pound Discharge Limitation

The permit limits a stationary seafood processing vessel discharging between shore and 1.0 nm from shore to a maximum of 3.3 million pounds of seafood processing waste per calendar year at each discharge location.

This discharge limit is based on computer modeling conducted as part of the AKG520000 permit issuance to predict the accumulation, persistence, and total areal coverage resulting from discharged seafood waste (see Part 4.4.2.1 for more information). The focus of the modeling was to predict the amount of seafood waste that could be discharged resulting in an area covered by an accumulation of seafood waste of no more than 1.0 acre. Based upon the model, a steady annual discharge of 4 million pounds or less of seafood waste near the surface to water greater than 50 feet in depth is predicted to create a ZOD with a 1.0-acre size. Based on predicted seafood waste spreading at the periphery of the deposit, DEC determined that a one-sixth margin of safety was appropriate to protect water quality and not exceed permit limitations. The AKG520000 permit provided that the maximum limit for discharged seafood processing waste is equal to (5/6) * 4 million = 3.3 million pounds per calendar year between shore and 1.0 nm of shore at a single discharge location while stationary.

Discharges to waters deeper than 120 feet are assumed to be dispersed and not result in accumulation on the seafloor. Therefore, the AKG523000 permit limits stationary vessels discharging seafood waste from shore to 1.0 nm from shore into water depths less than 120 feet to 3.3 million pounds of waste per discharge location per year.

3.1.3.2 Seafood Processing Waste System Inspection Requirements (Permit Part 2.1.3)

A pre-operational check of the waste treatment and discharge system shall be performed at the beginning of each processing season (at least annually) to ensure operability. The results of the pre-operational check shall be recorded and kept on board the vessel and submitted to DEC with the Annual Report.

The permit requires routine inspection of the waste conveyance/treatment system whenever seafood processing occurs. The purpose of the monitoring is to confirm permit compliance and implement operational corrections based on BMP Plan requirements and the observations made by the permittee. DEC compliance inspections and site visits have found that operational maintenance issues are often the cause of historical permit violations. Requiring inspections of the waste conveyance/treatment system, along with the development and implementation of a robust BMP Plan, should increase permittee compliance with permit requirements.

The AKG523000 permit continues to require permittees to inspect the grinder system or other treatment methods to evaluate compliance with the discharge size limitation requirement and to ensure that foreign objects (e.g., ear plugs, plastic, etc.) are not being discharged. The permit requires that the permittee follow the standard seafood waste size sampling and analysis protocol (Permit Appendix I). Protocol modifications are authorized but require written approval from the Department prior to implementation. As a continued permit requirement, when ten or more seafood processing waste particles from a five-gallon bucket of wastewater exceed the maximum size requirement, corrective action (e.g., replacing or sharpening the grinder plates, adjusting the pump speed, reducing the cutting plate size, adding an audio grinder, etc.) is required within seven days and must be noted on the log.

Digital photographs of the grinder system or other methods of treatment in operation shall be captured at least once per calendar month that seafood processing occurs. Permittees with grind

size violations are not required to verbally report the noncompliance 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 human health or the environment. Grind size noncompliance events are required to be recorded on the inspection logs and reported as noncompliance occurrences in the Annual Report.

3.1.3.3 "Other Wastewaters" Discharges (Permit Part 2.1.4)

Historical Discussion

The 2001 AKG520000 permit stated:

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

"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 2011 AKG523000 requirements for "Other Wastewaters" stated:

> AKG523000 (Part 5.1.11) "An operator shall not discharge any wastewaters that exceed WQS (see Part 5.1.6), except in compliance with a mixing zone authorized in Part 1.2. Any incidental foam and scum produced by discharge of seafood catch transfer water must be minimized to the extent practicable, as described in the BMP Plan required in Part 6.1.5.2.5.11. Wastewaters that do not come in contact with seafood (for example, non-contact cooling water) are not required to be discharged through the seafood processing waste-handling system."

The 2011 AKG523000 permit carried over the requirements and list of "Other Wastewaters" from the AKG520000 permit but removed domestic graywater and storm water from the "Other Wastewaters" definition. The 2018 AKG523000 permit continued authorizing these "Other Wastewaters" as previously defined, with the addition of drinking water backwash, and required that "Other Wastewaters" were discharged through an authorized outfall from a vessel discharging to required marine water depths and that the permittee performed monitoring to ensure WQS were met.

The 2026 AKG523000 permit removes required effluent monitoring for "Other Wastewaters" discharges that are not commingled with seafood processing waste and wastewater, as monitoring during the previous permit term did not find WQS violations in these discharges. However, permittees are still required to implement BMPs to ensure that this remains the case, and any effluent that comes into contact with seafood waste must still be monitored for compliance with the 0.5-inch waste size effluent limit.

"Other Wastewaters" Pollutant Loading

Similar to most food processing industries, effluents from seafood processing are characterized by high concentrations of nutrients, high TSS, increased BOD and COD, and the presence of

sanitizers. The fish hold and transfer water may create foam and scum on the surface of the receiving water and may contribute to increased ammonia concentrations. The discharge of non-contact cooling water, retort water, and boiler water may have the potential to affect the temperature of the receiving water as well.

"Other Wastewaters" Outfall(s) Monitoring

The 2018 permit included new requirements to clarify what standards apply to "Other Wastewaters" and required the development of BMPs to assist in pollution reduction and meeting permit requirements. The permit contained the requirement that all vessel discharges meet the TBEL established for Remote facilities found in 40 CFR Part 408, which states that "No pollutants may be discharged which exceed 1.27 cm (0.5 inch) in any dimension." To meet the 1.27-cm size TBEL, most vessels send their seafood waste through a combination of different grinders. However, "Other Wastewaters," like live tank waters or catch transfer waters that come in contact with raw seafood, may not contain significant amounts of solids and the wastewater would not necessarily need to be ground to meet the TBEL. Additionally, the grinding pumps often do not function as designed when large hydraulic loads (such as catch transfer flows) are forced through the pump systems. Sending the "Other Wastewaters" waste stream that comes into contact with seafood waste through the seafood waste-handling system (grinding) is not the only way to meet the 1.27 cm (0.5 inch) size TBEL. As an alternative to meet the size TBEL, the "Other Wastewaters" could potentially be passed over a mesh (screen) to remove solids greater than 1.27 cm in size.

Monitoring "Other Wastewaters" outfalls for these discharges and requiring BMPs to be written and implemented to control these waste streams was a new permit requirement in the 2018 AKG523000 general permit. This monitoring information was collected for future potential permit limit development and for potential future mixing zone modeling efforts. During the second calendar year of the permit (January 1 through December 31, 2020) non-commingled "Other Wastewater" discharges were required to be monitored monthly during a one-year monitoring study, as found in Permit Table 6.

A summary of the results from that "Other Wastewaters" monitoring study for currently-permitted vessels from the previous (2018) permit term can be found in Table 2 below. After a review of the monitoring data, the Department determined that the results demonstrated that the "Other Wastewaters" discharges did not have the reasonable potential to cause an excursion of the WQS outside of the approved 100-foot mixing zone or at the end of pipe for ammonia, for which there is no authorized mixing zone. Based on the results of the "Other Wastewaters" monitoring study, the Department removed the non-commingled Outfall 004 effluent monitoring requirements that the 2018 AKG523000 general permit required. The 2026 AKG523000 general permit will continue to require the development of BMPs to assist in pollution reduction and meeting WQS.

Non-commingled "Other Wastewaters" outfalls are still required to be identified on the NOI (Permit Attachment A-1) and flows must be reported in the Annual Report (Permit Attachment E-1). Additionally, if determined necessary the Department may require effluent monitoring at those outfalls under Permit Part 2.1.1.10.

Table 2: Outfall 004 Effluent Monitoring Results

Parameter	Units [a]	Reported Range	WQS
Flow	mgd	0.0 – 1.0	n/a
Total Ammonia, as N	mg/L	0.0 – 0.0	variable
Total Residual Chlorine (TRC)	mg/L	0.0 – 2.2	0.1 compliance evaluation level
Temperature	°C	6.3 – 24.7	15
pH	SU	5.3 – 8.2	6.5 – 8.5
Color	Color Unit	0 – 20	15
Dissolved Oxygen (DO)	mg/L	6.1 – 15.1	4 - 17

Footnotes:

a. Units: mgd = million gallons per day, mg/L = milligrams per liter, °C = degrees Celsius, and SU = standard units.

3.2 Effluent Monitoring and Analysis Requirements (Permit Part 2.2)

In accordance with AS 46.03.110(d), the Department's permit may specify the terms and conditions under which waste material may be disposed. Monitoring and waste treatment system inspection requirements 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 whether additional effluent limits are required and/or to monitor the effluent's impact on the receiving water quality.

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 vessel's performance. The permittee has the option of taking more frequent samples than required under the permit. If the permittee monitors any pollutant more frequently than the permit requires, they must use test procedures approved under 40 CFR Part 136, adopted by reference in 18 AAC 83.010. The additional monitoring results must be included in reported DMR data and/or on 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. Monitoring data must be reported even if the method detection limits (MDLs) are less than the effluent limits. The use of approved sampling and test methods as found in 40 CFR Part 136 is required.

The 2026 AKG523000 general permit requires effluent sampling for Outfalls 001, 002, and 003 and provides collection and reporting information for effluent and receiving water sampling locations and results. As discussed above in Part 3.1.3.3, the previously required effluent sampling for Outfall 004 has been removed from the permit.

Monitoring the seafood processing waste and wastewater for conventional pollutants (TSS, O&G, and BOD) was previously required when the vessel had the equipment and trained staff to

perform the sample analysis onboard or where the discharge was located within 20 nm of a qualified lab or town with regular air service so that samples could be analyzed within hold times. DEC determined that the amount of data collected from this sampling requirement, given the above-mentioned limitations, was not sufficient to keep the requirement.

Inland waters discharge vessel permittees must conduct receiving water monitoring (under Permit Part 2.3.2.2) within one hour of effluent monitoring under Permit Part 2.2. The previous permit allowed processing vessels to collect these samples up to twelve hours apart, but the Department found that it was difficult to correlate the effluent and receiving water data with that much of a time gap between the sampling.

Effluent monitoring results shall be recorded on a DMR and submitted quarterly (defined as January – March, April – June, July – September, October – December). A summary report of monitoring data shall be submitted with the Annual Report for ease of future permit issuance and the data review process, and to ensure that all required pollutants are being monitored. For each discharge location identified in the Annual Report, the permittee is required to identify whether the vessel was able to perform the sampling. This requirement was added to create a tracking mechanism in the Annual Report to determine if and when sampling is performed, as data collected during previous permit cycles showed inconsistencies between discharges and sampling performed.

3.2.1 Seafood Processing Waste and Wastewaters and Commingled "Other Wastewaters" Monitoring

Permit Table 2 summarizes the monitoring requirements for a permittee that discharges seafood processing waste and wastewaters and commingled "Other Wastewaters." Samples shall be representative of the effluent being discharged before entering the receiving water.

The permit retains the monitoring requirements established in the previous permit (2018-2023) for Outfall 001, other than the removal of conventional pollutant monitoring discussed above in Part 3.2. There is also a change in the seafood waste size reporting. Instead of reporting the maximum size piece of waste found, permittees must report the number of pieces found that exceed the 0.5-inch waste size limit.

The parameters listed in Permit Table 2 will require analysis on-board the vessel, excluding ammonia samples if properly preserved. These parameters, excluding ammonia, require analysis as soon as reasonably possible after sample collection, within 15 minutes at the latest according to method holding times.

Ammonia

Monitoring for ammonia was a new permit requirement during the last permit cycle (2018-2023). Ammonia was documented as a pollutant in the 1975 Development Document for Seafood Processing ELGs. Ammonia has been found in every species of fish being processed, a fraction of which (depending on the pH of the receiving water) is in the un-ionized more toxic form. Ammonia may also be lost to wastewater by various sources, such as refrigeration system leaks and purging.

WQS information for ammonia is located in the *Alaska WQC Manual for Toxic and Other Deleterious Organic and Inorganic Substances (2008)*, adopted by reference in 18 AAC 70.020(b). The WQC are dependent on pH, temperature, and salinity.

Ammonia monitoring is continued in the 2026 general permit, as it was confirmed as a pollutant of concern in the Outfall 001 waste stream in the last permit cycle. Both inland waters discharge vessels and processing vessels reported effluent ammonia content that demonstrated reasonable potential to exceed WQS at the point of discharge. Because inland waters discharge vessels were not required to perform receiving water monitoring during the previous permit cycle, the Department is requiring these vessels to conduct receiving water monitoring in the 2026 permit to assist in determining how large of a mixing zone is required for ammonia levels to fall to the WQS. Since modeling discharges from a moving vessel is not practicable for the Department, this study (required once during the permit term at each discharge location) will be a substitute to allow the determination of dilution factors so that appropriate effluent limits may be set.

For processing vessels, the Department will use a dilution factor as discussed below in Part 4.3.2, as well as required collection of pH, temperature, and salinity data in the receiving water, to set ammonia effluent limits at each discharge location. This was already completed for the Trident Independence vessel (the only currently-permitted processing vessel that collected enough ammonia data during the last permit term for the Department to conduct an RPA analysis), and the resulting limits will be included in that vessel's discharge authorization. See Appendix A, Appendix B, and Appendix C for more information.

Other Wastewaters

Some permittees have historically interpreted the "Other Wastewaters" language found in the AKG520000 and AKG523000 permits to allow the discharges of "Other Wastewaters" from multiple outfall configurations. The seafood processing ELGs make no differentiation for these "Other Wastewaters" discharges. Thus, the 2018 AKG523000 permit required monitoring for each "Other Wastewaters" outfall for the same pollutant parameters as seafood processing waste outfall discharges. Monitoring "Other Wastewaters" discharges not commingled with seafood processing waste was required monthly during a one-year monitoring study conducted during the second year of the permit cycle (January 1 through December 31, 2020). This allowed the Department to build a dataset to evaluate potential impacts. As discussed in Part 3.1.3.3, DEC did not find that the discharges had reasonable potential to cause an excursion of the WQS, and the monitoring was dropped from this permit issuance. Commingled "Other Wastewaters" shall still be sampled as required in Permit Table 2.

3.2.2 Treated Sanitary Wastewater (Outfall 002) and Graywater (Outfall 003) Discharges

The 2026 AKG523000 permit provides coverage for vessel discharges of sanitary (i.e., treated sewage) wastewater and graywater.

If discharged by the vessel, a vessel's sanitary waste must be treated by a Type II MSD that meets the applicable Coast Guard pollution control standards in effect (33 CFR Part 159). Alternatively, a vessel's sanitary wastewater may be disposed to an onshore facility's permitted domestic wastewater treatment system.

Permit Table 3 presents the monitoring requirements for each MSD device outfall when sanitary effluent is discharged. Permit Table 4 presents the monitoring requirements for each graywater outfall when graywater is discharged. The parameters listed in Permit Table 3 and Permit Table 4 will require analysis on-board the processing vessel.

4.0 RECEIVING WATER REQUIREMENTS (Permit Part 2.3)

4.1 Water Quality Standards

The CWA Section 301(b)(1)(C) requires the development of limitations 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 WQC, and an antidegradation policy. The use classification system designates the beneficial uses that each waterbody is expected to achieve. The numeric and/or narrative WQC are the criteria deemed necessary by the State to support the use classification of each waterbody. The antidegradation policy ensures that the designated 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 waterbodies in Alaska can also have site–specific WQC per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b).

The receiving waters for the permit include fresh and marine surface waters of Alaska that are designated for all uses, and the most stringent of the WQS for these uses shall be met. The designated use classes are: water supply for aquaculture, seafood processing, and industrial; contact and secondary recreation; growth and propagation of fish, shellfish, and other aquatic life; and harvesting for consumption of raw mollusks or other raw aquatic life. Any known existing uses (e.g., fresh water withdrawal location(s), set net or aquaculture locations) in the vicinity of the proposed discharge are required to be identified on the NOI.

The applicable WQS applied to the permit are in 18 AAC 70, amended August 9, 2025, with the exception of the residues standard. EPA has not approved the revised residues standard; therefore, the WQC for residues at 18 AAC 70.020(b)(20), as revised through June 26, 2003, applies.

4.2 Discharges to Water Quality-Impaired Waters

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.

If a waterbody that an existing permittee discharges to is listed as impaired during the permit cycle, the permittee may submit information to DEC that demonstrates that the discharge does not, or is not expected to, cause or contribute to an exceedance(s) of WQS. The Department will determine whether the vessel may remain covered under the general permit or if an individual permit is needed.

4.3 Mixing Zone

Mixing zones are DEC authorized areas where an effluent undergoes initial dilution. A mixing zone is an allocated impact zone in the receiving waterbody where WQC can be exceeded as long as toxic conditions are prevented and the designated uses of the water as a whole are not impaired as a result of the mixing zone. All WQC must be met at the boundary of the mixing zone.

Part 4.3.3 provides the information the Department used to determine the size of the general permit defined standard mixing zone.

Permittees may request mixing zones different from the standard (per Permit Part 1.6.1.4) by submitting Form 2M (with modeling) and Form 2G, but the burden of proof for justifying the non-standard zone rests with the applicant. The Department will consider requests on a case-by-case basis, and the Department will, in its discretion, only authorize a non-standard mixing zone if it finds that available evidence reasonably demonstrates that the requirements of 18 AAC 70.240 will be met. Any non-standard mixing zones will be public noticed in accordance with 18 AAC 83.120.

4.3.1 Department Authorization and Regulatory Basis for Mixing Zones

Consistent with 18 AAC 70.240, the Department is authorizing a mixing zone in the permit.

The Department has determined that the available information reasonably demonstrates that a mixing zone with a 100-foot radius centered on the outfall terminus or discharge point, extending vertically up to the surface and down to the seafloor, is as small as practicable and will protect the existing uses of the receiving water. The methods of treatment and dispersal required are the most effective technologically and economically feasible for the permitted vessels.

After completing a review of the NOI, the Department may authorize a mixing zone for each outfall from a seafood processing or inland waters discharge vessel where available assimilative capacity exists.

When determining whether authorizing the standard mixing zone is appropriate, the Department will include in its consideration the following (see 18 AAC 70.240(b) for the list in its entirety):

- The flushing and mixing characteristics of the receiving water,
- The characteristics of the effluent, and
- The cumulative effects of multiple discharges on the uses of the receiving water.

Within the standard mixing zone, the Department may authorize exceedance of the WQC of 18 AAC 70.020(b) for dissolved gas, non-petroleum O&G (polar), pH, temperature, color, turbidity, residues, fecal coliform and enterococci bacteria, total residual chlorine (TRC), and total ammonia (only if specified in the written discharge authorization, where RP has been identified and effluent limits have been set).

All WQC shall be met at the boundary of the mixing zone. The written authorization will specify whether a mixing zone has been authorized, the size of the authorized mixing zone, and the WQC that may be exceeded within the authorized mixing zone.

If through the review of an NOI the Department determines that it has insufficient information to determine whether a mixing zone is appropriate ensuring compliance with 18 AAC 70.240, a permittee may be required to submit additional information.

4.3.2 Mixing Zone Authorization History

The 2001 AKG520000 Permit Parts V(A)(1)(i), V(B)(1)(k), and V(C)(1)(k) read:

> "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 WQC may be exceeded: residues, dissolved gas, O&G, fecal coliform, pH, temperature, color, turbidity and TRC. Discharges shall not violate Alaska Water Quality Standards criteria beyond the 100-foot mixing zone."

The AKG520000 permit covered vessel discharges, so the mixing zone followed the vessel and was applicable to multiple vessel discharge locations, not a single location, as vessels move and discharge to different areas. 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 and Fact Sheet 2013DB0004), it is expected that sufficient dilution will be available at the boundary of the mixing zone when a processing vessel is discharging in-transit. Accordingly, the permit proposes to continue issuing standard 100-foot radius mixing zone to stationary processing vessels. However, in-transit processing and inland waters discharge vessels will be required to conduct receiving water monitoring this permit term to help validate that assumption (since dilution can vary greatly based on discharge manner and inland waters discharge vessels discharge differently than cruise ships).

Historical Mixing Zone Modeling

In the 1995 issuance of the AKG520000 permit, three mixing zone sizes were authorized: a 300-foot radius mixing zone for offshore processors, a 200-foot radius mixing zone for nearshore processors, and a 100-foot radius mixing zone for shore-based processors. The 2001 issuance of the AKG520000 permit estimated that a 100-foot radius mixing zone would provide a minimum dilution of 30:1 at the boundary of the mixing zone and would be authorized for all three categories of dischargers. However, upon review of the EPA and DEC administrative record for the 2001 AKG520000 permit reissuance, no record was found of any modeling performed to determine the basis of the 30:1 dilution factor or 100-foot size determination. Also, the 2001 AKG520000 permit did not require receiving water sampling or end of pipe sampling to determine whether the 100-foot radius mixing zone was sized appropriately or whether a 30:1 dilution was available at the boundary of the mixing zone. Given the margin of error in modeling and considering dilution factors found in recently-performed modeling for onshore facilities, in the 2026 AKG523000 general permit the Department will assume a 15:1 dilution factor for processing vessels and set limits accordingly for parameters that showed reasonable potential to cause an excursion of WQS during the last permit term (TRC, pH, temperature, ammonia (see discussion in Part 3.1.2.1), and DO).

Due to the lack of information available for inland waters discharge vessel and in-transit processing vessel mixing zone verification, DEC determined that ambient receiving water monitoring data is needed to ascertain whether it is appropriate to continue authorizing the general permit defined standard mixing zone for those vessels beyond this permit term, so that monitoring will be required in the 2026 AKG523000 permit.

During the 2011 – 2016 AKG523000 permit cycle, permittees were required to conduct additional effluent and receiving water monitoring to assist the Department to evaluate the general permit-defined standard mixing zone size determination. Because of the inconsistent quality of monitoring data, the limited size of the data set, and the lack of

demonstrated pollutant trends between effluent and receiving water samples, the 2011 - 2016 dataset did not provide reliable, repeatable data to perform modeling for any parameter with permit limits or to establish broader trends within the regulated industry. The Department also determined that the limited monitoring data did not provide enough information to demonstrate adverse environmental effect from the discharge of seafood processing waste at processing locations. Since the Department did not have sufficient data to model the near-field and far-field mixing of the effluent, the reissued 2018 permit continued to require monitoring data be collected during the permit cycle. Additionally, the Department clarified permit sampling procedures and reporting requirements in the 2018 permit to reduce the likelihood of the collection of questionable and ultimately unusable data. However, the data collected during that permit term still did not allow for correlation of effluent quality and receiving water impacts, likely due to effluent and receiving water samples being collected with too much time in between. Therefore, the Department will rely on the dilution factor discussed above to set appropriate effluent limits for processing vessels in the 2026 AKG523000 general permit.

4.3.3 Mixing Zone Analysis

This part provides the criteria and information the Department used to evaluate the appropriateness of authorizing a general permit defined standard mixing zone. Appendix D, Mixing Zone Analysis Checklist, outlines criteria that must be met in order for the Department to authorize a mixing zone. These criteria include the size of the mixing zone, treatment technology, existing uses of the waterbody, human consumption, spawning areas, human health, aquatic life, and endangered species. The following summarizes the Department's mixing zone analysis:

Size. In accordance with 18 AAC 70.240(k) and the currently available data, the Department determined that the size of the general permit defined standard size mixing zone (100-foot radius) for each vessel is as small as practicable. In accordance with 18 AAC 70.240(c)(2-3), the Department finds that existing uses of the waterbody outside the mixing zone are maintained and fully protected so that any discharge will neither partially nor completely eliminate an existing use of the waterbody outside the mixing zone and will not impair the overall biological integrity of the waterbody. New permittees may request, and DEC may authorize, a mixing zone for seafood waste and "Other Wastewater," sanitary wastewater, and graywater discharges. DEC may modify individual mixing zone sizes during review of submitted NOIs consistent with 18 AAC 70.240. Permittees may propose a mixing zone outside of the general permit defined standard mixing zone but must fulfill the requirements of Permit Part 1.6.1.4.

Technology. In accordance with 18 AAC 70.240(c)(1), the Department finds that the most effective technologically and economically feasible methods are used to treat, remove, reduce, and disperse pollutants. EPA has promulgated final ELGs specifying the minimum treatment standards for specific methods of processing Alaska seafood, and those performance standards (TBELs) have been incorporated into the permit.

Existing Use. Consistent with 18 AAC 70.240(b-c), a mixing zone will only be authorized if it has been appropriately sized to fully protect the existing uses of the waterbody. The permit requires the applicant to identify existing uses within 1.0 nm of the discharge. DEC will review available information to determine whether the existing uses and biological integrity of the waterbodies as a whole will be maintained and fully protected prior to authorizing a mixing zone. Permittees must operate in compliance with the terms of the permit and the permit requires

compliance with the WQS, which serve the specific function of protecting uses. Additional receiving water monitoring will be conducted during the permit term to ensure that existing uses will continue to be protected. Available data indicate that significant degradation is not likely to occur in areas of adequate dispersion and dilution (i.e., hydrodynamically energetic waters). The permit only authorizes discharges to hydrodynamically energetic waters with a high capacity of dilution and dispersion for both stationary and in transit operations.

Human Consumption. In accordance with 18 AAC 70.240(d)(6) and (c)(4)(C), 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. Mixing zones will not be authorized in areas of active seafood harvesting.

Spawning Areas. In accordance with 18 AAC 70.240(e-f), a mixing zone may not be authorized in a spawning area of any of the five species of anadromous Pacific salmon found in the state or be allowed to adversely affect the present and future capability of an area to support spawning, incubation, or rearing of such salmon. In lakes, streams, rivers, or other flowing fresh waters, except as provided by 18 AAC 70.240(g), a mixing zone will not be authorized in spawning areas for Arctic grayling, northern pike, lake trout, brook trout, sheefish, burbot, landlocked coho, chinook, and sockeye salmon or anadromous or resident rainbow trout, Arctic char, Dolly Varden, whitefish, or cutthroat trout.

Human Health. In accordance with 18 AAC 70.240(c-d), the mixing zone must be protective of human health and must not result in pollutants discharged at levels that will bioaccumulate, bioconcentrate, or persist above natural levels in sediments, water, or biota or at levels that otherwise will create a public health hazard through encroachment on a water supply or contact recreation uses. An analysis of the 2018-2023 effluent monitoring data results indicates that the discharge is not a threat to human health. The effluent data was used in conjunction with applicable WQC, which serve the purpose of protecting human and aquatic life, to size the mixing zone to ensure all WQC are met in the waterbody at the boundary of the mixing zone.

Seafood wastes are not expected to contain significant quantities of pollutants that may bioaccumulate in aquatic organisms. Seafood waste discharges are not expected to result in elevated levels of toxic or carcinogenic pollutants in marine organisms consumed by humans. DEC has determined that the permit satisfies 18 AAC 70.240(d)(1-2) and 18 AAC 70.240(c)(4)(B).

Aquatic Life and Wildlife. In accordance with 18 AAC 70.240(c), (d), and (g), the mixing zone authorized in the permit shall be protective of aquatic life and wildlife. Pollutants for which the mixing zone will be authorized will not accumulate in concentrations outside of the mixing zone that are undesirable, present a nuisance to aquatic life, cause permanent or irreparable displacement of indigenous organisms, or result in a reduction in fish or shellfish population levels.

Impacts from permittees discharging seafood processing waste in compliance with the requirements of the permit have shown to be localized. Although benthic community composition may be 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 for the entire waterbody, just a small portion of the waterbody, and 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 discharge. 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. Additionally, biota may be attracted to the discharge plume to feed on the discharged particulates, thereby increasing the biodiversity in some areas. The Department determined that the mixing zone will not create a significant adverse effect to fish spawning or rearing, form a barrier to migratory species, fail to provide a zone of passage, result in undesirable or nuisance aquatic life, result in permanent or irreparable displacement of indigenous organisms, or result in reduction in fish population levels and that 18 AAC 70.240(g)(1), (c)(4)(D-E, G), and (d)(5) are met.

Endangered Species. In accordance with 18 AAC 70. 240(c)(4)(F), the authorized mixing zone will not cause an adverse effect on threatened or endangered species.

In 2016, the USFW directed the Department to consult their Information for Planning and Consultation system to obtain lists of threatened and endangered species within the jurisdiction of the USFWS in the discharge area. NOAA/NFMS directed the Department to consult their Marine Mammal Species Range and Critical Habitat Interactive Map. The Department used these mapping platforms to verify determination of the permit's Excluded Areas as found in Permit Part 1.4.

Authorizations may incorporate site-specific threatened and endangered species-related requirements, as established Permit Part 1.7.

The Department will public notice the draft authorization when a new or modified discharge to an Excluded Area is proposed. Any comments received from the public or agencies regarding endangered species will be considered prior to issuance of the authorization.

4.3.4 Receiving Water Quality Monitoring

The Department has found through a review of collected data that the vessels covered under the permit are not meeting all WQC at the point of discharge. Therefore, permittees will be issued a mixing zone after a determination by the Department that the waterbody has available assimilative capacity. If assimilative capacity is not available, a vessel is not eligible for coverage under the permit. The Department has also found that continued monitoring is needed for further analysis of the pollutants being discharged and their dilution in the ambient receiving water. In accordance with AS 46.03.020(13) and Section 308 of the CWA, DEC has the authority to require a permittee to undertake this type of monitoring, sampling, and reporting. The Department has decided to require this monitoring inside the confines of the permit instead of issuing a separate CWA Section 308 information request letter.

The 2018 AKG523000 general permit required receiving water monitoring for processing vessels, as discussed above in Part 4.3.2. The 2026 AKG523000 general permit requires only temperature, pH, and salinity ambient monitoring for stationary processing vessels, as that data is necessary to determine the appropriate ammonia WQC at each discharge location during the time/season of discharge. Also as discussed above in Part 4.3.2, new in the 2026 AKG523000 general permit is receiving water monitoring for inland waters discharge vessels and in-transit

processing vessels at four locations (100 ft, 200 ft, 300 ft, and 1,000 ft horizontally from the point of discharge), as established in Permit Part 2.3.2 and Permit Table 6, for the same pollutants that are required to be monitored in the seafood processing wastewater effluent. This monitoring is only required once per permit term for each line or area of operation, to help characterize whether dilution available differs between operational areas.

4.4 Zone of Deposit (Permit Part 2.3.3)

A ZOD is defined as a limited area where substances may be authorized to be deposited on the seafloor of marine waters. Pursuant to 18 AAC 70.210, the Department determined that the available information reviewed reasonably demonstrates that a general permit defined ZOD of 1.0 acre or less for each marine and estuarine discharge location from a stationary processor between shore and 3.0 nm from shore will protect the existing uses of the receiving water. The methods of treatment and dispersal are the most effective technologically and economically feasible when a vessel discharges in conformance with the permit requirements, limitations, and conditions.

If the Department finds that available evidence reasonably demonstrates that the authorized general permit defined standard ZOD area has a significant unforeseen adverse environmental effect, the Department will modify the vessel's ZOD authorization.

The following Parts provide the regulatory basis, criteria, and information the Department used to evaluate the appropriateness of authorizing a general permit defined standard ZOD.

4.4.1 Zone of Deposit: Department Authorization and Regulatory Basis

4.4.1.1 The AKG523000 general permit does not include authorizations of ZODs for in-transit vessels discharging seafood waste. Seafood waste discharges from a vessel while in-transit to hydrodynamically energetic waters have been modeled to disperse over a large area and are not expected to produce deposits on the seafloor.

4.4.1.2 The AKG523000 general permit does not authorize a ZOD for any freshwater discharge locations (e.g., freshwater rivers or streams above tidally-influence reaches), as restricted in 18 AAC 70.210.

4.4.1.3 The permit does not limit the total number of ZODs for a stationary vessel. Rather, the permit will limit the amount of waste that can be discharged to a discharge location in a specific receiving water when appropriate. A stationary vessel's discharge location refers to a circular area with a radius equal to 0.5 nm. The area of this circle is approximately 665 acres. A 1.0-acre ZOD is 0.15% of the total area of the circle.

4.4.1.4 When determining whether the general permit defined standard ZOD area is appropriate or whether an alternate ZOD is more appropriate for a specific receiving area, the Department will include in its consideration the following:

- The effects that the discharge might have on the uses of the receiving water.
- The flushing and mixing characteristics of the receiving water.
- The cumulative effects of multiple ZODs and other inputs affecting the receiving water.

4.4.1.5 The WQC in 18 AAC 70.020(b) for marine residues may be exceeded in a ZOD. However, the WQS must 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. The written authorization will specify whether a ZOD has been authorized and the area of the authorized ZOD for each discharge location.

4.4.1.6 If through the review of a NOI the Department determines that it has insufficient information to determine whether a ZOD is appropriate at a discharge location, a permittee may be required to submit additional information (see 18 AAC 70.210(b)(1-6)). The burden of proof for providing the required information is on the person requesting a ZOD.

4.4.1.7 If multiple permittees 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 permittee. If a written authorization has been issued that authorizes a discharge to a specific discharge location or area of operation and the Department receives a new or updated NOI requesting coverage for another permittee in the same area, the Department will determine whether circumstances have changed such that the existing authorization requires modification or that the discharges are no longer appropriately controlled under the general permit before issuing an authorization to the new permittee.

4.4.2 Waste Weight Requirements

Conceptual modeling done by EPA in 1993 is still deemed applicable for the 1.0-acre general permit defined standard ZOD in the 2026 AKG523000 general permit. The following waste weight requirements were developed based on that effort, which modeled expected seafood residues coverage areas from varying discharge levels, and are incorporated in the permit.

4.4.2.1 The 3.3 Million Pound Requirement

The 2026 permit continues to limit stationary vessels discharging between shore and 1.0 nm from shore to a total seafood waste discharge amount of 3.3 million pounds annually per discharge location.

4.4.2.1.1 The first approximation of the annual near-surface open water 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/second at a depth of 50 feet and a flat seafloor 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 1.0 acre of seafood waste on the seafloor in waters with a net drift current speed of 0.49 feet/second at a depth of 50 feet and a flat seafloor is 4 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 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/second in depths of 100 feet or 150 feet and a flat seafloor is approximately 4 million pounds (wet weight) of waste solids. The maximum accumulated solids depth of these piles is predicted to be 0.3-0.8 feet.

4.4.2.1.2 The model predicted that discharges to near-surface waters would result in total areal coverage of 1.0 acre on the seafloor with significantly less seafood waste discharged than the near-seafloor discharge model cases. These results suggest that seafood waste discharges to the near-surface waters are exposed to the currents during settling for a longer time than the near-seafloor discharges and consequently are dispersed over a larger area.

4.4.2.1.3 The model predictions discussed above are considered conservative estimates of seafloor waste accumulation because the Water Quality Analysis Simulation Program (WASP) model did not consider the resuspension and transport of the deposited wastes. Therefore, a margin of safety was applied when DEC set the discharge limitation, as described in Part 3.1.3.1.

4.4.2.2 The 10 Million Pound Requirement

4.4.2.2.1 The 2001 AKG520000 permit had a 10 million pound limit on the amount of seafood waste that could be discharged from an onshore or near-shore facility. The 10 million pound limit was based upon modeling performed for the issuance of the 1996 AKG520000 general permit.

4.4.2.2.2 The model's first approximation of when shore-based discharges would result in coverage greater than 1.0 acre was at a current speed of 0.16 feet per second, a depth of 50 feet, and a flat bottom with an amount of 16 million pounds (wet weight) of seafood processing waste solids. Next, the model's current speed was set to 0.49 feet per second, the other factors remaining the same. This resulted in a 1.0 acre ZOD forming from only 12 million pounds (wet weight) seafood waste solids discharged. Further modeling was performed with the varying slope to the bottom, with results concluding that higher current speeds serve to spread the waste over a larger area. Thus, conservatively the Department chose to use 10 million pounds of waste discharged annually as a seafloor survey requirement trigger for stationary processors discharging over 1.0 nm from shore under the AKG523000 permit.

4.4.3 Zone of Deposit History

A 1.0-acre ZOD for seafood processing waste deposits was authorized in both the 1995 and the 2001 AKG520000 permit via the State's CWA Section 401 Certification for shore-based (onshore) processors discharging zero to 0.5 nm from shore and for near-shore processors (vessels) discharging 0.5 nm to 1.0 nm from shore. The Section 401 Certification also provided a ZOD for each shore-based processor and each single discharge location where a near-shore processor discharged. When EPA incorporated ZOD language into the AKG520000 permit, the following language was used:

> ***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)(1)*** *Shore-based Seafood Processors(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."

DEC reviewed the administrative record and in the final AKG520000 permit, EPA did not include language from the DEC AKG520000 CWA Section 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]

The 2001 AKG520000 permit, however, did not incorporate the state authorized ZOD approval for each discharge location for mobile facilities as provided in the July 12, 2001 DEC Section 401 Final Certification of AKG520000. The previous 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 1.0 acre ZOD. Seafloor surveys were only required for shore-based and near-shore facilities if a permittee discharged at a single location for more than seven days in water less than 120 feet deep at MLLW. A "single location" was defined as an outfall(s) (past and present) of an onshore facility or the anchorage of a vessel within a circular area with a radius equal to 0.5 nm.

A majority of the permittees in the AKG520000 coverage area moved to a different location within the seven-day period, in order to avoid the need to perform a seafloor survey, or applied for a waiver under the AKG520000 permit from performing a seafloor survey. Due to diver safety issues and lack of survey methods not involving divers performing a seafloor survey in deep water, the AKG520000 permit did not require seafloor monitoring in waters exceeding 120 feet deep at MLLW. There was also a limited number of divers that could perform seafloor surveys.

The AKG520000 permit established a 10 million pound limit on the amount of seafood processing waste that could be discharged from a shore-based or near-shore facility. The 10 million pound limit was based upon modeling performed for an outfall located approximately 6 feet above the seafloor. There were no limits on the seafood processing waste discharge amounts for offshore processing vessels (vessels that processed more than 1.0 nm from shore) nor were there ZODs authorized for these vessels.

Continued from the AKG520000 permit, the 2011 AKG523000 general permit did not limit the amount of seafood processing waste discharged from offshore processing vessels (vessels that processed more than 1.0 nm from shore) nor were there ZODs authorized. The permit did limit stationary vessels discharging between 0.5 nm and 1.0 nm to a total seafood waste discharge amount of 3.3 million pounds annually per single discharge location. Those stationary vessels discharging seafood waste between 0.5 nm and 1.0 nm were allowed up to a 1.0-acre ZOD as authorized by DEC in individual authorizations. The 2011 AKG523000 general permit did not authorize a ZOD for in-transit processing vessels, regardless of the processing distance from shore.

4.4.3.1 The 2011 – 2016 AKG523000 Permit Cycle Monitoring Requirements and Evaluation

The Department implemented a ZOD study and ambient water quality study in the 2011 AKG523000 permit. The following provides a discussion of commitments found in Part 6.0 of the 2011 AKG523000 Fact Sheet.

4.4.3.1.1 2011 AKG523000 Fact Sheet 6.4.3 Zone of Deposit Evaluation, 6.4.4 General Permit Defined Standard Zone of Deposit Area Determination, 6.4.6 Issues for the Next Permit Cycle

Findings: In the May 23, 2011 AKG523000 Final Fact Sheet, the Department committed to validating and refining the standard ZOD during permit reissuance to verify that the ZOD was accurate and applicable to the permit.

The Department reviewed the 1993 conceptual model of the transport, fate, and persistence of discharges from seafood processing facilities in Alaska used for the general permit defined standard ZOD area determination. While this modeling effort is still deemed complete, DEC had made previous commitments to verify that the modeling continued to be applicable and accurate. After a review of submitted seafloor surveys during the 2011 - 2016 permit cycle, the Department determined that an updated conceptual model (further solids modeling) was not warranted. This determination was two-fold, as the number of seafloor surveys submitted during the permit cycle was minimal (two), and the results of those surveys demonstrated no accumulation of seafloor deposits.

The permit required that processors discharge seafood waste in hydrodynamically energetic waters that will ensure dispersion and dilution of the seafood wastes and minimize accumulation of these deposits. The permit also required that a permittee identify and develop markets, to the extent feasible, for the use of seafood processing waste as a raw product and not as a waste material to be discharged. This requirement was part of the permit-required BMP Plan (2011 AKG523000 Permit Part 6.1.5). The data provided by permittees' NOIs, Annual Reports, and seafloor surveys demonstrated that permittees discharged in compliance with permit conditions, including meeting the permit limitation of no greater than a 1.0-acre ZOD.

Therefore, the permit continues to allow seafood processing waste discharges to hydrodynamically energetic waters, while setting permit conditions to ensure dispersion of seafood waste over large areas. Vessels dispersing seafood wastes are not expected to, nor have been shown to, produce measurable deposits on the seafloor.

The Department used a GIS database created from Annual Report data to identify whether there were any areas with a documented basis of concern, such as an area where multiple processors normally operate during the same time period or processing season, where a stationary vessel discharges a volume of seafood processing waste at or near the permit maximum of 3.3 million pounds at a single location for multiple consecutive years, or a vessel discharges to a receiving water with average currents near or below 0.33 knots. The Department used the database and NOAA current tables to identify receiving waters that have sufficient currents to disperse seafood processing waste so that the waste does not create deposits on the seafloor.

During analysis of the general permit defined standard ZOD, the Department did not find that there are any specific receiving waters of concern that warranted area-specific ZODs. Only

two vessels performed a seafloor survey per the requirements in the general permit. The results of the two surveys that were conducted found no waste of any kind at any of the sample stations during the seafloor surveys. Given the extreme currents and large tidal fluctuations in the surveyed waterbodies, waste accumulation of any type would be extremely unlikely in both discharge locations. The other permitted vessels did not trigger survey requirements, either reporting discharging at depths greater than 120 feet or not processing for seven or more days (168 hours) at a single location.

Because no receiving waters of concern were identified during the review of the permitting files and data collected during the permit cycle, no supplemental information was requested from any permit applicants to assess site-specific ZODs.

The permit did not previously contain a discharge amount (pound) trigger for performing a seafloor survey, only a time period of processing operations at a single location as the trigger. The Department evaluated discharge information and seafloor surveys conducted during the permit cycle in order to evaluate whether to include a discharge amount trigger in the next permit. Instead of a seafloor survey being required to be performed based on distance from shore (the former permit only required surveys in the 0.5 - 1.0 nm range), DEC changed the permit's seafloor survey trigger to require a seafloor survey for all discharges to less than 120 feet MLLW in depth. Additionally, a seafloor survey will be required when a company's vessel(s) discharge greater than 10.0 million pounds at a single anchorage site (actual discharge site).

4.4.4 Evaluation of ZODs in Comparison to 18 AAC 70.210(b)(1-6) Requirements

This section provides the criteria and information the Department used to evaluate the appropriateness of authorizing a general permit defined standard ZOD.

4.4.4.1 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, vessels are required by TBELs to grind to 0.5 inch in all dimensions, which under some receiving water characteristics may lead to the formation of deposits (residues) on the seafloor. EPA's 1975 Rulemaking and subsequent industry petitions for communities to be considered includes further financial analysis of the economic costs of having to screen seafood wastes and delivering the screened solids to a byproduct facility / line (Fish Meal, Oil, Hydrolysate, etc.). Alternatives to discharging from vessels considered by the Department included the barging of waste to deeper ocean waters or conversion of fish waste product to fish meal, fish oil, and byproduct recovery. Given EPA's Remote designations, requiring these alternatives were determined infeasible. The permit, however, requires that permittees ensure that waste is not discharged into poor flushing areas, as hydrodynamically energetic waters will ensure dispersion and natural attenuation of the seafood wastes and minimize accumulation of these deposits in one area. Additionally, vessels are mobile and can discharge their waste in varying locations, thereby altering the discharge location over time.

Some vessels processing in Alaska have byproduct lines directly on their vessel and can reduce waste and wastewater discharges by using the byproduct production line whenever feasible. The permit requires that a permittee identify and develop markets, to the extent feasible, for the use of seafood processing waste as a raw product and not as a waste material to be discharged.

4.4.4.2 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. 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. Alteration of phytoplankton species composition is another potential impact of nutrient rich discharges on marine phytoplankton. Effects produced by some phytoplankton species include physical damage to marine organisms (e.g., diatom species causing mortality of penned salmon) and toxic effects to marine organisms.

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

Potential direct impacts of solid waste discharges, such as 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. Due to the requirement to discharge in hydrodynamically energetic waters, seafood processing waste is not expected to pose a risk of bioaccumulation on aquatic life and other wildlife, as currents should be sufficient to disperse seafood processing wastes and minimize consumption of wastes. The decay of accumulated solid waste may reduce concentrations of DO 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 DO 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. Discharge prohibitions in Excluded Areas and required monitoring in the permit are intended to reduce, eliminate, and monitor for these types of potential impacts. It is not the Department's intent that seafood waste be authorized to wash up on the shoreline exposing more marine mammals and birds to seafood waste. Rather, the intent of the ZOD is to allow seafood wastes to naturally attenuate at depth. Vessels whose sea surface monitoring reveals deposits forming or landing on the shoreline should take proactive action on investigating the cause of deposits and relocate or make changes to vessel discharge practices to control these types of deposits. In addition, the general prohibition from discharging within 0.25 nm of shore should mitigate shoreline deposits.

4.4.4.4 The potential impacts on other uses of the waterbody.

Impacts from any individual vessel 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.

Impacts from toxicity due to anoxic conditions and changes in benthic community structure could be cumulative spatially and over time; however, impacts are expected to be localized. 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 waterbody monitoring has been included in the permit cycle to evaluate any waterbody impacts.

4.4.4.5 The expected duration of the deposit and any adverse effects.

The extent of seafloor seafood processing 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 and velocity of tidal movement and wave action. Once settled, these particles can form organic mats or thick waste piles. 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 a month following discharge and no adverse effects on DO concentrations were noted. The accumulation of these deposits in some areas indicates that the rate of discharge exceeds the assimilative capacity of some waterbodies and more specifically, the assimilative capacity of the benthic community and other aquatic life that metabolize this material. The permit requires that processors discharge seafood waste in hydrodynamically 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 waste discharge should be minimal and localized.

DEC initiated a research project to evaluate ground seafood solid waste impacts on the benthos in 2004. The study looked at the impacts to the seafloor 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 the deposits been receiving waste for the two years prior to the study. When the seafood processors 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 three to four knots, while the maximum current near the active piles was lower and approached two knots. The presence of seafood waste on the seafloor was readily apparent from all four areas surveyed. The largest area of seafloor affected was at the active discharge sites, where the waste piles merged. A more thorough 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 seafloor experiencing adverse effects from excess loading around the two active facilities was almost seven 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 seafloor 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 prevented 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 ever discontinued in the future. The study estimated that if the fish processing operations ever ceased, 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.

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

The extent of the initial accumulation of solid waste on the seafloor 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 advected 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 seafloor topography, and prevailing directions and speeds of wind- and tidally-forced currents. The solid waste particles will settle to the seafloor at a rate that depends on the shape, density, and size of the individual particles. Once deposited on the seafloor, periods of high currents or storm wave-induced seafloor turbulence can result in the resuspension and transport of deposited seafood waste solids away from the point of discharge.

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. Unground particles (primarily gills, skin, fins, and viscera 2-10 inches in diameter) required approximately a half hour to settle to the seafloor at depths of 400 to 500 feet. Smaller particles (less than 0.5 inch diameter) required more than one hour to settle to the seafloor. These ranges in settling times and water depths provide approximate bounds for the settling speeds of typical seafood waste particles.

The settling velocity of the solid waste particles (and the height of the discharge above the seafloor) affects the initial areal extent where seafood processing waste deposit covers the seafloor 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 seafood processing waste is resuspended and transported away from the vicinity of the discharge, the accumulation of seafood processing waste would be less than that predicted based on the settling velocity and decay rate. The potential adverse impacts to benthic communities may also then be reduced.

Following 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 DO 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 seafloor.

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 re-suspend and transport waste solids deposited on the seafloor.

A computer modeling effort was developed in 1993 to predict the accumulation, persistence, and areal coverage of discharged seafood waste from seafood processing facilities in Alaska and the potential adverse effects resulting from these discharges. The modeling effort was performed in support of the initial 1994 NPDES general permit for seafood processing facilities. Multiple computer modeling programs were used to determine the total areal extent of the seafood processing waste pile: WASP5, SURFER™, and 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 1.0 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 seafloor accumulation of seafood waste with a depth of 0.4 inch or greater over an area of 1.0 acre. This iterative process was conducted for twelve case scenarios, six for shore-based 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 waste is negligible. Resuspension and transport of deposited solids may occur at some discharge locations if seafloor current speeds exceed the critical current speeds required to re-suspend seafloor 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. Actual seafloor accumulations from vessels where current speeds are sufficient to re-suspend 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 vessels and comparing the current speeds to the estimated resuspension current speeds of updated modeling.

Two current speeds (0.5 and 0.15 cm/sec, 0.097 and 0.29 knots, respectively) were simulated. For the simulations of the floating vessels, 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 1.0-acre seafloor deposit of seafood waste. The modeling results indicated that for a stationary, near surface discharge in 50-foot water depth a steady annual discharge of approximately 8 million pounds would be required to produce a 1.0-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 1.0-acre in the absence of significant resuspension and transport of the deposited waste.

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.

Two programs were used to determine the total areal extent of the waste pile, WASP and SURFER™. Table 3 provides estimates of the total areal extent of coverage.

Table 3: Modeling Scenario Summary for Zones of Deposit

Net velocity (cm/sec)	Total depth (m)	Seafloor slope (%)	Waste solids discharge rate (lb/yr wet weight)	Maximum waste accumulation depth (cm)	Areal Coverage (acres)	
					S[a]	W[b]
Near-surface discharges in open ocean						
5	15.24	0.0	8,000,000	63.4	1.0	0.8
15	15.24	0.0	4,000,000	19.2	1.2	0.6
5	30.48	0.0	4,000,000	24.2	1.1	0.9
15	30.48	0.0	4,000,000	12.3	1.3	1.0
5	45.72	0.0	4,000,000	18.5	1.2	1.2
15	45.72	0.0	4,000,000	8.0	1.3	1.0

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

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

A first areal coverage estimate is based on interpolation of the WASP 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.

The second estimate of the total 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.

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 seafloor while also trying to maximize the dispersion and dilution of the waste. The WASP 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 (5 and 15 cm/sec

respectively) current speeds modeled. Under these conditions the areal extent of the waste deposit greater than 0.4 inches deep is controlled primarily by the discharge rate. Greater total area coverage of the waste from near-surface discharges is predicted for lower discharge rates than from near-seafloor discharges.

Seafood processing waste discharges from a processor 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. Discharges to waters deeper than 45 meters 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 seafloor within a 3-foot square sample plot. These assumptions based upon the current modeling effort are still deemed to be applicable to this ZOD evaluation, unless and until submitted seafloor surveying suggests otherwise.

4.5 Seafloor Surveys (Permit Part 2.3.4 and Appendix E)

Seafloor surveying and reporting requirements can be found in Permit Part 2.3.4, and Permit Appendix E contains the Seafloor Survey Protocol. A permittee can use the *Seafloor Survey Summary Report Form* (Permit Attachment D) in the reporting. Seafloor survey results will be used to gather data to determine whether additional authorization limitations are needed, to monitor effluent impact on receiving water quality, and to inform future permit reissuance decisions.

The 2011 AKG523000 permit only required permittees discharging to locations from 0.5 nm to 1.0 nm from shore to perform seafloor surveys if the permittees met certain requirements. The 2018 permit carried forward the previous seafloor survey trigger thresholds and required that any stationary vessel permittee discharging seafood processing waste to depths of less than 120 feet MLLW conduct a seafloor survey whenever seafood processing occurred at a discharge location for seven or more consecutive days in a calendar year or for greater than 168 hours cumulatively in a calendar year. The 2026 permit requires seafloor surveys for stationary vessel discharge locations between shore to 3.0 nm from shore in depths of less than 120 feet at MLLW. Discharges to waters deeper than 120 feet are assumed to disperse waste, and any seafood waste on the seafloor is assumed to be less than 0.5 inches thick and covering less than 10% of the seafloor.

A permittee shall determine whether a seafloor survey is necessary by recording the following information (Permit Attachment E) for each discharge location:

- The receiving water depth at MLLW;
- Whether the vessel discharged for at least 168 total hours during the year;
- Whether the vessel discharged for at least seven consecutive days during the year;
- Whether the vessel discharged at least 10 million pounds of waste during the year.

The 2018 AKG523000 permit required that a seafloor survey determine the area of continuous coverage (100%) and discontinuous coverage (10%-99%) of seafood processing waste at a single location. The seafloor survey used a seafood processing waste deposition of 0.5 inches or thicker on the seafloor and coverage of greater than 10% of the seafloor within a 3-foot square sample plot as the minimum detection level.

The 2026 AKG523000 permit Appendix E updates the Department's interpretation of applying the 1.0-acre ZOD requirement. The Department consulted with EPA during the most recent AKG521000 reissuance and established a new methodology for determining amounts of seafood waste deposits that would count toward the 1.0-acre limit. The permit now requires that those seafloor areas with both continuous coverage (95-100%) and greater than fifty percent (50%) discontinuous coverage count toward the 1.0-acre limit.

The permit requires the identification of Beggiatoa mats and their approximate coverage area(s). Beggiatoa and other filamentous bacteria can be found in marine environments, and as applicable to the permit use seafood waste (a type of organic waste) as a food source. They can usually be found in habitats where the reduction of sulfur and nitrates in the sediment and waste materials is occurring. As the seafood wastes decay, the nitrates and sulfur consume the oxygen molecules, thus depleting the oxygen in the water column directly above Beggiatoa mats. These environments may also include cold seeps, sulfur springs, areas with high levels of organic pollutant loading (other than seafood waste discharge) is occurring in the receiving water, and near deep hydrothermal vents. Thus, if these features are found by the surveyor, it should be noted in the Seafloor Survey Report.

Additionally, the 2026 AKG523000 permit now requires a permittee to submit a map depicting the observed coverage areas.

Waivers issued under AKG520000 Part VI(C)(10) from performing seafloor surveys were not continued in the 2018 AKG523000 permit. Those permittees who received EPA or DEC waivers from having to perform surveys in estuarine areas or in marine tidally influenced systems are required to complete the seafloor survey. However, the survey may not necessarily need to be performed using a diver. Permittees may request to document seafood waste deposits on the seafloor and/or bedlands at low tide if the seafloor survey data objectives can be met without using a diver. The 2026 AKG523000 permit continues to allow a permittee to apply for modification of the frequency of submitting seafloor surveys with the submittal of two seafloor surveys performed during the permit cycle. Both seafloor surveys must demonstrate that seafood waste has not accumulated to pile sizes greater than 0.75 acres.

A permittee is required to perform the seafloor survey as soon as practicable but no later than 60 days after cessation of discharge at the processing location. The permit requires that if surveys cannot be conducted within the 60-day timeline due to weather, availability of dive services (provided there is documented evidence that dive services were requested greater than three months in advance of when the survey is due to be performed), or other adverse conditions, the circumstances which delayed the survey shall be documented in the final seafloor survey report. DEC requires the survey to be performed within 60 days after the cessation of discharge to obtain an accurate reflection of each season's seafloor impacts.

Upon reviewing submitted seafloor survey results, the Department may alter existing authorization requirements or deny continued coverage for certain discharge locations with accumulation greater than or equal to 0.75 acres and require the permittee to propose new discharge locations. The presence of accumulation greater than 0.75 acres at a discharge location demonstrates that seafood processing wastes are not being discharged into hydrodynamically energetic waters that ensure the proper dispersal of seafood processing waste. The permittee may be required to perform continued annual monitoring for those discharge locations found to have greater than 1.0 acre of coverage even if the permittee has ceased discharging at that location.

In identifying the areas where seafood waste deposits may be located, it is important to understand that the NOI's identified discharge location(s) may not represent the actual location(s) of where a permittee anchored and discharged waste during the season. This disconnect between the NOI proposed discharge locations vs actual discharge locations may be due to a number of factors. First, the accuracy of the GIS used by the permittee to propose the discharge location points for the NOI. Second, the accuracy of the vessel's global positioning system (GPS) unit and how many satellites were within view of the boat while discharging. Third, the proposed discharge location size has been identified as a circle with a 0.5-nm radius, meaning the vessel could anchor anywhere in a 1.0-nm wide diameter circle and still be meeting permit conditions. Fourth, previous permits did not require the permittee to discharge at the location identified on the NOI with an identified coordinate accuracy. Lastly, anchor drag and anchor swing (the way a vessel moves around its anchor) during normal ocean conditions and storms may also impact where the seafood waste is deposited. These deposits may be outside of the NOI's proposed discharge location, but the permit still limits the ZOD coverage area to 1.0 acre. During this permit cycle, permittees are required to discharge within 0.5 nm of the NOI's proposed discharge location(s).

4.6 Sea Surface Monitoring (Permit Part 2.3.5)

All permittees are required to conduct visual sea surface monitoring of the readily visible area around all outfalls. The purpose of the monitoring is to record the occurrence and extent of films, foam, scum, or sheens (compliance with WQC at 18 AAC 70.020(b)); to record the occurrence and numbers of Western Steller sea lions, Steller's eiders, spectacled eiders, Northern sea otters, and short-tailed albatross; and to record any incidents of injured or dead threatened or endangered species. This monitoring shall be conducted daily while seafood processing waste discharge occurs. The permittee shall develop QAPP (Quality Assurance Project Plan) monitoring instructions for the observer.

5.0 OTHER REQUIREMENTS

5.1 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.

5.2 Quality Assurance Project Plan (Permit Part 3.1)

The permittee is required to develop QAPP sampling and other monitoring procedures to ensure that the monitoring data submitted is accurate and explains data anomalies if they occur. The permittee shall develop and implement the QAPP within 60 days of authorization to discharge under the permit. A permittee with current authorization shall review and update the QAPP annually or more frequently, in compliance with the permit. The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing, and shipping samples; conducting laboratory analysis; calculating limits; and reporting data. The QAPP shall be retained on the vessel and made available to the Department upon request.

5.3 Best Management Practices Plan (Permit Part 3.2)

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 or discharged. The permit requires the permittee to develop a BMP Plan in order to prevent or minimize the potential for the release of pollutants to waters of the U.S. through runoff, spillage or leaks, or erosion. The permit contains certain BMP conditions that must be included in the BMP Plan. The BMP Plan must be kept on the vessel and made available to the Department upon request.

A new permittee shall develop and implement a BMP Plan within 60 days of authorization to discharge under the permit. A previously permitted permittee shall review and update the BMP Plan as necessary under the permit. The BMP Plan shall be reviewed at least annually and be revised as needed, and the permittee shall ensure that the BMP Plan has been implemented

Vessels may use BMPs, in addition to numerical effluent limitations, 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 (EPA, 1980) recommended facility management directed towards total utilization of the raw materials and byproduct recovery as a fundamental and central element of waste reduction. Materials accounting, audits of on-vessel utilization of water and materials, and BMPs are often recommended as the profitable approach to waste management in seafood processing.

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. These documents are still available for permittees during 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 generation of pollutants and their release or potential release to the receiving water.

In addition to generalized BMP development and implementation to prevent or minimize the generation and release of pollutants to waters of the U.S., the permit requires some specific BMPs as well.

The 2018 AKG523000 permit required the following new updates be included in the BMP Plan:

- Description of the practices and training staff will receive to ensure that "Other Wastewaters" are properly routed through the seafood processing waste treatment system (if required), or how they will apply other treatments to comply with WQS.
- Identify pollutants discharged during the seafood processing byproduct production. Identify and develop methods to prevent, treat, or minimize the generation and discharge of pollutants in stickwater at the source to the greatest extent practicable. Stickwater shall be recycled and treated to the greatest extent practicable, in an environmentally safe manner, whenever feasible.
- The BMPs shall include a description of how refrigeration repairs, as well as maintenance and purging practices, are to be performed on board to mitigate any accidental releases.

The 2026 general permit also requires that the BMP be amended when reoccurring sea surface residues violations occur.

5.4 Annual Report (Permit Part 3.3)

The purpose of the Annual Report is to document the status of implementation of the permit's limitations and requirements, including:

- A self-assessment review of compliance with the permit conditions,
- A summary of results of monitoring information that has been collected and analyzed, and
- A discussion of proposed process changes or improvements for the next permit year (submittal of an updated NOI, if needed).

The permit includes a requirement in the Annual Report to provide a summary of any occurrences of leaks or breaks in the refrigeration system(s). The permit also requires the permittee to provide a list of chemicals, disinfectants, cleaners, biocides, and food processing additives (salts, acids, bases, enzymes, etc.) used and discharged during the annual reporting period. Requiring industrial facilities to identify chemicals in their processing wastewater discharges is an integral part of the CWA.

5.5 Antibacksliding

Regulations at 18 AAC 83.480 require that "effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit." Regulations at 18 AAC 83.480(c) also state that a permit may not be reissued "to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued."

As discussed in Part 3.2.1, data collected by several permittees in the previous permit term showed the presence of ammonia in the Outfall 001A effluent. The Department conducted the RPA (see Appendix B) and mixing zone analysis (see Appendix D) for the one processing vessel found to have RP, and the resulting Outfall 001A mixing zone was not larger than the standard general permit mixing zone. Additionally, no effluent limitations were relaxed. To the contrary, numeric WQBELs for ammonia will be added to that vessel's discharge authorization. The added mixing zone parameter is simply a result of analyzing the new information about ammonia discharged that was not available when the previous permit was written.

All other permit effluent limits, standards, and conditions in the permit are at least as stringent, if not more so, as in the previously issued permit and are consistent with 18 AAC 83.480. Accordingly, no further backsliding analysis is required for this permit issuance.

5.6 Antidegradation

Section 303(d)(4) of the CWA states that, for waterbodies where the water quality meets or exceeds the level necessary to support the waterbody's designated uses, WQBELs may be revised as long as the revision is consistent with the State's Antidegradation policy. The State's Antidegradation policy is found in the 18 AAC 70 WQS regulations at 18 AAC 70.015. The Department's approach to implementing the Antidegradation policy is found in 18 AAC 70.016 *Antidegradation implementation methods for discharges authorized under the federal Clean Water Act*. Both the Antidegradation policy and the implementation methods are consistent with

40 CFR §131.12 and approved by EPA. This Part analyzes and provides rationale for the Department's decisions in the permit issuance with respect to the Antidegradation policy and implementation methods.

Using the policy and corresponding implementation methods, the Department determines a Tier 1 or Tier 2 classification and protection level on a parameter by parameter basis. A Tier 3 protection level applies to a Tier 3 designated water. At this time, no Tier 3 waters have been designated in Alaska.

Regulatory requirements of 18 AAC 70.015(a)(1) state that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected (Tier 1 protection level).

There are no marine waters covered under the general permit listed as impaired (Category 4 or 5) on DEC's most recent *Integrated Water Quality Monitoring and Assessment Report*; therefore, no parameters have been identified where only the Tier 1 protection level would apply. Accordingly, this antidegradation analysis conservatively assumes that the Tier 2 protection level applies to all parameters, consistent with 18 AAC 70.016(c)(1).

Regulations at 18 AAC 70.015(a)(2) state that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality must be maintained and protected, unless the Department authorizes a reduction in water quality (Tier 2 protection level). The Department may allow a reduction of water quality only after the specific analysis and requirements under 18 AAC 70.016(b)(5)(A-C), 18 AAC 70.016(c)(7)(A-F), and 18 AAC 70.016(d) are met. The Department's findings are as follows:

5.6.1 **18 AAC 70.016(b)(5)**

(A) *existing uses and the water quality necessary for protection of existing uses have been identified based on available evidence, including water quality and use related data, information submitted by the applicant, and water quality and use related data and information received during public comment;*

(B) *existing uses will be maintained and protected; and*

(C) *) the discharge will not cause water quality to be lowered further where the department finds that the parameter already exceeds applicable criteria in 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b).*

Per 18 AAC 70.020 and 18 AAC 70.050, all marine waters are protected for all uses; therefore, the most stringent WQC found in 18 AAC 70.020 and in the Alaska WQC Manual for Toxic and Other Deleterious Organic and Inorganic Substances (DEC 2008) apply and were evaluated. This will ensure existing uses and the water quality necessary for protection of existing uses of the receiving waterbody are fully maintained and protected.

The permit places limits and conditions on the discharge of pollutants. The limits and conditions are established after comparing TBELs and WQBELs and applying the more restrictive of these limits. The WQC, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. WQBELs are set equal to the most stringent WQC available for any of the protected water use classes. The permit also requires ambient water quality monitoring to evaluate possible impacts to the receiving waters and existing uses.

Pollutants of concern in seafood waste are primarily the biological wastes generated by processing raw seafood into a marketable form and the chemicals used for processing or cleaning processing equipment and fish containment structures in order to maintain sanitary conditions. Biological wastes are primarily seafood parts. The chemicals used for cleaning are primarily disinfectants, which shall be used in accordance with manufacturer specifications. Refrigerants used are generally ammonia and Freon. Monitoring for ammonia is a permit requirement to evaluate whether WQS are being met.

The general permit includes numeric or narrative effluent limits and BMPs addressing each of the pollutants of concern. The permit requires permittees to implement BMP Plans to minimize the production of waste and the discharge of pollutants to waters of the U.S. to ensure that seafood processors provide for the protection or attainment of existing and designated uses.

Permit Part 1.3.9 requires that the discharge shall not cause a violation of the WQS at 18 AAC 70. As previously stated, there are no marine waters covered under the general permit that are listed as impaired; therefore, no parameters were identified as already exceeding the applicable criteria in 18 AAC 70.020(b) or 18 AAC 70.030. Marine waters covered under the general permit are not listed under 18 AAC 70.236(b) as subject to site-specific criteria.

The Department concludes that the terms and conditions of the permit will be adequate to fully protect and maintain the existing uses of the water and that the findings under 18 AAC 70.016(b)(5) are met.

5.6.2 **18 AAC 70.016(c)(7)(A-F)** *If, after review of available evidence, the department finds that the proposed discharge will lower water quality in the receiving water, the department will not authorize a discharge unless the department finds that:*

5.6.2.1 ***18 AAC 70.016(c)(7)(A)*** *the reduction of water quality meets the applicable criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b), unless allowed under 18 AAC 70.200, 18 AAC 70.210, or 18 AAC 70.240;*

As previously stated, Permit Part 1.3.9 requires that the discharge shall not cause a violation of the WQS at 18 AAC 70. WQBELs are set equal to the most stringent WQC available under 18 AAC 70.020(b) for any of the protected water use classes. Because of the nature of the permitted discharges, other pollutants are not expected to be present in the discharges at levels that would cause, have the reasonable potential to cause, or contribute to an exceedance of any Alaska WQS, including the whole effluent toxicity limit at 18 AAC 70.030. The Department will not authorize a discharge under the general permit to waters that have established or adopted site-specific criteria in the vicinity of the discharge. Currently, marine waters covered under the general permit are not listed under 18 AAC 70.236(b) as subject to site-specific criteria.

Except where a mixing zone or a ZOD has been authorized by the Department, all parameters at the point of discharge must meet the most stringent WQC available for any of the protected water use classes. In addition, if a mixing zone is authorized, all WQC must be met at the boundary of the mixing zone to ensure all criteria are met in the waterbody and the waterbody as a whole is protected. The WQC in 18 AAC 70.020 is a legal basis for the permit effluent limits, of which serve the specific purpose of protecting the existing and designated uses.

The Department has determined that the reduction of water quality meets the applicable criteria of 18 AAC 70.020(b), 18 AAC 70.030, and 18 AAC 70.236(b), and that the finding is met.

5.6.2.2 ***18 AAC 70.016(c)(7)(B)*** *each requirement under (b)(5) of this section for a discharge to a Tier 1 water is met;*
See 18 AAC 70.016(b)(5) analysis and findings above.

5.6.2.3 ***18 AAC 70.016(c)(7)(C)*** *point source and state-regulated nonpoint source discharges to the receiving water will meet requirements under 18 AAC 70.015(a)(2)(D); to make this finding the department will (i) identify point sources and state-regulated nonpoint sources that discharge to, or otherwise impact, the receiving water; and (ii) consider whether there are outstanding noncompliance issues with point source permits or required state-regulated nonpoint source best management practices, consider whether receiving water quality has improved or degraded over time, and, if necessary and appropriate, take actions that will achieve the requirements of 18 AAC 70.015(a)(2)(D); and (iii) coordinate with other state or federal agencies as necessary to comply with (i) and (ii) of this subparagraph;*
The requirements under ***18 AAC 70.015(a)(2)(D)*** state:

(D) 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 best management practices;

The highest statutory and regulatory requirements are defined at ***18 AAC 70.015(d)***:

(d) For purposes of (a) of this section, the highest statutory and regulatory requirements are

(1) any federal technology-based effluent limitation identified in 40 C.F.R. 122.29 and 125.3, revised as of July 1, 2017 and adopted by reference;

(2) any minimum treatment standards identified in 18 AAC 72.050;

(3) any treatment requirements imposed under another state law that is more stringent than a requirement of this chapter; and

(4) any water quality-based effluent limitations established in accordance with 33 U.S.C. 1311(b)(1)(C) (Clean Water Act, sec. 301(b)(1)(C)).

The first part of the definition includes all federal TBELs. The permit requires permittees to comply with 40 CFR Part 408, Canned and Preserved Seafood Processing Point Source Category. The ELGs set standards of performance for new sources and are incorporated in the permit.

The second part of the definition references the minimum treatment standards found at 18 AAC 72.050, which refers to domestic wastewater discharges only. The permit covers sanitary wastewater treated prior to discharge by a Type II MSD sanitary waste system that meets the applicable Coast Guard pollution control standards in effect (33 CFR Part 159). Conversely, a vessel's sanitary wastewater may be disposed to an onshore domestic wastewater treatment system.

The third part of the definition refers to treatment requirements imposed under another state law that are more stringent than 18 AAC 70. Other regulations beyond 18 AAC 70 that apply to this permitting action include 18 AAC 15 and 18 AAC 72. Neither the regulations in 18 AAC 15 and 18 AAC 72 nor another state law that the Department is aware of impose more stringent requirements than those found in 18 AAC 70.

The fourth part of the definition refers to WQBELs. A WQBEL is designed to ensure that the WQS of a waterbody are met and may be more stringent than TBELs. Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet WQS by July 1, 1977. WQBELs included in APDES permits are derived from EPA-approved 18 AAC 70 WQS. APDES regulation 18 AAC 83.435(a)(1) requires that permits include WQBELs that can "achieve water quality standards established under CWA §303, including state narrative criteria for water quality." The permit requires compliance with the 18 AAC 70 WQS, including effluent limits for pH, temperature, DO, ammonia, and TRC and monitoring for other applicable WQS pollutants.

The Department reviewed available information on known point source discharges to receiving waters covered under the permit and found that outstanding noncompliance issues are being addressed through compliance actions. There are no state regulated nonpoint sources that discharge to, or otherwise impact, the receiving waters covered under the permit.

After review of the methods of treatment and control and the applicable statutory and regulatory requirements, including 18 AAC 70, 18 AAC 72, and 18 AAC 83, the Department finds that the discharge authorized under this general permit meets the highest applicable statutory and regulatory requirements; therefore, the 18 AAC 70.016(c)(7)(C) finding is met.

5.6.2.4 ***18 AAC 70.016(c)(7)(D)(i-ii)*** *the alternatives analysis provided under (4)(C-F) of this subsection demonstrates that*

(i) a lowering of water quality under 18 AAC 70.015(a)(2)(A) is necessary; when one or more practicable alternatives that would prevent or lessen the degradation associated with the proposed discharge are identified, the department will select one of the alternatives for implementation; and

(ii) the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the department to be the most effective and practicable;

The Department performed an alternatives analysis and found that temporary lowering of water quality to accommodate important economic development throughout the State of Alaska is necessary. Alternatives were evaluated based on practicability, as defined at 18 AAC 70.990(48). Alternatives to offshore processing and waste discharges were determined to be non-practicable. Therefore, discharge under the limitations and requirements of the permit is identified as the practicable alternative, and the 18 AAC 70.016(c)(7)(D)(i) finding is met.

Permit requirements include the implementation of BMPs and ambient water quality monitoring to evaluate the need for updated limits in future permits.

The permit requires permittees to follow prescribed BMPs to minimize pollutant discharges, as well as to comply with 40 CFR Part 408, Canned and Preserved Seafood Processing Point Source Category. The regulations at 40 CFR Part 408 require 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. No mixing zones or zones of deposits will be issued that conflict with the ELGs applied in the general permit. 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,' which provides more documentation regarding treatment technologies used to develop the performance standards. 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 wastewater 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).

With the permit-required implementation of BMP controls and the requirement to meet ELGs and WQS, the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the Department to be the most effective and practicable; therefore, the 18 AAC 70.016(c)(7)(D)(ii) finding is met.

5.6.2.5 ***18 AAC 70.016(c)(7)(E)*** *except if not required under (4)(F) of this subsection, the social or economic importance analysis provided under (4)(G) and (5) of this subsection demonstrates that a lowering of water quality accommodates important social or economic development under 18 AAC 70.015(a)(2)(A); and*

Alaska has the most prolific commercial fishing industry in the United States, producing more harvest volume than all other states combined. According to a 2018 report released by the Alaska Seafood Marketing Institute, Alaska's seafood industry creates $5.2 billion in economic value for Alaska and generates an additional $7.6 billion in value as industry income circulates throughout the U.S. economy. Total direct and secondary economic output in the U.S. stemming from the Alaska seafood industry was estimated at $15.7 billion. The Alaska seafood industry directly employed 66,323 workers in Alaska in 2017 and is the largest manufacturing sector in Alaska, accounting for 72% of the state's manufacturing employment. As of 2016, the sector included 169 shore-based plants, 73 catcher-processors, and more than a dozen floating processors.

Seafood processors provide a service to communities throughout the areas where they are located. Many subsistence fisherman are also commercial fisherman, 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 Alaskan waters and sell their catch to processors located in Alaska, which 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 other states, as well as to international commerce, as seafood caught is sold to other countries.

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. Fisheries in turn support sector businesses, which 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 processors to continue to operate, allow new processors to begin operations, and regulate seafood processing and seafood waste discharges to protect water quality. The localized lowering of water quality is temporary and limited due to natural attenuation and dispersion of seafood waste.

The Department has determined that the operation of the seafood processors and discharges authorized by the permit demonstrate that the lowering of water quality accommodates important economic development; therefore, the 18 AAC 70.016(c)(7)(E) finding is met.

5.6.2.6 ***18 AAC 70.016(c)(7)(F)*** *18 AAC 70.015 and this section have been applied consistent with 33 U.S.C. 1326 (Clean Water Act, sec. 316) with regard to potential thermal discharge impairments.*

Discharges authorized under the permit are not associated with a potential thermal discharge impairment; therefore, the finding is not applicable.

5.7 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 §125.122(b) and adopted by reference at 18 AAC 83.010(C)(8), state that discharges found to be in compliance with CWA section 303 WQS 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 WQS] 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 any applicable 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, including WQBELs requirements under section 302. 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 the permit shall be presumed not to cause unreasonable degradation of the marine environment, for any of the pollutants or conditions specified.

5.8 Endangered Species Act

NMFS is responsible for administration of the Endangered Species Act (ESA) for listed cetaceans, seals, sea lions, sea turtles, anadromous fish, marine fish, marine plants, and corals. All other species (including polar bears, walrus, and sea otters) are administered by the USFWS.

The ESA requires federal agencies to consult with NOAA, 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. However, DEC voluntarily contacted the agencies to notify them of the proposed permit issuance and to obtain listings of threatened and endangered species near the discharge (as described in Part 4.3.3). The permit has integrated specific monitoring and permit requirements applicable to seafood processing discharges located near CHAs (as discussed in Part 1.8). The permit requires

permittees to collect data regarding threatened and endangered species during sea surface monitoring activities.

This fact sheet and the permit will be submitted to the agencies for review during the public notice period, and any comments received from these agencies will be considered prior to issuance of the permit.

5.9 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) requires federal agencies to consult with NOAA when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH.

As a state agency, DEC is not required to consult with NOAA on EFH. However, DEC voluntarily contacted NOAA to notify them of the proposed permit issuance and to obtain listings of EFH in the area. DEC has determined that seafood waste discharges from seafood processing or discharge vessels 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, and Alaska stocks of Pacific Salmon.

NMFS and the Alaska Department of Fish and Game (ADF&G) 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 1.4.3.4.

DEC will provide NMFS with copies of the permit and fact sheet during the public notice period. Any comments received from NMFS regarding EFH will be considered prior to issuance of the permit.

5.10 Permit Expiration

The permit will expire five years from the effective date of the permit, but it may be administratively continued.

6.0 REFERENCES

Alasalvar, C., Shahidi, F., Miyashita, K., and Wanasundara, U. 2011. *Handbook of Seafood Quality, Safety and Health Applications.* Wiley-Blackwell.

Bechtel, P.J. and Smiley, S. 2009. *A Sustainable Future: Fish Processing Byproducts. Proceedings of the symposium* February 25-26, 2009. Portland Oregon, USA. Alaska Sea Grant College Program. University of Alaska Fairbanks (AK-SG-10-02).

Colic, M., Morse, W., Hicks, J., Lecter, A., Miller, J.D. 2007. *Case Study: Fish Processing Plant Wastewater Treatment.* Clean Water Technology, Inc. Gas Energy Management. Goleta, CA 93117. (web access document 6/15/2016 http://www.cleanwatertech.com/publications/2007-07-29-fish_processing_wastewater.pdf).

EPA, Train, Russell, 1975. *Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Fish Meal, Salmon, Bottom Fish, Clam, Oyster, Sardine, Scallop, Herring, and Abalone Segment of the Canned and Preserved Fish and Seafood Processing Industry Point Source Category.* U.S. Environmental Protection Agency, Effluent Guidelines Division, Office of Water and Hazardous Materials. September, 1975.

EPA, 1980. *Seafood processing study: Executive summary.* U.S. Environmental Protection Agency, Office of Water. EPA 440/1-80/020. September 1980.

EPA, 1993. *Guidance Manual for Developing Best Management Practices (BMP)*. U.S. Environmental Protection Agency, Office of Water. EPA 833-B-93-004. October 1993.

EPA, 1994. *CWA Section 403: Procedural and Monitoring Guidance.* U.S. Environmental Protection Agency, Office of Water. EPA 842-B-94-003. March 1994.

EPA, 1999. WQC; Notice of Availability; 1999 Update of Ambient WQC for Ammonia; Notice," Federal Register/Vol. 64, No. 245/Wednesday, December 22, 1999.

EPA, 2008. *Draft Biological Evaluation for the General NPDES Permit for Offshore Seafood Processors in Alaska.* June 2008.

Himelbloom, B. H., and B. G. Stevens. 1994. *Microbial analysis of a fish waste dump site in Alaska*. Bioresource Technology. 47:229-233.

Nicklason, Peter M., Bottomline Resources; 1995. "Seafood Processing Handbook for Materials Accounting Audits and Best Management Practices Plans." H. Burney Hill, U.S. Environmental Protection Agency, Region 10, Seattle. October 13, 1995.

EPA and Limno Tech, 2008. *Environmental Assessment for the General NPDES Permit for Offshore Seafood Processors in Alaska:* U.S. Environmental Protection Agency, Region 10, Seattle. June, 2008.

NFMS, 2013. Federal Register Notice: 50 CFR Parts 223 and 224, [Docket No. 110901553–3764–02], RIN 0648–BB41, *Endangered and Threatened Species; Delisting of the Eastern Distinct Population Segment of Steller Sea Lion Under the Endangered Species Act; Amendment to Special Protection Measures for Endangered Marine Mammals*, National Marine Fisheries Service, NOAA. November 2013.

Ismond, Alan, 1994. *How to Do a Seafood Processing Plant Water, Waste and Wastewater Audit.* In "Proceedings, Wastewater Technology Conference and Exhibition for Seafood Processors", convened by the Fisheries Council of British Columbia in Vancouver, Canada. February 21-22, 1994.

Jordan, 1979. *Reassessment of Effluent Limitations Guidelines and New Source Performance Standards for the Canned and Preserved Seafood Processing Point Source Category.* Prepared by Edward C. Jordan Company for the U.S. Environmental Protection Agency, Effluent Guidelines Division. December 1979.

NMFS, 2005. *Final Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska* (Chapter 3). National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Alaska Region.

NMFS, 2008. *Recovery Plan for the Steller Sea Lion, Eastern and Western Distinct Population Segments, Revision*. National Marine Fisheries Service, NOAA. March 2008.

NOAA, 1993. *Designated Critical Habitat; Steller sea lion.* National Oceanographic and Atmospheric Administration, U.S. Department of Commerce. Title 50 – Wildlife and Fisheries, Part 226 – Designated Critical Habitat, 226.202 Critical habitat for Stellar [sic] sea lions.

OMB, 2007. *North American Industry Classification System.* U.S. Office of Management and Budget, US Printing Office, Washington DC. 2007.

Wang, L.K., Shammas, N.K., Selke, W.A., Aulenbach, D.B. 2010. Treatment of Seafood Processing Wastewater. Volume 12 - Flotation Technology. ISBN: 978-1-58829-494-4 (Print) 978-1-60327-133-2

Westington, M. A. and Slagel, M. J., 2010. *U.S. Maritime Zones and the Determination of the National Baseline*. Office of Coast Survey National Ocean Service- NOAA Silver Spring, Maryland USA.

Wu, T.Y., Mohammad, A.W., Anuar, N. and Rahman, R.A. 2002. *Potential use of nanofiltration membrane in treatment of wastewater from fish and surimi industries.* Songklanakarin J. Sci. Technol., 24(Suppl.): 977-987.

APPENDIX A. – BASIS FOR EFFLUENT LIMITATIONS

The Clean Water Act (CWA) requires seafood processors to meet effluent limits based on available wastewater treatment technology, specifically technology-based effluent limits (TBELs). TBELs are national in scope and establish performance standards for all facilities within an industrial category or subcategory. The Alaska Department of Environmental Conservation (DEC or the Department) may find, by analyzing the effect of an effluent discharge on the receiving waterbody, that TBELs are not sufficiently stringent to meet Water Quality Standards (WQS). In such cases, the Department is required to develop more stringent water quality-based effluent limits (WQBELs), which are designed to ensure that the WQS of the receiving waterbody are met.

In establishing permit limits, the permit writer first determines which TBELs must be incorporated into the permit. When TBELs do not exist for a particular pollutant expected to be in the effluent, the Department must determine whether 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 must be established in the permit.

A.1 Effluent Limitation Guideline

In June 1974, the Environmental Protection Agency (EPA) promulgated an effluent limitation guideline (ELG), 40 CFR Part 408 [adopted by reference at 18 AAC 83.010(g)(3)], for canned and preserved seafood processing point sources. The ELG regulations establish national technology-based effluent performance standards.

The processing and discharge vessels in the permit discharge as described in Part 1.6. Accordingly, 40 CFR Part 408 Subparts E, G, J, P, Q, T, AC, AE apply to the discharges. The vessels are defined as remote facilities. Thus, the ELG limitation under all applicable Subparts requires that no pollutants be discharged which exceed 1.27 centimeters (0.5 inches) in any dimension. The permit incorporates this ELG requirement.

A.2 Mass-Based Limitations

The regulation at 18 AAC 83.540 requires that effluent limits be expressed in terms of mass, unless they cannot appropriately be expressed by mass, it is infeasible, or the limits can be expressed in terms of other units of measurement. The mass-based limits are expressed in pounds per day (lbs/day) and are calculated as follows:

Mass-based limit (lbs/day) = pollutant concentration (mg/L) × flow (mgd) × 8.34 lbs/gallon

The permit does not require mass-based reporting, as the parameters limited can be expressed in terms of other units of measurement.

A.3 Water Quality-Based Effluent Limits

A.3.1 Statutory and Regulatory Basis

Regulations at 18 AAC 70.010 prohibit conduct that causes or contributes to a violation of the WQS. Regulations in 18 AAC 15.090 require that permits include terms and conditions to ensure criteria are met, including operating, monitoring, and reporting requirements.

The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and, where appropriate, dilution in the receiving waterbody.

The limits must be stringent enough to ensure that WQS are met and must be consistent with any available Waste Load Allocation (WLA).

The CWA requires that the effluent limit for a particular pollutant be the more stringent of either TBELs or WQBELs. TBELs are established by EPA for many industries in the form of ELGs and are based on available pollution control technology. The Department adopts the subject ELGs by reference in 18 AAC 83.010.

A.3.2 Reasonable Potential Analysis (RPA)

When evaluating the effluent to determine whether WQBELs based on chemical-specific numeric WQC (WQC) 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 from the receiving waterbody are factors used to project the receiving waterbody concentration. If the projected concentration of the receiving waterbody exceeds the WQC for a limited parameter, then there is a reasonable potential (RP) that the discharge may cause or contribute to an excursion above the applicable WQS, and a WQBEL must be developed.

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

A.3.3 Procedure for Deriving Water Quality-Based Effluent Limits

The *Technical Support Document for Water Quality-Based Toxics Control* (TSD) (EPA, 1991) and the WQS recommend the flow conditions for use in calculating WQBELs using steady-state modeling. The TSD, Alaska Pollutant Discharge Elimination System (APDES) guidance, and the WQS state the WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic WQC and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute WQC. In marine settings, tidal velocities must be representative of critical conditions as well.

The first step in developing a WQBEL is to develop a WLA for the pollutant. A WLA is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of WQS or a Total Maximum Daily Load (TMDL) in the receiving waterbody. If a mixing zone is authorized in the permit, the WQS apply at all points outside the mixing zone.

In cases where a mixing zone is not authorized, either because the receiving waterbody already exceeds the WQC, the receiving waterbody flow or tidal velocity and duration is too low to provide dilution, or for some other reason, the WQC becomes the WLA. Establishing the WQC as the WLA ensures that the permittee will not cause or contribute to an exceedance of the WQC. The WQS at 18 AAC 70.020(a) designate standards for beneficial uses such as water supply; water recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife.

A.3.4 Specific Water Quality-Based Effluent Limits

A.3.4.1 Residues

The WQS for marine "floating solids, debris, sludge, deposits, foam, scum, or" other residues are narrative. The most stringent standard, found at 18 AAC 70.020(b)(20)(A)(ii), states that residues "may not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines." This standard is carried from the previous permit and implemented through seafloor monitoring in Permit Part 2.3.4 and sea surface monitoring in Permit Part 2.3.5.

A.3.4.2 pH

Alaska WQS at 18 AAC 70.020(b)(18)(A)(i) (aquaculture) and 18 AAC 70.020(b)(18)(C) (Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife) state that the pH may not be less than 6.5 or greater than 8.5 SU.

The permit limits processing vessel seafood processing waste and wastewater pH to 6.3 – 8.7 SU, with mixing zone dilution applied as described in Part 4.3.2.

A.3.4.3 Temperature

The WQS at 18 AAC 70.020(b)(10)(A)(ii) for Water Supply - seafood processing state that temperature may not exceed 15 ° Celsius (°C).

The permit limits processing vessel seafood processing waste and wastewater temperature to 20 °C, with mixing zone dilution applied as described in Part 4.3.2.

A.3.4.4 Dissolved Oxygen

The WQS for water supply - aquaculture are the most stringent standards for dissolved oxygen (DO). The standards at 18 AAC 70.020(b)(15)(A)(i) require that "Surface DO concentration in coastal water may not be less than 6.0 mg/l for a depth of one meter except when natural conditions cause this value to be depressed. DO may not be reduced below 4 mg/l at any point beneath the surface. DO concentrations in estuaries and tidal tributaries may not be less than 5.0 mg/l except where natural conditions cause this value to be depressed. In no case may DO levels exceed 17 mg/l. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection."

The permit limits processing vessel seafood processing waste and wastewater DO to a minimum of 5.3 mg/L, with mixing zone dilution applied as described in Part 4.3.2.

A.3.4.5 Total Residual Chlorine

The most stringent WQS for total residual chlorine (TRC) to protect designated uses requires that concentrations may not exceed 13 micrograms per liter (µg/L) for acute marine aquatic life and 7.5 µg/L for chronic marine aquatic life [18 AAC 70.020(b)(23)(c)].

The permit limits seafood processing waste and wastewater TRC to 0.1 mg/L, with mixing zone dilution applied as described in Part 4.3.2.

A.3.4.6 Total Ammonia (as Nitrogen)

Total ammonia is the sum of ionized (NH_4^+) and un-ionized ammonia (NH_3). Temperature, pH, and salinity affect which form, NH_4^+ or NH_3, is present. NH_3 is more toxic to aquatic organisms than NH_4^+ and predominates with higher temperature and pH. NH_3 is less toxic with increased salinity. Excess ammonia as nitrogen in the environment can lead to DO depletion, eutrophication, and toxicity to aquatic organisms.

DMR data from the previous permit term indicated that the Trident Independence vessel seafood processing waste and wastewater effluent had RP to exceed the ammonia WQC.

DEC derived ammonia WQC from the *Alaska WQC Manual for Toxics and Other Deleterious Organic and Inorganic Substances* (Toxics Manual) (DEC, 2008) consistent with the Department's RPA and Effluent Limits guidance, for the vessel's winter (Akutan Bay) and summer (Bristol Bay) discharge areas.

DEC reviewed Akutan Harbor receiving water data from the previous permit term and determined that a receiving water temperature of 5.0 °C, salinity of 30 ppt, and pH of 8.0 SU were the closest values to the 85th percentile of the data. These values were used to derive ammonia WQC (16.3 mg/L and 2.5 mg/L acute and chronic WQC, respectively) from tables contained in Appendix F and G of the Toxics Manual.

DEC reviewed Bristol Bay-area receiving water data from the previous permit term and determined that a receiving water temperature of 15.0 °C, salinity of 17 ppt, and pH of 8.0 SU were the closest values to the 85th percentile of the data. These values were used to derive ammonia WQC (7.1 mg/L and 1.1 mg/L acute and chronic WQC, respectively) from tables contained in Appendix F and G of the Toxics Manual

WQBELs of 9.6 mg/L maximum daily limit (MDL) and 3.8 mg/L average monthly limit (AML) were developed for Akutan Harbor, and WQBELs of 8.5 mg/L maximum daily limit (MDL) and 3.3 mg/L average monthly limit (AML) were developed for the Bristol Bay area. The ammonia WQBELs are protective of the waterbodies as a whole. Mixing zone dilution was applied. See Appendix B for details on RPA and Appendix C for details on permit limit derivation.

A.3.5 Selection of Most Stringent Limitations

A.3.5.1 Waste Particle Dimension

As discussed in Part A.1, the TBEL applicable to the vessels' seafood processing waste discharge is found at 40 CFR Part 408 and requires that pollutants discharged do not exceed 0.5 inch in any dimension. Accordingly, the permit incorporates this requirement.

A.3.5.2 Parameter Summary

The Table below provides a summary and reference to those parameters that contain effluent limits at the point of discharge under the general permit and/or authorization letters.

Parameter	Fact Sheet Reference	Type of Effluent Limit
Residues	APPENDIX A- Part A.3.4.1	Narrative WQBEL, implemented through Best Management Practices (BMPs) and ambient monitoring
pH	APPENDIX A- Part A.3.4.2	WQBEL, dilution from mixing zone applied to meet WQS at boundary of mixing zone
Temperature	APPENDIX A- Part A.3.4.3	WQBEL, dilution from mixing zone applied to meet WQS at boundary of mixing zone
Dissolved Oxygen (DO)	APPENDIX A- Part A.3.4.4	WQBEL, dilution from mixing zone applied to meet WQS at boundary of mixing zone
TRC	APPENDIX A- Part A.3.4.5	WQBEL, dilution from mixing zone applied to meet WQS at boundary of mixing zone
Total Ammonia	APPENDIX A- Part A.3.4.6	WQBEL, dilution from mixing zone applied to meet WQS at boundary of mixing zone
Waste Particle Dimension	APPENDIX A- Part A.3.5.1	WQBEL, implemented at the end of pipe

APPENDIX B. – REASONABLE POTENTIAL DETERMINATION

The following describes the process the Alaska Department of Environmental Conservation (the Department or DEC) used to determine whether the discharge authorized in the reissued permit has the reasonable potential to cause or contribute to a violation of Alaska Water Quality Standards (WQS). The Department used the process described in the *Technical Support Document* (TSD) *for Water Quality-Based Toxics Control* (Environmental Protection Agency, 1991) and DEC's guidance, *Alaska Pollutant Discharge Elimination System Permits Reasonable Potential Analysis and Effluent Limits Development Guide* (June 30, 2014) (RPA Guide) to determine the reasonable potential for any pollutant to exceed a water quality numeric criterion.

To determine whether there is reasonable potential for the discharge to cause or contribute to an exceedance of WQC (WQC) for a given pollutant, the Department compares the maximum projected receiving waterbody concentration to the criteria for that pollutant. Reasonable potential to exceed exists if the projected receiving waterbody concentration exceeds WQC, and a water quality-based effluent limit (WQBEL) must be included in the permit (18 AAC 83.435). Ammonia at Akutan Harbor is used as an example to demonstrate the RP determination process for the Trident Independence vessel.

The Department's RPA Guide directs permit writers to use the 85th percentile of ambient receiving water data for the pollutant of concern as the critical upstream concentration. This Part discusses how the maximum projected receiving waterbody concentration is determined and presents the RPA done as summarized in the table below.

B.1 Mass Balance

For a discharge to a flowing waterbody, the maximum projected receiving waterbody concentration is determined using a steady state model represented by the following mass balance equation:

$$C_d Q_d = C_e Q_e + C_u Q_u \qquad \text{(Equation B-1)}$$

Where,

C_d = Receiving waterbody concentration downstream of the effluent discharge

C_e = Maximum projected effluent concentration

C_u = Assumed receiving waterbody ambient concentration

Q_d = Receiving waterbody flow rate downstream

Q_e = Effluent flow rate

Q_u = Receiving waterbody flow rate upstream

When the mass balance equation is solved for C_d, it becomes:

$$C_d = \frac{C_e Q_e + C_u Q_u}{Q_e + Q_u} \qquad \text{(Equation B-2)}$$

The above form of the equation assumes that the discharge is rapidly and completely mixed with the receiving waterbody. If a mixing zone based on a percentage of the critical flow in the receiving waterbody is authorized based on the assumption of incomplete mixing with the receiving waterbody, the equation becomes:

$$C_d = \frac{C_e Q_e + C_u (Q_U \times MZ)}{Q_e + (Q_u \times MZ)} \qquad \text{(Equation B-3)}$$

Where, MZ = the fraction of the receiving waterbody flow available for dilution.

Where mixing is rapid and complete, MZ is equal to 1 and equation B-2 is equal to equation B-3 (i.e., all of the critical low flow volume is available for mixing). If a mixing zone is not authorized, dilution is not considered when projecting the receiving waterbody concentration, and

$$C_d = C_e \quad \text{(Equation B-4)}$$

In other words, if a mixing zone is not authorized, the Department considers only the concentration of the pollutant in the effluent regardless of the upstream flow and concentration. If the concentration of the pollutant in the effluent is less than the WQS numeric criteria, the discharge cannot cause or contribute to a water quality violation for that pollutant. In this case, the mixing or dilution factor (% MZ) is equal to zero and the mass balance equation is simplified to $C_d = C_e$.

Equation B-2 can be simplified by introducing a dilution factor (D):

$$D = \frac{Q_e + Q_u}{Q_e} \quad \text{(Equation B-5)}$$

After the D simplification, this becomes:

$$C_d = \frac{(C_e - C_u)}{D} + c_u \quad \text{(Equation B-6)}$$

B.2 Maximum Projected Effluent Concentration

To calculate the maximum projected effluent concentration, the Department used the procedure described in Section 3.3 of the TSD, "*Determining the Need for Permit Limits with Effluent Monitoring Data*" and the process described in Section 2.4 of DEC's RPA Guide. In this procedure, the 99th percentile of the effluent data is the maximum projected effluent concentration which is used in the calculation of the maximum projected receiving waterbody concentration.

Since there are a limited number of data points available, the 99th percentile is calculated by multiplying the maximum observed effluent concentration (MOC) by a reasonable potential multiplier (RPM). The RPM is the ratio of the 99th percentile concentration to the MOC and accounts for the statistical uncertainty in the effluent data. The RPM is calculated from the coefficient of variation (CV) of the data and the number of data points. The CV is defined as the ratio of the standard deviation of the data set to the mean. When fewer than 10 data points are available, the TSD and DEC's RPA Guide recommend assuming that the CV is equal to 0.6. A CV value of 0.6 is a conservative estimate that assumes a relatively high variability. The RPM equation in Section 2.4.2.1 of the RPA Guide is used to determine the RPM for ammonia.

$$RPM = \frac{\mu_n + z_{99}\,\sigma}{\mu_n + p_n\,\sigma} \quad \text{(Equation B-7)}$$

Where,

z_{99} = the z − statistic at the 99th percentile = 2.326

σ = the standard deviation calculated by ProUCL = 1.012

p_n = the z − statistic at the 95th percent confidence level of $(1 - 0.95)^{\frac{1}{n}} = 0.942$

n = number of valid data samples = 18

μ_n = mean calculated by ProUCL = 1.024

RPM = 1.6*

The maximum expected concentration (MEC) is determined by multiplying the MOC by the RPM:

$$\text{MEC} = (\text{RPM})(\text{MOC}) \quad \text{(Equation B-8)}$$

MOC = 3.18 milligrams per liter (mg/L)

In the case of ammonia,

MEC = (1.6)(3.18) = 5.2 mg/L

* The above calculation is simplified for illustrative purposes. The RPA tool takes into account the cumulative distribution of p_n.

Comparison with ammonia WQC

In order to determine whether RP exists for this discharge to violate WQC, the highest projected concentrations at the boundary of the mixing zone is compared with acute and chronic WQC.

Acute: 16.3 mg/L (acute criterion) **NO,** there is no RP to violate acute criterion (at the end of pipe)

Chronic: 2.5 mg/L (chronic criterion) **YES**, there is RP to violate chronic criterion (at the end of pipe)

The table below summarizes the data, multipliers, and criteria used to determine RP to exceed WQC at the end of the pipe. Since there is a RP for the effluent to cause an exceedance of the chronic WQC for ammonia, WQBELs for ammonia are required. See Appendix C for the calculations.

Parameter	MOC	N[a]	C_u[b]	RPM	MEC (C_e)	D[c]	C_d[d]	WQC	Boundary of Mixing Zone RP?
Ammonia (acute)	3.18 mg/L	18	0.2 mg/L	1.6	5.2 mg/L	1	5.2 mg/L	16.3 mg/L	No
Ammonia (chronic)						2.1	2.48 mg/L	2.5 mg/L	No

Footnotes:
a. N = Number of valid samples
b. C_u = Assumed waterbody ambient concentration
c. D = Dilution factor
d. C_d = Calculated receiving water concentration (RWC) at boundary of the mixing zone

APPENDIX C. – SELECTION OF EFFLUENT LIMITS

If the Alaska Department of Environmental Conservation (the Department or DEC) does not authorize a mixing zone, water quality standards (WQS) numeric criteria are applied at the end of the pipe, and technology-based effluent limits (TBELs) are selected for those parameters that are solely technology based.

When DEC authorizes a mixing zone, parameters are identified in the mixing zone that will require dilution to meet WQS numeric criteria. If there are TBELs for an identified parameter in the mixing zone, TBELs apply at the end of the pipe, and WQS numeric criteria for that parameter apply at the boundary of the mixing zone. If the reasonable potential analysis (RPA) requires the development of water quality-based effluent limits (WQBELs) for specific parameters in order to protect human health criteria at the boundary of the mixing zone, WQBELs are applied as end-of-pipe effluent limits. Those parameters that are not identified in the authorized mixing zone must meet applicable water quality numeric criteria at the end of pipe.

In the case of the Trident Independence vessel, ammonia demonstrated reasonable potential (RP) to exceed WQS at the end of pipe; therefore, the Department developed WQBELs for ammonia. An example of the ammonia limit calculation for the Independence vessel in Akutan Harbor is depicted below.

C.1 Effluent Limit Calculation

Once the Department determines that the effluent has a reasonable potential to exceed a WQS, a WQBEL for the pollutant is developed. The Department used the process described in the *Technical Support Document* (TSD) *for Water Quality-Based Toxics Control* (Environmental Protection Agency, 1991) and DEC's guidance, *Alaska Pollutant Discharge Elimination System RPA and Effluent Limits Development Guide* (June 30, 2014) (RPA Guide) to calculate WQBELs for ammonia. The first step in calculating WQBELs is the development of a wasteload allocation (WLA) for the pollutant.

C.2 Mixing Zone-based WLA

When the Department authorizes a mixing zone for the discharge, the WLA is calculated using the available dilution, background concentrations of the pollutant, and the WQS. Acute and chronic aquatic life standards apply over different time frames and may have different mixing zones; therefore, it is not possible to compare the WLAs directly to determine which standard results in the most stringent limits. The acute WQC (WQC) are applied as a one-hour average and may have a smaller mixing zone, while the chronic WQC are applied as a four-day average and may have a larger mixing zone. To allow for comparison, long-term average (LTA) loads are calculated from both the acute and chronic WLAs. The most stringent LTA is used to calculate the permit limits.

C.3 "End-of-Pipe" WLAs

In many cases, there is no dilution available, either because the receiving waterbody exceeds the WQC or because the Department does not authorize a mixing zone for a particular pollutant. When there is no dilution available, the WQC becomes the WLA. Establishing the WQC as the WLA ensures that the permittee's discharge does not contribute to an exceedance of the WQC. As with the mixing-zone based WLA, the acute and chronic WQC must be converted to LTAs and compared to determine which one is more stringent. The more stringent LTA is then used to develop permit limits.

C.4 Permit Limit Derivation

Once the appropriate LTA has been calculated, the Department applies the statistical approach described in Chapter 5 of the TSD to calculate the maximum daily limit (MDL) and average monthly limit (AML). This approach takes into account effluent variability (using the coefficient of variation (CV)), sampling frequency, and the difference in time frames between the AML and MDL.

The MDL is based on the CV of the data and the probability basis, while the AML is dependent on these two variables and the monitoring frequency. As recommended in the TSD, the Department used a probability basis of 95% for the AML calculation and 99% for the MDL calculation.

The following is a summary of the steps to derive WQBELs from WQC for pollutants that have RP to exceed WQC. These steps are found in the Department's RPA Guide. The guidance was used to calculate the MDL and AML for ammonia from the Trident Independence vessel in Akutan Harbor.

Step 1- Determine the WLA

The acute and chronic aquatic life criteria are converted to WLAs using the following equation:

$$WLA_{a,c,hh} = \left(WQC_{a,c,hh}\right)\left(D_{a,c,hh}\right) + C_s\left(1 - D_{a,c,hh}\right)$$

$$WLA_{a,c,hh} = WQC_{a,c,hh}\left(\frac{Q_d + Q_s}{Q_d}\right) + C_s\left(1 - \left[\frac{Q_d + Q_s}{Q_d}\right]\right)$$

Where: $D_{a,c} = Dilution = \frac{(Q_d + Q_s)}{Q_d}$

$D_{hh} = (Dilution\ [Human\ Health]) = D_c\ (Dilution[Chronic\ Aquatic\ Life])$

$Q_d = Critical\ Discharge\ Flow$

$C_s = Critical\ Upstream\ Concentration$

$WLA_{a,c} = Wasteload\ Allocation\ (\ acute, chronic, or\ human\ health)$

$WQC_{a,c} = \ C_r\ = Water\ Quality\ Criterion(acute, chronic, or\ human\ health)$

For ammonia,

$D_a\ = 2$

$D_c\ = 2.1$

$C_s = 0$ (mg/L)

$WLA_a\ = 16.3\ mg/L$

$WLA_c = 5.25\ mg/L$

$WQC_a = 16.3\ mg/L$

$WQC_c = 2.5\ mg/L$

Step 2 - Determine the Long-Term Average (LTA)

The WLAs are converted to LTAs using multipliers that are derived from equations in Section 5.4 of the TSD:

$$LTA_a = WLA_a * exp(0.5\sigma^2 - z_{99}\sigma)$$

$$LTA_c = WLA_c * exp(0.5\sigma_4^2 - z_{99}\sigma_4)$$

Where:

$z_{99} = the\ z-statistic\ at\ the\ 99^{th} percentile = 2.326$

$LTA_a\ only: \sigma = ln[CV^2 + 1]^{1/2}$

$LTA_a\ only: \sigma^2 = ln[CV^2 + 1]$

$LTA_c\ only: \sigma_4 = ln\left[\left(\frac{CV^2}{4}\right) + 1\right]^{1/2}$

$LTA_c\ only: \sigma_4^2 = ln\left[\left(\frac{CV^2}{4}\right) + 1\right]$

$CV = coefficient\ of variation$

For ammonia:

$LTA_a = 3.4\ mg/L$

$LTA_c = 2.0\ mg/L$

Step 3 – Choosing the More Limiting LTA

To protect a waterbody from both acute and chronic effects, the more limiting of the two LTAs is used to derive the effluent limits. In the case of ammonia, the LTA_c is more limiting.

Step 4 - Calculate the Permit Limits

The MDL and AML are calculated using the following equations that are found in Table 5-2 of the TSD:

$$MDL_{aquatic\ life} = LTA * exp(z_{99}\sigma - 0.5\sigma^2)$$

Where:

$z_{99} = the\ z-statistic\ at\ the\ 99^{th} percentile = 2.326$

$\sigma_n = ln[CV^2 + 1]^{1/2}$

$\sigma_n^2 = ln[CV^2 + 1]$

$CV = coefficient\ of variation$

$$AML_{aquatic\ life} = LTA * exp(z_{95}\sigma_n - 0.5\sigma_n^2)$$

Where:

$z_{95} = the\ z-statistic\ at\ the\ 95^{th} percentile = 1.645$

$\sigma_n = ln\left[\left(\frac{CV^2}{n}\right) + 1\right]^{1/2}$

$$\sigma_n^2 = ln\left[\left(\frac{CV^2}{n}\right) + 1\right]$$

$$CV = coefficient\ of variation$$

$$n = number\ of\ samples\ per\ month$$

For ammonia:

$$MDL = 9.6\ mg/L$$

$$AML = 3.8\ mg/L$$

C.5 Mass-Based Limits

Alaska Pollutant Discharge Elimination System (APDES) regulations at 18 AAC 83.540 require that effluent limits be expressed in terms of mass unless they cannot appropriately be expressed by mass, if it is infeasible, or if the limits can be expressed in terms of other units of measurement. The mass-based limits are expressed in pounds per day and are calculated as follows:

mass-based limit (pounds (lbs)/day) = concentration limit (milligrams per liter) × maximum expected flow (million gallons per day (mgd)) × 8.34 (lbs/gallon)

The permit does not include mass-based limits because the limited parameters can be expressed in terms of other units of measurement.

APPENDIX D. – MIXING ZONE ANALYSIS CHECKLIST

The purpose of the Mixing Zone Checklist is to guide the permit writer through the mixing zone regulatory requirements to determine whether all of the mixing zone criteria at 18 AAC 70.240 are satisfied, as well as provide justification to authorize a mixing zone in an Alaska Pollutant Discharge Elimination System (APDES) permit. See Part 4.3.3 for the general permit mixing zone analysis.

Criteria	Description	Resources	Regulation
Size	Is the mixing zone as small as practicable?	Technical Support Document for Water Quality-Based Toxics Control DEC's Reasonable Potential Analysis Guidance Environmental Protection Agency's Permit Writers' Manual CORMIX	18 AAC 70.240(k)
Technology	Were the most effective technological and economical methods used to disperse, treat, remove, and reduce pollutants?		18 AAC 70.240(c)(1)
Low Flow Design	For streams, rivers, or other flowing fresh waters. Determine low flow calculations or documentation for the applicable parameters.		18 AAC 70.240(l))
Existing Use	Does the mixing zone… (1) maintain and protect designated and existing uses of the waterbody as a whole? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(2)
	(2) impair overall biological integrity of the waterbody? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(3)
	(3) create a public health hazard that would preclude or limit existing uses of the waterbody for water supply or contact recreation? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(B)
	(4) preclude or limit established processing activities or established commercial, sport, personal use, or subsistence fish and shellfish harvesting? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(C)

Criteria	Description	Resources	Regulation
Human consumption	Does the mixing zone… (1) produce objectionable color, taste, or odor in aquatic resources harvested for human consumption? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(d)(6)
Spawning Areas	Does the mixing zone… (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, or landlocked coho, chinook, or sockeye salmon? If yes, mixing zone is prohibited.		18 AAC 70.240(f)
Human Health	Does the mixing zone… (1) contain bioaccumulating, bioconcentrating, or persistent chemicals above natural or significantly adverse levels? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(d)(1)
	2) contain chemicals expected to present an unacceptable risk to human health from carcinogenic, mutagenic, teratogenic, or other effects as determined using risk assessment methods approved by the Department? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(d)(2)
	(5) occur in a location where the Department determines that a public health hazard reasonably could be expected? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(k)(4)
Aquatic Life	Does the mixing zone… (1) result in a reduction in fish or shellfish population levels? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(d)
	(2) form a barrier to migratory species or fish passage? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(G)

Criteria	Description	Resources	Regulation
Aquatic Life	(3) result in undesirable or nuisance aquatic life? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(d)(5)
	(4) result in permanent or irreparable displacement of indigenous organisms? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(E)
	(5) result in a reduction in fish or shellfish population levels? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(D)
	(6) fail to prevent lethality to passing organisms; or exceed acute aquatic life criteria at and beyond the boundaries of a smaller initial mixing zone surrounding the outfall, the size of which shall be determined using methods approved by the Department? If no, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(d)(7) 18 AAC 70.240(d)(8)
	(7) cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? If no, mixing zone may be approved as proposed or authorized with condition		18 AAC 70.240(c)(4)(A)
Endangered Species	Are there threatened or endangered species (T/E spp) 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 the United States Fish and Wildlife Service (USFWS) or National Oceanic and Atmospheric Administration (NOAA)? If yes, will conservation measures be included in the permit to avoid adverse effects?		18 AAC 70.240(c)(4)(F)