

DECISION DOCUMENT
Alaska Department of Environmental Conservation
Forest Practices Program
May 14, 2004

Wastewater Disposal Permit
Ketchikan Gateway Borough
Ward Cove Log Storage Facility
Ward Cove, Alaska
Permit Number 2003-DB-0034

The Ketchikan Gateway Borough (KGB) applied June 23, 2003, for a State Wastewater Disposal Individual Permit (State IP) for the discharge of bark and wood debris from log storage in Ward Cove in support of operation of the existing veneer mill owned by KGB.

This Decision Document presents an assessment of regulatory issues with respect to issuance of the State IP.

Background

ADEC issued public notice for a draft log storage State IP in Ward Cove on February 13, 2004. ADEC prepared an 11-page Fact Sheet to describe historical background, impaired status and pollutant issues, TMDLs, Water Quality Standards, the permit situation, the draft permit, the derivation of discharge limits, the recovery process, and the rationale for issuing a permit for discharge of additional residues in Ward Cove. The Fact Sheet is appended to this document, and is adopted by reference.

ADEC prepared a Water Quality Standards Technical Assessment in November 2003 addressing residues issues in Ward Cove. The Technical Assessment discusses the residues TMDL; the residues standard and Zones of Deposit and application to the TMDL; development of a residues allocation in the TMDL; and derivation of proposed bark discharge limits for permits. The conclusion to the Technical Assessment states that ADEC believes that limited additional residues will not significantly impede recovery of Ward Cove in the "waterbody as a whole," based on the extent of wood wastes that currently exists, and the proportional area and volume of proposed additional wood wastes. The Technical Assessment is appended to this document, and is adopted by reference.

Ward Cove is an estuary about one mile long and 1/2 mile wide, four miles north of Ketchikan, Alaska. The cove is one of the best accessible natural harbors in Southeast Alaska. The cove was the site of the Ketchikan Pulp Company (KPC) pulp mill from 1954 to 1997. Gateway Forest Products acquired all assets of the pulp mill, and operated the sawmill in 2000, and constructed the veneer mill and operated it in 2001. A salmon cannery, Wards Cove Packing Company, operated in the cove from 1912 to 2002. Leachate from the KPC industrial landfill, now closed, discharges to the cove. A sewage treatment plant also discharges to the cove; the treatment plant formerly served KPC and Gateway, but now is owned by KGB, which recently received a revised NPDES permit for the treatment plant.

KGB came into ownership or control of most of the real assets of the pulp mill and the veneer plant following the demise of Gateway Forest Products in 2002. Though inactive, the veneer plant remains a viable facility. KGB desires to reopen the veneer plant to enhance the economic base of the community, which has been hard hit by the downturn in the forest industry, particularly by closure of the pulp mill, sawmill, and veneer plant. The Borough also holds

patent title to approximately 210 acres of the 250 total acres of tidelands and submerged lands in Ward Cove.

Ward Cove has been 303(d)-listed as an impaired waterbody since 1990. ADEC and EPA jointly are preparing a Total Maximum Daily Load (TMDL) for Ward Cove, with completion expected in 2004. The parameters of concern are Dissolved Oxygen (DO), Residues, and Sediment Toxicity.

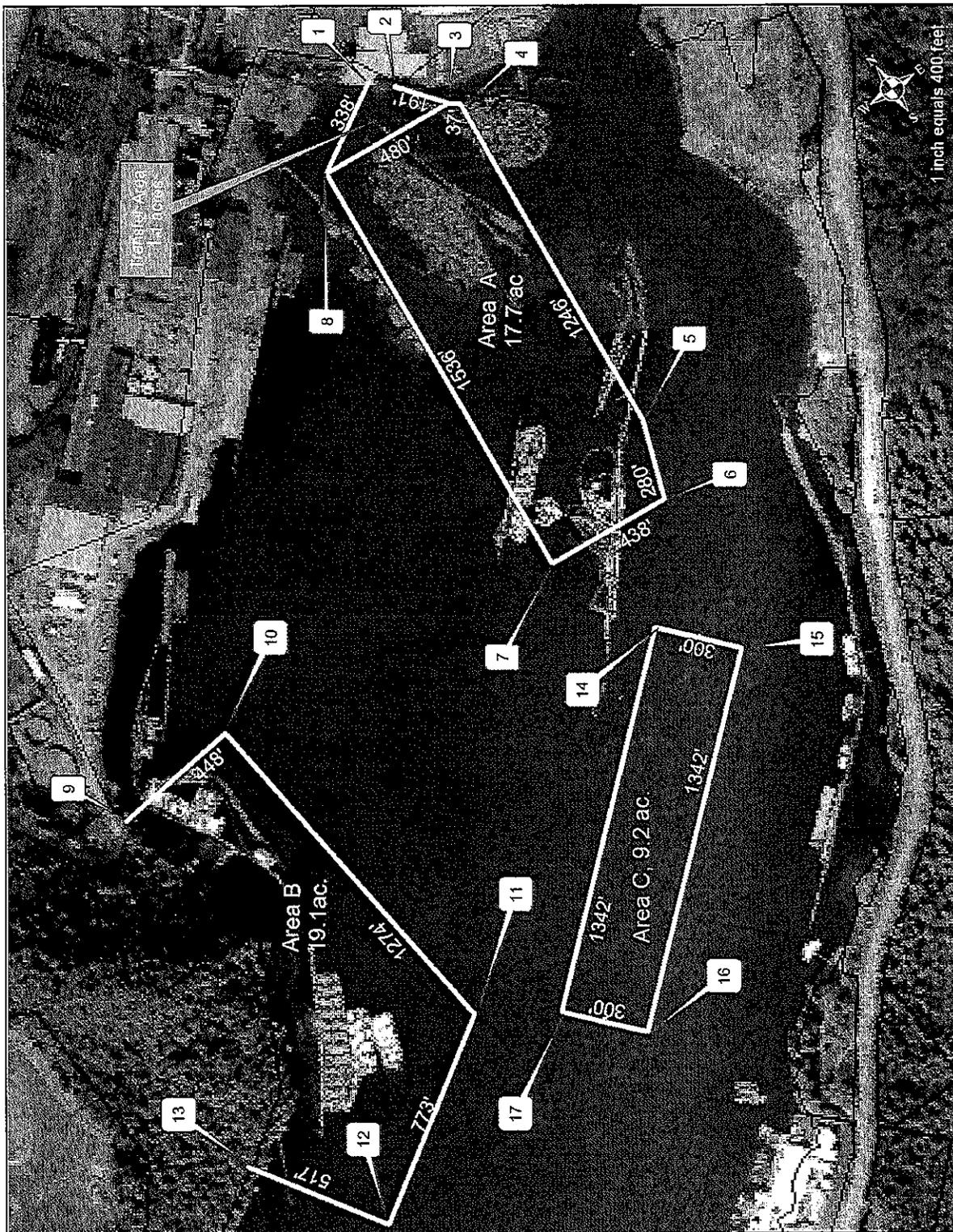
The Residues impairment in Ward Cove is caused by wood residues that cover roughly 75 percent of the bottom of the cove (185 acres) in varying degrees. The wood residues include more than 16,000 sunken logs, and extensive areas of deep, flocculent sediment presumed to be derived from decomposition of pulp residues discharged by the pulp mill, and bark wastes discharged by the high-volume log storage that took place through the life of the pulp mill.

The Sediment Toxicity impairment, at relatively mild levels, is due to ammonia, sulfides, and phenols formed as by-products of degradation of wood residues in sediments. Because Sediment Toxicity derives from wood residues, the TMDL for Sediment Toxicity is being incorporated in the TMDL for Residues. In 2000-2001, the Superfund program conducted remediation of sediment toxicity, dredging three acres of sediment, and capping roughly 30 acres of sediment in the cove, out of the 80 acres identified as having toxic properties.

The DO impairment in Ward Cove is due to a combination of low natural DO under stratified conditions in summer months, wood residues on the bottom of the cove, and fish wastes formerly discharged by the salmon cannery. In years prior to 2003 when fish wastes were discharged, the lowest DO values in summer months in deep water of the inner cove were in the range of 1 to 3 mg/l, well below the water quality standard of 5 mg/l. Monitoring in August and September 2003, in the absence of fish waste discharge, found DO in deep water to be consistently just above or just below 5 mg/l. Computer modeling results indicate that wood waste contributes 0.1-0.2 mg/l to the depression of DO levels.

The KGB application requested approval to discharge bark and wood debris from log storage in two areas of Ward Cove, designated as Area A (17.6 acres) and Area B (19.1 acres), and from a Transfer Area (1.1 acres), totaling 38.9 acres, or roughly 15 percent of the area of the cove. The log storage volume requested is 60 million board feet (mmbf) per year. The KGB application also requested approval for discharge of bark and wood debris associated with loading logs onto ships within an existing, separate moorage area, designated Area C, at a volume up to 20 mmbf annually. A map of these sites is on the following page. [INSERT MAP]

KGB holds an EPA NPDES general permit authorization for log storage in a portion of upper Ward Cove, approximately 25 acres in area, that encompasses Area A and the Transfer Area. This authorization was issued by EPA to Gateway Forest Products in 2000, and transferred to KGB in August 2003. The authorization expires in March 2005. KGB has not received authorization from EPA for log storage in Area B or Area C; those areas cannot be used until both State and EPA permits are issued.



At most log transfer facilities, ADEC authorizes discharge through the State LTF general permit, which is derived from ADEC's 401 certification of the EPA general permit. However, ADEC is prohibited by an adjudicatory decision from applying the general permit in impaired waterbodies. EPA has stated that the EPA general permit authorization is not valid until ADEC issues a Zone of Deposit in the State individual permit that is equivalent to the Zone of Deposit in the General Permit.

ADEC anticipates that the TMDL for Ward Cove will contain a wasteload allocation for residues that will accommodate the quantity of discharge of bark and wood debris allowed in the State IP. Following the TMDL, it is expected that KGB will be required to obtain an EPA individual permit for log storage and bark discharge in Ward Cove. That permit presumably will be certified by ADEC, and will constitute a State permit as well as an EPA permit. The NPDES permit, once issued, will supersede the State IP and the EPA GP authorization.

Contents of the State Wastewater Disposal Permit

The draft State IP should be reviewed in order to understand the terms and conditions contained. The permit contains the following sections:

1. Project Description
2. Operating Practices
3. Log Volume Limitations
4. Discharge Limitations
5. Zone of Deposit
6. Bark Monitoring Program
7. Petroleum Discharge Monitoring and Reporting
8. Pollution Prevention Plan
9. Quarterly Report
10. Reporting Addresses
11. Annual Conference
12. Compliance with Alaska Administrative Code
13. Prohibition of Discharge
14. Discharge Noncompliance
15. Adverse Impact
16. Civil and Criminal Liability
17. Access and Inspection
18. Application for Modified Discharge
19. Application for Renewal
20. Records Retention
21. Information Access
22. Transfer of Permit
23. Cultural or Paleontological Resources
24. Other Legal Obligations

Various limits are imposed by the permit. Annual log storage for the veneer mill is limited to 40 mmbf total in Area A and Area B (compared to 60 mmbf requested by KGB), and temporary log storage for ship loading is limited to 20 mmbf (as requested by KGB). If either limit is exceeded, the volume of log storage in the following year is reduced by the amount of

exceedance. Limits are placed on volume of discharge of bark and wood debris in Area A and Area B. If these limits are exceeded, the volume of log storage in the following year is reduced in proportion to the discharge exceedance. A limit is placed on volume of bark accumulation in the Transfer Area. If this limit is exceeded, the volume of log storage in Area A and Area B in the following year is reduced in proportion to the accumulation exceedance. A limit is placed on the thickness of bark accumulation in the Transfer Area. If this limit is exceeded, the permittee must remove all continuous cover bark within 180 days, to the extent practicable. Further, the permittee may be subject to enforcement actions as provided by law if limits are exceeded.

A Zone of Deposit is established within the project area, which comprises Area A, Area B, Area C, and the Transfer Area. A variety of required operating practices is established.

A bark monitoring program includes bark capture by baskets suspended under stored logs, with baskets removed monthly for measurement of bark collected. Semi-annual dive surveys are required to assess bark accumulation on the bottom of Area A, Area B, and the Transfer Area.

A Pollution Prevention Plan must be prepared prior to commencement of log storage. A quarterly report must be submitted, reporting on log storage volumes and monitoring. An annual conference is required to discuss monitoring, compliance, and other matters. Various other administrative provisions are included in the permit.

The key components of the permit are the bark discharge limits, and the monitoring program. Discharge limits were developed in conjunction with EPA. The conceptual basis for the discharge limit in each log storage area, A and B, is a volume equivalent to a two-centimeter thickness accumulated on the bottom over the area in five years. This volume, divided by five, becomes the annual bark discharge limit. Actual accumulation will not be uniform, but will be a reflection of the pattern of log storage on the water's surface. To the extent that there is thicker bark accumulation in portions of an area, there will be less accumulation in other portions. Two centimeters was selected as the conceptual allowable accumulation over five years (equivalent to 0.4 centimeters per year) based on certain factors. First, one inch (2.54 centimeters) is approximately the thickness of bark at which coverage becomes "continuous" over the bottom. Second, according to limited scientific literature, one to two centimeters is approximately the thickness of bark residues at which significant adverse impacts to benthic organisms may begin to occur. Third, although speculative, 0.4 centimeters per year may be similar to the rate of natural detrital accumulation on the bottom.

The bark limit in the Transfer Area is established as an annual accumulation limit, rather than a discharge limit. The conceptual bark thickness is 10 centimeters over the bottom of the Transfer Area in five years. The resulting volume, divided by five, is adopted as the annual accumulation limit (two centimeters, or 0.8 inch, per year). The limit is not set as a discharge limit, because there is no log storage in the Transfer Area, and therefore no ability to monitor discharge directly. An allowable thickness of 10 centimeters in five years was selected because this is the depth limit established for traditional LTFs in discharge guidelines for past permits.

ADEC can make no estimate of when, if ever, Ward Cove will return to a "natural" condition.

The discharge and accumulation limits are intended to allow the bottom of Ward Cove as a whole to continue progress toward biological recovery. The log storage area is approximately 15 percent of the cove.

ADEC is not aware of any information concerning the amount or rate of bark discharged by logs in storage. The monitoring program, both bark capture and dive surveys, is essential to estimating the actual rate of bark discharge.

The Alaska Water Quality Standards establish pollution limits for all waters, that may not be exceeded. Nonetheless, the standards contain several provisions that allow adaptation to economic and social necessity. The Antidegradation Policy recognizes that economic and social conditions may be a basis for lowering existing water quality. The Mixing Zone provision, Zones of Deposit, and other provisions provide avenues--and the responsibility--for ADEC to modify standards where appropriate, for economic and social purposes. The Antidegradation and Zone of Deposit provisions are described below.

Antidegradation Policy

The Antidegradation Policy of the Alaska Water Quality Standards (18 AAC 70.015) states that existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected. ADEC may allow reduction of water quality only after finding that five specific criteria are met. These criteria and the ADEC's findings are set out below.

1. 18 AAC 70.015 (a)(2)(A). Allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located.

The applicant has provided the following information respecting this criterion. The veneer mill is a viable existing facility that presently sits idle. Since 1990 the timber industry in Southeast Alaska has been reduced from an operating level of over 400 mmbf annually to less than 50 mmbf. 3,000 employees have been laid off due mainly to constraints on timber supply. From 1993 through 1998, employment in Ketchikan dropped 12 %. The veneer mill will employ 20-40 people. The associated timber harvest will employ 40-60 people. The economy of the City and Borough of Ketchikan would benefit from this added employment.

ADEC concurs that operation of the Ward Cove Log Storage Facility constitutes important economic development in the area, with corresponding social significance.

Because the Residue criteria of the Water Quality Standards prohibit any residues in the water or on the bottom, and logs in storage in water are known to discharge bark, ADEC believes that authorization of a Zone of Deposit, and the corresponding lowering of water quality, are necessary to accommodate operation of the proposed log storage and transfer in Ward Cove.

ADEC concludes that this criterion is met.

2. 18 AAC 70.015 (a)(2)(B). Except as allowed under this subsection, reducing water quality will not violate the applicable criteria of 18 AAC 70.020 or 18 AAC 70.235 or the whole effluent toxicity limit in 18 AAC 70.030.

ADEC concludes that this criterion will be met outside the authorized Zone of Deposit.

3. 18 AAC 70.015 (a)(2)(C). The resulting water quality will be adequate to fully protect existing uses of the water.

As defined in the Alaska Water Quality Standards, "existing uses" means those uses actually attained in a water body on or after November 28, 1975."

It is inherent that Zones of Deposit will have some degree of impact on water quality and on uses of water. The Zones of Deposit provision states that, "The water quality criteria of 18 AAC 70.020(b) and the antidegradation requirement of 18 AAC 70.015 may be exceeded in a zone of deposit. However, the standards must be met at every point outside the zone of deposit. In no case may the water quality standards be violated in the water column outside the zone of deposit by any action, including leaching from, or suspension of, deposited materials."

The EPA Water Quality Standards Handbook (Second Edition, 1994) establishes, with reference to Mixing Zones, "the entire extent of the water body is not required to be given full existing use protection." Rather, "any effect on the existing use must be limited to the area of the regulatory mixing zone." Mixing Zones must "protect designated uses of the waterbody as a whole." While the Handbook does not address Zones of Deposit, which are a State issue, there is a direct parallel with Mixing Zones, and ADEC extends the concept of protecting the waterbody as a whole to Zones of Deposit.

Industrial uses of Ward Cove were noted above. A pulp mill operated from 1954 to 1997. A fish processor operated from 1912 to 2002. Other dischargers to the cove after 1975 included a sawmill, a veneer plant, a sewage treatment plant, and a landfill leachate discharge. Produced pulp, timber, and veneer were exported by ship. Other ships have utilized the natural harbor, including for overwintering.

A commercial facility known as "Loggerville" presently is anchored within Area B. The facility formerly was a floating logging camp containing a dozen houses and a few shop buildings, which the present owner hopes to develop as a tourist attraction. The only proposed discharge from the facility is wastewater from a series of aquaria, already permitted by ADEC.

Recreational uses in Ward Cove itself are not well documented, and were limited historically by the industrial activities in the cove. According to the Department of Fish and Game, occasional recreational sport trolling for salmon takes place. A sport fishery for salmon also occurs along the shoreline south of the mouth of Ward Creek, including commercially-guided fishing. Commercial scenic boat tour operations have been based at the Wards Cove Packing fish processing facility near the south side of the mouth of the cove. Crab pots have been set in Ward Cove for personal use. No commercial fishing takes place in Ward Cove.

The "Central/Southern Southeast Alaska Area Plan, November 2000" prepared by the Department of Natural Resources designates Ward Cove for "waterfront development," and not for any biological resources. The Plan states, "This parcel is to be managed for the continued

development of relatively high intensity commercial, industrial and certain public uses. Since there are also areas of residential development, the parcel should be managed to permit shoreline development consistent with residential uses."

The Ketchikan Gateway Borough Coastal District Plan describes known resource values in Ward Cove and sets certain Enforceable Policies relative to log storage and other activities. The Ward Creek/Connell Lake system is noted as having important fisheries and recreational values with potential for fisheries enhancement. Two small areas of Tongass Narrows just outside the cove are noted as having heavy sport fishing. Both Ward Creek and the two areas of Tongass Narrows are designated as "environmentally sensitive areas." Ward Cove is noted as having a "herring winter concentration." An eagle nest is identified along Tongass Narrows just north of the mouth of the cove. Portions of the cove also are noted as having "good waterfront development potential," and being "ideal for industrial expansion."

In the District Plan, Enforceable Policies, along with Goals and Objectives, speak to the following:

- Support and funding, where appropriate, shall be given to diversification of timber manufacturing.
- Support shall be given for the expansion of log storage areas where there is documented good natural tide flushing action to minimize build-up of bark and wood chips.
- Major waterfront development should be allowed in identified environmentally sensitive areas if there is public need for the proposed development, if the identified resource values are not significantly impaired, provided there is no feasible or prudent alternative site for placement of the development.
- Protect and enhance the productivity of fish and wildlife habitat.
- All catalogued anadromous streams and stream banks, bays and coves with significant amounts of freshwater inflow, and subsistence and sport shellfish areas, shall be managed to protect and enhance fisheries resources.
- Tidelands dredge and fill, log storage areas, and other development that may directly cause a loss of fisheries habitat shall not be permitted in the immediate vicinity of areas critical to the productivity of local commercial and subsistence fisheries referenced as significant salmon-producing streams or subsistence salmon, clam, and Dungeness crab areas or herring beach spawning areas.

A new draft of the Coastal District Plan, not yet adopted, identifies Ward Cove as a priority location for major land and water uses for industrial and commercial expansion, including specifically development and expansion of log and lumber storage, processing, and distribution.

An EPA report on effects of low dissolved oxygen on fish and invertebrates in Ward Cove (Karna, 2003), noted that Ward Cove supports all five species of salmon, dolly varden char, steelhead, and cutthroat trout. All these species are anadromous, and spawn primarily in Ward Creek, which enters the head of the cove. The creek, a major stream, drains from Ward Lake and Connell Lake, and has a 14-square-mile watershed. The lake and stream system is heavily used for land-based sport fishing. The report also lists at least 75 non-salmonid fish species that may occur in the vicinity of Ward Cove or Tongass Narrows, including an array of rockfish, greenlings, flounder, sole, cod, herring, smelt, Pacific halibut, and other species.

Ward Cove clearly serves as the outmigration pathway for juvenile anadromous fish and the immigration pathway for returning anadromous fish. In varying degrees, the cove presumably serves a rearing function and a staging function for migrating fish species.

Occasional fish kills occurred during the life of the pulp mill, including both salmon and herring. It is not known whether the cause involved low oxygen, toxic substances, disease, or all three. Investigations after closure of the pulp mill found the water column to be free from toxics at levels expected to cause adverse effects on marine life and human health.

Extensive monitoring from 1996 to 2002 found very low oxygen levels under stratified conditions in summer months near the bottom of the cove at certain locations (which likely occurred prior to that period, as well). The lowest oxygen levels measured each year were in the range of 1 to 3 mg/l. DO values below 3 mg/l are expected to cause acute effects and mortality to marine organisms upon prolonged exposure. Effects of low-oxygen exposure are documented in the EPA report.

The primary cause of low oxygen levels at depth from 1996 to 2002 was the discharge and decomposition of fish wastes from the fish processing facility during the critical summer period. The cannery closed operation at the end of 2002. Monitoring in August and September 2003, in the absence of fish waste discharge, found DO in deeper water to be consistently just above or just below 5 mg/l, indicating substantial recovery from previous years. The Water Quality Standard for dissolved oxygen in marine waters is a minimum of 5 mg/l.

From this information, it appears that the water column of Ward Cove is not impaired, and is presumed to meet Water Quality Standards, with the possible exception of minor dissolved oxygen excursions at certain times and locations. As noted, computer modeling indicates that decomposing wood wastes contribute 0.1-0.2 mg/l to the depression of DO levels in the cove.

The issue of bark and wood debris concerns the bottom of Ward Cove. Two aspects must be considered; first what is the condition of the bottom of the cove; and second, what "existing uses" have been "attained" in the cove since 1975?

The KPC pulp mill operated roughly 21 years prior to November 28, 1975, and for 21 years after 1975 to early 1997. Two factors lead us to believe that much of the wood waste on the bottom of the cove was deposited before 1975. First, the pulp mill operated without limits on its discharge prior to 1971, when EPA issued the first NPDES permit to the mill, which imposed primary treatment requirements on the discharge. A revision of the permit in 1980 imposed secondary treatment requirements. This implies that much of the pulp residues likely accumulated before 1975.

Second, it is reported that logs were held singly in rafts until the early 1970s, but since that time have been contained in bundles. It is presumed that most of the logs on the bottom of Ward Cove sank before the practice of bundling commenced, though bundles occasionally can sink, as well.

Further, it is presumed that the bundling of logs reduced the discharge of bark, since more than half the log surfaces are inside the bundle, which should both reduce abrasion and contain bark within the bundle. It is likely that discharge of bark continued after log bundling commenced,

but we do not know either the proportion or the quantity discharged since 1975. In fact, ADEC is not aware of any measure of the amount of bark typically discharged from logs in storage.

It seems reasonable to conclude that the majority of the pulp waste, logs, and bark on the bottom of Ward Cove was deposited in the first half of the pulp mill's life, and that the benthic habitats present were dominated by decomposing wood wastes by 1975. If this is the case, then "existing uses" present after November 28, 1975, may be represented by the benthic habitat created by pulp, logs, and bark wastes over large portions of the cove, and may be generally similar to the habitats present today. However, we do not know how 1975 compares to the present, in terms of the area dominated by bark and wood wastes; the depth of introduced material, and the condition of the introduced material. Further, from 1975 until the closure of the pulp mill, it is likely that active accumulation of bark continued to occur, so that the bottom surface was "fresh," as opposed to its present state of advanced decomposition. These aspects imply that habitat conditions, while similar, have undergone continuing change since 1975.

The nature of wood residues on the bottom of the cove is generally known. The Superfund investigation in the 1990s produced maps of both log distribution (determined using sidescan sonar) and soft sediments (using coring). Logs in densities varying from 100 to more than 500 per hectare (2.5 acres) cover roughly 75 percent of the cove bottom. The greatest density of logs is in the upper cove, including within Area A. Flocculent organic-rich sediments cover more than half of the cove in thicknesses from two to 10 feet. However, the Superfund investigation did not find evidence of accumulation of pulp residues in peat-like deposits, which were found at the Sitka Pulp mill site.

Although various studies of Ward Cove have been conducted since the early 1950s, and accelerating into the 1980s and 1990s, little work has been done to characterize the biological community living in and on the bottom of Ward Cove, either in areas containing bark and wood wastes, or in unaffected areas.

In July 2003, KGB conducted a dive and video survey of portions of the bottom within limited parts of Area A and Area B, which ADEC staff observed. The result clearly showed the jumble of sunken logs in the upper end of Area A (but no logs on the bottom surface in Area B), and the flocculent sediments in both A and B. Relatively sparse marine life was evident. A few sea cucumbers and sea stars were seen on logs, along with tube worms, other encrustations, and a couple of Dungeness crabs. A few rock cod, ling cod, and shiners were seen swimming both around logs and above the sediment.

The TMDL for Ward Cove is expected to be completed in 2004. The goal of the TMDL is to provide prescriptions for discharge of pollutants that will allow the waterbody to achieve Water Quality Standards, and promote recovery of biological communities. ADEC views the culmination of "natural recovery" in Ward Cove sediments, and the achievement of water quality standards, to be the establishment of a stable, complex, and diverse biological community in the surface sediments through a process of natural biological succession. This process has been demonstrated to be occurring in the bottom sediments at the former Sitka pulp mill, where biological assessment has taken place.

The continuing rain of detritus from dead marine life, especially phytoplankton and zooplankton, may be a significant factor in developing substrates and habitat on the ocean bottom, at least where slopes are shallow and currents are slow so that detrital material tends to collect. This

material likely contributed to a soft-bottom habitat in Ward Cove prior to log storage, and may have been a predominant factor in determining habitat type. Detrital material similarly may dominate the surface of sediments in the future.

There are several components in the draft permit to minimize the additional accumulation of wood residues. First, log storage in Area A and Area B would be restricted to approximately 15 percent of the area of the cove. Second, bark discharge is limited to a volume equivalent to an average of two centimeters of accumulation over Area A and Area B in a five-year period, or 0.4 centimeter per year. Actual bark accumulation will be greater in some portions of the area, and less in other portions. Third, bark accumulation in the Transfer Area is limited to an average of 10 centimeters' thickness in five years, and bark thickness at any point is limited to 30 centimeters. Fourth, a rigorous system of bark monitoring and reporting is specified. Fifth, discharge reductions are imposed if stated limits are exceeded. Sixth, detailed quarterly reporting and annual conferences are required.

The key question in consideration of a permit for continued discharge of bark is, how much additional wood residue can be deposited on the bottom of Ward Cove, without significantly impeding the recovery process in the waterbody as a whole?

Given the log storage area limitations, the bark discharge and accumulation limitations, and other controls, ADEC believes that the proposed log storage activity will not significantly impede the recovery of biological communities on the bottom in the waterbody as a whole. Even within the log storage areas, the accumulation of bark is restricted to an average of less than 1/6 inch per year.

ADEC believes that continued log storage in Ward Cove--under these tightly controlled conditions--is reasonable and appropriate in order to support operation of the veneer plant, as requested by the Ketchikan Gateway Borough.

ADEC believes that ecologically significant effects from the proposed discharge and accumulation of bark and wood debris are not likely to occur outside the Zone of Deposit.

With respect to the proposed discharge of bark and wood debris, ADEC concludes that water quality will be adequate to fully protect existing uses of the waterbody as a whole.

4. 18 AAC 70.015 (a)(2)(D). The methods of pollution prevention, control, and treatment found by the department to be most effective and reasonable will be applied to all wastes and other substances to be discharged.

The methods of prevention, control, and treatment ADEC finds to be most effective are the practices and requirements set out in the State IP. These methods include operating practices, limits on log volumes, limits on discharge, a pollution prevention plan, monitoring requirements, bark remediation, quarterly and annual reporting, and other measures. ADEC concludes that this criterion is met.

5. 18 AAC 70.015 (a)(2)(E). 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 non-point sources, all cost-effective and reasonable best management practices.

In ADEC's understanding, no BAT treatment and control requirements are specifically applicable to log storage. ADEC believes that the highest statutory and regulatory requirements for point sources, and the cost-effective and reasonable best management practices for nonpoint sources, are the practices and requirements set out in the permit. ADEC concludes that this criterion is met.

Conclusion. ADEC finds that issuance of the Ward Cove Log Storage Wastewater Disposal Permit is consistent with the Antidegradation Policy of the Alaska Water Quality Standards.

Zone of Deposit

Under the Zones of Deposit provision of the Alaska Water Quality Standards (18 AAC 70.210), the Department may allow deposit of substances on the bottom of marine waters within limits set by the Department. The water quality criteria and the antidegradation requirement may be exceeded in a Zone of Deposit, but must be met at every point outside the Zone of Deposit.

The proposed Zone of Deposit authorizes accumulation of bark and wood debris on the ocean bottom within the project area proposed by the applicant, which includes Log Storage Area A (17.7 acres), Log Storage Area B (19.1 acres), the Ship Loading Area C (9.2 acres), and the Transfer Area (1.1 acres). These areas are depicted in the figure on page 3.

Accumulation of bark and wood wastes in the Zone of Deposit is constrained by the annual limits on bark discharge and accumulation set in the permit. Monitoring requirements include bark capture using baskets suspended under log storage, and dive and video surveys of the bottom.

In authorizing a Zone of Deposit, ADEC must consider six criteria. These criteria and ADEC's findings are set out below.

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

The applicant requested maximum log storage volume to supply the veneer mill of 60 mmbf per year. The permit authorizes a maximum of 40 mmbf per year, a reduction by 1/3. The applicant states that 40 mmbf is the minimum volume needed to operate the veneer mill with the two workshifts required for economic operation.

Log storage in the water of Ward Cove could be avoided or reduced if logs were transported to Ward Cove by barge and stored on land. The applicant has provided an analysis of the feasibility of this alternative.

The applicant indicates that it is not feasible to use the existing pulp mill dock to unload barges. The dock currently is used to moor large vessels. Cranes to unload barges are not in place. The

dock is roughly 1/4 mile from the veneer plant, which would require additional handling and transport of logs on land. Additional area would be required for handling, scaling, and storage of logs. Sufficient land for the purpose is not available, and is not within KGB's plans for use of the site. The additional cost of handling logs using the existing dock is estimated at \$15-30 per thousand board feet. Gateway Forest Products was planning to build a new barge unloading facility adjacent to the log lift and closer to the veneer plant. While this might be accomplished in the future, it would be costly and time consuming, requiring some years to complete. In either case, storage of a supply of logs sufficient to carry the veneer plant through the winter (15 mmbf) would require up to 24 acres of land, which simply is not available. There are only about five acres of land available in the vicinity of the veneer mill, and this land is needed for a scaling yard and storage of the veneer product prior to shipment. In any case, barges would have to be acquired, and barge infrastructure would have to be constructed at origin sites, if it does not exist. Barge bulkheads are expensive, and must undergo time-consuming permitting and construction. Loading barges at origins from logs in the water increases costs roughly \$5-10 per mmbf.

In summary, the cost of transporting logs by barge is roughly \$30-50 per mmbf, compared to rafting and towing at roughly \$10-30 per mmbf. The applicant states that barging logs to Ward Cove would increase costs by more than 20%, which "would ruin the economics of this startup operation."

Removing bark from logs prior to placing logs in the water would avoid the discharge of bark. The cost of removal of bark at the origin is unknown, but likely is significant, requiring a mechanical debarker to be installed at each origin site. Numerous origin sites are possible, and timber sales these days tend to be small, on the order of five to 20 mmbf. Huge volumes of bark would have to be disposed, most likely in landfills, such as quarry pits. ADEC does not believe bark removal is a feasible alternative.

DEC concludes that no viable alternative to the proposed log storage in Ward Cove is reasonably available.

2. Potential direct and indirect impacts on human health.

There is no indication that log storage and discharge and accumulation of bark and wood debris in Ward Cove will adversely affect human health.

3. Potential impacts on aquatic life and other wildlife, including the potential for bioaccumulation and persistence.

The bottom of Ward Cove is substantially impacted by legacy wood residues, and is in a slow process of recovery of biological function. The proposed permit is intended to allow biological recovery to proceed, and to protect existing uses, in the waterbody as a whole. Within the authorized Zone of Deposit, limits on volumes of bark discharge and accumulation are intended to minimize additional impacts on aquatic life. Item 3 of the discussion under Antidegradation discusses the protection of existing uses. The water column of Ward Cove is believed to meet water quality standards, and to not threaten aquatic life and wildlife.

4. Potential impacts on other uses of the waterbody.

Again, item 3 of the discussion under Antidegradation discusses the protection of existing uses. Other "existing uses" that must be protected in the waterbody as a whole include industrial uses having to do with various types of vessel traffic; recreational uses involving small boats and fishing; possible secondary recreation; seafood processing; and possible harvest of raw shellfish and other aquatic life. The water column of Ward Cove is believed to meet water quality standards, and to have no adverse effects on these uses. The Alaska Water Quality Standards do not deal with competing uses; the possible interference of log storage with other uses is not within the ADEC's jurisdiction. As above, the proposed permit is intended to allow biological recovery to proceed and to protect existing uses in the waterbody as a whole.

5. Expected duration of the deposit and any adverse effects.

The duration of recovery in Ward Cove is governed largely by the present mass of bark and wood residues on the bottom. ADEC has made no estimate of the time required to achieve recovery of viable biological communities on the present bottom of the cove; the time may be measured in decades. ADEC believes, however, that the additional bark and wood residues authorized by the permit will not significantly impede recovery in the waterbody as a whole, and will not have significant adverse impacts within the project area relative to the existing habitat. The situation will be reassessed if reissuance of the permit is sought at the end of its five-year life. At that point, information should be available from two cycles of monitoring under the Superfund program, planned for 2004 and 2007.

6. Potential transport of pollutants by biological, physical, and chemical processes.

Currents at the bottom of Ward Cove are extremely slow. While some downslope movement of bark fragments may occur, it is presumed to be very limited. Transport of bark and wood wastes is not expected to occur in significant quantities.

Conclusion. ADEC finds that issuance of the Ward Cove Log Storage Wastewater Disposal Permit is consistent with the Zones of Deposit provision of the Alaska Water Quality Standards.