# Water Quality Standards

Hrg. 5-4-92

# STATE OF ALASKA

**DEPARTMENT OF LAW**

*OFFICE OF THE ATTORNEY GENERAL*


**WALTER J. HICKEL, GOVERNOR**

*PLEASE REPLY TO:*

☐ *1031 W. 4TH AVENUE, SUITE 200*
*ANCHORAGE, ALASKA 99501-1994*
*PHONE: (907) 269-5100*
*FAX: (907) 276-3697*

☐ *KEY BANK BUILDING*
*100 CUSHMAN ST., SUITE 400*
*FAIRBANKS, ALASKA 99701-4679*
*PHONE: (907) 452-1568*
*FAX: (907) 456-1317*

☒ *P. O. BOX 110300 · STATE CAPITOL*
*JUNEAU, ALASKA 99811-0300*
*PHONE: (907) 465-3600*
*FAX: (907) 463-5295*


May 1, 1992

Senator Lloyd Jones
Chairman, Senate Resources Committee
State Capitol, Room 30
Juneau, Alaska 99801-1182

Re: State Water Quality Standards and Clean Water Act National Pollutant Discharge Elimination System Permitting

Dear Senator Jones:

In preparation for the oversight hearing on the relationship of the state water quality standards to the Clean Water Act National Pollutant Discharge Elimination System (NPDES) permitting process to be held before the Senate Resources Committee on May 4, 1992, you requested the Attorney General to prepare a written response to a number of questions contained in your letter dated April 27, 1992 to John Sandor, Commissioner of the Department of Environmental Conservation (DEC). We reviewed the Amendments to the Water Quality Standards Regulation to Establish the Numeric Criteria for Priority Toxic Pollutants Necessary to Bring All States into Compliance with Section 303(c)(2)(B), 56 Fed. Reg. 58,420-78 (1991), proposed by the United States Environmental Agency (EPA), also known as the "National Toxics Rule" (proposed rule). We also reviewed related statutory and regulatory provisions, in particular, the Clean Water Act, 33 U.S.C.A. §§ 1251 et seq. (1986 & Supp. 1991) and 40 C.F.R. Pts. 121-131 (1991). Our answers to your questions requesting a legal opinion follow.

1. Question No. 5. Socio-Economic Impacts of Proposed Rule on Permittees.

By statute, the Attorney General is the legal advisor to the governor and other state officers, AS 44.23.020, and consequently, would rely upon DEC or other state agencies to evaluate the socio-economic impacts of the proposed National Toxics Rule.

From a legal standpoint, there are two reasons why the proposed rule may result in greater costs to industry than state-adopted water quality standards for toxic pollutants. First, subject to EPA approval, the state may adopt standards less stringent than the proposed rule. 56 Fed. Reg. 58,433, 58,436. Second, procedural mechanisms such as variances and the site-

specific criteria process that are available under state regulations will not be available for the toxic pollutants subject to the proposed federal standards without additional federal rulemaking on a case-by-case basis. Id. at 58,433. The preamble to the proposed rule states:

> EPA cautions States and the public that promulgation of a Federal rule removes most of the flexibility available to States for modifying their standards on a discharger-specific or stream-specific basis. For example, variances, site-specific criteria and schedules of compliance actions pursuant to State law for federally promulgated criteria are precluded. Each of these types of modifications would require federal rulemaking on a case-by-case basis to change the Federal rule for that State.

Id. These procedures, along with mixing zones and the adjustment of designated uses, are legal mechanisms by which socio-economic considerations can be factored into the permitting process. See, e.g., Id. at 58,441.

2. Question No. 8. Application of Proposed National Toxics Rule to Preliminary Draft Permits.

The proposed National Toxics Rule has not as yet been formally adopted by EPA. Therefore, it has no legal effect and cannot provide a legal basis for the pulp mill permit requirements. 5 U.S.C.A. § 553 (1977). EPA's preamble to the proposed rule acknowledges as much: "Formally adopted standards form the legal basis for including water quality-based effluent limitations in NPDES permits to control toxic pollutant discharges." 56 Fed. Reg. 58,421. The proposed rule, once adopted, will become effective 30 days after publication in the Federal Register. See 5 U.S.C.A. § 553(d).

3. Question No. 10. Promulgation of Proposed National Toxics Rule.

We reviewed EPA's legal justification for promulgating federal water quality standards for priority toxic pollutants for the State of Alaska. In general, as explained below, we agree with EPA's analysis that it has statutory authority to adopt these standards for the state. Please refer to our response to question no. 16 for comments on 56 Fed. Reg. 58,476-77, the section pertaining to the State of Alaska.

Under section 303(c)(2)(B) of the Clean Water Act, the state is required to adopt numeric criteria for all pollutants on

the section 307(a) list of priority toxic pollutants for which section 304(a) EPA criteria recommendations ("Gold Book" recommendations) are available, the discharge or presence of which could reasonably be expected to interfere with designated uses. 33 U.S.C.A. § 1313(c)(2)(B). Section 303(c)(2)(B) requires the state to adopt numeric toxic pollutant criteria whenever the state reviews its water quality standards, which under section 303(c)(1) must occur at least once every three years beginning October 18, 1972. The Clean Water Act was amended in 1987, and therefore, in the state's first triennial review occurring after 1987, the state is required to adopt numeric criteria for priority toxic pollutants. As the state has not completed this triennial review, section 303(c)(4)(B) provides EPA the statutory authority to adopt water quality standards to meet the requirements of the Clean Water Act.

After the promulgation of the National Toxics Rule, if the state adopts standards for toxic pollutants which receive EPA approval, removal of the state from the National Toxics Rule will require federal rulemaking procedures. If the state adopts standards no less stringent than the federal rule, EPA will withdraw the federal rule without a notice and comment rulemaking. If, on the other hand, the state adopts standards that are less stringent than the federal rule, EPA will propose to withdraw the rule with a notice of proposed rulemaking and provide for public participation. 56 Fed. Reg. 58,433.

You also asked about the differences between designated and existing uses. Water quality standards consist of the designated uses of the navigable waters involved and the water quality criteria for those uses. "Designated uses" include water supply; water recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life; regardless of whether the use is attained. See 33 U.S.C.A. § 1313(c)(2); 40 C.F.R. § 131.3; 18 AAC 70.020. "Existing uses" are "those uses actually attained in the water body on November 28, 1975, whether or not they are included in the water quality standards." 40 C.F.R. § 131.3(e). EPA selected November 28, 1975 as an index date because it promulgated its original water quality standards regulation on that date. EPA, Introduction to Water Quality Standards 5 (Sept. 1988). An existing use cannot be modified unless uses are added that require more stringent criteria; designated uses, however, may be changed by means of a procedure known as a "use attainability analysis." 40 C.F.R. § 131.10(g).

Your remaining questions regarding the designation of the state's waters and the stringency of the classification of the state's waters fall within DEC's expertise, and will be addressed in its response.

4. Question No. 11. Moratorium on Federal Regulations.

The President's 90-day moratorium on new federal regulations began on January 28, 1992 and concluded on April 27, 1992. Memorandum from the President for Certain Department and Agency Heads 2-3 (Jan. 28, 1992) (President's January 1992 Memorandum). On April 29, the President extended the moratorium for another 120 days. The White House, Office of the Press Secretary, Fact Sheet on the President's Regulatory Reform Initiative (Apr. 29, 1992) (Apr. 1992 Fact Sheet). The moratorium applies to all federal regulations except those subject to a statutory or court-ordered deadline. A number of other exceptions are also listed in the President's January 1992 Memorandum, none of which appear applicable to the proposed National Toxics Rule.

It is arguable whether the proposed rule is subject to the moratorium. On the one hand, the 1987 amendments did not set a specific deadline for federal action if the states failed to adopt standards for priority toxic pollutants. It can be argued that without a clear statutory deadline for the promulgation of federal standards, the President's moratorium ought to preclude adoption of a final rule. On the other, section 303(c)(4) of the Clean Water Act requires the EPA to adopt any new standard it publishes under that section within 90 days of publication. This statutory provision may provide the requisite statutory deadline to exempt the proposed National Toxics Rule from the moratorium. EPA has requested an exemption from the Office of Management and Budget (OMB). Telephone conversation with Barry Allen, EPA Office of Policy, Planning, and Evaluation (May 1, 1992).

The proposed National Toxics Rule was transmitted to OMB for formal clearance on April 16, 1992. Typically, OMB requires 10 to 30 working days to review a regulation; although, given the controversial nature of the proposed rule, additional time may be required. Telephone conversation with David Sabock, EPA Office of Science and Technology (Apr. 28, 1992). Whether the socio-economic impacts of the proposed rule will play a role in determining whether the rule is subject to the moratorium is unclear. OMB previously waived regulatory (economic) impact analysis for the proposed National Toxics Rule. 56 Fed. Reg. 58,440. However, the President has "requested that all federal agencies prepare a thorough cost-benefit analysis of each major rule issued during the moratorium period." Apr. 1992 Fact Sheet. See also, "Federally Imposed Toxic Pollution Limits Said Unlikely to Be Affected by Moratorium," BNA Environmental Reporter 2374 (Feb. 14, 1992).

DEC will answer the remainder of your questions on this matter.

5. Question No. 12. Interpretation of State Water Quality Standards.

You asked whether the state or the EPA's interpretation of the state's water quality standards is entitled to primacy. We found no court decisions that squarely address this question.

The Clean Water Act expressly recognizes the primacy of the states in control of water pollution:

> It is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources, and to consult with the Administrator [of EPA] in the exercise of his authority under this chapter [the Clean Water Act].

33 U.S.C.A. § 1251. In Miners Advocacy Council v. State, 778 P.2d 1126, 1133 (Alaska 1989), cert. denied, 493 U.S. 1077 (1990), the Alaska Supreme Court reviewed the legislative history of the Clean Water Act and concluded that the states have broad power and discretion in the prevention and control of water pollution. The court also quoted the following passage from Mobil Oil Corp. v. Kelley, 426 F. Supp. 230, 234 (S.D. Ala. 1976):

> A review of the legislative history of the [Clean Water Act] reinforces the plain meaning of the Act itself to the effect that Congress intended the states to play a paramount role in the certification of potential polluters.

778 P.2d at 1133.

The preamble to the proposed National Toxics Rule also recognizes the primacy of the states. For example, the preamble states, "EPA has demonstrated extensive deference to State primacy and a willingness to provide broad flexibility in their adoption of State standards for toxics." 56 Fed. Reg. 58,431; see also, Id. at 58,430 (referring to "the principle of State primacy"); Id. at 58,433 ("[T]he water quality standards program has been established with an emphasis on State primacy . . . EPA prefers that States maintain primacy . . . .").

Given the statutory policy of state primacy and an administrative policy of deference to the states with respect to

water quality standards, and given that the state prepares, reviews, and revises its water quality standards, the state should be given deference in its interpretation of its standards and regulations, so long as its interpretation is consistent with the Clean Water Act. To the extent EPA finds a standard to be ambiguous or susceptible to an interpretation that would be inconsistent with the Clean Water Act, it has the opportunity to disapprove the standard within 90 days of the state's submission of the standard to EPA for approval. 33 U.S.C.A. § 1313(c)(3). Based on the above authorities, it would appear that if EPA has approved a state standard, and its subsequent interpretation is at odds with the state's interpretation, EPA's interpretation should not be accorded deference, unless the state's interpretation is plainly inconsistent with the Clean Water Act.

However, in two recent decisions, the United States Supreme Court emphasized the primacy of the federal government in the NPDES permitting process. United States Dep't of Energy v. Ohio, ___ U.S. ___, 60 U.S. 4325 (Apr. 21, 1992); Arkansas v. Oklahoma, ___ U.S. ___, 112 S.Ct. 1046, 117 L.Ed.2d 239, 60 U.S.L.W. 4176 (Feb. 26, 1992). The Ohio opinion, for example, begins with the statement that Section 402 of the Clean Water Act "gives primary authority to issue such permits to the United States Environmental Protection Agency . . . ." 60 U.S.L.W. at 4326.

In the Arkansas decision, the Court had occasion to address EPA's interpretation of Oklahoma's state water quality standards, but did not reach the question you have asked. Nonetheless, it may prove helpful to summarize some of the Court's observations. Because state standards are promulgated by the states with substantial guidance from EPA and are approved by EPA, the Court characterized state water quality standards as part of the federal law of water pollution control, at least insofar as interstate water pollution is concerned. 60 U.S.L.W. at 4181. Whether the Court would reach the same conclusion for coastal waters or wholly intrastate waters is not clear. Because the Oklahoma standards affected another state and therefore had a "federal character," the Court concluded that "EPA's reasonable, consistently held interpretation of those standards is entitled to substantial deference." Id. The Court found EPA's interpretation of Oklahoma's standards both reasonable and "consistent with the purposes and principles of the Clean Water Act," and its application of the standards, sound. Id. Further, Oklahoma did not dispute EPA's interpretation of its state standards. Id. The Arkansas decision indicates that a state's interpretation of its water quality standards is to be considered, and that EPA's interpretation of the state's standards is to be evaluated to determine whether it is reasonable, consistently held, and consistent with the purposes and principles of the Clean Water Act.

6. Question No. 16. Compliance with Section 303(c)(2)(B) of the Clean Water Act.

Please refer to our response to question number 10. We do not agree with the statement that "Alaska is included in today's proposal because although the State had previously adopted all section 304(a) criteria by reference, the State Attorney General has decided that the adoption by reference is invalid." 56 Fed. Reg. 58,476. The filing of a certified copy of a regulation with the Lieutenant Governor's Office raises a rebuttable presumption that the regulation was duly adopted. AS 44.62.100(a)(1). Since the filing of the regulation, our office has not determined the validity of the adoption of the section 304(a) criteria. Nonetheless, adoption by reference of the section 304(a) criteria would not fully meet the requirements of section 303(c)(2)(b), and thus the state would still be subject to the National Toxics Rule.

Please do not hesitate to contact me if I can be of further assistance with respect to this matter.

Sincerely,

CHARLES E. COLE
ATTORNEY GENERAL

By: Marie Sansone
Marie Sansone
Assistant Attorney General

cc: Hon. John Sandor, Commissioner
Alaska Department of Environmental Conservation

Hon. Paul Rusanowski, Director
Division of Governmental Coordination
Office of the Governor, State of Alaska

Paul Fuhs, Legislative Liaison
Office of the Governor, State of Alaska

Hon. Dana Rasmussen, Administrator
United States Environmental Protection Agency

MS:lmk

# Alaska State Legislature

Sen. Lloyd Jones, *Chair*
Sen. Sam Cotten, *Vice-Chair*
Sen. Dick Eliason, *Member*
Sen. Steve Frank, *Member*
Sen. Rick Halford, *Member*
Sen. Curt Menard, *Member*
Sen. Fred Zharoff, *Member*

P.O. Box V
Juneau, AK 99811

907 465-4907
Fax: 907 465-3922

## Senate Resources Committee

April 27, 1992

Mike Barton, Regional Forester
U.S. Forest Service
P. O. Box 21628
Juneau, AK 99802

Dear ~~Mr.~~ Barton:

The Senate Resources Committee requests your presence or that of your representative who has background and policy authority in this area on May 4, 1992 to testify at an oversight hearing on the relationship of State Water Quality Standards to the Clean Water Act National Pollutant Discharge Elimination System Permitting (NPDES) process. This relationship is an issue of concern to the Committee because of the impact on Alaska from the approach taken by the Environmental Protection Agency (EPA) in its November 19, 1991 proposed rulemaking entitled "Amendments to the Water Quality Standards Regulation to Establish the Numeric Criteria for Priority Toxic Pollutants Necessary to Bring All States Into Compliance with Section 303(c)(2)(B) (hereinafter "EPA proposed rule"). By this proposed rulemaking, EPA seeks to set water quality standards for Alaska for all the priority toxic pollutants for which EPA has issued section 304(a) water quality guidance criteria that have not already been promulgated by Alaska. While this regulation is still in draft and has just recently been received by the Office of Management and Budget in Washington, D.C., EPA Region 10 seems to have already begun applying it as seen by the appearance of human health criteria at $10^{-6}$ imposed in the preliminary draft permits for two pulp mills.

I am concerned that if the toxics regulation is applied to the NPDES permits of the two pulp mills that the impacts will be so devastating that the mills will not be able to continue in operation. I have asked the Environmental Protection Agency (EPA) and the Department of Environmental Conservation (DEC) whether they have considered the socio-economic implications of mill closures in this situation. We will find out at the hearing what is the case.

As I see it, it is critical to get the Forest Service view on this subject. The Committee would appreciate either you or your representative appearing at the hearing, prepared to describe to the Committee the impacts of the pulp mills' closures on both the public and private timber operations in Southeast Alaska.

Thank you for your cooperation. I look forward to seeing you, or your representative, at the May 4, 1992 hearing.

Yours very truly,

Lloyd

Senator Lloyd Jones, Chair

cc: The Honorable Dana Rasmussen
U.S. Environmental Protection Agency

The Honorable John Sandor
Commissioner, Alaska Department of Environmental Conservation

The Honorable Charles Cole
Attorney General, State of Alaska

Paul Rusanowski
Division of Governmental Coordination, State of Alaska

United States Department of Agriculture
Forest Service
Alaska Region
P.O. Box 21628
Juneau, AK 99802-1628

Reply to: 1960

Date: MAY 01 1992

Honorable Lloyd Jones
Alaska Senate
Juneau, AK 99811

Dear Senator Jones:

This is in response to your April 27 request that I testify before the Senate Resources Committee at an oversight hearing on Monday, May 4, on the relationship of State Water Quality Standards to the Clean Water Act National Pollutant Discharge Elimination System Permitting (NPDES) process.

Your letter of invitation expresses your concern that a recent proposed rule of the United States Environmental Protection Agency (EPA) could, if applied to the NPDES permits of the two pulp mills in Southeast Alaska, result in "impacts [that] will be so devastating that the mills will not be able to continue in operation." Your letter specifically asked me to "describe to the Committee the impacts of the pulp mills' closures on both the public and private timber operations in Southeast Alaska."

Unfortunately, neither I nor my Deputy can be present at Monday's hearing. I hope that the information provided in this letter will serve as an acceptable substitute for an appearance by me or a member of my staff.

I defer to EPA for comment on its proposed rule, and offer no opinion as to whether implementation of it would lead to a closure of the pulp mills.

If the two pulp mills were to close, the first question would be whether any buyers could be found to purchase the existing facilities and either modify or rebuild them to comply with the NPDES permits as modified by the proposed rule. Such a result would be possible, but it is difficult to judge how likely it would be. Assuming that pulp operations did not resume, the next question would be whether the existing sawmills operated by the pulp mill owners would continue to be operated. This too is not a simple question. The most reasonable assumption, however, seems to be that the sawmills would also be closed, due to the fact that the economic viability of sawmill operations in Southeast Alaska has been demonstrated to be very dependent upon the pulp mills as an outlet for the considerable amount of harvest volume that is not suitable for lumber production. Although some might argue that the export of wood chips could replace pulp as such an economic use of utility volume, the amount of such exports would have to rise to roughly twice the highest level achieved to date in order to accomplish that result. We assume, therefore, that the sawmills would also be closed permanently if the pulp mills were to cease their operations.

With these three assumptions--that closure of the pulp mills would be permanent, that they would not be replaced, and that such action would lead to irreversible closure of the three operating sawmills in Southeast Alaska--it is clear that closure of the two pulp mills would substantially reduce the wood products industry in Southeast Alaska. The pulp companies are the largest single employers in the region's wood products industry. In 1990, Ketchikan Pulp Company employed 530 people at its pulp mill and sawmill in Ketchikan and an additional 105 at its sawmill in Metlakatla. At that time, Alaska Pulp Corporation employed 375 people in its pulp mill at Sitka and 168 people at its sawmill in Wrangell. Therefore, in the event that the two companies ceased operations, an estimated 1,178 jobs would immediately be lost in these three communities. An additional 750 logging jobs also would be lost, exacerbating the adverse employment effects on logging companies from declining harvest levels on private land in Southeast Alaska. These losses represent over half the current level of employment in the region's wood products industry.

In addition to the direct employment effects discussed above, job losses would also be realized in construction, marine transport, and numerous retail and service industries throughout Southeast Alaska. In total, a permanent shutdown of the two pulp mills and the associated sawmills would result in a loss of some 2,513 jobs and over $91 million in personal income.

Additional analysis of the timber industry, including employment and income effects, is included in the Timber Supply and Demand Report, published annually by the Forest Service. I am enclosing 20 copies of the most recent report, published last year and covering 1990.

I hope you will find this information helpful. If there is anything else we can do to assist the Committee, please let me know.

Sincerely,

M E Eckblad

for MICHAEL A. PARMAN
Regional Forester

Enclosures (20)

cc:
CGC
PAC
INT
WO (1510, 2500)

United States
Department of
Agriculture

Forest Service

Alaska Region
R10-MB-156

# Timber Supply and Demand

## 1990



Alaska National Interest Lands Conservation Act
Section 706(a), Report Number 10

# PREFACE

Section 706(a) of the Alaska National Interest Lands Conservation Act (ANILCA) states that the Secretary of Agriculture will monitor timber supply and demand in Southeast Alaska and report annually on the ability of the Tongass National Forest to meet a timber supply rate of 4.5 billion board feet per decade as specified in Section 705[1]. This report is submitted to the Committee of Energy and Natural Resources of the U.S. Senate and the Committee on Interior and Insular Affairs of the House of Representatives.

The report to follow describes the developments in the timber market during fiscal year 1990.[2] It is based on information gathered by the USDA Forest Service from federal agencies, published reports, trade journals, etc. This is the tenth such report prepared by the USDA Forest Service in consultation with the State of Alaska, affected Native corporations, the Alaskan timber industry, commercial fishing interests and the Southeast Alaska Conservation Council in accordance with Section 706(c) of ANILCA. Comments on the report were solicited from the ANILCA cooperators and other industry experts, consultants and researchers.

As in previous years, this report includes references to the forest resources and timber industry's activities in Southcentral Alaska. Although the Southcentral region exhibits the potential for an enlarged role in the Pacific Rim marketplace, initial attempts at large scale operations have suffered financial difficulties. At present the Southcentral timber industry is considerably smaller than that of Southeast and its future remains uncertain.

1 The current Tongass Land Mangement Plan (TLMP) specifies an ASQ of 4.5 billion board feet per decade. Changes to this ASQ are being considered as part of the on-going TLMP Revision.

2 The 1990 federal fiscal year began October 1, 1989, extending through September 30, 1990. The Tongass Timber Reform Act (Public Law 101-626) was passed on November 28, 1990 (prior to publication of this report) and has significant implications for the long-term contracts and timber management on the Tongass. In particular, the requirement to meet a timber supply rate of 4.5 billlion feet per decade in Section 705 was replaced with a requirement to "provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle". Because this report is intended to be a review of the FY 1990 timber market, the implication of this legislation has not been addressed. The scope of the next supply and demand report will include any changes in the supply and demand situation related to the new act.

# EXECUTIVE SUMMARY

## Tongass National Forest Harvest Reaches Decade High

Timber harvest on the Tongass National Forest reached a decade high of 471 million board feet in fiscal year 1990 (October 1, 1989 - September 30, 1990). Of this total, some 48 percent was used in the production of lumber and cants, 39 percent in pulp production, and the balance consisted of cedar exports. Stumpage prices for Tongass timber sales also hit a record high of $120.9 per thousand board feet, more than a four fold increase over a two-year span. Timber sale operators responded by accelerating the harvest of volume under contract, dropping the level of timber sales under the short-term sale program to one-fourth that of fiscal year 1989.

At 1.09 billion board feet, the total timber harvest in Southeast Alaska was only slightly below the banner harvest level of fiscal year 1989. Timber harvested on National Forest lands accounted for 43 percent of the total while the volume removed from private lands accounted for 56 percent. Approximately 93 percent of the estimated 614 million board feet harvested on private lands was exported in the round.

## Strong Export Market for Alaskan Wood Products

With respect to market conditions over the last ten years, fiscal year 1990 was an outstanding year for the Alaskan forest products industry. The average value of log exports increased 17 percent over fiscal year 1989, reaching a decade high of $578 per thousand board feet. The increased price more than compensated for a slight reduction in trade volume and boosted the total dollar value of log exports from Alaska to over $350 million. The total value of exported lumber and cants increased to $85.3 million, driven by a 24 percent increase over the volume exported in fiscal year 1989. The volume of Alaskan pulp exports remained close to the record high of fiscal year 1989, although an 8 percent price drop reduced the total dollar value to $203 million.

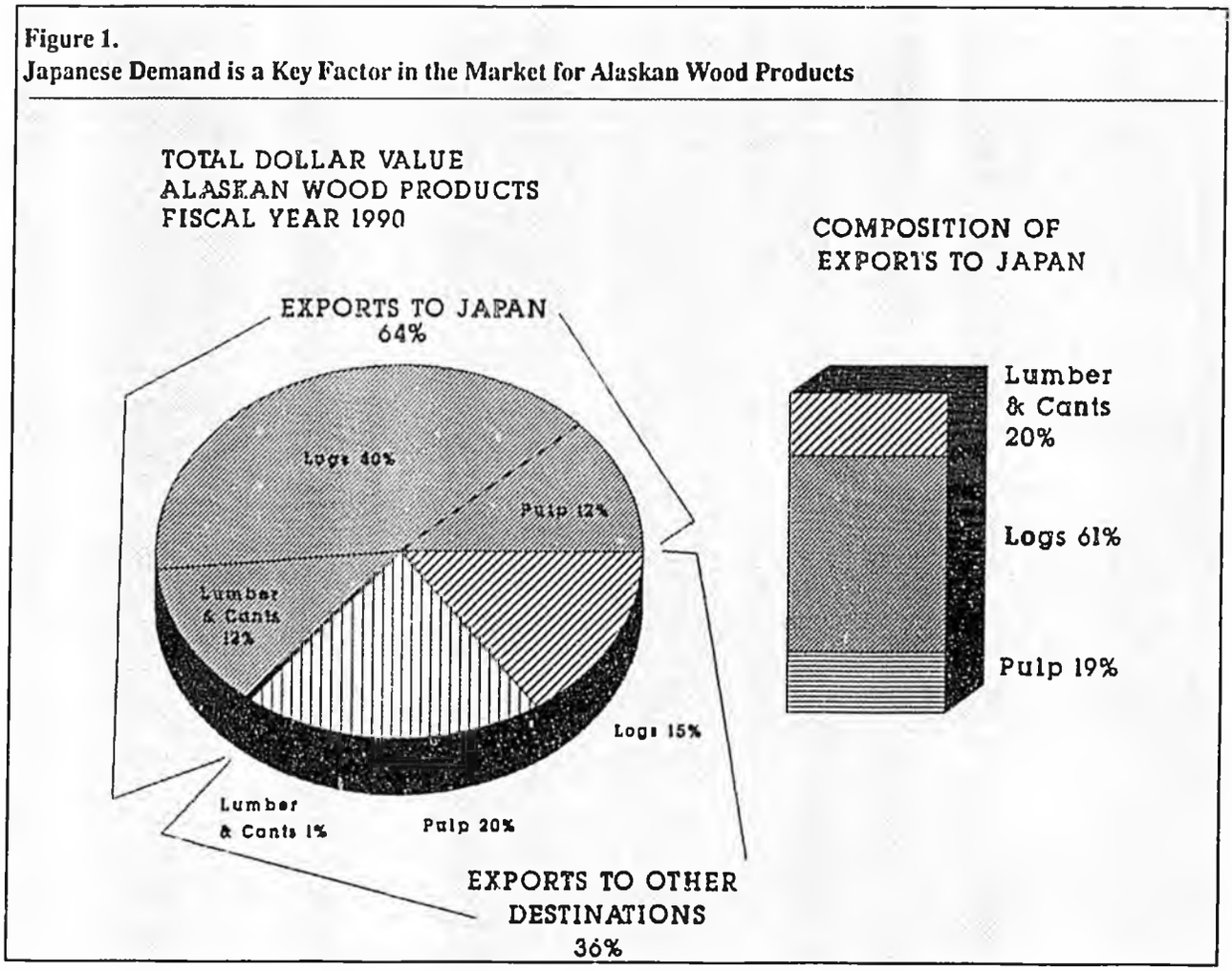
## Timber Industry Employment Continues to Grow

A major objective of the Alaska National Interest Lands Conservation Act (ANILCA) was to maintain timber supply availability for the Southeast Alaska timber industry, thereby stabilizing employment in local communities and diversifying the region's economic base. To a large extent, the employment objective was met again in fiscal year 1990. Logging , sawmill, and pulpmill employment reached a peak of 3543 jobs, a 30 percent increase relative to fiscal year 1981. Economic linkages with other industries supported an additional 2570 jobs. Because of the mandate to process National Forest timber within Alaska, most of the 1399 jobs provided by sawmills and pulpmills are linked to timber supplies from the Tongass.

## Japan Dominates Market for Alaskan Timber

Japan remained the primary destination for Alaskan wood products, and accounted for over 64 percent of the total export value of wood-based commodities in fiscal year 1990. The uncommonly high level of economic activity in Japan and favorable yen/dollar exchange ratio throughout fiscal year 1990 kept demand for Alaskan wood products high. Approximately 97% of Alaska's lumber and cant exports were shipped to Japan along with 37% of the exported pulp and 72% of the exported logs (Figure 1).

**Figure 1.**
**Japanese Demand is a Key Factor in the Market for Alaskan Wood Products**



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# INTRODUCTION

Covering 16.9 million acres, the Tongass is the largest Forest in the National Forest System and contains an important share of the nation's renewable and nonrenewable natural resources. Planning and on-going management of the Tongass present challenges of equal scale and complexity. As part of its mission, the Forest Service administers programs of timber management and forest renewal intended to further the national objective of ecosystem sustainability while providing commodity resources that stabilize employment and income in local communities. Timber harvest in Southeast Alaska dates back to the early 1900's, and the wood products industry is well-integrated into the economies and lifestyles of many communitites. Over the years, the timber industry has survived the fluctuations of a cyclical market, expanded international exports to include some thirty nations, and employed technological advances to maintain market share in the face of increased competition.

The sections to follow continue a ten-year series of reports documenting the role of the Tongass National Forest in the Alaskan wood products industry. First, the significance of the Tongass as a supply source for the wood products industry is examined. Second, timber and wood products flows and values for FY 1990 are presented, along with a discussion of the primary sources of demand for Alaskan wood-based commodities. Finally, the influence of the timber industry on the socioeconomic structure of Alaskan communitites is discussed.

ANILCA Section 706(a)

# TIMBER SUPPLY

### National Forest Contributions to Timber Supply

The Forest Service offered 334 million board feet (MMBF) for sale in Alaska during fiscal year (FY) 1990. This is 4 percent more than the volume offered in FY 1989. National forest timber harvest in fiscal year 1990 increased by 6 percent over 1989. Timber sale operators harvested 399 MMBF of sawtimber and 72 MMBF of utility grade logs, to result in a decade high harvest volume of 471 MMBF. Of this total, some 48 percent was used as sawlogs, 39 percent as pulp logs, and the remaining 13 percent was exported.

The FY 1990 short-term sale program on the Tongass demonstrated a fairly typical response to a rapid increase in stumpage prices. The volume sold was only 25 percent of the previous year's sales, dropping to a ten-year low of 22.7 MMBF. The volume harvested, however, reached a high of 149 MMBF. The difference came from the harvest of timber under contract, reducing timber backlog to the lowest point in a decade (Table 1). The volume offered under the short-term sale program was 40 percent less than that of FY 1989.

The volume offered under the two remaining long-term sales increased by 19 percent to 287 MMBF. Harvest under the long-term sales remained at the previous year's level of about 250 MMBF.

### Total Timber Harvest

The total volume of timber harvested in the State of Alaska dropped by 2 percent in FY 1990, reversing the trend of increased harvest observed since 1985 (Table 2). Total timber harvest in Southeast Alaska was 992.2 MMBF while harvest in Southcentral Alaska was 107.1 MMBF.

Private timber harvest (including that of the Southeast Alaska Native corporations organized under the Alaska Native Claims Settlement Act) fell by 5 percent in comparison with last fiscal year and accounted for 56 percent of the total harvest. The sawlog harvest from private timberlands in Alaska was approximately 547 MMBF and the pulp log harvest roughly 67 MMBF. Of this total, some 93 percent was exported and the remaining 7 percent was used as pulp logs.

**Table 1. Volume of Timber Offered, Sold and Harvested on the Tongass National Forest, Fiscal Years 1988-90 (all volumes in MMBF, net sawtimber)**

| | | 1988 | 1989 | 1990 |
|---|---|---|---|---|
| **Short-Term Sales** | | | | |
| | Volume Offered | 82 | 79 | 47 |
| | Volume Sold | 62 | 82 | 23 |
| | Volume Harvested | 83 | 126 | 149 |
| **Long-Term Sales** | | | | |
| | Volume Offered (Prepared) | 255 | 242 | 287 |
| | Volume Sold (Released) | 234 | 172 | 263 |
| | Volume Harvested | 249 | 251 | 250 |
| **Total Volume Offered** | | 331 | 321 | 334 |
| **Total Volume Sold** | | 296 | 254 | 286 |
| **Total Volume Harvested** | | 332 | 377 | 399 |

Note: The activities related to the long-term contracts are somewhat different than those of the short-term sale program. The following clarifications are provided in reference to the figures reported above.

Volume Offered- Under the short-term contracts, this refers to advertised volume. The volume fully prepared and available is reported here as a comparable measure for the long-term contracts.

Volume Sold- Under the short-term contracts, this refers to the volume awarded to purchasers. The volume formally released to contract holders is reported here as a comparable measure for the long-term contracts.

*Table 2. Timber Supply in Southeast and Southcentral Alaska*
*Harvest and Import by Source and Type of Timber, Fiscal Years 1982-1990 1/*

| | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|
| | (In million board feet, log scale) | | | | | | | | |
| **Southeast** | | | | | | | | | |
| **Public** | | | | | | | | | |
| Tongass N.F. | | | | | | | | | |
| Sawtimber | 326.6 | 220.0 | 226.7 | 162.5 | 251.4 | 282.0 | 331.5 | 377.0 | 399.0 |
| Utility[2/] | 43.8 | 30.0 | 34.0 | 69.5 | 39.1 | 54.2 | 64.7 | 67.6 | 72.0 |
| State of Alaska[3/] | | | | | | | | | |
| Sawtimber | 30.1 | 21.8 | 16.9 | 4.2 | 12.2 | 19.5 | 16.8 | 11.4 | 11.1 |
| Utility | 0.0 | 0.1 | 0.5 | 0.5 | 0.2 | 0.3 | 0.0 | 0.1 | 1.0 |
| BIA | 2.8 | 3.1 | 1.1 | 0.1 | 0.0 | 0.0 | 0.0 | 3.5 | 0.0 |
| **Private**[4/] | | | | | | | | | |
| Export Sawlogs | 137.0 | 249.3 | 202.3 | 225.3 | 295.9 | 286.1 | 286.4 | 419.8 | 441.7 |
| Pulplogs | 19.6 | 54.3 | 88.0 | 61.0 | 58.8 | 124.8 | 121.3 | 109.9 | 67.4 |
| SE AK Sawlog Harvest | 496.5 | 494.2 | 447.0 | 392.1 | 559.5 | 587.6 | 633.2 | 811.7 | 851.8 |
| SE AK Total Harvest | 559.8 | 578.6 | 569.5 | 523.1 | 657.7 | 766.9 | 819.3 | 989.2 | 992.2 |
| **Imports** | | | | | | | | | |
| Sawlogs | 3.1 | 21.1 | 5.7 | 7.8 | 24.4 | 5.7 | 0.1 | 1.8 | 1.2 |
| Pulpwood logs | 0.0 | 2.0 | 38.0 | 11.9 | 22.1 | 5.1 | 6.8 | 1.9 | 0.0 |
| Wood chips[5/] | 0.0 | 0.0 | 15.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| SE AK Wood Supply | 562.9 | 601.7 | 628.8 | 542.8 | 704.2 | 777.7 | 826.2 | 992.9 | 993.4 |
| **Southcentral** | | | | | | | | | |
| **Public** | | | | | | | | | |
| Chugach N.F. | 0.4 | 1.1 | 0.5 | 0.7 | 0.8 | 0.7 | 1.0 | 1.1 | 1.0 |
| State of Alaska | | | | | | | | | |
| Sawtimber | 1.4 | 0.8 | 0.8 | 0.5 | 1.0 | 1.1 | 0.5 | 0.5 | 0.4 |
| Utility | 0.8 | 27.8 | 2.3 | 1.8 | 0.8 | 0.8 | 1.6 | 1.6 | 0.6 |
| **Private** | | | | | | | | | |
| Export Sawlogs | 21.2 | ne | ne | ne | ne | 44.2 | 79.2 | 120.0 | 105.1 |
| Pulplogs | ne | ne | ne | ne | ne | 0 | 6.4 | 0.0 | 0.0 |
| **Southeast and Southcentral Alaska** | | | | | | | | | |
| Harvest Sawtimber | 519.5 | 496.1 | 448.3 | 393.3 | 561.3 | 633.6 | 713.9 | 932.4 | 958.3 |
| Harvest Total | 583.6 | 608.3 | 573.1 | 526.1 | 660.3 | 813.7 | 908.0 | 1112.4 | 1099.3 |
| Wood Supply | 586.7 | 631.4 | 632.4 | 545.8 | 707.3 | 824.5 | 914.9 | 1116.1 | 1100.5 |

1/ The Federal Fiscal Year extends from October 1st to September 30th of the following year.

2/ The Forest Service requires the harvest and removal of utility volume which is in addition to the 450 MMBF Allowable Sale Quantity (ASQ) calculated in the Tongass Land Management Plan (TLMP). The ASQ is based on net sawlog volume.

3/ Based on new information, State harvest totals have been updated for all years. The adjusted figures reported here supersede the figures displayed in previous year's reports.

4/ Estimate. Sources were not found for certain years or ownerships and are not estimated (ne). Some of the private harvest reported in fiscal years 1982-86 for southeast Alaska originated from southcentral Alaska, but data were not available to separate the two regions from the estimated total.

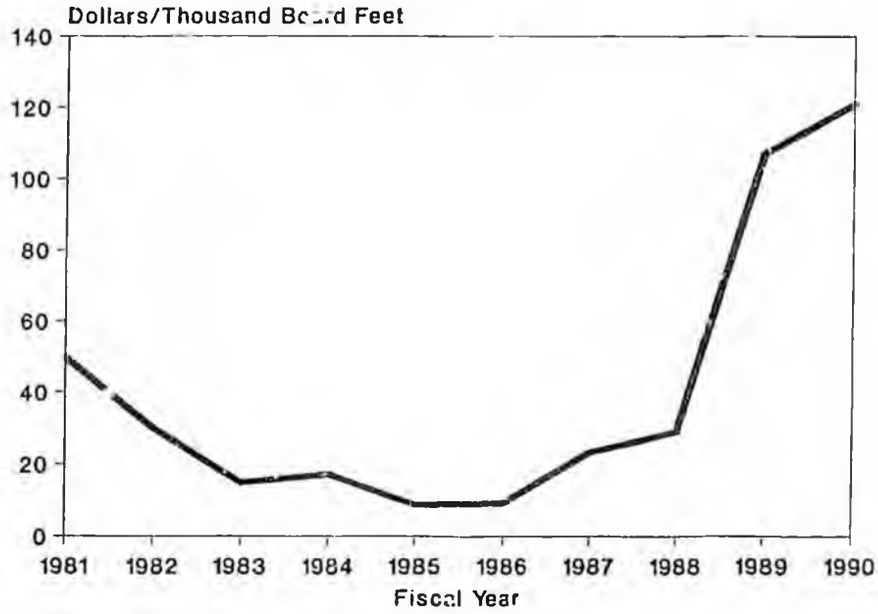
5/ Compiled from official statistics of the U.S. Department of Commerce. Commerce reports pulpwood imports and wood chips imports in short tons. Cords are converted to log scale at a ratio of 2 cords per thousand board feet(MBF). Wood chips are converted to log scale at a ratio of 2.7 short tons per MBF.

Harvest from other public lands (both federal and State) remained at 13 MMBF. The bulk of this timber is used as pulp logs.

There are four sources of timber for processors in Southeast Alaska: The Tongass National Forest, private timberlands, other government timberlands, and timber (and chip) imports (Table 2). The largest volume of the timber harvested in Southeast Alaska goes into the export market as logs, while the second largest use is for pulp. The sawlog market is the third largest market. Federal timber is used to make dimension lumber and dissolving pulp. A small volume (about 60 million board feet in FY 1990) of federal timber, mostly western red cedar and Alaskan yellow cedar, is sold as log exports. Timber from private timberlands is exported as logs or sold to the local pulp mills.

Finally, stumpage prices for National Forest sales (all convertible products but excluding long-term sales) in Alaska continued to rise in FY 1990 reaching their highest level in more than a decade (Figure 2). A contributing factor was the general increase in stumpage prices in the Pacific Northwest during the spring and early summer of 1990. These increases were attributed to supply restrictions associated with new plans for some of the National Forests in the Pacific Northwest along with numerous attempts to define and implement a conservation strategy for the Northern spotted owl, discussed later.

**Figure 2.**
**Stumpage Prices for National Forest Timber Sold in Alaska**



# DEMAND FOR ALASKAN TIMBER AND WOOD PRODUCTS

### Importance of Export Trade to Alaskan Economy

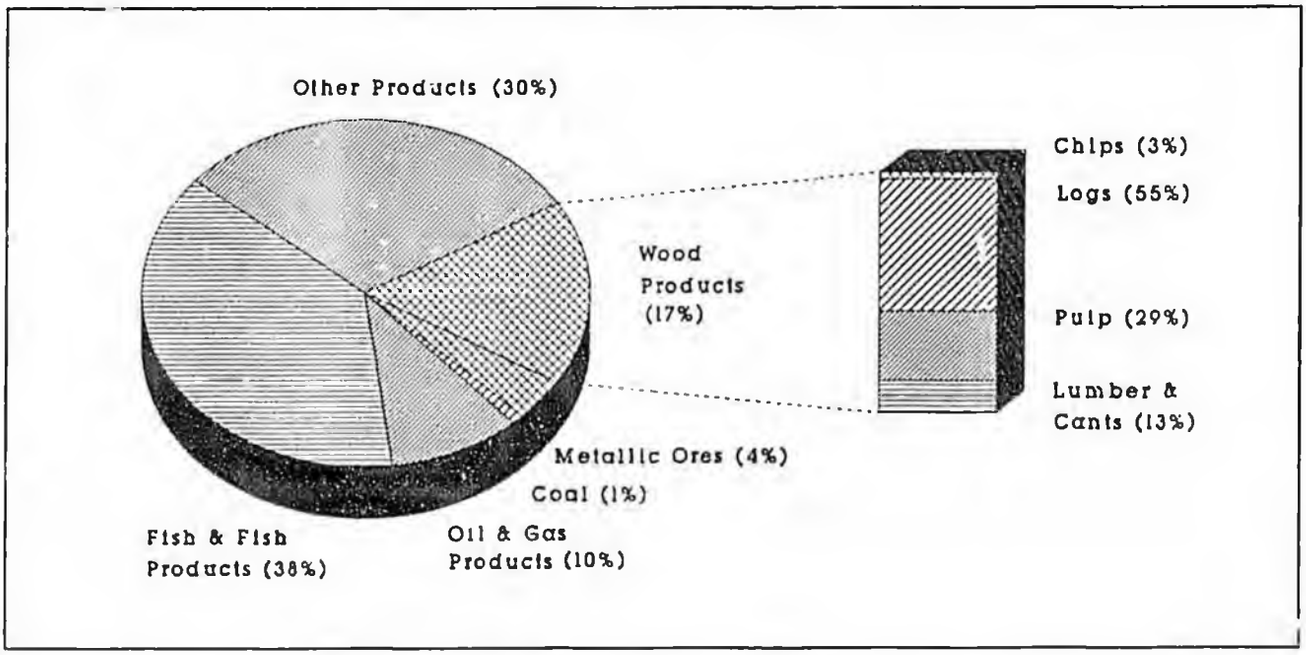
The abundance of natural resources and minimal industrial development in Alaska contribute to a reliance on export trade for the State's larger industries. Alaska exports a larger share of its total production relative to the United States as a whole. In 1986, the dollar value of the total output of goods in services in Alaska was $19.6 billion[1]. Commodity exports represented 6.6 percent, or $1.3 billion. In comparison, commodity exports represented 5.4 percent of the total United States production. It is important to note that Alaska is even more reliant upon dollars from outside the State than these figures would suggest. The sale of North Slope oil to the rest of the United States and income accruing from both international and domestic tourism activity are significant trade components as well.

The value of international exports from Alaska exceeded $3.3 billion in 1990. The greatest dollar value of international trade was generated from the export of fish and fish products (38%) followed by wood products (17%), oil and gas (10%), metalic ores (4%), and coal (1%) (Figure 3).

Alaska plays a significant, although far from dominant, role in world markets for wood products. Exclusive of Canada-United States trade, Alaska accounts for about six percent of the softwood logs moving into Pacific Rim markets (Haynes and Brooks 1990), and about five percent of the softwood lumber. Both percentages have been static for several years, with exports of Alaskan logs and lumber keeping pace with (roughly) a 25-percent increase in Pacific Rim supply and consumption. The market for Alaska's dissolving pulp is global and represents about 22 percent of the export trade to major consuming countries, including states in the Lower 48 (Haynes and Brooks 1990).

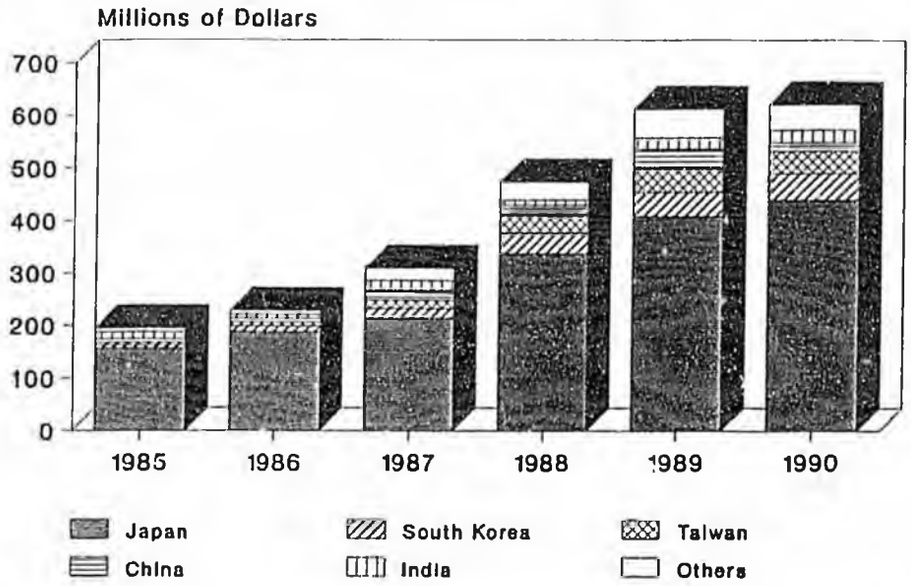
Overall, most of Alaskan pulp production and virtually all of the lumber manufactured go overseas, with some thirty nations represented among the purchasers (Figure 4). National Forest logs provide most of the basis for these flows, as private logs move largely into offshore markets as roundwood.

**Figure 3.**
**Value of Alaskan Exports in 1990 (Percent Distribution)**




1 The gross market value of the goods and services attributable to labor and property located in a state is referred to as Gross State Product (GSP). Annual estimates of GSP for each state are reported by the Bureau of Economic Analysis (BEA). As more recent data has not yet been released by BEA, the 1986 estimates were used in this report.

**Figure 4.**
**International Export of Alaskan Wood Products by Primary Destination**




### The 1990 Market for Alaskan Wood Products

FY 1990 was a time of relatively strong demand for Alaskan wood products, despite a leveling in the growth rate of construction activity in Japan and the lowest activity in U.S. housing since the deep recession of 1982. Although log exports dropped by 4 percent, total volume still exceeded 600 million board feet; more than a four-fold increase in a ten-year span (Figure 5). Total exports of lumber and cants from Alaska in 1990 reached a decade high of 225 million board feet, about a 25-percent increase relative to 1989 (Figure 6). The market for pulp, however, was not as strong and the volume exported dropped by nearly 15 percent (Figure 7).

**Figure 5.**
**International Export of Alaskan Softwood Logs**

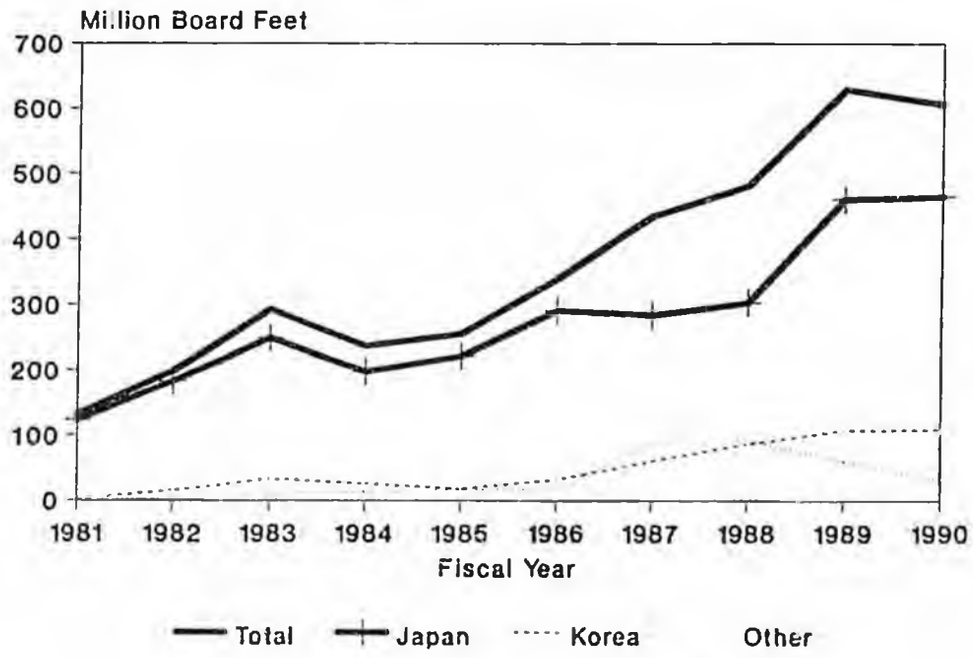


**Figure 6.**
**International Export of Alaskan Lumber and Cants**

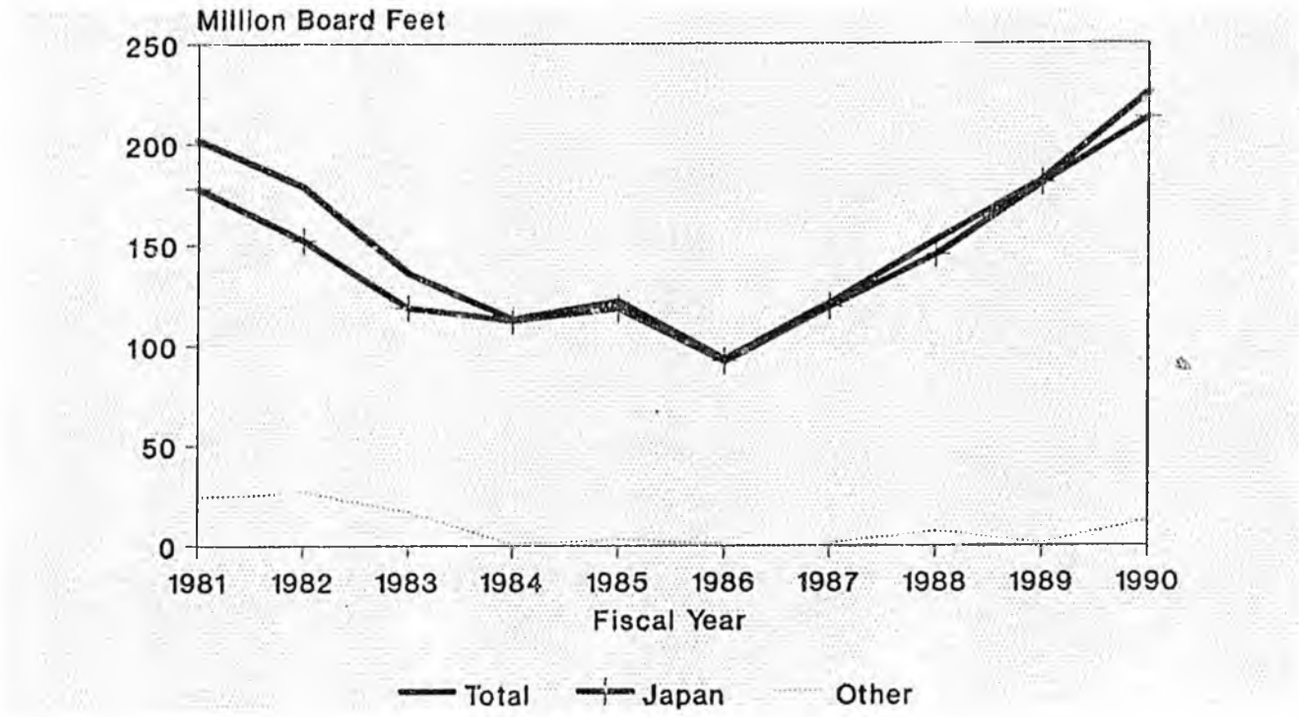
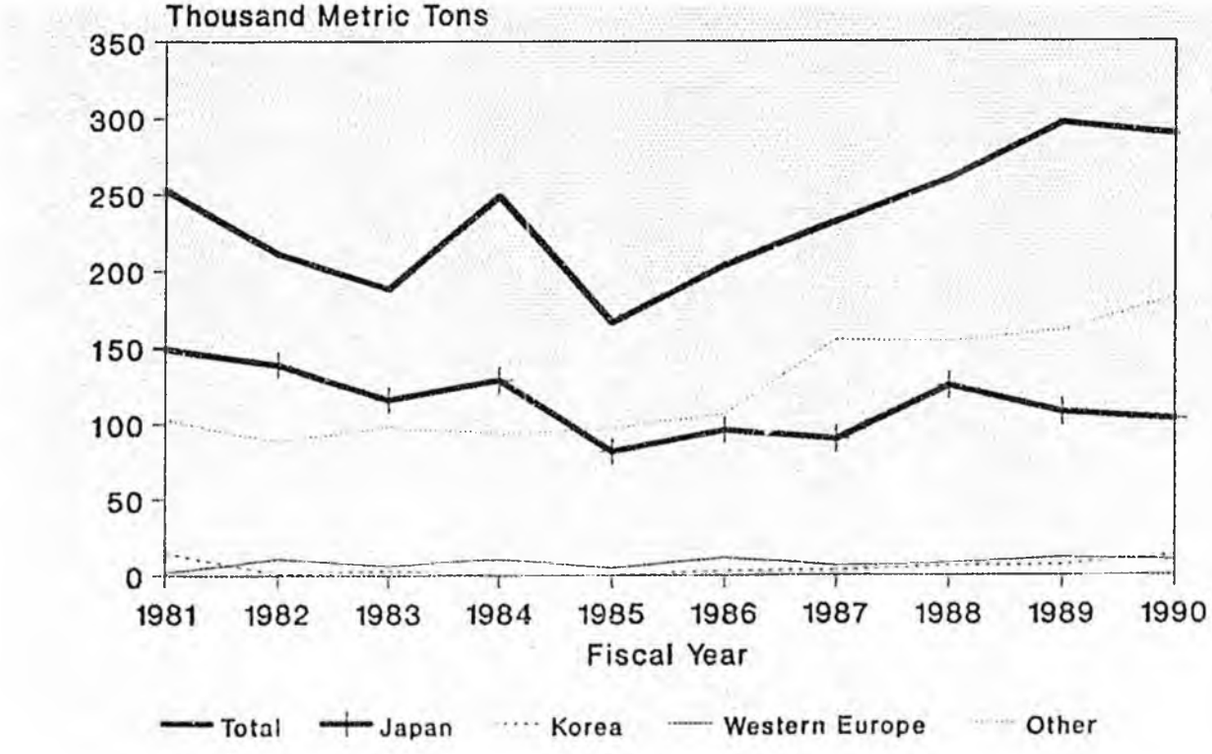



**Figure 7.**
**International Export of Alaskan Pulp**



The combined value of all exported Alaskan wood products was over 600 million dollars for the 1990 fiscal year. At $578 per thousand board feet (log scale), the average value of Alaskan softwood log exports was 17 percent above 1989 prices. Export values for lumber and cants remained strong at $378 per thousand board feet (lumber tally), dropping only 3 percent from the record prices of 1989. The value of exported pulp dropped 5 percent from 1989 prices to an average of $703 per metric ton for the fiscal year (Table 3).

Following a period of decline at the start of the year, prices for exported Alaskan lumber increased during the fourth quarter of FY 1990. The increase presumably reflected the rising value of the yen and scarcity factors in North America. Average prices of exported Alaskan logs increased throughout most of the fiscal year but fell slightly in the last quarter; the drift downward corresponding to an overall reduction in economic activity. Log prices rose by about ten percent early in the year and then receded by about five percent.

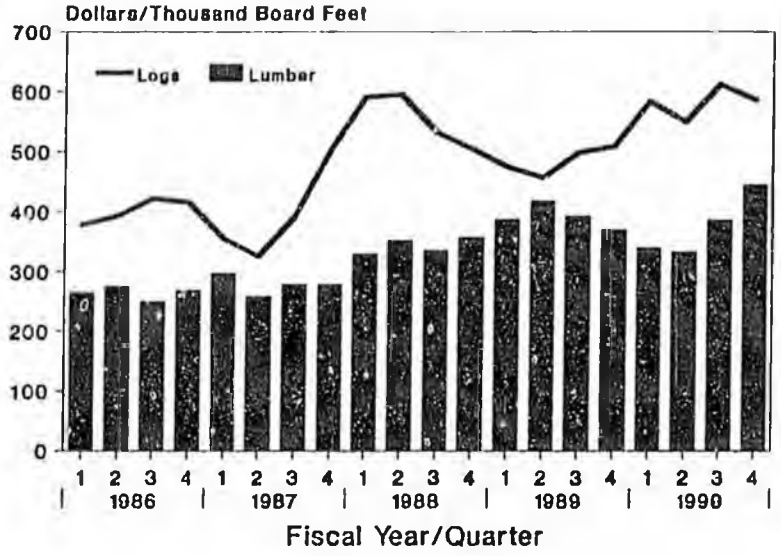
**Table 3. International Exports of Alaskan Wood Products Fiscal Years 1981-1990**

| Product/Unit[1] | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Softwood Logs** | | | | | | | | | | |
| Volume (MMBF) | 130.1 | 197.5 | 292.6 | 237.6 | 258.6 | 340.3 | 436.1 | 482.2 | 629.6 | 606.6 |
| Value ($millions) | 68.4 | 95.4 | 128.3 | 97.1 | 99.6 | 137.9 | 179.6 | 261.6 | 310.3 | 350.9 |
| Unit Value ($/MBF) | 526 | 483 | 439 | 408 | 385 | 405 | 412 | 543 | 493 | 578 |
| **Lumber and Cants** | | | | | | | | | | |
| Volume (MMBF) | 202.5 | 178.6 | 136.0 | 113.3 | 122.0 | 93.5 | 121.0 | 152.5 | 182.3 | 225.5 |
| Value ($millions) | 60.3 | 62.5 | 45.5 | 32.2 | 32.5 | 24.7 | 33.9 | 52.1 | 71.0 | 85.3 |
| Unit Value $/MBF | 298 | 350 | 334 | 284 | 266 | 264 | 280 | 342 | 389 | 378 |
| **Woodchips** | | | | | | | | | | |
| Volume (Mton) | 60.5 | 84.8 | 19.0 | 10.5 | 4.5 | 0 | 0 | 10.4 | 77.9 | 18.2 |
| Value ($millions) | 5.5 | 6.4 | 1.3 | .3 | .4 | 0 | 0 | .6 | 3.6 | 1.4 |
| Unit Value ($/ton) | 90 | 75 | 66 | 32 | 98 | 0 | 0 | 54 | 46 | 78 |
| **Woodpulp** | | | | | | | | | | |
| Volume (Mton) | 252.9 | 211.0 | 188.5 | 249.2 | 166.5 | 203.8 | 232.0 | 260.4 | 296.9 | 289.3 |
| Value ($millions) | 135.7 | 113.3 | 94.8 | 127.3 | 72.0 | 85.4 | 113.9 | 160.4 | 227.7 | 203.4 |
| Unit Value ($/ton) | 537 | 601 | 503 | 510 | 433 | 419 | 492 | 616 | 767 | 703 |
| TOTAL VALUE ($millions) | 269.9 | 277.6 | 269.9 | 256.9 | 204.5 | 248.0 | 327.4 | 474.7 | 612.7 | 641 |

[1] Volumes exported are reported as millions of board feet (MMBF) or thousands of metric tons (Mton). Values are free along ship (FAS) in millions of nominal dollars. Unit values are dollars per unit.

Source: Compiled from official statisitics of the U.S. Department of Commerce (1990).

**Figure 8.**
**Quarterly Average Prices of Exported Alaskan Logs and Lumber**



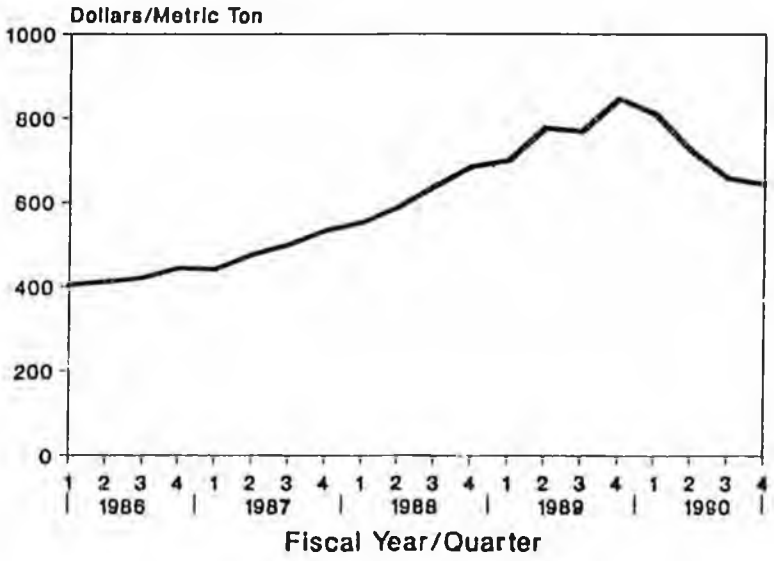

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**Five-Year Trends**

Figure 8 tracks quarterly price averages for exported Alaskan logs and lumber, since 1986. The upward trend, about 50 percent for logs and about 40 percent for lumber over the period, substantially exceeded the average rate of inflation-based price increases for other U.S. producer goods. During these five years on the uphill side of an economic cycle, solid-wood products became more valuable in Alaska and more costly to offshore purchasers, at least in terms of U.S. dollars.

The average price of dissolving-grade pulp leaving Alaska increased by about half over the five-year span (Figure 9). The increase is attributable to growing demand for rayon and acetate fabrics and for paper-grade pulps (Durback, USDA Forest Service 1989). The former change presumably reflected changing consumer tastes in clothing materials as well as rising consumer affluence; the latter trend coincided with an upward economic cycle.

**Figure 9.**
**Quarterly Average Prices of Exported Alaskan Pulp**



### Japan, Major Destination

Japan remains the principal customer for Alaskan wood products. As shown in Table 4, 72 percent of logs and 95 percent of lumber exports were purchased by Japan in FY 1990. The Japanese share of pulp exports was 38 percent; this was the largest single foreign destination (Table 5).

**Table 4. Alaskan Log and Lumber Exports**
**Value by Destination and Fiscal Year**
**(Thousands of dollars)**

| | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|
| **Softwood Logs:** | | | | | |
| Australia | 0 | 0 | 0 | 35 | 150 |
| Canada | 1,707 | 1,564 | 9,840 | 9,313 | 8,625 |
| China | 745 | 0 | 3,775 | 3,229 | 3,735 |
| Germany | 0 | 0 | 0 | 17 | 0 |
| Israel. | 0 | 0 | 37 | 0 | 0 |
| Japan | 91,415 | 126,466 | 148,874 | 211,393 | 252,323 |
| South Korea | 5,778 | 9,613 | 16,595 | 33,833 | 41,315 |
| Taiwan | 0 | 293 | 529 | 3,778 | 4,335 |
| Turkey | 0 | 0 | 0 | 246 | 0 |
| World | 137,935 | 179,645 | 261,643 | 310,348 | 350,873 |
| **Lumber and Cants:** | | | | | |
| Japan | 24,290 | 33,506 | 48,385 | 70,309 | 80,178 |
| South Korea | 315 | 61 | 2,754 | 559 | 732 |
| World | 24,657 | 33,704 | 52,116 | 70,985 | 82,898 |

**Source:** Compiled from official statistics of the U.S. Department of Commerce.

General economic activity was uncommonly high in Japan during FY 1990. Gross national product was 5-1/2 percent above the previous year. Industrial production rose 2 percent, to the highest level since World War II.

For the year as a whole, housing starts in Japan were at the third highest level in the nation's history in 1990, exceeding the U.S. level by half. However, the Japanese rate was peaking, with the all-year rate 2.7 percent above 1989's, while the first six months were more than four percent above the same period of 1989. By late 1990, the world recession was being felt, with housing starts several percentage points below late 1989.

**Table 5. Alaskan Pulp Exports**
**Value by Destination and Fiscal Year**
**(Thousands of dollars)**

| | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|
| Argentina | 1,326 | 1,239 | 1,341 | 0 | 0 |
| Austria | 0 | 103 | 0 | 0 | 0 |
| Bangladesh | 0 | 795 | 0 | 0 | 845 |
| Belgium/ Luxemburg | 1,725 | 2,032 | 1,198 | 4,307 | 2,479 |
| Bulgaria | 531 | 246 | 0 | 0 | 0 |
| Canada | 0 | 0 | 354 | 0 | 68 |
| China | 7,572 | 14,436 | 16,842 | 33,929 | 18,928 |
| Czechoslovakia | 0 | 0 | 47 | 302 | 3,790 |
| Egypt | 5,343 | 3,122 | 5,621 | 7,563 | 11,216 |
| France | 0 | 0 | 0 | 377 | 200 |
| Germany | 1,610 | 931 | 2,171 | 3,276 | 3,122 |
| Hong Kong | 0 | 372 | 0 | 0 | 0 |
| Hungary | 0 | 0 | 0 | 38 | 0 |
| India | 6,837 | 18,401 | 9,043 | 21,192 | 25,214 |
| Indonesia | 1,500 | 3,500 | 2,433 | 1,998 | 6,366 |
| Japan | 42,677 | 45,340 | 77,010 | 82,079 | 76,686 |
| Netherlands | 117 | 112 | 0 | 0 | 0 |
| Poland | 0 | 1,394 | 4,294 | 6,780 | 4,279 |
| South Korea | 1,103 | 1,418 | 3,282 | 4,684 | 7,061 |
| Soviet Union | 3,271 | 4,015 | 5,247 | 10,472 | 7,186 |
| Spain | 1,571 | 0 | 1,271 | 773 | 1,034 |
| Switzerland | 0 | 0 | 0 | 9 | 0 |
| Taiwan | 8,180 | 16,946 | 28,880 | 40,237 | 32,439 |
| Thailand | 2,210 | 1,912 | 2,579 | 5,859 | 2,320 |
| Turkey | 0 | 0 | 0 | 0 | 25 |
| United Kingdom | 0 | 0 | 0 | 73 | 133 |
| World | 85,363 | 113,924 | 160,397 | 227,713 | 203,391 |

**Note:** Alaskan pulp is also shipped to buyers in the Lower 48 states. Traditionally, this market has accounted for 5-10% of total production.

**Source:** Official statistics, U.S. Dept. of Commerce

The value of the yen, relative to the U.S. dollar, changed markedly during FY 1990, first falling and then rising. The changes added to the instability of markets and uncertainty for Alaskan sellers. The yen declined about 12 percent during the first six months of FY 1990, followed by a rise of about 23 percent. These changes contributed to a rise in yen prices of North American lumber, followed by a slight decline. However, the price movements coincided with a buildup and decline in log inventories in Japan, so the specific importance of currency values cannot be deduced clearly.

**South Korean Potential**

South Korea is becoming an important customer for Alaskan roundwood. In FY 1990, 18 percent of Alaskan log exports were bound for South Korea. The volume increased by 3-1/2 times relative to FY 1986.

The diversity of South Korea's wood quality needs is similar to the range of Alaskan offerings. Like Japan, South Korea produces pianos and other goods using Alaska's high-quality spruce (Kim and others [in press]). At the other end of the spectrum, South Korea is well-known for its imports of low-grade softwoods, exemplified by "K-sort" logs from the Pacific Northwest and packaging-grade radiata pine from Chile. Whether South Korean interest will shift to lumber as (exportable) private log supplies diminish in Alaska, is not yet clear.

South Korea's economy grew by 9 percent in 1990, one of the world's fastest growth rates, suggesting sustained strong demand for softwood products. Over the course of a single generation, South Korea has moved from an agrarian subsistence-level country to a newly-industrialized society with a per-capita income of $5,000. National income has doubled, in real terms, in just seven years. The country now has one of the largest economies in Asia. Much of that growth has been founded on manufactured exports, with most imported wood exported as finished goods and packaging. With rising incomes, South Koreans have begun enjoying amenities, including wood-based housing.

**Demand and Timber Quality**

The broad spectrum of Alaska's timber values is rivaled only by British Columbia's. Timber in Southeast Alaska ranges from large, knot-free Sitka spruce (Picea sitchensis (Bong.) Carr.) whose premium logs are valued at several thousand dollars per thousand board feet; to construction-grade spruce and hemlock (Tsuga heterophylla (Raf.) Sarg.) trees of small size, many with internal decay. Within this range lie many marketing options and challenges, the latter because of competing sources abroad (Brooks 1989, Flora and others 1991 a and b, Flora and McGinnis 1989, Flora and Vlosky 1986). Because of opportunities to avoid defects and select product dimensions, sawmilling tends to raise the quality of products, giving additional meaning to the phrase "value-added". Thus a small tree with substantial taper, typical of southeast Alaska's northern reaches and upper elevations, may yield highly valuable tight-grained lumber. In this respect, Alaska's fine-grained smaller trees compete in Japan with Soviet logs; and because federal timber cannot be exported in round form, Soviet logs tend to displace Alaskan national-forest cants from small trees.

The majority of Alaska's timber exports, lumber and logs, are in the middle grades, termed "performance grades" here and elsewhere (Flora and McGinnis 1989, Haynes and Brooks 1990). Performance-grade logs are characterized by substantial length, small knots and little defect; they compete with number 2 sawlogs from the Pacific Northwest. Lumber from such logs, both spruce and hemlock, faces competing supplies from British Columbia and the Pacific Northwest. Nonetheless, because of its prominence in Alaska's inventory and the paucity of competition in this class outside North America, most of Alaska's 1990 log exports represented performance grades. Alaska's lumber exports were at this quality level or above.

# MARKET DYNAMICS

This report is concerned primarily with Alaskan timber circumstances in FY 1990. However some supply and demand factors evolving in 1990 will bear heavily on Alaska's markets in the near future.

The prominence of Southeast Alaska's old-growth forests in the world timber economy was increased in 1990 by two circumstances elsewhere in North America. First, attempts by Federal agencies to develop strategies to ensure survival of the northern spotted owl are likely to restrict timber management activities within the old-growth forests of Oregon, Washington and California. In addition, replanning of private and public cutting are already underway in these areas. The Pacific Northwest Research Station has estimated that the replanning and the emphasis on owl protection are likely to result in a price increase of 137 percent for export logs in the short run. It was estimated that export softwood lumber prices would rise about 116 percent. The above figures assume an 18 percent harvest reduction in the Douglas-fir region of Washington and Oregon from replanning and a 35 percent harvest reduction directly related to owl habitat provisions.[1] (Flora and McGinnis, 1991).

The second matter, also bearing on old-growth timber, was British Columbia's late-1989 return to a strict interpretation of its long-standing prohibition of log exports. During weak markets of the 1980s, certain locales and species had been exempted from the embargo. By late 1990, log exports from British Columbia had fallen by more than half, with the remainder largely attributable to harvests arranged earlier but not yet completed.

A third event was a Congressional embargo on log exports from most States in the West. Excepted were Alaska and one-fourth of Washington's harvests from State-owned lands. Although it was not to take effect until the start of 1991, the embargo was widely anticipated, causing market impacts well in advance.

Anticipation of all three developments probably produced larger inventories of North American logs abroad, and higher prices, than would otherwise have occurred in 1989 and 1990. The Canadian decision, for instance, could reasonably have been expected to raise prices of Canadian export lumber in 1990. There was also rapid growth in softwood lumber exports from the Northwest in 1986-90, based partly on growing Japanese reliance on cants from federal lands, the principal remaining source of old-growth timber. However sharp reductions in Canadian lumber exports to the United States, because of reduced housing demand, undoubtedly damped price movements. In any event, prices of Canadian lumber fell during 1990, prices of Pacific Northwest export lumber remained roughly constant, and Alaskan lumber followed the trajectory shown in Figure 8.

The possibility of a continuing world recession in demand for wood products has been raised by a number of analysts. 1989-90 has been widely seen as a cyclic peak in world wood-based construction activity. High interest rates in Japan, a lower-valued yen, and a trough in housing starts there may coincide to suppress demand for Alaska wood products of all kinds.

Meanwhile, competition from Soviet timber, mentioned earlier with respect to Japan, may be developing. During 1990, several U.S. firms were aggressively surveying timber prospects in the Soviet Far East and eastern Siberia, attempting to secure timber opportunities in especially favorable situations of timber quality and access, while dealing with profound uncertainties about regulatory and ownership circumstances, as well as the likelihood of competition from other countries aiming at developing Soviet resources. Several Pacific Rim countries tentatively plan wood-products investments in the Soviet Union.

U.S. involvement was complicated in 1990 by concerns about the possibility of introducing Soviet forest pests into North America, a matter that came under intensive inter-agency federal study. Whatever the outcome, increased shipments to the Pacific Rim of Soviet timber, whether as logs, lumber or plywood, would have some impact on markets for lower-grade timber everywhere, via a domino effect. Possible effects on prices and U.S. shipments are described elsewhere (Flora and others, 1991a).

Equally uncertain are the prospects for competition for Alaskan wood products from radiata pine (Pinus

1 In mid-1991 the USDI Fish and Wildlife Service expanded by three million acres the area of forest land viewed as habitat critical to maintenance of owl populations in the Pacific Northwest. A great deal of uncertainty persists as to the location and type of timber management activities to be permitted within designated habitat areas. As a result, the impacts of implementing owl strategies are speculative. In particular, the effect on the market for Alaskan wood products will depend on how such environmental actions are perceived internationally. The possibility of similar environmental actions in Alaska could reduce the State's appeal as a source of timber to replace that no longer available from the Pacific Northwest.

radiata ) originating in Chile and New Zealand (Brooks 1989, Flora and others 1991a, Haynes and Brooks 1990). In Chile, harvests increased by half in the three years ending in 1988. Together, the two countries may double harvests in the decade after 1990 (Haynes and Brooks 1990). In the late 1980s, their joint harvest was about 23 million cubic meters annually, or about four billion board feet. A key question is whether pine lumber and logs, with the especially wide growth rings associated with fast growth, will compete in the same markets as Alaska's construction-grade timber. Meanwhile, Japan, Korea and China are significant importers of radiata pine.

During 1990, China increased significantly its capacity to import wood products. Although Alaska did not participate significantly in that market, U.S. softwood log shipments to China were at the annual rate of one-half billion board feet in the last quarter of FY 1990. This was about half the level of 1988, but almost twice the level of third-quarter 1989. China's foreign exchange was growing rapidly at the end of 1990, suggesting further improvement in markets there for basic construction materials. Developments in China may have been among the most dynamic market features of Pacific Rim softwood demand in 1990.

# TIMBER AND THE ALASKAN ECONOMY

**Employment in the Wood Products Industry**

A relatively strong market for Alaskan wood products in FY 1990 resulted in record employment for the industry in Southeast Alaska (Table 6). Total industry employment was estimated to be 3543 jobs. Employment in both logging and sawmills increased in comparison to 1989, although at a slower rate than in previous years. Pulp mill employment declined slightly, dropping back down to the 1988 level.

Economists sometimes use a multiplier to help express the effect that a firm or industry has on a the economic activity of a region. The actual size of the multiplier varies depending upon the availability of the goods and services required by the industry to operate and the portion of the total payroll that is actually spent in the area. Multipliers for Southeast Alaska are smaller than those of metropolitan areas with greater industrial capacity and a larger resident labor force. Nevertheless, when the multiplier concept is applied, the total number of jobs related to timber harvesting is significantly more than the employment reported for the wood products industry alone. An estimated 2570 additional jobs are indirectly supported in other industries such as construction, towing, stevedoring and numerous retail and service outlets.

**Table 6. Employment in the Wood Products Industry of Southeast Alaska Fiscal Years 1981-1990.**

| EMPLOYMENT | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|---|
| Logging | 1047 | 991 | 1010 | 946 | 1004 | 1239 | 1545 | 1981 | 2113 | 2144 |
| Sawmills | 605 | 540 | 429 | 395 | 363 | 331 | 375 | 468 | 478 | 500 |
| Pulpmills | 1081 | 975 | 854 | 700 | 580 | 772 | 861 | 892 | 925 | 899 |
| Total Direct Employment1/ | 2733 | 2506 | 2293 | 2041 | 1947 | 2342 | 2790 | 3341 | 3516 | 3543 |
| Indirect and Induced Employment[2/] | 2125 | 1950 | 1800 | 1600 | 1500 | 1825 | 1950 | 2350 | 2550 | 2570 |
| TOTAL | 4858 | 4456 | 4093 | 3641 | 3447 | 4167 | 4740 | 5691 | 6066 | 6113 |

1/ Source. Alaska Department of Labor and USDA-Forest Service, Alaska Region

2/ These estimates were generated with the computer simulation model IPASS, developed for the Forest Service to analyze the effects of agency management initiatives and investments on employment and earnings in Southeast Alaska. The distinction between direct and indirect employment is a function of the Standard Industrial Classification (SIC) system underlying the collection and grouping of the Federal economic statistics embedded in the model. In this context, the term "direct employment" refers to the number of jobs reported for each industry under its corresponding SIC code. The term "indirect employment" refers to the number of jobs reported under the SIC codes corresponding to the industries from which purchases are made throughout the production process. "Induced employment" refers to the additional number of jobs that are supported when the wages and salaries of these employees are spent locally. Direct employment provides the best indication of the growth of an individual industry while the sum of all three categories is a better indication of the significance of any one industry to the region's economy.

Private timberlands are not subject to the requirement for primary manufacture that restricts the export of most logs from the Tongass. Therefore, almost all of the private timber harvested moves directly into the international market for softwood logs. As a consequence, most of the 1399 jobs provided by the pulp mills and sawmillls in Southeast Alaska are linked to timber supplies from the National Forest. Figure 10 shows that timber cut from lands open to log exporting generates about 3.5 jobs per million board feet harvested annually. This includes the indirect employment as described above. For timber cut on the Tongass, the number of jobs supported per million board feet of annual harvest is estimated at 8.7. The mandate for domestic processing generates 2-1/2 times as much employment per unit of wood in comparison to logs exported in the round.

As illustrated in Figure 11, logging employment is at a decade high but it is subject to wide fluctuations that are closely linked to changes in annual harvest volume. Over the last five years, the number of logging jobs has more than doubled with the resurgance of harvest on National Forest lands and the continued high level of harvest on timberlands owned by the Native corporations. It is not likely that employment will remain at this level because harvest on private timberlands is expected to decline considerably over the next few years (ADOL, "Alaska Economic Trends", June 1991). Because of the remote location of logging operations and the mobility of the work force, the secondary impacts of changes in logging employment are smaller in relation to other components of the wood products industry.

**Figure 10.**
**Total Employment Estimates**
**National Forest vs Export-Oriented Harvest**

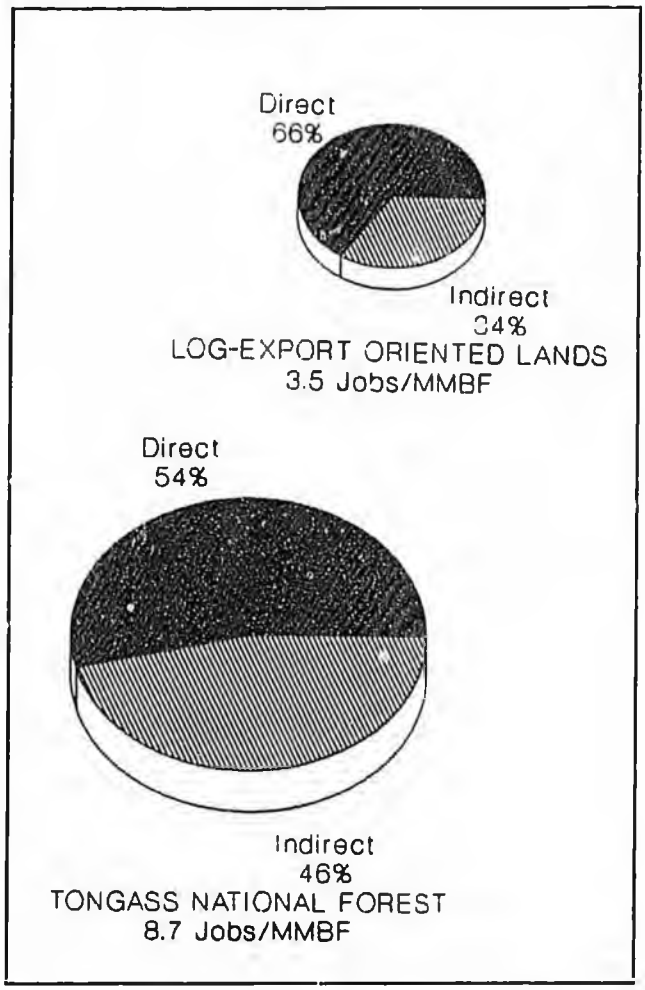
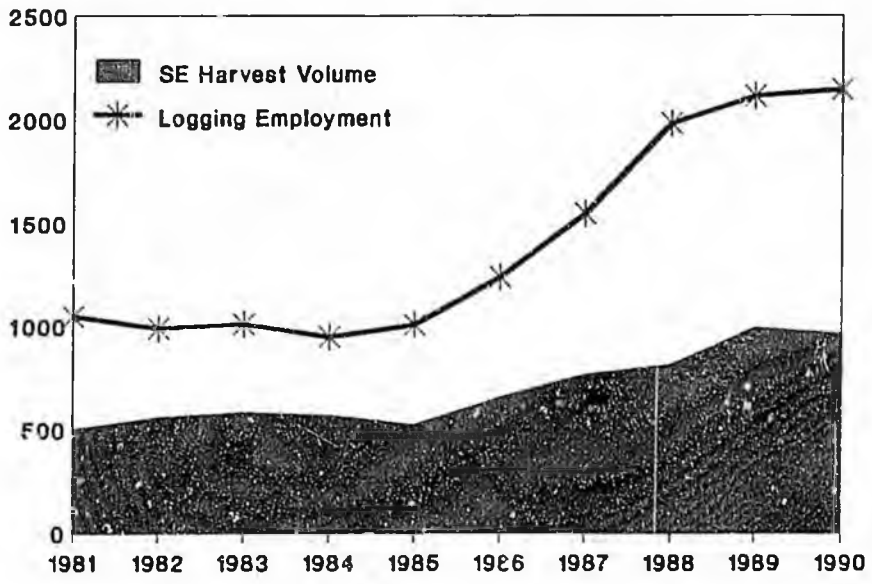



**Figure 11.**
**Timber Harvest and Logging Employment**
**Southeast Alaska 1981-1990**



**Pulp Production in Alaska**

Two pulp mills, one operated by Alaska Pulp Corporation in Sitka and the other by Ketchikan Pulp Company in Ketchikan, were built in the 1950's. Long-term timber sale contracts guaranteed a supply of raw materials and helped to attract new industry to Southeast Alaska. The effort was initiated by the Federal Government and the Territory of Alaska to promote greater economic stability in the region.

> *"During the 1940's the region's economic base was all but wiped out. Gold mining was terminated in 1942. After decades of serious over exploitation, the salmon resource crashed -- average annual salmon harvests declined from 31 million fish in 1945-49 to 19 million fish in 1950-1976 and bottomed out at 8 million fish for 1977-79.*
>
> *The creation of the new forest products industry in 1954, therefore, was something of a rescue mission for the region's economy. The provisions of the fifty year contracts guaranteeing timber supply were essential to induce the substantial private investment required. The initial investment was over one hundred million dollars and further substantial investments were made for increasing capacity and modifying the processes. This made it the largest private investment in Alaska since the Morgan-Guggenhiem investment in copper and a railroad in the first decade of the century. (Rogers, 1989)"*

The two firms continue to dominate the wood processing endeavors of Southeast Alaska and have employed a number of techniques to survive the economic fluctuations of the 1980's:

The same characteristics that provide for stable employment make it difficult for the pulp mills to be responsive to market shifts. The extensive capital investment represents a fixed cost that cannot be altered in the short-term. Also, the nature of production is such that it cannot be adjusted incrementally; the plant must be run continuously or shutdown. The shutdown of either of the mills would have significant impacts on the communities in which they are located. The Ketchikan Pulp Company is ranked as the number ten firm in the State with regard to the number of people employed, and Alaska Pulp Corporation ranks twenty-second. Both are the single largest employers in their respective communities. Some flexibility is achieved by directing more logs to lumber production when the return on processing will be higher. The automated mill constructed at Ward Cove for KPC is illustrative of this symbiotic relationship; Wrangell Forest Products serves the same function for APC.

The pulp mills in Alaska were originally designed to produce high grade dissolving pulp, although they can produce paper grade pulp if market conditions warrant. Given the higher prices that dissolving grade pulp has traditionally commanded, and the availability of raw material which is suited to the production of dissolving pulp, there has been limited production of paper grade pulp to date.

In the world market, the Alaskan mills are at a competitive disadvantage for a number of reasons. Profit margins are reduced by the high costs of harvesting Alaskan timber. When viewed from a global perspective, United States regulations for environmental protection further increase operating costs. Finally, lawsuits threaten the continued availability of an adequate timber supply to maintain a consistent level of pulp production. The plans covering the current operating periods for both the APC and KPC contracts have been in litigation since they were approved by the Forest Service. Harvesting of a portion of the volume has been blocked by court order at various times in the lawsuits. Continued uncertainty as to the availability of raw materials may erode the confidence of world trade partners in the reliability of the Alaskan pulp supply.

# FINANCIAL ANALYSIS OF THE TONGASS TIMBER SALE PROGRAM AND THE ECONOMIC IMPACTS OF THE TIMBER SALE PROGRAM ON SOUTHEAST ALASKA

Harvest and processing of timber from the Tongass National Forest provides employment in Southeast Alaska. Revenues from the Tongass timber sale program are shared by the federal government and the State of Alaska. The State of Alaska uses these shared revenues for schools and roads.

The Tongass Timber program is part of a long-term cooperative effort among the federal government, the State of Alaska and local government to provide greater economic diversity in Southeast Alaska and more year-long employment. The Forest Service established requirements to process National Forest timber in Alaska, including the construction and operation of pulpmills via long-term, 50-year timber sale contracts. Maintaining timber supply opportunities for the Southeast Alaska timber industry was a major objective of the Tongass Land Management Plan and the Alaska National Interest Lands Conservation Act. To a large extent the employment objective was met again in fiscal year 1990 -- logging, sawmill, and pulpmill employment in Southeast Alaska is now 30 percent greater than it was in fiscal year 1981 (Table 3 ).

Clearly, a constant supply of Tongass timber alone cannot assure the maintenance of ANILCA's timber employment objectives. Other controlling factors include exchange rates, the overall Pacific Rim demand for wood fiber and the competitiveness of timber suppliers outside the Tongass National Forest. But, it is certain that with an internationally competitive United States dollar and stable domestic economic growth, the demand for timber from the Tongass National Forest and other ownerships in Southeast Alaska has increased over the past three fiscal years. It is equally clear that Alaskan producers of wood products can survive, prosper and create new jobs in a positive macroeconomic environment which promotes exports from the United States. The Alaska Department of Labor has noted the success of Alaska's manufacturing sectors, and especially the wood products industry, to continue competing abroad and expanding employment.

*"During the good market years of 1986 and 1987, the timber industry posted double digit percentage employment gains. This is strong growth under any circumstances, but especially considering the poor performance of the economy as a whole. In 1986, seafood processing was the only other industry to register any employment gains. Outside of the manufacturing sector, no other major industry groupings posted employment gains during 1986 or 1987. Without the strength of the manufacturing industry, the state's most recent recession would have been even worse."*(Rae, 1988)

### Timber Sale Program Information Reporting System

TSPIRS, which stands for Timber Sale Program Information Reporting System, is an information system developed by the Forest Service for evaluating the performance of timber sale programs on individual National Forests. Congress directed the Forest Service to develop and implement a timber sale cost accounting system. This request was in response to concerns about the efficiency of timber sale programs on the National Forests, especially those sale programs where costs were believed to exceed revenues. These are commonly called below-cost timber sale programs. At Congressional request, the Forest Service developed TSPIRS cooperatively with the General Accounting Office (GAO).

Presented in this section are the *Statement of Revenues and Expenses, Economic Account and Employment, Income, and Program Level Account* from TSPIRS for FY 1990 for the Tongass National Forest. A number of technical reports are available to Congress and the public which describe TSPIRS (GAO 1986, GAO 1987, USDA Forest Service 1987). Provided below is a brief description of the how the findings in TSPIRS are calculated and what the numbers mean. This description of TSPIRS is adapted in part from Schuster and Jones, 1989.

### How the TSPIRS numbers are calculated.

The Statement of Revenues and Expenses, is an annual financial statement. It matches timber-related costs against the revenues received from the timber harvested on the Tongass in fiscal year 1990. The cost of current and previous investments are included. The calculation of revenues and costs are based on "generally accepted accounting principles" for government as established by GAO. Revenues include cash and assets received from timber sale activities on the Tongass, including stumpage receipts, purchaser road credits established and associated charges such as deposits for brush disposal. Costs for the sale of timber on the Tongass are reported in two broad categories, payments to states and

controllable expenses associated with timber harvesting. Controllable expenses include annual costs such as sale administration, general administration and depreciation on agency-funded facilities. Also counted as controllable expenses are allowances from two cost pools.

GAO defines cost pools as deferred-cost asset accounts. One pool accounts for long-term timber development or investment costs (the growth activity pool) and the other deals with short-term or temporary sale operation costs (the sale activity pool). Each pool consists of costs in specified categories accumulated over several years, including fiscal year 1990. Costs are not discounted but enter the pool at current value. The sale activity pool includes multi-year costs attributable to specific timber sales, for example, timber sale preparation. The growth activity pool includes costs which cannot be assigned to an individual timber sale but serve the whole timber sale program or support timber sales in a region or complete drainage. Arterial or main-line roads are a good example of a cost item serving a number of timber sales over many years, and therefore, an item entered as a cost in the growth activity pool.

A percentage of each cost pool was counted as an expense in fiscal year 1990. For example, the percentage of the sale activity pool charged as a current expense is based on the ratio of volume harvested to the sum of volume under contract plus volume harvested. In sum, the Statement of Revenues and Expenses shows that the Tongass experienced a net gain of $2.8 million on its timber sale program in fiscal year 1990.

The Economic Account, displays current and future long-term benefits and costs from the acres receiving timber treatments in fiscal year 1990. Unlike the single-year time frame of the Statement of Revenues and Expenses, the Economic Account has an infinitely long time horizon. Future costs and benefits are discounted to fiscal year 1990.

The purpose of the Economic Account is to display the net present value of the acres affected by timber harvest in fiscal year 1990. Net means positive or negative. Present is defined as discounted costs or benefits. And finally, value refers to the monetized worth of the output produced through the timber sale program. Desirable outputs such as increased hunter-days are considered positive effects while undesirable outputs such as increased sedimentation are assessed as negative effects.

The money spent to establish a new stand of trees is counted as a cost today. Future returns to the government of selling the timber and costs of management are discounted. This is to say the future dollars are compared with dollars invested today which would earn a four percent return on investment after inflation. For example, if an investment yields an eight percent annual return but inflation averages four percent, then the investment, in fact yields a four percent return net of inflation.

The TSPIRS Economic Account for the Tongass National Forest finds that the program of forest management established for the acres harvested in fiscal year 1990 will yield a positive present net value of $19.6 million.

The Employment, Income, and Program Level Account supplements the findings displayed in the Statement of Revenues and Expenses, and the Economic Account with information such as the local economic impacts of the timber sale program. Also reported are general data on the timber sale program such as volume and acres harvested, acres of young stands receiving silvicultural treatments and a display of the miles of road built to support the timber sale effort.

Impacts of the timber sale program on the local economy are estimated using an economic model of Southeast Alaska (McHugh et.al. 1989). Reported are the economic impacts of the harvest and processing of timber from the Tongass National Forest in fiscal year 1990. The employment levels supported by the timber sale program are reported in full-time equivalents. For example, one full-time equivalent in logging may actually represent two timber-felling jobs where each employee is working only six months per calander year due to weather conditions in Alaska.

TABLE 7. Revenues and Expenses Tongass National Forest
Fiscal Years 1989 and 1990

| | FY 1989 | FY 1990 |
|---|---|---|
| **1. REVENUES** | | |
| Timber Sales | 3,573,281 | 16,105,341 |
| Purchaser Road Credit | 17,194,336 | 20,175,165 |
| Associated Charges | 270,954 | 236,225 |
| Interest and Penalties | 72,885 | 113,242 |
| **TOTAL REVENUES** | 21,111,456 | 36,624,973 |
| **2. EXPENSES** | | |
| Sale Administration | 3,192,144 | 5,081,695 |
| Sale Activity Allowance | 4,916,827 | 9,014,615 |
| Growth Activity Allowance | 3,044,602 | 5,321,195 |
| Facilities Depreciation | 538,974 | 538,974 |
| General Administration | 3,200,577 | 4,964,118 |
| **TOTAL OPERATING EXPENSES** | 14,893,123 | 24,920,080 |
| Gain/[Loss] Before Payments to State | 6,218,332 | 11,709,892 |
| **3. PAYMENT TO STATE** | 4,989,178 | 8,888,674 |
| Net Gain/[Loss] From Timber Sales | 1,229,154 | 2,821,218 |
| **4. VOLUME HARVESTED** (Board Feet) | 444,606,000 | 471,634,000 |

**TABLE 8. Present Value of Investments and Future Benefits**
**Tongass National Forest**
**Fiscal Years 1989 and 1990**

| | FY 1989 | FY 1990 |
|---|---|---|
| **1. PRESENT VALUE BENEFITS** | | |
| Timber | 25,972,319 | 38,213,887 |
| Recreation | 0 | 94,838 |
| Wildlife | 26,685 | 456,453 |
| Fisheries | 3,912,963 | 2,100,866 |
| **TOTAL PRESENT BENEFITS** | 29,911,967 | 40,866,044 |
| **2. NEGATIVE EFFECTS** | | |
| Wildlife | 611,801 | 790,356 |
| **3. VALUE OF INVESTMENTS** | | |
| Timber | 18,200,561 | 19,745,018 |
| Roads | 46,775 | 16,628 |
| Recreation | 0 | 10,405 |
| Wildlife | 0 | 2,003 |
| Fisheries | 821,968 | 659,387 |
| **TOTAL INVESTMENTS** | **19,069,304** | **20,433,441** |
| **4. PRESENT NET VALUE** | 10,230,862 | 19,642,247 |

**TABLE 9. Employment, Income, and Physical Accomplishments**
**Tongass National Forest**
**Fiscal Years 1989 and 1990**

| | FY 1989 | FY 1990 |
|---|---|---|
| **1. EMPLOYMENT** | | |
| Direct Jobs | 2,083 | 2,214 |
| Indirect and Induced Jobs | 1,776 | 1,881 |
| **Total Jobs** | **3,859** | **4,095** |
| **2. LOCAL FISCAL EFFECTS** | | |
| Total Personal Income | 128,505,000 | 136,364,000 |
| Federal Income Tax Generated | 24,416,000 | 25,909,000 |
| Cumulative Value to Local Communities | 530,000,000 | 562,450,000 |
| 25% Fund Payment to State | 4,989,178 | 8,888,674 |
| **3. TIMBER PROGRAM ACCOMPLISHMENTS** | | |
| Volume Offered - Net Sawlog | 320,000,000 | 334,300,000 |
| Volume Sold - Net Sawlog | 252,000,000 | 286,513,000 |
| Volume Harvested - Net Sawlog | 377,000,000 | 399,000,000 |
| - Utility and Firewood | 68,000,000 | 73,000,000 |
| **Total Harvest Volume** | 445,000,000 | 472,000,000 |
| Regeneration Treatment (Acres) | 7,908 | 8,128 |
| Timber Stand Improvement (Acres) | 2,414 | 2,792 |
| **Total Acres Harvested** | 13,470 | 14,234 |
| **4. ROADS CONSTRUCTED IN SUPPORT OF TIMBER PROGRAM** | | |
| Appropriated | 8 | 32 |
| Purchaser Credit | 149 | 123 |
| **Total Road Miles** | 157 | 155 |

# Alaska State Legislature

Sen. Lloyd Jones, *Chair*
Sen. Sam Cotten, *Vice-Chair*
Sen. Dick Eliason, *Member*
Sen. Steve Frank, *Member*
Sen. Rick Halford, *Member*
Sen. Curt Menard, *Member*
Sen. Fred Zharoff, *Member*

P.O. Box V
Juneau, AK 99811

907 465-4907
Fax: 907 465-3922

## Senate Resources Committee

April 27, 1992

VIA FACSIMILE

The Honorable Dana Rasmussen
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, Washington 98101

Dear Administrator Rasmussen:

The Senate Resources Committee requests your presence, or that of your representative who has background and policy authority in this area, on May 4, 1992 to testify at an oversight hearing on the relationship of State Water Quality Standards to the Clean Water Act National Pollutant Discharge Elimination System Permitting (NPDES) process. This relationship is an issue of concern to the Committee because of the impact on Alaska from the approach taken by the Environmental Protection Agency (EPA) in its November 19, 1991 proposed rulemaking entitled. "Amendments to the Water Quality Standards Regulation to Establish the Numeric Criteria for Priority Toxic Pollutants Necessary to Bring All States Into Compliance with Section 303(c)(2)(B) (hereinafter "EPA proposed rule"). By this proposed rulemaking, EPA seeks to set water quality standards for Alaska for all the priority toxic pollutants for which EPA has issued section 304(a) water quality guidance criteria that have not already been promulgated by Alaska. While this regulation is still in draft and has just recently been received by the Office of Management and Budget in Washington, D.C., EPA Region 10 seems to have already begun applying it as seen by the appearance of human health criteria at $10^{-6}$ imposed in the preliminary draft permits for two pulp mills.

The Committee needs to know what this portends for Alaska. Accordingly, the Committee would appreciate it if you would provide us written responses in advance[1] and come to the May 4, 1992 oversight hearing prepared to answer the following questions:

---

[1] The Committee would appreciate it if in your written response to be submitted in advance you would first list the question and then follow that

Al Ewing

(1) Even though the human health criterion appeared in the preliminary draft permit for the two pulp mills, is the Committee right to be concerned that the approach taken by EPA's rulemaking as reflected in those permits would impact not only the pulp mills, but would also apply to those in the fish processing, mining and oil and gas industries and municipalities which require an NPDES permit?

(2) Does EPA intend to delay issuance of NPDES permits to affected municipalities and industries while DEC proceeds with amendments to Alaska's water quality standards? Will EPA delay issuance of it NPDES permits while the state completes its triennial review process? If so, how will this affect entities seeking permit renewals?

(3) Has EPA determined how many Alaskan industries and municipalities are seeking new NPDES permits which will be delayed while DEC promulgates new water quality standards to deal with EPA's proposed rules? What is EPA doing to speed up the process to provide these entities undelayed permits?

(4) Has EPA considered the socio-economic impact of EPA's proposed rule on industry and municipalities in Alaska? What, if anything, can EPA do to help reduce these costs through its rulemaking?

(5) Please explain how the impact on receiving water quality from applying the human health factor to the toxic criteria pollutants differs from the impact on receiving water quality from requiring an entity to meet drinking water quality standards. If the human health criteria is more stringent for specific parameters, must DEC make Alaska's drinking water quality standards more stringent? Does EPA know what industries and municipalities would be impacted by such DEC action and at what cost to those industries and municipalities?

(6) Has EPA Office of Counsel or the Department of Justice examined the legal basis for EPA's application of the draft rule to the pulp mills' preliminary draft permits? What is that legal justification?

(7) Have you determined whether EPA's proposed rule falls within the 90 day moratorium on regulations adversely affecting industry announced by the President in his State of the Union address?

(8) Has EPA determined whether the state or the EPA interpretation of the state's WQS is entitled to primacy? Did DEC provide input on EPA's interpretation of the state's WQS set forth in the preliminary draft permits for the pulp mills?

---

with the answer. We understand that the time is short but would appreciate having your written response by noon on May 1, 1992.

(9) It is my understanding that EPA engaged in a lengthy multimedia review of the Sitka pulp mill in August 1990 which resulted in a finding of no dioxin levels in the mills' effluent above normal background as measured by what was expected in the rest of the United States. Is this the case? What were the findings?

(10) In describing the source of the Alaska specific list of toxic priority pollutants promulgated for Alaska by EPA in new regulation 40 CFR § 131.36 (see pages 58449-58450 of EPA's proposed rule), EPA used, among other things, the so-called section 304(l) list "identifying toxic pollutants likely to impair designated uses." (See page 58431) It is my understanding that this 304(l) list was prepared by DEC. Please set forth a detailed history and chronology of DEC's compilation and submission of the section 304(l) list. What were the criteria used for inclusion on the list of an Alaska water body likely to be impaired?

It is my understanding that in the final submission of the section 304(l) list, DEC asserted that only 47 water bodies were impaired, but that EPA insisted upon using a list of 112 Alaskan water bodies. Is this correct? If so, how did this come about and which list does DEC believe is the correct list and why?

(11) As a justification for promulgating water quality standards for priority toxic pollutants for the State of Alaska (and the other 14 states), EPA states in its draft proposed rule:

> "Until standards for toxic pollutants are in place, neither EPA nor the States can fully focus on the emergency, ecologically based water quality activities such as wetlands criteria, biological criteria and sediment criteria."

Id. at 58429. What is EPA doing in these regards? How will these things affect Alaska?

Thank you for your cooperation and for providing written responses to these questions in advance of the hearing. I look forward to seeing you, or your representative, at the May 4, 1992 hearing.

Yours very truly,

Lloyd Jones

Senator Lloyd Jones, Chair

cc: The Honorable John Sandor,
Commissioner, Alaska Department of Environmental Conservation

The Honorable Charles Cole,

The Honorable Paul Rusanowski
Division of Governmental Coordination, State of Alaska

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

Reply to
Attn of: WD-139

Honorable Lloyd Jones
Senate Resources Committee
Alaska State Legislature
P.O.Box V
Juneau, Alaska 99811

Dear Senator Jones:

Thank you for the invitation to attend the May 4, 1992, oversight hearing. Unfortunately, I will be unable to attend. Al Ewing, the Assistant Regional Administrator for the Alaska Operations Office, will be attending in my place.

Enclosed, as requested, are responses to questions you asked in your April 27, 1992 letter. Please call me or Harold Geren of my staff at (206) 553-8414 if you have any further questions.

Sincerely,

for Dana A. Rasmussen
Regional Administrator

cc: John Sandor, Commissioner ADEC
Charles Cole, Attorney General, State of Alaska
Paul Rusanowksi, Division of Governmental Coordination
State of Alaska

Enclosure

05/01/92 14:43 FAX 206 553 0165 WATER DIVISION

QUESTIONS AND ANSWERS

(1) Even though the human health criteria appeared in the preliminary draft permit for the two pulp mills, is the Committee right to be concerned that the approach taken by EPA's rulemaking as reflected in those permits would impact not only the pulp mills, but would also apply to those in the fish processing, mining and oil and gas industries and municipalities which require an NPDES permit?

This question seems to imply that the limitations in the preliminary draft NPDES permits for Alaska Pulp Corporation and Ketchikan Pulp Company were based on the proposed National Toxics Rule. In fact, the permit limits were based on the state's water quality standards, which reference EPA's Quality Criteria for Water (Gold Book) for toxic pollutants. The Gold Book includes criteria based on both human health and aquatic life protection. Where a state has not specifically designated a risk level for carcinogens, it has been EPA's policy to assume a $10^{-6}$ risk level (or, one additional cancer per million exposed individuals). Alaska has not designated a risk level, although the water quality standards do consider carcinogens in the mixing zone provisions and in the reference to the Gold Book for toxic pollutants.

The above-described approach would also apply to other permits. Where necessary, those permits would contain limitations to protect human health. It is unlikely that such pollutants will be present in discharges from fish processing facilities. However, mining, oil and gas, and municipal permits could require limitations based on human health criteria, depending upon whether any of those pollutants were discharged at levels that could exceed the criteria.

(2) Does EPA intend to delay issuance of NPDES permits to affected municipalities and industries while DEC proceeds with amendments to Alaska's water quality standards? Will EPA delay issuance of its NPDES permits while the state completes its triennial review process? If so, how will this affect entities seeking permit renewals?

Where possible, EPA has agreed to delay permits for a reasonable period of time while the state proceeds with its expedited rulemaking. However, it is not likely we would be able to delay permits until the state completes its triennial review. The delay will not affect permittees (whether seeking renewal of existing NPDES permits or new dischargers) whose permits would not require limits that may be affected by the rulemaking. However, the delay could adversely affect certain new

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dischargers whose permits will require water quality-based limits for pollutants that could be affected by the Alaska rulemaking. Those permittees would not be authorized to begin discharging until NPDES permits have been issued.

(3) Has EPA determined how many Alaskan industries and municipalities are seeking new NPDES permits which will be delayed while DEC promulgates new water quality standards to deal with EPA's proposed rules? What is EPA doing to speed up the process to provide these entities undelayed permits?

This question implies that the amendments to the state standards are being undertaken to deal with the National Toxics Rule. It is true that some of the amendments are being proposed to address issues in the Toxics Rule: however, there are also a number of revisions that the state is considering to clarify existing standards or to address pollutants other than those addressed in the Toxics Rule.

There are approximately 40 permits scheduled for issuance or reissuance in the next six months which could be delayed. Most (31) of the 40 permits are for placer mining operations which may not be directly affected by the DEC promulgation. EPA is working with the state to expedite the amendments to the state standards and to ensure a rapid review of the proposed changes. In addition, EPA is continuing to work on the technical and administrative parts of the permits that are not affected by the proposed standards amendments, so that when the amendments are completed, the permits may be issued expeditiously.

(4) Has EPA considered the socio-economic impact of EPA's proposed rule on industry and municipalities in Alaska? What, if anything, can EPA do to help reduce these costs through its rulemaking?

The Office of Management and Budget (OMB) waived the Executive Order requirement to quantify potential economic impacts of this rulemaking. OMB agreed with EPA's conclusion that the great number of assumptions and analytical uncertainties associated with this rulemaking would preclude meaningful quantification of the costs. For example, the development of compliance cost estimates for this rule would require numerous assumptions about pollutant loadings, impacts of technology-based regulations on loadings, combinations of pollutants handled by a given treatment approach, and the costs of each treatment train. The many sources of uncertainty associated with estimating the costs would produce an

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estimate with limited value for evaluating the merits of the rule.

EPA plans, however, to include additional descriptive material related to economics and provide examples of potential impacts. These examples will be based on a best-case, worse-case scenario using several example industries based on data from EPA and the public.

One final note, the proposed rule establishes a legal minimum standard for states that have not complied with the statutory mandate to adopt numeric criteria for toxic pollutants. The statute mandating the rule does not allow cost to be a consideration in setting water quality criteria. However, while criteria may not consider cost, implementation of criteria may do so, for example, in the designation of mixing zone sizes.

(5) Please explain how the impact on receiving water quality from applying the human health factor to the toxic criteria pollutants differs from the impact on receiving water quality from requiring an entity to meet drinking water standards. If the human health criteria are more stringent for specific parameters, must DEC make Alaska's drinking water quality standards more stringent? Does EPA know what industries and municipalities would be impacted by such DEC action and at what cost to those industries and municipalities?

Human health criteria and drinking water standards are fundamentally different from one another. Human health criteria set a minimum standard for ambient waters used potentially for drinking purposes and for consumption of fish and shellfish. Therefore, the human health criteria consider not only exposure to the carcinogen through water consumption (for fresh water only), but also exposure based on the potential for the pollutant to bioaccumulate in fish and shellfish that may be consumed. In contrast, drinking water standards only consider exposure through the consumption of drinking water. They are therefore, independent of one another and changes to one will not influence changes to the other.

(6) Has EPA Office of Counsel or the Department of Justice examined the legal basis for EPA's application of the draft rule to the pulp mills' preliminary draft permits? What is that legal justification?

Again, this question assumes that the limitations in the preliminary draft permits were derived from the draft National Toxics Rule. As discussed above, the limitations were based on the state's existing water quality standards. It should be noted, however, that

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both the state standards and the toxics rule use the Gold Book in establishing numeric criteria.

(7) Have you determined whether EPA's proposed rule falls within the 90 day moratorium on regulations adversely affecting industry announced by the President in his State of the Union address?

Administrator Reilly made a finding of state noncompliance with Section 303(c)(2)(B) before the moratorium. Therefore, to correct noncompliance the 90 day statutory deadline for completing the regulation takes precedence over the moratorium and is binding.

(8) Has EPA determined whether the state or the EPA interpretation of the state's WQS is entitled to primacy? Did DEC provide input on EPA's interpretation of the state's WQS set forth in the preliminary draft permits for the pulp mills?

The state's interpretation of their water quality standards would generally be controlling in determining permit limitations. However, such an interpretation would of course have to be consistent with the plain reading of the standards.

In the course of drafting the preliminary permits, EPA coordinated with DEC regarding the interpretation of state standards. It was at EPA's request that Commissioner Sandor sent a letter on March 24, 1992, clarifying the state's toxicity standard as well as the state's intentions with regard to establishing mixing zones for carcinogens. In addition, EPA sent preliminary draft permits to the state expressly for the purpose of coordinating with DEC regarding their interpretation of the state's standards.

(9) It is my understanding that EPA engaged in a lengthy multimedia review of the Sitka pulp mill in August 1990 which resulted in a finding of no dioxin levels in the mills' effluent above normal background as measured by what was expected in the rest of the United States. Is this the case? What were the findings?

The samples collected during the multimedia inspection did not show detectable levels of dioxin in the Alaska Pulp Corporation (APC) effluent. However, the detection limit used to analyze the samples was in the parts per billion range, several orders of magnitude above the water quality standard for dioxin. In addition, dioxin was not detected in APC's effluent during the EPA/Pulp and Paper Industry Cooperative Dioxin Study (104 mill study), meaning that the concentration of dioxin was less

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that the detection level of 7 parts per quadrillion. This level is still 500 times the criterion, so the inability to detect dioxin in the effluent does not preclude it from being a concern. Dioxin was detected in the sludge during the 104 mill study, which indicates that it is present in unknown quantities in the effluent.

At the same time the multimedia inspection was conducted, a reconnaissance survey was conducted in Silver Bay. The survey found levels of dioxins and furans in the few samples of sediment and fish tissue analyzed that were comparable to levels found in other industrialized areas (e.g., Puget Sound). Because dioxin is a carcinogen, EPA believes that exposure to any level of dioxin poses some cancer risk. The levels of dioxins and furans found in Sitka Bay were not such that the bay needs to be closed to recreational or commercial fishing; however, the levels are such that we need to continue to do as much as possible to reduce them. This is the same strategy that EPA and other states are following in areas like Puget Sound where dioxin has been found.

(10) In describing the source of the Alaska specific list of toxic priority pollutants promulgated for Alaska by EPA in new regulation 40 CFR § 131.36 (see pages 58449-58450 of EPA's proposed rule), EPA used, among other things, the so-called section 304(l) list "identifying toxic pollutants likely to impair designated uses." (See page 58431) It is my understanding that this 304(l) list was prepared by DEC. Please set forth a detailed history and chronology of DEC's compilation and submission of the section 304(l) list. What were the criteria used for inclusion on the list of an Alaska water body likely to be impaired?

It is my understanding that in the final submission of the section 304(l) list, DEC asserted that only 47 water bodies were impaired, but that EPA insisted upon using a list of 112 Alaskan water bodies. Is this correct? If so, how did this come about and which list does DEC believe is the correct list and why?

This question implies that the list of toxic priority pollutants promulgated for Alaska by EPA was based on Alaska's section 304(l) list. This is not the case.

Over the course of several years in working with the states, the Agency reviewed the readily-available data, including states' section 304(l) lists, on the discharge and presence of priority toxic pollutants. The data strongly indicated the discharge or presence of virtually all priority toxic pollutants in all states. After evaluating these data, EPA concluded that a comprehensive

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promulgation of federal criteria for all priority section 304(a) toxic pollutants was appropriate. EPA then proposed criteria for all priority toxic pollutants not fully addressed by state criteria. This, rather than Alaska's 304(l) list, was the basis for the promulgated criteria identified on pages 58449-58450 of the proposed rule.

Attached is a public notice of the Agency's 304(l) list of waters in Alaska. It summarizes EPA's notice of final decision and response to comments regarding the listing of Alaskan waters under section 304(l).

(11) As a justification for promulgating water quality standards for priority toxic pollutants for the State of Alaska (and the other 14 states), EPA states in its draft proposed rule:

> "Until standards for toxic pollutants are in place, neither EPA nor the States can fully focus on the emergency, ecologically based water quality activities such as wetlands criteria, biological criteria and sediment criteria."

Id. at 58429. What is EPA doing in these regards? How will these things affect Alaska?

EPA has been expending considerable time and resources on bringing states into compliance with section 303(c)(2)(B). EPA is pleased that this rulemaking is coming to a close so that we can again pay attention to other priority activities such as developing guidance and criteria for wetlands, biocriteria and sediment.

At this point in time, EPA has made varying degrees of progress in publishing guidance and criteria for each of these subject areas. The process will be long term. States will be encouraged to periodically update their standards in response to new information released by EPA.

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United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

MAY 1 - 1992

Reply to
Attn of: WD-139

Honorable Lloyd Jones
Senate Resources Committee
Alaska State Legislature
P.O.Box V
Juneau, Alaska 99811

Dear Senator Jones:

Thank you for the invitation to attend the May 4, 1992, oversight hearing. Unfortunately, I will be unable to attend. Al Ewing, the Assistant Regional Administrator for the Alaska Operations Office, will be attending in my place.

Enclosed, as requested, are responses to questions you asked in your April 27, 1992 letter. Please call me or Harold Geren of my staff at (206) 553-8414 if you have any further questions.

Sincerely,

for Charles Findley

Dana A. Rasmussen
Regional Administrator

cc: John Sandor, Commissioner ADEC
Charles Cole, Attorney General, State of Alaska
Paul Rusanowksi, Division of Governmental Coordination
State of Alaska

Enclosure

QUESTIONS AND ANSWERS

(1) Even though the human health criteria appeared in the preliminary draft permit for the two pulp mills, is the Committee right to be concerned that the approach taken by EPA's rulemaking as reflected in those permits would impact not only the pulp mills, but would also apply to those in the fish processing, mining and oil and gas industries and municipalities which require an NPDES permit?

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**The above-described approach would also apply to other permits. Where necessary, those permits would contain limitations to protect human health. It is unlikely that such pollutants will be present in discharges from fish processing facilities. However, mining, oil and gas, and municipal permits could require limitations based on human health criteria, depending upon whether any of those pollutants were discharged at levels that could exceed the criteria.**

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**Where possible, EPA has agreed to delay permits for a reasonable period of time while the state proceeds with its expedited rulemaking. However, it is not likely we would be able to delay permits until the state completes its triennial review. The delay will not affect permittees (whether seeking renewal of existing NPDES permits or new dischargers) whose permits would not require limits that may be affected by the rulemaking. However, the delay could adversely affect certain new**

**dischargers whose permits will require water quality-based limits for pollutants that could be affected by the Alaska rulemaking. Those permittees would not be authorized to begin discharging until NPDES permits have been issued.**

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Over the course of several years in working with the states, the Agency reviewed the readily-available data, including states' section 304(l) lists, on the discharge and presence of priority toxic pollutants. The data strongly indicated the discharge or presence of virtually all priority toxic pollutants in all states. After evaluating these data, EPA concluded that a comprehensive

**promulgation of federal criteria for all priority section 304(a) toxic pollutants was appropriate. EPA then proposed criteria for all priority toxic pollutants not fully addressed by state criteria. This, rather than Alaska's 304(l) list, was the basis for the promulgated criteria identified on pages 58449-58450 of the proposed rule.**

**Attached is a public notice of the Agency's 304(l) list of waters in Alaska. It summarizes EPA's notice of final decision and response to comments regarding the listing of Alaskan waters under section 304(l).**

(11) As a justification for promulgating water quality standards for priority toxic pollutants for the State of Alaska (and the other 14 states), EPA states in its draft proposed rule:

> "Until standards for toxic pollutants are in place, neither EPA nor the States can fully focus on the emergency, ecologically based water quality activities such as wetlands criteria, biological criteria and sediment criteria."

Id. at 58429. What is EPA doing in these regards? How will these things affect Alaska?

**EPA has been expending considerable time and resources on bringing states into compliance with section 303(c)(2)(B). EPA is pleased that this rulemaking is coming to a close so that we can again pay attention to other priority activities such as developing guidance and criteria for wetlands, biocriteria and sediment.**

**At this point in time, EPA has made varying degrees of progress in publishing guidance and criteria for each of these subject areas. The process will be long term. States will be encouraged to periodically update their standards in response to new information released by EPA.**

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

SEP 2 1991

Reply to
Attn of: WD-139

John A. Sandor
Commissioner
Alaska Department of Environmental Conservation
P.O. Box 0
Juneau, Alaska 99811-1800

Dear Mr. Sandor:

I have enclosed the U.S Environmental Protection Agency's (EPA) final lists of waters required under Clean Water Act Section 304(l)(1)(A)(ii) (the long list), and EPA's Response to Public Comments.

As you know, on May 31, 1990, EPA withdrew our approval of Alaska's long list and proposed our own long list. At that time, we also solicited public comments and any additional information or petitions to add waters to the list. Today I am transmitting our final listing decisions made in response to these public comments and to further data evaluation by EPA.

I appreciate the assistance of you and your staff in developing this list. Please call me if you have any questions concerning our actions, or have your staff call Judith Leckrone at (206) 553-6911.

Sincerely,

Dana A. Rasmussen
Regional Administrator

Enclosures

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

Reply To
Attn Of: WD-139

SEP 24 1991

Dear Interested Party,

I have enclosed a letter from Dana Rasmussen, U.S. Environmental Protection Agency (EPA) Regional Administrator, to John Sandor, Commissioner of the Alaska Department of Environmental Conservation that transmits and summarizes EPA's notice of final decision and response to comments regarding the listing of Alaskan waters under Section 304(l)(1)(A)(ii) of the Clean Water Act.

If you have any questions or would like additional information, please contact Judith Leckrone in the Office of Water Planning, Water Quality Section at (206) 553-6911.

Sincerely,

Harold Burd

for Robert S. Burd
Director, Water Division

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 10

1200 SIXTH AVENUE

SEATTLE, WASHINGTON 98101

## I. NOTICE OF THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY'S LIST OF WATERS IN ALASKA REQUIRED BY SECTION 304(l)(1)(A)(ii) OF THE CLEAN WATER ACT AS AMENDED BY THE WATER QUALITY ACT OF 1987

## II. TODAY'S ACTION

The U.S. Environmental Protection Agency (EPA) is issuing a final list of waters in Alaska that meet the requirements of Section 304(l)(1)(A)(ii) of the Clean Water Act. The list of waters can be found in Attachment A of this notice.

## III. DESCRIPTION OF SECTION 304(l) REQUIREMENTS:

Section 304(l) of the Clean Water Act (the Act) as amended by the Water Quality Act of 1987 required every state to develop lists of impaired waters, identify certain point sources and amounts of pollutants causing toxic impact, and to develop individual control strategies for each identified point source.

Section 304(l) required the state to submit the above information in four lists. The first list included waters which,

after application of the technology-based requirements of section 301(b)(2) of the Act, could not reasonably be expected to attain or maintain certain state numeric water quality standards (those developed in accordance with section 303(c)(2)(B) of the Act) for the toxic pollutants listed under section 307(a) of the Act. (Paragraph (1)(A)(i) of section 304(l) required this list.)

The second list included all waters which, after application of the technology-based requirements of section 301(b)(2) of the Act, could not reasonably be expected to attain or maintain water quality standards for any conventional, nonconventional or toxic pollutant due to any point or nonpoint source of pollution; this list was also to include waters classified for uses not meeting the fishable or swimmable goals of the Act. (Paragraph (1)(A)(ii) of section 304(l) required this list.)

The third list included waters not meeting numeric or narrative water quality standards for the toxic pollutants listed under section 307(a) of the Act due entirely or substantially to discharges from point sources. (Paragraph (1)(B) of section 304(l) required this list.)

The fourth list was a list of point sources discharging the section 307(a) pollutants into waters listed under paragraph (1)(B). This list of point sources was to include the amount of pollutant which the point source was discharging into the water.

The state was to develop and submit an individual control strategy for each point source on the third list. The individual control strategy was to be a draft or final National Pollutant

Discharge Elimination System permit. The individual control strategy was to be designed to ensure that applicable water quality standards are achieved no later than three years after the establishment of the individual control strategy.

The deadline for submitting lists of waters, point sources, amounts of pollutants and the individual control strategies by each state to the EPA was February 4, 1989. The state of Alaska's lists were submitted to EPA, Region 10, on February 23, 1989 (for the section 304(l)(1)(A)(i) and (B) lists), on April 12, 1989 (for the section 304(l)(1)(C) list), and on May 26, 1989 (for the section 304(l)(1)(A)(ii) list).

For states such as Alaska which are not authorized by the EPA to issue permits under the National Pollutant Discharge Elimination System program, the EPA was to develop the individual control strategies. The only individual control strategy required for Alaska was for the Alyeska ballast water treatment facility, which was issued by the EPA on May 8, 1989.

Not later than 120 days after a state submitted the lists and individual control strategies to the EPA, the EPA was to approve or disapprove the lists and control strategies. If a state failed to submit a list or control strategy, or the EPA did not approve a list or control strategy, the EPA, in cooperation with the state and after opportunity for public comment, was to develop the lists and control strategies.

The EPA issued a decision on June 9, 1989, to approve the state of Alaska's submissions under section 304(l). Notice of

the EPA's decisions was published in local Alaska newspapers on June 26, 1989. Since all lists were approved or conditionally approved, and because the state had conducted a public review of its proposed lists of waters and sources, the EPA did not solicit additional public comments or petitions to add waters or sources to Alaska's lists.

## IV. EPA'S WITHDRAWAL OF APPROVAL AND DISAPPROVAL OF ALASKA'S SECTION 304(l)(1)(A)(ii) LIST:

On May 31, 1991, the EPA withdrew its previous approval of the state of Alaska's list of waters required by section 304(l)(1)(A)(ii) (the "long list"), and consequently disapproved the state's list. The EPA's prior approval of this list was conditioned upon the state's commitment to further evaluate waters suspected of being impaired or threatened by timber harvesting and placer mining. The basis for the EPA's withdrawal was the failure of the state to fulfill that commitment.

The EPA's prior approval of Alaska's long list of waters was largely based on statements in the state's May 26, 1989 letter to the EPA that "completion of the [Clean Water Act section] 319 assessment will result in a number of additional waterbodies being documented as impaired." The EPA interpreted this statement as a commitment that further evaluation of the information available to the state, or additional documentation of actual or threatened impairment, would occur. EPA's approval of the Alaska long list was conditioned on Alaska's fulfillment

of this commitment. However, the listings of impaired waters in the section 319 Nonpoint Source Assessment and the state's 1990 report required by section 305(b) of the Act, did not differ significantly from the state's final long list of waters, and did not adequately address waters degraded or threatened by forest practices and other activities.

The state's preliminary long list, submitted to the EPA in October 1988, included numerous waters impaired or threatened by forest practices and other activities. Since the state conducts only limited monitoring of ambient water quality, many of their listing decisions on this preliminary list were based upon "best professional judgment." The final long list submitted by the state on May 26, 1989, however, was limited to "....only those waters that are confirmed to violate one or several water quality standards." This decision to restrict the long list to waters with documented violations of water quality standards does not meet the requirements of section 304(l)(1)(A)(ii) (see below). In addition, given the paucity of ambient monitoring data on streams in Alaska affected by timber harvesting and other activities, the decision effectively deleted all such streams from the list. As a result, the final long list contained 112 fewer waterbodies than the preliminary list.

The EPA, therefore, proposed on May 31, 1990, to issue its own list of waters, based on the state's preliminary long list. At this time, the EPA provided a 120-day public comment period during which the EPA solicited public comment on its proposal to

issue its own long list, and encouraged all parties to submit both data and recommendations based upon "best professional judgement" to the EPA during the public comment period.

## V. DESCRIPTION OF TODAY'S ACTION

Today's action responds to public comment and issues a final list of waters to meet the statutory requirements of Section 304(l)(1)(a)(ii) of the Act. Today's list of waters differs from the final list issued by the state primarily in that today's list includes waters that EPA believes based on professional judgment, "cannot reasonably be anticipated to attain or maintain ... that water quality which shall assure protection of public health, public water supplies, agricultural or industrial uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow recreational activities in and on the water." This is the section 304(l)(1)(A)(ii) language which clearly does not limit EPA or the state to listing under this paragraph of section 304(l) only those waters with documented violations of water quality standards, as the state did.

Best Professional Judgment

The State of Alaska is extremely large and its ambient water quality monitoring network is quite limited. Consequently, there are only a few waters where documented violations of water quality standards exist. Data and information on water quality impacts of resource extracting industries (e.g. mining and forestry) is particularly limited. Consequently, EPA believes

that it is appropriate to rely on the best professional judgment of field personnel in order to evaluate whether a water is impaired.

The EPA considers the use of best professional judgment to be appropriate in making listing decisions under section 304(l) where adequate ambient monitoring data does not exist. Listing decisions under section 304(l) were intended to cast a "broad net" in the list development and review process, and were to include both waters reasonably believed to be degraded as well as waters whose quality was reasonably believed to be threatened. In evaluating a broad universe of waters for possible inclusion on the lists, states were to list waters which "....the data and information show, after assurance of its reliability and the use of professional judgment, cannot reasonably be anticipated by the state to attain or maintain applicable water quality standards..." (see preamble to the regulations for implementing section 304(l) in the June 2, 1989 Federal Register Vol. 54 No. 105 at 23868)

Use of best professional judgment by EPA and the states to assess water quality and habitat conditions is a common, accepted practice. EPA's guidance for the Clean Water Act Section 305(b) Reports states that waters for which ambient monitoring data is scarce or nonexistent "should be included in the 305(b) process if the state has any reasonable basis for evaluation." The guidance calls these "evaluated" waters (as opposed to monitored waters).

> "Evaluated waters" are those waterbodies for which the use support decision is based on information other than current site-specific ambient data, such as land use, location of

sources, predictive modelling using estimated input variable, surveys of fisheries personnel, and citizen complaints.

Guidelines for Listing Decisions

EPA has listed only those waters today for which it was able to identify and evaluate impacts based on quantitative data or on adequate best professional judgment. The Alaska Department of Conservation (ADEC) in 1987 conducted a one-time survey of field professionals by distributing questionnaires to state and federal resources agencies throughout the state. Though the information provided by these questionnaires is limited, EPA reviewed them along with data submitted in response to its May 31, 1990, request for data and public comments. In addition, EPA contracted with the University of Alaska to evaluate available forestry related data, and conducted limited site visits in conjunction with U.S. Forest Service staff.

Today's decisions are based on these review and collection activities. EPA used the following guidelines when deciding which waters to list on today's final list.

- Include all of the waters that ADEC included on its May, 1989, final list.
- Include all waters that ADEC identified as water quality-limited in July, 1990.
- Include all waters that ADEC identified as impaired in its 1990 Clean Water Act Section 305(b) Report.
- Include waters for which ADEC had received a returned questionnaire which indicated that the respondent had based his or her judgment of "impaired" or "threatened" on

verifiable quantitative or qualitative data and information.

- Delete all those waters for which there was no questionnaire available and were listed as "threatened' or "unimpacted" in Alaska's 1988 Clean Water Act Section 305(b) water quality report. Many of the waterbodies that were listed in the 1988 305(b) report were pristine, and there was little or no explanation on how a proposed management activity would threaten water quality.
- Include all waters that the U.S. Forest Service identified as having adversely impacted fisheries or water quality, or both, in its October, 1990, public comments to EPA.
- Add or delete waters in response to other public comments or petitions when the comments or petitions relied upon quantitative or qualitative data.
- Add or delete waters for which any other quantitative or qualitative data exists or information based on Best Professional Judgment exists that EPA believes indicates that the addition or deletion of the water is appropriate.

Need for Improved and Ongoing Water Quality Assessment

EPA recognizes that there is widespread disagreement on the actual water quality status of many of the state's waters. Some waters not listed on today's list may in fact have serious water quality or fisheries impacts, or conversely, waters listed may not be as severely impacted as the available data indicates. However, water quality assessment and problem identification is an ongoing process and EPA is working with the State of Alaska to improve the state's water quality problem identification

protocols. In addition, EPA is under court order to take all necessary steps to ensure that degraded Alaskan waters are identified. Finally, proposed revisions to EPA's Water Quality Management regulations (40 CFR Part 130) would require all states to identify and report their degraded waters every two years. Therefore, EPA is requesting that the state clarify the water quality status of those waters not listed today, or those mistakenly listed, in subsequent Alaska Section 305(b) water quality reports.

## VI. PUBLIC COMMENT AND REQUESTS FOR PUBLIC HEAKING

Since the EPA is making final decisions on the listing of waterbodies, no further public comment or requests for hearing are solicited.

## VII. PETITIONS TO ADD WATERS

Because a 120-day public comment period, including an opportunity to petition to add waters to the list, has already occurred, the EPA is not accepting further petitions to add to the list.

## VIII. EPA RESPONSE TO COMMENTS

The Regional Administrator has considered all petitions and comments received after the May 31, 1990, notice and has provided a written response to these comments and petitions. This response to comments and petitions will be available to the

public, and can be obtained by contacting the person named at the end of this notice.

## IX. ADDITIONAL INFORMATION ABOUT THE EPA'S DECISIONS OF APPROVAL AND DISAPPROVAL AND SECTION 304(l)

The administrative record containing the EPA's documentation on its decision under section 304(l) is on file and may be inspected at the EPA, Region 10 office between the hours of 8:30 a.m. and 4:30 p.m., Monday through Friday except holidays. To make arrangements to examine the administrative record, contact the person named at the end of this notice.

The administrative record is also available at the Alaska Operations Office of the EPA at Room 537, Federal Building, 222 W. 7th Avenue, #19, Anchorage, Alaska, (907) 271-5083 or 3200 Hospital Drive, Suite 101, Juneau, Alaska (907) 586-7619.

For additional information about section 304(l), see the EPA's publication Final Guidance for Implementation of Requirements Under Section 304(l) of the Clean Water Act as Amended (March 1988), and final regulations under section 304(l) published in the Federal Register June 2, 1989.

Copies of these documents and of section 304(l) of the Act may be obtained by writing or calling the EPA contact person named below.

Judith Leckrone
Office of Water Planning, WD-139
U.S. EPA, Region 10
1200 Sixth Avenue
Seattle, Washington 98101
(206) 553-6911

Dana Rasmussen
Regional Administrator

9-24-91
Date

ATTACHMENT A

# FINAL

# CLEAN WATER ACT

# SECTION 304(l)(1)(A)(ii) LIST

# FOR THE STATE OF ALASKA

SEPTEMBER 1991

## THE SECTION 304(l) LONG LIST

The Section 304(l) long list is a comprehensive list of waters of concern in the state of Alaska. According to Section 304(l) of the Clean Water Act (the Act) this list must include all waters which are not reasonably expected to attain or maintain water quality standards for any conventional, nonconventional or toxic pollutant due to any point or nonpoint source of pollution. It must also include those waters classified for uses that do not meet the fishable or swimmable goals of the Act.

The attached long list of waters was prepared by the U.S Environmental Protection Agency, Region 10 (EPA). The Alaska Department of Conservation (ADEC) had submitted its own long list of waters as required by Section 304(l), but EPA ultimately disapproved that list because it believed it was inadequate. (Please see the document Notice of the U.S. EPA's List of Waters in Alaska Required By Section 304(l)(1)(A)(ii) of the Clean Water Act of 1987, September, 1991, for a full description of the requirements of Section 304(l), a history of Section 304(l) activities in Alaska, and the specific guidelines EPA used to develop this list.)

A water's presence on the Section 304(l) long list does not necessarily mean that sources to that water will be subject to any source control activities. The long list serves as a universe from which EPA or the state can choose waters for further monitoring and assessment to determine if a water needs to be placed on one of the other lists of waters described below. However, waters not listed on the long list can also be listed on the other lists as well.

States are required to submit several lists of waters to EPA pursuant to various sections of the Act. These lists do overlap, and understandably can cause confusion. Therefore, the following is a brief description of the other lists.

The Section 303(d) list of water quality-limited waters.

The Section 303(d) list of waters is a subset of the long list of waters. These waters are "water quality-limited" and therefore require the establishment of a total maximum daily load (TMDL). Water quality-limited waters are those waters that still do not meet water quality standards even after the sources of pollution to the water have applied technology-based controls to their discharges. A TMDL establishes the allowable loadings of a pollutant into a waterbody.

The Section 305(b) Report list of impaired waters.

The Section 305(b) Report is a report on the state's overall water quality. Every state is required to submit a 305(b) report to EPA every two years. All waters that appear on the Section 305(b) Report list of impaired waters also appear on the long list of waters.

The state has identified the waters on the Section 305(b) Report list as impaired though not necessarily water quality-limited, therefore ADEC did not include these waters in its July, 1990, Section 303(d) list of waters. These waters are candidates for a TMDL but need further assessment and monitoring to determine if one is necessary.

The Section 319 nonpoint source list.

The nonpoint source list is a subset of the long list waters. These waters are impacted primarily by nonpoint sources of pollution. Section 319 of the Act requires that every state prepare an assessment report that identifies all waterbodies affected by nonpoint source pollution. The state must also identify the types of nonpoint source pollution that affect the waterbody (e.g agriculture, mining). The Act also requires each state to prepare a Management Strategy that includes plans for reducing pollution from each of those types of sources and to the particular waterbodies.

# ALASKA §304(1) LONG LIST OF WATERBODIES

| Alaska ID Number | Waterbody | Location | Causes |
|---|---|---|---|
| **1. Southeast Alaska** | | | |
| | **Southeast Mainland** | | |
| 10101-004 | Bradfield R | S of Wrangell | TH |
| | **Ketchikan** | | |
| 10102-003 | Unnamed Cr | Ketchikan | LF |
| 10102-010 | Hoadly Cr | Ketchikan | UR LD RD |
| 10102-011 | Herring Bay Cr | Ketchikan | UR LD |
| 10102-012 | ADF&G 101-45-10500 | George Inlet | TH RC |
| 10102-601 | Ward Cove | Ketchikan | IN Pulp Mill |
| | **Prince of Wales** | | |
| 10103-004 | Dog Salmon Creek | Port St. Nicholas | TH RC |
| 10103-007 | Harris R-below Fubar cr | Hollis | TH RD |
| 10103-011 | Natzuhini Cr | Hydaburg | TH RC |
| 10103-012 | Staney Cr | Prince of Wales Is | TH |
| 10103-023 | N Fork Deer Cr | Prince of Wales Is | TH RC |
| 10103-026 | Black Cr | Prince of Wales Is | TH RC RD RE |
| 10103-029 | Rush Cr | | TH |
| 10103-031 | Fubar Cr | Prince of Wales Is | RC |
| 10103-401 | Dora Lake | Prince of Wales Is | TH RC |
| 10103-601 | Thorne Bay | Prince of Wales | HA SE LTF |
| | **Southeast Mainland — Central** | | |
| 10201-002 | Hobart Bay Cre | N of Petersburg | TH |
| | **Kulu - Kuprеanof - Mitkof - Etolin - Zarembo - Wrangell Islands** | | |
| 10202-601 | Wrangell Narrows | Petersburg | TH UR ST PP RD SF |
| 10202-602 | Rowan Bay | Kuiu Is | TH |
| | **Baranof - Chichagof Islands** | | |
| 10203-005 | Granite Cr | Sitka | UR GH |
| 10203-022 | Katlian R | Sitka N | TH |
| 10203-024 | Nakwasina Cr | Sitka N | TH |
| 10203-025 | Rodman Cr | Sitka N | TH |
| 10203-601 | Silver Bay | Sitka | IN Pulp Mill |
| 10203-602 | Klag Bay | Chichagof Island | MI TA |
| 10203-603 | Long Island | Port Frederick | TH |
| 10203-604 | Herring Cove | Sitka | LF Woodwaste |
| | **Lynn Canal** | | |
| 10301-002 | Salmon Cr | Juneau | UR DDE PCB |
| 10301-003 | Sawmill Cr | Haines | UR ST CH SM RD |
| 10301-005 | Duck Cr | Juneau | UR PP LF CH RD LD |
| 10301-008 | Gold Cr | Juneau | GH UR |
| 10301-009 | Jordan Cr | Juneau | UR LD LA |
| 10301-010 | Lawson Creek | Douglas | UR RD CH SM |
| 10301-011 | Lemon Cr | Juneau | UR PP MI LF SM GH |
| 10301-012 | Mendenhall R | Juneau | UR SE |
| 10301-014 | Pederson Hill Cr | Juneau | UR SE LD |
| 10301-017 | Vanderbilt Cr | Juneau | UR GM LF |

Cause Codes:

| | | | | |
|---|---|---|---|---|
| Cd= Cadmium | IN= Industrial | Pb= Lead | SE= Sewage Discharge | TA= Tailings |
| CH= Channelized Stream | LD= Land Development | PCB | SF= Seafood Processing | TN= Timber Harvest |
| DA= Dam/Flow Regulation | LF= Landfill | PP= Petroleum Products | SM= Streambank Modif. | TO= Toxic Substances |
| GM= Gravel Mining | MI= Mining | RC= Road Construction | ST= Septic Tanks | UR= Urban Runoff |
| Hg= Mercury | OG= Oil & Gas | RD= Road Runoff | STP=Sewage Treatment Plant | Zn= Zinc |

# ALASKA §304(l) LONG LIST OF WATERBODIES

| Alaska ID Number | Waterbody | Location | Causes |
|---|---|---|---|
| | **Lynn Canal (con't)** | | |
| 10301-020 | Salmon Cr | Juneau | UR ED |
| 10301-401 | Twin Ls | Juneau | UR LD RE |
| | **Chilkat - Skagway Rivers** | | |
| 10303-004 | Pullen Cr | Skagway | UR IN LD CH RD |
| 10303-601 | Skagway Harbor | Skagway | Ore facility Pb Zn Cd Hg |
| | **Yakutat Bay** | | |
| 10401-601 | Sawmill Cove | Yakutat | TH |

## 2. Southcentral Alaska

| | | | |
|---|---|---|---|
| | **Eastern Prince William Sound** | | |
| 20201-401 | Robe L | Valdez | DA UR |
| 20201-402 | Eyak L | Cordova | UR SE ST RD LD |
| 20201-602 | Port Valdez | Valdez | OG BWT plant |
| 20201-605 | Prince William Sound | | OG PP |
| | **Western Prince William Sound** | | |
| 20202-001 | Clear Cr | Seward | UR ST TO |
| 20202-602 | Kenai Fjords | South Central Alaska | OG PP |
| | **Lower Kenai Peninsula** | | |
| 20301-601 | Seldovia Bay | Seldovia | SE |
| | **Upper Kenai Peninsula** | | |
| 20302-002 | Kenai R | Kenai | UR ST RE STP |
| 20302-404 | Fire L | Anchorage | UR |
| 20302-701 | Kenai Wetlands | Kenai OG Fields | OG IN PP |
| | **Anchorage** | | |
| 20401-001 | Cherry Hill Cr | Anchorage | PP |
| 20401-002 | Glacier Cr | Anchorage | PP UR |
| 20401-003 | Chester Cr | Anchorage | UR SE ST SM PP |
| 20401-004 | Campbell Cr | Anchorage | UR ST RD STP SE |
| 20401-005 | Fish Cr | Anchorage | UR DA RD LD ST PP SM |
| 20401-006 | Furrow Cr | Anchorage | UR SE LD SM CH |
| 20401-007 | Rabbit Cr | Anchorage | UR ST SM |
| 20401-014 | Eagle R | Eagle R | UR SE |
| 20401-017 | Little Campbell Cr | Anchorage | UR ST RC SM LD |
| 20401-019 | Peters Cr | Anchorage | UR |
| 20401-020 | Ship Cr | Anchorage | UR PP PCB |
| 20401-401 | Mirror Lake | Anchorage | UR ST RD |
| 20401-402 | Campbell Lake | Anchorage | UR LD |
| 20401-403 | Cheney Lake | Anchorage | UR |
| 20401-404 | Conners Lake | Anchorage | UR |
| 20401-407 | Goose L | Anchorage | UR |
| 20401-408 | Hidden Lake | Anchorage | UR |
| 20401-410 | Jones L | Anchorage | UR LD |
| 20401-412 | L Hood/Spenard | Anchorage | UR |

Cause Codes:

| | | | | |
|---|---|---|---|---|
| CD= Cadmium | IN= Industrial | Pb= Lead | SE= Sewage Discharge | TA= Tailings |
| CH= Channelized Stream | LD= Land Development | PCB | SF= Seafood Processing | TH= Timber Harvest |
| DA= Dam/Flow Regulation | LF= Landfill | PP= Petroleum Products | SM= Streambank Modif. | TO= Toxic Substances |
| GM= Gravel Mining | MI= Mining | RC= Road Construction | ST= Septic Tanks | UR= Urban Runoff |
| Hg= Mercury | OG= Oil & Gas | RD= Road Runoff | STP=Sewage Treatment Plant | Zn= Zinc |

# ALASKA §304(1) LONG LIST OF WATERBODIES

| Alaska ID Number | Waterbody | Location | Causes |
|---|---|---|---|
| | **Anchorage (con't)** | | |
| 20401-413 | L Otis | Anchorage | UR |
| 20401-414 | Little Campbell L | Anchorage | UR |
| 20401-415 | Meadow L | Anchorage | UR |
| 20401-417 | Sand L | Anchorage | UR |
| 20401-419 | University L | Anchorage | UR |
| 20401-421 | Westchester Lagoon | Anchorage | UR ST PP LD RD RE |
| 20401-601 | Port of Anchorage | Anchorage | PP HA |
| | **Matanuska** | | |
| 20402-401 | Walby L | Wasilla | UR RD ST |
| | **Upper Susitna River** | | |
| 20501-002 | Gold Cr | N of Anchorage | PM SE RE |
| | **Yentna River** | | |
| 20504-001 | Cache Cr | NW of Anchorage | PM TA |
| 20504-003 | Mills Cr | NW of Anchorage | PM |
| | **Lower Susitna River** | | |
| 20505-409 | Lucille L | Wasilla | UR RC RE RD LD |
| 20505-410 | Wasilla L | Wasilla | UR RD RE ST |
| | **Redoubt - Trading Bays** | | |
| 20601-002 | Cappe Cr | Cook Inlet | Natural silt |
| | **Tuxedni - Kamishak Bays** | | |
| 20602-601 | Lower Cook Inlet | South Central Alaska | OG PP |
| | **Kodiak - Afognak Islands** | | |
| 20701-001 | Kodiak Landfill | Kodiak | LF |
| 20701-003 | Buskin Cr | Kodiak | UR LF ST |
| 20701-405 | Beaver Lake | Kodiak | UR |
| 20701-600 | Women's Bay | Kodiak | PP |
| 20701-604 | St Paul's Harbor | Kodiak | UR SF STP PP |
| 20701-605 | Gibson Cove | Kodiak | IN SF PP UR RD SD |
| 20701-606 | Shelikof Strait | Alaska Peninsula | OG PP |
| 20701-609 | W. Gulf of Alaska | | OG PP |
| 20701-610 | Katmai Nat. Mon. | Alaska Peninsula | OG PP |

## 3. *Southwest Alaska*

| | | | |
|---|---|---|---|
| | **Fox Islands** | | |
| 30102-601 | Unalaska Bay | Akutan Harbor | IN SF STP SE |
| 30102-602 | Illiuliuk Bay | Dutch Harbor | SF SE PP |
| 30102-603 | Dutch Harbor | Dutch Harbor | PP SE SF |
| 30102-604 | Akutan Harbor | Akutan | SF |
| | **Western Aleutian Islands** | | |
| 30103-003 | Fox Valley Cr | Great Sitkin Island | PP |

Cause Codes:

| | | | | | |
|---|---|---|---|---|---|
| Cd= Cadmium | IN= Industrial | Pb= Lead | SE= Sewage Discharge | TA= Tailings |
| CH= Channelized Stream | LD= Land Development | PCB | SF= Seafood Processing | TH= Timber Harvest |
| DA= Dam/Flow Regulation | LF= Landfill | PP= Petroleum Products | SM= Streambank Modif. | TC= Toxic Substances |
| GR= Gravel Mining | MI= Mining | RC= Road Construction | ST= Septic Tanks | UR= Urban Runoff |
| Hg= Mercury | OG= Oil & Gas | RD= Road Runoff | STP=Sewage Treatment Plant | Zn= Zinc |

# ALASKA §304(1) LONG LIST OF WATERBODIES

| Alaska ID Number | Waterbody | Location | Causes |
|---|---|---|---|
| | **Naknek** | | |
| 30204-001 | Naknek R | King Salmon/Naknek | UR IN STP PP SF SE |
| 30204-002 | King Salmon Cr | King Salmon | LF TO |
| 30204-003 | Eskimo Cr | King Salmon | UR SE PP |
| | **Holitna River** | | |
| 30404-002 | Mukslulik Cr | | |
| | **Aniak** | | |
| 30501-001 | Red Devil Cr | Aniak | TA Hg Mine |
| 30501-001 | Cinnabar Cr | | |
| | **Kuskokwim Delta** | | |
| 30502-002 | Tuluksak R | E of Bethel | PM TA |
| 30502-801 | Cape Newenham | Kuskokwim | LF RD PP SE |

## 4. Yukon Alaska

| | | | |
|---|---|---|---|
| | **Fortymile River** | | |
| 40104-001 | Buckskin Cr | | |
| 40104-002 | Chicken Cr | Canada Border | PM |
| 40104-003 | Jack Wade Ck | Canada Border | PM |
| 40104-004 | S Fork Fortymile R | | |
| 40104-005 | Walker Fork Cr | Forty Mile River | PM |
| 40104-008 | N Fork Fortymile R | Chicken | PM |
| 40104-010 | Fortymile R | E of Fairbanks | PM |
| | **Eagle to Circle** | | |
| 40401-003 | American Cr | Canada Border | PM |
| | **Birch-Beaver Creeks** | | |
| 40402-001 | Beaver Cr | Central | PM |
| 40402-001 | Birch Cr Dr | Central | PM |
| 40402-002 | Bedrock Cr | Central | PM |
| 40402-002 | Crooked Cr | Central | PM |
| 40402-004 | Boulder Cr | Central | PM |
| 40402-005 | Ketchem Cr | Central | PM |
| | **Ramparts** | | |
| 40404-001 | Minook Cr | Rampart | PM |
| | **Healy Lake** | | |
| 40503-001 | Delta Clearwater R | Delta | UR AG RE |
| | **Chena River** | | |
| 40506-002 | Chena Slough | East of Fairbanks | UR GM RCRD |
| 40506-003 | Noyes Slough | Fairbanks | GM UR LD RC |
| 40506-007 | Chena R | Fairbanks Portion | UR LF RC LD RD GM PCB |

Cause Codes:

| | | | | | |
|---|---|---|---|---|---|
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| CH= Channelized Stream | LD= Land Development | PCB | SF= Seafood Processing | TM= Timber Harvest | |
| DA= Dam/Flow Regulation | LF= Landfill | PP= Petroleum Products | SM= Streambank Modif. | TO= Toxic Substances | |
| GM= Gravel Mining | MI= Mining | RC= Road Construction | ST= Septic Tanks | UR= Urban Runoff | |
| Hg= Mercury | OG= Oil & Gas | RD= Road Runoff | STP=Sewage Treatment Plant | Zn= Zinc | |

# ALASKA §304(1) LONG LIST OF WATERBODIES

| Alaska ID Number | Waterbody | Location | Causes |
|---|---|---|---|
| | **Tanana Flats** | | |
| 40507-004 | Pile Driver Slough | Eielson AFB | AG RC RD LF |
| | **Nenana River** | | |
| 40508-001 | Valdez Cr | Cantwell | PM PP |
| 40508-007 | Lignite Cr | Healy | MI(Coal) |
| | **Tolovana River** | | |
| 40509-001 | Goldstream Cr | Fairbanks | PM UR AG TA |
| 40509-002 | Chatanika R | Fairbanks | PM |
| 40509-003 | Tolovana R | Fairbanks | PM |
| 40509-004 | Faith Cr | Chatanika Dr | PM |
| 40509-004 | Livengood Cr | Livengood | PM |
| | **Kantishna River** | | |
| 40510-002 | Kantishana R Dr | W of Healy | PM |
| | **Lower Tanana River** | | |
| 40511-001 | Tanana R Dr | Manley | PM |
| 40511-002 | Baker Cr Dr | Manley Hot Springs | PM |
| 40511-006 | Patterson Cr Dr | W of Fairbanks | PM |
| | **Upper Koyukuk River** | | |
| 40601-003 | Koyukuk R Dr (Mid) | NW of Fairbanks | PM |
| 40601-005 | Slate Cr | Coldfoot | PM RC |

## 5. *Northwest Alaska*

| | | | |
|---|---|---|---|
| | **Nome** | | |
| 50104-001 | Sneke R Dr | Nome | UR SE IF LD PM |
| 50104-001 | Center Cr | Nome | LF |
| 50104-009 | Solomon R Dr | Nome | PM RE |
| 50104-013 | Shovel Cr | Nome | PM PP RC |
| 50104-014 | Sinuk R | Teller | GM |
| | **Selawik River** | | |
| 50301-401 | Shungnak L | Selawik | PP |
| 50301-402 | Kotzebue Lagoon | Kotzebue | UR GM PP RC |
| | **Wulik-Kivalina Rivers** | | |
| 50404-006 | Wulik R | Kivalina | PM |
| 50404-007 | Red Dog Cr Dr | Nome | UR MI RC RD |
| 50404-008 | Ikalukrok Cr | Kivalina | Nat. high |
| 50404-801 | Red Dog Port | Kivalina | IN MI SM HA |

Cause Codes:

| | | | | | |
|---|---|---|---|---|---|
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| CH= Channelized Stream | LD= Land Development | PCB | SF= Seafood Processing | TH= Timber Harvest |
| DA= Dam/Flow Regulation | LF= Landfill | PP= Petroleum Products | SM= Streambank Modif. | TO= Toxic Substances |
| GM= Gravel Mining | MI= Mining | RC= Road Construction | ST= Septic Tanks | UR= Urban Runoff |
| Hg= Mercury | OG= Oil & Gas | RD= Road Runoff | STP=Sewage Treatment Plant | Zn= Zinc |

# ALASKA §304(l) LONG LIST OF WATERBODIES

| Alaska ID Number | Waterbody | Location | Causes |
|---|---|---|---|
| **6. *Arctic Alaska*** | | | |
| | **Northwest Coast** | | |
| 60202-401 | S/Mid Salt | Lagoon Barrow | LF SE |
| | **Lower Colville River** | | |
| 60304-601 | Nearshore Beaufort Lgn | Colville to Beechey PT | OG |
| | **Kuparuk River** | | |
| 60401-002 | Putuligayuk R | North Slope | OG MI IN GM |
| 60401-004 | Ugnuravik R | Prudhoe Bay | OG SM RC RD |
| 60401-401 | Big L | Prudhoe Bay | OG |
| 60401-601 | Nearshore Beaufort Lgn | Beechey Pt to Prudhoe | OG |
| 60401-702 | N Slope Wetlands | Colville to Prudhoe | OG GM PP RC |
| | **Sagavanirktok River** | | |
| 60402-005 | Sagavanirktok R Dr | Prudhoe Bay | OG GM SM LD |
| 60402-601 | Nearshore Beaufort Lgn | Prudhoe Bay to Foggy Is. | OG temp. Salinity |
| 60402-702 | N Slope Wetlands | Prudhoe Bay to | OG GM PP RC IN LF TO |
| | **Mikkelson Bay** | | |
| 60403-601 | Nearshore Beaufort Lgn | Foggy Is Bay to Canning | OG |
| 60403-702 | N Slope Wetlands | Foggy Is Bay to Canning | OG |

Cause Codes:

| | | | | |
|---|---|---|---|---|
| Cd= Cadmium | IN= Industrial | Pb= Lead | SE= Sewage Discharge | TA= Tailings |
| CH= Channalized Stream | LD= Land Development | PCB | SF= Seafood Processing | TH= Timber Harvest |
| DA= Dam/Flow Regulation | LF= Landfill | PP= Petroleum Products | SM= Streambank Modif. | TO= Toxic Substances |
| GR= Gravel Mining | MI= Mining | RC= Road Construction | ST= Septic Tanks | UR= Urban Runoff |
| Hg= Mercury | OG= Oil & Gas | RD= Road Runoff | STP=Sewage Treatment Plant | Zn= Zinc |

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 10

# RESPONSE TO COMMENTS ON EPA'S PROPOSED SECTION 304(l)(1)(A)(ii) LIST FOR THE STATE OF ALASKA

SEPTEMBER, 1991

**U.S. ENVIRONMENTAL PROTECTION AGENCY**
**REGION 10**

**RESPONSE TO COMMENTS**
**ON EPA'S PROPOSED SECTION 304(l)(1)(A)(ii) LIST**
**FOR THE STATE OF ALASKA**

**Comments on the U.S. Environmental Protection Agency (EPA), Region 10, decisions to list waters in the State of Alaska under Clean Water Act section 304(l)(1)(A)(ii) were received from the parties listed below.**

Alaska Department of Environmental Conservation, (ADEC), Dennis D. Kelso, Commissioner

Forest Alliance, Robert Loiselle, Executive Director

Kotzebue Fisherman's Association, Eugene Smith, Vice President

Salmon Bay Protective Association, Alan Stein

Sealaska Corporation, Richard Harris, Vice President, Resource Planning and Administration

Southeast Alaska Conservation Council, Robert E. Lindekugel, Staff Attorney

Trustees for Alaska, Mike Wenig, Staff Attorney

United States Department of Agriculture, Forest Service, Alaska Region, Michael A. Barton, Regional Forester

**Comments are followed by a set of abbreviations that refer to the commentor. Below are the abbreviations assigned to each commentor.**

Alaska Department of Environmental Conservation (ADEC)
Forest Alliance (FA)
Kotzebue Fisherman's Association (KFA)
Salmon Bay Protective Association (SBPA)
Sealaska Corporation (SC)
Southeast Alaska Conservation Council (SEACC)
Trustees for Alaska (TA)
USDA Forest Service (FS)

## GENERAL COMMENTS

Comment Set #1

Fully support EPA's May 31, 1990, decision to assume responsibility for development of Alaska's list of impaired waters under section 304(l)(1)(A)(ii) of the Clean Water Act. (SEACC)

We fully support and commend EPA's proposed decision to withdraw prior approval and revise the long list to include waters suspected by the State of being impaired. (TA) (KFA)

Response #1 Comment noted.

Comment Set #2

EPA's approval of Alaska's 304(l) short, mini and long lists in June 1989 was not expressed as being "conditional." The public notice unequivocally approved all three lists. (ADEC) (SC)

The State did further evaluate waters on the long list and document additional waters as impaired. (ADEC)

Response #2 The U.S. EPA's prior approval of Alaska's long list of waters was largely based on statements in the state's May 26, 1989 letter to the U.S. EPA that "completion of the [Clean Water Act section] 319 assessment will result in a number of additional waterbodies being documented as impaired." The U.S. EPA interpreted this statement as a commitment that further evaluation of the information available to the state, or additional documentation of actual or threatened impairment, would occur. EPA's approval of the Alaska long list was conditioned on Alaska's fulfillment of this commitment. However, the listings of impaired waters in the section 319 Nonpoint Source Assessment and the state's 1990 report required by section 305(b) of the Act, did not differ significantly from the state's final long list of waters, and did not adequately address waters degraded or threatened by forest practices and other activities.

Comment Set #3

The EPA national final guidance concerning 304(l) clearly supports the State's method in preparing the long list, stating that the final lists will include only those waters with documented violation of water quality standards. (ADEC)

Sole use of best professional judgment to list waters violates EPA's applicable guidance documents, and EPA's own interpretations of its regulations. These documents show that best professional judgment can be used to assess site specific data, but not to replace it. (SC)

Response #3 EPA disagrees. The U.S. EPA considers the use of best professional judgment to be appropriate in making listing decisions under section 304(l) where adequate ambient monitoring data does not exist. Listing decisions under section 304(l) were intended to cast a "broad net" in the list development and review process, and were to include both waters reasonably believed to be degraded as well as waters whose quality was reasonably believed to be threatened. In evaluating a broad universe of waters for possible inclusion on the lists, states were to list waters which "....the data and information show, after assurance of its reliability and the use of professional judgment, cannot reasonably be anticipated by the state to attain or maintain applicable water quality standards..." (see Preamble to the regulations for implementing section 304(l) in the June 2, 1989 Federal Register.)

The State of Alaska is extremely large and lacks the resources to develop and maintain a comprehensive ambient water quality monitoring network throughout the state. Consequently, very little ambient water quality data exists for the state of Alaska that definitively documents water quality effects from potentially high impact land use activities such as timber harvesting and placer mining. Therefore, in order to make any listing decisions for section 304(l), EPA must rely to some extent on best professional judgment.

Use of best professional judgment by EPA and the states to assess water quality and habitat conditions is a common, accepted practice. EPA's guidance for the Section 305(b) Reports states that waters for which ambient monitoring data is scarce or nonexistent "should be included in the 305(b) process if the state has any reasonable basis for evaluation." The guidance calls these "evaluated" waters (as opposed to monitored waters).

> "Evaluated waters" are those waterbodies for which the use support decision is based on information other than current site-specific ambient data, such as land use, location of sources, predictive modelling using estimated input variable, surveys of fisheries personnel, and citizen complaints.

In addition, EPA's guidance document for section 304(l), as well as the implementing regulations, specifically refer to including waters identified as impaired or threatened in state's Clean Water Act Section 305(b) Reports.

Comment Set #4

The plain language of section 304(l) requires that the long list be composed of waters which cannot "reasonably be anticipated" to be impaired [sic]. On its face, that standard includes within the long list waters whose impairment is demonstrated by best professional judgment, whether or not there is sufficient data to "definitively" confirm or corroborate that judgment. (TA)

ADEC has refused to include those waters on the long list which its experts consider to qualify for listing based on their "best professional judgment," absent conclusive or definitive data. ADEC's narrow listing approach is contrary to the plain language of the standards for listing in the CWA and EPA's own interpretation of that section. (SEACC)

The state of Alaska clearly lacks the resources for ambient water quality monitoring. Thus, for all practical purposes, the state's use of the" definitive documentation" standard would prevent any impaired streams from ever being classified as such. (TA)

Response #4 EPA agrees, see Response #3.

Comment #5

EPA has misinterpreted both the language and intent of section 304(l) of the Clean Water Act. Section 304(l) was intended to apply to toxic pollutants only, EPA's expansion of this section to non-toxic, nonpoint sources of pollution is without justification and exceeds its statutory responsibilities under the Act. (FS) (SC)

Response #5 EPA disagrees. Only section 304(l)(1)(A)(i) and (304)(1)(B) apply to listing waters affected by toxic pollutants from point sources, section 304(l)(1)(A)(ii) contains no reference to either toxic pollutants or specific types of pollutant sources.

Comment #6

EPA is not authorized under section 304(l) to substitute its own "long list" for that prepared by the state. Section 304(l) only authorizes the administrator to approve or disapprove the individual control strategies submitted by the state.

Response #6 EPA disagrees. Section 304(l)(1) (the introduction to the section) states that "each State shall submit to the Administrator for review, approval and implementation..." The paragraphs that follow this introduction include the lists as well as the individual control strategies.

The implementing regulations for section 304(l) clearly provide disapproval procedures for EPA when a state's lists are inadequate.

Comment #7

Placement of waters on the section 304(l) list may increase the likelihood that these waters will be placed on the state's section 303(d) impaired list. Section 303(d) is intended to identify waters for which effluent limitations need to be placed on point sources. The standards for placement of a water on the 303(d) list should be significantly higher than the 304(l) list. (SC)

Response #7 EPA agrees but emphasizes that the inclusion of a water on the section 304(l) list does not necessarily mean that the water is automatically included on the section 303(d) list. The section 304(l) list is merely a universe of waters from which the 303(d) waters could be selected. However, if a water does not appear on the 304(l) list it does not mean that it cannot eventually appear on the states 303(d) list.

Comment #8

EPA should schedule a public hearing on its proposed disapproval in Juneau, Alaska, following the receipt of comments and possible petitions on October 5, 1990. (FA) (ADEC)

Response #8 EPA chose not to schedule a public hearing on the section 304(l) lists because EPA is working closely with ADEC to design a process for routinely identifying degraded waters. EPA will also be exploring methods to effectively use best professional judgment of the many water quality experts in Alaska. During these activities, both EPA and state are committed to seeking full public participation.

In light of the upcoming activities and opportunities for public participation, which will directly address the concerns of these commentors, EPA believed that it would not be productive to reopen the section 304(l) process for the third time to hold public hearings. Since the time frames for these hearings, if they were to be held, would overlap with the upcoming public process for identifying water quality limited waters under section 303(d) of the CWA, public confusion and duplication would be inevitable.

## COMMENTS ON SPECIFIC WATERS

Comment #9

Our review of all streams identified in the state's 1988 305(b) reports indicates that none of these streams located on National Forest lands are impacted by toxic pollutants. Thus none of these streams should be included in the section 304(l) list. (FS)

Response #9 The statutory and regulatory requirements of section 304(l) also addresses waters affected by pollutants not designated as toxic. Please see Response #5.

Comment #10

Analysis conducted to date (12/10/90) indicates that the following waterbodies have been adversely impacted from the standpoints of both water quality and fisheries habitat by past timber harvest related activities. (FS)

| | |
|---|---|
| 10103-031 | Fubar Creek - tributary to Harris River |
| 10103-029 | Rush Creek |

Response #10 EPA is listing these waters on the section 304(l)(1)(A)(ii) list due to water quality and fisheries habitat impacts.

Comment #11

Analysis conducted to date (12/10/90) indicates that the following waterbodies have been adversely impacted from the fisheries habitat standpoint by past timber harvest related activities (FS)

| | |
|---|---|
| 10101-004 | Bradfield River |
| 10203-022 | Katlian River |
| 10203-024 | Nakwasina River |
| 10103-007 | Harris River |
| 10203-025 | Rodman Creek |
| 10202-602 | Rowan Bay - in the immediate vicinity of the LTF |
| 10103-012 | Staney Creek |
| | Thorne Estuary - in the immediate vicinity of the log sort yard |

Response #11 EPA is listing these waters on the section 304(l)(1)(A)(ii) list due to fisheries habitat impacts.

Comment #12

The analysis conducted to date indicates the following waterbodies have not been significantly or measurably impacted from either the water quality or fisheries habitat standpoints. (FS)

| | |
|---|---|
| 10103-001 | Black Bear Creek - that portion on FS lands |
| 10103-926 | Black Creek - tributary to Black Bear Creek, that portion on FS lands |
| 10201-017 | Chuck River - that portion on FS lands |
| 10103-017 | Dall Island Creeks - that portion on FS lands |
| 10103-004 | Dog Salmon Creek |
| 10203-002 | Freshwater Creek |
| 10103-008 | Hatchery Creek |
| 10203-002 | Iyouktug Creek |
| 10401-005 | Ophir Creek - watershed mixed ownership |
| 10203-011 | Pavlof River |
| 10103-013 | Steelhead Creek - tributary to Big Salt Creek, that portion on FS lands |
| | Hawk Inlet |
| | Thorne River |

Response #12 EPA agrees and is not listing these waters on the Section 304(l)(1)(A)(ii) list.

Comment #13

An analysis of site-specific data on water quality and habitat parameters shows that:

1. The good water quality of Election Creek, Humpback Creek and Gunnuck Creek will be maintained
2. Given the operational constraints of Alaska's new Forest Practices Act that it can reasonably be anticipated that water quality of Deer Creek, North Fork Deer Creek, Steelhead Creek and North Fork Steelhead Creek will be maintained.

The sediment loads found within these seven streams were within the range of expectations for undisturbed old growth forest. (SC)

Response #13 EPA agrees and is not listing the above waters with the exception of North Fork Deer Creek. North Fork Deer Creek is being listed because ADEC identified this water as impaired in its 1990 Section 305(b) report.

## PETITIONS TO ADD WATERS TO THE LONG LISTS

From Southeast Alaska Conservation Council

The following waters are located on national forest land on Prince of Wales Island and will suffer long term water quality impacts from streamside logging or landslides induced by logging or roading activities. (SEACC)

Rush Creek (Stream #102-70-1580-2017-3010-4018) near Thorne Bay (slides)

Logjam Creek (Stream #106-30-10670-2004-3030) (streamside logging)

Tolstoi Bay Creek, Ratz Harbor Creek, Slide Creek, and Lava Creek in Thorne Bay area.

Buster Creek (Stream # 106-41-10420), Alder Creek (Stream #106-41-10440), Hole-in-the-Wall Creek

Kina Creek near Kassan Bay

The following waters on national forest lands on Kupreanof and N. Kiui Islands will suffer long term water quality impacts from streamside logging or landslides induced by logging or roading activities. (SEACC)

Big John Creek (Kupreanof)

Straight Creek, Saganaw Creek, Rowan Creek, Browns Creek, Security Creek, Kadake Creek (N. Kuiu)

The following waters on native lands in southeast Alaska will suffer long term water quality impacts from streamside logging or landslides induced by logging or roading activities. (SEACC)

Three Mile Creek near Klawock on Prince of Wales Island (POW)

Klakas Inlet stream near Hydaburg on POW

Trocadero Creek near Craig on POW

Coco Harbor Creek & Brazy Creek near Dall Island

Libby Creek, Salt Chuck and Laura's Creek in Hobart Bay, on mainland between Juneau and Petersburg

Response No quantitative or qualitative information was submitted with this petition to EPA. EPA does not believe it is appropriate to list a water under section 304(l) merely because water quality impacts are anticipated due to planned timber harvest activities in the watershed.

Therefore, EPA is denying the petition to list all the waters indicated above, except Rush Creek. EPA is listing Rush Creek based on analysis conducted by the United States Forest Service. See Response #10.

From Trustees for Alaska

EPA should reclassify Ikalukrok Creek (#50404-008), and the Wulik River (#50404-006) as impaired and list on Alaska's section 304(l)(1)(A)(ii) list.

According to an August 22, 1990 compliance order from ADEC, 1990 water quality samples show that leaching from the Red Dog Mine "has resulted in the pollution of Red Dog Creek, Ikalukrok Creek, and the Wulik River with zinc, cadmium, lead and iron concentrations which greatly exceed concentrations of these metals previously recorded in baseline data."

From Kotzebue Fisherman's Association

EPA should reclassify Ikalukrok Creek (#50404-008), and the Wulik River (#50404-006) as impaired and list on Alaska's section 304(l)(1)(A)(ii) list based on the following information:

- Reports from local people of orange colored water from Red Dog Creek staining Ikalukrok Creek to within a mile of the Wulik River.
- Local fisherman have noticed a reduction in the number of salmon and char in the Wulik River.
- This observation was substantiated by Alaska Department of Fish and Game. Tissue analysis from the Ikalukrok showed substantially higher concentrations of various heavy metals over these of baseline samples from 1982.
- Water quality samples taken by ADEC demonstrated elevated levels of toxic heavy metals in violation of Cominco's NPDES permit and exceeding levels established by the state's water quality standards.

Response EPA agrees and is listing Ikalukrok Creek and the Wulik River on Alaska's 304(l)(1)(A)(ii) list.

From Salmon Bay Protective Association

Hourly temperature data shows violations of Alaska water quality standards on Staney Creek. Please classify it as threatened.

Response EPA agrees and is listing Staney Creek on Alaska's 304(l)(1)(A)(ii) list.

# Alaska State Legislature

Sen. Lloyd Jones, *Chair*
Sen. Sam Cotten, *Vice-Chair*
Sen. Dick Ellason, *Member*
Sen. Steve Frank, *Member*
Sen. Rick Halford, *Member*
Sen. Curt Menard, *Member*
Sen. Fred Zharoff, *Member*

P.O. Box V
Juneau, AK 99811

907 465-4907
Fax: 907 465-3922

## Senate Resources Committee

April 27, 1992

The Honorable John Sandor
Alaska Department of Environmental Conservation
410 Willoughby Avenue, Suite 105
Juneau, Alaska 99801

Dear Commissioner Sandor:

The Senate Resources Committee requests your presence on May 4, 1992 to testify at an oversight hearing on the relationship of State Water Quality Standards to the Clean Water Act National Pollutant Discharge Elimination System Permitting (NPDES) process. This relationship is an issue of concern to the Committee because of the impact on Alaska from the approach taken by the Environmental Protection Agency (EPA) in its November 19, 1991 proposed rulemaking entitled "Amendments to the Water Quality Standards Regulation to Establish the Numeric Criteria for Priority Toxic Pollutants Necessary to Bring All States Into Compliance with Section 303(c)(2)(B) (hereinafter "EPA proposed rule"). By this proposed rulemaking, EPA seeks to set water quality standards for Alaska for all the priority toxic pollutants for which EPA has issued section 304(a) water quality guidance criteria that have not already been promulgated by Alaska. While this regulation is still in draft and has just recently been received by the Office of Management and Budget in Washington, D.C., EPA Region 10 seems to have already begun applying it as seen by the appearance of human health criteria at $10^{-6}$ imposed in the preliminary draft permits for two pulp mills.

The Committee needs to know what this portends for Alaska. Accordingly, the Committee would appreciate it if you would provide us written responses in advance[1] and come to the May 4, 1992 oversight hearing, prepared to answer the following questions:

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[1] The Committee would appreciate it if in your written response to be submitted in advance you would first list the question and then follow that with the answer. We understand that the time is short but would appreciate having your written response by noon on May 1, 1992.

(1) Even though the human health criterion appeared in the preliminary draft permit for the two pulp mills, is the Committee right to be concerned that the approach taken by EPA's rulemaking as reflected in those permits would impact not only the pulp mills, but would also apply to those in the fish processing, mining and oil and gas industries and municipalities? What would the permitting and cost impacts to each of these entities be and what resources would DEC need to find out?

(2) In its Proposed Rule of November 19, 1991, EPA lists Alaska as one of fifteen states that has not yet complied with Section 303(c)(2)(B) of the Clean Water Act. (Fed. Reg. Vol. 56 No. 223, November 19, 1991 at page 58428). Assuming that the State does intend to comply with section 303(c)(2)(B), please tell us:

(a) the rulemaking process by which you intend to comply - will it be the triennial review or a more expedited process?

(b) other than yourself as commissioner, who on your staff is the person primarily charged with responsibility for completing the process on time? (Please bring this person to the hearing with you.)

(c) please provide the schedule for completing the rulemaking process.

(d) what additional resources do you need from the Administration and the Legislature to meet this schedule? Could additional resources speed up this schedule?

(e) what technical research has been and is being done to respond to EPA's requirements?

(f) what is the working arrangement with EPA R-10 to coordinate compliance with EPA's proposed rules? Does EPA intend to delay issuance of NPDES permits to affected municipalities and industries while DEC completes the rulemaking process? If so, how will this affect entities seeking permit renewals?

(g) Has DEC checked with other states that have not yet complied with section 303(c)(2)(B) of the Clean Water Act to determine what those states are doing in response to EPA's proposed rule?

(3) Have you determined how many Alaskan industries and municipalities are seeking new NPDES permits which will be delayed while DEC promulgates new water quality standards to deal with EPA's proposed rules? What can DEC do to speed up the process to provide these entities undelayed permits?

(4) Has EPA considered the socio-economic impact of EPA's proposed rule on industry and municipalities in Alaska? What impact will EPA's

proposed rule have in causing the loss of existing industry and discouraging new industry from coming to Alaska?

(5) Have you or the Attorney General determined what impact these socio-economic costs have on EPA's proposed rule or its application to individual permittees? What impact, if any, will these socio-economic costs have on DEC's rulemaking?

(6) It is my understanding that the EPA Regional Administrator has commented that Alaska's water quality standards are more stringent than necessary. If so, in what regards? Do you agree with this? Will these problems be addressed during DEC's rulemaking process?

(7) Please explain how the impact on receiving water quality from applying the human health factor to the toxic criteria pollutants differs from the impact on receiving water quality from requiring an entity to meet drinking water quality standards. If the human health criteria is more stringent for specific parameters, does DEC intend to make drinking water quality standards more stringent? What industries and municipalities would be impacted by such DEC action and at what cost to those industries and municipalities?

(8) Has DEC or the Attorney General examined the legal basis for EPA's application of the draft rule to the pulp mills' preliminary draft permits? Does DEC plan to object to the inclusion of the draft rule's requirements to these permits?

(9) It is my understanding that EPA has issued 31 draft permits for placer mining operations that include EPA's proposed rule. Is this correct? Does DEC plan to object to the inclusion of the draft rule requirements in these permits?

(10) Has the Attorney General's office reviewed EPA's legal justification for promulgating water quality standards for the State of Alaska (see pages 58429-58431 of the proposed rule)? Does the Attorney General agree with EPA's analysis? Specifically, EPA's determination that it has authority to promulgate standards for the state because of "the state's failure to complete the timely review and adoption of the necessary standards required by section 303(c)(2)(B) despite information that providing toxic pollutants may interfere with designated uses of the State waters." If not, why not? What is the difference between "designated" and "existing" uses? How are most waters of the state "designated?" Is this classification too stringent under existing circumstances?

(11) Do you know whether EPA or the federal OMB has determined whether EPA's proposed regulation falls within the 90 day moratorium on regulations adversely affecting industry announced by the President in his State of the Union address? What role do the socio-economic costs of complying with EPA's proposed rule addressed in questions 4 and 5 play in a determination whether the proposed rule is subject to the moratorium? What, if any, additional

resources would the Administration need to do so? Does DEC plan to contact the Congressional delegation on this point?

(12) Has DEC or the Attorney General determined whether the state or the EPA interpretation of the state's WQS is entitled to primacy? Did DEC provide input on EPA's interpretation of the state's WQS set forth in the preliminary draft permits for the pulp mills?

(13) In describing the proposed rules for application of the human health factor, EPA appears willing to accept a state's assertion of what pathways exist for consumption of toxic pollutants. (See pages 58432-58433). If water and fish consumption pathways exist simultaneously, application of the human health criteria is more severe. It therefore seems logical that application of the human health criteria in fresh water has the potential to result in more stringent limitations than to marine waters (which people do not drink). Does DEC contend that in addition to being a pathway for fish, marine waters constitute a pathway for water consumption? Since Alaskans do not drink marine water, why is marine water currently required in the state water quality standards to achieve the more stringent of the 96 hour LC50 x .01, drinking water standards, or Goldbook?

(14) At page 58426 of the proposed rule, EPA uses dioxin as an example of the "difficulties faced by states in adopting criteria for priority toxic pollutants." However, EPA suggests that its dioxin effort shows the benefits of its efforts because 38 states have adopted human health based criteria for dioxin while 11 states "have proposed, or are expected to propose, numeric human health based criteria for dioxin."

At page 58436 of the proposed rule, however, EPA then makes the following statement which is inconsistent with its use of the dioxin example at page 58426:

> "On September 11, 1991 EPA's Office of Research and Development (ORD) began reassessing the scientific models and exposure scenarios used to predict the risks of biological effects from exposure to low levels of dioxin. This reassessment has the potential to alter the risk assessment for dioxin and accordingly the Agency's regulatory decisions related to dioxin. At this time, EPA is unable to say with any certainty what the degree or direction of any changes in risk estimates might be. This rulemaking includes a proposed Agency action with regard to dioxin that may be affected by the reassessment."

What is the present status of DEC's rulemaking, if any, on dioxin? In light of the foregoing statement that EPA is reassessing its position, how could the State reach any substantive conclusions on dioxin? Do the mills not run a substantial risk of being driven out of business to achieve an undetectable dioxin standard set out in the proposed rule and in the pulp mills' permits that may not be necessary to protect human health? Has DEC determined what other parameters listed by

EPA for promulgation as state water quality standards may also need "reassessment" based on technical data? Has the state considered taking the same approach with dioxin for marine waters as was taken by Alabama, Louisiana, Maryland and Virginia?

(15) It is my understanding that EPA engaged in a lengthy multimedia review of the Sitka pulp mill in August 1990 which resulted in a finding of no dioxin levels in the mills' effluent above normal background as measured by what was expected in the rest of the United States. Is this the case? What were the findings?

(16) At pages 58476-58477 of the proposed rule, EPA explains why it believes Alaska has not met the requirements of section 303(c)(2)(B) of the Clean Water Act? Do you and the Attorney General agree with EPA's explanation of why Alaska does not comply and if you do not agree, why not?

(17) In describing the source of the Alaska specific list of toxic priority pollutants promulgated for Alaska by EPA in new regulation 40 CFR § 131.36 (see pages 58449-58450 of EPA's proposed rule), EPA used, among other things, the so-called section 304(l) list "identifying toxic pollutants likely to impair designated uses." (See page 58431) It is my understanding that this 304(l) list was prepared by DEC. Please set forth a detailed history and chronology of DEC's compilation and submission of the section 304(l) list. What were the criteria used for inclusion on the list of an Alaska water body likely to be impaired?

It is my understanding that in the final submission of the section 304(l) list, DEC asserted that only 47 water bodies were impaired, but that EPA insisted upon using a list of 112 Alaskan water bodies. Is this correct? If so, how did this come about and which list does DEC believe is the correct list and why?

(18) At page 58476 EPA admits that "For most priority toxic pollutants [in Alaska], however, available data on the discharge and presence of priority toxic pollutants are spatially and temporarily limited." EPA nevertheless chose to apply them to Alaska. Given EPA's admission that there is a lack of evidence of toxic pollutant problems in Alaska, what effort has DEC made to limit the application of EPA's proposed rule to those water bodies within Alaska which DEC believes to have been adversely affected by toxic pollutants? What challenge to EPA's proposed rule on the basis of EPA's own above admission that there is a lack of evidence of toxic pollutant problems in Alaska does DEC intend to make and when will it be made? Given EPA's admissions that there is a lack of evidence of toxic pollutant problems in Alaska, has DEC identified any environmental benefits to be derived for the state which would offset the socio-economic impacts you have identified?

(19) In the preliminary draft permits, DEC is invited to design a mixing zone for the mill outfalls. Does DEC intend to work with the mills in this regard?

(20) Is DEC reviewing the permit limit derivations set forth in the preliminary draft permit for each mill for accuracy and consistency with the state interpretation of its own state water quality standards? Will the results of this analysis be reflected in DEC's rulemaking process for state water quality standards?

(21) Does DEC agree with EPA's application of the human health criteria from EPA's November 19, 1991 proposed toxics rule to the state's mixing zone regulation (18 AAC 70.032) as was done in the preliminary draft pulp mill permits? If not, why not?

(22) Has DEC determined the capital and operating costs to the pulp mills of complying with EPA's preliminary draft permit?

(23) As a justification for promulgating water quality standards for priority toxic pollutants for the State of Alaska (and 14 other states), EPA states in its draft proposed rule:

> "Until standards for toxic pollutants are in place, neither EPA nor the States can fully focus on the emergency, ecologically based water quality activities such as wetlands criteria, biological criteria and sediment criteria."

Id. at 58429. What is EPA doing in these regards? How will these things affect Alaska? How is DEC organized to handle these matters?

Thank you for your cooperation and for providing written responses to these que ions in advance of the hearing. By copy of this letter to Attorney General Charles Cole, I am asking him to prepare written responses to all questions regarding the Attorney General's opinion. I am also asking him or his representative to appear with you at the May 4, 1992 hearing to respond to questions. Finally, by copy of this letter, I am asking Paul Rusanowski, Director of the Division of Governmental Coordination, to appear with you at the May 4, 1992 hearing to respond to questions.

Yours very truly,

Lloyd Jones

Senator Lloyd Jones, Chair

cc: The Honorable Dana Rasmussen, Administrator
Region 10, United States Environmental Protection Agency

The Honorable Charles Cole
Attorney General, State of Alaska

The Honorable Paul Rusanowski
Division of Governmental Coordination, State of Alaska

5/1 3:45

# *** DRAFT ***

## FEDERAL WASTEWATER DISCHARGE (NPDES) PERMITS AND THE ALASKA WATER QUALITY Standards

Prepared for the Senate Resources Committees

of the Alaska State Legislature

Alaska Department of Environmental Conservation

May 4, 1992

DRAFT

# FEDERAL WASTEWATER DISCHARGE (NPDES) PERMITS AND THE ALASKA WATER QUALITY Standards

## INTRODUCTION

My name is John Sandor, Commissioner of the Department of Environmental Conservation. With me today are other DEC personnel as well as representatives of the Division of Governmental Coordination, Office of the Governor; and the Department of Law. Those who are prepared to supplement my statement or answer questions within their fields of expertise are:

Dr. Paul Rusanowski, Director of the Division of Governmental Coordination
Janet Kowalski, Division of Governmental Coordination
Marie Sansone, Department of Law
Dick Stokes, Regional Administrator for DEC's Southeast Region
Mike Menge, Director, Division of Environmental Quality
Jim Powell, Acting Deputy Director, Division of Environmental Quality
Doug Redburn, Chief of the Water Quality Management Section
Dave Sturdevant, Water Quality Standards Coordinator

We are pleased to be able to respond to your April 27 request for specific information and response to questions included in this letter. We have prepared a formal statement with the responses to question raised, and a draft of this material was presented to the Committee. It is my intention to summarize our statement, and then suggest your Committee members raise whatever questions they may have. We will do our best to respond to these questions.

First of all, I want to acknowledge our appreciation for your keen interest and concern in these issues. The preliminary draft NPDES Permit changes have the potential of profoundly impacting the communities of Ketchikan and Sitka, and the entire Southeast Alaska Region. The extension of these permit requirements to NPDES permits to communities, fish processing facilities, miners and others would have major adverse effects on the entire state.

Let me begin by explaining the relationship of the State Water Quality Standards to federal "NPDES" wastewater discharge permits and to the National Toxics Rule being promulgated by the Environmental Protection Agency. I'd like to set the stage by giving an overview of where we are today, and then proceed with a discussion of issues.

Nationally, as well as in Alaska, we are at a turning point in the evolution of both State Water Quality Standards and NPDES permits. Due to mandates in the Clean Water Act and federal regulations, the Standards and the NPDES permits are now required to incorporate specific criteria to control toxic pollutants. Virtually all states are working to adopt toxic pollutant criteria and implement them in this new generation of more stringent and more complex NPDES permits.

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In 1987, benchmark amendments to the Clean Water Act required each state to adopt specific numeric criteria for EPA's toxic "priority pollutants." In 1986, Alaska had adopted all of EPA's toxic criteria by reference in the Water Quality Standards, but had not adopted a Human Health risk level for carcinogens. Early in 1990, Alaska initiated the process called "Triennial Revision" of Water Quality Standards expressly to adopt toxic numeric criteria and a risk level. Our target now is to complete the Triennial process by the end of 1992.

In November of last year, EPA issued the draft National Toxics Rule. This regulation would promulgate federal toxic criteria for all states not fully in compliance with the Clean Water Act. Alaska is included in the rule, particularly for Human Health criteria for carcinogens. This presents some issues we will discuss later. We understand the proposed rule recently was sent to the White House Office of Management and Budget for review and approval. We do not know whether the proposed rule is subject to the President's moratorium on issuance of new regulations, or whether it is being evaluated for potential economic impact.

Meanwhile, EPA--and states like Washington and Oregon that have primacy for their own NPDES programs--has begun to issue NPDES permits with effluent limits for toxic pollutants sufficient to meet State water quality criteria. These limits are called "water quality-based limits," as opposed to the "technology-based limits" which previously governed permits. We'll discuss these terms shortly. EPA policy published in 1984 contained the directive to incorporate state toxic criteria in NPDES permits. Federal regulations in 1989 clarified and reinforced the requirement. In the late 1980s, then, water quality-based NPDES permits began to hit the streets.

Alaska's precursor to water quality-based permits was the Greens Creek Mine on Admiralty Island in 198___, which attracted relatively little notice. In 1991, controversial draft permits surfaced for the AJ and Kensington mines. As you know, preliminary draft permits for the Ketchikan and Sitka Pulp mills have been released. The pulp mill permits expose the grave concerns on economic and technological feasibility, and hopefully will lead to expedited remedies. These issues are equally important to permits pending for placer mining, seafood processors, municipal sewage treatment plants, and municipal and industrial stormwater discharges.

So, where are we today? First, our Water Quality Standards have not kept pace entirely with evolving national requirements. We are somewhat "behind the curve" in being able to resolve concerns in applying our Standards to NPDES permits. The Standards need revision, both in the short term and in the long run. This need has been recognized for some time. Remedies have been underway since 1991, and now will be accelerated. We are looking at problems with the Standards in three areas:

First is achieving compliance with the Clean Water Act by adopting toxic pollutant criteria.

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Second is adding and clarifying language to resolve some missing pieces and ambiguities that have plagued us.

Third is modifying certain existing criteria that are more stringent than is scientifically justifiable, such as the marine water criterion for "Color," and the "0.01 LC50" chronic toxicity provision.

Our top priority will be to accelerate the revision of Standards for a subset of critical items, with full public process. It is absolutely essential that economic and technological feasibility be an integral part of any revision of Standards and permit requirements. Then we will complete the Triennial Revision already underway. In the long run, we will continue to revise the Standards to create a model product for the twenty-first century. Because of developing national programs, enhancement of Water Quality Standards will continue indefinitely.

Also underway is development of a Memorandum of Agreement with EPA to formalize updated procedures for the development, review and issuance of NPDES permits, and the corresponding State 401 certification and coastal zone consistency review. EPA has pledged to work with the State in addressing both Water Quality Standards and the NPDES process.

We realize the critical nature of these matters to regulated industries and to the public. In a sense, water quality gives us a truckload of issues whose time has come. We expect a vigorous public debate as we work to resolve those issues.

We must proceed quickly, but we also must be cautious enough to avoid wrong turns in the road. Establishing Water Quality Standards is a technical and scientific endeavor, but economic and technological feasibility must be considered as the Standards are revised and applied. Our goal is to develop and implement sound and defensible Water Quality Standards that are applied through a reasonable, cooperative, and public permit process. A companion goal is to consider the socio-economic impact of such Standards on communities and other entities that are affected.

Now let me tackle these subjects one at a time.

## THE NEW NPDES PERMITS

"NPDES" stands for National Pollutant Discharge Elimination System. These permits were mandated by the Clean Water Act for industrial and municipal wastewater discharges in 1972. An NPDES permit is scheduled to be reissued every five years, but delays are common.

The new challenge that we face is the matter of water quality-based permits. As stated earlier, water quality-based permits came into effect in the late 1980s. The new and revised permits currently on the table for mines and pulp mills in Alaska

are the first major permits of the new generation. The complexity of these permits, coupled with some "flat tires" in the Water Quality Standards, has us scrambling to fix both technical and procedural problems.

The heart of an NPDES permit is the effluent limits, generally expressed as maximum allowable pollutant concentrations. A permit also contains monitoring, reporting, and compliance requirements.

There are two types of effluent limits. The first type is technology-based limits, which are established by EPA in federal regulation for each category of major industry. These limits are based on "Best Available Technology," or "BAT," and its relatives "BCT" and "BPT"--Best Conventional Technology and Best Practicable Technology. Technology-based limits include consideration of "economic achievability."

The second type is water quality-based limits, which are derived directly from the State Water Quality Standards for receiving waters. Water quality-based limits are intended to assure that Water Quality Standards are met after dilution of the effluent in the defined mixing zone. EPA regulations require that EPA incorporate water quality-based effluent limits in an NPDES permit whenever a pollutant in the discharge causes, has reasonable potential to cause, or contributes to, exceedance of a water quality criterion.

For a given pollutant, a permit by federal regulation (___ CFR ___) must contain the more stringent of either technology-based or water quality-based limits. The water quality-based limits usually are more stringent, especially for toxic pollutants. So the State Water Quality Standards play a crucial role in determining the effluent limits in an NPDES permit.

## THE NPDES PERMIT PROCESS

NPDES permits are issued by EPA, but the State must certify under Section 401 of the Clean Water Act that each permit will meet State Water Quality Standards. The State also must issue a coastal zone consistency determination that the activity complies with the Standards of the Alaska Coastal Management Program (ACMP), which is coordinated through the Division of Governmental Coordination (DGC). Procedures for coordinating the timeframes for the Section 401 certification and the ACMP consistency determination with the NPDES permit program are spelled out in a 1986 agreement among EPA, DEC, and DGC.

There are several steps in the development and issuance of a new or revised NPDES permit. These are depicted graphically on a page at the back of the testimony handout.

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APPLICATION: The operator submits an application to EPA.

PRELIMINARY DRAFT PERMIT: EPA prepares the preliminary draft for review by the State prior to public notice. Resolution of major issues is attempted at this stage.

DRAFT PERMIT: EPA and DEC issue joint public notice soliciting public comment; public workshops and hearings may be held; the draft permit goes through coastal zone consistency review under ACMP, and a consistency determination is issued by the State.

FINAL DRAFT PERMIT: EPA prepares the final draft permit for certification by the State under Section 401.

FINAL PERMIT: EPA issues the final permit to the applicant.

NPDES permits are reviewed by the state at three junctures: the pre-public, preliminary draft permit stage; the draft permit that goes out for public review and state comment; and the final draft permit submitted by EPA for formal State certification.

Considerable effort is made to resolve issues and differences during the State's review of pre-public, preliminary draft permits. Issues are discussed verbally at the staff level, and in written comment.

The State's coastal zone consistency review takes place concurrently with the public comment period for the draft NPDES permit. Additional State comment to EPA occurs during this time, and a consistency determination is issued by the State.

EPA weighs public comments on draft permits, and sends a final draft permit to the State for certification. At this stage, the State of Alaska is prohibited under federal regulation from imposing less stringent conditions on the federal permit.

The Water Quality Standards are the basis for DEC's Section 401 certification. The coastal zone consistency review, coordinated by DGC, also embodies the Water Quality Standards in their entirety, with deference on water quality issues given to DEC. State agency reviews address additional ACMP Standards for coastal development, recreation, energy facilities, habitats, and air, land and water quality.

The State's coastal consistency determination is completed and issued by DGC prior to DEC's 401 certification. DEC is generally obligated to issue its 401 certificate within five days of the coastal consistency determination.

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**THE ALASKA WATER QUALITY Standards**

Next, I would like to present a overview of the State Water Quality Standards. Please refer to the document in your binders for additional information.

Water Quality Standards are mandated by the Clean Water Act. All states have them. Standards establish allowable limits in all natural waters for pollutants that result from human actions.

Alaska's Water Quality Standards Regulation is in the Administrative Code, 18 AAC 70. Alaska has had Water Quality Standards for forty years. The territorial legislature established the Alaska Water Pollution Control Board in 1949. The first Water Quality Standards were produced in 1952 in a joint effort with northwest states and British Columbia. Many Standards were derived from previous work by the U.S. Public Health Service. The protection of all waters for the highest use was established at this time. With statehood, the 1952 Standards were translated into the State Administrative Code under the Department of Health and Welfare. DEC was established in 1971 and assumed responsibility for the Standards. Minor modifications were made through 1979, when toxic criteria were first adopted by reference. The toxic criteria were updated in 1982 and 1987.

State Water Quality Standards must be approved by EPA. If disapproved, EPA is required to promulgate federal Standards for the State. The State's Triennial Review and Revision of Standards must take place every three years. The Triennial Revision has several phases: first, a public comment period to solicit proposed modifications; second, preparation of draft revisions by DEC; third, public notice and hearings on the draft revisions; fourth, promulgation after review by the Attorney General and the Lieutenant Governor; and fifth, review and approval by EPA. Revision of Standards is an ongoing process, as I will discuss later. The revision process also is depicted graphically at the back of the testimony handout [EXPLAIN].

Water Quality Standards must contain the following elements:

** BENEFICIAL USES to be protected, including public water supplies, fish and wildlife, recreation, agriculture, and industrial purposes;

** WATER QUALITY CRITERIA sufficient to protect the designated uses;

** METHODS to analyze water quality; and

** an ANTIDEGRADATION POLICY.

Alaska's Standards also contain provisions addressing Mixing Zones, Site-specific Criteria, Short-term Variances, Zones of Deposit, Reclassification, and Enforcement Discretion

The Standards apply to fresh waters, to groundwaters, and to marine waters. All waters are protected for all designated uses, except those waters that have been "reclassified."

The seven designated uses for fresh waters are Drinking Water, Aquaculture, Agriculture, Seafood Processing, Industrial, Contact Recreation, Secondary Recreation, Growth and Propagation of Fish. Shellfish, Other Aquatic Life, and Wildlife.

The seven designated uses for marine waters are Aquaculture, Seafood Processing, Industrial, Contact Recreation, Secondary Recreation, Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife, and Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life.

The Standards cover thirteen pollutants, or groups of pollutants--Fecal Coliform Bacteria, Sediment. Turbidity, Temperature, Dissolved Oxygen, Dissolved Inorganics, pH, Color, Petroleum Hydrocarbons, Residual Chlorine, Residues, and Radioactivity, in addition to Toxic Substances. Under each pollutant, a criterion is stated for each designated use. The criterion may be either a narrative description, or a numeric limit. Because waters are protected for all designated uses, the applicable criterion for a pollutant is the most stringent of the criteria stated.

## TOXIC POLLUTANTS

Toxic pollutants are a special case. The criteria for toxic "priority pollutants" are adopted by reference, either from EPA's so-called "Gold Book" or from the Alaska Drinking Water Standards, whichever value is lower.

EPA specifies two classes of criteria: those for protection of Aquatic Life and those for protection of Human Health. Aquatic Life criteria are developed for both fresh water and for salt water.

Human Health criteria are based on consumption of contaminated water and aquatic organisms. Pollutants having Human Health criteria are considered either carcinogens (that is, causing cancer) or non-carcinogens: For carcinogens, criteria are based on Human Health risk levels, which indicate the increased risk of contracting cancer for individuals with a certain exposure to a carcinogen--not the entire population, just exposed individuals. EPA specifies criteria for cancer risk levels of $10^{-5}$ (one-in-one-hundred-thousand), $10^{-6}$ (one-in-one-million), and $10^{-7}$ (one-in-ten-million). Establishing criteria for carcinogens requires first selecting the Human Health risk level that will be applied. For non-carcinogens, criteria are single numbers, and are not based on risk level.

The criteria for carcinogens take into account assumptions for human body weight, lifetime exposure (70 years), rate of consumption of organisms and water, bioconcentration by organisms, and the carcinogenic potency of the pollutant.

For the majority of pollutants, the Aquatic Life criteria are more stringent than the Human Health criteria, and are the ones applied in a permit. However, there are important exceptions, such as Dioxin, which has the most restrictive Human Health criterion. At the $10^{-6}$ risk level, the Dioxin criteria are expressed in parts per quadrillion.

Alaska has not yet adopted a Human Health risk Level. Therefore, we do not presently advocate applying Human Health criteria for carcinogens in NPDES permits. However, EPA has been applying Human Health criteria in Alaskan NPDES permits, with an assumed risk level of $10^{-5}$, based on EPA's interpretation of State Water Quality Standards and expected adoption of this level in the National Toxics Rule.

In the State's Triennial Revision, Alaska will adopt a Risk Level, and adopt specific numeric criteria for toxics. This is necessary to bring the State into compliance with the Clean Water Act. Following this adoption, Alaska will apply Human Health criteria in appropriate situations, for both carcinogens and non-carcinogens.

## THE NATIONAL TOXICS RULE

Under the Clean Water Act, EPA is required to promulgate federal criteria for any state which has not fully adopted toxic criteria. EPA has encouraged states since 1988 to complete the adoption of toxic criteria. EPA published guidance to states in 1988 and provided policy guidance to it Regions in 1989. EPA notified Alaska in April 1990 that we would be included in the promulgation. The draft federal regulation, known as the National Toxics Rule, was published in November 1991. The final rule recently was sent to the Office of Management and Budget for review and approval.

The sequence of steps in development of the National Toxics Rule since 1987 is shown another graphic at the back of the testimony handout.

For Alaska, the National Toxics Rule will adopt Human Health criteria for carcinogens, since we have not adopted a Human Health risk level for these compounds. In addition, Alaska is included for acute Aquatic Life criteria and a few chronic Aquatic Life criteria published by EPA after 1985. Alaska is not included for chronic Aquatic Life criteria adopted through 1985 (which are the great majority of such criteria) or for Human Health criteria for non-carcinogens. Any state later achieving compliance will be removed from the federal regulation.

In effect, the National Toxics Rule is one jump ahead of the State in adopting toxic criteria. The difficulty, however, is that the rule likely will impose criteria at the $10^{-6}$ risk level. These criteria are ten times more stringent than at the $10^{-5}$ level, and carry substantial economic implications. The State of Alaska would strongly object to blanket adoption of criteria at $10^{-6}$. About half of the states instead have chosen

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the $10^{-5}$ level. Establishing carcinogenic criteria is a complex and technical matter, based on numerous assumptions and uncertainties. We believe examination of each carcinogenic pollutant, particularly the important ones such as Dioxin and Arsenic, is required to establish defensible criteria.

Imposing the $10^{-6}$ risk level is important in another respect. A provision in the Clean Water Act called "anti-backsliding" may prevent less stringent criteria from being assigned later to a facility initially complying with $10^{-6}$ criteria. Thus, if the pulp mills, for example, are given effluent limits based on the $10^{-6}$ risk level, it may be difficult or impossible to revise permits if the State should adopt criteria at a lower risk level. It is therefore essential that the State oppose blanket adoption of criteria based on the $10^{-6}$ risk level.

## REMEDIES UNDERWAY

We are pursuing specific remedies in three areas. These are:

Accelerated revision of selected Water Quality Standards;

A Memorandum of Understanding with EPA to establish new cooperative procedures for the development, review, and issuance of NPDES permits;

Ongoing revision of Alaska's Water Quality Standards.

The accelerated revision of Water Quality Standards is expected to focus on the following items:

Adoption of a Human Health risk level, and adoption of Human Health criteria for selected carcinogens, particularly Dioxin, Arsenic, Chloroform and Cyanide;

Deletion of the 0.01 LC50 surrogate chronic toxicity provision from the toxic criteria; and addition of discretionary use of standard chronic toxicity protocols;

Modification of selected non-toxic criteria, particularly Color, Total Hydrocarbons, Sediment, and Fecal Coliform Bacteria; and

Clarification of language in the Mixing Zone provision.

Here is our timeline for the accelerated revision. We will go to public notice July 1 for 30-day public review of the draft regulation. The final regulation will be approved by the Commissioner and the Attorney General by August 15, and signed by the Lieutenant Governor by September 1. At that point the regs go to EPA for review and approval; but are in effect in the State and will be applied by EPA.

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Work has already begun on the Memorandum of Understanding (MOU) regarding the NPDES process. The MOU will set out improved cooperative procedures for developing permits, emphasizing early communication and issue resolution between the two agencies. It will provide for annual meetings to plan for short-term and long-term NPDES schedules; to identify scientific, technical and economic issues that need assessment; and to identify NPDES issues that may be controversial. It also will provide for working groups to address scientific and technical issues, and economic issues.

Completing the Triennial Revision will be a part of the ongoing revision of Water Quality Standards. The Triennial will complete the adoption of toxic pollutant criteria. In subsequent revisions, we expect to reorganize the presentation of the Standards and clean up additional language. We will re-examine and justify criteria for all of the pollutants, because they were established 10 years ago and more. Many comments on various criteria were received in the initial Triennial public comment period. Another critical detail is to update the laboratory analytical methods by which pollutants are measured, and to prepare a field manual. Also pending is clarification of the Antidegradation policy, and developing implementation procedures. With each of these measures, we will need to provide guidance and training to our field staff. Further on, we will deal with other national programs, such as standards for sediments, wetlands, and biological factors.

DEC also is addressing the issue of protection of all State waters for all designated uses. The Clean Water Act requires designated uses to be established, with criteria sufficient to protect those uses. At present, reclassification of a specific waterbody can remove uses if a rigorous analysis shows that the uses are not existing, and are not attainable. Reclassification actions currently are under discussion with the Municipality of Anchorage. During ongoing revisions of the Standards, we will be developing realistic reclassification procedures that reflect existing and planned waterbody uses. This effort will address a critical need for updating the blanket classification in the 1950s of all waters for all uses, and will establish a more flexible approach to recognizing actual uses and quality of waters. Such an approach is used in a number of other states. Modification of our present classification scheme will be an involved and lengthy process.

The measures I have described will bring up a wide variety of legal and procedural issues. We will continue to work closely in these efforts with the Division of Governmental Coordination, and with the Attorney General's Office.

**SUMMARY**

Here are the conclusions we would like to leave you with:

Water Quality Standards and NPDES permits are mandates of the Clean Water Act.

We are in a new generation of Standards and permits because of the requirements

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concerning toxic pollutants.

We recognize a range of problems, large and small, in the present system. The issues are complex. Perhaps inevitably in a time of change, we are somewhat behind the curve in having remedies to these problems.

The process to develop remedies is well underway, and is being accelerated. The Triennial Revision of Standards has been underway since 1990, with completion due in late 1992.

Revision and refinement of Water Quality Standards will be an ongoing process in the State.

DEC is working closely with EPA, the Governor's Office, and the Attorney General in tackling these issues.

We are especially conscious of the need for full public involvement in this process.

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Thank you. We'll be glad to answer any questions you may have.

# RESPONSE TO QUESTIONS CONCERNING NPDES PERMITS AND THE ALASKA WATER QUALITY STANDARDS

Prepared for the Senate Resources Committee

of the Alaska State Legislature

Alaska Department of Environmental Conservation

May 4, 1992

# RESPONSE TO QUESTIONS CONCERNING NPDES PERMITS AND THE ALASKA WATER QUALITY STANDARDS

This document presents responses by the Department of Environmental Conservation and the Department of Law to questions posed by Senator Lloyd Jones, Chair of the Senate Resources Committee, in a letter dated April 27, 1992. The questions and responses concern the relationship of the Alaska Water Quality Standards to federal "NPDES" wastewater discharge permits and to the proposed federal National Toxics Rule.

Each question is stated or summarized, followed by the response. As requested, the Department of Law separately is providing responses to questions within its jurisdiction. Department of Law responses are incorporated in this document. Each response notes whether the source is "DEC" or "Law."

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(1) Would human health criteria as applied by EPA in the preliminary draft pulp mill permits also impact the fish processing, mining, and oil and gas industries and municipalities? What would the permitting and cost impacts to each of these entities be and what resources would DEC need to find out?

Response, DEC: EPA apparently is basing application of human health criteria in the preliminary draft permits on the State's adoption of federal criteria by reference in the State Water Quality Standards. However, because Alaska has not adopted a human health risk level, EPA itself has made a determination to apply criteria at the $10^{-6}$ risk level. Until the State adopts a risk level and numeric criteria, we presume EPA will apply the $10^{-6}$ criteria in permits for all industries. After the State adopts a risk level and numeric criteria, those criteria will become the operable criteria, applied in all permits.

Water quality criteria should be applied uniformly in all permits, unless site-specific criteria are justified for a given facility. The mixing zone is the main tool available to provide flexibility in the discharge limits for a given facility.

DEC has not determined cost impacts for the various industries, and does not presently have the capability for rigorous economic analysis. The Department is currently working with the University of Alaska's Environment and Natural Resources Institute to develop methodologies for the generation of economic impact information.

(2) How will the State achieve compliance with section 303(c)(2)(B)) of the Clean Water Act, which requires adoption of numeric criteria for toxic pollutants?

(a) What rulemaking process will be used?

Response, DEC: The State will comply with section 303(c)(2)(B) in two phases. Through an expedited process to be completed this summer, we will selectively adopt some of the more controversial human health criteria at issue in permits. These include dioxin, arsenic, chloroform and cyanide. The department has largely completed technical research on these pollutants, initiated over one year ago with the Triennial Revision process. Remaining criteria, both human health and aquatic life, will be adopted through an ongoing process of Water Quality Standards review and revision. The department will continue its deliberate review of options for criteria. We feel that blanket adoption of a risk level for all carcinogens--while a quicker solution--is ill-advised due to a number of assumptions we are investigating.

(b) Other than yourself as commissioner, who on your staff is the person primarily charged with responsibility for completing the process on time?

Response, DEC: Mike Menge, director of the Division of Environmental Quality, is my immediate subordinate responsible for completing the revisions.

(c) Please provide the schedule for completing the rulemaking process.

Response, DEC: The revision schedule will occur in two phases: expedited revisions and an ongoing. The expedited revision calls for public notice of the draft revisions by July 1, with a thirty-day public comment period and public hearing. The schedule calls for adoption of final regulations by the Commissioner August 15, and filing with the Lieutenant Governor by September 1. EPA has up to 60 days to review and approve the regulations.

Phase 2 really represents a process which will be ongoing for the next several years. During this time it is the Department's intention to completely modernize the Alaskan Water Quality Standards to bring them in tune with the needs of the times.

It is important to note that it is the Department's full intention to undertake this process with full public participation. We believe that these are Alaskan regulations that deserve the input and support of all the State's citizens and special interest groups.

(d) What additional resources do you need from the Administration and the Legislature to meet this schedule? Could additional resources speed up this schedule?

Response, DEC: The expedited revision process is resource intensive. The department will be expanding its existing water quality standards team to obtain help from a variety of sections, including the Department of Law for drafting assistance. For selected human health criteria, we also may be convening

smaller working groups which include outside technical experts. While additional resources would assist the department in selected areas, our real needs are to enlist the help of technical experts in the issues being addressed through the expedited process. In the FY 93 budget, the department likely will submit a request for a modest staff increase in the Water Quality Standards section (3 or 4 positions) and an amount of contractual services dollars to accomplish a wide variety of water quality and stream classification related activities.

(e) What technical research has been and is being done to respond to EPA's requirements?

Response, DEC: A great deal of review of human health criteria for the majority EPA's 126 priority pollutants has been completed, including dioxin and arsenic. Further review of cyanide and chloroform is required for adoption of human health criteria in the expedited revision of Standards. Additionally, the department has received many responses from its water quality standards working group and help group--consisting of members of industry, environmental groups, agencies and the general public--for eight key pollutants being considered for revision.

(f) What is the working arrangement with EPA to coordinating compliance with EPA's proposed toxics rule? Will EPA delay issuance of NPDES permits, and how will this affect permit applicants?

Response, DEC: It is likely that the National Toxics Rule will be promulgated before the State completes adoption of all toxic criteria. If so, the criteria in the rule will become the operable, federally-imposed criteria in the State. EPA has agreed to delay issuance of key NPDES permits now in draft until criteria issues are resolved. We presume that additional permits also would be delayed. However, permits cannot be delayed indefinitely, so the State must proceed with revision of Standards as quickly as possible. We will continue to work with EPA and facilities in reviewing current draft permits to seek site-specific remedies such as mixing zone flexibility, outfall considerations, and process considerations. It is important to note that, if reissuance of existing NPDES permits is delayed, facilities will be able to continue operating under current permits by having those permits extended administratively. For new facilities, delay in permit issuance could result in delay of start-up dates.

(g) Has DEC checked with other states that have not yet complied with section 303(c)(2)(B) of the Clean Water Act to determine what those states are doing in response to EPA's proposed rule?

Response, DEC: DEC has made contacts with Washington, Oregon and Idaho to obtain their Water Quality Standards, and has discussed the matter with EPA. We will expand this investigation as our effort continues.

(3) Has DEC determined many new industry/municipal NPDES permits may be delayed? What can DEC do to speed up the process?

Response, DEC: At this time, DEC does not have an accurate count of new and potentially delayed permits. DEC has initiated a tally of expected new and revised permits statewide. To minimize delays, DEC needs to carry out the proposed actions: the expedited revision of Standards; the ongoing revision of Standards; and the MOU on NPDES process.

(4) Has EPA considered the socio-economic impact of the proposed toxic rule, and what impact will this rule have on existing and new industry in Alaska?

Response, DEC: EPA will need to respond to the question about socio-economic impacts. Regarding the second part of the question: it would be difficult to imagine a case where imposition of more stringent permit requirements would not have a negative economic impact on both existing and potential industrial activities within the state. The severity of those impacts could only be determined by an examination of specific industries and specific permit stipulations.

(5) Has DEC or the Attorney General determined what impact socio-economic costs may have on EPA's proposed National Toxics Rule or its application to individual permittees? What impact will socio-economic costs have on DEC's rulemaking?

Response, DEC: DEC has no current information concerning impact of socio-economic costs on development of the National Toxics Rule. However, the draft rule contains the following information on the regulatory impact analysis (paraphrased). Executive Order 12291 requires EPA to perform regulatory impact analyses for major regulations--those that impose an annual cost to the economy of $100 million or more. While the National Toxics Rule is considered a major regulation, the regulatory impact analysis has been waived by the Office of Management and Budget. The reason is that the rule establishes a "legal minimum standard" where states have failed to comply with the Clean Water Act mandate. The economic impacts therefore are no different than what would occur if states acted to adopt their own standards.

The draft rule states that a meaningful estimate of costs to dischargers through NPDES permits is difficult develop due to assumptions required and inherent uncertainties. Costs incurred depend upon the type and amount of pollutants discharged and the extent of additional treatment requirements. The draft rule recognizes that increased costs may be incurred by both point sources and nonpoint sources. The draft rule also states that societal benefits are expected through reduction of risk to human health and ecological impacts on aquatic life.

DEC believes there is a flaw in EPA's rationale in that the National Toxics Rule itself indeed will have economic impact on dischargers to the extent that the

risk level and corresponding criteria imposed by the federal rule are more stringent than what would be adopted by the State.

In both rule-making and administrative processes, DEC is taking steps to reasonably and properly incorporate economic considerations.

In the next 30 days, DEC will be working with the University of Alaska Anchorage / Environmental and Natural Resources Institute to assess economic and technological impacts of the preliminary draft permits for the Ketchikan and Sitka pulp mills. In addition, steps are currently underway to create long-term procedures which would generate economic impact information. This information would then be available for all decision makers to use during their consideration of proposed revisions to Alaska's Water Quality Standards.

NPDES permits are required for pulp mills, seafood processing and other major facilities in the state. These facilities employ a significant percentage of the work force in the communities where they are located. Consequently, if an NPDES permit causes a facility to be shut down due to the cost of compliance, the impact of the permit can be significant.

Because of the Socio-Economic impact NPDES permits may have on a community, DEC is developing an MOU with EPA to develop a process to identify potentially controversial permit-related technological, scientific, or economic issues early in the process. Early identification of these potentially controversial elements will allow enough time to engage in a full analysis of the impacts before a permit is issued.

Response, Law: By statute, the Attorney General is the legal advisor to the governor and other state officers, AS 44.23.020, and consequently, would rely upon DEC or other state agencies to evaluate the socio-economic impacts of the proposed National Toxics Rule.

From a legal standpoint, there are two reasons why the proposed rule may result in greater costs to industry than state-adopted water quality standards for toxic pollutants. First, subject to EPA approval, the state may adopt standards less stringent than the proposed rule. 56 Fed. Reg. 58,433, 58,436. Second, procedural mechanisms such as variances and the site-specific criteria process that are available under state regulations will not be available for the toxic pollutants subject to the proposed federal standards without additional federal rulemaking on a case-by-case basis. Id. at 58,433. The preamble to the proposed rule states:

> EPA cautions States and the public that promulgation of a Federal rule removes most of the flexibility available to States for modifying their standards on a discharger-specific or stream-specific basis. For example, variances, site-specific criteria and schedules of compliance

> actions pursuant to State law for federally promulgated criteria are precluded. Each of these types of modifications would require federal rulemaking on a case-by-case basis to change the Federal rule for that State.

Id. These procedures, along with mixing zones and the adjustment of designated uses, are legal mechanisms by which socio-economic considerations can be factored into the permitting process. See, e.g., Id. at 58,441.

(6) It is my understanding that the EPA Regional Administrator has commented that Alaska's water quality standards are more stringent than necessary. If so, in what regards? Do you agree with this? Will these problems be addressed during DEC's rulemaking process?

Response. DEC: DEC believes the Regional Administrator's comments have been made only in regard to selected elements of the Water Quality Standards: the sediment standard for fresh waters; the color standard for marine waters; specific language dealing with chronic toxicity protocols; and the fecal coliform standard for contact recreation. Since the State has not adopted a standard for dioxin or other carcinogenic pollutants, her comments did not address these compounds. The department feels that some of the comments were based on misinterpretation of the State's discretion in its water quality standards, particularly with respect to authorizing mixing zones for carcinogenic compounds. This misinterpretation of the State's mixing zone regulations since has been corrected. The department does not agree, as a general statement, that its standards are more stringent than the those of the federal government. This is because in the vast majority of cases, the department has adopted criteria identical to the federal criteria.

Another area where the State Standards are "too stringent" is the classification of all waters for the protection of all designated uses. Please see the response to Question 10.

These problems will be addressed during DEC's rulemaking process. Our proposed revisions to the water quality standards are based on three objectives: (1) address human health criteria required under the Clean Water Act; (2) revise selected criteria that are scientifically unsupported or do not reflect currently accepted methods; and (3) reduce ambiguity and clarify language in the standards. The specific parameters addressed are included in the attachments.

(7) Explain how the impact on receiving water quality from applying human health criteria for toxic pollutants differs from requiring an entity to meet drinking water quality standards. If the human health criteria are more stringent for specific parameters, does DEC intend to make drinking water quality standards more

stringent? What industries and municipalities would be impacted by such DEC action and at what cost to those industries and municipalities?

Response, DEC: EPA's proposed human health criteria are stricter than the State drinking water maximum contaminant levels (MCLs) for only a few contaminants. For instance, the drinking water MCL for arsenic is 50 micrograms per liter (ug/l). The proposed EPA human health criterion (for consumption of fish and water) for arsenic is 0.018 ug/l at the $10^{-6}$ risk level. The stricter human health criteria would be more protective of water quality, but also substantially more difficult for dischargers to meet in permits.

DEC does not propose to change the drinking water MCL's because of the promulgation of the proposed human health criteria. Human health criteria are based on protection human health from drinking water and fish consumption or fish consumption alone. Drinking water MCL's are already designed to protect human health for consumption of water. MCL's take the economics of water treatment into account.

(8) Has DEC or the Attorney General examined the legal basis for EPA's application of the draft toxics rule to the pulp mills' preliminary draft permits?

Response, DEC: EPA asserts that the basis for criteria in the preliminary draft pulp mill permits is not the draft National Toxics Rule, but the State Water Quality Standards. However, it is clear that, because Alaska has not adopted a human health risk level, EPA itself has made a determination to apply criteria at the $10^{-6}$ risk level. These criteria, based on the EPA "Gold Book," are not necessarily the same as updated criteria in the draft toxics rule.

Response, Law: The proposed National Toxics Rule has not as yet been formally adopted by EPA. Therefore, it has no legal effect and cannot provide a legal basis for the pulp mill permit requirements. 5 U.S.C.A. § 553 (1977). EPA's preamble to the proposed rule acknowledges as much: "Formally adopted standards form the legal basis for including water quality-based effluent limitations in NPDES permits to control toxic pollutant discharges." 56 Fed. Reg. 58,421. The proposed rule, once adopted, will become effective 30 days after publication in the Federal Register. See 5 U.S.C.A. § 553(d).

(9) It is my understanding that EPA has issued 31 draft permits for placer mining operations that include EPA's proposed rule. Is this correct? Does DEC plan to object to the inclusion of the draft rule requirements in these permits?

Response, DEC: EPA sent to DEC a pre-public, preliminary draft NPDES permit for 33 placer mining discharges for review. The preliminary draft permit contained an arsenic effluent limit of 50 ug/liter, which is based on the State drinking water MCL. DEC staff received verbal agreement from EPA that this 50 ug/liter limit also would be incorporated in the draft

permits for public review. However, if EPA were to publish or send to DEC draft permits with an arsenic limit based on the proposed toxic rule (0.018 ug/l), DEC would strongly object, since there would be no basis for the effluent limit in State or federal regulations. It also is the State's opinion that arsenic effluent limit of 0.018 ug/liter is unnecessarily stringent to protect human health.

(10) Does the Attorney General agree with EPA's legal justification for promulgating water quality standards for the State of Alaska? What is the difference between "designated" and "existing" uses? How are most waters of the state "designated?" Is this classification too stringent under existing circumstances?

Response, DEC: In short, "designated" uses are those named in the State Water Quality Standards, for which criteria are expressed for each pollutant. By federal law and regulation (40 CFR 131), designated uses must include public water supplies, protection of fish, shellfish and wildlife, recreation on and in the water, agricultural, industrial, and other purposes including navigation. "Existing" uses are uses "actually attained" in a waterbody on or after November 28, 1978. Designated uses are not necessarily existing uses, but rather may be potential uses.

Except for the few waters that have been "reclassified" to eliminate certain uses, all waters are classified for the protection of all uses. Thus, for a given pollutant, the criteria that apply are the most stringent criteria a[illegible]ng all designated uses.

Existing uses have little bearing except when a waterbody is proposed for reclassification. Then a Use Attainability Analysis must be conducted to show that designated uses proposed for removal are not existing uses (since 1978), and further, are not attainable.

In some cases, the classification of a waterbody for all uses is "too stringent." This determination would depend on analysis of each situation. The matter of classification will be addressed in the ongoing revision of Water Quality Standards.

Response, Law: We reviewed EPA's legal justification for promulgating federal water quality standards for priority toxic pollutants for the State of Alaska. In general, as explained below, we agree with EPA's analysis that it has statutory authority to adopt these standards for the state. Please refer to our response to question no. 16 for comments on 56 Fed. Reg. 58,476-77, the section pertaining to the State of Alaska.

Under section 303(c)(2)(B) of the Clean Water Act, the state is required to adopt numeric criteria for all pollutants on the section 307(a) list of priority toxic pollutants for which section 304(a) EPA criteria recommendations ("Gold Book" recommendations) are available, the discharge or presence of which could

reasonably be expected to interfere with designated uses. 33 U.S.C.A. § 1313(c)(2)(B). Section 303(c)(2)(B) requires the state to adopt numeric toxic pollutant criteria whenever the state reviews its water quality standards, which under section 303(c)(1) must occur at least once every three years beginning October 18, 1972. The Clean Water Act was amended in 1987, and therefore, in the state's first triennial review occurring after 1987, the state is required to adopt numeric criteria for priority toxic pollutants. As the state has not completed this triennial review, section 303(c)(4)(B) provides EPA the statutory authority to adopt water quality standards to meet the requirements of the Clean Water Act.

After the promulgation of the National Toxics Rule, if the state adopts standards for toxic pollutants which receive EPA approval, removal of the state from the National Toxics Rule will require federal rulemaking procedures. If the state adopts standards no less stringent than the federal rule, EPA will withdraw the federal rule without a notice and comment rulemaking. If, on the other hand, the state adopts standards that are less stringent than the federal rule, EPA will propose to withdraw the rule with a notice of proposed rulemaking and provide for public participation. 56 Fed. Reg. 58,433.

You also asked about the differences between designated and existing uses. Water quality standards consist of the designated uses of the navigable waters involved and the water quality criteria for those uses. "Designated uses" include water supply; water recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life; regardless of whether the use is attained. See 33 U.S.C.A. § 1313(c)(2); 40 C.F.R. § 131.3; 18 AAC 70.020. "Existing uses" are "those uses actually attained in the water body on November 28, 1975, whether or not they are included in the water quality standards." 40 C.F.R. § 131.3(e) EPA selected November 28, 1975 as an index date because it promulgated its original water quality standards regulation on that date. EPA, Introduction to Water Quality Standards 5 (Sept. 1988). An existing use cannot be modified unless uses are added that require more stringent criteria; designated uses, however, may be changed by means of a procedure known as a "use attainability analysis." 40 C.F.R. § 131.10(g).

(11) Has EPA or OMB determined whether EPA's proposed regulation falls within the President's 90-day moratorium on new regulations?

Response. Law: The President's 90-day moratorium on new federal regulations began on January 28, 1992 and concluded on April 27, 1992. Memorandum from the President for Certain Department and Agency Heads 2-3 (Jan. 28, 1992) (President's January 1992 Memorandum). On April 29, the President extended the moratorium for another 120 days. The White House, Office of the Press Secretary, Fact Sheet on the President's Regulatory Reform Initiative (Apr. 29, 1992) (Apr. 1992 Fact Sheet). The moratorium applies to all federal regulations except those

subject to a statutory or court-ordered deadline. A number of other exceptions are also listed in the President's January 1992 Memorandum, none of which appear applicable to the proposed National Toxics Rule.

It is arguable whether the proposed rule is subject to the moratorium. On the one hand, the 1987 amendments did not set a specific deadline for federal action if the states failed to adopt standards for priority toxic pollutants. It can be argued that without a clear statutory deadline for the promulgation of federal standards, the President's moratorium ought to preclude adoption of a final rule. On the other, section 303(c)(4) of the Clean Water Act requires the EPA to adopt any new standard it publishes under that section within 90 days of publication. This statutory provision may provide the requisite statutory deadline to exempt the proposed National Toxics Rule from the moratorium. EPA has requested an exemption from the Office of Management and Budget (OMB). Telephone conversation with Barry Allen, EPA Office of Policy, Planning, and Evaluation (May 1, 1992).

The proposed National Toxics Rule was transmitted to OMB for formal clearance on April 16, 1992. Typically, OMB requires 10 to 30 working days to review a regulation; although, given the controversial nature of the proposed rule, additional time may be required. Telephone conversation with David Sabock, EPA Office of Science and Technology (Apr. 28, 1992). Whether the socio-economic impacts of the proposed rule will play a role in determining whether the rule is subject to the moratorium is unclear. OMB previously waived regulatory (economic) impact analysis for the proposed National Toxics Rule. 56 Fed. Reg. 58,440. However, the President has "requested that all federal agencies prepare a thorough cost-benefit analysis of each major rule issued during the moratorium period." Apr. 1992 Fact Sheet. See also, "Federally Imposed Toxic Pollution Limits Said Unlikely to Be Affected by Moratorium," BNA Environmental Reporter 2374 (Feb. 14, 1992).

(12) Has DEC or the Attorney General determined whether the State or EPA interpretation of the State's Water Quality Standards is entitled to primacy?

Response. Law: You asked whether the state or the EPA's interpretation of the state's water quality standards is entitled to primacy. We found no court decisions that squarely address this question.

The Clean Water Act expressly recognizes the primacy of the states in control of water pollution:

> It is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use (including restoration, preservation, and enhancement) of land and water resources, and to consult with the Administrator [of EPA] in the exercise of his authority under

> this chapter [the Clean Water Act].

33 U.S.C.A. § 1251. In Miners Advocacy Council v. State, 778 P.2d 1126, 1133 (Alaska 1989), cert. denied, 493 U.S. 1077 (1990), the Alaska Supreme Court reviewed the legislative history of the Clean Water Act and concluded that the states have broad power and discretion in the prevention and control of water pollution. The court also quoted the following passage from Mobil Oil Corp. v. Kelley, 426 F. Supp. 230, 234 (S.D. Ala. 1976):

> A review of the legislative history of the [Clean Water Act] reinforces the plain meaning of the Act itself to the effect that Congress intended the states to play a paramount role in the certification of potential polluters.

778 P.2d at 1133.

The preamble to the proposed National Toxics Rule also recognizes the primacy of the states. For example, the preamble states, "EPA has demonstrated extensive deference to State primacy and a willingness to provide broad flexibility in their adoption of State standards for toxics." 56 Fed. Reg. 58,431; see also, Id. at 58,430 (referring to "the principle of State primacy"); Id. at 58,433 ("[T]he water quality standards program has been established with an emphasis on State primacy . . . EPA prefers that States maintain primacy . . . .").

Given the statutory policy of state primacy and an administrative policy of deference to the states with respect to water quality standards, and given that the state prepares, reviews, and revises its water quality standards, the state should be given deference in its interpretation of its standards and regulations, so long as its interpretation is consistent with the Clean Water Act. To the extent EPA finds a standard to be ambiguous or susceptible to an interpretation that would be inconsistent with the Clean Water Act, it has the opportunity to disapprove the standard within 90 days of the state's submission of the standard to EPA for approval. 33 U.S.C.A. § 1313(c)(3). Based on the above authorities, it would appear that if EPA has approved a state standard, and its subsequent interpretation is at odds with the state's interpretation, EPA's interpretation should not be accorded deference, unless the state's interpretation is plainly inconsistent with the Clean Water Act.

However, in two recent decisions, the United States Supreme Court emphasized the primacy of the federal government in the NPDES permitting process. United States Dep't of Energy v. Ohio, ___ U.S. ___, 60 U.S. 4325 (Apr. 21, 1992); Arkansas v. Oklahoma, ____ U.S. ___, 112 S.Ct. 1046, 117 L.Ed.2d 239, 60 U.S.L.W. 4176 (Feb. 26, 1992). The Ohio opinion, for example, begins with the statement that Section 402 of the Clean Water Act "gives primary authority to issue such permits to the United States Environmental Protection Agency . . . ." 60 U.S.L.W. at 4326.

In the Arkansas decision, the Court had occasion to address EPA's interpretation of Oklahoma's state water quality standards, but did not reach the question you have asked. Nonetheless, it may prove helpful to summarize some of the Court's observations. Because state standards are promulgated by the states with substantial guidance from EPA and are approved by EPA, the Court characterized state water quality standards as part of the federal law of water pollution control, at least insofar as interstate water pollution is concerned. 60 U.S.L.W. at 4181. Whether the Court would reach the same conclusion for coastal waters or wholly intrastate waters is not clear. Because the Oklahoma standards affected another state and therefore had a "federal character," the Court concluded that "EPA's reasonable, consistently held interpretation of those standards is entitled to substantial deference." Id. The Court found EPA's interpretation of Oklahoma's standards both reasonable and "consistent with the purposes and principles of the Clean Water Act," and its application of the standards, sound. Id. Further, Oklahoma did not dispute EPA's interpretation of its state standards. Id. The Arkansas decision indicates that a state's interpretation of its water quality standards is to be considered, and that EPA's interpretation of the state's standards is to be evaluated to determine whether it is reasonable, consistently held, and consistent with the purposes and principles of the Clean Water Act.

(13) Why do the State Water Quality Standards apply Alaska Drinking Water Standards to marine waters, which do not serve as drinking water?

Response, DEC: DEC can only say that the application of Drinking Water Standards to marine waters is a historical artifact. This concern will be eliminated by adoption in the Triennial Revision of specific numeric criteria for each pollutant in place of the present adoption by reference that leads to this confusion.

(14) What is the status of DEC's rulemaking on dioxin in light of EPA's pending reassessment of dioxin's toxic effects and appropriate criteria? Do the mills run a substantial risk of being driven out of business to achieve an undetectable dioxin standard that may not be necessary to protect human health? Has DEC determined what other parameters listed by EPA for promulgation as State criteria may also need "reassessment" based on technical data?

Response, DEC: DEC has put considerable effort into review of information concerning dioxin toxicity and criteria, and is well aware of EPA's reassessment of dioxin. DEC will continue its independent review, and will propose dioxin criteria as one of the main factors in the expedited revision of Water Quality Standards scheduled to go to public notice July 1, 1992. The State's proposed criteria will be based on current scientific information, and assumptions appropriate to Alaska. Our approach to setting criteria is to "reassess" each carcinogen to determine appropriate criteria levels. Other carcinogens, such as arsenic, clearly need individual assessment. Our current view is that EPA's

criteria at the $10^{-6}$ risk level for dioxin (0.014 parts per quadrillion) is not supportable given expected exposures. We are closely examining the $10^{-6}$ risk level and associated criteria and the action of other states. An issues paper summarizing our findings is in preparation.

The economic analysis now being prepared by DEC will indicate the mills' cost of compliance with the $10^{-6}$ dioxin human health criterion proposed by EPA in the preliminary draft permits, and will help determine the risk of mill closure. Criteria at the $10^{-6}$ level certainly present a greater threat to the mills that at the $10^{-5}$ level.

It should be noted that dioxin remains one of the most toxic compounds known. Indications are that, while carcinogenic potential actually is less than previously suspected, other systemic toxic effects are as great or greater than previously suspected. Pulp mills in other locations, for example, Oregon, presently must comply with criteria at the $10^{-6}$ level.

(15) What were the findings of the 1990 multimedia study conducted by EPA at the Sitka pulp mill?

Response, DEC: The multimedia study included sampling for the presence of dioxins, furans, and approximately 250 other organic and inorganic compounds in several APC waste streams and in soils, sediments and water around the Sitka area (fly ash and floating sludge from APC, leachate and sludge from the city landfill, sediment from Silver Bay and Blue Lake, soil from areas around Sitka, water from Blue Lake - Sitka's drinking water source and seafood from Silver Bay, Thimbleberry Lake and Blue Lake). The study report also completes a preliminary risk assessment for exposure to dioxins and furans by people living in Sitka.

Very low concentrations of dioxins and furans were found in the Sitka area. At these low concentrations, using worst case exposure assumptions, the likelihood of health effects occurring is also very low. The analysis presented in this report is not intended to be considered a formal risk assessment.

Trace levels (0 to 22 parts per trillion) of dioxins and furans were found in floating residue, soils and sediments. These levels appear to be similar to background concentrations reported for the U.S. and other countries throughout the world. No dioxins or furans were found in leachate from the landfill and water from Blue Lake. The highest levels were found in ask from the pulp mill power boilers. High concentrations of dioxins and furans in ash from incinerators have been previously documented in other municipal and industrial settings. Seafood from Silver Bay also contained trace levels of dioxins and furans. The range in concentration from (0 to 3 parts per trillion) is similar to other background levels measured in the U.S. Subsequent seafood samples taken from Silver Bay (halibut and

salmon) and Ward Cove (rock fish and salmon) show similar concentrations of dioxins and furans. However, crab liver samples from Ward Cove had elevated concentrations of a furan (2,3,7,8-TCDF, 68.7 ng/kg wet weight).

(16) Do DEC and the Attorney General agree with EPA's explanation of why Alaska does not comply with section 303(c)(2)(B) of the Clean Water Act?

Response, DEC: In a letter of October 9, 1991 and in DEC's comments on the draft National Toxics Rule, DEC opposed EPA's assertion that "the Attorney General has decided that the adoption by reference is invalid." This assertion clearly was a misunderstanding, and since has been vacated by EPA. In the comments on the rule, DEC also opposed EPA's inclusion of acute criteria for aquatic life. In a January response, EPA maintained that whether or not the State has adopted acute criteria by reference is ambiguous, so inclusion of acute criteria in the rule is appropriate. DEC does agree that the State has not adopted a human health risk level, or chronic aquatic life criteria since 1985.

Response, Law: Please refer to our response to question number 10. We do not agree with the statement that "Alaska is included in today's proposal because although the State had previously adopted all section 304(a) criteria by reference, the State Attorney General has decided that the adoption by reference is invalid." 56 Fed. Reg. 58,476. The filing of a certified copy of a regulation with the Lieutenant Governor's Office raises a rebuttable presumption that the regulation was duly adopted. AS 44.62.100(a)(1). Since the filing of the regulation, our office has not determined the validity of the adoption of the section 304(a) criteria. Nonetheless, adoption by reference of the section 304(a) criteria would not fully meet the requirements of section 303(c)(2)(b), and thus the state would still be subject to the National Toxics Rule.

(17) Please set forth a detailed history and chronology of DEC's compilation and submission of the section 304(l) list. What criteria were used for inclusion on the list? In the submission, DEC asserted that only 47 waterbodies were impaired, but EPA insisted upon using a list of 112 waterbodies. Which list does DEC believe is correct?

Response, DEC: Section 304(l) of the Clean Water Act ("Individual Control Strategies for Toxic Pollutants") was an amendment added in 1987. It required each state to submit three lists of waters to EPA in February 1989. The nature of each list is described below, along with DEC's date of submittal.

The "Short List" was a list of waters not meeting water quality standards due to discharges of toxic pollutants from point sources. The "Mini List" was a list of waters not meeting water quality standards due to discharges of toxic pollutants from point sources or nonpoint sources. DEC submitted these two lists to EPA on February 23, 1989. The Short List

contained only one waterbody, Port Valdez. The Mini List contained two waterbodies, Ship Creek (Anchorage) and Skagway Harbor.

The "Long List" was a list of waterbodies not expected to maintain "water quality which shall assure protection of public health, public water supplies, agricultural and industrial uses, and the protection and propagation of a balanced population of shellfish, fish and wildlife, and allow recreational activities in and on the water." This was interpreted by EPA to include all waters not meeting standards from any pollutant and any source. The Long List, containing 35 waters, was submitted to EPA on May 26, 1989.

On April 12, 1989, DEC submitted a supplement to the Short List identifying the Alyeska Pipeline Service Company's ballast water treatment facility as the point source affecting Port Valdez.

On June 16, DEC submitted to EPA the State's supplement to the Long List of 112 "Suspected" waterbodies, those "needing further investigation to determine whether they are meeting or maintaining water quality standards."

EPA issued approval of the State's three lists on June 9, 1989. On May 31, 1990, EPA withdrew approval of the State's Long List, claiming the State had not fulfilled certain commitments to further evaluate additional waters suspected of belonging on the Long List. The State vigorously opposed the grounds for EPA's decision to withdraw during the public comment period in a letter dated October 5, 1990. Nonetheless, in a letter dated September 24, 1991, EPA issued a final Long List of waters it believed met the requirements of section 304(l). EPA's list essentially added the State's list of Suspected waters onto the Long List, making it considerably longer than the State's list.

The three lists submitted by the State were derived from the broad list of waters not meeting water quality standards prepared in 1988 for the Statewide Water Quality Assessment Report submitted to EPA under section 305(b) of the Clean Water Act. The criterion used by DEC within the context of each of the three lists was definitive documentation of violation of State Water Quality Standards. Waters lacking definitive documentation were placed on the Suspect List. In EPA's interpretation, the Long List was to include both documented and suspected violations of Water Quality Standards.

DEC firmly believes that EPA erred in its determination; DEC clearly expressed the State's view in the letter of October 5, 1990. In preparing the Long List, DEC followed EPA's national guidance that the list should contain only waters with documented violation of Water Quality Standards. In its withdrawal of approval and substitution of a federal list, EPA Region 10 ignored this national guidance.

(18) What effort has DEC made to limit the application of EPA's proposed toxics rule to waterbodies within Alaska which DEC believes to be adversely affected by toxic pollutants? What challenge to the rule does DEC intend to make, based on EPA's admission that data on toxic discharges in Alaska are limited?

Response, DEC: The National Toxics Rule will impose federal toxic water quality criteria for the State of Alaska until such time as State adopts its own criteria, has them approved by EPA, and is formally withdrawn from the federal toxics rule. These criteria will be applied by EPA in NPDES permits as the operative State criteria. They will only be applied as water quality-based effluent limits in NPDES permits where a given pollutant causes, or has reasonable potential to cause, exceedance of a water quality criterion. That determination is made, for existing facilities, based on past discharge monitoring by the operator; and for new facilities, based on the operator's projected pollutant discharge levels. Both take into account the modelled dilution in the authorized mixing zone. Thus the toxic criteria, whether federal or State, are applied in permits through an analysis of each pollutant discharged, based either on data or on projected discharge levels.

Any challenge by the State of Alaska on the National Toxics Rule likely would not be based on EPA's admission that data on toxic discharges in Alaska are limited.

(19) Does DEC intend to work with the pulp mills in designing mixing zones for the mill outfalls?

Response, DEC: Yes, DEC will work with the mills in designating mixing zones. The Water Quality Standards require that a mixing zone be "as small as practicable," but the zone can be expanded upon a suitable demonstration of need by the operator. This determination will require technical input and data from the mill. The determination will consider economically and technologically feasible treatment and/or process modifications as well as adverse impacts to aquatic life and human health.

(20) Is DEC reviewing the pulp mill preliminary draft permits for accuracy and consistency with the State Water Quality Standards? Will the results be reflected in DEC's rulemaking?

Response, DEC: Yes. In the review of NPDES permits, DEC verifies criteria and procedures used by EPA to derive effluent limitations, and reviews other provisions of permits relating to State Water Quality Standards. DEC will use the information gained in the upcoming revision of Water Quality Standards. The revised standards will address any ambiguity of the current State standards and adopt specific numeric criteria.

(21) Does DEC agree with EPA's application of the human health criteria from EPA's November 19, 1991 proposed toxics rule to the State's mixing zone regulation (18 AAC 70.032) as was done in the preliminary draft pulp mill permits? If not, why not?

Response, DEC: EPA asserts that the basis for criteria in the preliminary draft pulp mill permits is not the draft National Toxics Rule, but the State Water Quality Standards. Criteria used by EPA in the permits are based on the EPA "Gold Book." The State opposes the imposition of human health criteria at the $10^{-6}$ risk level. The State also does not agree with EPA's preliminary decision not to grant a mixing zone for carcinogens. We feel EPA's decision is based on misinterpretation of the State's mixing zone regulations. In a March 22, 1992, letter to EPA prepared at EPA's request, Commissioner Sandor explicitly clarified the State's mixing zone regulations as they relate to granting a mixing zone for carcinogens. The preliminary draft permits did not reflect the State's position. Subsequent meetings with EPA in Seattle have resolved the issue in favor of the State in granting due deference to the State in the interpretation of its own regulations.

(22) Has DEC determined the capital and operating costs to the pulp mills of complying with EPA's preliminary draft permits?

Response, DEC: APC estimates that it will cost $104 million to come into compliance under the new preliminary draft permit. The lion's share of that cost is to meet EPA's proposed dioxin and color discharge limits. Collectively, these total $89 million, or roughly 86 percent of APC's estimated $104 million total cost.

Currently, the Department has no information to either support or refute the published numbers. The Department, in conjunction with the University of Alaska's Institute of Environment and Natural Resources, will address this question over the coming weeks.

(23) What is EPA doing to promote development of wetlands criteria, biological criteria, and sediment criteria? How will these things affect Alaska? How is DEC organized to handle these matters?

Response, DEC: EPA's national agenda for water quality standards calls for state development of wetlands criteria, biological criteria, and sediment criteria. EPA has published guidance documents in each of these areas, particularly for sediment and biological criteria. Several states are experimenting with these items, and some states have regulations in place. The state of Washington, for example, recently promulgated comprehensive criteria for sediment quality, and Oregon is advanced in the use of biological criteria. The current markup bill in Congress for amendment of the Clean Water Act includes a specific requirement for all states to develop sediment criteria. We must expect that all

of these matters will come to Alaska with time, but we cannot predict schedules until the Clean Water Act is reauthorized. DEC is beginning to examine biological criteria, but does not plan to implement any of the three criteria types in the immediate future.

# BRIEFING MATERIALS

# FEDERAL WASTEWATER DISCHARGE (NPDES) PERMITS AND THE ALASKA WATER QUALITY STANDARDS

Prepared for the Senate Resources Committee

of the Alaska State Legislature

Alaska Department of Environmental Conversation

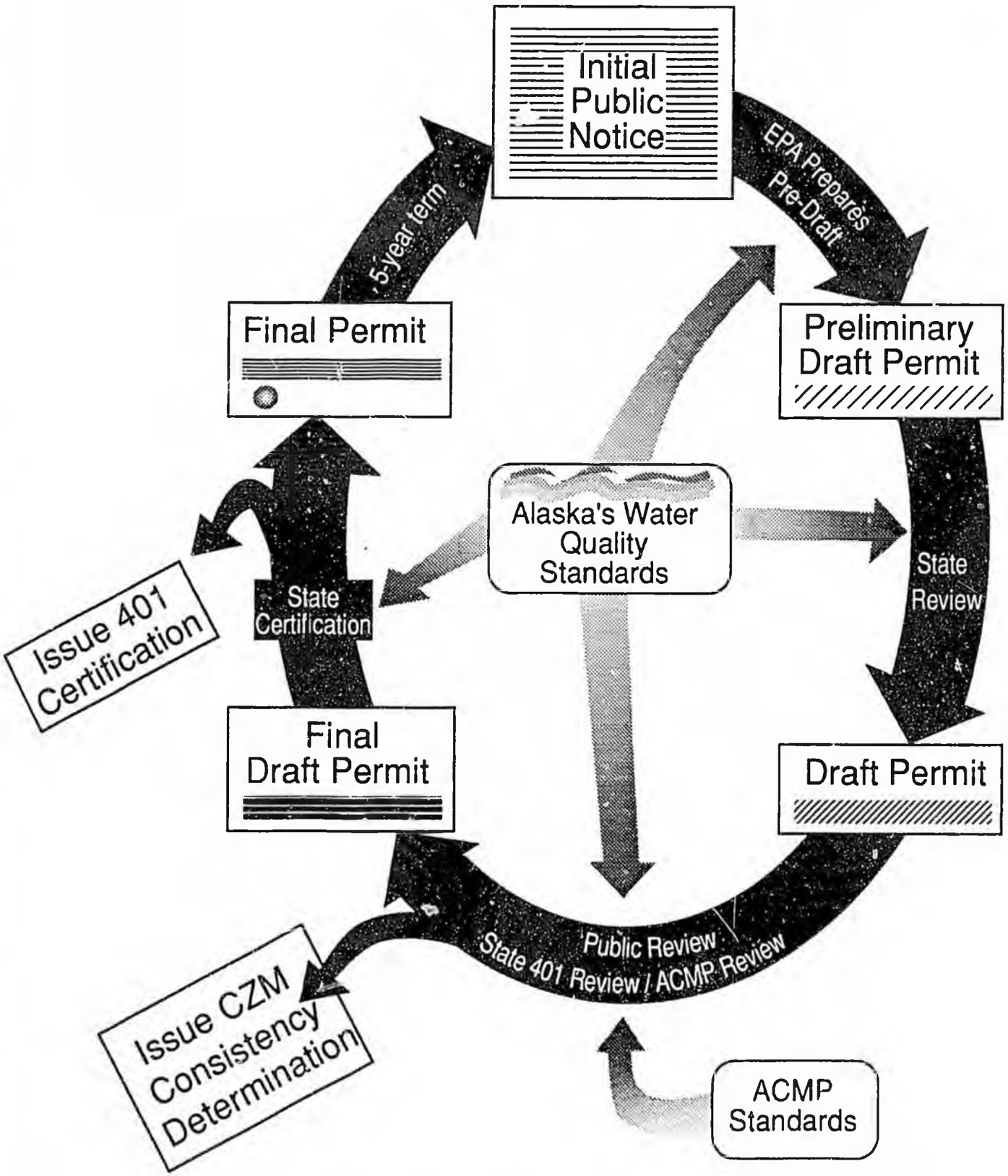
May 4, 1992

## SENATE RESOURCES COMMITTEE BRIEFING PACKAGE

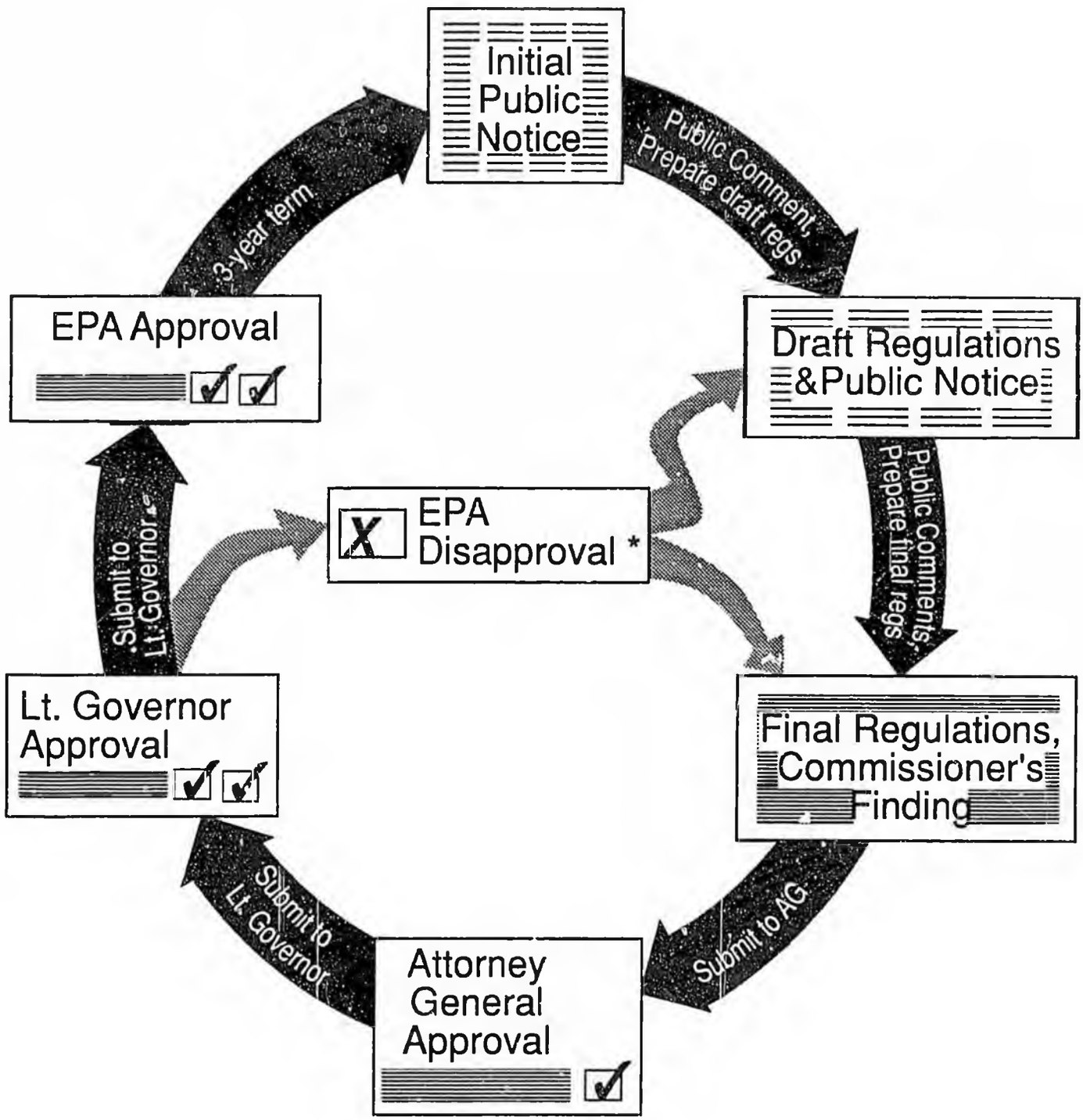
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# NPDES Permit Process



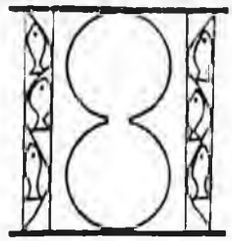
# *Process for Triennial Revision of Water Quality Standards*




* If EPA disapproves regulations, the State has 90 days to make changes. Otherwise EPA is obligated to promulgate federal Water Quality Standards for the State.

# National Toxics Rule

| | |
|---|---|
| **1987** | Clean Water Act Mandate given [Section. 303 (c) (2) (B)]—States must adopt toxic pollutant criteria. EPA must promulgate federal criteria in regulation for states that do not. |
| **1988** | EPA published guidance to states on achieving compliance with the Clean Water Act. |
| **April 1990** | EPA sent notice to states not in compliance that they would be included in the federal regulation. |
| **October 1991** | DEC sent letter to EPA supporting the validity of Alaska's adoption of EPA criteria by reference. |
| **November 1991** | EPA published the draft National Toxics Rule, including Alaska for carcinogenic criteria, chronic aquatic life criteria since 1985, and acute aquatic life criteria. |
| **December 1991** | DEC sent comments to EPA on the National Toxics Rule, opposing adoption of acute criteria and clarifying other matters. |
| **January 1992** | EPA prepared a response to Alaska's comments, noting that acute aquatic life criteria would be retained, but agreeing with other state comments. |
| **???** | Final National Toxics Rule promulgated. |



# A Brief History of the Classification of Alaskan Waters

From a Review of Water Quality Objectives/Standards Since 1949

**1949** The Alaska Water Pollution Control Board was established by the territorial legislature under the authority of Chapter 117, titled simply "An Act". The Alaska Water Pollution Control Board was responsible for administration of the Alaska Water Pollution Control "Act" to safeguard Alaskan waters from pollution and establish standards of water purity which affect public health, fish and wildlife, recreation and industrial development.

According to Amos Alter (Person. comm., 1992), Director of the Division of Sanitation and Engineering for the Alaska Department of Health in 1949, there was only one person assigned to actively administer the water pollution control program. It wasn't possible for this one person to classify all Alaskan waters for different uses. It was also generally believed by the Board that Alaska had a unique chance to protect it's pristine waters, unlike states that already had many polluted waterbodies. Therefore, it was determined that Alaskan waters should be generally protected for the highest water use. This was "water supply and their sources." Initial limits were provided by the US Public Health Service (USPHS) and included federal Drinking Water Standards.

**1952** The first Water Quality Objectives table of standards was produced. This is found in a paper titled, "Pollution Control Council, Pacific Northwest Area". It was developed through the coordination of the engineering representatives from pollution control agencies in Alaska, British Columbia, Idaho, Montana, Oregon, and Washington. These standards were applicable to those regions and the Territory of Alaska.

It is in this table, "applicable to the receiving waters for salt and fresh surface waters and underground waters," that the first employment of protecting waters for the highest water use is evident. For example, for the parameter "toxic, colored or other deleterious substances", the USPHS standards applied to four of the five listed water uses.

**1959** The Territory of Alaska became the State of Alaska. Concurrently, the Alaska Administrative Procedure Act became effective. Water Quality Objectives were published in the Administrative Code, Title 7, under Health and Welfare. The Water Pollution Control Board was disbanded. The Water Quality Objectives were under the broad authority of A.S. Title 46, (Water) and A.S. Title 16, (Fish and Game). The Commissioner of Health and Welfare after conducting public hearings, could establish standards and/or group the designated waters of the state into classes.

The Water Quality Objectives adopted by the State of Alaska were the same table established in 1952 by the Territory.

**1952 - 1979** For 27 years the original work and intent of the Alaska Water Pollution Control Board and the Pacific Northwest Council were repeated in succeeding Water Quality Standard (WQS) revisions. Clarifications in language and some modifications were made but these did not change the character of the original work. Key elements in the classification of state waters follow:

1. It was possible through public hearings to reclassify waters for specific uses. If waters were not reclassified, the "highest water use" superceded the other uses for a given waterbody.

2. The burden of justifying a reclassification was placed on those wishing to reclassify a waterbody.

3. In 1970, Ward Cove in Ketchikan, Ship Creek in Anchorage, Chena River, Fairbanks, and Silver Bay in Sitka were classified for specific uses as were all coastal waters. In 1971, both Ward Cove and Silver Bay were deleted from the reclassification list.

4. In 1973 the following significant clarification was made: "if waters have more than one use, the most stringent water quality criterion of the the uses shall apply." Up until 1979, numeric limits were primarily found in the USPHS Drinking Water Standards because other criteria had not been developed. It became more evident with this wording clarification that criteria and designated uses

were integral parts of a water quality standard.

The Department of Environmental Conservation was created in July of 1971 as a split off from the Division of Environmental Health in the Department of Health and Welfare. DEC made few changes in the 1971 Water Quality Standards from previous Department of Health and Welfare standards. Reclassification required public hearings, the approval of the Commissioner of DEC and concurrence by the Administrator of the EPA for interstate waters.

**1979** In 1979 significant changes were made in style, format and content of the WQS. Water quality criteria applicable to each use were significantly broadened in scope and detail. It was in this revision that aquatic life criteria made their first appearance with the adoption of federal criteria from the 1976 Red Book for the parameter of "toxic and other deleterious organic and inorganic substances." The USPHS Drinking Water Standards were also replaced by the Alaska Drinking Water Standards. It was now stated that between the Drinking Water Standards and the aquatic life criteria, the more stringent should be chosen as the applicable criterion. This practice continues today and in most cases, EPA's aquatic life criteria are more stringent than the Drinking Water Standards.

In general, the WQS took a more restrictive turn in 1979. There were many more stipulations that had to be met before a waterbody could be reclassified. For the first time, there was a section that included waterbodies ineligible for reclassification (parks, refuges, etc.). Another section spelled out what conditions defined the designated uses. To eliminate a use for a given waterbody it would have to be proven that those conditions did not exist. Ship Creek and marine waters were deleted from the reclassified list in this revision.

Key points are that although significant alterations were made in 1979, it was still quite possible to reclassify a waterbody after public hearings and the approval of the Commissioner. The burden of proof was on the applicant and the applicant only had to address "existing uses" of the waterbody in the reclassification procedures.

**1979 - 1987** During this period, amendments were proposed and adopted through the public process, but no comprehensive Water Quality Standard document was published with the incurred changes. No significant amendments were made concerning reclassification of waterbodies during this time.

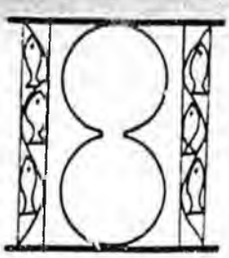
In 1982 one important amendment was the adoption by reference of federal aquatic life criteria for 64 compounds or classes of compounds listed in the 1980 EPA Ambient Water Quality Criteria documents. This adoption by reference includes the bulk of the numeric criteria in effect today. Human health criteria for non-carcinogens also were adopted at that time.

In 1984 Nolan Creek and five tributaries near Wiseman were reclassified for the industrial use.

**1987 - Today** In 1987, revised Water Quality Standards were published. It was in this revision that aquatic life criteria for nine compounds, published by EPA in 1985, were adopted by reference. The procedures for reclassifying state waters were extensively modified to make them consistent with 1983 EPA regulations. The Clean Water Act does not address procedures for reclassifying state waters. At the time of this revision, two waterbodies remained on the reclassified list, Nolan Creek and Chena River. Although not referred to specifically in the WQS, the department now had to comply with EPA regulations in order to reclassify waterbodies of the state. Significant federal requirements follow:

A) To exclude a designated use through reclassification, it was no longer enough to show that the designated use was not an "existing use" of the waterbody. One also had to prove that the designated use was not "attainable." This provision added a new and more difficult element in the formula for reclassification of state waters. It has proven to be onerous and costly to show that some designated uses might not be attained at some place in time, by some method.

B) EPA's regulations also require that a structured scientific study called a "use attainability

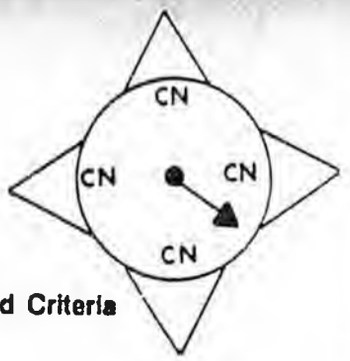


analysis" (UAA) must be conducted to prove that a use cannot be attained. Therefore, the decision to reclassify a waterbody is made after conducting a use attainability analysis. The State's request to reclassify must be approved by the Regional Administrator of EPA. High costs of analysis and strict EPA guidelines were prohibitive for considering all suggested reclassifications proposed. Based on these factors, a provision was added in the WQS that the decision on whether to proceed with a reclassification was at the department's discretion.

In November, 1989 an amendment to the WQS included a revision of the section on Classification of Waters. As a result of the Tolovana Use Attainability Analysis, the Department removed some protected use classes from 14 streams or segments of streams in the Tolovana River Basin. The cost to the state was extensive and it proved to be very difficult to eliminate significant "attainable" uses that would satisfy the original intent of the applicant. In the final analysis, the department's cost and efforts to reclassify or not to reclassify rested solely on EPA's final approval. Therefore, even if the department wished to reclassify a waterbody, the department decisions can be vetoed by EPA according to the 1983 EPA regulations still in effect today.

The 1989 WQS revision retained the same procedures for reclassification adopted in 1987, and they remain the same today.

KW/WQM, February 1992




# *ALASKA WATER QUALITY STANDARDS HISTORICAL UPDATE*

**The History of How Revisions of the Water Quality Standards Have Affected Criteria**
Using The Cyanide Criteria As An Example

**1949 - 1979** During this period, chemical constituents could not exceed the US Public Health Service Standards. The USPHS Drinking Water Standards did not contain a limit for cyanide. They did, however, make recommendations based on standards developed for cyanide by other agencies and countries. The cyanide limits used by other agencies and countries appeared to be based on the toxicity to fish and not to man. It was recommended that cyanide concentrations be kept below **10 ug/l** in water. For the protection of the health of human populations, concentrations above **200 ug/l** constituted grounds for rejection of the supply. (1962, USPHS Drinking Water Standards)

**1979 - 1982** In 1979 with the adoption by reference of the EPA 1976 Red Book criteria, the state cyanide standard for aquatic life automatically became the cyanide criterion in the Red Book. The new criterion was the chronic value of **5 ug/l** for freshwater and marine aquatic life and wildlife. The human health limit remained at **200 ug/l**.

The USPHS Drinking Water Standards were replaced by the Alaska Drinking Water Standards in 1979. With the addition of EPA aquatic life criteria to the WQS, a provision was added that between the Drinking Water Standards and the aquatic life criteria, the most stringent should be chosen as the applicable criteria. There was no Alaska Drinking Water Standard for cyanide so the aquatic life criterion of 5.0 ug/l was the only criterion to choose from. To date there still is no Alaska Drinking Water Standard for cyanide so the **aquatic life** criteria automatically apply to fresh, salt and groundwaters of the state.

**1982 - 1987** In 1982 with the adoption by reference of the 1980 EPA Water Quality Criteria documents, the value for cyanide again automatically changed. At this time, EPA provided criteria for fresh and saltwater and for both acute (higher concentrations allowed for short periods) and chronic (lower concentrations allowable over the long term) conditions. The WQS state that only the most stringent value applies. This means that the chronic criteria must be selected.

For free cyanide, the aquatic life criterion for freshwater became **3.5 ug/l** applied as a 24-hour average. For saltwater the criterion became **2.0 ug/l**. The department also adopted human health criteria for noncarcinogens from the 1980 criteria documents. The cyanide criterion EPA recommended was identical to the USPHS Drinking Water Standards which was **200 ug/l**. Since the aquatic life criterion of 3.5 ug/l for freshwater was more stringent, it automatically superceded the human health criterion of 200 ug/l.

**1987 - 1992** In 1987, aquatic life criteria for nine compounds were adopted by reference. These included replacement criteria for free cyanide. The "new" freshwater, chronic criterion for free cyanide was **5.2 ug/l** (4-day average). The criterion for saltwater was **1.0 ug/l** (1-hour average). The saltwater criterion is the acute value because there is no chronic criterion for cyanide.

These criteria for cyanide remain the same today and new cyanide criteria are not expected to be published by EPA in the near future. **A table on the following page summarizes the applicable criteria for cyanide since 1949.**

KW/WQM, February 1992

## THE DEVELOPMENT OF CYANIDE CRITERIA FROM 1949 TO 1992

| Period and Source | Criteria for Aquatic Life | Criteria for Human Health |
|---|---|---|
| 1949 - 1979<br>US Public Health Service Standards | 10 ppb | 200 ppb |
| 1979 - 1982<br>EPA 1976 Red Book | 5 ppb<br>(Chronic) | 200 ppb |
| 1982 - 1987<br>EPA 1980 Water Quality Criteria Document for FREE Cyanide | Freshwater = 3.5 ppb<br>(24-Hour Average)<br><br>Saltwater = 2.0 ppb<br>(4-Day Average, est.) | 200 ppb |
| 1987 - 1992<br>EPA 1984 Water Quality Criteria Document for FREE Cyanide | Freshwater = 5.2 ppb<br>(4-Day Average)<br><br>Saltwater = 1.0 ppb<br>(1-Hour Average) | 200 ppb |

**Notes:**

1. "ppb" = parts per billion, equivalent to micrograms per liter (ug/l).

2. **For cyanide**, only the aquatic life criteria are applicable to protect surface and groundwaters because they are more stringent than human health criteria.

3. The 1986 EPA "Gold Book" contains excerpts from the 1976 "Red Book" and the 1980 and 1984 EPA Water Quality Criteria documents.

# MEMORANDUM STATE OF ALASKA

**DEPARTMENT OF ENVIRONMENTAL CONSERVATION**
**Division of Environmental Quality**

TO: Water Quality Standards
Work Group Member

DATE: January 27, 1992

FILE NO.:

FROM: Katy Wilkinson

PHONE NO.: 465-5302

SUBJECT: Water Quality Standard Questionnaires

Enclosed are the first four of a group of questionnaires on Water Quality Standard issues that we are addressing in this revision. Also enclosed is a copy of the **1991 Summary Response To Public Comments On The Revision of Alaska's Water Quality Standards** and a one page article from Science magazine that may be of interest.

We will continue to compose questionnaires on various topics based on issues we said we'd address in the Triennial Response Summary, federal requirements and a few topics from the EPA in Region 10 "wish list." I have also formed an outside D.E.C "Help" Group composed of industry, some environmental groups and a few folks who have requested to be participants.

I would like to reiterate that the initial public comment period is over for this revision. We are seeking your input on the WQS revision that will again go back out for a full public review when it is completed.

The issues are varied and I hope that these questionnaires while raising questions will also serve to inform you on the WQS. Thank you for your time and effort.

ADEC Water Quality Work Group Members

Jeff Hock/EQ Monitoring Lab
Cameron Leonard/Assistant Attorney General, Fairbanks
Bill Lamoreaux/Anchorage District Office
Bruce Erickson/Western District Office
Les Buchholz/Kenai District Office
Simon Mawson/Pipeline Corridor Regional Office
Ron Doyel/Matanuska-Susitna District Office
Paul Pinard/Matanuska-Susitna District Office
Jane Tonkin/Cordova Field Office
Clara Jodwalis/Northern Regional Office
Dick Stokes/Southeast Regional Office
Ron Flinn/Southeast Regional Office
Amy Kruse/Southeast Regional Office
Sharmon Stambaugh/Southeast Regional Office
Pete McGee/Northern Regional Office
Joyce Beelman/Northern Regional Office
Al Keglar/Juneau District Office
Steve Haavig/Juneau District Office
Jim Clare/Sitka District Office
Barry Hogarty/Ketchikan District Office
Randy Romenesko/Nome District Office
Doug Dasher/Interior District Office
Svendt Brandt-Erichsen/Southcentral Regional Office
Ursula Spannagel/Southeast Regional Office
Mike Menge/EQ Director
Billie Wilson/Paralegal Assistant/Commissioner's Office
Dick Nenahlo/Pipeline Corridor Regional Office
George Wilson/Pipeline Corridor Regional Office
Jim Hayden/Central Office
Robert Dolan/Southcentral Regional Office
Arnie Shryock/Kodiak District Office
Brad Fristoe/Northern Regional Office
Kenwyn George/Central Office
Robert Regis/Assistant Attorney General/Juneau
Conrad Christianson/Northern Regional Office
Bill Morgan/Northern Regional Office
Tim Rumfelt/Southcentral Regional Office
Doug Redburn/Central
Dave Sturdevant/Central
Bonnie Friedman/Central

"-hard science remains our most reliable compass
in a turbulent sea of environmental concerns."

William K. Reilly
EPA Administrator



## #1 Water Quality Standard Review Questionnaire/January 1992

Topic: FECAL COLIFORM BACTERIA STANDARD FOR PRIMARY CONTACT RECREATION IN SURFACE WATERS OF THE STATE

**The Current Standard for Both Fresh and Marine Waters:**

| | |
|---|---|
| Water Recreation (I) contact recreation | Based on a minimum of 5 samples taken in a 30 day period, the mean shall not exceed 20 FC/100 ml, and not more than 10% of the total samples shall exceed 40 FC/100 ml. |

Based on Triennial Review comments from the public, the fecal coliform standard for contact recreation is being reviewed. This criterion first appeared in Alaska Water Quality Standards in 1979. Substantiation for this criterion is not readily available. However, the suggested reasoning is that if a swimmer ingests water accidentally then that water should be protected at the same level as for the drinking water use.

The 1976 EPA Red Book recommended for Bathing Waters (the primary contact recreation equivalent) that the fecal coliform bacteria level should not exceed 200 colonies per 100 ml. Many states adopted this criterion directly into their standards and most remain the same today. According to the American Fisheries Society who critiqued the Red Book, "The criterion proposed for bathing waters is acceptable for human health based on the current state of epidemiological information available from recreational water studies."

EPA's 1986 water quality criteria document for bacteria maintains the validity of 200 colonies per 100 ml as the standard for contact recreation. However, the document recommends that measurement of fecal coliforms be replaced with measurement of E. coli and entercocci because they more accurately indicate risk of disease from exposure. To revise the bacteria criteria to reflect E. coli and enterococci as a new measure is beyond the scope of the present review and will be considered at a later time.

In some of the public comments for the Triennial Revision of the WQS, the view was expressed that this standard should be increased from 20 to 200 colonies per 100 ml to be consistent with the Federal fecal coliform standard for primary contact recreation.

Based on the results of a comprehensive bacterial monitoring program on several creeks in the Anchorage bowl, the Municipality of Anchorage Department of Health and Human Services believes that the current standard is too stringent. They have found that streams flowing from undeveloped, pristine areas have values that exceed 20 FC/100 ml.

Attached is a summary of other states' fecal coliform criteria for contact recreation in surface waters, provided by the Municipality of Anchorage. Two states use 100; Alaska is the only state below 100. The rest use 200 and 240.

MOA - DHHS
STATE STANDARDS FOR BACTERIA (EPA 1972)
NOVEMBER 1991
LEE B.

| STATE | PRIMARY/BODY CONTACT RECREATION FECAL COLIFORMS | TOTAL COLIFORMS |
|---|---|---|
| Alabama | 200/100 ml | |
| Alaska | 20/100 ml | |
| Arizona | 200/100 ml | |
| Arkansas | | 1,000/100 ml |
| Colorado | 100/100 ml | 1,000/100 ml |
| Connecticut | | 1,000/100 ml |
| Delaware | | 1,000/100 ml |
| District of Columbia | 240/100 ml | |
| Florida | | 1,000/100 ml |
| Hawaii | 200/100 ml | 1,000/100 ml |
| Indiana | 200/100 ml | |
| Iowa | 200/100 ml | |
| Kansas | 200/100 ml | |
| Kentucky | 200/100 ml | 1,000/100 ml |
| Louisiana | | 1,600,100 ml |
| Maine | 200/100 ml | 1,000/100 ml |
| Maryland | 240/100 ml | 5,000/100 ml |
| Massachusetts | | 70/100 ml |
| Michigan | 100/100 ml | 1,000/100 ml |
| Minnesota | | 1,000/100 ml |
| Mississippi | | 1,000/100 ml |
| Nebraska | 200/100 ml | |
| New Hampshire | 240/100 ml | |
| New Jersey | 200/100 ml | |
| New Mexico | 200/100 ml | |
| North Carolina | 200/100 ml | |
| North Dakota | | 1,000/100 ml |
| Ohio | | 1,000/100 ml |
| Oklahoma | 200/100 ml | 1,000/100 ml |
| Oregon | | 1,000/100 ml |
| Pennsylvania | | 1,000/100 ml |
| Rhode Island | | 1,000/100 ml |
| South Carolina | 200/100 ml | |
| South Dakota | 200/100 ml | |
| Tennessee | | 1,000/100 ml |
| Texas | 200/100 ml | |
| Utah | | 1,000/100 ml |
| Virginia | 200/100 ml | 2,400/100 ml |
| Washington | 240/100 ml | 1,000/100 ml |
| Wisconsin | | 1,000/100 ml |
| Wyoming | 240/100 ml | |

LB/jgk97



## #1 Water Quality Standard Review Questionnaire\January 1992

Respondent's Name: _____

**QUESTION**

1. Identify the fecal coliform criterion you believe should be proposed in this revision of the Water Quality Standards to protect the use of contact recreation in the surface waters of the State.

   20 FC/100 ml (current criterion) ☐

   100 FC/100 ml ☐

   200 FC/100 ml ☐

   Other _____

**Further Suggestions or Reasoning for Your Selection**

_____

_____

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR TIME AND EXPERTISE

Please fold this page and mail. If you have further questions feel free to call Katy Wilkinson at 465-5302.

Attn. Katy Wilkinson
D.E.C./Water Quality Management
P.O. Box O
Juneau, Alaska 99801-1800

"There's always an easy solution to every human problem-
neat, plausible and wrong."

H.L. Mencken

## #2 Water Quality Standard Questionnaire/January 1992

Topic: ORGANOLEPTIC CRITERIA

### EPA's Definition

An organoleptic criterion defines a concentration of a compound that imparts an undesirable taste and\or odor to water. It is applied as a human health criterion but is considered to be mostly aesthetic. The research papers that discuss taste and odor thresholds are cryptic in their descriptions of test methodologies, number of subjects tested and concentration\response relationships. Thus the quality of organoleptic data is often much lower than that of toxicological data used in establishing other criteria (Federal Register\Vol. 45, No. 231\Friday, November 28, 1980, p. 79355).

EPA's water quality criteria documents state, "It should be recognized that organoleptic data as a basis for establishing a water quality criterion have limitations and have no demonstrated relationship to potential adverse human health effects." The most recent organoleptic criteria proposed by EPA were published in 1980.

Also, when the organoleptic data are listed in EPA criteria documents there are few or no references. This could make them difficult to defend.

### Organoleptic Criteria and The Alaska Water Quality Standards

The AWQS currently adopt by reference numeric organoleptic criteria for **23** compounds (See Table 1 of the Workbook or Note 5 in the AWQS). For **12** compounds, the **only** criteria listed are organoleptic. There are no other numeric criteria for fresh or saltwater for these 12 compounds. Most of these are in the chlorinated phenol class.

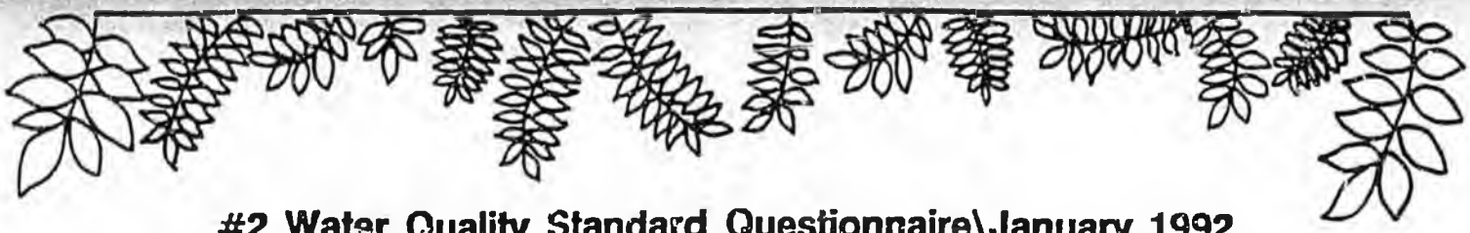
In the AWQS, for toxic and other deleterious organic and inorganic substances, in freshwater, an organoleptic narrative criterion for the uses a) aquaculture and b) growth and propagation of fish, shellfish, and other aquatic life, and wildlife, is stated as follows:

**Substances shall not be present or exceed concentrations which individually or in combination impart undesirable odor or taste to fish or other aquatic organisms as determined either by bioassay or organoleptic test (See Note 5 and 8).**

In marine water, the same narrative criterion is stated for the same uses as freshwater in addition to the use of **harvesting for consumption of raw mollusks or other raw aquatic life**.

Currently there is no EPA or State implementation guidance for using organoleptic criteria as water quality standards. In Alaska, we have not applied organoleptic criteria to date and when it has been attempted there have been too many difficulties for sound implementation and enforcement. Therefore their use, placement in the AWQS, and overall purpose in the regulatory setting are under review.

Organoleptic criteria are meant to be applied as aesthetic human health criteria relating to taste or smell when drinking water or eating fish and wildlife. EPA does not recommend using them to supercede fresh or saltwater criteria that are based on sound toxicological data (i.e., EPA's aquatic life criteria).



## #2 Water Quality Standard Questionnaire\January 1992

**Questions**

1. Should the **numeric** organoleptic criteria adopted by reference be elevated into regulation as it appears in Table 1 of your workbooks?

Yes ☐ No ☐

2. Of the 23 compounds listed, are there any for which organoleptic criteria are important and necessary in certain cases?

Yes ☐ No ☐

A. If so, cite the compounds and cases when organoleptic criteria should be used.

_____

_____

_____

_____

B. List literature that is readily available to support the validity of the criteria for compounds cited in 2A.

_____

_____

_____

3. Should the **narrative** organoleptic criteria be retained?

Yes ☐ No ☐

4. If retained, to which designated uses should either the narrative or numeric organoleptic criteria apply?

_____

_____

5. If there are any wording changes recommended in the narrative criterion please write them below.

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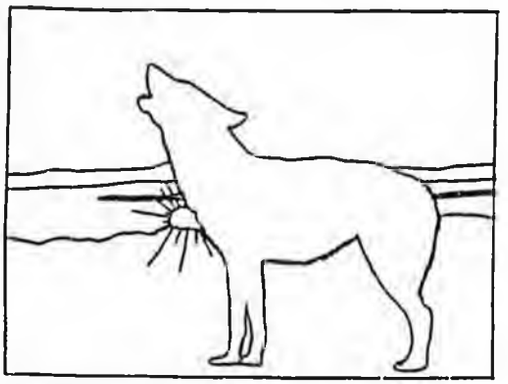
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_____

THANK YOU FOR YOUR TIME AND EXPERTISE

Please fold this page and mail. **If you need more space on the above questions or have further suggestions on how to implement organoleptic criteria, please add attached pages.** If you have other questions feel free to call Katy Wilkinson at 465-5302.

"The Chemical Abstract Service has assigned registry numbers to some 10 million chemicals. Roughly 70,000 chemicals are used in commerce; fewer than 10,000 have some health effects data; and about 100 have some direct human data. Certainly these data limitations are formidable." (From Dr. Kim, Director of the Division of Environmental Health Assessment, New York State Department of Health).



## #3 Water Quality Standard Questionnaire/January 1992

Topic: LOWEST OBSERVED EFFECT LEVELS (LOELs) OR LOWEST OBSERVED EFFECT CONCENTRATIONS (LOECs)

**What Is an LOEL or LOEC?**

An LOEL or LOEC is the lowest concentration of a toxicant shown to have statistically significant adverse effects (i.e., reproduction, respiration, growth, behavior, etc.) on plants or animals in exposure studies.

In other words, aquatic plants and organisms are exposed in water to varying concentrations of toxic substances. The lowest concentration that results in statistically significant adverse effects is recorded as the LOEL or LOEC.

Since 1980, for saltwater and freshwater, to establish **final** aquatic life criteria, EPA requires toxicity test results from 1 species in eight different families, 3 acute-chronic tests, 1 algal test and 1 bioconcentration test. EPA follows a set of calculations to **derive** final critiera from these toxicity test results. When available data are insufficient to derive final criteria, EPA presents the LOEL as an interim criterion. It is generally presumed that final criteria will be lower values (more stringent) than LOELs. For example, when EPA calculates the final chronic value, their method is to use a conservative approach in order to approximate a no observed effects level over the long term.

The LOEL is applied only when there is no final criterion available. Currently in the Alaska Water Quality Standards (AWQS), the department has adopted by reference LOELs for fresh or saltwater for 58 compounds. This represents about one-half of the the total number of compounds for which there are criteria. The time and tax dollars it has taken to develop LOELs is significant. As an example, it took EPA several years to develop the LOEL for dioxin in freshwater.

**Discussion**

Since LOELs represent interim criteria, what are the chances that EPA will update LOELs to final criteria status? In 1985, EPA published updated criteria for eight compounds. Since then, only a few replacement criteria have been developed. **A federal district court ruled July 17, 1991** (NRDC v. EPA, DC EVa, No. 3:91CV00058, 7/17/91) **that it is not mandatory that the EPA develop and**

**update numerical water quality criteria under the Clean Water Act.** According to EPA attorney, Roland Dubois, "Narrative criteria will also satisfy the law."

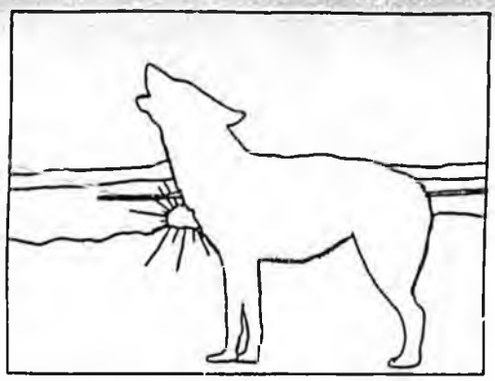
At this writing there is no guarantee that the present LOELs will be updated to final criteria by EPA. The "new" thinking in the high level ranks of EPA is to set environmental priorities based on "relative" risks to natural ecology and human welfare due to the heavy costs to society of environmental regulation (Raymond Loehr, Chair of the Science Advisory Board, 1991). In this relative risk scenario, the Science Advisory Board has placed **toxics** in the **relatively medium risk** category. This placement could translate into less funding for criteria developments of toxic pollutants in lieu of higher priority risks (March/April EPA Journal, 1991, p. 11).

**Some Final Thoughts**

1. To delete the LOELs from the WQS is to have no numeric criteria for fresh or saltwater for 58 compounds.

2. To apply an across the board factor to reduce the LOELs to a presumed no-effect-concentration is to ignore the research and charactistics of the individual compounds. Science Advisory Board member, Dr. Neuhold stated the following in April of 1990 and his view still holds true: "A significant body of scientific research has been undertaken in the last 15 years confirming that reliance on arbitrary safety factors is no longer appropriate, particularly with nonpersistent toxicants." In some cases the LOELs may prove to be more than protective for indigenous Alaskan species and in other cases, not protective enough.

3. LOELs may be the best available criteria for some time to come. Therefore, one alternative is to apply them and include a narrative to allow for site-specific criteria changes based on the results of no-effects-level toxicity tests on indigenous species.



The Congress, in 1978, established the Science Advisory Board to provide independent scientific and engineering advice to EPA and to those committees of Congress responsible for environmental matters (EPA Journal, March/April, 1991)

## #3 Water Quality Standard Review Questionnaire\January 1992

1. Should the LOELs shown in Table 1 of the Workbook be included in a similar table in the WQS?

   A. If they are included, what kind of qualifying narrative, if any, should be included to address the fact that some of the criteria may not provide sufficient protection?

2. If the LOELs are not used for those 58 compounds, what criteria could replace them, if any?

THANK YOU FOR YOUR TIME AND EXPERTISE

Please fold this page and mail. If you need more space please add attached pages. If you have further questions feel free to call Katy Wilkinson at 465-5302.

"Unfortunately, the arbitrary standard can develop a life of its own, and become the purpose itself, rather than the imperfect expression of the purpose."

H.L. Lewis

## #4 Water Quality Standard Questionnaire/January 1992

TOPIC: 0.01 TIMES THE LOWEST MEASURED 96-HOUR LC50 (FOR MOST SENSITIVE ALASKAN ORGANISMS) CRITERIA

### Background Information

In August of 1991, the Department issued a policy paper stating that the 0.01 times the 96Hr LC50 values should not be applied, and that the criteria presented in Table 1 of the WQS workbooks (Gold Book chronic in most cases) should continue to be used to protect the receiving waters of the State. The main reasons for this conclusion were that 0.01 is scientifically outdated as an acute to chronic ratio, and that insufficient toxicity testing data are available for Alaska. This provision first appeared in AWQS in 1979. Since then, there have only been a couple of cases when it has been applied. If you do not have a copy of the policy paper, please write or call Katy Wilkinson at 465-5302 (address on back of attached questionnaire). Additionally, this criterion has been misused by EPA in at least five NPDES permits to **derive** wastewater effluent limits. This is not the intended purpose or use of this criterion.

### Excerpts From The Current Alaska Water Quality Standards Containing the .01 x 96HR LC50 Provision

| I. FRESH WATER USES * | II. MARINE WATER USES * | TOXIC AND OTHER DELETERIOUS ORGANIC AND INORGANIC SUBSTANCES |
|---|---|---|
| Water Supply aquaculture<br><br>Growth and Propagation of Fish, Shellfish, other Aquatic Life, and Wildlife | Water Supply aquaculture<br><br>Growth and Propagation of Fish, Shellfish, Aquatic Life, and Wildlife<br><br>Harvesting for Consumption of Raw Mollusks or other Raw Aquatic Life | Substances shall not individually or in combination exceed 0.01 times the lowest measured 96 hour $LC_{50}$ (See Note 8) for life stages of species identified by the department as being the most sensitive, biologically important to the location, or exceed criteria cited in EPA, Quality Criteria for Water (See Note 5) or Alaska Drinking Water Standards (18 AAC 80), whichever concentration is less. |
| Water Supply aquaculture | Water Supply aquaculture | PETROLEUM HYDROCARBONS, OILS AND GREASE<br><br>Shall not exceed 0.01 times the continuous flow 96 hour $LC_{50}$ or, if not available, the static test 96 hour $LC_{50}$ for the species involved. (See Notes 8 and 9). |
| Growth and Propagation of Fish, Shellfish, other Aquatic Life, and Wildlife | Growth and Propagation of Fish, Shellfish, Aquatic Life, and Wildlife | Total hydrocarbons in the water column shall not exceed 15 ug/l or 0.01 of the lowest measured continuous flow 96 hour $LC_{50}$ for life stages of species identified by the department as the most sensitive, biologically important species in a particular location, whichever concentration is less (See Notes 8 and 9). Total aromatic hydrocarbons in the water column shall not exceed 10 ug/l, or 0.01 of the lowest measured continuous flow 96 hour $LC_{50}$ for life stages of species identified by the department as the most sensitive, biologically important species in a particular location whichever concentration is less (See Notes 9 and 10). |



The 0.01 x 96Hr LC50 provision **will be deleted** from the revised 1992 Water Quality Standards. A new approach is needed if we are to retain the ability to develop criteria based on toxicity tests of Alaskan species. Such criteria could be used, for example where we want to address site-specific Alaskan conditions. There is currently no intent for the Department to get seriously into the business of toxicity testing. However, we may want to address site-specific cases, probably by requiring permittees to conduct the toxicity testing. Implementation would be at the Department's discretion.

**Alternatives To The 0.01 Times The 96Hr-LC50 Criterion**

1. Do **not replace** the 0.01 LC50 provision with any other narrative criterion at this time. This would place the sole burden of protecting Alaskan species on EPA's national numeric criteria, many of which are LOELs.

2. Replace 0.01 LC50 with a discretionary provision allowing criteria to be developed through Alaskan species toxicity testing based on the **No Observed Effects Level** (NOEL) test method. This would mean requiring applicants to do NOEL toxicity tests. According to one Triennial Response commentor, the State of California's Ocean Plan uses this approach.

**Key Points of Triennial Response Commentors:**

a) Treatment of chronic toxicity limits as **instantaneous** limits are not approriate.
b) No **single** application factor should be applied for all compounds.
c) **Actual** concentration and length of exposure are always considered.

Although this is a cursory treatment of a complex subject please review and respond to the questions on the following page as best as you can.



## CHANGE IS HERE TO STAY

## #4 Water Quality Standard Questionnaire/January 1992

1. Do not replace the 0.01 x 96HR LC50 provision with any other narrative criterion at this time and defer it for three years until the next WQS revision?

yes ☐ no ☐

2. Replace the 0.01 x 96Hr LC50 with a discretionary provision allowing criteria to be developed through Alaskan species toxicity testing based the NOEL test method.

yes ☐ no ☐

A) If your answer is yes, please suggest specifics. For example, should there be a minimum of three species tested? What species? Is it a given that the applicant must pay for and provide the site-specific criteria? What specific cases would merit requiring site-specific criteria? Suggest regulatory language that best spells out how and when this provision should be used.

3. Are there other narrative criteria that you can suggest to address the special consideration of allowing for site-specific, Alaskan toxicity testing? If so please elaborate below.

THANK YOU FOR YOUR TIME AND EXPERTISE

Please fold this page and mail. If you need more space please add attached pages. If you have further questions, feel free to call Katy Wilkinson at 465-5302.

# MEMORANDUM STATE OF ALASKA

**DEPARTMENT OF ENVIRONMENTAL CONSERVATION**
**Division of Environmental Quality**

TO: Water Quality Standards
Work Group Member

DATE: April 1, 1992

FILE NO.:

FROM: Katy Wilkinson

PHONE NO.: 465-5302

SUBJECT: Water Quality Standard Questionnaires

Enclosed are four more questionnaires on Water Quality issues that we are addressing in the revision. Also enclosed are a copy of a public notice sent out by our section requesting information on waterbodies that may not meet Water Quality Standards; a paper titled, "A Brief History of the Classification of Alaskan Waters;" and a one page historical update titled "The History of How Revisions of the Water Quality Standards Have Affected Criteria - Using the Cyanide Criteria As An Example." I hope that these historical briefs in addition to the questionnaires will help you to understand how certain aspects of the WQS have evolved.

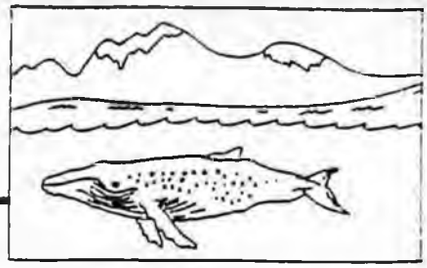
Responses to the first eight questionnaires will have to be in by May 15. I appreciate those who have responded in a timely manner on the first four. We encourage everyone to participate. Please do not feel that your answers must reflect years of careful study on the subject. We are interested in your thoughts, ideas and common sense approaches of what will work versus what won't.

I would like to reiterate that once the revision is compiled, it will go out for a full public review. The target date for the final public review is this September. The public will also have the opportunity to respond to all the questionnaires as you have.

The next topic on the WQS agenda is human health criteria. I have been working to develop a table of human health criteria for the state as required by Section 303(c)(2)(B) of the Clean Water Act. This will be the next product that will be sent out for your review. In the interim, if you have any questions on WQS issues that I may be able to help you with please feel free to give me a call. Thank you for your time and interest.

ADEC Water Quality Work Group Members

Jeff Hock/EQ Monitoring Lab
Cameron Leonard/Assistant Attorney General, Fairbanks
Bill Lamoreaux/Anchorage District Office
Bruce Erickson/Western District Office
Les Buchholz/Kenai District Office
Simon Mawson/Pipeline Corridor Regional Office
Ron Doyel/Matanuska-Susitna District Office
Paul Pinard/Matanuska-Susitna District Office
Jane Tonkin/Cordova Field Office
Clara Jodwalis/Northern Regional Office
Dick Stokes/Southeast Regional Office
Ron Flinn/Southeast Regional Office
Amy Kruse/Southeast Regional Office
Sharmon Stambaugh/Southeast Regional Office
Pete McGee/Northern Regional Office
Joyce Beelman/Northern Regional Office
Al Keglar/Juneau District Office
Steve Haavig/Juneau District Office
Jim Clare/Sitka District Office
Barry Hogarty/Ketchikan District Office
Randy Romenesko/Nome District Office
Doug Dasher/Interior District Office
Svendt Brandt-Erichsen/Southcentral Regional Office
Ursula Spannagel/Southeast Regional Office
Mike Menge/EQ Director/Central Office
Billie Wilson/Paralegal Assistant/Commissioner's Office
Dick Nenahlo/Pipeline Corridor Regional Office
George Wilson/Pipeline Corridor Regional Office
Jim Hayden/Central Office
Robert Dolan/Southcentral Regional Office
Arnie Shryock/Kodiak District Office
Brad Fristoe/Northern Regional Office
Kenwyn George/Central Office
Robert Regis/Assistant Attorney General/Juneau
Conrad Christianson/Northern Regional Office
Bill Morgan/Northern Regional Office
Tim Rumfelt/Southcentral Regional Office
Doug Redburn/Central Office
Dave Sturdevant/Central Office
Bonnie Friedman/Central/Anchorage
Kit Ballentine/EH Director/Central Office
Tim Wingerter/Pipeline Corridor Regional Office
Linda Himmelbauer/EQ Monitoring Lab
Mehrdad Nadem/Pipeline Corridor Regional Office
Jean Bodeau/Central/Anchorage



**#5 Water Quality Standard Questionnaire/February 1992**

Topic: TOTAL AROMATIC HYDROCARBON STANDARD

The current water quality criterion for total aromatic hydrocarbons (TAH) to protect the growth and propagation of fish, shellfish, and wildlife use for fresh and marine waters is as follows:

> **Total aromatic hydrocarbons in the water column shall not exceed 10 ug/l, or 0.01 of the lowest measured continuous flow 96Hr LC50 for life stages of species identified by the Department as the most sensitive, biologically important species in a particular location, whichever concentration is less.**

In the Triennial Review of the Water Quality Standards, the Department is proposing to delete the 0.01 times the 96Hr LC50 provision because it is based on acute (LC50) rather than chronic measurement, and because the application factor of 0.01 is scientifically outdated. The DEC Water Quality Standards group is reviewing alternative provisions based on discretionary use of chronic testing.

Due to the proposed deletion of the 0.01 LC50 provision, a review of information related to the existing criteria based on this application factor, including TAH, is warranted. The Water Quality Management Section is requesting any information you may have on hydrocarbon toxicity using water soluble fractions.

**Background Information**

The TAH criterion of 10 ug/l (or parts per billion) was adopted into the AWQS in 1979. The Department used a two-tiered approach to establish this criterion: (1) a review of laboratory and field test literature on the sublethal, chronic and acute levels of aromatic hydrocarbons to determine actual chronic values of the most sensitive species; and (2) a comparative approach using the 0.01 factor applied to acute (96Hr-LC50) toxicity values for sensitive life stages to see how these derived chronic values compared to the actual chronic values taken from scientific literature. The comparison of values from the two approaches showed reasonable agreement for some sensitive species, particularly with respect to the adverse effect on photosynthetic activity of phytoplankton. The approach of using the 0.01 application factor with LC50 (acute) data in lieu of actual chronic toxicity data was consistent with national EPA guidance at the time. The department did not state the duration of exposure associated with the chronic criterion of 10 ug/l TAH and has applied the value as an instantaneous, never-to-be-exceeded limit.

The literature the Department reviewed included 60 articles written by 44 different authors dating from 1982 to 1974. New literature available since 1982 needs to be evaluated to update the scientific basis for selecting a TAH criterion.

One purpose of the Triennial Review is to evaluate existing criteria in light of current scientific findings. It is important that the TAH criterion is based on defensible, good

science and includes a determination that current research supports the criterion developed.

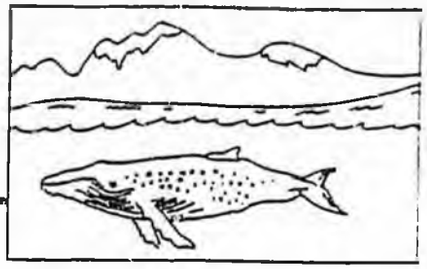
Triennial Response commentors have brought out some of the above points and indicated that the literature the Department reviewed to determine the 10 ppb criterion was based on longer term exposure studies and not acute or short-term toxicity tests that would lead to never-to-be-exceeded limits.

Since 1979, EPA has developed the two-number criterion approach emphasizing the acute (1-hour average) criterion and the chronic (4-day average) criterion. The Department has adopted some LOEL criteria based on studies with up to 27 day averages. It is recognized by the Water Quality Standards group that duration of exposure used to develop the criteria, whether acute or chronic, is an integral part of the application of criteria to permits and in subsequent compliance monitoring.

**Discussion**

The Water Quality Standards group wants to begin the process of evaluating the the existing TAH criterion of 10 ppb and determine whether there is a need to revisit this criterion. Therefore, we solicit your input to the questions on the following page.

KW/WQM



**#5 Water Quality Standard Questionnaire/February 1992**

Respondent's Name _____

Agency or Company _____

1. Should the total aromatic hydrocarbon criterion be reassessed in light of the proposed deletion of the 0.01 LC50 provision, or because of new scientific information?

Yes ☐ No ☐

Please include relevant literature or data.

2. Should there be **clarification** language in the water quality standards that clearly states 10 ppb is a chronic criterion and for compliance monitoring should not be applied as an "instantaneous" never-to-be-exceeded limit?

Yes ☐ No ☐

An alternative would be to apply the number as an average over a period of time (ie. 4-day average).

A) If your answer is yes, specify clarification language you would like to see.

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THANK YOU FOR YOUR TIME AND EXPERTISE

Please fold this page and mail. If you need more space please add attached pages. If you have further questions, feel free to call Katy Wilkinson at 465-5302.



## #6 WATER QUALITY STANDARD QUESTIONNAIRE/FEBRUARY 1992

Topic: TOTAL HYDROCARBON STANDARD

The total hydrocarbons (TH) criterion is a companion to the total aromatic hydrocarbons (TAH) criterion. The current water quality criterion for total hydrocarbons to protect the growth and propagation of fish, shellfish, and wildlife use for fresh and marine waters is as follows:

> **Total hydrocarbons in the water column shall not exceed 15 ug/l, or 0.01 of the lowest measured continuous flow 96 hour LC50 for life stages of species identified by the department as the most sensitive, biologically important species in a particular location, whichever concentration is less.**

When DEC adopted the 15 ppb TH limit in 1979, it was stated, "as the field and laboratory data base for TAH expands, it is anticipated that the TH standard will be revised or possibly dropped." In fact, historically, the Department has infrequently used the TH standard in NPDES permits, relying on the TAH standard in the vast majority of cases. A problem exists in that current wording of the WQS implies that both TAH and TH limits need to be applied.

In this Triennial Water Quality Standards revision, the Department is proposing to delete the 0.01 LC50 provision because it is based on acute (LC50) rather than chronic measurement, and because the application factor of 0.01 is scientifically outdated (See Questionnaire #4). The DEC Water Quality Standards group is reviewing alternatives to replace this provision, including the possibility of a provision for a "no observed effects concentration" (NOEC) approach to be required at the discretion of the Department.

Due to a variety of reasons, including the proposed deletion of the 0.01 LC50 provision, a review of the TH criterion is warranted.

### Background Information

An explanation of the origin of the TH criterion is given in the following statement by DEC employee Bill Lamoreaux dated June 1988.

> **Total hydrocarbon (TH) concentrations in the water soluble phase are generally proportional to total aromatic hydrocarbons (TAH) concentrations in the same test solution (Anderson in Wolf, 1977; Rice, Short and Karinen in Wolf, 1977). This toxicity ratio (TH:TAH) is roughly 1.5 to 1 for crude oil using various fish species as test organisms. Given that the TAH criterion is 10 ppb and applying this average ratio, an allowable level of 15 ppb (ug/l) total hydrocarbons (using infrared analyses) was adopted for the aquatic environment.**

So the TH criterion is developed directly from the criterion of TAH of 10 ppb. The TAH criterion is based partly on the application of the 0.01 factor and partly on a literature review (See Questionnaire #5).

In addition, the LC50 test procedure is based on laboratory measurement of the water soluble petroleum hydrocarbon fraction, excluding whole oil droplets or oily particles. The few permits that incorporate TH have used a method that measures "total" petroleum hydrocarbons which includes the droplet/particle fraction. It has been found that the TH to TAH ratio is highly variable, depending on the type of hydrocarbon, length of exposure, etc.. In one Alaskan case, using the total petroleum hydrocarbon method, it was found that the actual ratio of TH to TAH exceeded 560 to 1. This obviously skews results greatly compared to measuring only the water soluble fraction.

A key point here is that to require a total hydrocarbon measurement and match it against a criterion that only takes into account the water soluble fraction of petroleum hydrocarbons is analytically inconsistent. The Water Quality Standards group in recent months has worked to achieve sample preparation consistency with the numeric criteria for toxic compounds (See 1991 Alaska Water Quality Standards Workbook. Table 1).

Additionally, the analytical method often "defines" the pollutant. In the definition section of the Water Quality Standards under "total hydrocarbons", method 503B is cited to measure total hydrocarbons. This method actually defines the parameter "oil and grease" and was primarily developed to provide a crude screening analysis to determine approximate amounts of oils and greases in sewage treatment facilities. Given the technological advances made in hydrocarbon analytical techniques, the WQS group is considering more appropriate analytical methods to define the pollutants in question, including oil and grease and petroleum hydrocarbons. It is planned to form a technical advisory group to re-evaluate analytical methods required to meet the WQS.

Triennial Response commentors noted the following additional concerns.

> "TH itself is a nonspecific criterion that is not useful as a water quality criterion. It does not differentiate between nontoxic and toxic materials such as aromatic hydrocarbons (BETX), and is therefore very imprecise."
>
> "..no other states that regulate oil and grease or total hydrocarbons have water quality standards in the ppb range. Four of the five states that have receiving water quality criteria for oil and grease have a 10 ppm standard, and the fifth has a 1 ppm standard. A number of states also include oil and grease effluent limitations that range from 10-75 ppm, with 15 ppm being the most common. Alaska's 15 ppb TH standard is orders of a magnitude more restrictive than any other state standard." (See Attached table provided by the commentor)

Please review the questions on the following page and respond as best as you can.

KV/WQM



## #6 WATER QUALITY STANDARD QUESTIONNAIRE/FEBRUARY 1992

Respondent's Name _____

Agency or Company _____

1. Should the Total Hydrocarbon criterion of 15 ppb be retained as a measure of the water soluble fraction of petroleum?

Yes ☐ No ☐

2. Should the total hydrocarbon criterion be revised with clear identification of the method of analysis to define what is meant by total hydrocarbons?

Yes ☐ No ☐

3. Should the total hydrocarbon criterion be omitted because it is duplicative of the TAH criterion or because it is based on the 1.5 to 1 TH:TAH toxicity ratio?

Yes ☐ No ☐

If you have further comments or suggestions please write them below.

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**THANK YOU FOR YOUR TIME AND EXPERTISE**

Please fold this page and mail. If you have further questions feel free to call Katy Wilkinson at 465-5302.

TABLE 1

## Survey of State Water Quality Standards for Total Hydrocarbons

| STATE | Total Hydrocarbons/ Oil & Grease Standard[2] | Permit or Receiving Water Limitation | Authority | Source[1] |
|---|---|---|---|---|
| Alaska | 15 µg/l or 0.01 of the lowest measured cont. flow 96 hr. $LC_{50}$ for life stages of most sensitive species | Receiving | 18 Alaska Admin. Code §70.020 (1989) | BNA |
| Alabama | Narrative | Receiving | Ala. Water Imp. Comm., Tit. II, § IV. 2 (1982) | BNA |
| Arizona | Narrative | Receiving | Ariz. Surface Water Quality Standards, Arizona Admin. Rules & Reg., Title 18, Chap. 11, Art. 1, § R9-21-204 C. (1989 | BNA |
| Arkansas | Narrative with Numerical Guideline: 10 mg/l av. or 15 mg/l max. when discharged to surface waters (Effluent lmt) | Receiving | Reg. No.2, Surface Water Standards for Ark., § 6 (J) (1988) | BNA |
| California | Ocean Discharges: (Effluent lmt) Numerical: 25 mg/l monthly 40 mg/l weekly 75 mg/l maximum (applies only to publicly owned treatment works & industrial discharges for which no limitations have been set in FWPCA) | Permit | Water Quality Control Plan for Ocean Waters of Ca., Chap. IIB.1, Chap. IV, Table A, Ca. State Water Resources Control Board (1978) | EPA 1982 |
| Colorado | Numerical: 10 mg/l max. plus no visible sheen (Effluent lmt.) | Permit | Col. Water Quality Control Regs., § 10.1.4, Code of Col. Regs., Title 5, Chap. 1002, Art. 3 (1990) | BNA |
| | Narrative | Receiving | Col. Water Quality Standards for Surface Waters, Code of Col. Regs., Title 5, Chap. 1002, § 3.1.11 (1989) | BNA |
| Connecticut | Narrative | Receiving | Dept. of Environmental Protection, Water Compliance Unit Water Quality Standards, III. 3. (1987) | BNA |

TABLE 1

1. The information in this table is a compilation of Oil and Grease standards reported in State Water Laws, Environmental Reporter. (BNA) (Vols. 1-5) -- designated herein as BNA. Unless otherwise stated, those values not contained in the BNA Reporter are derived from an earlier EPA compilation, A Compilation of Water Quality Standards for Marine Waters, E.P.A. (1982) -- designated herein as EPA (1982). All states with numerical standards are included. Not all states with narrative standards are listed. If a state is not listed, it has a narrative standard.

2. Numerical standards are expressed as $\mu$g/l or mg/l:
   $\mu$g/l = micrograms per liter or parts per billion (ppb)
   mg/l = milligrams per liter or parts per million (ppm)

TABLE 1 (cont'd)

| | | | | |
|---|---|---|---|---|
| Delaware | (1) Narrative | Receiving | Del. Surface Water Quality Standards, § 4 (a)(i), Del. Dept. Nat. Resources & Env. Control (1990) | BNA |
| | (2) Numerical: (Effluent Lmt) | Permit | Del.River Basin Comm. Water Quality Regs., Admin. Manual, Pt. III, § 3.10.40.b. (1991) | BNA |

Oil and Grease:

1. Oil Storage Terminal Runoff: 15 mg/l max. av. where precipitation not greater than 2"/hr or 4 1/2" in 24 hrs.; or max. runoff of 80 gal./min. over 24 hrs. Determined from samples that are representative of actual discharge.
2. Industrial Wastewater Discharges: EPA effluent standards for industrial category in question.

| | | | | |
|---|---|---|---|---|
| District of Columbia | Narrative | Receiving | D.C. Water Quality Standards, Municipal Regs, Title 21, Chap. 11, § 1102 (1987) | BNA |
| Florida | Narrative/Numerical: 5.0 mg/l plus no undissolved oil, or visible oil defined as iridescence | Receiving | Fla. Water Quality Standards, Title 17, Dept. of Env. Reg., § 17-302.510.(3)(k) (1990) | BNA |
| Georgia | Narrative | Receiving | Ga. Water Quality Control Regs & Standards, Title 391, Chap. 3, Rule 6, § 391-3-6.03(5)(b) (1991) | BNA |
| Hawaii | Narrative | Receiving | Hawaii Water Quality Standards, Title 11, Chapter 54, § 11-54-04 (a)(2) (1990) | BNA |
| Idaho | Narrative | Receiving | Idaho Water Quality Standards, Idaho Dept. of Health & Welfare, Div. of Env. Regs., Title 1, Chap. 2, § 01.2200.04 (1990) | BNA |
| Indiana | Grand Calumet River & Indiana Harbor Ship Canal: 10.0 mg/l plus no film or coating of banks | Receiving | Indiana Water Quality Standards, Ind. Admin. Code, 327 IAC 2-8-5(8) (1990) | BNA |
| Louisiana | Narrative | Receiving | La. Admin. Code, Title 33, Part IX, Chap. 11 (1989) | BNA |

TABLE 1 (cont'd)

| | | | | |
|---|---|---|---|---|
| Maine | Narrative/Numerical (Effluent lmt) | Permit | Maine Water Quality Regs., Chapter 588 (1989) | BNA |

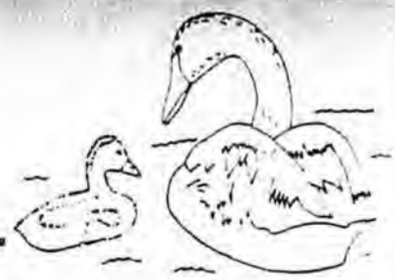
Chapter 588 Waste Discharge License by Rule Standards
5. Waste Discharge Activities
8. Petroleum Storage & Transfer Facilities
1. Applicability. This subsection is applicable to discharges of treated stormwater runoff from existing petroleum storage and transfer facilities including marketing and pipeline terminals and marketing bulk plant.
2. Effluent Limitations & Conditions (Stormwater runoff only)
(c) The effluent from the oil/water separator shall not exceed 15 mg/l oil and grease based on an arithmetic average of 4 grab samples as measured by methodology 503A -- Standard Methods for the Examination of Water and Wastewater.
(d) The effluent shall not contain a visible oil sheen, foam or floating solids at any time.

| | | | | |
|---|---|---|---|---|
| Maryland | Narrative | Receiving | Md. Water Pollution Control Regs., Title 26, (1990) | BNA |
| Massachusetts | Narrative (Surface Waters) | Receiving | Mass. Surface Water Quality Standards, Title 314 Chapter 4 (1990) | BNA |
| | Numerical: (Groundwater) 15 mg/l max., Class I & II groundwater (Effluent lmt) | Permit | Mass. Groundwater Discharge Permit Regs., Title 314, Chapter 5, § 5.10(3)(a)5. (1990) | BNA |
| Mississippi | Narrative | Receiving | Miss. Water Quality Criteria for Intrastate, Interstate, & Coastal Waters (1985) | BNA |
| Nebraska | 10 mg/l | Receiving | Nebraska Water Quality Standards, Dept. of Env. Control, Title 117, Chap. 4, § 003.01D (1990) | BNA |
| New Hampshire | Narrative | Receiving | N.H. Water Quality Standards N.H. Code of Admin Rules, Env-Ws 432.03(a)(5) (1990) | BNA |
| New Jersey | Narrative | Receiving | N.J. Surface & Groundwater Water Quality Standards, N.J. A.C. Title 7, Chap. 9 §§ 7:9-4.14(c)4., 7:9-6.6(c) 29 (1989) | BNA |
| New York | Narrative | Receiving | N.Y. Water Classifications & Quality Standards, N.Y. Code, Title 6, Chap. V., Pt. 609, § 701.20 Item 1 (1988) | BNA |
| No. Carolina | Narrative | Receiving | No. Car. Water Quality Standards, No. Car. Admin Code, Title 15A, Chap. 2, Subchap. 2B §§ .0211(b)(F), .0212(b)(F) (1990) | BNA |
| Oregon | Narrative | Receiving | Oregon Water Quality Standards Ore. Admin. Rules, Chap. 340 (1990) | BNA |
| Rhode Island | Narrative | Receiving | R.I. Water Quality Standards, R.I. Water Quality Regs., § 6.32 (1988) | BNA |

TABLE 1 (cont'd)

| | | | | | |
|---|---|---|---|---|---|
| South Carolina | | Narrative | Receiving | So. Car. Water Classification Standards, So. Car. Code of Regs., Chap. 61 § E.(2)(b) (1990) | BNA |
| South Dakota | | 10 mg/l or a visible sheen or film | Receiving | So. Dak. Water Quality Standards, So. Dak. Admin. Code, Title 74, Art. 74:03:02:29 (1987) | BNA |
| Tennessee | (1) | Narrative | Receiving | Tenn. Water Quality Criteria Tenn. Rules & Regs., Chap. 1200-4, Rule 3 (1983) | BNA |
| | (2) | Effluent Lmt: Industrial Wastewater Treatment Plants 30 mg/l daily max plus no visible or floating oil or grease | Permit | Tenn. Effluent Lmts and Standards, Tenn. Water Quality Control Bd., Chap. 1200-4-5.03 (1977) | BNA |
| Texas | | Narrative | Receiving | Texas Water Quality Standards Tex. Admin. Code, Title 31, § 307.4 (1988) | BNA |
| Virginia | (1) | Narrative (Surface Waters) | Receiving | Va. Water Quality Standards VR680-21-01.2B. (1990) | BNA |
| | (2) | Numerical: (Groundwater) 1 mg/l | Receiving | Va. Water Quality Standards VR680-21-04.3 (1990) | BNA |
| Washington | | Narrative | Receiving | WAC 173-201-045 (1988) | BNA |
| Wyoming | | Effluent lmt for "produced water"* 10 mg/l max. in any single properly preserved grab sample | Permit | Wyo. Effluent Guidelines for Oil and Gas, Wyo. Dept. of Env. Quality, Chap. VII, § 4.e. (1978) | BNA |
| Guam | | Narrative | Receiving | Guam Water Quality Standards § II B. 10 (1982) | EPA 1982 |
| Puerto Rico | | Narrative | Receiving | Puerto Rico Env. Qual. Bd., Water Quality Standards Regs, Article 3, § 3.1.1 (1987) | BNA |
| Tr. Territories of the Pacific | | Narrative | Receiving | Marine & Freshwater Quality Standard Regs, Title 63, Chap. 13, Subchap. VII, Pt. 6, § (A) (1), (9) | EPA 1983 |
| Virgin Islands | | Narrative | Receiving | Water Quality Standards for Coastal Waters of the Virgin Islands, Chap. 7 | EPA 1982 |

* Underground water which surfaces through oil and/or gas wells and which is usually disposed of by reinjection, discharge to complete containment ponds or, after treatment for removal of oil, discharged to surface waters of the State.



## #7 WATER QUALITY STANDARD QUESTIONNAIRE/MARCH 1992

TOPIC: REVIEW OF THE CYANIDE STANDARD AND IT'S APPLICATION TO THE SURFACE AND GROUNDWATERS OF THE STATE

The purpose of this questionnaire is to clarify how aquatic life criteria and human health criteria for **noncarcinogens** are applied to protect fresh waters, marine waters and groundwaters of the State. The criteria for cyanide are used as an illustration.

The numeric criteria for cyanide are adopted by reference in the Water Quality Standards (WQS) under the parameter, "Toxic and Other Deleterious Organic and Inorganic Substances" (Section 18 AAC 70.020). The applicable numeric criteria can be found in Table 1 of the Workbook or the Excerpts. The numeric criteria for cyanide include the criterion for freshwaters and the criterion for marine waters. The freshwater criterion also applies to groundwaters. Additionally, there is a narrative criterion applicable to groundwaters under the marine industrial use.

The State's cyanide criterion for fresh waters is EPA's aquatic life, chronic criterion of **5.2 ug/l (4-day average, measured as free cyanide)**. The criterion for marine waters is EPA's aquatic life, acute criterion of **1.0 ug/l (1-hour average, measured as free cyanide)**. There is no chronic criterion for saltwater available so the acute criterion of 1 ug/l is applied. The WQS human health criterion of **200 ug/l** is EPA's recommended criterion, and is derived from the US Public Health Service Drinking Water Standards.

Section 18 AAC 70.050. CLASSIFICATION OF STATE WATERS states what classes or designated uses apply to fresh, marine and groundwaters of the state. The fresh waters and marine waters of the State are protected for all designated uses unless they have been reclassified. Groundwaters are protected for the four, freshwater water supply uses and the marine industrial use.

According to the WQS, section 18 AAC 70.030, if a waterbody is protected for more than one designated use, the most stringent water quality criteria for all the designated uses will apply. This means that for both fresh waters and groundwaters the aquatic life criterion of 5.2 ug/l (4-day average, measured as free cyanide) is the applicable criterion because it is more stringent than the 200 ug/l human health criterion. Likewise, the marine aquatic life criterion of 1.0 ug/l is the applicable criterion because it is more stringent than the human health criterion of 200 ug/l.

The department is reviewing the possibility of applying the human health criterion of 200 ug/l to the groundwaters of the state. The question has been raised as to why aquatic life criteria should apply to groundwaters, since groundwaters contain essentially no aquatic life. Of course, there often is exchange between surface and groundwaters. One proposal is to apply the aquatic life criterion of 5.2 ug/l (4-day average, measured as free cyanide) at any point of groundwater discharge to the surface (measured just prior to mixing with the surface waters).

For some compounds, other than cyanide, the human health criterion may be **more stringent** than the aquatic life criteria for the same compound. If human health criteria are to be directly applied to the groundwaters then there may be cases when the criteria would be lower than the aquatic life.

**The Cyanide Criteria For Alaska's Surface Waters**

The cyanide criterion of **5.2 ug/l (4-day average, measured as free cyanide)** applies to all the fresh, surface waters of the state unless waterbodies have been reclassified.

Also, for marine water, the cyanide criterion of **1 ug/l (1-hour average, measured as free cyanide)** applies to all the marine waters of the state unless waterbodies have been reclassified.

**The Cyanide Criteria For Alaska's Groundwaters**

The groundwaters of the state are not protected for all uses. However, they are protected for all freshwater water supply uses. They are not protected for water recreation or growth and propagation of fish. To reiterate, a key issue of this questionnaire is that although groundwaters are not protected for the growth and propagation of fish use, the aquatic life criterion is currently applied to protect the water supply uses, including drinking water.

So, the cyanide freshwater chronic criterion of **5.2 ug/l (4-day average, measured as free cyanide)** applies to the four **water supply** uses for groundwater.

Presently groundwaters are also protected for the marine industrial use. The marine narrative criterion states that, "substances shall not be present which pose hazards to worker contact." This criterion is identical to that for the freshwater industrial use.

This is somewhat perplexing to the Water Quality Standards group. It is not clear in the standards why this use is protected for groundwater. One proposal is to delete this provision for groundwater from the WQS as it could be a typographical error.

Given this information as background please answer the questions on the following page as best as you can.

KW/WQM



## #7 WATER QUALITY STANDARD QUESTIONNAIRE/MARCH 1992

Respondent's Name _____

Agency or Company _____

1. Retain the current application of the aquatic life criterion of 5.2 ug/l (4-day average, measured as free cyanide) to the groundwaters of the state.

Yes ☐ No ☐

2. Apply the human health criterion of 200 ug/l for free cyanide to groundwaters.

Yes ☐ No ☐

a) If your answer to #2 is yes, then apply the aquatic life criterion of 5.2 ug/l at the point of discharge of groundwaters to surface waters (measured just prior to mixing with the surface waters).

Yes ☐ No ☐

b) If your answer to #2 is yes then do you believe this procedure of applying human health criteria to protect human health for groundwater is applicable to other compounds other than cyanide, even where the human health criterion may be lower than the aquatic life criterion?

Yes ☐ No ☐

3. Delete the provision that groundwaters are protected for the marine industrial use.

Yes ☐ No ☐

a) If your answer to the above question is no, please explain in what circumstance that groundwaters should be protected for the industrial use in marine water. Note that groundwaters are also protected for the freshwater industrial use.

_____

_____

_____

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_____

THANK YOU FOR YOUR TIME AND EXPERTISE

Please fold this page and mail. If you have further questions feel free to call Katy Wilkinson at 465-5302.



## #8 WATER QUALITY STANDARD QUESTIONNAIRE/MARCH 1992

Topic: SEDIMENT STANDARD (Not applicable to groundwater supplies)

The purpose of this questionnaire is to propose some language to clarify the sediment standard. The need for this clarification has been brought up by Triennial Response commentors and confirmed by the Water Quality Standards group.

**Background Information**

The applicable criterion for any waterbody is the most stringent criterion for all the designated uses. The most stringent water quality criterion for sediment in freshwater is as follows:

> **No increase in concentration of sediment, including settleable solids, above natural conditions (See Note 15).**
>
> **Note 15.** Volumetric measurements of settleable solids must be determined according to the following procedure: fill an Imhoff cone to the one-liter mark with a thoroughly mixed sample. Settle for 45 minutes; gently stir sides of cone with a rod or by spinning; settle 15 minutes longer, and record volume of settleable matter in the cone as milliliters per liter. If the settled matter contains pockets of liquid between large settled particles, estimate volume of these and subtract from volume of settled matter.

The most stringent water quality criterion for sediment in marine water is as follows:

> **No measureable increase in concentrations above natural conditions.**

The definition in 18 AAC 70.110 (37) states that sediment means "solid material of organic or mineral origin that is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and organic material such as humus."

**Analytical Method Review**

The sediment parameter has been carried over from several previous revisions without clear identification of what exactly is to be measured and hence, regulated. In 1985 an amendment was made to the sediment standard to clarify that sediment in the form of settleable solids is to be measured by the Imhoff cone method.

The WQS definition of sediment is clear enough in itself; however, as was discussed in Questionnaire #6, the parameter is "defined" by the analytical method prescribed. The term "sediment" can be taken to mean several different parameters as defined by distinctly different analytical methods. Solid material suspended in water can be measured by direct methods (e.g., methods that directly measure the total suspended solids) and by indirect methods (e.g., use of turbidity to determine the level of suspended solids). Solid material that is deposited from water is typically measured by a direct method (Imhoff cone) to determine "settleable solids."

The sediment standard for freshwater is intended only to regulate measureable settleable solids as is defined by the method cited in Note 15. No other analytical method is cited that would define any other parameter required for measurement (e.g., total suspended solids). The WQS group is considering deleting the term "sediment" as too general for the WQS regulation.

We propose to delete the definition for "sediment" and replace it with a definition for "settleable solids" as measured by the volumetric Imhoff cone method 2540 F described in the 17th edition of Standard Methods for the Examination of Water and Wastewater, p. 2-78 (See Attachment).

The WQS group also is considering deleting "sediment" from the freshwater criterion, leaving "settleable solids." "Settleable solids" likewise would be added to the marine criterion.

Further, in the 1985 amendments to the WQS, the word "measured" was deleted from the freshwater criterion for sediment. The reasoning for this is not clear. The WQS group is considering reinstating the word "measured" as it is used in the marine criterion for sediment. In summary, the freshwater sediment criterion would be clarified as follows:

> **No measureable increase in settleable solids above natural conditions. Settleable solids are defined by the volumetric Imhoff cone method described in Note 15, p. 21.**

The marine sediment standard would be clarified to read as follows:

> **No measureable increase in settleable solids above natural conditions. Settleable solids are defined by the volumetric Imhoff cone method described in Note 15, p. 21.**

**Total Suspended Solids Versus Turbidity**

In 1985 and more recently, Triennial Response commentors have suggested that the WQS also incorporate total suspended solids in addition to turbidity and settleable solids. However, the accepted techniques for measuring suspended solids (Method 2540 D, See Attachment) are time consuming and expensive, and require special laboratory equipment (e.g., drying oven, sensitive analytical balance). NPDES permits require measurements to be taken by the discharger. To regulate industry, it is necessary to have methods of measurement that are cost-effective and can be performed by the operator on-site. The Department has found that, if required methods are unnecessarily difficult, even agency chemists will not use them routinely. The Department therefore believes that requiring measurement of total suspended solids is not practicable in many situations.

Although turbidity and suspended solids are not synonymous, they are related, and turbidity can be used to help define the level of suspended solids (Peterson and others, 1985). The Department maintains that the turbidity levels, measured on-site by a nephelometer, provide the best practical means to regulate solids in suspension.

KW/WQM



#8 WATER QUALITY STANDARD QUESTIONNAIRE/MARCH 1992

Respondent's Name _____

Agency or Company _____

1. Should the term "sediment" be removed leaving the term "settleable solids", as defined by the Imhoff cone method, in the freshwater criterion?

Yes ☐ No ☐

2. Likewise, should the term "settleable solids" be added to the marine criterion?

Yes ☐ No ☐

3. Review again the following clarification language for the freshwater sediment criterion. Add changes or comments in the space provided below.

**No measureable increase in settleable solids above natural conditions. Settleable solids are defined by the volumetric Imhoff cone method described in Note 15, p. 21.**

_____

_____

_____

_____

_____

4. Please add any other comments or describe what you feel the sediment standard issues are.

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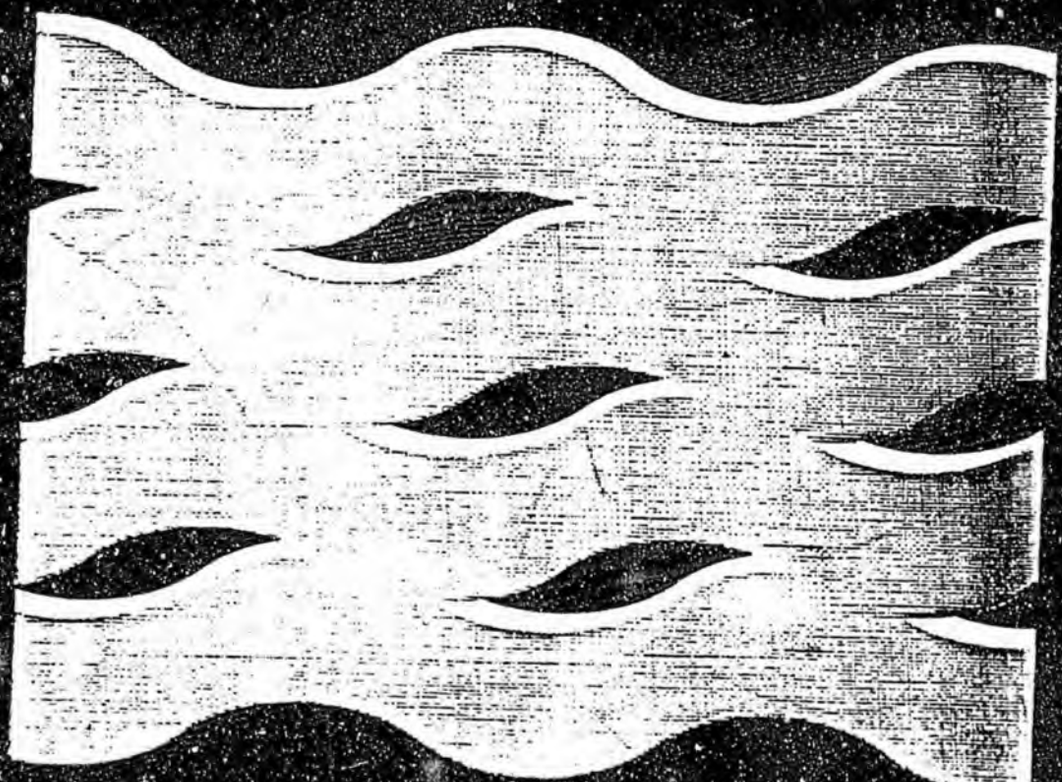
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THANK YOU FOR YOUR TIME AND EXPERTISE

Please fold this page and mail. If you have further questions, feel free to call Katy Wilkinson at 465-5302.

# STANDARD METHODS

## FOR THE EXAMINATION OF WATER AND WASTEWATER



1989
17th EDITION

EDITED BY
LENORE S. CLESCERI
ARNOLD E. GREENBERG
R. RHODES TRUSSELL

# 2540 F. Settleable Solids

## 1. General Discussion

Settleable solids in surface and saline waters as well as domestic and industrial wastes may be determined and reported on either a volume (mL/L) or a weight (mg/L) basis.

## 2. Apparatus

The volumetric test requires only an Imhoff cone. The gravimetric test requires all the apparatus listed in Section 2540D.2 and a glass vessel with a minimum diameter of 9 cm.

## 3. Procedure

*a. Volumetric:* Fill an Imhoff cone to the 1-L mark with a well-mixed sample. Settle for 45 min, gently stir sides of cone with a rod or by spinning, settle 15 min longer, and record volume of settleable solids in the cone as milliliters per liter. If the settled matter contains pockets of liquid between large settled particles, estimate volume of these and subtract from volume of settled solids. The practical lower limit of measurement depends on sample composition and generally is in the range of 0.1 to 1.0 mL/L. Where a separation of settleable and floating materials occurs, do not estimate the floating material as settleable matter.

*b. Gravimetric:*

1) Determine total suspended solids of well-mixed sample (Section 2540D).

2) Pour a well-mixed sample into a glass vessel of not less than 9 cm diam using not less than 1 L and sufficient to give a depth of 20 cm. Alternatively use a glass vessel of greater diameter and a larger volume of sample. Let stand quiescent for 1 h and, without disturbing the settled or floating material, siphon 250 mL from center of container at a point halfway between the surface of the settled material and the liquid surface. Determine total suspended solids (milligrams per liter) of this supernatant liquor (Section 2540D). These are the nonsettleable solids.

## 4. Calculation

$$\text{mg settleable solids/L} = \text{mg total suspended solids/L} - \text{mg nonsettleable solids/L}$$

## 5. Precision and Bias

Precision and bias data are not now available.

## 6. Bibliography

FISCHER, A.J. & G.E. SYMONS. 1944. The determination of settleable sewage solids by weight. *Water Sewage Works* 91:37.

# 2540 D. Total Suspended Solids Dried at 103–105°C

## 1. General Discussion

*a. Principle:* A well-mixed sample is filtered through a weighed standard glass-fiber filter and the residue retained on the filter is dried to a constant weight at 103 to 105°C. The increase in weight of the filter represents the total suspended solids. If the suspended material clogs the filter and prolongs filtration, the difference between the total solids and the total dissolved solids may provide an estimate of the total suspended solids.

*b. Interferences:* Exclude large floating particles or submerged agglomerates of nonhomogeneous materials from the sample if it is determined that their inclusion is not desired in the final result. Because excessive residue on the filter may form a water-entrapping crust, limit the sample size to that yielding no more than 200 mg residue. For samples high in dissolved solids thoroughly wash the filter to ensure removal of the dissolved material. Prolonged filtration times resulting from filter clogging may produce high results owing to excessive solids capture on the clogged filter.

## 2. Apparatus

Apparatus listed in Sections 2540B.2 and 2540C.2 is required, except for evaporating dishes, steam bath, and 180°C drying oven. In addition:

*Planchet,** aluminum or stainless steel, 65-mm diam.

## 3. Procedure

*a. Preparation of glass-fiber filter disk:* Insert disk with wrinkled side up in filtration apparatus. Apply vacuum and wash disk with three successive 20-mL portions of distilled water. Continue suction to remove all traces of water, and discard washings. Remove filter from filtration apparatus and transfer to an aluminum or stainless steel planchet as a support. Alternatively remove crucible and filter combination if a Gooch crucible is used. Dry in an oven at 103 to 105°C for 1 h. If volatile solids are to be measured, ignite at 550 ± 50°C for 15 min in a muffle furnace. Cool in desiccator to balance temperature and weigh. Repeat cycle of drying or igniting, cooling, desiccating, and weighing until a constant weight is obtained or until weight loss is less than 0.5 mg between successive weighings. Store in desiccator until needed. Weigh immediately before use.

*b. Selection of filter and sample sizes:* See Section 2540C.3*c*. For nonhomogeneous samples such as raw wastewater, use a large filter to permit filtering a representative sample.

*c. Sample analysis:* Assemble filtering apparatus and filter and begin suction. Wet filter with a small volume of distilled water to seat it. Filter a measured volume of well-mixed sample through the glass fiber filter. Wash with three successive 10-mL volumes of distilled water, allowing complete drainage between washings and continue suction for about 3 min after filtration is complete. Carefully remove filter from filtration apparatus and transfer to an aluminum or stainless steel planchet as a support. Alternatively, remove the crucible and filter

*Available from New England Nuclear, Boston, Mass., or equivalent.

## 4. Calculation

$$\text{mg total suspended solids/L} = \frac{(A - B) \times 1000}{\text{sample volume, mL}}$$

where:

$A$ = weight of filter + dried residue, mg, and
$B$ = weight of filter, mg.

## 5. Precision

The standard deviation was 5.2 mg/L (coefficient of variation 33%) at 15 mg/L, 24 mg/L (10%) at 242 mg/L, and 13 mg/L (0.76%) at 1707 mg/L in studies by two analysts of four sets of 10 determinations each.

Single-laboratory duplicate analyses of 50 samples of water and wastewater were made with a standard deviation of differences of 2.8 mg/L.

## 6. Bibliography


DEGEN, J. & F.E. NUSSBERGER. 1956. Notes on the determination of suspended solids. *Sewage Ind. Wastes* 28:237.

CHANIN, G., E.H. CHOW, R.B. ALEXANDER & J. POWERS. 1958. Use of glass fiber filter medium in the suspended solids determination. *Sewage Ind. Wastes* 30:1062.

NUSBAUM, I. 1958. New method for determination of suspended solids. *Sewage Ind. Wastes* 30:1066.

SMITH, A.L. & A.E. GREENBERG. 1963. Evaluation of methods for determining suspended solids in wastewater. *J. Water Pollut. Control Fed.* 35:940.

WYCKOFF, B.M. 1964. Rapid solids determination using glass fiber filters. *Water Sewage Works* 111:277.

combination from the crucible adapter if a Gooch crucible is used. Dry for at least 1 h at 103 to 105°C in an oven, cool in a desiccator to balance temperature, and weigh. Repeat the cycle of drying, cooling, desiccating, and weighing until a constant weight is obtained or until the weight loss is less than 4% of the previous weight or 0.5 mg, whichever is less.

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT. 1975. A Preliminary Review of Analytical Methods for the Determination of Suspended Solids in Paper Industry Effluents for Compliance with EPA-NPDES Permit Terms. Spec. Rep. No. 75-01. National Council of the Paper Industry for Air & Stream Improvement, New York, N.Y.

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT. 1977.

TABLE 1

**SUMMARY OF PROPOSED WATER QUALITY STANDARDS REVISIONS**

**UNDER THE STATE'S TRIENNIAL REVIEW PROCESS**

| Parameter | Basis for Proposed Revision: Address ambiguity/ clarify standards | New standard;address human health criteria in National Toxics Rule | Revise 2/ existing criteria |
|---|---|---|---|
| 1. Dioxin | | x | |
| 2. Mixing zones | x | | |
| 3. Color for marine waters 1/ | | | x |
| 4. Chronic toxicity protocols | x | | x |
| 5. Arsenic, chloroform, cyanide | | x | |
| 6. Total hydrocarbons 2/ | x | | |
| 7. Sediment | x | | |
| 8. Fecal coliform bacteria | | | x |
| 9. Other Human health 3/ criteria for carcinogens | | x | |
| 10. Update aquatic life 3/ criteria since 1985 | | x | |

1/ Color criterion for marine waters inadvertently includes drinking water criterion.
2/ Standards are scientifically unsupported or do not reflect accepted methods.
3/ These revisions will be completed separately in fall 1992 after the expedited regulation process.

## ALASKA WATER QUALITY STANDARDS

## REVIEW AND REVISION PROCESS

### PHASE 1

(EXPEDITED REVISION PROCESS)

| | |
|---|---|
| May 4 – June 30 | Department of Environmental Conservation expedites sub-set of standards under revision |
| July 1 – July 31 | Draft water quality standards go out for public review and hearings |
| Aug 1 – Aug 14 | Responsiveness summary drafted and public input factored into draft water quality standards |
| Aug 15 | DEC Commissioner adopts final water quality standards revisions |
| Aug 15 – Aug 31 | Attorney General reviews and certifies water quality standards revisions |
| Sept 1 | Lt. Governor signs revised water quality standards |
| Sept 4 | EPA receives Alaska's revised water quality standards for review and approval |

**ALASKA WATER QUALITY STANDARDS**

**REVIEW AND REVISION PROCESS**

**PHASE 2**

(LONG-TERM PROCEDURES)

EPA/DEC Memorandum of Agreement on NPDES Process

* Formal Yearly Meetings
* NPDES Permit scheduling Identified
* Problem and Controversies Identification Process

DEC In-State Action Process
(Based on results of yearly EPA NPDES meeting)

Issues and Topic Specific Questionnaires
Distributed to DEC In-House Work Group
and the Department's External
Water Quality Standards Help Group
(Public Participation Process)

If Determined Necessary,
Working Advisory Groups Formed to Evaluate Specific
Scientific, Technological, and Economic Issues
(Public Participation Process)

Input from Participatory Process
Folded into Ongoing Alaska Water
Quality Standards Review, Revision, and
Modernization Process

Draft WQS Published and Sent
Out for Public Review

DEC Commissioner Approval

Attorney General Certification

Lt. Governor Approval

Submission to EPA for Review and Approval

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 131

[WH-FRL-4029-2]

## Amendments to the Water Quality Standards Regulation To Establish the Numeric Criteria for Priority Toxic Pollutants Necessary to Bring All States Into Compliance With Section 303(c)(2)(B)

**AGENCY:** Environmental Protection Agency.

**ACTION:** Proposed rule.

**SUMMARY:** This proposed rulemaking would promulgate the chemical-specific, numeric criteria for priority toxic pollutants necessary to bring all States into compliance with the requirements of section 303(c)(2)(B) of the Clean Water Act (CWA). States which have been determined by EPA to fully comply with section 303(c)(2)(B) requirements would not be affected by today's proposed rulemaking.

The proposed rulemaking addresses several situations. For a few States EPA would promulgate only a limited number of criteria because the Agency previously identified, in disapproval letters to such States, the specific priority toxic pollutants that require new or revised criteria. For these States, EPA would promulgate Federal criteria only for the priority toxic pollutants which require new or revised criteria. In the vast majority of States, EPA would promulgate, at a minimum, broadly applicable Federal criteria for all priority toxic pollutants for which EPA has issued section 304(a) water quality criteria guidance and that are not the subject of approved State criteria.

For those priority toxic pollutants included in today's proposed rulemaking where the section 304(a) criteria recommendation is based on carcinogenicity, the proposed criteria are based on an incremental one in one million cancer risk level (i.e., $10^{-6}$).

The primary focus of this rule is the inclusion of the water quality criteria for pollutant(s) in State standards as necessary to support water quality-based control programs. The Agency is accepting comment on the criteria proposed in today's rule. However, Congress has established a very ambitious schedule for the promulgation of the final criteria. The statutory deadline in section 303(c)(4) clearly indicates that Congress intended the Agency to move very expeditiously when Federal action is warranted. The Agency believes that the limited time available for promulgation of the regulation can be used most efficiently and effectively by addressing those issues that have not already come before the Agency.

**DATES:** All written comments received on or before December 19, 1991, will be considered in the preparation of any final rulemaking.

A public hearing will be held on December 19, 1991, in Washington, DC, beginning at 9 a.m. The hearing officer reserves the right to limit oral testimony to 10 minutes, if necessary.

**ADDRESSES:** Comments, in quadruplicate, on this proposed rule should be addressed to William R. Diamond, Director, Standards and Applied Science Division (WH-585), Office of Science and Technology, 401 M Street, SW., Washington, DC 20460 (Telephone: 202-260-1315). The public may inspect the administrative record for this rulemaking, including documentation supporting the aquatic life and human health criteria, and all comments received on this proposed rule at EPA's Public Information Reference Unit, EPA Library, room 2904, Waterside Mall, 401 M Street, SW., Washington, DC 20460 (Telephone: 202-260-5926) on weekdays during the Agency's normal business hours of 8 a.m. to 4:30 p.m. Each of EPA's ten Regional offices will also have copies for public inspection and copying of the administrative records for the States in that Region. These records will be available in the Water Management Divisions of each respective Regional office. A reasonable fee will be charged for photocopies.

The public hearing will be held in the EPA auditorium, 401 M Street, SW., Washington, DC.

**FOR FURTHER INFORMATION CONTACT:** David K. Sabock or R. Kent Ballentine, Telephone 202-260-1315.

**SUPPLEMENTARY INFORMATION:**

This preamble is organized according to the following outline:

A. Introduction and Overview
1. Introduction
2. Overview
B. Statutory and Regulatory Background
1. Pre-Water Quality Act Amendments of 1987 (P.L. 100-4)
2. The Water Quality Act Amendments of 1987 (P.L. 100-4)
a. Description of the New Requirements
b. EPA's Initial Implementing Actions for Sections 303(c) and 304(l)
3. EPA's Program Guidance for Section 303(c)(2)(B)
4. Revisions to the Water Quality Standards Regulation to Incorporate the Requirements of Section 303(c)(2)(B)
C. State Actions Pursuant to Section 303(c)(2)(B)
D. Determining State Compliance With Section 303(c)(2)(B)
1. EPA's Review of State Water Quality Standards for Toxics
2. Determining Current Compliance Status
E. Rationale and Approach for Developing Today's Proposed Rulemaking
1. Legal Basis
2. Approach for Developing Today's Proposed Rulemaking
3. Approach for States That Fully Comply Subsequent to Issuance of Today's Proposed Rulemaking
F. Derivation of Proposed Criteria
1. Section 304(a) Criteria Process
2. Aquatic Life Criteria
3. Criteria for Human Health
4. Section 304(a) Human Health Criteria Excluded
5. Cancer Risk Level Proposed
6. Applying EPA's Nationally Derived Criteria to State Waters
G. Description of the Proposed Rule
1. Scope
2. EPA Criteria for Priority Toxic Pollutants
3. Applicability
H. Specific Issues for Public Comment
I. Executive Order 12291
J. Regulatory Flexibility Act
K. Paperwork Reduction Act

### A. Introduction and Overview

#### *1. Introduction*

This section of the preamble introduces the topics which are addressed subsequently and provides a brief overview of EPA's basis and rationale for proposing to promulgate Federal criteria for priority toxic pollutants. Section B of this preamble presents a description of the evolution of the Federal Government's efforts to control toxic pollutants beginning with a discussion of the authorities in the Federal Water Pollution Control Act Amendments of 1972. Also described in some detail is the development of the water quality standards review and revision process which provides for establishing both narrative goals and enforceable numeric requirements for controlling toxic pollutants. This discussion includes the recent changes enacted in the 1987 Clean Water Act Amendments which are the basis for this proposed rulemaking. Section C summarizes State efforts since 1987 to comply with the requirements of Section 303(c)(2)(B). Section D describes EPA's procedure for determining whether a State has fully complied with Section 303(c)(2)(B). Section E sets out the rationale and approach for developing today's proposed rulemaking, including a discussion of EPA's legal basis. Section F describes the development of the criteria included in today's proposed rulemaking. Section G summarizes the provisions of the proposed rule and Section H highlights certain issues

raised by the proposal for public comment. Sections I, J, and K address the requirements of Executive Order 12291, the Regulatory Flexibility Act, and the Paperwork Reduction Act, respectively. Section L provides a list of subjects covered in today's proposed rulemaking.

*2. Overview*

Today's proposed rulemaking to establish Federal toxics criteria for States is important for a number of environmental, programmatic and legal reasons.

First, control of toxic pollutants in surface waters is an important priority to achieve the Clean Water Act's goals and objectives. The most recent National Water Quality Inventory indicates that one-third of monitored river miles, lake acres, and coastal waters have elevated levels of toxics. Forty-seven States and Territories have reported elevated levels of toxic pollutants in fish tissues. States have issued a total of 586 fishing advisories and 135 bans, attributed mostly to industrial discharges and land disposal.

The absence of State water quality standards for toxic pollutants undermines EPA's overall toxic control efforts to address these problems. Without clearly established water quality goals, the effectiveness of many of EPA's water programs is jeopardized. Permitting, enforcement, coastal water quality improvement, fish tissue quality protection, certain nonpoint source controls, drinking water quality protection, and ecological protection all depend to a significant extent on complete and adequate water quality standards. Numeric criteria for toxics are essential to the process of controlling toxics because they allow States and EPA to evaluate the adequacy of existing and potential control measures to protect aquatic ecosystems and human health. Formally adopted standards form the legal basis for including water quality-based effluent limitations in NPDES permits to control toxic pollutant discharges. The critical importance of controlling toxic pollutants has been recognized by Congress and is reflected, in part, by the addition of section 303(c)(2)(B) to the Act. Congressional impatience with the pace of State toxics control programs is well documented in the legislative history of the 1987 CWA amendments. In order to protect human health, aquatic ecosystems, and successfully implement toxics controls, EPA believes that all actions which are available to the Agency must be taken to ensure that all necessary numeric criteria for priority toxic pollutants are established in a timely manner.

Second, as States and EPA continue the transition from an era of primarily technology-based controls to an era in which technology-based controls are integrated with water quality-based controls, it is important that EPA ensures timely compliance with CWA requirements. An active Federal role is essential to assist States in getting in place complete toxics criteria as part of their pollution control programs. While most States recognize the need for enforceable water quality standards for toxic pollutants, their recent adoption efforts have often been stymied by a variety of factors including limited resources, competing environmental priorities, and difficult scientific, policy and legal challenges. Although many water quality criteria for toxic pollutants have been available since 1980 and the water quality standards regulation has required State adoption of numeric criteria for toxic pollutants since 1983 (see 40 CFR 131.11), a preliminary assessment of the water quality standards for all States in February of 1990 showed that only six States had established fully acceptable criteria for toxic pollutants. This rate of toxics criteria adoption is contrary to the CWA requirements and is a reflection of the difficulties faced by States. EPA should exercise its CWA authorities to assist States in such circumstances.

EPA's proposed action will also help restore equity among the States. The CWA is designed to ensure all waters are sufficiently clean to protect public health and the environment. The CWA allows some flexibility and differences among States in their adopted and approved water quality standards, but it was not designed to reward inaction and inability to meet statutory requirements.

Although most States have made some progress toward satisfying CWA requirements, many appear to have failed to fully comply with section 303(c)(2)(B). The CWA assigns EPA the legal responsibility to promulgate standards where necessary to meet the requirements of the Act. Where States have not satisfied the CWA requirement to adopt water quality standards for toxic pollutants, which was re-emphasized by Congress in 1987, it is imperative that EPA take action.

EPA's ability to oversee State standards-setting activities and to correct deficiencies in State water quality standards is critical to the effective implementation of section 303(c)(2)(B). This proposed rulemaking is a necessary and important component of EPA's implementation of section 303(c)(2)(B) as well as EPA's overall efforts to control toxic pollutants in surface waters.

B. Statutory and Regulatory Background

*1. Pre-Water Quality Act Amendments of 1987 (Pub. L. 100-4)*

Section 303(c) of the 1972 Federal Water Pollution Control Act Amendments (FWPCA) (33 U.S.C. 1313(c)) established the statutory basis for the current water quality standards program. It completed the transition from the previously established program of water quality standards for interstate waters to one requiring standards for all surface waters of the United States.

Although the major innovation of the 1972 FWPCA was technology-based controls, Congress maintained the concept of water quality standards both as a mechanism to establish goals for the Nation's waters and as a regulatory requirement when standardized technology controls for point source discharges and/or nonpoint source controls were inadequate. In recent years these so-called water quality-based controls have received new emphasis by Congress and EPA in the continuing quest to enhance and maintain water quality to protect the public health and welfare.

Briefly stated, the key elements of section 303(c) are:

(a) A water quality standard is defined as the designated beneficial uses of a water segment and the water quality criteria necessary to support those uses;

(b) The minimum beneficial uses to be considered by States in establishing water quality standards are specified as public water supplies, propagation of fish and wildlife, recreation, agricultural uses, industrial uses and navigation;

(c) A requirement that State standards must protect public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act;

(d) A requirement that States must review their standards at least once each three year period using a process that includes public participation;

(e) The process for EPA review of State standards which may ultimately result in the promulgation of a superseding Federal rule in cases where a State's standards are not consistent with the applicable requirements of the CWA, or in situations where the Agency determines Federal standards are necessary to meet the requirements of the Act.

Another major innovation in the 1972 FWPCA was the establishment of the

National Pollutant Discharge Elimination System (NPDES) which requires point source dischargers to obtain a permit before legally discharging to the waters of the United States. In addition to the permit limits established on the basis of technology (e.g. effluent limitations guidelines), the Act requires dischargers to meet instream water quality standards. (See section 301(b)(1)(C), 33 U.S.C. 1311(b)(1)(C)).

Thus water quality standards serve a dual function under the Clean Water Act regulatory scheme. Standards establish narrative and numeric definitions and quantification of the Act's goals and policies (see section 101, 33 U.S.C. 1251) which provide a basis for identifying impaired waters. Water quality standards also establish regulatory requirements which are translated into specific discharge requirements. In order to fulfill this critical function, adopted State criteria must contain sufficient parametric coverage to protect both human health and aquatic life.

In its initial efforts to control toxic pollutants, the FWPCA, pursuant to section 307, required EPA to designate a list of toxic pollutants and to establish toxic pollutant effluent standards based on a formal rulemaking record. Such rulemaking required formal hearings, including cross-examination of witnesses. EPA struggled with this unwieldy process and ultimately promulgated effluent standards for six toxic pollutants, pollutant families or mixtures. (See 40 CFR part 129.) Congress amended section 307 in the 1977 Clean Water Act Amendments by endorsing the Agency's alternative procedure of regulating toxic pollutants by use of effluent limitationguidelines, by amending the procedure for establishing toxic pollutant effluent standards to provide for more flexibility in the hearing process for establishing a record, and by directing the Agency to include sixty-five specific pollutants or classes of pollutants on the toxic pollutant list. EPA published the required list on January 31, 1978 (43 FR 4109). This toxic pollutant list was the basis on which EPA's efforts on criteria development for toxics was focused.

During planning efforts to develop effluent limitation guidelines and water quality criteria, the list of sixty-five toxic pollutants was judged too broad as some of the pollutants were, in fact, general families or classes of organic compounds consisting of many individual chemicals. EPA selected key chemicals of concern within the 65 families of pollutants and identified a more specific list of 129 priority toxic pollutants. Three volatile chemicals were removed from the list (see 46 FR 2266, January 8, 1981; 46 FR 10723, February 4, 1981) so that at present there are 126 priority toxic pollutants. This list is published as Appendix A to 40 CFR part 423.

Another critical section of the 1972 FWPCA was section 304(a) (33 U.S.C. 1314(a)). Section 304(a)(1) provides, in pertinent part, that EPA

> • • • shall develop and publish • • • criteria for water quality accurately reflecting the latest scientific knowledge (A) on the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish, shellfish, wildlife, plant life, shorelines, beaches, esthetics, and recreation which may be expected from the presence of pollutants in any body of water, • • • and (C) on the effects of pollutants on biological community diversity, productivity, and stability, • • •

In order to avoid confusion, it must be recognized that the Clean Water Act uses the term "criteria" in two separate ways. In section 303(c), which is discussed above, the term is part of the definition of a water quality standard. That is, a water quality standard is comprised of designated uses and the criteria necessary to protect those uses. Thus, States are required to adopt regulations or statutes which contain legally achievable criteria. However, in section 304(a), the term criteria is used in a scientific sense and EPA develops recommendations which States consider in adopting regulatory criteria.

In response to this legislative mandate and an earlier similar statutory requirement, EPA and a predecessor agency have produced a series of water quality criteria documents. Early Federal efforts were Water Quality Criteria (1968 "Green Book") and Quality Criteria for Water (1976 "Red Book"). EPA also sponsored a contract effort with the National Academy of Science—National Academy of Engineering which resulted in Water Quality Criteria, 1972 (1973 "Blue Book"). These early efforts were premised on the use of literature reviews and the collective scientific judgment of Agency and advisory panels. However, when faced with the list of 65 toxic pollutants and the need to develop criteria for human health as well as aquatic life, the Agency determined that new procedures were necessary. Continued reliance solely on existing scientific literature was now inadequate, since for many pollutants essential information was not available. EPA scientists developed formal methodologies for establishing scientifically defensible criteria. These were subjected to review by the Agency's Science Advisory Board and the public. This effort culminated on November 28, 1980, when the Agency published criteria development guidelines for aquatic life and for human health, along with criteria for 64 toxic pollutants. (See 45 FR 79318.) Since that initial publication, the aquatic life methodology was slightly amended (50 FR 30784, July 29, 1985) and additional criteria were proposed for public comment and finalized as Agency criteria guidance. EPA summarized the available criteria information in Quality Criteria for Water 1986 (1986 "Gold Book") which is updated from time-to-time. However, the individual criteria documents, as updated, are the official guidance documents.

EPA's criteria documents provide a comprehensive toxicological evaluation of each chemical. For toxic pollutants, the documents tabulate the relevant acute and chronic toxicity information for aquatic life and derive the criteria maximum concentrations (acute criteria) and criteria continuous concentrations (chronic criteria) which the Agency recommends to protect aquatic life resources. For human health criteria, the document provides the appropriate reference doses, and if appropriate the carcinogenic slope factors, and derives recommended criteria. The details of this process are described more fully in a following part of this preamble.

Programmatically, EPA's initial efforts were aimed at converting a program focused on interstate waters into one addressing all interstate and intrastate surface waters of the United States. Guidance was aimed at the inclusion of traditional water quality parameters to protect aquatic life (e.g., pH, temperature, dissolved oxygen and a narrative "free from toxicity" provision), recreation (e.g., bacteriological criteria) and general aesthetics (e.g., narrative "free from nuisance" provisions). EPA also required State adoption of an antidegradation policy to maintain existing high quality or ecologically unique waters as well as maintain improvements in water quality as they occur.

The initial water quality standards regulation was actually a part of EPA's water quality management regulations implementing section 303(e) (33 U.S.C. 1313(e)) of the Act. It was not comprehensive and did not address toxics or any other criteria specifically. Rather, it simply required States to adopt appropriate water quality criteria necessary to support designated uses. (See 40 CFR 130.17 as promulgated in 40 FR 55334, November 28, 1975).

After several years of effort and faced with increasing public and Congressional concerns about toxic pollutants, EPA realized that proceeding under section 307 of the Act would not comprehensively address in a timely manner the control of toxics through either toxic pollutant effluent standards or effluent limitations guidelines because these controls are only applicable to specific types of discharges. EPA sought a broader, more generally applicable mechanism and decided to vigorously pursue the alternative approach of EPA issuance of scientific water quality criteria documents which States could use to adopt enforceable water quality standards. These in turn could be used as the basis for establishing State and EPA permit discharge limits pursuant to section 301(b)(1)(C) which requires NPDES permits to contain

> * * * any more stringent limitation, including those necessary to meet water quality standards * * *, or required to implement any applicable water quality standard established pursuant to this Act.

Thus, the adoption by States of appropriate toxics criteria applicable to their surface waters, such as those recommended by EPA in its criteria documents, would be translated by regulatory agencies into point source permit limits. Through the use of water quality standards, all discharges of toxics are subject to permit limits and not just those discharged by particular industrial categories. In order to facilitate this process, the Agency amended the water quality standards regulation to explicitly address toxic criteria requirements in State standards. The culmination of this effort was the promulgation of the present water quality standards regulation on November 8, 1983 (40 CFR part 131, 48 FR 51400).

The current water quality standards regulation (40 CFR part 131) is much more comprehensive than its predecessor. The regulation addresses in detail both the beneficial use component and the criteria component of a water quality standard. Section 131.11 of the regulation requires States to review available information and,

> * * * to identify specific water bodies where toxic pollutants may be adversely affecting water quality or the attainment of the designated water use or where the levels of toxic pollutants are at a level to warrant concern and must adopt criteria for such toxic pollutants applicable to the water body sufficient to protect the designated use.

The regulation provided that either or both numeric and narrative criteria may be appropriately used in water quality standards.

EPA's water quality standards emphasis since the early 1980's reflected the increasing importance placed on controlling toxic pollutants. States were strongly encouraged to adopt criteria in their standards for the priority toxic pollutants, especially where EPA had published criteria guidance under Section 304(a) of the Act.

Under the statutory scheme, during the 3-year triennial review period following EPA's 1980 publication of water quality criteria for the protection of human health and aquatic life, States should have reviewed those criteria and adopted standards for many priority toxic pollutants. In fact, State response to EPA's criteria publication and toxics initiative was disappointing. A few States adopted large numbers of numeric toxics criteria, although primarily for the protection of aquatic life. Most other States adopted few or no water quality criteria for priority toxic pollutants. Some relied on a narrative "free from toxicity" criterion, and so-called "action levels" for toxic pollutants or occasionally calculated site-specific criteria. Few States addressed the protection of human health by adopting numeric human health criteria.

In support of the November, 1983, water quality standards rulemaking, EPA issued program guidance entitled, Water Quality Standards Handbook (December 1983) simultaneously with the publication of the final rule. The foreword to that guidance noted EPA's two-fold water quality based approach to controlling toxics: chemical specific numeric criteria and biological testing in whole effluents or ambient waters to comply with narrative "no toxics in toxic amounts" standards. More detailed programmatic guidance on the application of biological testing was provided in the Technical Support Document for Water Quality Based Toxics Control (TSD) (EPA 440/4-85-032, September 1985). This document provided the needed information to convert chemical specific and biologically based criteria into water quality standards for ambient receiving waters and permit limits for discharges to those waters. The TSD focused on the use of bioassay testing of effluents (so-called whole effluent testing or WET methods) to develop effluent limitations within discharge permits. Such effluent limits were designed to implement the "free from toxicity" narrative standards in State water quality standards. The TSD also focused on water quality standards. Procedures and policy were presented for appropriate design flows for EPA's section 304(a) acute and chronic criteria. EPA revised the TSD. (Technical Support Document for Water Quality-based Toxics Control, EPA 505/2-90-001, March 1991.) A Notice of Availability was published in the Federal Register on April 4, 1991 (56 FR 13827). All references in this Preamble are to the revised TSD.

The Water Quality Standards Handbook and the TSD are examples of EPA's efforts and assistance that were intended to help, encourage and support the States in adopting appropriate water quality standards for the protection of their waters against the deleterious effects of toxic pollutants. In some States, more and more numeric criteria for toxics were being included as well as more aggressive use of the "free from toxics" narratives in setting protective NPDES permit limits. However, by the time of Congressional consideration and action on the CWA reauthorization, most States had adopted few, if any, water quality standards for priority toxic pollutants.

State practices of developing case-by-case effluent limits using procedures that were not standardized in State regulations made it difficult to ascertain whether such procedures were consistently applied. The use of approaches to control toxicity that did not rely on the statewide adoption of numeric criteria for the priority toxic pollutants generated frustration in Congress. Senator Robert Stafford, first chairman and then ranking minority member of the authorizing committee, noted during the Senate debate:

> An important problem in this regard is that few States have numeric ambient criteria for toxic pollutants. The lack of ambient criteria (for toxic pollutants) make it impossible to calculate additional discharge limitations for toxics * * * It is vitally important that the water quality standards program operate in such a way that it supports the objectives of the Clean Water Act to restore and maintain the integrity of the Nation's Waters. (bracketed material added). A Legislative History of the Water Quality Act of 1987 (Pub. L. 100-4), Senate Print 100-144, USGPO, November 1988 at page 1324.

Other comments in the legislative history similarly note the Congressional perception that the States were failing to aggressively address toxics and that EPA was not using its oversight role to push the States to move more quickly and comprehensively. Thus Congress developed the water quality standards amendments to the Clean Water Act for reasons similar to those strongly stated during the Senate debate by a chief sponsor, Senator John Chaffee.

A cornerstone of the bill's new toxic pollution control requirements is the so called beyond-BAT program. * * * Adopting the beyond BAT provisions will assure that EPA continues to move forward rapidly on the program. * * * If we are going to repair the damage to those water bodies that have become highly degraded as a result of toxic substances, we are going to have to move forward expeditiously on this beyond-BAT program. The Nation cannot tolerate endless delays and negotiations between EPA and States on this program. Both entities must move aggressively in taking the necessary steps to make this program work within the time frame established by this Bill * * * Ibid. at page 1309.

This Congressional impatience with the pace of State and EPA progress and an appreciation that the lack of State standards for toxics undermined the effectiveness of the entire CWA-based scheme, resulted in the 1987 adoption of stringent new water quality standard provisions in the Water Quality Act amendments.

*2. The Water Quality Act Amendments of 1987 (Pub. L. 100–4)*

a. Description of the New Requirements

The 1987 Amendments to the Clean Water Act added section 303(c)(2)(B) which provides:

Whenever a State reviews water quality standards pursuant to paragraph (1) of this subsection, or revises or adopts new standards pursuant to this paragraph, such State shall adopt criteria for all toxic pollutants listed pursuant to section 307(a)(1) of this Act for which criteria have been published under section 304(a), the discharge or presence of which in the affected waters could reasonably be expected to interfere with those designated uses adopted by the State, as necessary to support such designated uses. Such criteria shall be specific numerical criteria for such toxic pollutants. Where such numerical criteria are not available, whenever a State reviews water quality standards pursuant to paragraph (1), or revises or adopts new standards pursuant to this paragraph, such State shall adopt criteria based on biological monitoring or assessment methods consistent with information published pursuant to section 304(a)(8). Nothing in this section shall be construed to limit or delay the use of effluent limitations or other permit conditions based on or involving biological monitoring or assessment methods or previously adopted numerical criteria.

b. EPA's Initial Implementing Actions for Sections 303(c) and 304(l)

This new requirement to the existing water quality standards review and revision process of section 303(c) did not change the existing procedural or timing provisions. For example, section 303(c)(1) still requires that States review their water quality standards at least once each 3 year period and transmit the results to EPA for review. EPA's oversight and promulgation authorities and statutory schedules in section 303(c)(4) were likewise unchanged. Rather, the provision required the States to place heavy emphasis on adopting numeric chemical-specific criteria for toxic pollutants (i.e., rather than just narrative approaches) during the next triennial review cycle. As discussed in the previous section, Congress was frustrated that States were not using the numerous section 304(a) criteria that EPA had developed, and was continuing to develop, to assist States in controlling the discharge of priority toxic pollutants. Congress therefore took an usual action: for the first time in the history of the Clean Water Act, it explicitly mandated that States adopt numeric criteria for specific toxic pollutants.

In response to this new Congressional mandate, EPA redoubled its efforts to promote and assist State adoption of water quality standards for priority toxic pollutants. EPA's efforts included the development and issuance of guidance to the States on acceptable implementation procedures for several new sections of the Act, including Sections 303(c)(2)(B) and 304(l).

The 1987 CWA Amendments added to, or amended, other CWA sections related to toxics control. Section 304(l) (33 U.S.C. 1314(l)) was an important corollary amendment because it required States to take actions to identify waters adversely affected by toxic pollutants, particularly those waters entirely or substantially impaired by point sources. Section 304(l) entitled "Individual Control Strategies for Toxic Pollutants," requires in part, that States identify and list waterbodies where the designated uses specified in the applicable water quality standards cannot reasonably be expected to be achieved because of point source discharge of toxic pollutants. For each segment so identified, the State is required to develop individual control strategies to reduce the discharge of toxics from point sources so that in conjunction with existing controls on point and nonpoint sources, water quality standards will be attained. To assist the States in identifying waters under section 304(l), EPA's guidance listed a number of potential sources of available data for States to review. States generally assembled data for a broad spectrum of pollutants, including the priority toxic pollutants, which could be useful in complying with sections 304(l) and 303(c)(2)(B). In fact, between February 1988 and October 1988, EPA assembled pollutant candidate lists for section 304(l) which were then transmitted to each jurisdiction. Thus, each State had a preliminary list of pollutants that had been identified as present in, or discharged to, surface waters. Such lists were limited by the quantity and distribution of available effluent and ambient monitoring data for priority toxic pollutants. This listing exercise further emphasized the need for water quality standards for toxic pollutants. Lack of standards increased the difficulty of identifying impaired waters. On the positive side, the data gathered in support of the 304(l) activity proved helpful in identifying those pollutants most obviously in need of water quality standards.

EPA, in devising guidance for section 303(c)(2)(B), attempted to provide the maximum flexibility in its options that not only complied with the express statutory language but also with the ultimate congressional objective: Prompt adoption of numeric toxics criteria. EPA believed that flexibility was important so that each State could comply with section 303(c)(2)(B), accommodate its existing water quality standards regulatory approach, and not violate the resource constraints specific to the State. These options are described in the next Section of this preamble. EPA's program guidance was issued in final form on December 12, 1988 but was not substantially different from earlier drafts available for review by the States. The availability of the guidance was published in a Federal Register notice on January 5, 1989 (54 FR 346).

3. EPA's Program Guidance for Section 303(c)(2)(B)

EPA's section 303(c)(2)(B) program guidance identified three options that could be used by a State to meet the requirement that the State adopt toxic pollutant criteria "* * * the discharge or presence of which in the affected waters could reasonably be expected to interfere with those designated uses adopted by the State, as necessary to support such designated uses."

*Option 1.* Adopt statewide numeric criteria in State Water Quality Standards for all section 307(a) toxic pollutants for which EPA has developed criteria guidance, regardless of whether the pollutants are known to be present.

This option is the most comprehensive approach to satisfy the statutory requirements because it would include all of the priority toxic pollutants for which EPA has prepared section 304(a)

criteria guidance for either or both aquatic life protection and human health protection. In addition to a simple adoption of EPA's section 304(a) guidance as standards, a State must select a risk level for those toxic pollutants which EPA believes are carcinogens (i.e., that cause, or may cause cancer in humans). EPA also recommended that States should supplement this comprehensive approach with a water quality standard variance and/or a site-specific criteria methodology to provide the opportunity for flexibility in applying criteria.

Many States found this option attractive because it ensured comprehensive coverage of the priority toxic pollutants with scientifically defensible criteria without the need to conduct a resource-intensive evaluation of the particular segments and pollutants requiring criteria or future prevalence of priority toxic pollutants in their waters. It was also determined this option would not be more costly to dischargers than the other options because permit limits would only be based on the regulation of the particular toxic pollutants in their discharges and not on the total listing in the water quality standards. Thus, actual permit limits should be the same under any of the options.

*Option 2.* Adopt chemical-specific numeric criteria for priority toxic pollutants that are the subject of EPA section 304(a) criteria guidance, where the State determines based on available information that the pollutants are present or discharged and can reasonably be expected to interfere with designated uses.

This option results in the adoption of numeric water quality standards for some subset of those pollutants for which EPA has issued section 304(a) criteria guidance based on a review of current information. To satisfy this option, the guidance recommended that States use the data gathered during the section 304(l) water quality assessments as a starting point to identify those water segments that need water quality standards for priority toxic pollutants. That data would be supplemented by a State and public review of other data sources to ensure sufficient breadth of coverage to meet the statutory objective. Among the available data to be reviewed were: (1) Ambient water monitoring data, including those for the water column, sediment, and aquatic life (e.g., fish tissue data); (2) NPDES permit applications and permittee self-monitoring reports; (3) effluent guideline development documents, many of which contain priority toxic pollutant scans; (4) pesticide and herbicide application information and other records of pesticide or herbicide inventories; (5) public water supply source monitoring data noting pollutants with maximum contaminant levels (MCLs); and (6) any other relevant information on toxic pollutants collected by Federal, State, industry, agencies, academic groups, or scientific organizations. EPA also recommended that States adopt a translator provision similar to that described in Option 3 but applicable to all chemicals causing toxicity, and not just priority toxic pollutants.

This Option 2 review resulted in a State proposing new or revised water quality standards and providing an opportunity for public review and comment on the pollutants, criteria, and water bodies included. Throughout this process, EPA's Regional Offices were available to assist States by providing additional guidance and technical assistance on applying EPA's recommended criteria to particular situations in the States.

*Option 3.* Adopt a procedure to be applied to a narrative water quality standard provision prohibiting toxicity in receiving waters. Such procedures would be used by the State in calculating derived numeric criteria which must be used for all purposes under section 303(c) of the CWA. At a minimum, such criteria need to be developed for section 307(a) toxic pollutants, as necessary to support designated uses, where these pollutants are discharged or present in the affected waters and could reasonably be expected to interfere with designated uses.

The combination of a narrative standard (e.g., "free from toxics in toxic amounts") and an approved translator mechanism as part of a State's water quality standards satisfies the requirements of section 303(c)(2)(B). As noted above, such a procedure is also a valuable supplement to either option 1 or 2. There are several regulatory and scientific requirements EPA's guidance specifies are essential to ensure acceptable scientific quality and full involvement of the public and EPA in this approach. Briefly stated these are:

- The procedure (i.e., narrative criterion and translator) must be used to calculate numeric water quality criteria;
- The State must demonstrate to EPA that the procedure results in numeric criteria that are sufficiently protective to meet the goals of the Act;
- The State must provide for full opportunity for public participation during the adoption of the procedure;
- The procedure must be formally adopted as a State rule and be mandatory in application; and
- The procedure must be submitted for review and approval by EPA as part of the State's water quality standards regulation.

Several States currently apply translators that have been approved by EPA. The scientific elements of a translator are similar to EPA's 304(a) criteria methodologies when applied on a site-specific basis. For example, aquatic criteria are developed using a sufficient number and diversity of aquatic species representative of the biological assemblage of a particular water body. Human health criteria focus on determining appropriate exposure conditions (e.g. amount of aquatic life consumed per person per day) rather than underlying pollutant toxicity. The results of the procedures are scientifically defensible criteria that are protective for the site's particular conditions. EPA review of translator procedures includes an evaluation of the scientific merit of the procedure using the Section 304(a) methodology as a guide.

Ideally, States adopting option 3 translator procedures should prepare a preliminary list of criteria and specify the waters the criteria apply to at the time of adoption. Although under option 3 the State retains flexibility to derive new criteria without revising the adopted standards, establishing this preliminary list of derived criteria at the time of the triennial review will assist the public in determining the scope of the adopted standards, and help ensure that the State ultimately complies with the requirement to establish criteria for all pollutants that can "reasonably be expected" to interfere with uses. EPA believes that States selecting solely option 3 should prepare an analysis similar to that required of option 2 States at the time of the triennial review.

EPA's December 1988 guidance also addressed the timing issue for State compliance with section 303(c)(2)(B). The statutory directive was clear: All State standards triennial reviews initiated after passage of the Act must include a consideration of numeric toxic criteria.

The structure of section 303(c) is to require States to review their water quality standards at least once each three year period. Section 303(c)(2)(B) instructs States to include reviews for toxics criteria whenever they initiate a triennial review. EPA initially looked at February 4, 1990, the 3-year anniversary of the 1987 CWA amendments, as a convenient point to index State

compliance. The April 1990 Federal Register notice used this index point for the preliminary assessment. However, some States were very nearly completing their State administrative processes for ongoing reviews when the 1987 amendments were enacted and could not legally amend those proceedings to address additional toxics criteria. Therefore, in the interest of fairness, and to provide such States a full 3-year review period, EPA's FY 1990 Agency Operating Guidance provided that "By the end of the FY 88–90 triennium, States should have completed adoption of numeric criteria to meet the section 303(c)(2)(B) requirements." (p. 48.) The FY 88–90 triennium ended on September 30, 1990.

Clean Water Act section 303(c) does not provide penalties for States that do not complete timely water quality standards reviews. In no previous case has the EPA Administrator found that State failure to complete a review within three years jeopardized the public health or welfare to such an extent the promulgation of Federal standards pursuant to section 303(c)(4)(B) was justified. The pre-1987 CWA never mandated State adoption of priority toxic pollutants or other specific criteria. EPA relied on its water quality standards regulation (40 CFR 131.11) and its criteria and program guidance to the States on appropriate parametric coverage in State water quality standards, including toxic pollutants. However, because of Congressional concern exhibited in the legislative history for the 1987 Clean Water Act amendments regarding undue delays by States and EPA, and because States have been explicitly required to adopt numeric criteria for appropriate priority toxic pollutants since 1963, the Agency in this proposed rulemaking is proceeding pursuant to section 303(c)(4)(B) and 40 CFR 131.22(b).

4. Revisions to the Water Quality Standards Regulation to Incorporate the Requirements of Section 303(c)(2)(B)

In a rulemaking separate from today's proposal, EPA intends to propose amendments to the Water Quality Standards Regulation to incorporate the requirements of section 303(c)(2)(B). EPA views the effects of that intended rulemaking to be prospective only. EPA's expected regulatory change would provide principally more consistency among the States in their approaches to adopting appropriate toxic and other criteria in future triennial reviews.

The current requirements for water quality criteria in State water quality standards are addressed in 40 CFR 131.11. EPA's intended rulemaking will propose amendments to this section and incorporate the three options described in its December 12, 1988 guidance. Of special concern are the specific requirements for the translator provision described as option 3.

The current regulation at 40 CFR part 131 in conjunction with the statutory language provides a clear and unambiguous basis and process for today's proposed Federal promulgation.

C. State Actions Pursuant to Section 303(c)(2)(B)

There has been substantial progress by many States in the adoption, and EPA approval, of water quality standards for toxic pollutants. For example, for freshwater aquatic life uses, the average number of priority toxic pollutants with criteria adopted has tripled from ten per State in 1986 to thirty per State on February 4, 1990. In addition, the number of States with at least some aquatic life criteria adopted has increased from thirty-three in April 1986 to forty-five as of February 4, 1990.

Furthermore, virtually all States have at least proposed new toxics criteria for priority toxic pollutants since section 303(c)(2)(B) was added to the CWA in February of 1987. Unfortunately, not all such State proposals address, in a comprehensive manner, the requirements of section 303(c)(2)(B). For example, some States have proposed to adopt criteria to protect aquatic life, but not human health; other States have proposed human health criteria which do not address major human exposure pathways. In addition, in some cases final adoption of proposed State toxics criteria which would be approvable by EPA has been substantially delayed due to controversial and difficult issues associated with the toxics criteria adoption process. For purposes of today's proposed rulemaking, it is EPA's judgment that only 35 States completed actions which fully satisfy the requirements of section 303(c)(2)(B).

The difficulties faced by States in adopting criteria for priority toxic pollutants are exemplified by recent State efforts to adopt criteria for the priority toxic pollutant 2,3,7,8–TCDD (dioxin). As is generally true of State section 303(c)(2)(B) efforts, State efforts to adopt numeric human health dioxin criteria have been slow and controversial, but in many respects impressive. For example, since 1987, a total of 34 States have adopted numeric human health criteria for dioxin which have been approved by EPA. In total, 38 States have adopted numeric human health criteria for dioxin. Twenty-five of these 38 States adopted criteria during calendar year 1991, showing that the pace of State actions to adopt dioxin criteria has accelerated substantially.

The progress which has been made by States in adopting dioxin criteria is particularly impressive in light of the substantial attention and controversy which has been focused on such actions. EPA, States, dischargers, environmental groups, and the public at large have been involved in discussions concerning the ambient level of protection that is protective of public health. In some States, the struggle to select an appropriate dioxin criterion has been the major impediment to successful completion of section 303(c)(2)(B) actions.

At issue are scientific questions specific to dioxin, such as determining the carcinogenic potency of the pollutant and the extent to which the pollutant tends to accumulate in fish tissues. Other issues are generic to EPA'S human health criteria, such as determining the rate at which humans consume fish and other forms of aquatic life, and the necessity of setting ambient criteria at levels which may not be detected by state-of-the-art laboratories. Most of these issues relate, directly or indirectly, to concerns expressed by dischargers regarding the cost of complying with water quality-based effluent limits for dioxin which, although variable from State to State, generally are based on State numeric water quality criteria that allow only minute quantities of dioxin per liter of water. For example, twelve States have adopted EPA's recommended ambient water column concentration of 0.013 picograms per liter.

Currently, a total of eleven States have proposed, or are expected to propose, numeric human health-based criteria for dioxin. These States could face the same issues, obstacles, and resource requirements that the 33 States which previously adopted criteria have faced.

In summary, States have devoted substantial resources, and have made substantial progress, in adopting new or revised numeric criteria for priority pollutants. In so doing they have addressed a number of significant and difficult issues. These issues and the attendant controversy has accounted, at least in part, for the fact that 22 jurisdictions still have not adopted numeric toxics criteria that fully comply with section 303(c)(2)(B). For a more detailed State-specific outline of actions taken in response to section 303(c)(2)(B), refer to part III of appendix 1, which itemizes State actions to adopt toxics criteria for States approved by EPA as

being in full compliance as well as States which EPA has not approved as being in full compliance with section 303(c)(2)(B).

D. Determining State Compliance With Section 303(c)(2)(B)

*1. EPA's Review of State Water Quality Standards for Toxics*

The EPA Administrator has delegated the responsibility and authority for review and approval or disapproval of all State water quality standards actions to the 10 EPA Regional Administrators (see 40 CFR 131.21). State section 303(c)(2)(B) actions are thus submitted to the appropriate EPA Regional Administrator for review and approval. This de-centralized EPA system for State water quality standards review and approval is guided by EPA Headquarter's Office of Water, which issues national policies and guidance to the States and Regions such as the annual Office of Water Operating Guidance and various technical operating guidance manuals.

For purposes of evaluating State compliance with CWA section 303(c)(2)(B), EPA relied on the language of section 303(c)(2)(B), the existing water quality standards regulation, and section 303(c)(2)(B) national guidance to provide the basis for EPA review. In some cases, individual Regions also used Regional policies and procedures in reviewing State section 303(c)(2)(B) actions. The flexibility provided by the national guidance, coupled with subtle differences in Regional policies and procedures, contributed to some differences in the approaches taken by States to satisfy section 303(c)(2)(B) requirements.

As discussed previously, EPA's final guidance on compliance with section 303(c)(2)(B) was developed to provide States with the necessary flexibility to allow State standards revisions that would complement the State's existing water quality standards program, fully comply with section 303(c)(2)(B), and not violate State-specific resource constraints. As guidance, it did not contain clearly defined limits on the range of acceptable approaches, but rather described EPA's recommendations on approaches States could use to satisfy the statutory requirements. Some innovative State approaches were expected as well as differences in terms of criteria coverage, stringency and application procedures.

Although the guidance provided for State flexibility, it was also consistent with existing water quality standards regulation requirements at 40 CFR 131.11 that explicitly require State criteria to be sufficient to protect designated uses. Such water quality criteria also must be based on sound scientific rationale and support the most sensitive use designated for a water body.

The most complicated EPA compliance determinations involve States that select EPA Options 2 or 3. Since most States use EPA's Section 304(a) criteria guidance, where States select Option 1, EPA normally is able to focus Agency efforts on verifying that all available EPA criteria are included, appropriate cancer risk levels are selected, and that sufficient application procedures are in place (e.g. laboratory analytical methods, mixing zones, flow condition, etc.).

However, for States using EPA's Option 2 or 3, substantially more EPA evaluation and judgment is required because the Agency must evaluate which priority pollutants and, in some cases, segments or designated uses, require numeric criteria. Under these options, the State must adopt or derive numeric criteria for priority toxic pollutants for which EPA has section 304(a) criteria, "* * * the discharge or presence of which in the affected waters could reasonably be expected to interfere with those designated uses adopted by the State * * *" The necessary justification and the ultimate coverage and acceptability of a State's actions vary State-to-State because of differences in the adequacy of available monitoring information, local water bodies use designations, the effluent and nonpoint source controls in place, and different approaches to the scientific basis for criteria.

In submitting criteria for the protection of human health, States are not limited to a 1 in 1 million risk level ($10^{-6}$). EPA generally regulates pollutants treated as carcinogens in the range of $10^{-6}$ to $10^{-4}$ for average exposed individuals. If a State selects a criterion that represents an upper bound risk level less protective than 1 in 100,000 (i.e., $10^{-5}$), however, the State will need to have substantial support in the record for this level. This support should focus on two distinct issues. First, the record must include documentation that the decision maker considered the public interest of the State in selecting the risk level, including documentation of public participation in the decision making process as required by the water quality standards regulation at 40 CFR 131.20(b). Second, the record must include an analysis showing that the risk level selected, when combined with other risk assessment variables, is a balanced and reasonable estimate of actual risk posed, based on the best and most representative information available. The importance of the estimated actual risk increases as the degree of conservatism in the selected risk level diminishes. EPA will carefully evaluate all assumptions used by a State if the State chooses to alter any one of the standard EPA assumption values.

Where States select Option 3, EPA reviews must also include an evaluation of the scientific defensibility of the translator procedure. EPA must also verify that a requirement to apply the translator whenever toxics may reasonably be expected to interfere with designated uses (e.g., where such toxics exist or are discharged) is included in the State's water quality standards. Satisfactory application procedures must also be developed by States selecting Option 3.

In general, each EPA Region made compliance decisions based on whatever information was available to the State at the time of the triennial review. For some States, information on the presence and discharge of priority toxic pollutants is extremely limited. Nevertheless, during the period of February 1988 to October 1990, to supplement State efforts, EPA assembled the available information and provided each State with various pollutant candidate lists in support of the section 304(l) and section 303(c)(2)(B) activities. These were based in part on computerized searches of existing Agency data bases.

Beginning in 1988, EPA provided States with candidate lists of priority toxic pollutants and water bodies in support of CWA section 304(l) implementation. These lists were developed because States were required to evaluate existing and readily available water-related data in order to comply with section 304(l), 40 CFR 130.10(d). A similar "strawman" analysis of priority pollutants potentially requiring adoption of numeric criteria under section 303(c)(2)(B) was furnished to most States in September or October of 1990 for their use in on-going and subsequent triennial reviews. The primary differences between the "strawman" analysis and the section 304(l) candidate lists were that the "strawman" analysis: (1) Organized the results by chemical rather than by water body, (2) included data for certain STORET monitoring stations that were not used in constructing the candidate lists, (3) included data from the Toxics Release Inventory database, and (4) did not include a number of data sources used in preparing the candidate lists (e.g., those, such as fish kill

information, that did not provide chemical specific information).

In its 1988 section 303(c)(2)(B) guidance, EPA urged States, at a minimum, to use the information gathered in support of section 304(l) requirements as a starting point for identifying which priority toxic pollutants require adoption of numeric criteria. EPA also encouraged States to consider the presence or potential construction of facilities that manufacture or use priority toxic pollutants as a strong indication of the need for toxics criteria. Similarly, EPA indicated to States that the presence of priority pollutants in ambient waters (including those in sediments or in aquatic life tissue) or in discharges from point or nonpoint sources also be considered as an indication that toxics criteria should be adopted. A limited amount of data on the effluent characteristics of NPDES discharges was readily available to States. States were also expected to take into account newer information as it became available, such as information in annual reports from the Toxic Chemical Release Inventory requirements of the Emergency Planning and Community Right-To-Know Act of 1986. (Title III, Pub. L. 99-499.)

In summary, EPA and the States had access to a variety of information, gathered in support of section 304(l), section 303(c)(2)(B), and section 305(b) activities. For some States, as noted above, such information for priority toxic pollutants is extremely limited. In the final analysis, the Regional Administrator made a judgment on a duly submitted State standards triennial review based on the State's record and the Region's independent knowledge of the facts and circumstances surrounding the State's actions. These actions, taken in consultation with the Office of Water, determined which State actions were sufficiently consistent with the coverage contemplated in the statute to justify approval. These approval actions include allowable variations among State water quality standards. EPA approval indicates that, based on the record, the State water quality standards met the requirements of the Act.

2. Determining Current Compliance Status

The following summarizes the process generally followed by the Agency in assessing compliance with section 303(c)(2)(B). As with other aspects of this rule, EPA invites comments on the compliance determination process.

A State was determined to be in full compliance with the requirements of section 303(c)(2)(B) if:

a. The State had submitted a water quality standards package for EPA review since enactment of the 1987 Clean Water Act amendments or was determined to be already in compliance, and,

b. The adopted State water quality standards are effective under State law and consistent with the CWA and EPA's implementing regulations (EPA's December 1988 guidance described three Options, any one, or a combination of which EPA suggested States could adopt for compliance with the CWA and EPA regulations), and

c. EPA has issued a formal approval determination to the State.

States meeting these criteria are not included in this proposed rulemaking.

States which adopted standards following Option 1 generally have been found to satisfy section 303(c)(2)(B). An exception exists for selected States which attempted to follow Option 1 by adopting all EPA section 304(a) criteria by reference. EPA has withheld approval for a few States which have adopted such references into their standards because the adopted standards did not specify application factors necessary to implement the criteria (e.g., a risk level for carcinogens). Other States have achieved full compliance following options 1, 2, 3, or some combination of these options.

As of the date of signature of today's proposal, the Agency has determined that 35 States and Territories are in full compliance with the requirements of section 303(c)(2)(B). Compliance status for all States and Territories is set forth in Table 1.

TABLE 1.—PRELIMINARY ASSESSMENT OF STATE COMPLIANCE WITH CWA SECTION 303(C)(2)(B)

| State | Is State in compliance with section 303(c)(2)(B)? |
|---|---|
| Alabama | Yes. |
| Alaska | No. |
| Arizona | No. |
| Arkansas | No. |
| California | No. |
| Colorado | No. |
| Connecticut | No. |
| Delaware | Yes. |
| Florida | No. |
| Georgia | Yes. |
| Hawaii | No. |
| Idaho | No. |
| Illinois | Yes. |
| Indiana | Yes. |
| Iowa | Yes. |
| Kansas | No. |
| Kentucky | Yes. |
| Louisiana | No. |
| Maine | Yes. |
| Maryland | Yes. |
| Massachusetts | Yes. |
| Michigan | No. |
| Minnesota | Yes. |
| Mississippi | Yes. |
| Missouri | Yes. |
| Montana | Yes. |
| Nebraska | Yes. |
| Nevada | No. |
| New Hampshire | No. |
| New Jersey | No. |
| New Mexico | Yes. |
| New York | Yes. |
| North Carolina | Yes. |
| North Dakota | Yes. |
| Ohio | Yes. |
| Oklahoma | Yes. |
| Oregon | Yes. |
| Pennsylvania | Yes. |
| Rhode Island | No. |
| South Carolina | Yes. |
| South Dakota | Yes. |
| Tennessee | Yes. |
| Texas | Yes. |
| Utah | Yes. |
| Vermont | No. |
| Virginia | No. |
| Washington | No. |
| West Virginia | Yes. |
| Wisconsin | Yes. |
| Wyoming | Yes. |
| American Samoa | Yes. |
| Commonwealth of the Northern Mariana Islands. | No. |
| District of Columbia | No. |
| Guam | Yes. |
| Puerto Rico | No. |
| Trust Territories | Yes. |
| Virgin Islands | Yes. |

Section III of appendix 1 provides a State-by-State summary of how compliance was achieved for the EPA-approved States, and what has been, and yet needs to be, accomplished in States included in this proposed rule.

### E. Rationale and Approach for Developing Today's Proposed Rulemaking

The addition of section 303(c)(2)(B) to the Clean Water Act was an unequivocal signal to the States that Congress wanted toxics criteria in the State's water quality standards. The legislative history notes that the "beyond BAT" program (i.e., controls necessary to comply with water quality standards that are more stringent than technology-based controls) was the cornerstone to the Act's toxic pollution control requirements.

The major innovation of the 1972 Clean Water Act Amendments was the concept of effluent limitation guidelines

which were to be incorporated into NPDES permits. In many cases, this strategy has succeeded in halting the decline in the quality of the Nation's waters and, often, has provided improvements. However, the effluent limitation guidelines for industrial discharges and the similar technology-based secondary treatment requirements for municipal discharges are not capable, by themselves, of ensuring that the fishable-swimmable goals of the Clean Water Act will be met.

The basic mechanism to accomplish this in the Act is water quality standards. States are required to periodically review and revise these standards to achieve the goals of the Act. In the 1987 CWA amendments, Congress focused on addressing toxics in several sections of the Act, but special attention was placed on the section 303 water quality standards program requirements. Congress intended that the adoption of numeric criteria for toxics would result in direct improvements in water quality by forcing, where necessary, effluent limits more stringent than those resulting from technology-based effluent limitations guidelines.

As the legislative history demonstrates, Congress was dissatisfied with the piecemeal, slow progress being made by States in setting standards for toxics. Congress reacted by legislating new requirements and deadlines directing the States to establish toxics criteria for pollutants addressed in EPA Section 304(a) criteria guidance, especially for those priority toxic pollutants that could reasonably be expected to interfere with designated uses. In today's action, EPA is exercising its authority under section 303(c)(4) to propose criteria where States have failed to act in a timely manner.

For those States not in compliance with section 303(c)(2)(B) four and one-half years after enactment, EPA now begins the process that will culminate in the promulgation of appropriate toxics criteria and the determination of the necessary parametric coverage and stringency of such criteria. While the previous section of this preamble explains EPA's approach to evaluating the adequacy of State actions in response to section 303(c)(2)(B), this section explains EPA's legal basis for issuing today's proposed rulemaking, discusses EPA's general approach for developing the proposed State-specific requirements in § 131.36(d).

In addition to the Congressional directive and the legal basis for this proposed action, there are a number of environmental and programmatic reasons why further delay in establishing water quality standards for toxic pollutants is no longer acceptable.

Prompt control of toxic pollutants in surface waters is critical to the success of a number of Clean Water Act programs and objectives, including permitting, enforcement, fish tissue quality protection, coastal water quality improvement, sediment contamination control, certain nonpoint source controls, pollution prevention planning, and ecological protection. The decade-long delay in State adoption of water quality standards for toxic pollutants has had a ripple effect throughout EPA's water programs. Without clearly established water quality goals, the effectiveness of many water programs is jeopardized.

Failure to take prompt action at this juncture would also undermine the continued viability of the current statutory scheme to establish standards. Continued delay subverts the entire concept of the triennial review cycle which is to combine current scientific information with the results of previous environmental control programs to direct continuing progress in enhancing water quality.

Finally, another reason to proceed expeditiously is to bring closure to this long-term effort and allow State attention and resources to be directed towards important new national program initiatives. Until standards for toxic pollutants are in place, neither EPA nor the States can fully focus on the emerging, ecologically based water quality activities such as wetlands criteria, biological criteria and sediment criteria.

### b. *Legal Basis*

Clean Water Act section 303(c) specifies that adoption of water quality standards is primarily the responsibility of the States. However, section 303(c) also describes a role for EPA of overseeing State actions to ensure compliance with CWA requirements. If the Agency's review of the State's standards finds flaws or omissions, then the Act authorizes EPA to initiate promulgation to correct the deficiencies (see section 303(c)(4)). The water quality standards promulgation authority has been used by EPA to issue final rules on nine separate occasions. These actions have addressed both insufficiently protective State criteria and/or designated uses and failure to adopt needed criteria. Thus, today's action is not unique, although it would affect more States and pollutants than previous actions taken by the Agency.

The Clean Water Act in section 303(c)(4) provides two bases for promulgation of Federal water quality standards. The first basis in paragraph (A) applies when a State submits new or revised standards that EPA determines are not consistent with the applicable requirements of the Act. If, after EPA's disapproval, the State does not promptly amend its rules so as to be consistent with the Act, EPA must promulgate appropriate Federal water quality standards for that State. The second basis for EPA's action is paragraph (B), which provides that EPA shall promptly initiate promulgation "* * * in any case where the Administrator determines that a revised or new standard is necessary to meet the requirements of this Act." EPA is relying on both section 303(c)(4)(A) and section 303(c)(4)(B) as the legal basis for this proposed rulemaking.

Section 303(c)(4)(A) supports today's action for several States. These States have submitted criteria for some number of priority toxic pollutants and EPA has disapproved the State's adopted standards. The basis for EPA's disapproval generally has been the lack of sufficient criteria or particular criteria that were insufficiently stringent. In these cases, EPA has, by letter to the State, noted the deficiencies and specified the need for corrective action. (See section III of appendix 1 for a summary description of each State's section 303(c)(2)(B) history.) Not having received an appropriate correction within the statutory time frame, EPA is today proposing the needed criteria. The action in today's proposal pursuant to section 303(c)(4)(A) may differ from those taken pursuant to section 303(c)(4)(B) by being limited to criteria for specific priority toxic pollutants, particular geographic areas, or particular designated uses.

Section 303(c)(4)(B) is the basis for EPA's proposed requirements for most States. For these States, the Administrator proposes criteria that would bring the States into compliance with the requirements of the CWA. In these cases, EPA is proposing, at a minimum, criteria for all priority toxic pollutants not addressed by approved State criteria. EPA is also proposing criteria for priority toxic pollutants where any previously-approved State criteria do not reflect current science contained in revised criteria documents and other guidance sufficient to fully protect all designated uses or human exposure pathways, or where such previously-approved State criteria are not applicable to all appropriate designated uses. EPA's action pursuant

to section 304(c)(4)(B) may include several situations.

In some cases, the State has failed to adopt and submit for approval any criteria for those priority toxic pollutants for which EPA has published criteria. This includes those States that have not submitted triennial reviews. In other cases, the State has adopted and EPA has approved criteria for either aquatic life or human health, but not both. In yet a third siuation, States have submitted some criteria but not all necessary criteria. Lastly, one State has submitted criteria that do not apply to all appropriate geographic sections of the waters of the State. (See section III of appendix 1.)

The use of section 303(c)(4)(B) requires a determination by the Administrator "* * *that a revised or new standard is necessary to meet the requirements of * * *" the Act. The Administrator's determination could be supported in different ways.

One approach would be for EPA to undertake a time-consuming effort to research and marshall data to demonstrate the need for promulgation for each criteria for each stream segment or waterbody in each State. This would include evidence for each section 307(a) priority toxic pollutant for which EPA has section 304(a) criteria and that there is a "discharge or presence" which could reasonably "be expected to interfere with" the designated use. This approach would not only impose an enormous administrative burden, but would be contrary to the statutory scheme and the compelling Congressional directive for swift action reflected in the 1987 addition of section 303(c)(2)(B) to the Act.

An approach that is more reasonable and consistent with Congressional intent focuses on the State's failure to complete the timely review and adoption of the necessary standards required by section 303(c)(2)(B) despite information that priority toxic pollutants may interfere with designated uses of the State's waters. This approach is consistent with the fact that in enacting section 303(c)(2)(B) Congress expressed its determination of the necessity for prompt adoption and implementation of water quality standards for toxic pollutants. Therefore, a State's failure to meet this fundamental 303(c)(2)(B) requirement of adopting appropriate standards constitutes a failure "to meet the requirements of the Act." That failure to act can be a basis for the Administrator's determination under section 303(c)(4)(B) that new or revised criteria are necessary to ensure designated uses are adequately protected. Here, this determination is buttressed by the existence of evidence of the discharge or presence of priority toxic pollutants in a State's waters for which the State has not adopted numeric water quality criteria. The Agency has compiled an impressive volume of information in the record for this rulemaking (See appendix 1) on the discharge or presence of toxic pollutants in State waters. This data supports the Administrator's proposed determination pursuant to section 303(c)(4)(B).

The Agency's choice to base the proposed determination on the second approach is supported by both the elicit language of the statutory provision and by the legislative history. Congress added subsection 303(c)(2)(B) to section 303 with full knowledge of the existing requirements in section 303(c)(1) for triennial water quality standards review and submission to EPA and in section 303(c)(4)(B) for EPA promulgation. There was a clear expectation that these provisions be used in concert to overcome the programmatic delay that many legislators criticized and achieve the Congressional objective of the rapid availability of enforceable water quality standards for toxic pollutants. As quoted earlier, chief Senate sponsors, including Senators Stafford, Chafee and others, wanted the provision to eliminate State and EPA delays and force aggressive action.

In normal circumstances, it might be argued that to exercise section 303(c)(4)(B) the Administrator might have the burden of marshalling conclusive evidence of "necessity" for Federally promulgated water quality standards. However, in adopting section 303(c)(2)(B), Congress made clear that the "normal" procedure had become inadequate. The specificity and deadline in section 303(c)(2)(B) were layered on top of a statutory scheme already designed to achieve the adoption of toxic water quality standards. Congressional action to adopt an essentially redundant provision was driven by their impatience with the lack of State progress. The new provision was essentially a Congressional "determination" of the necessity for new or revised comprehensive toxic water quality standards by States. In deference to the principle of State primacy, Congress, by linking section 303(c)(2)(B) to the section 303(c)(1) three-year review period, gave States a last chance to correct this deficiency on their own. However, this Congressional indulgence does not alter the fact that section 303(c)(2)(B) changed the nature of the CWA State/EPA water quality standard relationship. The new provision and its legislative background indicate that the Administrator's determination to invoke his section 303(c)(4)(B) authority in this circumstance can be met by a generic finding of inaction on the part of a State and without the need to develop data for individual stream segments. Otherwise, the Agency would face the heavy data gathering burden of justifying the need for each Federal criterion, the process could stretch for years and never be realized. To interpret the combination of subsections (c)(2)(B) and (c)(4) as an effective bar to prompt achievement of statutory objectives would be a perverse conclusion and render section 303(c)(2)(B) essentially meaningless.

A second strong argument against requiring EPA to shoulder a heavy burden to exercise section 303(c)(4)(B) authority is that it would invert the traditional statutory scheme of EPA as national overseer and States as the entity with the greatest local expertise. The CWA provides States the flexibility to tailor water quality standards to local conditions and needs based upon their wealth of first-hand experience, knowledge and data. However, this allowance for flexibility is based on an assumption of reasoned and timely State action, not an abdication of State responsibility by failure to act. EPA does not possess the local expertise or resources necessary to successfully tailor State water quality standards. Therefore, the fact that the CWA allows States flexibility in standards development does not impose an inappropriate burden on EPA in the exercise of its oversight promulgation responsibilities. A broad Federal promulgation based on a showing of State inaction coupled with basic information on the discharge and presence of toxic pollutants meets the statutory objective of having criteria in place that are protective of public health and the environment. Without local expertise to help accurately narrow this list of pollutants and segments requiring criteria, there is no assurance of comparable protection. Nothing in the overall statutory water quality standards scheme anticipates EPA would develop this expertise in lieu of the States. EPA's lack of familiarity with local conditions argues strongly for a simple "determination" test to trigger section 303(c)(4)(B) promulgations. It also supports the concept of an across-the-board rulemaking for all priority toxic pollutants with section 304(a) criteria.

A final major reason supporting a simple determination to trigger 303(c)(4)(B) action is that comprehensive

Federal promulgation imposes no undue or inappropriate burden on States or dischargers. It merely puts in place standards for toxic pollutants that are utilized in implementing Clean Water Act programs. Under this rulemaking, a State still retains the ability to adopt alternative water quality standards simply by completing its standards adoption process. Upon EPA approval of those standards, EPA would take actions to withdraw the Federally-promulgated criteria.

Federal promulgation of State water quality standards should be a course of last resort. It is symptomatic of something awry with the basic statutory scheme. Yet, when it is necessary to exercise this authority, as the evidence suggests is this case, there should be no undue impediments to its use. Section 303(c)(4) is replete with deadlines and Congressional directives for the Administrator to act "promptly" in these cases. The statute indicates that the Administrator of EPA, is to "* * * promptly prepare and publish proposed regulations setting forth a revised or new water quality standard * * *" and "* * * shall promulgate any revised or new standard * * * not later than 90 days after he published such proposed standards, unless prior to such promulgation, such State has adopted a revised or new standard which the Administrator determines to be in accordance with the Act." EPA intends to make every effort to meet the 90 day schedule. The adoption of section 303(c)(2)(B) reinforced this emphasis on expeditious actions. EPA has demonstrated extensive deference to State primacy and a willingness to provide broad flexibility in their adoption of State standards for toxics. However, to fulfill its statutory obligation requires that EPA's deference and flexibility cannot be unlimited.

For the reasons just discussed, EPA does not believe it is necessary to support the criteria proposed today on a pollutant specific, State-by-State, waterbody-by-waterbody basis. Nonetheless, over the course of the past several years in working with and assisting the States, the Agency has reviewed the readily-available data on the discharge and presence of priority toxic pollutants. While this data is not necessarily comprehensive, it constitutes a substantial record to support a *prima facie* case for the need for numeric criteria for most priority toxic pollutants with section 304(a) criteria guidance in most States. In the absence of final State actions to adopt criteria pursuant to either Option 2 or 3 which meet the requirements for EPA approval, this evidence strongly supports EPA's decision to propose, pursuant to Section 303(c)(4)(B), criteria for all priority toxic pollutants not fully addressed by State criteria. The EPA data supporting this assertion is discussed more fully in the next section.

*2. Approach for Developing Today's Proposed Rulemaking*

The proposed State-specific requirements in § 131.36(d) were developed using one of two approaches. In the formal review of the adopted standards for certain States, EPA has determined that specific numeric toxics criteria are lacking. For some, criteria were omitted from the State standards, even though in EPA's judgment, the pollutants can reasonably be expected to interfere with designated uses. In these cases where EPA has specifically identified deficiencies in a State submission, today's proposed rule would establish Federal criteria for that limited number of priority toxic pollutants necessary to correct the deficiency.

For the balance of the States, EPA proposes to apply, to all appropriate State waters, the section 304(a) criteria for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously-approved State criteria do not reflect current science contained in revised criteria documents and other guidance sufficient to fully protect all designated uses or human health exposure pathways, where such previously-approved State criteria do not protect against both acute and chronic aquatic life effects, or where such previously-approved State criteria are not applicable to all appropriate State designated uses. EPA encourages public comments regarding any data which demonstrate that specific priority pollutants or water bodies may not require Federal criteria to protect State designated uses.

Absent a State-by-State pollutant specific analysis to narrow the list, existing data sources strongly support a comprehensive rulemaking approach. Information in the rulemaking record from a number of sources indicates the discharge, potential discharge or presence of virtually all priority toxic pollutants in all States. The data available to EPA has been assembled into a "strawman" analysis designed to identify priority toxic pollutants that potentially require the adoption of numeric criteria. Information on pollutants discharged or present was identified by accessing various national data sources:

—Final section 304(1) short lists identifying toxic pollutants likely to impair designated uses;
—Water column, fish tissue and sediment observations in the Storage Retrieval (STORET) data base (i.e., where the pollutant was detected);
—The National Pollutant Discharge Elimination System's (NPDES) Permit Compliance System data base to identify those pollutants limited in direct dischargers' permits;
—Pollutants included on Form 2(c) permit applications which have been submitted by wastewater dischargers;
—Information on discharges to surface waters or POTWs from the Toxics Release Inventory required by the Emergency Planning and Community Right-To-Know Act of 1986 (title III, Pub. L. 99-499);
—Pollutants predicted to be in the effluent of NPDES dischargers based on industry-specific analyses conducted for the Clean Water Act effluent guideline program.

The extent of this data supports a conclusion that promulgation of Federal criteria for all priority toxic pollutants with section 304(a) criteria guidance documents is appropriate for those States that have not completed their standards adoption process. This conclusion is supported by several other factors.

First, many of the available data sources have limitations which argue against relying on them solely to identify all needed water quality criteria. For example, the section 304(l) short lists only identified water bodies where uses were impaired by point source discharges; State long lists did not generally identify pollutants causing use impairment by nonpoint sources. Other available data sources (i.e., NPDES permit limits) have a similar narrow scope because of their particular purposes. Even the value of those data bases designed to identify ambient water problems is restricted by the availability of monitoring data.

In many States, the quantity, spatial and temporal distribution, and pollutant coverage of monitoring data is severely limited. For example, the most recent Water Quality Inventory Report to Congress included an evaluation of use attainment for only one-third of all river miles and less than one-half of lake acres. Even for those waters where use attainment status was reported, many assessments were based on data which did not include the chemical-specific information necessary to identify the priority toxic pollutants which pose a threat to designated uses. After evaluating this data, EPA concluded that

it most likely understates the adverse presence or discharge of priority toxic pollutants.

Further evidence justifying a broad promulgation rulemaking can be found in the State actions to date in their standards adoption process. While many have not come to completion, the initial steps have led many States to develop or propose rulemaking packages with extensive pollutant coverage. The nature of these preliminary State determinations argues for a Federal promulgation of all section 304(a) criteria pollutants to ensure adequate public health and environmental protection against priority toxic pollutant insults.

EPA's strawman analysis for each State is described in greater detail in part III of appendix 1 and the complete record is available for public review.

The detailed assumptions and "rules" followed by EPA in writing the proposed § 131.36(d) requirements for all jurisdictions are listed below. Comment is invited on the details of these determinations.

(1) No criteria are proposed for States which have been fully approved by EPA as complying with the section 303(c)(2)(B) requirements.

(2) For States which have not been fully approved, if EPA has not previously determined which specific pollutants/criteria/waterbodies are lacking from a State's standards (i.e., as part of an approval/disapproval action only), all of the criteria in columns B, C, and D of the proposed § 131.36(b) matrix are proposed for statewide application to all appropriate designated uses, except as provided for elsewhere in these rules. That is, EPA proposes to bring the State into compliance with section 303(c)(2)(B) via an approach which is comparable to option 1 of the December 1988 national guidance for section 303(c)(2)(B).

(3) If EPA has previously determined which specific pollutants/criteria/waterbodies are needed to comply with CWA section 303(c)(2)(B) (i.e., as part of an approval/disapproval action only), the criteria in proposed section 131.36(b) are proposed for only those specific pollutants/criteria/waterbodies (i.e., EPA proposes to bring the State into compliance via an approach which is comparable to option 2 of the December 1988 national guidance for section 303(c)(2)(B)).

(4) For aquatic life, except as provided for elsewhere in these rules, all waters with designated aquatic life uses providing even minimal support to aquatic life are included in the proposed rule (i.e., fish survival, marginal aquatic life, etc.).

(5a) For human health, except as provided for elsewhere in these rules, all waters with designated uses providing for public water supply protection (and therefore a potential water consumption exposure route) or minimal aquatic life protection (and therefore a potential fish consumption exposure route) are included in the proposed rule.

(5b) Where a State has determined the specific aquatic life segments which provide a fish consumption exposure route (i.e., fish or other aquatic life are being caught and consumed) and EPA approved this determination as part of standards approval/disapproval action, the proposed rule includes the fish consumption (Column D(II)) criteria for only those aquatic life segments, except as provided for elsewhere in these rules. In making a determination that certain segments do not support a fish consumption exposure route, a State must have completed, and EPA approved, a use attainability analysis consistent with the provisions of 40 CFR 131.10(j). In the absence of such an approved State determination, EPA has proposed fish consumption criteria for all aquatic life segments.

(6) Uses/Classes other than those which support aquatic life or human health are not included in the proposed rulemaking (e.g., livestock watering, industrial water supply), unless they are defined in the State standards as also providing protection to aquatic life or human health (i.e., unless they are described as protecting multiple uses including aquatic life or human health). For example, if the State standards include a use such as industrial water supply, and in the narrative description of the use the State standards indicate that the use includes protection for resident aquatic life, then this use is included in the proposed rulemaking.

(7) For human health, the "water+fish" criteria in Column D(I) of § 131.36(b) are proposed for all waterbodies where public water supply and aquatic life uses are designated, except as provided for elsewhere in these rules (e.g., rule 9).

(8) If the State has public water supplies where aquatic life uses have not been designated, or public water supplies that have been determined not to provide a potential fish consumption exposure pathway, the "water only" criteria in Column D(I) of § 131.36(b) are proposed for such waterbodies, except as provided for elsewhere in these rules (e.g., rule 9).

(9) EPA is generally not proposing criteria for priority toxic pollutants for which a State has adopted criteria and received EPA approval. The exceptions to this general rule are described in rules 10 and 11.

(10) For priority toxic pollutants where the State has adopted human health criteria and received EPA approval, but such criteria do not fully satisfy section 303(c)(2)(B) requirements, the proposed rule includes human health criteria for such pollutants. For example, consider a case where a State has a water supply segment that poses an exposure risk to human health from both water and fish consumption. If the State has adopted, and received approval for, human health criteria based on water consumption only (e.g., Safe Drinking Water Act Maximum Contaminant Levels (MCLs)) which are less stringent than the "water+fish" criteria in Column D(I) of proposed § 131.36(b), the Column D(I) criteria are proposed for these water supply segments. The rationale for this is to ensure that both water and fish consumption exposure pathways are adequately addressed and human health is fully protected. If the State has adopted water consumption only criteria which are more stringent or equal to the Column D(I) criteria, the "water+fish" criteria in Column D(I) criteria are not proposed.

(11) For priority toxic pollutants where the State has adopted aquatic life criteria and previous to the 1987 CWA Amendments received EPA approval, but such criteria do not fully satisfy section 303(c)(2)(B) requirements; the proposed rule includes aquatic life criteria for such pollutants. For example, if the State has adopted not-to-be-exceeded aquatic life criteria which are less stringent than the 4-day average chronic aquatic life criteria in § 131.36(b) (i.e., in Columns B(II) and C(II)), the acute and chronic aquatic life criteria in Section 131.36(b) are proposed for those pollutants.

The rationale for this is that the State-adopted criteria do not protect resident aquatic life from both acute and chronic effects, and that Federal criteria are necessary to fully protect aquatic life designated uses. If the State has adopted not-to-be-exceeded aquatic life criteria which are more stringent or equal to the chronic aquatic life criteria in § 131.36(b), the acute and chronic aquatic life criteria in § 131.36(b) are not proposed for those pollutants.

(12) Under certain conditions discussed in rules 9, 10, and 11, criteria listed in § 131.36(b) are not proposed for specific pollutants; however, EPA made such exceptions only for pollutants for which criteria have been adopted by the State and approved by EPA, where such criteria are currently effective under State law the appropriate EPA Region

concluded that the State's criteria fully satisfy section 303(c)(2)(B) requirements.

*3. Approach for States That Fully Comply Subsequent to Issuance of Today's Proposed Rulemaking*

As discussed in prior sections of this preamble, the water quality standards program has been established with an emphasis on State primacy. Although this proposed rule has been developed to Federally promulgate toxics criteria for States, EPA prefers that States maintain primacy, revise their own standards, and achieve full compliance. EPA is hopeful that today's proposed rulemaking will provide additional impetus for non-complying States to adopt the criteria for priority toxic pollutants necessary to comply with section 303(c)(2)(B).

For States that achieve full compliance before publication of the final rulemaking, EPA will not include such States in the final rulemaking. At any point in the process prior to final promulgation, a State can ensure that it will not be affected by this action by adopting the necessary criteria pursuant to State law and receiving EPA approval. The content of the adopted standards must be within the boundaries of the several acceptable approaches described earlier in this preamble.

Following a final promulgation of this rule, removal of a State from the rule will require rulemaking by EPA according to the requirements of the Administrative Procedure Act (5 U.S.C. 551 *et seq.*). EPA will withdraw the Federal rule without a notice and comment rulemaking when the State adopts standards no less stringent than the Federal rule (i.e., standards which provide, at least, equivalent environmental protection). For example, see 51 FR 11580, April 4, 1986, which finalized EPA's removal of a Federal rule for the State of Mississippi.

However, if a State adopts standards for toxics which are less stringent than the Federal rule but, in the Agency's judgment, fully meet the requirements of the Act, EPA will propose to withdraw the rule with a notice of proposed rulemaking and provide for public participation. This procedure would be required for partial or complete removal of a State from this rulemaking. A State covered by the final rule could adopt the necessary criteria using any of the three options or combinations of those Options described in EPA's 1989 guidance.

EPA cautions States and the public that promulgation of a Federal rule removes most of the flexibility available to States for modifying their standards on a discharger-specific or stream-specific basis. For example, variances, site-specific criteria and schedules of compliance actions pursuant to State law for federally promulgated criteria are precluded. Each of these types of modifications would require Federal rulemaking on a case-by-case basis to change the Federal rule for that State.

F. Derivation of Proposed Criteria

*1. Sections 304(a) Criteria Process*

Under the authority of CWA section 304(a) EPA has developed methodologies and specific criteria to protect aquatic life and human health. These methodologies are intended to provide protection for all surface water on a national basis. As described below, there are site specific procedures for more precisely addressing site specific conditions for an individual water body. However, these site-specific criteria procedures are infrequently used because the section 304(a) criteria recommendations have proven themselves to be appropriate for the vast majority of water bodies. The methodologies have been subject to public review, as have the individual criteria documents. Additionally, the methodologies have been reviewed and approved by EPA's Science Advisory Board.

EPA incorporates by reference into the record of this proposed rulemaking the aquatic life methodology as described in "Appendix B—Guidelines for Deriving Water Quality Criteria for the Protection of Aquatic Life and Its Uses" (45 FR 79341, November 28, 1980) as amended by "Summary of Revisions to Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses" (50 FR 30792, July 29, 1985). EPA also incorporates by reference into the record of this proposed rulemaking the human health methodology as described in "Appendix C—Guidelines and Methodology Used in the Preparation of Health Effects Assessment Chapters of the Consent Decree Water Criteria Documents" (45 FR 79347, November 28, 1980). EPA also recommends that the following be reviewed for information: "Appendix D—Response to Comments on Guidelines for Deriving Water Quality Criteria for the Protection of Aquatic Life and Its Uses," (45 FR 79357, November 28, 1980); "Appendix E—Responses to Public Comments on the Human Health Effects Methodology for Deriving Ambient Water Quality Criteria" (45 FR 79368, November 28, 1980); and "Appendix B—Response to Comments on Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses" (50 FR 30793, July 29, 1985). EPA also is placing into the record the most current individual criteria documents for the priority toxic pollutants included in today's proposal.

The primary focus of this rule is the inclusion of the water quality criteria for pollutant(s) in State standards as necessary to support water quality-based control programs. The Agency is accepting comment on the criteria proposed in today's rule. However, Congress has established a very ambitious schedule for the promulgation of the final criteria. The statutory deadline in section 303(c)(4) clearly indicates that Congress intended the Agency to move very expeditiously when Federal action is warranted. The Agency believes that the limited time available for promulgation of the regulation can be used most efficiently and effectively by addressing those issues that have not already come before the Agency.

The methodology used to develop the criteria and the criteria themselves (to the extent not updated through IRIS) have previously undergone scientific peer review and public review and comment, and have been revised as appropriate. For the most part, this review occurred before Congress amended the Act in 1987, to require the inclusion of numeric criteria for certain toxic pollutants in State standards. Congress acted with full knowledge of the EPA process for developing criteria and the Agency's recommendations under section 304(a). EPA believes it is consistent with Congressional intent to rely in large part on existing criteria rather than engage in a time-consuming reevaluation of the underlying basis for water quality criteria. Accordingly, the Agency does not intend in this rulemaking to address the issues that have already been addressed by the Agency in response to previous comments. It is the Agency's belief that this approach will best achieve the purpose of moving forward in promulgating criteria for States not in compliance with section 303(c)(2)(B) so that environmental controls intended by Congress can be put into place to protect public health and welfare and enhance water quality.

It should be noted that the Agency is initiating a review of the basic guidelines for developing criteria and that comments received in this rulemaking may be of value in that effort as well. Future revisions to the criteria guidelines will be reviewed by

the Agency's Science Advisory Board and submitted to the public for review and comment following the same process that was used in issuing the existing methodological guidelines. Subsequent revisions of criteria documents and the issuance of any new criteria documents will also be subject to public review.

*2. Aquatic Life Criteria*

Aquatic life criteria may be expressed in numeric or narrative forms. EPA's guidelines describe an objective, internally consistent and appropriate way of deriving chemical-specific, numeric water quality criteria for the protection of the presence of, as well as the uses of, both fresh and marine water aquatic organisms.

An aquatic life criterion derived using EPA's section 304(a) method represents an estimate of the highest concentration of a pollutant in water that does not present a significant risk to aquatic organisms *per se* or to their use. EPA's guidelines are designed to derive criteria that protect aquatic communities by protecting most of the species and their uses most of the time, but not necessarily all of the species all of the time. Aquatic communities can tolerate some stress and occasional adverse effects on a few species so that total protection of all species all of the time is not necessary. EPA's guidelines attempt to provide a reasonable and adequate amount of protection with only a small possibility of substantial overprotection or underprotection. As discussed in detail below, there are several individual factors which may make the criteria somewhat overprotective or underprotective. Clearly, addressing them all is probably infeasible and, in any case, would make the criteria derivation process unduly resource intensive and time consuming. The approach EPA is using is believed to be as well balanced as possible, given the state of the science.

Numerical aquatic life criteria derived using EPA's most recent guidelines are expressed as short-term and long-term numbers, rather than one number, in order that the criteria more accurately reflect toxicological and practical realities. The combination of a criteria maximum concentration (CMC), a one-hour average acute limit, and a criteria continuous concentration (CCC), a four-day average concentration chronic limit, provide protection of aquatic life and its uses from acute and chronic toxicity to animals and plants, and from bioconcentration by aquatic organisms, without being as restrictive as a one-number criterion would have to be.

The two number criteria are intended to identify average pollutant concentrations which will produce water quality generally suited to maintenance of aquatic life and their uses while restricting the duration of excursions over the average so that total exposures will not cause unacceptable adverse effects. Merely specifying an average value over a time period is insufficient unless the time period is short, because excursions higher than the average can kill or cause substantial damage in short periods.

EPA's guidelines were developed on the assumption that the results of laboratory tests are generally useful for predicting what will happen in field situations. Certain ambient waters may have some capacity to bind pollutants and make them less bioavailable. The site-specific criteria process provides a means of addressing this effect (i.e., by allowing development and use of a "water effect ratio" that quantifies the difference in toxicity of a pollutant in site water versus the toxicity of the pollutant in the laboratory water used to develop the section 304(a) criteria recommendation). However, in the absence of such an approach, the criteria may be somewhat overprotective in some situations.

A minimum data set of eight specified families is required for criteria development (details are given in the methodology cited above). The eight specific families are intended to be representative of a wide spectrum of aquatic life. For this reason it is not necessary that the specific organisms tested be actually present in the water body. States may develop site-specific criteria using native species, provided that the broad spectrum represented by the eight families is maintained. All aquatic organisms and their common uses are meant to be considered, but not necessarily protected, if relevant data are available.

EPA's application of guidelines to develop the criteria matrix in the proposed rule is judged by the Agency to be applicable to all waters of the United States, and to all ecosystems. There are waters and ecosystems where site-specific criteria could be developed, as discussed below, but it is up to States to identify those waters and develop the appropriate site-specific criteria.

Fresh water and salt water (including both estuarine and marine waters) have different chemical compositions, and freshwater and saltwater species rarely inhabit the same water simultaneously. To provide additional accuracy, criteria developed recently are developed for fresh water and for salt water.

Assumptions which may make the criteria underprotective include the use of criteria on an individual basis, with no consideration of additive or synergistic effects, and the general lack of consideration of impacts on wildlife, due principally to a lack of data.

*3. Criteria for Human Health*

As with aquatic life, EPA's guidelines for human health criteria attempt to provide a reasonable and adequate amount of protection with only a small possibility of substantial overprotection or underprotection. EPA's section 304(a) criteria for human health are based on two types of biological endpoints:

(1) Carcinogenicity and (2) systemic toxicity (i.e., all other adverse effects other than cancer). Thus, there are two procedures for assessing these health effects: One for carcinogens and one for non-carcinogens.

EPA's guidelines assume that carcinogenicity is a "non-threshold phenomenon," that is, there are no "safe" or "no-effect levels" because even extremely small doses are assumed to cause a finite increase in the incidence of the response (i.e., cancer). Therefore, EPA's water quality criteria for carcinogens are presented as pollutant concentrations corresponding to increases in the risk of developing cancer.

For pollutants that do not manifest any apparent carcinogenic effects in animal studies (i.e., systemic toxicants), EPA assumes that the pollutant has a threshold below which no effects will be observed. This assumption is based on the premise that a physiological mechanism exists within living organisms to avoid or overcome the adverse effects of the pollutant below the threshold concentration.

The human health risks of a substance cannot be determined with any degree of confidence unless dose-response relationships are quantified. Therefore, a dose-response assessment is required before a criterion can be calculated. The dose-response assessment determines the quantitative relationships between the amount of exposure to a substance and the onset of toxic injury or disease. Data for determining dose-response relationships are typically derived from animal studies, or less frequently, from epidemiological studies in exposed populations.

The dose-response information needed for carcinogens is an estimate of the carcinogenic potency of the compound. Carcinogenic potency is defined here as a general term for a chemical's human cancer-causing potential. This term is often used loosely

to refer to the more specific carcinogenic or cancer slope factor which is defined as an estimate of carcinogenic potency derived from animal studies or epidemiological data of human exposure. It is based on extrapolation from test exposures of high dose levels over relatively short periods of time to more realistic low dose levels over a lifetime exposure period by use of linear extrapolation models. The cancer slope factor, q1*, is EPA's estimate of carcinogenic potency and is intended to be a conservative upper bound estimate (e.g. 95% upper bound confidence limit).

For non-carcinogens, EPA uses the reference dose (RfD) as the dose response parameter in calculating the criteria. The RfD was formerly referred to as an "Acceptable Daily Intake" or ADI. The RfD is useful as a reference point for gauging the potential effects of other doses. Doses that are less than the RfD are not likely to be associated with any health risks, and are therefore less likely to be of regulatory concern. As the frequency of exposures exceeding the RfD increases and as the size of the excess increases, the probability increases that adverse effects may be observed in a human population. Nonetheless, a clear conclusion cannot be categorically drawn that all doses below the RfD are "acceptable" and that all doses in excess of the RfD are "unacceptable." In extrapolating non-carcinogen animal test data to humans to derive an RfD, EPA divides a no-observed-effect dose observed in animal studies by an "uncertainty factor" which is based on professional judgment of toxicologists and typically ranges from 10 to 10,000.

For section 304(a) criteria development, EPA typically considers only exposures to a pollutant that occur through the ingestion of waters and contaminated fish and shellfish. Thus the criteria are based on an assessment of risks related to the surface water exposure route only.

The assumed exposure pathways in calculating the criteria are the consumption of 2 liters per day at the criteria concentration and the consumption of 6.5 grams per day of fish/shellfish contaminated at a level equal to the criteria concentration but multiplied by a "bioconcentration factor." The use of fish consumption as an exposure factor requires the quantification of pollutant residues in the edible portions of the ingested species. Bioconcentration factors (BCFs) are used to relate pollutant residues in aquatic organisms to the pollutant concentration in ambient waters. BCFs are quantified by various procedures depending on the lipid solubility of the pollutant. For lipid soluble pollutants, the average BCF is calculated from the weighted average percent lipids in the edible portions of fish/shellfish, which is about 3%; or it is calculated from theoretical considerations using the octanol/water partition coefficient. For non-lipid soluble compounds, the BCF is determined empirically. The assumed water consumption is taken from the National Academy of Sciences publication "Drinking Water and Health" (1977). The 6.5 grams per day contaminated fish consumption value is equivalent to the average per-capita consumption rate of all (contaminated and non-contaminated) freshwater and estuarine fish for the U.S. population.

EPA also assumes in calculating water quality criteria that the exposed individual is an average adult with body weight of 70 kilograms. The issue of concern is dose per kilogram of body weight. EPA assumes 6.5 grams per day of contaminated fish consumption and 2 liters per day of contaminated drinking water consumption for a 70 kilogram person in calculating the criteria. Persons of smaller body weight are expected to ingest less contaminated fish and water, so the dose per kilogram of body weight is generally expected to be roughly comparable. There may be subpopulations within a State, such as subsistence fishermen, who as a result of greater exposure to a contaminant, are at greater risk than the hypothetical 70 kilogram person eating 6.5 grams per day of maximally contaminated fish and shellfish and drinking 2 liters per day of maximally contaminated drinking water. (EPA is in part addressing the potential that highly exposed subpopulations exist by selecting a relatively stringent cancer risk level ($10^{-6}$) for use in deriving State-wide criteria for carcinogens. Individuals that ingest ten times more of a pollutant than is assumed in derivation of the criteria will be protected to a $10^{-5}$ level, which EPA has historically considered to be adequately protective. There may, nevertheless, be circumstances where site-specific numeric criteria that are more stringent than the State-wide criteria are necessary to adequately protect highly exposed subpopulations. Although EPA intends in this initial promulgation to focus on promulgation of appropriate State-wide criteria that will reduce risks to all exposed individuals, including highly exposed subpopulations, site specific criteria may be developed subsequently by EPA or the States where warranted to provide necessary additional protection.)

For non-carcinogens RfDs are developed based on pollutant concentrations that cause threshold effects. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious effects during a lifetime.

Criteria are calculated for individual chemicals with no consideration of additive, synergistic or antagonistic effects in mixtures. If the conditions within a State differ from the assumptions EPA used, the States have the option to perform the analyses for their conditions.

EPA has a process to develop a scientific consensus on oral reference doses and carcinogenic slope factors. Reference doses and slope factors are validated by two Agency work groups (i.e., one work group for each) which are composed of senior Agency scientists from all of the program offices and the Office of Research and Development. These work groups develop a consensus of Agency opinion for Rfds and slope factors which are then used throughout the Agency for consistent regulation and guidance development. EPA maintains an electronic data base which contains the official Agency consensus for Rfd's and slope factors which is known as the Integrated Risk Information System (IRIS). It is available for use through EPA's electronic mail system, and also available through the Public Health Network of the Public Health Foundation, and on the National Institutes of Health National Library of Medicine's TOXNET system. For the criteria included in today's proposal, EPA used the criteria recommendation from the appropriate section 304(a) criteria document. (The availability of EPA's criteria documents has been announced in various Federal Register notices. These documents are also placed in the record for today's proposed rule.) However, if the Agency has changed in IRIS any parameters used in criteria derivation since issuance of the criteria guidance document, EPA recalculated the criteria recommendation with the latest information. (This information is included in the record.) Thus, there may be differences between the original recommendation, and those in today's proposal, but today's proposal presents the Agency's most current section 304(a) criteria recommendation. The recalculated human health numbers are denoted by an "a" in the criteria matrix in subsection 131.36(b) of today's proposed rule.

In order to base its regulatory decisions on the best available science, EPA continuously updates its assessment of the risk from exposure to contaminants. On September 11, 1991, EPA's Office of Research and Development (ORD) began reassessing the scientific models and exposure scenarios used to predict the risks of biological effects from exposure to low levels of dioxin. This reassessment has the potential to alter the risk assessment for dioxin and accordingly the Agency's regulatory decisions related to dioxin. At this time, EPA is unable to say with any certainty what the degree or directions of any changes in risk estimates might be. This rulemaking includes a proposed Agency action with regard to dioxin that may be affected by the reassessment. The Agency will be carefully monitoring ORD's efforts in order to ensure that appropriate actions are taken during the course of this rulemaking to reflect any necessary changes resulting from the reassessment. If a final Agency action on this rulemaking occurs prior to completion of ORD's work, the Agency will consider revisiting that decision.

*4. Section 304(a) Human Health Criteria Excluded*

Today's proposal does not contain certain of the Section 304(a) criteria for priority toxic pollutants because those criteria were not based on toxicity. The basis for these particular criteria are organoleptic effects (e.g., taste and odor) which would make water and edible aquatic life unpalatable but not toxic. Because the basis for this proposed rulemaking is to protect the public health and aquatic life from toxicity consistent with the language in section 303(c)(2)(B), EPA is proposing criteria only for those priority toxic pollutants whose criteria recommendations are based on toxicity. The Section 304(a) human health criteria based on organoleptic effects for copper, zinc, 2,4-dimethylphenol, and 3-methyl-4-chlorophenol are excluded for this reason.

*5. Cancer Risk Level Proposed*

EPA's Section 304(a) criteria guidance documents for priority toxic pollutants which are based on carcinogenicity present concentrations for upper bound risk levels of 1 excess cancer per 100,000 people ($10^{-5}$), per 1,000,000 people ($10^{-6}$) and per 10,000,000 people ($10^{-7}$). However, the criteria documents do not recommend a particular risk factor as EPA policy.

In the April, 1990, Federal Register notice of preliminary assessment of State compliance, EPA announced the intention to include in the proposed rulemaking an incremental cancer risk level of one in a million ($10^{-6}$) for all priority toxic pollutants regulated as carcinogens. That cancer risk level is reflected in this proposed rule. The reasons supporting this decision are discussed below. However, EPA's Office of Water's guidance to the States has consistently reflected the Agency's policy of accepting cancer risk policies from the States in the range of $10^{-6}$ to $10^{-4}$. EPA reviews individual State policies as part of its water quality standards oversight function and determines if States have appropriately consulted its citizens and applied good science in adopting water quality criteria.

First, EPA's human health criteria have been developed based on a number of exposure assumptions. Many of these assumptions are based on the exposure for an average individual. For example, EPA's criteria assumes exposure of a 70 kilogram (154 pound) adult who consumes 2 liters (2.1 quarts) of water per day and 6.5 grams of fish per day (less than 7 ounces per month). These assumptions are based on approximate national averages, but considerably understate the exposure that would occur for certain segments of the population that have high fish consumption or depend on fish consumption for subsistence. Similarly, it would overstate the exposure of those who consume less fish than the National average amount. Therefore, although EPA would accept a lower State adopted risk level, in the range of $10^{-4}$ to $10^{-6}$, EPA has chosen a $10^{-6}$ risk level to protect the average exposed individual at a conservative incremental lifetime cancer risk.

A second strong reason is that a $10^{-6}$ risk level is consistent with what most States have selected, or are expected to select, as their risk level. A recent EPA status report on State compliance with section 303(c)(2)(B) found that 38 of the 57 States and Territories will select $10^{-6}$ as their risk level (12 States have selected or are expected to select $10^{-5}$ and 9 of the remaining States are undecided). EPA's proposal is therefore consistent with the majority of the States, does not contradict those States choosing a $10^{-6}$ risk level and does not preclude States from eventually choosing a risk level below $10^{-6}$.

Third, by selecting a risk level of $10^{-6}$ for the average exposed individual, some assurance is provided against the possibility that current section 304(a) criteria are not sufficiently stringent. The various parameters used in deriving the Section 304(a) criteria (e.g. cancer potency slopes, reference doses, bioaccumulation factors, etc.) are based on the state of present science. With additional research and experience, EPA may find that one or more of these factors understates the actual public risk. In addition, in many cases, EPA's criteria are based upon a single health effect. As the science evolves and available information expands, there is the potential that EPA will determine that other endpoints or effects are more sensitive than those currently considered. This risk level also reflects a recognition that certain factors are not considered in the current criteria methodology.

A proposed $10^{-6}$ risk level does not preclude State alternatives. If a State decides that a different risk level is more appropriate, it may avoid Federal promulgation by completing its standards adoption process in compliance with section 303(c)(2)(B). As discussed earlier, this would be the case both in advance of or subsequent to final promulgation.

*6. Applying EPA's Nationally Derived Criteria to State Waters*

To assist States in modifying EPA's water quality criteria, the Agency has provided guidance on developing site specific criteria for aquatic life and human health (see Water Quality Standards Handbook and the Guidelines for Deriving Numerical National Water Quality Criteria). This guidance can be used by the appropriate regulatory authority to develop alternative criteria. Where such criteria are more stringent than the criteria finally developed pursuant to this proposed rulemaking, section 510 of the Clean Water Act (33 U.S.C. 1370) provides authority for their implementation and enforcement in lieu of today's proposed criteria.

EPA's experience with such site-specific criteria has verified that the national criteria are generally protective and appropriate for direct use by the States.

**G. Description of the Proposed Rule**

EPA's final rule would establish a new § 131.36 in 40 CFR part 131 entitled, "Toxics Criteria for Those States Not Fully Complying With Clean Water Act section 303(c)(2)(B)."

*1. Scope*

Subsection (a), entitled "Scope", clarifies that this section is not a general promulgation of the section 304(a) criteria for priority toxic pollutants but is restricted to specific pollutants in specific States.

*2. EPA Criteria for Priority Toxic Pollutants*

Subsection (b) presents a matrix of the applicable EPA criteria for priority toxic pollutants. Section 303(c)(2)(B) of the Act addresses only pollutants listed as "toxic" pursuant to section 307(a) of the Act. As discussed earlier in this preamble, the section 307(a) list of toxics contains 65 compounds and families of compounds, which potentially include thousands of specific compounds. The Agency uses the list of 126 "priority toxic pollutants" for administrative purposes (see 40 CFR part 423, appendix A). Reference in this proposed rule to priority toxic pollutants, toxic pollutants, or toxics refers to the 126 priority toxic pollutants.

However, EPA has not developed both aquatic life and human health section 304(a) criteria for all of the 126 priority toxic pollutants. The matrix in paragraph (b) contains human health criteria in Column D for 102 priority toxic pollutants which are divided into criteria (Column I) for water consumption (i.e., 2 liters per day) and aquatic life consumption (i.e., 6.5 grams per day of aquatic organisms), and Column II for aquatic life consumption only. The term aquatic life includes fish and shellfish such as shrimp, clams, oysters and mussels. The total number of priority toxic pollutants with criteria proposed today differs from the total number of priority toxic pollutants with section 304(a) criteria because EPA has developed and is proposing chromium criteria for two valence states. Thus, although chromium is a single priority toxic pollutant, there are two criteria for chromium. See numbers 5a and 5b in proposed § 131.36(b).

The matrix contains aquatic life criteria for 30 priority pollutants. These are divided into freshwater criteria (Column B) and saltwater criteria (Column C). These columns are further divided into acute and chronic criteria. The aquatic life criteria are considered by EPA to be protective when applied under the conditions described in the section 304(a) criteria documents and in the "Technical Support Document for Water Quality-based Toxics Control." For example, waterbody uses should be protected if the criteria are not exceeded, on average, once every three year period. It should be noted that the criteria maximum concentrations (the acute criteria) are one-hour average concentrations and that the criteria continuous concentrations (the chronic criteria) are four-day averages. It should also be noted that for certain of the metals, the actual criteria are equations which are included as footnotes to the matrix. The toxicity of these metals are water hardness dependent. The values shown in the table are based on a hardness expressed as calcium carbonate of 100 mg/L. Finally, the criterion for pentachlorophenol is pH dependent. The equation is the actual criterion and is included as a footnote. The value shown in the matrix is for a pH of 7.8 units.

Several of the freshwater aquatic life criteria are incorporated into the matrix in the format used in the 1980 criteria methodology. This distinction is noted in footnote (g) to the table. EPA has not updated these criteria for various reasons. Footnote (g) describes an approximate method to translate these 1980 criteria to the equivalent criteria by the 1985 methodology. EPA could make this translation in a final rule and solicits public comment on which approach is better.

The matrix also includes toxicity-based human health criteria for copper, 2-chloroethylvinyl ether, 1,2-trans-dichloroethylene, 2-chlorophenol, acenaphthene, butylbenzyl phthalate, and N-nitrosodi-n-propylamine. The criteria for these substances are shown in parentheses and are *not* being proposed today but are included for informational purposes and as notice for consideration in all future State triennial reviews. Although sufficient information on these compounds was previously unavailable to calculate a section 304(a) criterion based on carcinogenicity or systemic toxicity, Agency-approved information in IRIS now allow calculation of these criteria using the EPA criteria guidelines. EPA has assembled another matrix which provides all of the factors used to calculate the proposed human health criteria. This supplementary matrix is included in the record for this proposal.

*3. Applicability*

Section 131.36(d) establishes the applicability of the criteria proposed for each included State. It provides that the criteria promulgated for each State supersede and/or complement any State criteria for that toxic pollutant. EPA believes it has not proposed to supersede any State criteria for priority toxic pollutants unless the State-adopted criteria are disapproved or otherwise insufficient. The approach followed by the Agency in preparing proposed § 131.36(d) is described in section E.2. and further rationale is provided in section E.3 of this preamble. EPA invites comment on the accuracy of the Agency's decisions to include or exclude particular priority toxic pollutant criteria.

EPA's principal purpose today is to propose the toxics criteria necessary to comply with section 303(c)(2)(B). However, in order for such criteria to achieve their intended purpose the implementation scheme must be such that the final results protect the public health and welfare. In section F of this preamble a discussion focused on the factors in EPA's assessment of criteria for carcinogens. For example, fish consumption rates, bioaccumulation factors, and cancer potency slopes were discussed. When any one of these factors is changed, the others must also be evaluated so that, on balance, resulting criteria are adequately protective.

Once an appropriate criterion is selected for either aquatic life or human health protection, then appropriate conditions for calculating water quality-based effluent limits for that chemical must be established in order to maintain the intended stringency and achieve the necessary toxics control. EPA has included in this proposal appropriate implementation factors necessary to maintain the level of protection intended. These proposals are included in subsection (c).

For example, most States have low flow values for streams and rivers which establish flow rates below which numeric criteria may be exceeded. These low flow values became design flows for sizing treatment plants and developing water quality-based effluent limits. Historically, these so-called "design" flows were selected for the purposes of waste load allocation analyses which focused on instream dissolved oxygen concentrations and protection of aquatic life. With the publication of the 1985 Technical Support Document for Water Quality Based Toxics Control (TSD), EPA introduced hydrologically and biologically based analyses for the protection of aquatic life and human health.[1] EPA recommended either of two methods for calculating acceptable low flows, the traditional hydrologic method developed by the U.S. Geological Survey and a biological based method developed by EPA. The

[1] These concepts have been expanded subsequently in guidance entitled "Technical Guidance Manual for Performing Wasteload Allocations, Book 6, Design Conditions," USEPA, Office of Water Regulations and Standards, Washington, DC (1985). These new developments are included in appendix D of the revised TSD. The discussion here is greatly simplified and is provided to support EPA's decision to propose baseline application values for instream flows and thereby maintain the intended stringency of the criteria for priority toxic pollutants.

results of either of these two methods may be used.

Some States have adopted specific low flow requirements for streams and rivers to protect designated uses against the effects of toxics. Generally these have followed the guidance in the TSD. However, EPA believes it is essential to include proposed design flows in today's proposed rule so that, where States have not yet adopted such design flows, the criteria proposed today would be implemented appropriately. Clearly, if the proposed criteria were implemented using inadequate design flows, the resulting toxics controls would not be fully effective, because the resulting ambient concentrations would exceed EPA's recommended levels.

In the case of aquatic life, more frequent violations than the once in 3 years assumed exceedences would result in diminished vitality of stream ecosystems characteristics by the loss of desired species such as sport fish. The low flow values proposed are:

| | |
|---|---|
| Aquatic Life: | |
| Acute criteria (CMC). | 1 Q 10 or 1 B 3. |
| Chronic criteria (CCC). | 7 Q 10 or 4 B 3 |
| Human Health: | |
| Non-carcinogens | 30 Q 5. |
| Carcinogens | harmonic mean flow. |

Where:

1 Q 10 is the lowest one day flow with an average recurrence frequency of once in 10 years determined hydrologically;

1 B 3 is biologically based and indicates an allowable exceedence of once every 3 years. It is determined by EPA's computerized method (DFLOW model);

7 Q 10 is the lowest average 7 consecutive day low flow with an average recurrence frequency of once in 10 years determined hydrologically;

4 B 3 is biologically based and indicates an allowable exceedence for 4 consecutive days once every 3 years. It is determined by EPA's computerized method (DFLOW model);

30 Q 5 is the lowest average 30 consecutive day low flow with an average recurrence frequency of once in 5 years determined hydrologically; and

The harmonic mean flow is a long term mean flow value calculated by dividing the number of daily flows analyzed by the sum of the reciprocals of those daily flows.

EPA is proposing the harmonic mean flow to be applied with human health criteria. The concept of a harmonic mean is a standard statistical data analysis technique. EPA's model for human health effects assumes that such effects occur because of a long-term exposure to low concentration of a toxic pollutant. For example, two liters of water per day for seventy years. To estimate the concentrations of the toxic pollutant in those two liters per day by withdrawal from streams with a high daily variation in flow, EPA believes the harmonic mean flow is the correct statistic to use in computing such design flows rather than other averaging techniques.[2]

All waters, whether or not suitable for such hydrologic calculations but included in this proposed rule (including lakes, estuaries, and marine waters), must contain the criteria proposed today. Such attainment must occur at the end of the discharge pipe, unless the State has an EPA approved mixing zone regulation. If the State has an EPA approved mixing zone regulation, then the criteria would apply at the locations stated in that regulation. For example, the chronic criteria (CCC) must apply at the geographically defined boundary of the mixing zone. Discussion and guidance of these factors are included in the revised TSD in chapter 4.

EPA is aware that the criteria proposed today for some of the priority toxic pollutants are at concentrations less than EPA's current analytical detection limits. Detection limits have never been an acceptable basis for setting standards since they are not related to actual environmental impacts. The environmental impact of a pollutant is based on a scientific determination, not an arbitrary measuring technique which is subject to change. Setting the criteria at levels that reflect adequate protection tends to be a forcing mechanism to improve analytical detection methods. As the methods improve, limits closer to the actual criteria necessary to protect aquatic life and human health are measurable. The Agency does not believe it is appropriate to promulgate insufficiently protective criteria (e.g., criteria equal to the current analytical detection limits).

EPA does believe, however, that the use of analytical detection limits are appropriate for determining compliance with NPDES permit limits. This historical view of the role of detection limits was recently articulated in guidance for translating dioxin criteria into NPDES permit limits which is the principal method used for water quality standards enforcement.[3] This guidance presents a model for addressing toxic pollutants which have criteria recommendations less than current detection limits. This guidance is equally applicable to other priority toxic pollutants with criteria recommendations less than current detection limits. The guidance explains that detection limits may be used for purposes of determining compliance with permit limits, but not for purposes of establishing water quality criteria or permit limits. Because under the Clean Water Act analytical detection limits are appropriately used only in connection with NPDES permit limit compliance determinations. EPA has not considered analytical detection limits in deriving the criteria proposed today.

EPA has added provisions in paragraph (c)(3) to determine when fresh water or saltwater aquatic life criteria apply. The structure of the paragraph is to establish presumptively applicable rules and to allow for site-specific determinations where the rules are not consistent with actual field conditions. Because a distinct separation generally does not exist between fresh water and marine water aquatic communities, EPA is proposing the following: (1) The fresh water criteria apply at salinities of 1 part per thousand and below; (2) marine water criteria apply at 10 parts per thousand and above; and (3) at salinities between 1 and 10 parts per thousand the more stringent of the two apply unless EPA approves another site specific criterion for the pollutant. This proposed assignment of criteria for fresh, brackish and marine waters was developed in consultation with EPA's research laboratories at Duluth, Minnesota and Narragansett, Rhode Island. The Agency believes such an approach is consistent with field experience.

In paragraph (c)(4)(i) EPA has included a limitation on the amount of hardness that EPA can allow to antagonize the toxicity of certain metals (see footnote (e) in the criteria matrix in paragraph (b) of the rule). The data base used for the Section 304(a) criteria documents for metals do not include data supporting the extrapolation of the hardness effects on metal toxicity beyond a range of hardness of 25 mg/l to 400 mg/l (expressed as calcium carbonate). Thus, the aquatic life values for the CNC (acute) and CCC (chronic) criteria for these metals in waters with a hardness less than 25 mg/l, must nevertheless use 25 mg/l when calculating the criteria; and in waters with a hardness greater than 400 mg/l, must nevertheless use 400 mg/l when calculating the criteria.

[2] For a description of harmonic means see "Design Stream Flows Based on Harmonic Means," Lewis A. Rossman, J. of Hydraulics Engineering, Vol. 116, No. 7, July, 1990. This article is contained in the record for this proposal.

[3] Strategy for the Regulation of Discharges of PHDDs and PHDFs from Pulp and Paper Mills to Waters of the United States," memorandum from the Assistant Administrator for Water to the Regional Water Management Division Directors and NPDES State Directors, May 21, 1990.

Subsection (d) lists the States for which rules are being proposed. For each identified State, the water uses impacted (and in some cases the waters covered) and the criteria proposed are identified.

H. Specific Issues for Public Comment

As is the Agency's custom, EPA would like to request that particular public review be directed to the issues and alternatives presented in this section. Although the issues presented below are particularly notable and worthy of comment, EPA encourages public comment on any aspect of this proposed rule.

1. In section D of this preamble, EPA has presented a discussion of how EPA determines State compliance with section 303(c)(2)(9). The process described has been the Agency's general practice since the beginning of the water quality standards program, although the requirements specific to toxics criteria have evolved over the years. Briefly stated, EPA's ten Regional offices review the State-adopted standards to ascertain compliance with the Clean Water Act using the information developed by the State and other relevant and available data and information.

For compliance with section 303(c)(2)(B), EPA's focus in many cases was on the process the State used to assemble the criteria for those priority toxic pollutants which could reasonably be expected to interfere with the State's designated uses. For example, EPA's review of individual State water quality standards had to balance a need for national consistency with the need to implement the CWA scheme that provides for State primacy and State-specific approaches. If EPA had information on a toxic pollutant sufficient to satisfy the test that the pollutant can reasonably be expected to interfere with designated uses, and the State did not adopt sufficient, scientifically defensible criteria for that pollutant, EPA disapproved the State action as being inconsistent with Section 303(c)(2)(B). Alternative approaches could have had either a narrower focus on fewer priority toxic pollutants (for example, relying only on the results of the section 304(l) short list process) or might have been broader, (for example, requiring most States to adopt criteria for the complete list of priority toxic pollutants addressed in EPA section 304(a) criteria recommendations). EPA solicits comment on whether the Agency's traditional review process should have been changed.

2. EPA's approach and rationale for deciding which criteria to propose for a State is discussed in section E of this Preamble. Briefly stated, EPA either: (1) Proposed to promulgate Federal criteria for all priority toxic pollutants not acceptably addressed by approved State criteria (this approach is used for most States), or (2) proposed to promulgate Federal criteria only for specific priority pollutants for which State criteria are lacking or insufficient (this approach is used for only a few States). EPA could have used other approaches and solicits public comment. For example, EPA could have relied totally on the State's own determination pursuant to section 304(l) and 305(b), or entirely on an Option 1 approach of promulgating all Federal criteria for all State waters.

3. This proposed rulemaking includes proposed minimum implementation factors for the criteria, such as flow conditions. As proposed, these factors are dependent on existing State rules but subject to base values which are those used in developing the criteria. EPA's revised TSD explains more fully the details of these base values. EPA could rely entirely on existing State rules or establish the proposed Federal rules.

4. The conditions under which States will be removed from the rule, either before or after final promulgation, are described in section E.4 of this preamble. EPA could make the conditions for removing the applicability of the rule to a State more or less stringent. A difficult aspect of this issue is a definition of what the State must adopt for EPA to withdraw the applicability of its rule entirely. As currently stated, EPA's policy is that if the State's standards are judged to meet the requirements of the Act and thereby provide adequate environmental protection, EPA will withdraw the applicability of the Federal Rule as to that State. In the context of this proposal, the State would have to demonstrate that the criteria it adopted meet the statutory test of protecting the public health and would protect designated uses. State compliance could be by any one or a combination of the 3 options described in EPA's guidance. Once such a showing were made EPA would propose to withdraw the applicability of its rule entirely. However, if a State fails to make such a demonstration for all pollutants, partial withdrawals for certain pollutants could occur, leaving applicable parts of the Federal rule.

5. EPA must also decide whether it should pick a uniform cancer risk level of, for example, $10^{-6}$, for all States included in a final rule, or whether different risk levels for different States are appropriate. EPA today proposes the human health criteria at a cancer risk level of $10^{-6}$ because such a risk level is conservative for the general population and in the generally applied risk range. However, as noted in section F.5., EPA has approved human health risk levels of $10^{-5}$ in 10 States, and for some criteria and uses risk levels of $10^{-4}$. EPA's review of the explanations provided by the States supporting State-adopted risk levels of less than $10^{-5}$ focuses on public participation and the supportability of the risk factors included in the State's analysis.

While today's proposed action is predicated on a $10^{-6}$ risk level for carcinogens, another option that the public should consider in responding to this rule is the application of the proposed criteria at a $10^{-5}$ risk level. EPA's rationale for proposing at a $10^{-6}$ risk level was articulated earlier in the preamble. However, there are several arguments to support a less protective $10^{-5}$ level. The model used to calculate the criteria for carcinogens is a conservative one and has a very low probability of underestimating the potency of a carcinogen. As a result, a higher level of accepted risk as the endpoint for criteria calculations may be reasonable. For "Class C" carcinogens, i.e., those for which the data demonstrating oncogenicity in animal studies are most limited, a $10^{-5}$ risk level is closer to the criteria values calculated as Rfds (non-cancer endpoints of toxicity) for these chemicals. Use of RfDs reduces the likelihood that EPA is over-regulating chemicals of less definitive cancer potency. A $10^{-5}$ risk is within the range of accepted risks for other major EPA rulemakings which aim to protect the general public, such as national drinking water standards.

Similarly, EPA must decide what a State must adopt in the way of a risk level for EPA to withdraw a final rule. The question to be addressed is whether EPA can accept less stringent risk levels (applied statewide; by individual chemicals, or by geographical sub-area) than contained in EPA's final rule if such less stringent risk levels were adopted following State administrative procedures and adequately supported by the administrative record.

6. Today's proposed rulemaking includes an Agency proposal to establish criteria for only those EPA priority toxic pollutant criteria which are based on toxic effects. The Agency could include other section 304(a) priority toxic pollutant criteria

recommendations which are based on organoleptic (i.e., taste and odor) effects. The logic would be that the congressional reference to "toxic pollutants" in section 303(c)(2)(B) was the generic list of 126 priority toxic pollutants and EPA should include all such criteria developed for these pollutants rather than just those based on toxicity. Organoleptic effects cause taste and odor problems in drinking water which may increase treatment costs or the selection by the public of alternative but less protective sources of drinking water and may cause tainting or off flavors in fish flesh and other edible aquatic life reducing their marketability, thus diminishing the recreational and resource value of the water. EPA believes that because the Section 303(c)(2)(B) focuses on toxicity of the priority toxic pollutants, EPA's proposal should likewise focus on toxicity.

7. EPA also invites public comment on the merits of promulgating a translator procedure (that could support derivation of new or revised chemical-specific criteria for those priority toxic pollutants for which EPA has not issued section 304(a) criteria guidance) for States in this rule to enhance State and EPA implementation of section 303 (c)(2)(B). Such a procedure would supplement the specific numeric criteria included in this proposal. The rationale for, and specifics of, such an approach are described below.

As discussed in previous sections of this preamble, CWA section 303(c)(2)(B) represents a clear congressional mandate for State adoption of chemical-specific numeric criteria for priority toxic pollutants where EPA has issued section 304(a) criteria guidance. However, where no such criteria exist, section 303(c)(2)(B) went on to direct States that, " * * * Where such numerical criteria are not available, whenever a State reviews water quality standards * * * or revises or adopts new standards * * *, such State shall adopt criteria based on biological monitoring or assessment methods * * *."

EPA's December 1988 national guidance provided States with three options for satisfying the chemical-specific criteria requirements. Option 3 of the guidance allows States to adopt and apply translator procedures. As described in section B-3 of this preamble, such translator procedures are defined as the methods, equations, and protocols by which a State calculates derived chemical-specific numeric criteria for priority toxic pollutants to ensure that the State's narrative toxics criterion is fully satisfied.

There are several alternative approaches for establishing a translator procedure. All approaches would utilize EPA's criteria guidelines (i.e., for aquatic life and human health as described in section F.1. of this preamble) as the basis for deriving chemical-specific criteria. They could also require EPA to periodically issue an updated list of derived numeric criteria and notice the availability of the list in the Federal Register.

One alternative would be to promulgate a mechanism for State usage only for the pollutants where EPA has not issued a section 304 (a) criteria guidance document.

Another alternative would be to allow criteria revisions in specific situations where EPA determines that a revised criterion is necessary. For example, if EPA issued a final revised estimate of the cancer potency slope of a priority toxic pollutant (i.e., by adding it to IRIS), such cancer slopes would be available for use in deriving new human health criteria for that pollutant following the translator procedure. Another example would be situations where additional data on the toxicity of a pollutant to aquatic life becomes available such that the minimum database requirements in the EPA criteria guidelines are satisfied. In such situations, the data could be applied to the translator procedure to derive new or revised aquatic life criteria more rapidly than the current method of proposing for comment and then publishing a final section 304(a) recommendation for subsequent consideration by States. This alternative would apply to criteria for both aquatic life and human health protection and could apply to pollutants for which a section 304(a) criteria recommendation exists or to those pollutants where no such recommendation exists.

A third approach would limit the applicability of the translator procedure to the priority toxic pollutants for which numeric criteria are contained in today's proposed rulemaking. Under this alternative, criteria could not be derived for pollutants without a section 304(a) criteria recommendation using the translator procedure, even where: (1) Formal Agency estimates of the parameters necessary to support derivation are issued, or (2) the data necessary to satisfy the minimum database requirements become available.

A final alternative providing only limited flexibility would be to limit use of the translator procedure to human health criteria where the Agency issues a final revised risk assessment for the parameter in IRIS. Such IRIS estimates are subject to extensive intra-Agency review. This alternative would limit revisions to situations where EPA makes a formal determination that a revised human health risk assessment is appropriate.

The Agency invites public comment on the environmental, programmatic and legal aspects of including a promulgation of a criteria translator mechanism for each State in the final issuance of this rulemaking. Comment is also invited on the scope and details of such an approach as described above.

8. EPA solicits comment on the section 304(a) assessment methodology (cancer and non-cancer) used to derive human health criteria for section 307(a) priority toxic pollutants. This methodology is discussed in section F of the Preamble but is derived in the criteria methodology published in the Federal Register on November 26, 1980 (45 FR 79347). For example, EPA has included proposed criteria for 3 PAHs (acenaphthylene, benzo(ghi)perylene and phenanthrene). The included criteria treat these PAHs as carcinogens and are based on data for benzo(a)pyrene. The section 304(a) criteria methodology does not distinguish between classes of carcinogens and allows the use of closely related chemicals of similar structure to carry the same criteria recommendation. This methodology is basic to the development of the human health criteria proposed today.

## I. Executive Order 12291

Executive Order 12291 requires EPA and other agencies to perform regulatory impact analyses for major regulations. Major regulations are those that impose an annual cost to the economy of $100 million or more, or meet other criteria. This is a major regulation, however, a regulatory impact analyses has been waived by the Office of Management and Budget for this proposal for the reasons discussed below.

This rulemaking establishes a legal minimum standard where States have failed to comply with the statutory mandate to adopt numeric criteria for toxic pollutants. The impacts to dischargers are no different than what would occur if States had acted to adopt their own standards. There will be a cost to dischargers for complying with these proposed new standards as the standards are translated into specific NPDES permit limits for individual dischargers. However, for reasons discussed in more detail below, a meaningful cost estimate is difficult to

develop. The increased costs incurred will depend upon the type and amount of pollutants discharged and the extent to which additional treatment needs to be installed beyond that which is required to meet the generally applicable technology-based limit regulations. As discussed earlier in the Preamble, the control of toxic pollutants is expected to provide societal benefits by reducing risk to human health and to reduce ecological impacts on aquatic life.

The general impacts on point source dischargers, publicly owned treatment works (POTWs) and nonpoint sources may be described. By establishing new goals for a waterbody, the addition of criteria for toxic pollutants into State water quality standards will affect the wasteload allocations developed for each waterbody segment to the extent the pollutant is actually discharged into the stream. If the pollutant is not present in the wastestream, the addition of criteria has no impact. Revised wasteload allocations may result in adjustments to individual NPDES permit limits for point source dischargers which could result in increased incremental treatment costs required to meet the revised water quality standards. These costs will vary depending on the types of treatment involved, the number and kind of pollutant(s) being treated, and the controls necessary to meet the technologically based effluent limits for a given industry.

Compliance costs for indirect industrial dischargers will be reflected in increased incremental costs for POTWs assuming that industrial sources are the primary source of toxics discharged by POTWs and that the incremental treatment costs incurred by POTWs will be passed along to their industrial dischargers. Possible areas where the addition of criteria for toxic pollutants into State standards may have a cost impact include: (1) POTW expansion, (2) operational changes, and (3) increased operator training costs.

Increased costs may also be incurred by nonpoint sources of toxic pollutants to the extent that best management practices need to be modified to reflect the revised standards. Although there is no comparable Federal permit program for nonpoint sources as there is to control point source discharges, there are existing State regulatory programs to control nonpoint sources.

Monitoring programs to generate information on the existing quality of water and the kinds and amount of pollutants being discharged are likely to be affected by this proposed rulemaking. However, the addition of criteria for toxic pollutants into State standards does not require the State to engage in a program to monitor for all such pollutants unless there is some reasonable expectation that the pollutants are manufactured or actually used in the State with the likelihood that they will be discharged into surface waters.

While recognizing that the application of criteria for toxic pollutants will result in increased treatment costs and that such costs are appropriately considered in several areas of the standards to permits process, it is important to consider the difficulties and the large potential uncertainties involved in developing meaningful cost estimates for purposes of this proposed rulemaking. The development of compliance cost estimates would require numerous assumptions about pollutant loadings, impacts of technology-based regulations on loadings, combinations of pollutants handled by a given treatment approach, the costs of each treatment train and the variables for each pollutant in each waterbody in each State. There are many sources of uncertainty in making these assumptions, and the resulting estimates could contain such significant estimation errors that the figures would have questionable value.

This proposed rule including the above determination, has been reviewed by the Office of Management and Budget. Any written comments from OMB to EPA and any EPA response to those comments are included in the public record and are available for inspection.

### J. Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, Pub. L. 96-354) requires EPA to assess whether its regulations create a disproportionate effect on small entities. According to the provisions of the Act, EPA must prepare an initial regulatory flexibility analysis for all proposed regulations that have a significant impact on a substantial number of small entities. There will be a cost to dischargers for complying with these standards as they are translated into permit limits for individual dischargers. However, for the reasons discussed in the previous section, a meaningful estimate of the total cost or impact on small entities cannot be meaningfully computed.

This proposed regulation fills a regulatory void left by States not fully complying with the statute; thus, the impact on small entities is not different than what would have occurred if States had acted to adopt standards. In addition, the water quality standards regulation provides several means (such as adjusting designated uses, setting site-specific criteria, or granting variances) to consider costs and adjust standards to account for the impacts on dischargers.

### K. Paperwork Reduction Act

The information collection requirements associated with this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* An Information Collection Request (ICR) document has been prepared by EPA (ICR No. 0988.04) and a copy may be obtained from Sandy Farmer, Information Policy Branch; EPA; 401 M St., SW. (PM-223Y); Washington, DC 20460 or by calling (202) 382-2740.

Public reporting burden for this collection of information is estimated to average 745 hours per respondent, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection information.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM-223Y, U.S. EPA, 401 M St., SW., Washington, DC 20460; and to the Office of Information and Regulatory Affairs; Office of Management and Budget, Washington, DC 20503, marked "Attention: Desk Officer for EPA." The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

### List of Subjects

Water quality standards, Toxic pollutants.

Dated: November 6, 1991.

William K. Reilly,

*Administrator.*

For the reasons set out in the preamble, part 131 of title 40 of the Code of Federal Regulations is proposed to be amended as follows:

## PART 131—WATER QUALITY STANDARDS

1. The authority citation for part 131 continues to read as follows:

Authority: Clean Water Act, Pub. L. 92-500, as amended; 33 U.S.C. 1251 *et seq.*

2. Section 131.36 is added to subpart D to read as follows:

**§ 131.36 Toxics criteria for those states not complying with Clean Water Act section 303(c)(2)(B)**

(a) *Scope.* This section is not a general promulgation of the section 304(a) criteria for priority toxic pollutants but is restricted to specific pollutants in specific States.

(b) *EPA's Section 304(a) Criteria for Priority Toxic Pollutants*

| A | | B | | C | | D | |
|---|---|---|---|---|---|---|---|
| | | Freshwater | | Saltwater | | Human health ($10^{-6}$ risk for carcinogens) | |
| (#) Compound | CAS No. | Criterion maximum concentration d (µg/L) B1 | Criterion continuous concentration d (µg/L) B2 | Criterion maximum concentration d (µg/L) C1 | Criterion continuous concentration d (µg/L) C2 | For consumption of: Water and organisms (µg/L) D1 | For consumption of: Organisms only (µg/L) D2 |
| 1 Antimony | 7440360 | | | | | 14 a | 4300 a |
| 2 Arsenic | 7440382 | 360 | 190 | 69 | 36 | 0.018 bc | 0.14 bc |
| 3 Beryllium | 7440417 | | | | | 0.0077 ac | 0.13 ac |
| 4 Cadmium | 7440439 | 3.9 e | 1.1 e | 43 | 9.3 | 16 | 170 aj |
| 5a Chromium (III) | 16065831 | 1700 e | 210 e | | | 33000 a | 670000 a |
| b Chromium (VI) | 18540299 | 16 | 11 | 1100 | 50 | 170 a | 3400 a |
| 6 Copper | 7440508 | 18 e | 12 e | 2.9 | 2.9 | (1300) b | |
| 7 Lead | 7439921 | 82 e | 3.2 e | 220 | 8.5 | 50 | |
| 8 Mercury | 7439976 | 2.4 | 0.012 i | 2.1 | 0.025 i | 0.14 | 0.15 |
| 9 Nickel | 7440020 | 1400 e | 160 e | 75 | 8.3 | 610 a | 4600 a |
| 10 Selenium | 7782492 | 20 | 5 | 300 | 71 | 100 b | 6800 bj |
| 11 Silver | 7440224 | 4.1 e | | 2.3 | | 105 a | 65000 aj |
| 12 Thallium | 7440280 | | | | | 1.7 a | 6.3 a |
| 13 Zinc | 7440666 | 120 e | 110 e | 95 | 86 | | |
| 14 Cyanide | 57125 | 22 | 5.2 | 1 | 1 | 700 a | 220000 aj |
| 15 Asbestos | 1332214 | | | | | 7,000,000 fibers/L k | |
| 16 2,3,7,8-TCDD (Dioxin) | 1746016 | | | | | 0.000000013 c | 0.000000014 c |
| 17 Acrolein | 107028 | | | | | 320 | 780 |
| 18 Acrylonitrile | 107131 | | | | | 0.059 ac | 0.66 ac |
| 19 Benzene | 71432 | | | | | 1.2 ac | 71 ac |
| 20 Bromoform | 75252 | | | | | 4.3 ac | 360 ac |
| 21 Carbon Tetrachloride | 56235 | | | | | 0.25 ac | 4.4 ac |
| 22 Chlorobenzene | 108907 | | | | | 680 a | 21000 aj |
| 23 Chlorodibromomethane | 124481 | | | | | 0.41 ac | 34 ac |
| 24 Chloroethane | 75003 | | | | | | |
| 25 2-Chloroethylvinyl Ether | 110758 | | | | | | |
| 26 Chloroform | 67663 | | | | | 5.7 ac | 470 ac |
| 27 Dichlorobromomethane | 75274 | | | | | 0.27 ac | 22 ac |
| 28 1,1-Dichloroethane | 75343 | | | | | | |
| 29 1,2-Dichloroethane | 107062 | | | | | 0.38 ac | 99 ac |
| 30 1,1-Dichloroethylene | 75354 | | | | | 0.057 ac | 3.2 ac |
| 31 1,2-Dichloropropane | 78875 | | | | | (0.52) kc | (39) kc |
| 32 1,3-Dichloropropylene | 542756 | | | | | 10 a | 1700 a |
| 33 Ethylbenzene | 100414 | | | | | 3100 a | 29000 a |
| 34 Methyl Bromide | 74839 | | | | | 48 a | 4000 a |
| 35 Methyl Chloride | 74873 | | | | | 5.7 ac | 470 ac |
| 36 Methylene Chloride | 75092 | | | | | 4.7 ac | 1600 ac |
| 37 1,1,2,2-Tetrachloroethane | 79345 | | | | | 0.17 ac | 11 ac |
| 38 Tetrachloroethylene | 127184 | | | | | 0.8 c | 8.85 c |
| 39 Toluene | 108883 | | | | | 6800 a | 200000 a |
| 40 1,2-Trans-Dichloroethylene | 156605 | | | | | (700) a | (140000) a |
| 41 1,1,1-Trichloroethane | 71556 | | | | | 3100 a | (170000) a |
| 42 1,1,2-Trichloroethane | 79005 | | | | | 0.60 ac | 42 ac |
| 43 Trichloroethylene | 79016 | | | | | 2.7 c | 81 c |
| 44 Vinyl Chloride | 75014 | | | | | 2 c | 525 c |
| 45 2-Chlorophenol | 95578 | | | | | (120) a | (400) a |
| 46 2,4-Dichlorophenol | 120832 | | | | | 93 a | 790 aj |
| 47 2,4-Dimethylphenol | 105679 | | | | | (540) a | (2300) a |
| 48 2-Methyl-4,6-Dinitrophenol | 534521 | | | | | 13.4 | 765 |
| 49 2,4-Dinitrophenol | 51285 | | | | | 70 a | 14000 a |
| 50 2-Nitrophenol | 88755 | | | | | | |
| 51 4-Nitrophenol | 100027 | | | | | | |
| 52 3-Methyl-4-Chlorophenol | 59507 | | | | | | |
| 53 Pentachlorophenol | 87865 | 20 f | 13 f | 13 | 7.9 | 0.28 ac | 8.2 acj |
| 54 Phenol | 108952 | | | | | 21000 a | 4600000 a |
| 55 2,4,6-Trichlorophenol | 88062 | | | | | 2.1 ac | 6.5 ac |
| 56 Acenaphthene | 83329 | | | | | (1200) a | (2700) a |
| 57 Acenaphthylene | 208968 | | | | | 0.0028 c | 0.031 c |
| 58 Anthracene | 120127 | | | | | 9600 a | 110000 a |
| 59 Benzidine | 92875 | | | | | 0.00012 ac | 0.00054 ac |
| 60 Benzo(a)Anthracene | 56553 | | | | | 0.0028 c | 0.031 c |
| 61 Benzo(a)Pyrene | 50328 | | | | | 0.0028 c | 0.031 c |
| 62 Benzo(b)Fluoranthene | 205992 | | | | | 0.0028 c | 0.031 c |

| A | | B | | C | | D | |
|---|---|---|---|---|---|---|---|
| | | Freshwater | | Saltwater | | Human health (10⁻⁶ risk for carcinogens) | |
| (#) Compound | CAS No. | Criterion maximum concentration d (µg/L) B1 | Criterion continuous concentration d (µg/L) B2 | Criterion maximum concentration d (µg/L) C1 | Criterion continuous concentration d (µg/L) C2 | For consumption of: Water and organisms (µg/L) D1 | For consumption of: Organisms only (µg/L) D2 |
| 63 Benzo(ghi)Perylene | 191242 | | | | | 0.0028 c | 0.031 c |
| 64 Benzo(k)Fluoranthene | 207089 | | | | | 0.0028 c | 0.031 c |
| 65 Bis(2-Chloroethoxy)Methane | 111911 | | | | | | |
| 66 Bis(2-Chloroethyl)Ether | 111444 | | | | | 0.031 ac | 1.4 ac |
| 67 Bis(2-Chloroisopropyl)Ether | 108601 | | | | | 1400 a | 170000 a |
| 68 Bis(2-Ethylhexyl)Phthalate | 117817 | | | | | 1.8 ac | 5.9 ac |
| 69 4-Bromophenyl Phenyl Ether | 101553 | | | | | | |
| 70 Butylbenzyl Phthalate | 85687 | | | | | (3000) a | (5200) a |
| 71 2-Chloronaphthalene | 91587 | | | | | (1700) a | (4300) a |
| 72 4-Chlorophenyl Phenyl Ether | 7005723 | | | | | | |
| 73 Chrysene | 218019 | | | | | 0.0028 c | 0.031 c |
| 74 Dibenzo(a,h)Anthracene | 53703 | | | | | 0.0028 c | 0.031 c |
| 75 1,2-Dichlorobenzene | 95501 | | | | | 2700 a | 17000 a |
| 76 1,3-Dichlorobenzene | 541731 | | | | | 400 | 2600 |
| 77 1,4-Dichlorobenzene | 106467 | | | | | 400 | 2600 |
| 78 3,3'-Dichlorobenzidine | 91941 | | | | | 0.04 ac | 0.077 ac |
| 79 Diethyl Phthalate | 84662 | | | | | 23000 a | 120000 a |
| 80 Dimethyl Phthalate | 131113 | | | | | 313000 | 2900000 |
| 81 Di-n-Butyl Phthalate | 84742 | | | | | 2700 a | 12000 a |
| 82 2,4-Dinitrotoluene | 121142 | | | | | 0.11 c | 9.1 c |
| 83 2,6-Dinitrotoluene | 606202 | | | | | | |
| 84 Di-n-Octyl Phthalate | 117840 | | | | | | |
| 85 1,2-Diphenylhydrazine | 122667 | | | | | 0.040 ac | 0.54 ac |
| 86 Fluoranthene | 206440 | | | | | 300 a | 370 a |
| 87 Fluorene | 86737 | | | | | 1300 a | 14000 a |
| 88 Hexachlorobenzene | 118741 | | | | | 0.00075 ac | 0.00077 ac |
| 89 Hexachlorobutadiene | 87683 | | | | | 0.44 ac | 50 ac |
| 90 Hexachlorocyclopentadiene | 77474 | | | | | 240 a | 17000 aj |
| 91 Hexachloroethane | 67721 | | | | | 1.9 ac | 8.9 ac |
| 92 Indeno(1,2,3-cd)Pyrene | 193395 | | | | | 0.0028 c | 0.031 c |
| 93 Isophorone | 78591 | | | | | 8.4 ac | 600 ac |
| 94 Naphthalene | 91203 | | | | | | |
| 95 Nitrobenzene | 98953 | | | | | 17 a | 1900 aj |
| 96 N-Nitrosodimethylamine | 62759 | | | | | 0.00069 ac | 8.1 ac |
| 97 N-Nitrosodi-n-Propylamine | 621647 | | | | | (0.005) ac | (1.4) ac |
| 98 N-Nitrosodiphenylamine | 86306 | | | | | 5.0 ac | 16 ac |
| 99 Phenanthrene | 85016 | | | | | 0.0028 c | 0.031 c |
| 100 Pyrene | 129000 | | | | | 960 a | 11000 a |
| 101 1,2,4-Trichlorobenzene | 120821 | | | | | | |
| 102 Aldrin | 309002 | 3 g | | 1.3 g | | 0.00013 ac | 0.00014 ac |
| 103 alpha-BHC | 319846 | | | | | 0.0039 ac | 0.013 ac |
| 104 beta-BHC | 319857 | | | | | 0.014 ac | 0.046 ac |
| 105 gamma-BHC | 58899 | 2 g | 0.08 g | 0.16 g | | 0.019 c | 0.063 c |
| 106 delta-BHC | 319868 | | | | | | |
| 107 Chlordane | 57749 | 2.4 g | 0.0043 g | 0.09 g | 0.004 g | 0.00057 ac | 0.00059 ac |
| 108 4-4'-DDT | 50293 | 1.1 g | 0.001 g | 0.13 g | 0.001 g | 0.00059 ac | 0.00059 ac |
| 109 4,4'-DDE | 72559 | | | | | 0.00059 ac | 0.00059 ac |
| 110 4,4'-DDD | 72548 | | | | | 0.00083 ac | 0.00084 ac |
| 111 Dieldrin | 60571 | 2.5 g | 0.0019 g | 0.71 g | 0.0019 g | 0.00014 ac | 0.00014 ac |
| 112 alpha-Endosulfan | 959988 | 0.22 g | 0.056 g | 0.034 g | 0.0087 g | 0.93 a | 2.0 a |
| 113 beta-Endosulfan | 33213659 | 0.22 g | 0.056 g | 0.034 g | 0.0087 g | 0.93 a | 2.0 a |
| 114 Endosulfan Sulfate | 1031078 | | | | | 0.93 a | 2.0 a |
| 115 Endrin | 72208 | 0.18 g | 0.0023 g | 0.037 g | 0.0023 g | 0.76 a | 0.81 aj |
| 116 Endrin Aldehyde | 7421934 | | | | | 0.76 a | 0.81 aj |
| 117 Heptachlor | 76448 | 0.52 g | 0.0038 g | 0.053 g | 0.0036 g | 0.00021 ac | 0.00021 ac |
| 118 Heptachlor Epoxide | 1024573 | 0.52 g | 0.0038 g | 0.053 g | 0.0036 g | 0.00010 ac | 0.00011 ac |
| 119 PCB-1242 | 53469219 | | 0.014 g | | 0.03 g | 0.000044 ac | 0.000045 ac |
| 120 PCB-1254 | 11097691 | | 0.014 g | | 0.03 g | 0.000044 ac | 0.000045 ac |
| 121 PCB-1221 | 11104282 | | 0.014 g | | 0.03 g | 0.000044 ac | 0.000045 ac |
| 122 PCB-1232 | 11141165 | | 0.014 g | | 0.03 g | 0.000044 ac | 0.000045 ac |
| 123 PCB-1248 | 12672296 | | 0.014 g | | 0.03 g | 0.000044 ac | 0.000045 ac |
| 124 PCB-1260 | 11096825 | | 0.014 g | | 0.03 g | 0.000044 ac | 0.000045 ac |
| 125 PCB-1016 | 12674112 | | 0.014 g | | 0.03 g | 0.000044 ac | 0.000045 ac |
| 126 Toxaphene | 8001352 | 0.73 | 0.0002 | 0.21 | 0.0002 | 0.00073 ac | 0.00075 ac |
| Total No. of Criteria (h) = | | 24 | 29 | 33 | 27 | 103 | 102 |

Footnotes:

a. Criteria revised to reflect current agency $q_1^*$ or RfD, as contained in the Integrated Risk Information System (IRIS). The fish tissue bioconcentration factor (BCF) from the 1980 criteria documents was retained in all cases. Values in parentheses indicate that no health based criteria appeared in the 1980 documents. The criteria in parentheses are not being proposed today but are presented as notice for inclusion in future state triennial reviews.

b. EPA in the Office of Research and Development's Environmental Criteria and Assessment Office prepared documentation of criteria documents for arsenic, copper and selenium which are used instead of IRIS for this rulemaking. Each document was entitled as an "Addendum" to the prior criteria documents. These documents are available in the record for this proceeding.

c. Criteria based on carcinogenicity ($10^{-6}$ risk).

d. Criteria Maximum Concentration = the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (1-hour average) without deleterious effects.

Criteria Continuous Concentration = the highest concentration of a pollutant to which aquatic life can be exposed for an extended period of time (4-days) without deleterious effects.

ug/L = micrograms per liter

e. Freshwater aquatic life criteria for these metals are expressed as a function of total hardness (mg/L), as follows (where exp represents the base e exponential function). (Values displayed above in the matrix correspond to a total hardness of 100 mg/L)

| | CMC = exp($m_a$[ln(hardness)] + $b_a$) | | CCC = exp($m_c$[ln(hardness)] + $b_c$) | |
|---|---|---|---|---|
| | $m_a$ | $b_a$ | $m_c$ | $b_c$ |
| Cadmium | 1.128 | −3.828 | 0.7852 | −3.490 |
| Copper | 0.9422 | −1.464 | 0.8545 | −1.465 |
| Chromium (III) | 0.8190 | 3.688 | 0.8190 | 1.561 |
| Lead | 1.273 | −1.460 | 1.273 | −4.705 |
| Nickel | 0.8460 | 3.3612 | 0.8460 | 1.1645 |
| Silver | 1.72 | −6.52 | | |
| Zinc | 0.8473 | 0.8604 | 0.8473 | 0.7614 |

f. Freshwater aquatic life criteria for pentachlorophenol are expressed as a function of pH, and are calculated as follows. (Values displayed above in the matrix correspond to a pH of 7.8.)

$CMC = \exp(1.005(pH) - 4.830)$ $CCC = \exp(1.005(pH) - 5.290)$

g. Aquatic life criteria for these compounds were issued in 1980 utilizing the 1980 Guidelines for criteria development. The acute values shown are final acute values (FAV). According to the 1980 Guidelines, the acute values were intended to be interpreted as instantaneous maximum values, and the chronic values shown were interpreted as 24-hour average values. EPA has not updated these criteria pursuant to the 1985 Guidelines. However, as an approximation, dividing the final acute values in columns B1 and C1 by 2 yields a Criterion Maximum Concentration. No numeric changes are required for columns B2 and C2, and EPA suggests using these values directly as Criterion Continuous Concentration.

h. These totals simply sum the criteria in each column. For aquatic life, there are 30 priority toxic pollutants with some type of freshwater or saltwater, acute or chronic criteria proposed. For human health, there are 102 priority toxic pollutants with either "water + fish" or "fish only" criteria proposed. Note that these totals count chromium as one pollutant even though EPA has developed criteria based on two valence states. In the matrix, EPA has assigned numbers 5a and 5b to the proposed criteria for chromium to reflect the fact that the list of 126 priority toxic pollutants includes only a single listing for chromium. Criteria enclosed in parentheses are also *not* included in the totals.

i. Applies to methyl mercury.

j. No criteria for protection of human health from consumption of aquatic organisms (excluding water) was presented in the 1980 criteria document or in the 1986 Quality Criteria for Water. Nevertheless, the criterion value has not been placed in parentheses, because sufficient information was presented in the 1980 document to allow a calculation of a criterion, even though the results of such a calculation were not shown in the document.

k. The criterion for asbestos is the MCL (56 FR 3526, January 30, 1991). The criteria for 1,2-dichloropropane have been derived using MCL (56 FR 3526, January 30, 1991).

**General notes:**

(1) This chart lists all of EPA's priority toxic pollutants whether or not criteria recommendations are available. Blank spaces indicate the absence of criteria recommendations. Because of variations in chemical nomenclature systems, this listing of toxic pollutants does not duplicate the listing in appendix A of 40 CFR part 423. EPA has added the Chemical Abstracts Service (CAS) registry numbers, which provide a unique identification for each chemical.

(2) The following chemicals have organoleptic based criteria recommendations that are not included on this chart (for reasons which are discussed in the preamble): copper, zinc, chlorobenzene, 2-chlorophenol, 2,4-dichlorophenol, acenaphthene, 2,4-dimethylphenol, 3-methyl-4-chlorophenol, hexachlorocyclopentadiene, pentachlorophenol, phenol

(3) For purposes of this rulemaking, freshwater criteria apply at salinity levels equal to or less than 1 part per thousand (ppt); saltwater criteria apply at salinity levels equal to or greater than 10 ppt; for waters with salinity between 1 and 10 ppt, the applicable criteria are the more stringent of the freshwater or saltwater criteria.

(c) *Applicability.* (1) The criteria in paragraph (b) of this section apply to the States' designated uses cited in paragraph (d) of this section and supersede any criteria adopted by the State, except when State regulations contain criteria which are more stringent for a particular use in which case the State's criteria will continue to apply;

(2) The criteria established in this section are subject to the State's general rules of applicability in the same way and to the same extent as are the other numeric toxics criteria when applied to the same use classifications including mixing zones, and low flow values below which numeric standards can be exceeded in flowing fresh waters, but only if these State general policies have been reviewed and approved previously by EPA after November 8, 1983.

(i) For all waters with approved EPA mixing zone regulations or implementation procedures, the criteria apply at the appropriate locations within or at the boundary of the mixing zones; otherwise the criteria apply throughout the waterbody including at the end of any discharge pipe, canal or other discharge point.

(ii) A State shall not use a low flow value below which numeric standards can be exceeded that is less stringent than the following for waters suitable for the establishment of low flow return frequencies (i.e., streams and rivers):

Aquatic Life

acute criteria (CMC): 1 Q 10 or 1 B 3

chronic criteria (CCC): 7 Q 10 or 4 B 3

Human Health

non-carcinogens: 30 Q 5

carcinogens: harmonic mean flow

where:

CMC—criteria maximum concentration = the water quality criteria to protect against acute effects in aquatic life and is the highest instream concentration of a priority toxic pollutant consisting of a one-hour average not to be exceeded more than once every three years on the average.

CCC—criteria continuous concentration = the water quality criteria to protect against chronic effects in aquatic life is the highest instream concentration of a priority toxic pollutant consisting of a 4-day average not to be exceeded more than once every three years on the average.

1 Q 10 is the lowest one day flow with an average recurrence frequency of once in 10 years determined hydrologically;

1 B 3 is biologically based and indicates an allowable exceedence of once every 3 years. It is determined by EPA's computerized method (DFLOW model);

7 Q 10 is the lowest average 7 consecutive day low flow with an average recurrence frequency of once in 10 years determined hydrologically;

4 B 3 is biologically based and indicates an allowable exceedence for 4 consecutive days once every 3 years. It is determined by EPA's computerized method (DFLOW model);

30 Q 5 is the lowest average 30 consecutive day low flow with an average recurrence frequency of once in 5 years determined hydrologically and, the harmonic mean flow is a long term mean flow value calculated by dividing the number of daily flows analyzed by the sum of the reciprocals of those daily flows.

(iii) If a State does not have such a low flow value for numeric standards compliance, then none shall apply and the criteria included in paragraph (d) of this section herein apply at all flows.

(3) The aquatic life criteria in the matrix in paragraph (b) of this section apply as follows:

(i) For waters in which the salinity is equal to or less than 1 part per thousand, the applicable criteria are the freshwater criteria in Column B.

(ii) For waters in which the salinity is equal to or greater than 10 parts per thousand, the applicable criteria are the saltwater criteria in Column C;

(iii) For waters in which the salinity is between 1 and 10 parts per thousand, the applicable criteria are the more stringent of the freshwater or saltwater criteria. However, the Regional Administrator may approve the use of alternative criteria if scientifically defensible information and data demonstrate that on a site-specific basis the biology of the waterbody is dominated by freshwater aquatic life and that freshwater criteria are more appropriate; or conversely, the biology of the waterbody is dominated by saltwater aquatic life and that saltwater criteria are more appropriate.

(4) Application of metals criteria. (i) For purposes of calculating freshwater aquatic life criteria for metals from the equations in footnote (e) to the criteria matrix in paragraph (b) of this section, the minimum hardness allowed for use in those equations shall not be less than 25 mg/l, as calcium carbonate, even if the actual ambient hardness is less than 25 mg/l as calcium carbonate. The maximum hardness value for use in those equations shall not exceed 400 mg/l as calcium carbonate, even if the actual ambient hardness is greater than 400 mg/l as calcium carbonate.

(ii) The hardness values used shall be consistent with the design discharge conditions established in paragraph (c)(2) of this section for flows and mixing zones.

(d) *Criteria for Specific Jurisdictions.*—(1) *Connecticut, Region 1*

(i) All waters assigned to the following use classifications in the "State of Connecticut Water Quality Standards" adopted pursuant to section 22a–426 of the Connecticut General Statutes are subject to the criteria in paragraph (d)(1)(ii) of this section, without exception:

II.5.(A)—Class AA Surface Waters
II.5.(B)—Class A and SA Surface Waters
II.5.(C)—Class B and SB Surface Waters

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(1)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| Class AA; Class A; Class B waters where water supply use is designated. | Each of these classifications is assigned the criteria in: Column B(I)—all. Column B(II)—all. Column D(II)—all. |
| Class B waters where water supply use is not designated. | This classification is assigned the criteria in: Column B(II)—all. Column B(III)—all. Column D(III). |
| Class SA; Class SB | Each of these classifications is assigned the criteria in: Column C(I)—all. Column C(II)—all. Column D (II)—all. |

(2) *New Hampshire, Region 1*

(i) All waters assigned to the following use classifications in the New Hampshire Revised Statutes Annotated Chapter 149:3 are subject to the criteria in paragraph (d)(2)(ii) of this section, without exception:

149:3.I Class A
149:3.II Class B
149:3.III Class C

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(a)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| Class A; Class B waters where water supply use is designated. | Each of these classifications is assigned the criteria in: Column D (I)—#16. Column D(II)—#16. |
| Class B waters where water supply use is not designated Class C. | |

(3) *Rhode Island, Region 1*

(i) All waters assigned to the following use classifications in the Water Quality Regulations for Water Pollution Control adopted under chapters 46–12, 42–17.1, and 42–35 of the General Laws of Rhode Island are subject to the criteria in paragraph d(3)(ii) of this section without exception:

6.21 Freshwater
Class A
Class B
Class C

6.22 Saltwater
Class SA
Class SB
Class SC

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(3)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| Class A; Class B waters where water supply use is designated. | These classifications are assigned the criteria in: Column D (I)—all. |
| Class B waters where water supply use is not designated Class C; Class SA; Class SB; Class SC. | Each of these classifications is assigned the criteria in: Column D (II)—all. |

(4) *Vermont, Region 1*

(i) All waters assigned to the following use classifications in the Vermont Water Quality Standards adopted under the authority of the Vermont Water Pollution Control Act (10 V.S.A., Chapter 47) are subject to the criteria in paragraph (d)(4)(ii) of this section, without exception:

Class A
Class B
Class C

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(4)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| Class A; Class B waters where water supply use is designated. | This classification is assigned the criteria in: Column B(I)—all. Column B(II)—all. Column D(I)—all. |
| Class B waters where water supply use is not designated; Class C. | These classifications are assigned the criteria in: Column B(II)—all. Column B(III)—all. Column D(II)—all. |

(5) *New Jersey, Region 2*

(i) All waters assigned to the following use classifications in the New Jersey Administrative Code (N.J.A.C.) 7:9–4.1 et seq., Surface Water Quality Standards, are subject to the criteria in paragraph (d)(5)(ii) of this section, without exception:

N.J.A.C. 7:9–4.12(c): Class FW2
N.J.A.C. 7:9–4.12(d): Class SE1
N.J.A.C. 7:9–4.12(e): Class SE2
N.J.A.C. 7:9–4.12(f): Class SE3
N.J.A.C. 7:9–4.12(g): Class SC

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(5)(i) of this section:

| Use classificaton | Applicable criteria |
|---|---|
| FW2 | This classification is assigned the criteria in: Column B(1)—all except #102, 105, 107, 108, 111, 112, 113, 115, 117, and 118. Column B(2)—all except #105, 107, 108, 111, 112, 113, 115, 117, 118, 119, 120, 121, 122, 123, 124, and 125. Column D(1)—all except #4, 5a, 5b, 7, 10, and 11. Column D(2)—all. |
| SE1, SE2, SE3, SC. | These classifications are each assigned the criteria in: Column C(1)—all except #102, 105, 107, 108, 111, 112, 113, 115, 117, and 118. Column C(2)—all except #105, 107, 108, 111, 112, 113, 115, 117, 118, 119, 120, 121, 122, 123, 124, and 125. Column D(2)—all. |

(6) *Puerto Rico, Region 2*

(i) All waters assigned to the following use classifications in the Puerto Rico Water Quality Standards (promulgated by Resolution Number R-83-5-2) are subject to the criteria in paragraph (d)(6)(ii) of this section, without exception.

Article 2.2.2—Class SB
Article 2.2.3—Class SC
Article 2.2.4—Class SD

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(6)(i) of this section:

| Use classificaton | Applicable criteria |
|---|---|
| Class SD | This classification is assigned criteria in: Column B(1)—all, except: 10, 102, 105, 107, 108, 111, 112, 113, 115, 117, and 126. Column B(2)—all, except: 105, 107, 108, 112, 113, 115, and 117. Column D(1)—all, except: 4, 5a, 5b, 6, 7, 10, 11, 14, 105, 112, 113, and 115. Column D(2)—all, except: 4, 5a, 5b, 10, 14, 105, 112, 113, and 115. |
| Class SB, Class SC. | These classifications are assigned criteria in: Column C(1)—all, except: 4, 5b, 7, 8, 10, 11, 13, 102, 105, 107, 108, 111, 112, 113, 115, 117, and 126. Column C(2)—all, except: 4, 5b, 10, 13, 108, 112, 113, 115, and 117. Column D(2)—all, except: 4, 5a, 5b, 10, 14, 105, 112, 113, and 115. |

(7) *Virginia, Region 3*

(i) All waters assigned to the following use classifications in the Virginia Water Quality Standards, VR680-21 are subject to the criteria in paragraph (d)(6)(ii) of this section without exception:

VR680-21-08 Classes I–VII and PWS

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(7)(i) of this section:

| Use classificaton | Applicable criteria |
|---|---|
| Class I | This classification is assigned the criteria in: Column C(I)—all. Column C(II)—all. Column D(III)—all, except #16. |
| Class II | This classification is assigned the criteria in: Column B(I)—all. Column B(III)—all. Column C(I)—all. Column C(II)—all. Column D(III)—all, except #16. |
| Class III–VII | Each of these classifications is assigned the criteria in: Column B(I)—all. Column B(III)—all. Column D(III)—all, except #16. |
| PWS | This classification is assigned the additional criteria in: Column D(I)—all, except #16. |

(8) *District of Columbia, Region 3*

(i) All waters assigned to the following use classifications in Chapter 11 Title 21 DCMR, Water Quality Standards of the District of Columbia are subject to the criteria in paragraph (d)(8)(ii) of this section without exception:

1101.2 Class C waters

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classification identified in paragraph (d)(8)(i) of this section:

| Use classificaton | Applicable criteria |
|---|---|
| Class C | This classification is assigned the additional criteria in: Column B(II)—#10, 118, 126. Column D(I)—#7, 15, 16, 44, 67, 68, 79, 80, 81, 88, 114, 116, 118. Column D(II)—all. |

(9) *Florida, Region 4*

(i) All waters assigned to the following use classifications in Chapter 17-301 of the Florida Administrative Code (i.e., identified in Section 17-302.600) are subject to the criteria in paragraph (d)(9)(ii) of this section, without exception:

Class I
Class II
Class III

(ii) The following criteria from the matrix paragraph (b) of this section apply to the use classifications identified in paragraph (d)(9)(i) of this section:

| Use classificaton | Applicable criteria |
|---|---|
| Class I | This classification is assigned the criteria in: Columns B1 and B2—5(b), 6, 7, 8, 9, 10, 11, 107, 111, 115, 118, and 126; and Column D1—all. |
| Class II; Class III (marine). | This classification is assigned the criteria in: Columns C1 and C2—2, 6, 7, 8, 9, 11, 13, 14, 111, 115, 118, and 126; and Column D2—all. |
| Class III (freshwater). | This classification is assigned the criteria in: Columns B1 and B2—5(b), 6, 7, 8, 9, 10, 11, 107, 111, 115, 118, and 126; and Column D2—all. |

(10) *Michigan, Region 5*

(i) All waters assigned to the following use classifications in the Michigan Department of Natural Resources Commission General Rules, R 323.1043 Definitions; A to N, (i.e., identified in Section (g) "Designated use") are subject to the criteria in paragraph (d)(10)(ii) of this section, without exception:

(A) Industrial water supply
(B) Agricultural water supply
(C) Public water supply
(D) Recreation
(E) Fish, other aquatic life, and wildlife
(F) Navigation

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(10)(i) of this section:

| Use classificaton | Applicable criteria |
|---|---|
| Public water supply | This classification is assigned the criteria in: Column B (I)—all. Column B (II)—all. Column D (I)—all. |
| All other designations. | These classifications are assigned the criteria in: Column B (I)—all. Column B (II)—all, and Column D (II)—all. |

(11) *Arkansas, Region 6*

(i) All waters assigned to the following use classification in Section 4C (Waterbody uses) identified in Arkansas Department of Pollution Control and Ecology's Regulation No. 2 as amended and entitled, "Regulation Establishing Water Quality Standards

for Surface Waters of the State of Arkansas" are subject to the criteria in paragraph (d)(11)(ii) of this section, without exception:

(A) Extraordinary Resource Waters
(B) Ecologically Sensitive Waterbody
(C) Natural and Scenic Waterways
(D) Fisheries:
(*1*) Trout
(*2*) Lakes and Reservoirs
(*3*) Streams
(*i*) Ozark Highlands Ecoregion
(*ii*) Boston Mountains Ecoregion
(*iii*) Arkansas River Valley Ecoregion
(*iv*) Ouachita Mountains Ecoregion
(*v*) Typical Gulf Coastal Ecoregion
(*vi*) Spring Water-influenced Gulf Coastal Ecoregion
(*vii*) Least-altered Delta Ecoregion
(*viii*) Channel-altered Delta Ecoregion
Domestic Water Supply

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classification identified in paragraph (d)(11)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| Extraordinary resource waters | |
| Ecologically sensitive waterbody | |
| Natural and scenic waterways | |
| Fisheries: | |
| (1) Trout | |
| (2) Lakes and reservoirs | |
| (3) Streams | |
| (a) Ozark highlands ecoregion | |
| (b) Boston mountains ecoregion | |
| (c) Arkansas river valley ecoregion | |
| (d) Ouachita mountains ecoregion | |
| (e) Typical gulf coastal Ecoregion | |
| (f) Spring water-influenced gulf coastal ecoregion | |
| (g) Least-altered Delta ecoregion | |
| (h) Channel-altered Delta ecoregion. | These uses are each assigned the criteria in Column B1—# 2, 4, 5a, 5b, 6, 7, 8, 9, 10, 11, 13, 14. Column B2—# 2, 4, 5a, 5b, 6, 7, 8, 9, 10, 13, 14. Column D2—all. |
| Domestic water supply. | This use is assigned the criteria in: Column D1—all. |

(12) *Louisiana, Region 6*

(i) All waters assigned to the following use designations in the Louisiana Administrative Code, Title 33—Environmental Quality, Part IX—Water Quality Regulations, Chapter 11 (i.e., identified in Section 1111 Water Use Designations) are subject to the criteria in paragraph (d)(12)(ii) of this section, without exception:

(A) Public Water Supply –
(B) Fish and Wildlife Propagation
(C) Oyster Propagation

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(12)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| Public water supply..... | This classification is assigned the criteria in: Column D(II)—#16. |
| Fish and wildlife propagation. | These classifications are assigned the criteria in: Column D(II) #16. |
| Oyster propagation ..... | Column D(II) #16. |

(13) *Kansas, Region 7*

(i) All waters assigned to the following use classification in the Kansas Department of Health and Environment regulations, K.A.R. 28–16–28b through K.A.R. 28–16–28f, are subject to the criteria in paragraph (d)(13)(ii) of this section, without exception.

Section 28–16–28d:
Section (2)(A)—Special Aquatic Life Use Waters
Section (2)(B)—Expected Aquatic Life Use Waters
Section (2)(C)—Restricted Aquatic Life Use Waters
Section 5—Domestic Water Supply
Section (6)(c)—Consumptive Recreation Use.

(ii) The following criteria from the matrix is paragraph (b) of this section apply to the use classifications identified in paragraph (d)(13)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| Sections (2)(A), (2)(B), (2)(C), 6(C). | These classifications are each assigned all criteria in: Column B(I), except #9, 13, 102, 103, 107, 108, 111–113, 115, 117, and 126; Column B(II), except #9, 13, 105, 107, 108, 111–113, 115, 117, 119–125, and 126; and Column D(II), except #9, 10, 112, 113, and 115. |
| Section 13)..... | This classification is assigned all criteria in: Column D(I), except #9, 10, 12, 112, 113, and 115. |

(14) *Colorado, Region 8*

(i)(A) All waters assigned to the following use classifications in the Colorado Classifications and Numeric Standards for the following Basins:

(*1*) Arkansas River Basin—3.2.0 (5CCR 1002–8);

(*2*) Upper Colorado River Basin and North Platte River Basin (Planning Region 12)—3.3.0 (5CCR 1002–8);

(*3*) San Juan and Dolores River Basins—3.4.0 (5CCR 1002–8);

(*4*) Gunnison and Lower Dolores River Basins—3.5.0 (5CCR 1002–8);

(*5*) Rio Grande River Basin 3.6.0 (5CCR 1002–8);

(*6*) Lower Colorado Basin—3.7.0 (5CCR 1002–8);

(*7*) South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin—3.8.0 (5CCR 1002–8);

are subject to the criteria in paragraph (d)(14)(ii) of this section, except where only particular segments require criteria as delineated in paragraph (d)(14)(ii) of this section.

The following are the use classifications:

(*1*) Domestic Water Supply
(*2*) Class 1—Cold Water Aquatic Life
(*3*) Class 2—Cold Water Aquatic Life
(*4*) Class 1—Warm Water Aquatic Life
(*5*) Class 2—Warm Water Aquatic Life

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications in paragraph (d)(14)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| Domestic water supply. | All waters assigned to this use classification are subject to the criteria in: Column D(I)—all except #4, 5a, 5b, 6, 7, 10, 11, 22, 33, 39, 41, 44, 53, 66, 77, 90, 95, 115. |
| Class 1 Cold Water A.L. | |
| Class 2 Cold Water A.L. | |
| Class 1 Warm Water A.L. | |
| Class 2 Warm Water A.L. | All waters assigned to these use classifications are subject to the criteria in: Column B(I)—#10. Column B(II)—#10. Column D(II)—all and the following specific segments (which have been assigned one of these aquatic life uses) are further assigned the criteria set forth below. |

1. The criteria in: B(I)—#2, 4, 5a, 5b, 6, 7, 8, 9, 11, 13, 14; B(II)—#2, 4, 5a, 5b, 6, 7, 8, 9, 13, 14 are assigned to the following specific segments:

• Basin 3.2.0

Upper Arkansas River Basin: segments 14, 26
Middle Arkansas River Basin: segments 4, 13, 18
Fountain Creek Basin: segments 3a, 8
Lower Arkansas River Basin: segments 2, 6b
Cimarron River Basin: segment 1
- Basin 3.3.0
Blue River Basin (14010002): segments 5, 20
Eagle River Basin (14010003): segment 11
North Platte River Basin (1018001, 10180002): segment 7
Yampa River Basin (14050001, 14050002): segment 12
- Basin 3.4.0
San Juan River Basin: segments 3, 10, 11
Piedra River Basin: segment 6
Los Pinos River Basin: segment 6
Animas and Florida River Basin: segment 13b
La Plata River, Mancos River, McElmo Creek and San Juan River Basin in Montezuma County and Dolores Counties: segments 3, 6, 8
Dolores River Basin: segment 11
- Basin 3.5.0
Upper Gunnison River Basin: segments 6b, 16, 28, 32
North Fork of the Gunnison River Basin: segment 8, 10
Uncompahgre River Basin: segments 10, 12
Lower Gunnison River Basin: segment 4
San Miguel River Basin: segment 12
Lower Dolores River Basin: segment 4
- Basin 3.6.0
Rio Grande River Basin: segments 15b, 25
Closed Basin—San Luis Valley: segment 3
- Basin 3.7.0
Lower Yampa River/Green River Basin: segments 3a, 3b, 6, 14, 17, 20
White River Basin: segments 5, 9, 13a, 22
Lower Colorado River Basin: segments 11b, 11e, 13
- Basin 3.8.0
Republican River Basin: segments 6, 7
South Platte River Basin (Region 1): segment 2
Cache La Poudre River Basin: segments 8, 13
Big Thompson River Basin: segments 6, 10
South Platte River Basin (Region 2): segment 3
St. Vrain Creek Basin: segment 6
Boulder Creek Basin: segments 8, 11
Big Dry Creek Basin: segment 1
Clear Creek Basin: segments 8, 16, 18
Cherry Creek Basin: segment 4
South Platte River Basin (Regions 2, 3, 4): segments 7a, 11a, 16
South Platte River Basin (Region 3 and 4): segment 7

2. The criteria in: Column B(I)—=9: Column B(II)—=9 are assigned to the following specific segments:

- Basin 3.3.0
Blue River Basin (14010002): segment 12
- Basin 3.4.0
Animas and Florida River Basin: segment 15
La Plata River, Mancos River, McElmo Creek and San Juan River Basin in Montezuma County and Dolores Counties: segment 9
- Basin 3.8.0
Big Thompson River Basin: segment 13
Boulder Creek Basin: segments 4c, 6
Clear Creek Basin: segment 12
Bear Creek Basin: segments 4a, 5
South Platte River Basin (Region 2, 3, and 4): segment 7b

3. The criteria in: Column B(I)—=8: Column B(II)—=8 are assigned to the following specific segments:

- Basin 3.7.0—Lower Colorado River Basin: segment 4
- Basin 3.8.0—South Platte River Basin (Region 2, 3, and 4): segment 11b

4. The criteria in: Column B(I)—=14: Column B(II)—=14 are assigned to the following specific segment:

- Basin 3.2.0—Upper Arkansas River Basin: segment 8b

5. The criterion in: Column B(I)—=11 is assigned to the following specific segment:

- Basin 3.7.0—Lower Colorado River Basin: segment 4.

(15) *Arizona, Region 9*

(i) All waters assigned the use classifications in chapter 21 of the Arizona Administrative Code (AAC) which are referred to in paragraph (d)(15)(ii) of this section, are subject to the criteria in paragraph (d)(15)(ii) of this section, without exception. These criteria amend the existing State standards contained in chapter 21 of the AAC sections R9–21–101 through 304, Water Quality Standards for Waters of the State, for the toxic pollutants identified in paragraph (d)(15)(ii) of this section. For purposes of this action, the specific standards to be applied are based on the following selected use designations as defined in chapter 21, AAC §§ R9–21–101 through R9–21–304:

(A) DWS—Domestic Water Source
(B) A&W—Aquatic & Wildlife (including any aquatic life designation)

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the water and use classifications defined in paragraph (d)(15)(i) of this section and identified below:

| Water and use classification | Applicable criteria |
|---|---|
| Waters of the State with A&W but without DWS. | These waters are assigned the criteria in: Column B1—all pollutants. Column B2—all pollutants. Column D2—all pollutants. |
| Waters of the State with A&W and DWS. | These waters are assigned the criteria in: Column B1—all pollutants. Column B2—all pollutants. Column D1—all pollutants. |
| Waters of the State with DWS but without A&W. | These waters are assigned the criteria in: Column D1—all pollutants. |

(16) *California, Region 9*

(i) All waters assigned any aquatic life or human health use classifications in the Water Quality Control Plans for the various Basins of the State ("Basin Plans"), as amended, adopted by the California State Water Resources Control Board ("SWRCB"), except for ocean waters covered by the Water Quality Control Plan for Ocean Waters of California ("Ocean Plan") adopted by the SWRCB with resolution Number 90–27 on March 22, 1990, are subject to the criteria in paragraph (d)(16)(ii) of this section, without exception. These criteria amend the portions of the existing State standards contained in the Basin Plans. More particularly these criteria amend water quality criteria contained in the Basin Plan Chapters specifying water quality objectives (the State equivalent of federal water quality criteria) for the toxic pollutants identified in paragraph (d)(16)(ii) of this section. Although the State has adopted several use designations for each of these waters, for purposes of this action, the specific standards to be applied in paragraph (d)(16)(ii) of this section are based on the presence in all waters of some aquatic life designation and the presence or absence of the MUN use designation (Municipal and domestic supply). (See Basin Plans for more detailed use definitions).

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the water & use classifications defined in paragraph (d)(16)(i) of this section and identified below:

| Water and use classification | Applicable criteria |
|---|---|
| Waters of the state defined as bays or estuaries except the Sacramento-San Joaquin Delta and San Francisco Bay. | These waters are assigned the criteria in: Column B1—all pollutants. Column B2—all pollutants. Column C1—all pollutants. Column C2—all pollutants. Column D2—all pollutants |

| Water and use classification | Applicable criteria |
|---|---|
| Waters of the Sacramento-San Joaquin Delta and waters of the state defined as inland (i.e., all surface waters of the state not bays or estuaries or ocean) that include a MUN use designation except the San Joaquin River from the mouth of the Merced River to Vernalis and the Sacramento River and its tributaries upstream from Hamilton City. | These waters are assigned the criteria in: Column B1—all pollutants. Column B2—all pollutants. Column D1—all pollutants. |
| Waters of the state defined as inland without an MUN use designation except waters flowing to Grasslands Water District, San Luis National Wildlife Refuge and Los Banos State Wildlife Area. | These waters are assigned the criteria in: Column B1—all pollutants. Column B2—all pollutants. Column D2—all pollutants. |
| Waters of the San Joaquin River from the mouth of the Merced River to Vernalis. | These waters are assigned the criteria in: Column B1—all pollutants except #10. Column B2—all pollutants. Column D1—all pollutants except #10. |
| Waters of the Sacramento River and its tributaries upstream from Hamilton City. | These waters are assigned the criteria in: Column B1—all pollutants except #4, 6, 13. Column B2—all pollutants except #4, 6, 13. Column D1—all pollutants except #4. |
| Waters flowing to Grasslands Water District, San Luis National Wildlife Refuge, and Los Banos State Wildlife Area. | These waters are assigned the criteria in: Column B1—all pollutants. Column B2—all pollutants. Column D2—all pollutants except #10. |
| Waters of San Francisco Bay. | These waters are assigned the criteria in: Column B1—all pollutants. Column B2—all pollutants. Column C1—all pollutants except #10. Column C2—all pollutants except #10. Column D2—all pollutants. |

(17) *Nevada, Region 9*

(i) All waters assigned the use classifications in chapter 445 of the Nevada Administrative Code (NAC), Nevada Water Pollution Control Regulations, which are referred to in paragraph (d)(17)(ii), of this section, are subject to the criteria in paragraph (d)(17)(ii) of this section, without exception. These criteria amend the existing State standards contained in the Nevada Water Pollution Control Regulations. More particularly, these criteria amend or supplement the table of numeric standards in NAC 445.1339 for the toxic pollutants identified in paragraph (d)(17)(ii) of this section.

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the waters defined in paragraph (d)(16)(i) of this section and identified below:

| Water and use classification | Applicable criteria |
|---|---|
| Waters that the State has included in NAC 445.1339 where municipal or domestic supply is a designated use. | These waters are assigned the criteria in: Column B1—pollutant #118. Column B2—pollutant #118. Column D1—pollutants 15, 16, 18, 19, 20, 21, 23, 26, 27, 29, 30, 34, 35, 36, 37, 38, 42, 43, 55, 57–64, 66, 73, 74, 78, 82, 85, 87–89, 91, 92, 96, 98–100, 103, 104, 105, 114, 116, 117, 118. |
| Waters that the State has included in NAC 445.1339 where municipal or domestic supply is not a designated use. | These waters are assigned the criteria in: Column B1—pollutant #118. Column B2—pollutant #118. Column D2—all pollutants except #2. |

(18) *Hawaii, Region 9*

(i) All waters assigned the use classifications in the existing State standards ("State Standards") which are referred to in paragraph (d)(18)(ii) of this section, are subject to the criteria in paragraph (d)(18)(ii) of this section, without exception. These criteria amend the existing State standards. Specifically, these criteria supplement the table of numeric standards for toxic pollutants applicable to all of Hawaii's waters in section 11-54-04(b)(3).

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the waters defined in paragraph (d)(18)(i) of this section and identified below:

| Water and use classification | Applicable criteria |
|---|---|
| Waters of the State assigned to Classes AA, A, 1, and 2. | These waters are assigned the criteria in: Column D2—pollutants #3, 8. |
| Waters of the State assigned to Classes AA and A. | These waters are assigned criteria in: Column C1—pollutant #6. Column C2—pollutants #6, 7, 8. |

(19) *Commonwealth of the Northern Mariana Islands, Region 9*

(i) All waters assigned the use classifications in the existing Commonwealth of the Northern Mariana Islands Marine and Fresh Water Quality Standards ("Standards") which are referred to in paragraph (d)(19)(ii) of this section, are subject to the criteria in paragraph (d)(19)(ii) of this section, without exception. These criteria amend the existing standards. Specifically, these criteria supplement the table of numeric standards in part 7.10 of the Standards.

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the waters defined in paragraph (d)(19)(i) of this section and identified below:

| Water and use classification | Applicable criteria |
|---|---|
| Fresh surface waters of the Commonwealth assigned to classes 1 and 2. | These waters are assigned the criteria in: Column D1—all pollutants. Column B1—pollutants #53, 108, 118. Column B2—pollutants #53, 108, 118. |
| Marine waters of the Commonwealth to classes AA and A. | These waters are assigned the criteria in: Column D2—all pollutants. Column C1—pollutants #53, 108, 118. Column C2—pollutants #53, 108, 118. |

(20) *Alaska, Region 10*

(i) All waters assigned to the following use classifications in the Alaska Administrative Code (AAC), chapter 18 (i.e., identified in 18 AAC 70.020) are subject to the criteria in paragraph(d)(20)(ii) of this section, without exception:

| | |
|---|---|
| 70.020.(1)(A) | Fresh water. Water supply. (i) Drinking, culinary, and food processing. (ii) Aquaculture; |
| 70.020.(1)(B) | Water recreation. (i) Contact recreation. (ii) Secondary recreation; |
| 70.020.(1)(C) | Growth and propagation of fish, shellfish, other aquatic life, and wildlife. |

| | |
|---|---|
| 70.020.(2)(A) | Marine water.<br>Water supply.<br>(i) Aquaculture.<br>(ii) Seafood processing. |
| 70.020.(2)(B) | Water recreation.<br>(i) Contact recreation.<br>(ii) Secondary recreation. |
| 70.020.(2)(C) | Growth and propagation of fish, shellfish, other aquatic life, and wildlife. |
| 70.020.(2)(D) | Harvesting for consumption of raw mollusks or other raw aquatic life. |

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(20)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| (1)(A)i | This classification is assigned the criteria in:<br>Column B(I)—#'s 9, 10, 53.<br>Column B(II)—human health carcinogens: #'s 2, 3, 16, 18, 19, 20, 21, 23, 26, 27, 29, 30, 35, 36, 37, 42, 43, 44, 55, 57–64, 66, 68, 73, 74, 78, 82, 85, 87, 88, 89, 91, 92, 96, 97, 98, 99, 100, 102–111, 117–126. |
| (1)(A)ii | This classification is assigned the criteria in:<br>Same as for (1)(A)i (above) plus:<br>Column B(I)—all.<br>Column B(II)—#'s 9, 10, 13, 53. |
| (1)(B)i | This classification is assigned the criteria in:<br>Same as for (1)(A)i above. |
| (1)(B)ii | This classification is assigned the criteria in:<br>Column B(I)—all.<br>Column B(II)—#'s 9, 10, 13, 53.<br>Column B(III)—#'s 9, 10, 53.<br>Column D(II) human health carcinogens: #'s 2, 3, 16, 18, 19, 20, 21, 23, 26, 27, 29, 30, 35, 36, 37, 42, 43, 44, 55, 57–64, 66, 68, 73, 74, 78, 82, 85, 87, 88, 89, 91, 92, 96, 97, 98, 99, 100, 102–111, 117–126 |
| (1)(C) This classification is assigned the criteria in:<br>Same as for (1)(B)(ii). | |

| Use classification | Applicable criteria |
|---|---|
| (2)(A)i | This classification is assigned the criteria in:<br>Column C(I)—all.<br>Column C(III)—#'s 9, 10, 13, 53.<br>Column D(II)—#'s 9, 10, 53.<br>Column D(III)—human health carcinogens: #'s 2, 3, 16, 18, 19, 20, 21, 23, 26, 27, 29, 30, 35, 36, 37, 42, 43, 44, 55, 57–64, 66, 68, 73, 74, 78, 82, 85, 87, 88, 89, 91, 92, 96, 97, 98, 99, 100, 102–111, 117–126 |
| (2)(A)ii | This classification is assigned the criteria in:<br>Column C(I)—all.<br>Column C(II)—only for #'s 9, 10, 13, 53. |
| (2)(B)i & ii | These classifications are assigned the criteria in:<br>Column D(II) for #'s 9, 10.<br>Column D(III)—human health carcinogens: #'s 2, 3, 16, 18, 19, 20, 21, 23, 26, 27, 29, 30, 35, 36, 37, 42, 43, 44, 55, 57–64, 66, 68, 73, 74, 78, 82, 85, 87, 88, 89, 91, 92, 96, 97, 98, 99, 100, 102–111, 117–126. |
| (2)(C) and (2)(D) | These classifications are assigned the criteria in:<br>Same as for (2)(A)i. |

(21) *Idaho, Region 10*

(i) All waters assigned to the following use classifications in the Idaho Administrative Procedures Act (IDAPA), chapter 16 (i.e., identified in IDAPA 16.01.2100.02–16.01.2100.07) are subject to the criteria in paragraph (d)(21)(ii) of this section, without exception:

| | |
|---|---|
| 16.01.2100.02. | Domestic Water Supplies. |
| 16.01.2100.03. | Cold Water Biota. |
| 16.01.2100.04. | Warm Water Biota. |
| 16.01.2100.05. | Salmonid Spawning. |
| 16.01.2100.06. | Primary Contact Recreation. |
| 16.01.2100.07. | Secondary Contact Recreation. |

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(21)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| 02 | This classification is assigned the criteria in:<br>Column D(I)—all except #'s 4, 5, 7, 10, 11, 14, 115. |
| 03, 04 and 05 | These classifications are assigned the criteria in:<br>Column B(I)—all.<br>Column B(II)—all.<br>Column D(II)—all. |
| 06 | This classification is assigned the criteria in:<br>Column B(I)—all.<br>Column B(II)—all. |
| 07 | This classification is assigned the criteria in:<br>Column B(I)—all.<br>Column B(II)—all.<br>Column D(II)—all. |

(22) *Washington, Region 10*

(i) All waters assigned to the following use classifications in the Washington Administrative Code (WAC), chapter 173–201 (i.e., identified in WAC 173–201–045) are subject to the criteria in paragraph (d)(22)(ii) of this section, without exception:

| | |
|---|---|
| 173–201–045. | Class AA water supplies.<br>Class A.<br>Class B.<br>Class C.<br>Lake class. |

(ii) The following criteria from the matrix in paragraph (b) of this section apply to the use classifications identified in paragraph (d)(22)(i) of this section:

| Use classification | Applicable criteria |
|---|---|
| AA and A | These classifications are assigned the criteria in:<br>Column D(I)—all.<br>Column D(II)—all.<br>Columns B(I), B(II), C(I), and C(II): all except #'s 4, 5a&b, 7, 8, 9, 11, 13, 53, 103, 109, 110, 115, 117, 119–126 |
| B and C | These classifications are assigned the criteria in:<br>Same as for AA and A except do not include Column D(I). |
| Lake class | This classification is assigned the criteria in:<br>Same as for AA and A except do not include Columns C(I), C(II) or D(I). |

(Note.—The following appendix will not appear in the Code of Federal Regulations.)

## Appendix to Preamble of Today's Proposal

### *I. Introduction*

The purpose of this appendix is to provide background information and further explanation of today's proposed rulemaking. Two major topics are discussed. The first topic concerns the detailed assumptions and rules followed

by EPA in writing the State-specific proposed regulatory requirements (i.e., the water quality uses and criteria) contained in proposed section § 131.36(d). The second topic concerns EPA's rationale for proposing the § 131.36(d) requirements. Separate, customized rationales are provided for each jurisdiction included in the water quality standards program (i.e., as defined by 40 CFR 131.3(j)).

*II. Assumptions and Rules Followed by EPA in Writing the Proposed Section 131.36(d) Requirements for all Jurisdictions*

The "rules" followed by EPA in writing the proposed § 131.36(d) requirements for all jurisdictions are as follows:

1. No criteria are proposed for States which have been fully approved by EPA as complying with the section 303(c)(2)(B) requirements.

2. For States which have not been fully approved, if EPA has not previously determined which specific pollutants/criteria/waterbodies are lacking from a State's standards (i.e., as part of an approval/disapproval action only), all of the criteria in Columns B, C, and D of the proposed § 131.36(b) matrix are proposed for statewide application to all appropriate designated uses, except as provided for elsewhere in these rules. That is, EPA proposes to bring the State into compliance with section 303(c)(2)(B) via an approach which is comparable to option 1 of the December 1988 national guidance for section 303(c)(2)(B).

3. If EPA has previously determined which specific pollutants/criteria/waterbodies are needed to comply with CWA section 303(c)(2)(B) (i.e., as part of an approval/disapproval action only), the criteria in proposed § 131.36(b) are proposed for only those specific pollutants/criteria/waterbodies (i.e., EPA proposes to bring the State into compliance via an approach which is comparable to option 2 of the December 1988 national guidance for section 303(c)(2)(B)).

4. For aquatic life, except as provided for elsewhere in these rules, all waters with designated aquatic life uses providing even minimal support to aquatic life are included in the proposed rule (i.e., fish survival, marginal aquatic life, etc.).

5(a). For human health, except as provided for elsewhere in these rules, all waters with designated uses providing for public water supply protection (and therefore a potential water consumption exposure route) or minimal aquatic life protection (and therefore a potential fish consumption exposure route) are included in the proposed rule.

5(b). Where a State has determined the specific aquatic life segments which provide a fish consumption exposure route (i.e., fish or other aquatic life are being caught and consumed) and EPA approved this determination as part of a standards approval/disapproval action, the proposed rule includes the fish consumption (Column D(II)) criteria for only those aquatic life segments, except as provided for elsewhere in these rules. In making a determination that certain segments do not support a fish consumption exposure route, a State must complete and EPA must have previously approved, a use attainability analysis consistent with the provisions of 40 CFR part 131.10(j). In the absence of such an approved State determination, EPA has proposed fish consumption criteria for all aquatic life segments.

6. Uses/Classes other than those which support aquatic life or human health are not included in the proposed rulemaking (e.g., livestock watering, industrial water supply), unless they are defined in the State standards as also providing protection to aquatic life or human health (i.e., unless they are described as protecting multiple uses including aquatic life or human health). For example, if the State standards include a use such as industrial water supply, and in the narrative description of the use the State standards indicate that the use includes protection for resident aquatic life, then this use is included in the proposed rulemaking.

7. For human health, the "water + fish" criteria in Column D(I) of § 131.36(b) are proposed for all waterbodies where public water supply and aquatic life uses are designated, except as provided for elsewhere in these rules (e.g., rule 9).

8. If the State has public water supplies where aquatic life uses have not been designated, or public water supplies that have been determined not to provide a potential fish consumption exposure pathway, the "water + fish" criteria in Column D(I) of § 131.36(b) are proposed for such waterbodies, except as provided for elsewhere in these rules (e.g., rule 9).

9. EPA is generally not proposing criteria for priority toxic pollutants for which a State has adopted criteria and received EPA approval. The exceptions to this general rule are described in rules 10 and 11.

10. For priority toxic pollutants where the State has adopted human health criteria and received EPA approval, but such criteria do not fully satisfy section 303(c)(2)(B) requirements, the proposed rule includes human health criteria for such pollutants. For example, consider a case where a State has a water supply segment that poses an exposure risk to human health from both water and fish consumption. If the State has adopted, and received approval for, human health criteria based on water consumption only (e.g., Safe Drinking Water Act Maximum Contaminant Levels (MCLs)) which are less stringent than the "water + fish" criteria in Column D(I) of proposed § 131.36(b), the Column D(I) criteria are proposed for those water supply segments. The rationale for this is to ensure that both water and fish consumption exposure pathways are adequately addressed and human health is fully protected. If the State has adopted water consumption only criteria which are more stringent or equal to the Column D(I) criteria, the "water + fish" criteria in Column D(I) criteria are not proposed.

11. For priority toxic pollutants where the State has adopted aquatic life criteria and received EPA approval, but such criteria do not fully satisfy section 303(c)(2)(B) requirements, the proposed rule includes aquatic life criteria for such pollutants (e.g., because previously approved State criteria do not reflect current science contained in revised criteria documents and other guidance sufficient to protect all designated uses or human health exposure pathways). For example, if the State has adopted not-to-be-exceeded aquatic life criteria which are less stringent than the 4-day average chronic aquatic life criteria in § 131.36(b) (i.e., in Columns C(I) and C(II)), the acute and chronic aquatic life criteria in § 131.36(b) are proposed for those pollutants. The rationale for this is that the State-adopted criteria do not protect resident aquatic life from both acute and chronic effects, and that federal criteria are necessary to fully protect aquatic life designated uses. If the State has adopted not-to-be-exceeded aquatic life criteria which are more stringent or equal to the chronic aquatic life criteria in § 131.36(b), the acute and chronic aquatic life criteria in § 131.36(b) are not proposed for those pollutants.

12. Under certain conditions discussed in rules 9, 10, and 11, criteria listed in § 131.36(b) are not proposed for specific pollutants; however, EPA made such exceptions only for pollutants for which criteria have been adopted by the State and approved by EPA, where such criteria are currently effective under State law and fully satisfy section 303(c)(2)(B) requirements.

III. State-by-State Summary Information and Rationale

EPA's jurisdiction-specific rationale for the § 131.36(d) requirements is described below. In addition, all proposed § 131.36(d) requirements conform to the rules specified in the previous section of this appendix.

*Region I*

Connecticut is included in today's proposal because the State has not adopted any criteria for priority toxic pollutants, either before or in response to the statutory requirement, and EPA has reason to believe that at least some criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Connecticut's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows.

—August, 1990. Draft WQS revisions were submitted to EPA by the State. In this draft revision the State proposed adopting criteria for all priority pollutants for fresh water aquatic life and human health protection. No criteria were proposed for marine waters.

—December, 1990. EPA Region I notified Connecticut that adoption of criteria for marine waters is necessary to achieve compliance with section 303(c)(2)(B).

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the State Section 304(1) short list for which State criteria have not been adopted and approved.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 34 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

—Long Island Sound study conducted as part of the National Estuaries Program which indicates presence of priority pollutants in Long Island Sound.

Maine has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—June 1990. Legislative adoption of all EPA issued section 304(a)(1) criteria by reference.

—December 20, 1990. EPA approved the adopted State criteria.

EPA fully approved the criteria for priority toxic pollutants adopted by Maine in June of 1990 as being consistent with option 1 of the December 12, 1988 section 303(c)(2)(B) guidance document.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Massachusetts has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

Massachusetts' actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—Massachusetts adopted revised standards on July 23, 1990. The State adopted the section 304(a)(1) criteria for aquatic life protection in fresh and marine waters.

—Massachusetts toxicity control policy adopted with the standards incorporates a $10^{-6}$ risk level.

—December 20, 1990. EPA fully approved the Massachusetts toxics criteria as fully satisfying the requirements of section 303(c)(2)(B).

EPA fully approved the criteria for priority toxic pollutants adopted by Massachusetts as being consistent with option 1 of the December 12, 1988 section 303(c)(2)(B) guidance document.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

New Hampshire is included in today's proposal because although the State adopted numeric criteria for some priority toxic pollutants before the 1987 amendments, the State has not completed a review of their numeric criteria for priority toxic pollutants in response to the statutory requirement and EPA has reason to believe that at least some additional criteria are necessary to comply with section

303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

New Hampshire's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—August 1990. The State adopted water quality standards revisions following an option 1 approach using EPA national criteria for all pollutants. New Hampshire used a $10^{-6}$ risk assumption for human health protection for all pollutants except 2,3,7,8–TCDD for which a risk level of $10^{-5}$ was assumed.

—December 19, 1990. The revised toxics criteria adopted by the State were approved with the exception of the human health criteria for dioxin, which was disapproved.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 126 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory data base and/or the Permit Compliance System data base.

Rhode Island is included in today's proposal because although the State has completed a review and adopted numeric criteria for some priority pollutants in response to the statutory requirement, EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Rhode Island's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—October 1989. The State adopted revised WQS incorporating an option 1 approach for all section 304(a)(1) criteria for aquatic life protection in fresh and marine waters. No criteria were adopted for the protection of human health.

—March 30, 1989. EPA approved the water quality standards and informed Rhode Island that to come into full compliance with Section 303(c)(2)(B) that the State would have to adopt human health criteria.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the State section 304(1) short list for which State toxics criteria have not been adopted and approved.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric

criteria for an as yet undetermined number of priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

—Superfund monitoring data indicating presence of priority pollutants at hazardous waste sites that may enter surface water through surface drainage and ground water migration.

—The Narragansett Bay Study conducted under the National Estuaries Program which indicated presence of priority pollutants in fish and shellfish tissue.

Vermont is included in today's proposal because the State has not adopted any criteria for priority toxic pollutants, either before or in response to the statutory requirement, and EPA has reason to believe that at least some criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Vermont's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—April 1990. Vermont proposed draft water quality standards revisions following an option 1 approach for all section 304(a)(1) pollutants for aquatic life and human health protection.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 126 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

*Region 2*

New Jersey is included in today's proposal because although the State adopted numeric criteria for some priority toxic pollutants before the 1987 amendments, the State has not completed a review/revision of their numeric criteria for priority toxic pollutants in response to the statutory requirement and EPA has reason to believe that additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

New Jersey adopted criteria for some priority toxic pollutants prior to passage of section 303(c)(2)(B) on April 29, 1985 (N.J.A.C 7:9–4.1 et seq.). EPA approved these criteria on July 8, 1985. Some of these criteria are not affected by today's proposed rulemaking.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—June 20, 1988: the State published a public notice of proposed revisions to the State Surface Water Quality Regulation, including new numeric criteria for toxic pollutants.

—July 14, 1989: The State adopted revisions to the State Surface Water Quality Standards Regulation. Numeric criteria were not included in the adopted revisions.

—July 16, 1990: The State informed EPA that it would be proposing numeric criteria for all EPA priority pollutants.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority

pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the State section 304(1) list for which appropriate State criteria have not been adopted and approved, including metals.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 16 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

—Correspondence from the State indicating that the adoption of criteria for all EPA priority pollutants would be proposed for adoption.

Puerto Rico is included in today's proposal because although the State adopted numeric criteria for some priority toxic pollutants before the 1987 Amendments, the State has not completed a review/revision of their numeric criteria for priority toxic pollutants in response to the statutory requirement and EPA has reason to believe that additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Puerto Rico adopted criteria for some priority pollutants prior to passage of section 303(c)(2)(B) on February 28, 1983 (Puerto Rico Water Quality Standards Regulation, as amended, promulgated by Environmental Quality Board Resolution Number R-83-5-2). Some of these criteria are not affected by today's proposed rulemaking.

Puerto Rico's actions to respond to the 1987 Section 303(c)(2)(B) requirement can be summarized as follows:

—March 15, 1990: The Commonwealth submitted draft water quality standards revisions to EPA for review prior to issuing proposed standards for public comment.

—May 2-3, 1990 and July 12-13, 1990: The Commonwealth held public hearings on its proposed water quality standards revisions.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the Commonwealth into full compliance with section 303(c)(2)(B). To fully protect Puerto Rico's designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate Commonwealth waters, the criteria in proposed § 231.36(b) for all priority toxic pollutants which are not the subject of approved Commonwealth criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved Commonwealth criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved Commonwealth criteria are not applicable to all appropriate Commonwealth designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect Puerto Rico's designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with Puerto Rico's designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the Commonwealth's section 304(l) short list for which appropriate state criteria have not been adopted and approved, including metals and organic compounds.

—The Commonwealth's efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The Commonwealth has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 9 priority toxic pollutants. These efforts represent evidence of the Commonwealth's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the Commonwealth's priority pollutants for which sufficient Commonwealth numeric criteria have not been adopted, based on surface water monitoring data in STORET.

—Discharge to surface waters of priority pollutants for which sufficient Commonwealth numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

—Previously proposed revisions to Puerto Rico's Water Quality Standards Regulation indicating that numeric criteria for additional priority pollutants are necessary.

New York has not been included in today's proposed rulemaking because the State has water quality standards which meet the requirements of section 303(c)(2)(B). The State has met the requirements of section 303(c)(2)(B) of the Act through a combined Option 2 and Option 3 approach, as described in

EPA's December 12, 1988 guidance document.

State actions in response to the Clean Water Act requirement to adopt criteria may be summarized as follows:

—September 1985: The State adopted numeric criteria for 95 substances or classes of substances, including aquatic life and/or human health criteria. The State also adopted procedures, in regulation, for developing both aquatic life and human health based criteria. The procedures are used for developing the numeric criteria in the standards as well as for developing guidance values to be used for all purposes for which numeric criteria are used. The State has applied these procedures to develop aquatic life or human health based criteria for a total of 215 substances or classes of substances.

—September 30, 1985: EPA approved the State Water Quality Standards submittal.

—June 8, 1990: EPA approved State section 304(l) lists. No segments were included on the "short list" under Section 304(l) due to the presence of EPA priority pollutants for which the State did not have either a numeric criterion or derived guidance value.

—New York State had begun a triennial review prior to the 1987 amendments to the Clean Water Act. A notice of a public hearing and public information meetings was issued on May 25, 1990. The State has proposed the adoption of a limited number of aquatic life and human health based criteria for EPA priority pollutants. Public hearings and meetings were conducted in August 1990. A number of the proposed aquatic life and human based criteria were formerly included as guidance values. The State may be expected to convert additional guidance values during the next triennial review.

EPA approved the criteria for priority toxic pollutants adopted by New York on September 27, 1990, as being consistent with options 2 and 3 of the December 12, 1988 section 303(c)(2)(B) guidance document. In this letter, EPA directed the State to adequately address three issues: the need for greater public participation in the use of guidance values; the need for additional bioconcentration/bioaccumulation-based criteria and guidance values; and participation in the process to identify appropriate water quality criteria for use in developing TMDLs/WLAs for the waters of the New York/New Jersey Harbor Complex. EPA believes that the State has established standards which include or provide for the derivation of numeric criteria for all priority toxic pollutants which "may reasonably be expected to interfere with designated uses".

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

The U.S. Virgin Islands has not been included in today's rulemaking. No EPA priority pollutants have been identified as impairing designated uses in the U.S. Virgin Islands through water quality monitoring and assessment activities. Further, EPA believes that there are no priority toxic pollutants present or discharged to surface waters which "may reasonably be expected to interfere with designated uses."

The following information supports EPA's conclusion:

—June 4, 1989: The U.S. Virgin Islands submitted lists of impaired waters pursuant to section 304(l). No waters were included on the section 304(l) "short list." No EPA priority pollutants were identified as impairing uses on other section 304(l) lists.

—May 9, 1990: EPA approved section 304(l) lists submitted by the U.S. Virgin Islands.

EPA has determined that the Water Quality Standards of the U.S. Virgin Islands fully meet the requirements of CWA section 303(c)(2)(B).

If additional information is submitted during the public comment period asserting that the U.S. Virgin Islands has not fully complied with section 303(C)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

*Region 3*

Virginia is included in today's proposal because although the State adopted numeric criteria for some priority toxic pollutants before the 1987 amendments, such criteria are not mandatory in application and, furthermore, the State has not completed a review of their numeric criteria for priority toxic pollutants in response to the statutory requirement. EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirements can be summarized as follows:

—September 29, 1987. The State Water Control Board adopted a resolution to adopt numerical criteria for toxic pollutants immediately after EPA issuance of CWA section 303(c)(2)(B) guidance.

—November 29, 1988. The State held a public meeting to receive comments on the adoption of criteria for toxic pollutants.

—December 30, 1988. EPA sent the State final "Guidance for State Implementation of Water Quality Standards for CWA section 303(c)(2)(B)."

—January 10, 1989. EPA submitted formal comments from the public meeting.

—October 23, 1989. Virginia requested EPA to submit recommendations for its triennial review.

—November 21, 1989. EPA responded to Virginia's request for triennial review recommendations.

—December 14, 1989. Virginia began public meetings to receive comments on issues to be included in the triennial review.

—February 12, 1990. Virginia began public hearings on a water quality standard for dioxin.

—February 16, 1990. EPA informed the State of EPA's intent to include the State in the national rule to promulgate numeric water quality criteria for priority toxic pollutants for those States which failed to meet the requirements of section 303(c)(2)(B).

—March 5, 1990. EPA submitted comments on Virginia's proposed dioxin standard.

—April 9, 1990. The EPA Assistant Administrator for the Office of Water informed the State that it was going to be included in a proposed national rule to establish numeric surface water criteria for toxic pollutants designed to bring all States into full compliance with the requirements of section 303(c)(2)(B).

—July 25, 1990. Virginia began public hearings on proposed water quality standards, including criteria for toxics.

—August 7, 1990. EPA submitted comments on Virginia's proposed standards.

—August 17, 1990. Virginia reproposed changes to the water quality standards for public comment.

—September 14, 1990. EPA submitted comments on the revisions to the proposed water quality standards.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed section 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the State section 304(l) short list for which mandatory State criteria have not been adopted and approved.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has adopted a human health criterion for dioxin and has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 67 other priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

Delaware has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—December 30, 1988. EPA sent the State final "Guidance for State Implementation of Water Quality Standards for CWA Section 303(c)(2)(B)."

—November 18, 1988. First draft revisions to water quality standards, including toxics.

—January 25, 1989. Second draft revisions to water quality standards.

—March 1, 1989. Third draft revisions to standards.

—June 1, 1989. Workshop draft of water quality standards, including development documents.

—June 12, 1989. Delaware began public workshops on standards revisions.

—July 10, 1989. EPA provided preliminary comments on the workshop draft revisions.

—July 28, 1989. Delaware submitted revised standards for EPA review.

—September 6, 1989. Delaware held a public hearing on the triennial review revisions to the water quality standards.

—September 6, 1989. EPA provided comments at the public hearing.

—February 2, 1990. Delaware adopted revisions to the water quality standards.

—February 5, 1990. Delaware submitted revised standards to EPA.

—February 16, 1990. EPA informed the State of EPA's intent to include the State in the national rule to promulgate numeric water quality criteria for priority toxic pollutants for those States which failed to meet the requirements of section 303(c)(2)(B).

—March 13, 1990. Delaware completed a responsiveness summary for its standards review.

—March 21, 1990. Delaware's Attorney General certified the revised standards.

—April 9, 1990. The EPA Assistant Administrator for the Office of Water informed the State that it was going to be included in a proposed national rule to establish numeric, surface water criteria for toxic pollutants designed to bring all States into full compliance with the requirements of section 303(c)(2)(B).

—August 24, 1990. EPA approved Delaware's revised standards for toxics.

EPA fully approved the criteria for priority toxic pollutants adopted by Delaware on February 2, 1990 as being consistent with option 2 of the December 12, 1988 section 303(c)(2)(B) guidance document. As part of its submittal of revised standards for EPA review, the State included information which demonstrated that numeric criteria had been adopted for all priority toxic pollutants which "may reasonably be expected to interfere with designated uses."

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Maryland has not been included in today's proposed rulemaking, because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(C)(2)(B) requirement and received Environmental Protection Agency (EPA) approval for the criteria portion of the water quality standards.

The State's response to the 1987 section 303(C)(2)(B) requirement can be summarized as follows:

—December 30, 1988. EPA sent the State final "Guidance for State Implementation of Water Quality Standards for CWA section 303(c)(2)(B)."

—February 16, 1990. EPA informed the State of EPA's intent to include the State in the national rule to promulgate numeric water quality criteria for priority toxic pollutants for those States which failed to meet the requirements of section 303(c)(2)(B).

—March 21, 1990. The State adopted revised water quality standards which

included numeric criteria for priority toxic pollutants.

—April 9, 1990. The EPA Assistant Administrator for the Office of Water informed the State that it was going to be included in a proposed national rule to establish numeric, surface water criteria for toxic pollutants designed to bring all States into full compliance with the requirements of section 303(c)(2)(B).

—April 30, 1990. The State submitted the adopted water quality standards with a State Attorney General certification to EPA for approval/disapproval.

—May 4, 1990. The State proposed in the Maryland Register to adopt maximum contaminant levels (MCLs) for selenium and silver as drinking water criteria, which corrects a printing error resulting in the criteria being placed in the wrong column in the regulations proposed on November 3, 1989.

—June 12, 1990. Maryland submitted for EPA review the public hearing record for the toxic substances regulations proposed November 3, 1989.

—September 12, 1990. EPA approved the revised State numeric criteria for priority toxic pollutants.

EPA approved the criteria for priority toxic pollutants adopted by Maryland on March 21, 1990, as being consistent with option 2 of the December 12, 1988 section 303(c)(2)(B) guidance document. As part of its submittal of final revised standards for EPA review, the State included information which demonstrated that numeric criteria had been adopted for all priority toxic pollutants which "may reasonably be expected to interfere with designated uses".

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Pennsylvania has not been included in today's proposed rulemaking because the State has adopted a translator procedure to derive numeric criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—August 28, 1987. The State submitted to EPA a proposed list of issues to be addressed during the triennial water quality standards review.

—April 5, 1988. EPA submitted comments on the draft proposed revisions to the water quality standards.

—June 16, 1988. The State held a public hearing on its proposed water quality standards revisions, at which EPA provided verbal testimony.

—June 20, 1988. EPA submitted written comments to the State regarding the proposed water quality standards revisions.

—November 15, 1988. The State adopted revised water quality standards which included a translator procedure (option 3) for deriving numeric criteria for priority toxic pollutants.

—December 30, 1988. EPA sent the State final "Guidance for State Implementation of Water Quality Standards for CWA section 303(c)(2)(B)."

—April 17, 1989. The State submitted the adopted water quality standards with a State Attorney General certification to EPA for approval/disapproval.

—July 21, 1989. EPA requested clarification on the enforceability of the procedure adopted to derive criteria for priority toxic pollutants.

—July 28, 1989. The State responded to EPA's clarification request.

—September 29, 1989. EPA conditionally approved the State's water quality standards due to concerns regarding the enforceability and public participation of the translator procedure and the derived criteria.

—November 15, 1989. The State responded to EPA's conditional approval.

—January 18, 1990. EPA requested additional clarification regarding the State's response to the conditional approval.

—February 16, 1990. EPA informed the State of EPA's intent to develop a national rule to promulgate numeric water quality criteria for priority toxic pollutants for those States which failed to meet the requirements of section 303(c)(2)(B).

—February 20, 1990. The State provided additional clarification, in response to EPA's January 18, 1990, letter.

—April 9, 1990. The EPA Assistant Administrator for the Office of Water informed the State that it was going to be included in a proposed national rule to establish numeric, surface water criteria for toxic pollutants designed to bring all States into full compliance with the requirements of section 303(c)(2)(B).

—April 11, 1990. EPA approved the translator procedure for developing criteria for priority toxic pollutants.

EPA fully approved the procedure for developing numeric criteria for priority toxic pollutants which was adopted by Pennsylvania on November 15, 1988 as being consistent with option 3 of the December 12, 1988 section 303(c)(2)(B) guidance document.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

West Virginia has not been included in today's proposal because the State has adopted criteria for priority toxic pollutants in response to the statutory requirement and will receive full EPA approval by September 13, 1990.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—June 23, 1988. The State submitted a draft list of toxic pollutants for criteria development to EPA for review prior to issuing proposed standards for public comment.

—July 25, 1988. EPA provided written comments on the draft list of toxic pollutants for criteria development.

—September 12, 1988. The State held a public hearing on its proposed water quality standards revisions, at which EPA provided verbal testimony.

—September 21, 1988. EPA provided written comments on the proposed revisions to the water quality standards.

—October 18, 1988. The State submitted proposed revisions to EPA for review and approval.

—December 30, 1988. EPA sent the State final "Guidance for State Implementation of Water Quality Standards for CWA section 303(c)(2)(B)."

—April 27, 1989. The State adopted final revisions to the water quality standards.

—September 29, 1989. EPA disapproved criteria for seven priority pollutants. Aquatic life criteria were disapproved for arsenic, cadmium, mercury, nickel, lead, selenium, and silver. Human health criteria were disapproved for arsenic, mercury and nickel. In addition, EPA disapproved site-specific toxics criteria (cyanide, hexavalent chromium, and copper) for two waterbody segments (Little Scary Creek and Turkey Run).

—November 13, 1989. The State responded to EPA's disapproval of the final revisions to the water quality standards.

—January 30, 1990. The State sent a letter to EPA which stated that the permittee discharging to Turkey Run

was relocating its outfall to another water body.

—January 31, 1990. EPA responded to the State's November 13, 1989 reply to EPA's disapproval of the water quality standards revisions.

—February 16, 1990. EPA informed the State of EPA's intent to develop a national rule to promulgate numeric water quality criteria for priority toxic pollutants for those States which failed to meet the requirements of section 303(c)(2)(B).

—March 12, 1990. EPA granted the State an extension to address EPA's disapproval.

—April 9, 1990. The EPA Assistant Administrator for the Office of Water informed the State that it was going to be included in a proposed national rule to establish numeric surface water criteria for toxic pollutants designed to bring all States into full compliance with the requirements of section 303(c)(2)(B).

—April 1990. The State submitted rejustification for a disapproved site-specific criterion for copper.

—June 13, 1990. The State submitted emergency revisions to the water quality standards to address EPA's disapproval.

—July 16, 1990. The State held a public hearing on its emergency rulemaking, at which EPA provided verbal testimony.

—July 25, 1990. The State submitted comments received on the standards revisions by industrial representatives and requested EPA's reaction to the comments.

—July 27, 1990. EPA held a conference call with the State and discharger to Little Scary Creek to discuss the site-specific copper criteria rejustification submitted in April, 1990.

—August 2, 1990. EPA sent the State recommended revised site-specific copper criteria for Little Scary Creek.

—August 13, 1990. EPA replied to the State's July 25, 1990 request to respond to comments received by industrial representatives.

—August 20, 1990. The State adopted final emergency revisions to the water quality standards to address EPA's remaining concerns.

—August 27, 1990. The State submitted the adopted final emergency revisions to the water quality standards with a State Attorney General certification to EPA for approval/ disapproval.

—September 18, 1990. EPA fully approved the State's revised State water quality standards, including full approval of the revised numeric criteria for priority toxic pollutants.

EPA fully approved the criteria for priority toxic pollutants adopted by West Virginia on August 20, 1990 as being consistent with option 2 of the December 12, 1988 section 303(c)(2)(B) guidance document. As part of its submittal of final revised standards for EPA review, the State included information which demonstrated that numeric criteria had been adopted for all priority toxic pollutants which "may reasonably be expected to interfere with designated uses."

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

The District of Columbia is included in today's proposal because although the District adopted numeric criteria for most priority toxic pollutants before the 1987 amendments, the District has not completed a review of their numeric criteria for priority toxic pollutants in response to the statutory requirement, and EPA has reason to believe that at least some additional criteria are necessary and some criteria need to be revised to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the District is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

On August 26, 1985, prior to the passage of section 303(c)(2)(B), the District of Columbia adopted under emergency powers some criteria for priority toxic pollutants, chapter 11 of title 21 DCMR, "Water Quality Standards of the District of Columbia." EPA approved these criteria on October 31, 1985. The District made the emergency rules final on December 27, 1985.

The District's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—August 26, 1988. EPA sent comments to the District as to what issues should be addressed for the upcoming triennial water quality standards review.

—December 30, 1988. EPA sent the State final "Guidance for State Implementation of Water Quality Standards for CWA section 303(c)(2)(B)."

—February 15, 1989. The District submitted draft water quality standards revisions to EPA for review prior to issuing proposed standards for public comment.

—May 30, 1989. EPA sent the District a letter which emphasized the need for expediting the triennial water quality standards review.

—June 26, 1989. The District submitted proposed water quality standards revisions to EPA for review.

—July 5, 1989. The District held a public hearing on the proposed water quality standards revisions.

—September 15, 1989. The District submitted revised proposed water quality standards revisions to EPA for review.

—September 25, 1989. EPA submitted comments on the proposed water quality standards revisions and indicated that the District must adopt human health criteria for the consumption of fish.

—October 3, 1989. The District responded to EPA's comments.

—November 3, 1989. EPA provided additional comments on the proposed water quality standards revisions.

—December 11, 1989. EPA telephoned the District to inquire about a response to EPA's November 3, 1989, letter and the status of the water quality standards revisions.

—February 16, 1990. EPA informed the District of EPA's intent to develop a national rule to promulgate numeric water quality criteria for priority toxic pollutants for those States which failed to meet the requirements of section 303(c)(2)(B).

—April 9, 1990. The EPA Assistant Administrator for the Office of Water informed the State that it was going to be included in a proposed national rule to establish numeric surface water criteria for toxic pollutants designed to bring all States into full compliance with the requirements of section 303(c)(2)(B).

—September 7, 1990. The District public noticed for comment proposed water quality standards revisions.

—October 5, 1990. EPA submitted comments on the proposed water quality standards revisions.

The District has adopted aquatic life criteria for 120 priority toxic pollutants and human health criteria for 107 priority toxic pollutants. The aquatic life criteria for two of the pollutants (selenium and toxaphene) and the human health criterion for one of the pollutants (hexachlorobenzene) exceed EPA's section 304(a)(1) criteria recommendations. Therefore, EPA believes that revised criteria for these pollutants are necessary. The District did not adopt human health criteria applicable to public water supplies for nine priority toxic pollutants (lead, asbestos, 2,3,7,8-tetrachlorodibenzo-p-

dioxin, vinyl chloride, bis(2-chloroisopropyl) ether, bis(2-ethylhexyl) phthalate, diethyl phthalate, dimethyl phthalate, and di-n-butyl phthalate) and has not provided justification that the discharge or presence of these pollutants cannot reasonably be expected to interfere with designated uses in the District's surface waters. Therefore, EPA believes that human health criteria for the consumption of water are necessary for these pollutants.

The District has not adopted any criteria for the protection of humans from the consumption of fish. Since the District's 1989 State Clean Water Strategy identifies that fishing does occur on District waters, EPA believes it is necessary to propose human health criteria for fish consumption for all priority toxic pollutants for which EPA has issued section 304(a)(1) criteria recommendations.

This proposed rulemaking would federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 12 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient numeric criteria have not been adopted, based on surface water monitoring data in STORET.

*Region 4*

Alabama has not been included in today's proposed rulemaking because the State has adopted criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—January 24, 1990. The Alabama Environmental Management Commission adopted the triennial review of water quality standards.

—May 23, 1990. The State Attorney General notified EPA that the adopted water quality standards would not be certified.

—June 1, 1990. The State sent EPA a copy of the revised standards without a request for formal EPA review and approval.

—November 26, 1990. The State submitted draft water quality standards revisions for EPA review. These revisions include: (1) Criteria for protection of aquatic life based on an Option I approach as described in EPA's December 12, 1988 guidance document, (2) numeric criteria for protection of human health for 17 priority toxic pollutants based on Option II of the guidance, and (3) proposed criteria equations based on Option III of the guidance for the protection of human health for the remaining priority toxic pollutants.

—January 17, 1991. The State held public hearings on the proposed revisions to water quality standards.

—February 20, 1991. The State adopted revisions to water quality standards including the numeric criteria for priority toxic pollutant based on an Option I approach as described in EPA's December 12, 1988 guidance document.

—April 18, 1991. EPA received the State's request for formal review of the adopted water quality standards.

—May 24, 1991. The State Attorney General submitted information relating to the legal certification of the adopted water quality standards.

—July 3, 1991. The State Attorney General submitted further information relating to the legal certification of the adopted water quality standards.

—July 18, 1991. EPA approved the revised State water quality standards.

EPA fully approved the criteria for priority toxic pollutants adopted by Alabama on July 19, 1991 as being consistent with Option I of the December 12, 1988 guidance document.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Florida is included in today's proposal because although the State has adopted numeric criteria for priority toxic pollutants in response to the statutory requirement, the State has not yet requested or obtained EPA approval of the adopted criteria. In addition, EPA has reason to believe that criteria for at least one other priority toxic pollutant is necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

On September 24, 1987 EPA approved the previous triennial review of Florida Water quality standards with the exception of three areas of the water quality standards which were disapproved. Included in the water quality standards which were approved by EPA were several numeric criteria for toxic priority pollutants derived for the protection of aquatic life. These criteria were initially adopted by the State as water quality standards in adoption proceedings prior to 1985. These criteria were not revised in the State's triennial review completed in 1987.

These criteria included criteria values which are less stringent in value than several of the national ambient water quality criteria included in the proposed rulemaking. Data used to develop the national ambient water quality criteria were not available for consideration by the State at the time of the initial adoption of these criteria by the State.

In the letter approving revisions to water quality standards, EPA instructed the State "to initiate a review of existing criteria at the earliest possible date." This review was necessary to address the 1987 requirements of section 303(c)(2)(B) for adoption of numeric criteria for toxic priority pollutants.

In directing the State to complete this review, EPA stated, "Recent changes in federal law relating to water quality standards will make it necessary for the State to complete an extensive review of water quality criteria during the next triennial review of water quality standards. The Water Quality Act of 1987 mandates that each state adopt numerical criteria for all 307(a) toxics for which national criteria are available or adopt procedures which will result in numeric limitations in National Pollutant Discharge Elimination System permits for these contaminants.

Considering the above, EPA is including the national ambient aquatic life-based water quality criteria values for these toxic priority pollutants in this proposed rulemaking.

In addition, the criteria adopted by the State in 1990 for the protection of human health have not been formally submitted and certified to EPA with a request for approval. Therefore, EPA is including all national ambient water quality criteria for protection of human health (as a class of criteria).

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—December 27, 1989. The State submitted draft water quality standards revisions to EPA for review. These revisions include proposed criteria for protection of human health based on an Option II approach as described in EPA's December 12, 1988 guidance document as well as updates to adopted criteria for protection of aquatic life.

—February 7 and May 1, 1990. The State held public workshops on its proposed water quality standards revisions.

—December 7, 1990. The State adopted revisions to water quality standards which include 68 numeric criteria for priority toxic pollutants.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed section 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—priority toxic pollutants on the section 304(1) lists;

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has adopted new or revised chemical-specific, numeric criteria for 66 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Priority toxic pollutants for which there exist water quality-based limits in an NPDES permit or where NPDES permit screening shows that the Federal 304(a) criteria may be exceeded instream;

—Priority toxic pollutant ambient monitoring data or site specific data which show that the Federal 304(a) criteria in the water column or in fish tissue may be exceeded;

—Priority toxic pollutant data in the Toxics Release Inventory under section 313 of SARA title III or in the National Bioaccumulation Study which show that the Federal 304(a) criteria in the water column or in fish tissue may be exceeded;

—Priority toxic pollutant data for which there are reasonable expectations that the Federal 304(a) criteria will be exceeded in the water column or fish tissue as a result of impacts from Superfund or RCRA sites; and

—Consideration of other data such as sediment data and location of storage facilities of priority toxic pollutants where these pollutants could reasonably be expected to interfere with designated uses.

Georgia has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 Section 303(c)(2)(B) requirement can be summarized as follows:

—December 7, 1988. The State adopted revisions to water quality standards which included 12 criteria for 307(a) toxics.

—December 8, 1988. The State submitted the adopted revisions to water quality standards for review and approval.

—March 29, 1989. EPA disapproved the adopted 307(a) criteria adopted by the State.

—December 6, 1989. The State adopted water quality standards which included an Option I approach for the section 303(c)(2)(B) requirement with the exception of 2,3,7,8 TCDD (dioxin) and PCBs.

—December 14, 1989. The State submitted the adopted revisions to water quality standards for review and approval.

—March 28, 1990. The State adopted water quality criteria for dioxin and PCBs.

—April 3, 1990. EPA approved the priority toxic pollutant criteria adopted by the State on December 6, 1989.

—May 29, 1990. The State submitted the adopted criteria for dioxin and PCBs for EPA review and approval.

—October 29, 1990. The State submitted draft revisions to water quality standards including revised criteria for dioxin.

—November 27, 1990. EPA disapproved the adopted criteria for dioxin and approved the adopted criteria for PCBs.

—January 23, 1991. The State adopted revised criteria for dioxin.
—April 2, 1991. The State submitted the revised water quality standard for dioxin with a State Attorney General certification to EPA for approval.
—June 3, 1991. EPA approved the dioxin criteria, thus bringing the State into full compliance with section 303(c)(2)(B).

EPA fully approved the criteria for priority toxic pollutants on June 3, 1991 as being consistent with Option 1 of the December 12, 1988 guidance.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency s determination of full compliance.

Kentucky has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—May 31, 1990. The State adopted revised water quality standards which included numeric criteria for priority toxic pollutants based on Option I approach for the section 303(c)(2)(B) requirement.
—June 29, 1990. The State submitted the adopted water quality standards with a State Attorney General certification to EPA for approval.
—October 5, 1990. EPA approved the revised State water quality standards, including full approval of the revised numeric criteria for priority toxic pollutants.

EPA fully approved the criteria for priority toxic pollutants adopted by Kentucky on October 5, 1990 as being consistent with Option I of the December 12, 1988 guidance document.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Mississippi has not been included in today's proposed rulemaking because the State has adopted criteria for priority toxic pollutants in response to the section 303(c)(2(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—March 22, 1990. The State adopted revisions to water quality standards in response to the section 303(C)(2)(B) requirement. The adopted revisions did not include criteria for dioxin.
—May 14, 1990. The State submitted the adopted revisions to water quality standards for review and approval.
—October 5, 1990. EPA approved the water quality criteria adopted by the State with the exception of the absence of criteria for dioxin, which was disapproved.
—January 29, 30 and 31, 1991. The State held public hearings to receive comments on the proposed dioxin criteria.
—March 28, 1991. The State adopted dioxin criteria of 1.0 ppq for protection of human health from the exposure routes of consumption of fish and shellfish and consumption of water.
—July 12, 1991. The State submitted the adopted dioxin criteria for EPA review and approval.
—July 15, 1991. The State submitted the adopted dioxin criteria for EPA review and approval.
—July 24, 1991. EPA approved the State-adopted water quality criteria for dioxin.

EPA fully approved the criteria for priority toxic pollutants adopted by Mississippi on July 24, 1991, as being consistent with Options I and III of the December 12, 1988 guidance document.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

North Carolina has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—July 13, 1989. The State adopted revisions to water quality standards in response to the section 303(C)(2)(B) requirement.
—October 27, 1989. The State submitted the adopted revisions to water quality standards for review and approval.
—April 12, 1990. EPA approved the water quality criteria adopted by the State with the exception of the criteria for arsenic (saltwater), chromium - (freshwater), copper, lead, pentachlorophenol and zinc.
—October 5, 1990. EPA approved the adopted criteria for chromium (freshwater) and decided that no criteria were required for pentachlorophenol to meet the 303(c)(2)(B) requirement. In addition, EPA conditionally approved the criteria for arsenic (saltwater), copper, lead and zinc based on a commitment by the State that revisions to these criteria would be adopted by the State by December 13, 1990.
—December 13, 1990. The State adopted revised criteria for arsenic, copper, chromium, lead and zinc.
—January 18, 1991. The State submitted the adopted water quality standards with a State Attorney General certification to EPA for approval.
—February 7, 1991. EPA approved the revised North Carolina water quality standards, including full approval of the revised criteria for priority toxic pollutants.

On February 7, 1991, EPA fully approved the criteria for priority toxic pollutants adopted by North Carolina as being consistent with Options II and III of the December 12, 1988 guidance document.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

South Carolina has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—April 27, 1990. The State Legislature adopted revisions to water quality standards in response to the section 303(c)(2)(B) requirement.
—May 28, 1990. The State submitted the adopted revisions to water quality standards for review and approval.
—June 14, 1990. The State submitted for EPA review draft water quality standards revisions including numeric human health-based criteria based on Option I of the December 12, 1988 guidance document.
—August 1 and 2, 1990. The State held public hearings on proposed revisions to water quality standards which included 103 water quality criteria for protection of human health.
—October 5, 1990. EPA approved the water quality criteria adopted by the State with the exception of the criteria for protection of human health as a

class of criteria. The human health criteria for arsenic and lead were approved by EPA.

—October 11, 1990. The South Carolina Board of Health and Environmental Control promulgated the proposed revisions to water quality standards which included 103 criteria for the protection of human health.

—December 7, 1990. Promulgation by the Board of the South Carolina Department of Health and Environmental Control.

—March 13, 1991. Attorney General certification made.

—April 26, 1991. Revisions to South Carolina Water Classifications and Standards, Regulation 61–68, pertaining to numeric human health criteria for Clean Water Action section 307(a) toxics became effective upon publication in the State Register.

—May 8, 1991. The State submitted the adopted human health criteria for EPA review and approval.

—July 9, 1991. EPA approved the adopted standards, thus bringing the State into full compliance with section 303(c)(2)(B).

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Tennessee has not been included in today's proposed rulemaking because the State has adopted criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—May 1, 1989. The State submitted draft water quality standards revisions to EPA for review.

—December 15, 1989. The State submitted draft water quality standards revisions to EPA for review. The proposal included revisions to the draft water quality standards based on comments made by EPA and the public.

—December 15, 1989. The State held a public hearing on proposed revisions to water quality standards.

—July 30, 1990. The State submitted draft water quality standards revisions to EPA for review. The proposal included revisions to the draft water quality standards based on comments made by EPA and the public.

—November 15, 1990. The State held a second public hearing on proposed revisions to the water quality standards.

—January 17, 1991. The State adopted revised water quality standards which included numeric criteria for priority toxic pollutants based on Option II of EPA's December 12, 1988 guidance.

—August 14, 1991. The State submitted the adopted water quality standards with a State Attorney General certification to EPA for approval.

—September 28, 1991. EPA approved the revised State water quality standard, including full approval of the criteria for toxic pollutants.

EPA fully approved the criteria for toxic pollutants adopted by Tennessee on September 28, 1991 as being consistent with Option II of the December 12, 1988 guidance.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

*Region 5*

Wisconsin has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirements can be summarized as follows:

—February 1987. The Natural Resources Board authorized public hearings on Chapter NR 105.

—December 1987. The Natural Resources Board authorized public hearings on Chapter NR 106.

—Thirteen public hearings were held on the water quality standards revisions in 1987 and 1988.

—November 17, 1988 and December 15, 1988. The State adopted revised water quality standards (Chapter NR 106 and Chapter NR 105, respectively) which included numeric criteria for priority pollutants.

—February 3, 1989. Wisconsin Department of Natural Resources submitted the adopted water quality standards with a State Attorney General certification to EPA for approval/disapproval.

—March 1, 1989. Water quality standards became effective.

—May 15, 1989. USEPA approved the revised State water quality standards, including full approval of the revised numeric criteria for priority toxic pollutants.

USEPA fully approved the criteria for priority toxic pollutants adopted by Wisconsin on November 17 and December 15, 1988 as being consistent with option 2 of the December 12, 1988, section 303(c)(2)(B) guidance document. As part of its submittal of final revised standards for USEPA review, the State included information which demonstrated that numeric criteria had been adopted for all priority toxic pollutants which "may reasonably be expected to interfere with designated uses."

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Illinois has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirements can be summarized as follows:

—January 25, 1990. The State adopted revised water quality standards which included criteria for priority toxic pollutants.

—February 2, 1990. The State submitted the adopted water quality standards with a State Attorney General certification to USEPA for approval/disapproval.

—February 13, 1990. Water quality standards rules became effective.

—February 15, 1990. USEPA approved the revised water quality standards (Docket A), including full approval of the revised criteria for priority pollutants.

USEPA fully approved the criteria for priority toxic pollutants adopted by Illinois on January 25, 1990 as being consistent with a combination of options 2 and 3 of the December 12, 1988 section 303(c)(2)(B) guidance document. As part of its submittal of final revised standards for USEPA review, the State included information which demonstrated that numeric criteria had been adopted for all priority toxic pollutants which "may reasonably be expected to interfere with designated uses."

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the

Agency's determination of full compliance.

Indiana has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirements can be summarized as follows:

—March 1, 2, and 7, 1989. The State conducted public hearings for the water quality standards rules revisions.

—December 13, 1989. The State adopted revised water quality standards which included criteria for priority toxic pollutants. The Governor signed the revised standards on January 31, 1990.

—March 3, 1990. Water quality standards rules became effective.

—April 5, 1990. The State submitted the adopted water quality standards with a State Attorney General certification to USEPA for approval/disapproval.

—May 7, 1990. USEPA approved the revised water quality standards including full approval of the revised numeric criteria for priority pollutants.

USEPA fully approved the criteria for priority toxic pollutants adopted by Indiana on December 15, 1989 as being consistent with a combination of options 2 and 3 of the December 12, 1988 section 303(c)(2)(B) guidance document. As part of its submittal of final revised standards for USEPA review, the State included information which demonstrated that numeric criteria had been adopted for all priority toxic pollutants which "may reasonably be expected to interfere with designated uses."

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Ohio has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirements can be summarized as follows:

—November 28, 29 and 30, 1989. Ohio EPA conducted public hearings addressing water quality standards revisions.

—December 18, 1989 Public record closed.

—February 1, 1990. The State adopted revised water quality standards which included criteria for priority toxic pollutants.

—February 12, 1990. The State submitted the adopted water quality standards to USEPA for approval/disapproval.

—March 13, 1990. The State submitted the required Attorney General certification of the water quality standards.

—April 25, 1990. USEPA approved the revised water quality standards including full approval of the revised numeric criteria for priority pollutants.

—May 1, 1990. Water quality standards rules became effective.

USEPA fully approved the criteria for priority toxic pollutants adopted by Ohio on February 1, 1990 as being consistent with a combination of options 2 and 3 of the December 12, 1988 section 303(c)(2)(B) guidance document. As part of its submittal of final revised standards for USEPA review, the State included information which demonstrated that numeric criteria had been adopted for all priority toxic pollutants which "may reasonably be expected to interfere with designated uses."

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Michigan is included in today's proposal because although the State adopted criteria for priority pollutants before the 1987 amendments, the State has not completed a review of their criteria for priority toxic pollutants in response to the statutory requirement and USEPA has reason to believe that modification of the water quality standards is necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Michigan adopted criteria for priority toxic pollutants consistent with option 3 of the December 12, 1988 section 303(c)(2)(B) guidance document prior to actual passage of section 303(c)(2)(B) on November 14, 1988 (General Rules of the Michigan Water Resources Commission, Part 4, Water Quality Standards, R 323 of the Michigan Administrative Code). USEPA approved these criteria on August 4, 1987. However, the translator mechanism guidelines implementing Rule 57 were not included within the water quality standards regulation itself and, therefore, the criteria calculated through the implementation of this procedure were not binding upon the Water Resources Commission but instead are considered to be recommendations to the Commission. The State's efforts in response to section 303(c)(2)(B) have consisted of bringing the existing option 3 procedure within Rule 57 itself, thereby making implementation of the procedure-generated criteria in permits mandatory.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirements can be summarized as follows:

—July 21, 1988. MDNR staff presented and the Michigan Water Resources Commission approved a proposed water quality standards review process and schedule.

—August, September and October 1988. Informal public comment on requests for changes in the water quality standards taken in Water Resources Commission meetings at Houghton, Lansing and Tawas, Michigan, respectively.

—February 28, 1989. Scoping session held by MDNR staff with interested parties prior to development of water quality standards package.

—August 20, 1989. Draft proposed water quality standards package as presented to the Commission and was approved for informal public comment through September 29, 1989.

—October 20, 1989. Staff presented a draft proposed standards package to the Commission which the Commission approved for formal public hearings.

—December 31, 1989. The proposed water quality standards were published in the November, 1989 Michigan Register along with a Notice of Public Hearing.

—February 20, 21 and 22, 1990. Public Hearings on the proposed standards were held in Lansing, Traverse City and Marquette, respectively.

—April 2, 1990. Public comment period ended.

—May 1990. Water Resources Commission approved revised water quality standards.

—September 1990. Revised water quality standards are to go before Joint Committee on Administrative Rules (JCAR) for approval/disapproval. The JCAR dropped this item from its agenda and did not address it during 1990. The Michigan

DNR has again submitted the existing revisions to JCAR for its review during February 1991.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the Michigan Section 304(l) short list (February 3, 1989) for which State criteria consistent with Section 303(c)(2)(B) have not been adopted and approved, including metals, dioxin, and polynuclear aromatic hydrocarbons.
—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET.
—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.
—1990 Michigan 305(b) Report.
—Current implementation of Michigan's Rule 57 in the State's NPDES program (e.g., Form 2c data, presence of water quality-based effluent controls in existing NPDES permits).

Minnesota has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirements can be summarized as follows:

—December 1989. Minnesota Pollution Control Agency begins rulemaking proceedings on amendments to Minnesota Rules Chapter 7050.
—February 1 to March 16, 1990. Minnesota Pollution Control Agency holds nine public hearings addressing the revised standards.
—April 10, 1990. Public record for the standards revisions closed.
—May 10, 1990. Administrative Law Judge issued his report on the standards revisions.
—June 25, 1990. Minnesota Pollution Control Agency staff met with the Minnesota Pollution Control Agency Board—Water Quality Committee to discuss standards revision issues.
—July 24, 1990. Board approved and adopted the standards revisions.
—July 16, 1991. EPA approved the revised Minnesota water quality standards, including full approval of the revised criteria for priority toxic pollutants.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

*Region 6*

Arkansas is included in today's proposal because although the State has completed a review and adopted numeric criteria for some priority toxic pollutants in response to the statutory requirement, EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Arkansas adopted some criteria for priority pollutants on November 1984 and January 1988. EPA approved these criteria on 1/28/85 and 5/6/88 and these criteria are not affected by today's rulemaking.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—November 1984. The State adopted revised water quality standards that included numeric criteria for 16 toxic substances to protect aquatic life. These were approved by EPA on January 28, 1985.
—January 1988. The State adopted revised water quality standards that included numeric criteria for 24 priority pollutants to protect aquatic life. These were approved by EPA on May 6, 1988.
—July 27, 1990. The State proposed revised water quality standards that included numeric criteria for 38 priority pollutants to protect aquatic life and for 13 priority pollutants to protect human health at a 10–6 risk.
—August 27, 1990. The State held a public hearing to receive public comment on the proposed revisions mentioned above.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted

to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). A list of the pollutants requiring criteria was included in letters to the State dated February 15, 1990 and June 11, 1990 (copies are contained in the record). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the State section 304(l) short list for which State criteria consistent with Section 303(c)(2)(B) have not been adopted and approved.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 7 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET and the National Bioaccumulation Study.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

Louisiana is included in today's proposal because although the State has adopted criteria for some priority toxic pollutants in response to the statutory requirement, EPA disapproved the lack of criteria for dioxin and has reason to believe that some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with Section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

The State completed a triennial revision of its water quality standards since passage of the Clean Water Act (CWA) section 303(c)(2)(B) and adopted revised standards on September 20, 1989. The revised numeric criteria were approved by EPA on December 19, 1989 with the exception of dioxin (no criterion proposed). Since this revision, a review of several databases—STORET, TRI, State 305(b) reports, and NPS assessments—indicated the need for Louisiana to adopt additional numeric criteria for mercury, lead, cadmium, copper and nickel via an Option 2 approach.

On March 20, 1991 the State adopted numeric criteria for 5 metals (cadmium, copper, lead, mercury and nickel). EPA received these revisions for our review on June 20, 1991.

Today's rule would only promulgate numeric criteria for dioxin and the metals listed above. Criteria approved on December 19, 1989 by EPA are not affected by today's proposed rulemaking.

New Mexico has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—June 6, 1988. The State proposed revised water quality standards that included numeric criteria for 11 priority pollutants to protect aquatic life. Additionally, the State proposed a narrative statement about protecting against toxic substances in domestic water supplies that create more than a 10–5 cancer risk.

—June 13, 1990. The State held a public hearing to receive public comment on the proposed revisions mentioned above.

—May 22, 1991. The State adopted numeric criteria for 14 priority pollutants. EPA received these revisions for our review on June 7, 1991.

—August 19, 1991. EPA approved the revised New Mexico water quality standards, including full approval of the revised criteria for priority toxic pollutants.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Oklahoma has not been included in today's proposed rulemaking because the State has adopted criteria for priority pollutants in response to the section 303(c)(2)(B) requirement and received full approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—June 10, 1989. The State adopted revised water quality standards which included numeric criteria for priority toxic pollutants.

—November 1, 1989. The State submitted the adopted water quality standards with a State Attorney General's certification to EPA for approval/disapproval.

—January 18, 1990. EPA approved the revised State water quality standards, including full approval of the numeric criteria for priority toxic pollutants.

EPA fully approved the criteria for priority toxic pollutants adopted by Oklahoma on June 10, 1989 as being consistent with Option 1 for aquatic life criteria and Option 2 for human health criteria as described in the December 12, 1988 section 303(c)(3)(B) guidance document. EPA's review concluded that numeric criteria had been adopted for all priority toxic pollutants which "may reasonably be expected to interfere with designated uses."

If additional information is submitted during the public comment period asserting that the State is not in compliance with section 303(c)(2)(B), EPA will transmit these comments to Oklahoma and will reevaluate the Agency's determination of full compliance after Oklahoma's submittal of their 1992 revised water quality standards to EPA for our approval/disapproval.

Texas has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—April 7, 1988. The State adopted revised water quality standards that included numeric criteria for 30 toxic

substances to protect aquatic life. The numeric criteria adopted for mercury protected human health in addition to aquatic life.

—June 29, 1985. EPA approved the aquatic life criteria for 30 priority toxic pollutants and the human health criterion for mercury.

—December 24, 1990. The State issued proposed water quality standards revisions for public comment. The proposed revisions included numeric criteria for 29 priority pollutants.

—February 25, 1991. The State held a public hearing on the proposed revisions to the water quality standards mentioned above.

—June 12, 1991. The State adopted numeric criteria for 29 priority pollutants. EPA received these revisions for our review on July 1, 1991.

—September 25, 1991. EPA approved the revised Texas water quality standards, including full approval of the revised criteria for priority toxic pollutants.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

*Region 7*

Iowa has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—March 19, 1990—The Iowa Environmental Protection Commission adopted aquatic life use protection criteria for several priority toxic pollutants.

—April 9, 1990—The State submitted the adopted aquatic life criteria to EPA with a proposed effective date of May 23, 1990.

—May 3, 1990—The State submitted draft human health criteria to EPA.

—June 1, 1990—The State resubmitted draft human health criteria to EPA.

—July 11, 1990—The State published a notice of intended action concerning standards revisions for human health criteria and scheduled public hearings

—August 1, 2, and 7, 1990—The State held public hearings at three locations in the State.

—September 17, 1990—The State scheduled adoption by the Environmental Protection Commission for October 15, 1990.

—December 19, 1990. Standards become effective.

—June 11, 1991. EPA approved the revised State water quality standards as satisfying the requirement of section 303(c)(2)(B).

EPA fully approved the criteria for priority toxic pollutants adopted by Iowa on June 11, 1991, as being consistent with Option 1 of the December 12, 1988 guidance.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

EPA has withheld approval of the aquatic life criteria revisions until the State completes and submits all of the revisions and documentation necessary under section 303 (c)(2)(B).

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the State section 304 (l) short list including metals for which revised state criteria have not been adopted and approved.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for ____ priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Regional Ambient Fish Tissue Monitoring data indicating elevated fish flesh concentrations of pesticides which are not currently covered with approved state criteria.

—STORET data indicating the presence in surface waters of priority toxic pollutants which are not currently covered with approved state criteria.

Kansas is included in today's proposal because although the state adopted numeric criteria for a few priority toxic pollution before the 1987 amendments, the state has not completed a review of their numeric criteria for priority toxic pollutants in response to the statutory requirements and the Environmental Protection Agency (EPA) has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Kansas adopted some criteria for priority toxic pollutants prior to the passage of section 303(c)(2)(B) on May 1, 1988 (State Regulation K.A.R. 28–16–28e). EPA approved these criteria on June 19, 1988, and most of these criteria are not affected by today's proposed rulemaking. (Those not affected are aquatic life criteria for nickel, silver, zinc, aldrin, chlordane, DDT, dieldrin,

endosulfan, endrin, heptachlor, lindane, and PCBs).

The state's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—January 1990—The state submitted a preliminary draft of numeric criteria for EPA prior to starting an internal and external review of water quality standards revisions.

—July 1990—The state stopped all action on the standards revisions citing concerns over the costs of compliance.

—January 1991—The state submitted a draft package of standards revisions to EPA including numeric criteria to satisfy section 303(c)(2)(B) and set a date of June 1991 for final adoption.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the state section 304(l) short and mini lists for which State criteria have not been adopted and approved, including metals.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for ___ priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—STORET data indicating the presence in surface water of priority toxic pollutants which are not currently covered with approved state criteria.

Missouri has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—March 17, 1989—Missouri Clean Water Commission adopted additional numeric criteria for priority toxic pollutants for aquatic life use protection.

—April 15, 1989—The adopted criteria became effective under State law.

—October 13, 1989—EPA approved criteria with a recommendation that Missouri review the need for additional human health criteria.

—August 6, 1990—The State held a public meeting to discuss human health criteria revisions.

—August 23, 1990—The State scheduled a public hearing and adoption before the Missouri Clean Water Commission for October 23, 1990.

—December 12, 1990. Clean Water Commission adopts water quality standards.

—January 30, 1991. Standards sumbitted to EPA for review.

—March 4, 1991. Standards become effective in State.

—June 11, 1991. EPA approves standards as complying with section 303(c)(2)(B).

EPA fully approved the criteria for priority toxic pollutants adopted by Missouri on June 11, 1991 as being consistent with Option 1 of the December 12, 1988 guidance.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Nebraska has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—May 20, 1988—The state adopted numeric criteria for aquatic life protection for priority toxic pollutants.

—August 29, 1988—The adopted criteria became effective under state law.

—October 18, 1988—EPA approved Nebraska's Water Quality Standards noting that the need for additional human health criteria must be evaluated.

—December 1, 1989—The state adopted some numeric priority toxic pollutant criteria for a human health use (drinking water supply).

—February 20, 1990—The adopted criteria became effective under state law.

—January 17, 1990—DEC proposed human health fish consumption criteria for priority toxic pollutants.

—February 16, 1990—The state adopted the proposed human health fish consumption numeric criteria.

—June 27, 1990—The human health fish consumption numeric criteria became effective under state law.

—August 10, 1990—The state proposed revisions to mixing zone provisions of State Water Quality Standards which affect the application of numeric criteria.

—September 21, 1990—The state adopted proposed revisions to mixing zone policies.

—August 2, 1991. EPA approved the revised Nebraska water quality standards, including full approval of the revised criteria for priority toxic pollutants.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

*Region 8*

Colorado is included in today's proposal because, although Colorado has completed a review and adopted numeric criteria for some priority toxic pollutants in response to the statutory requirement, EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Colorado's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—June 5, 1989—Region VIII notified the State that the priority pollutant standards under consideration for adoption would not fully satisfy the requirements of section 303(c)(2)(B).

—August 17, 1989—Colorado completed its triennial review and revised the State's Basic Standards and Methodologies. The revised Standards were submitted to EPA for review on October 6, 1989. The revised Basic Standards and Methodologies included new numeric criteria for some of the priority toxic pollutants; however, not all of the priority toxic pollutants for which EPA has developed 304(a) criteria were included in the revised State rule.

—January 17, 1990—Region VIII sent a letter to the State explaining the requirements for full compliance with section 303(c)(2)(B). The letter explained that where a State selected an option 2 approach to full compliance (i.e., option 2 as described in EPA's December 12, 1988 guidance and the Region's January 17, 1990 letter to the State), the burden was on the State to demonstrate that additional criteria beyond those already adopted were not needed.

—February 5, 1990—In a letter from the Colorado Water Quality Control Division to EPA Region VIII, Colorado notified EPA that it intended to meet the full compliance requirements by way of option 2. To date, however, the documentation supporting full compliance with option 2 has not been received.

—July 9, 1990—Region VIII sent a letter to the State commenting on what the Region considered to be needed revisions to the State's Basic Standards and Methodologies. In the letter, the Region again advised the State that the current toxics provisions of the Basic Standards and Methodologies were incomplete and subject to the federal promulgation. The letter explained the Agency's approach to the upcoming promulgation, and the proposed regulatory language and criteria values to be promulgated were enclosed for State review.

—July 12, 1990—In a memorandum to the State, Region VIII provided additional information on compliance with the toxic requirements and the upcoming federal promulgation. The memorandum included a listing of EPA published and modified toxics criteria which could be used in proposing needed amendments to the existing toxics provisions in the Basic Standards and Methodologies (modified criteria were based on the most recent information in IRIS).

—August 13, 1990—Region VIII sent an improved version of the toxics criteria chart to the State staff.

—September 19, 1990, Region VIII sent to the State a "strawman" data analysis which provided stream-specific information regarding the priority toxic pollutants that may require adoption of criteria to satisfy the option 2 full compliance requirements of section 303(c)(2)(B).

—February 21, 1991. The State proposed amendments to the Basic Standards and Methodologies for its July triennial review hearing. The proposed amendments include: (1) Revisions and additions to the existing aquatic life criteria, and (2) application of EPA's human health criteria to all class 1 waters and any class 2 waters which provide an exposure pathway via consumption of contaminated aquatic organisms and/or drinking water.

—May 21, 1991. Region VIII sent a letter to the State detailing three deficiencies in the State's February 21, 1991 proposed revisions to the Basic Standards and Methodologies: (1) Failure to explain why health-based standards applicable to water supply segments were not included for more than 40 priority toxic pollutants addressed by section 304(a) guidance, (2) failure to explain why health-based standards applicable to aquatic life segments were not included for more than 20 priority toxic pollutants addressed by section 304(a) guidance, and (3) failure to finally resolve within the Basic Standards and Methodologies the applicability of: (a) The numeric aquatic life and human health standards for inorganics, and (b) certain human health numeric standards (i.e., those that address human exposure from water and fish consumption) for organics. The Region VIII letter notified the State that these deficiencies would need to be addressed to satisfy the full compliance requirements and to ensure that Colorado would not be affected by the Federal section 303(c)(2)(B) promulgation.

—July 1, 1991. The State held a public hearing on the proposed standards revisions. At the hearing, EPA submitted written testimony that identified the specific issues and options related to section 303(c)(2)(B) compliance.

—August 20, 1991. In a letter to the State, EPA Region VIII approved the August 17, 1989 toxics criteria adopted by Colorado as partially fulfilling the requirements of section 303(c)(2)(B). The letter clearly indicated that additional State action would be required to achieve full compliance.

—October 8, 1991. The State Water Quality Control Commission adopted additional numeric criteria for priority toxic pollutants, including criteria for all such toxics addressed by EPA section 304(a) criteria guidance. The adopted standards were intended to resolve all issues related to section 303(c)(2)(B) compliance. Because EPA has not yet had sufficient opportunity to review and approve these standards, today's proposal is based on the standards previously adopted by the State on August 17, 1989.

This proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved State criteria are not applicable to all appropriate State designated uses. For example, to fully protect aquatic life uses from the impacts of inorganic priority toxic pollutants (including metals), EPA proposes to promulgate aquatic life criteria for only those particular segments and inorganic substances for which State aquatic life criteria have not been applied. EPA invites public comment regarding any specific priority pollutants or water bodies for which

Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory data base and/or the Permit Compliance System data base.

North Dakota has not been included in today's proposed rulemaking because the State has adopted revised criteria in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—May 1, 1989. North Dakota completed its triennial review and revised the State's standards. The revised standards were submitted to EPA for review on September 20, 1989. The revised standards included new numeric criteria for some of the priority toxic pollutants; however, not all of the priority toxic pollutants for which EPA has developed 304(a) criteria were included in the revised State rule.

—January 17, 1990. Region VIII sent a letter to the State explaining the requirements for full compliance with section 303(c)(2)(B). The letter explained that the burden was on the State to demonstrate that additional criteria beyond those already adopted were not needed.

—February 7, 1990. In a letter from the North Dakota Water Supply and Pollution Control Division to EPA Region VIII, North Dakota notified EPA that it intended to meet the full compliance requirements by way of option 1 (i.e., an option 1 approach as described in EPA's December 12, 1988 guidance document and the Region's January 17, 1990 letter to the State).

—July 12, 1990. In a memorandum to the State, Region VIII provided additional information on compliance with the toxics requirements and the upcoming federal promulgation. The memorandum included a listing of EPA published and modified toxics criteria which could be used in proposing needed amendments to the existing toxics provisions in the State standards (modified criteria were based on the most recent information in IRIS).

—August 13, 1990. Region VIII sent an improved version of the toxics criteria chart to the State staff.

—October 16, 1990. The Region approved the previously adopted State standards as partially fulfilling the section 303(c)(2)(B) requirements and notified the State that the standards would be considered incomplete pending completion of the full compliance requirements. The Regional WQS review letter also notified the State that the incomplete portions of the State rule would be subject to the proposed federal promulgation.

—November 15, 1990. North Dakota adopted additional standards for the priority toxic pollutants. The amended standards include criteria for all of the priority pollutants for which EPA has published 304(a) criteria plus additional criteria based on the most recent information in EPA's IRIS data base. The amended standards meet the requirements for full compliance with section 303(c)(2)(B). The amended standards became effective February 1, 1991, and the standards were submitted by the State for EPA review and approval on February 25, 1991.

—March 8, 1991. Region VIII approved the amended State water quality standards and advised the State that the amended standards met the full compliance requirements of section 303(c)(2)(B).

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

South Dakota has not been included in today's proposed rulemakingbecause the State has adopted revised criteria for priority toxic pollutants in response to the section 393(c)(2)(B) requirement and received full EPA approval.

South Dakota's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—October 8, 1987. South Dakota completed its triennial review and revised the State's Standards. The revised Standards were submitted to EPA for review on May 5, 1989. The revised Standards included a reference to EPA's Water Quality Criteria, 1986 as the numeric criteria incorporated in State Standards; however, the State did not include or identify certain information needed to distinguish which specific EPA criteria had been adopted as State Standards.

—January 17, 1990. Region VIII sent a letter to the State explaining the requirements for full compliance with section 303(c)(2)(B). The letter explained that incorporation of EPA's national criteria into State Standards by reference to EPA's Quality Criteria for Water, 1986 was acceptable; however, such a reference would have to include sufficient information to identify the specific numeric criteria which comprised State Standards. The needed information was not provided prior to today's proposal.

—February 13, 1990. Region VIII sent a letter to the State further explaining the issues that would have to be clarified before the Region would be able to grant final approval of the toxics portion of the State water quality standards.

—March 8, 1990. South Dakota further amended the State Standards to clarify the role of the Department of Natural Resources in applying the criteria in Quality Criteria for Water, 1986; however, the new amendments did not address the specific information needed to satisfy the full compliance requirements for section 303(c)(2)(B).

—July 12, 1990. Region VIII sent additional information to the State on

compliance with the toxics requirements and the upcoming federal promulgation. The memorandum included a listing of EPA published and modified toxics criteria which could be used in proposing needed amendments to the existing toxics provisions in the State standards (modified criteria were based on the most recent information in IRIS).

—August 13, 1990. Region VIII sent an improved version of the toxics criteria chart to the State staff.

—November 6, 1990. Region VIII sent additional information to the State further delineating the specific application information that would be needed to achieve approval of the toxics provisions of the water quality standards.

—March 6, 1991. In a letter from the Division of Environmental Regulation, South Dakota provided a complete interpretation of the toxics control provisions in section 74:03:02:14, the section of the South Dakota water quality standards which incorporates EPA's Quality Criteria for Water, 1986 by reference. The State's letter included a listing of the specific criteria which are considered to be standards of the State. The list included all of the published 304(a) criteria and identified the uses to which the criteria applied.

—March 13, 1991. The Region approved the adopted State criteria as fulfilling the section 303(c)(2)(B) requirements.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Utah has not been included in today's proposed rulemaking because the State has adopted revised criteria in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—April 21, 1988. Utah completed its triennial review and revised the State's standards. The revised standards were submitted to EPA for review on February 10, 1989. The revised standards included new numeric criteria for some of the priority toxic pollutants for which EPA has developed 304(a) criteria were included in the revised State rule.

—January 17, 1990. Region VIII sent a letter to the State enplaning the requirements for full compliance with section 303(c)(2)(B). The letter explained that the burden was on the State to demonstrate that additional criteria beyond those already adopted were not needed.

—January 31, 1990. In a letter from the Utah Bureau of Water Pollution Control to EPA Region VIII, Utah notified EPA that it intended to meet the full compliance requirements by way of option 1 (i.e., an option 1 approach as described in EPA's December 12, 1988 guidance document and the Region's January 17, 1990 letter to the State).

—July 12, 1990. In a memorandum to the State, Region VIII provided additional information on compliance with the toxics requirements and the upcoming federal promulgation. The memorandum included a listing of EPA published and modified toxics criteria which could be used in proposing needed amendments to the existing toxics provisions in the State standards (modified criteria were based on the most recent information in IRIS).

—August 13, 1990. Region VIII sent an improved version of the toxics criteria chart to the State staff.

—November 29, 1990. The Region approved the previously adopted State standards as partially fulfilling the section 303(c)(2)(B) requirements and notified the State that the standards would be considered incomplete pending completion of the full compliance requirements. The Regional water quality standards review letter also notified the State that the incomplete portions of the State rule would be subject to the provisions of the proposed federal promulgation.

—January 18, 1991. Utah adopted additional standards for the priority toxic pollutants. The amended standards include criteria for all of the priority pollutants for which EPA has published 304(a) criteria. The amended standards meet the requirements for full compliance with section 303(c)(2)(B). The amended standards were submitted by the State for EPA review and approval on February 13, 1991.

—March 8, 1991. Region VIII approved the amended State water quality standards and advised the State that the amended standards met the full compliance requirements of section 303(c)(2)(B).

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Wyoming has not been included in today's proposed rulemaking because the State has adopted revised criteria in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—January 17, 1990. Region VIII sent a letter to the State explaining the requirements for full compliance with section 303(c)(2)(B). The letter explained that the burden was on the State to demonstrate that additional criteria beyond those already adopted were not needed.

—February 12, 1990. In a letter from the Wyoming Water Quality Division of the Department of Environmental Quality, Wyoming notified EPA that it intended to meet the full compliance requirements by way of option 1 (i.e., an option 1 approach as described in EPA's December 12, 1988 guidance document and the Region's January 17, 1990 letter to the State).

—May 29, 1990. Region VIII provided written comments for the Wyoming Environmental Quality Council triennial review hearing. The Region's comments further explained the requirements for full compliance with section 303(c)(2)(B).

—July 12, 1990. In a memorandum to the State, Region VIII provided additional information on compliance with the toxics requirements and the upcoming federal promulgation. The memorandum included a listing of EPA published and modified toxics criteria which could be used in proposing needed amendments to the existing toxics provisions in the State standards (modified criteria were based on the most recent information in IRIS).

—July 19, 1990. Region VIII provided additional written comment to the Wyoming Environmental Quality Council. The Region's comments provided further information on the toxics requirements, including specific lists of published and modified criteria for the priority pollutants which would meet the full compliance requirements.

—August 13, 1990. Region VIII sent an improved version of the toxics criteria chart to the State staff.

—October 3, 1990. Wyoming adopted additional standards for the priority toxic pollutants. The amended standards include criteria for all of the

priority pollutants for which EPA has published 304(a) criteria plus additional criteria based on the most recent information in EPA's IRIS data base. The amended standards meet the requirements for full compliance with section 303(c)(2)(B). The amended standards became effective November 29, 1990, and the standards were submitted by the State for EPA review and approval on December 24, 1990. Clarification of the legal standing of the newly adopted rule was provided with a memorandum from the State dated January 12, 1991.

—March 8, 1991. Region VIII approved the amended State water quality standards and advised the State that the amended standards met the full compliance requirements of section 303(c)(2)(B).

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary to respond to those comments and reevaluate the Agency's determination of full compliance.

Montana has not been included in today's proposed rulemaking because the State has adopted revised criteria in response to the section 303(c)(2)(B) requirement and received full EPA approval. The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—September 23, 1988. The State adopted final water quality standards which included numeric criteria for the priority toxic pollutants (by reference to EPA's Quality Criteria for Water, 1986 through update =2 1987 including supporting information).

—December 9, 1988. The State submitted the adopted water quality standards with a State Attorney General certification to EPA for approval/disapproval.

—March 8, 1989. EPA approved the portion of the revised State water quality standards which responded to the requirements of section 303(c)(2)(B) (other portions of the revised standards were disapproved).

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary to respond to those comments and reevaluate the Agency's determination of full compliance.

*Region 9*

American Samoa has not been included in today's proposed rulemaking because it has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

American Samoa's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—January 1990. American Samoa submitted draft water quality standards revisions to EPA and the public for review.

—February 1990. American Samoa held a public hearing on its proposed water quality standards revisions.

—September 7, 1990. The American Samoa Environmental Commission adopted its proposed water quality standards revisions which include numeric criteria for priority toxic pollutants.

—September 20, 1990. American Samoa submitted the adopted water quality standards to EPA for approval/disapproval.

—September 25, 1990. American Samoa submitted the State Attorney General certification.

—September 27, 1990. EPA approved the revised American Samoa water quality standards, including full approval of the revised numeric criteria for priority pollutants.

EPA fully approved the criteria for priority toxic pollutants adopted by American Samoa on September 27, 1990 based on a determination that the criteria are consistent with option 1 of the December 12, 1988 section 303(c)(2)(B) guidance document.

If additional information is submitted during the public comment period asserting that American Samoa has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Arizona is included in today's proposal because, although the State adopted numeric criteria for some priority toxic pollutants before the 1987 amendments, the State has not completed a review of their numeric criteria for priority toxic pollutants in response to the statutory requirement and EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—Late 1988. The State submitted a series of discussion papers to EPA and the public.

—June 7, 1989. The State submitted draft water quality standards revisions to EPA for review prior to issuing proposed standards for public comment.

—December 11, 1989. The State transmitted a Surface Water Quality Standards Triennial Review Briefing Book, dated December 8, 1989, to EPA and the public.

—February 15, 1990. The State submitted, to EPA and the public, draft proposed revisions to its Surface Water Quality Standards.

—March 16, 1990. The State submitted Proposed Surface Water Quality Standards Rules to EPA and the public.

—During 1988–90, the State held several public meetings and roundtables regarding the proposed water quality standards.

—October 26, 1990. Arizona prepared revised draft water quality standards which were released for comment October 29, 1990.

—December 14, 1990. EPA provided written comments to the States.

—January 15, 1991. Arizona prepared a re-draft of the water quality standards for review and comment.

—February 13, 1991. EPA provided written comments to the States.

—May 8, 1991. Arizona approval by the Governor's Regulatory Review Council on May 7, 1991 of the Navigable Water Quality Standards proposed rules and the Economic Impact Statement.

Also announced the schedule of oral proceedings and availability of the proposed rules.

Today's proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not included in approved State criteria. EPA also proposes to promulgate the § 131.36(b) criteria where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all waters with relevant State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may

not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for section 303(c)(2)(B) criteria. For most priority toxic pollutants, however, available data on the discharge and presence of such pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that section 303(c)(2)(B) criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the State Section 304(l) lists (as updated), and supporting documentation, for which State criteria have not been adopted and approved, including metals, dioxin, and some organics.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 126 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—STORET data indicating the presence in surface waters of a majority of the priority toxic pollutants which are not covered with approved State criteria.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

California is included in today's proposal because, although the State has completed a review and adopted numeric criteria for some priority toxic pollutants for some waters in response to the statutory requirement, EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

For ocean waters, the State adopted revised criteria on March 22, 1990, and EPA fully approved those criteria on June 23, 1990. Regarding inland waters and bays and estuaries, the State adopted numeric criteria for some priority toxic pollutants before the 1987 amendments and a few site specific criteria since 1987. Included among these criteria are numeric criteria for copper, cadmium and zinc applicable to the Sacramento River and its tributaries upstream of Hamilton City adopted by the State on August 16, 1984, and approved by EPA on August 7, 1985. Since the 1987 amendments, the State adopted numeric monthly mean and maximum criteria for selenium in the San Joaquin River from the mouth of the Merced River to Vernalis and monthly mean criteria in flows to Grasslands Water District, San Luis National Wildlife Refuge, and Los Banos State Wildlife Area on September 21, 1989; EPA approved these criteria on April 13, 1990, and, at the same time, disapproved selenium criteria for other locations. These approved numeric criteria comply with section 303(c)(2)(B) and are not amended by today's proposed rulemaking. Subsequent to these specific efforts, the State completed a review of their numeric criteria for priority toxic pollutants for State inland waters and bays and estuaries and transmitted them to EPA. EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). In addition, several parties have petitioned State Court to restrain the SWRCB from utilizing the standards for inland waters and bays and estuaries.

The State's actions, regarding inland waters and bays and estuaries, to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—October 6, 1989. The State issued a staff report proposing methodologies for development of water quality criteria for statewide plans.

—December 1, 1989. EPA submitted written comments to State on its proposed methodology.

—January 29, 1990. The State issued draft water quality standards for inland surface waters and enclosed bays and estuaries for EPA and public review.

—February 28 and March 5, 1990. The State held public hearings on proposed standards revisions.

—March 29, 1990. EPA submitted written comments to the State on proposed standards revisions.

—August 16, 1990. The State held a public workshop on development and implementation of standards for agricultural drains and ephemeral streams. (EPA testified.)

—August 22, 1990. EPA submitted written comments to the State on development and implementation of standards for agricultural drains and ephemeral streams.

—November 2, 1990. The State issued revised draft water quality standards for EPA and public review.

—December 7, 1990. EPA submitted written comments on the revised draft water quality standards.

—December 10, 1990. The State held a hearing on the revised draft standards. (EPA testified.)

—February 8, 1991. EPA provided written comments to the State re: the agricultural drains section of the Inland Surface Waters Plan.

—March 26, 1991. The State issued drafts of the Statewide Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries.

—March 27, 1991. EPA provided written comments to the San Francisco Bay Regional Water Quality Control Board re: proposed interim objectives for toxic pollutants in the South Bay.

—April 10, 1991. EPA provided written comments to the State re: The Statewide Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries.

—April 10, 1991. EPA provided written comments to the State re: EPA's position on how to proceed with dioxin related programs.

—April 11, 1991. The State adopted the Statewide Waters Quality Control Plans for Inland Surface Water and Enclosed Bays and Estuaries.

—May 10, 1991. The State transmitted to EPA the Statewide Waters Quality Control Plans for Inland Surface Water and Enclosed Bays and Estuaries.

Today's proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a

minimum, EPA proposes to apply, to all State inland waters and bays and estuaries, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not included in EPA approved State criteria. EPA also proposes to promulgate section 303(c)(2)(B) criteria for priority toxic pollutants where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all waters with relevant State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some additional Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for section 303(c)(2)(B) criteria. For most priority toxic pollutants, however, available data on the discharge and presence of such pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that section 303(c)(2)(B) criteria are necessary may be summarized as follows:

—priority toxic pollutants discussed in the State Section 304(l) lists, and supporting documentation, for which State criteria have not been adopted and approved, including metals, dioxin, and some organics.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants for inland waters and bays and estuaries, as described above. The State has completed efforts to adopt new or revised chemical-specific, numeric criteria for 68 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—STORET data indicating the presence in inland waters and bays and estuaries of priority toxic pollutants which are not covered with approved State criteria (e.g., detection of more than 40 priority toxic pollutants in the water column).

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

The Commonwealth of the Northern Mariana Islands (CNMI) is included in today's proposal because, although the State adopted numeric criteria for some priority toxic pollutants before the 1987 amendments, the State has not completed a review of their numeric criteria for priority toxic pollutants in response to the statutory requirement and EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

The Commonwealth's actions to respond to the 1987 section 303(c)(2)(B) requirements can be summarized as follows:

—March 22, 1990. The Commonwealth transmitted a letter to EPA indicating that its water quality standards revision process had been delayed.

—March 28, 1991. CNMI submitted draft water quality standards revisions to EPA for review.

—May 22, 1991. EPA provided comments to CNMI re: the draft revised standards.

Today's proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not included in approved State criteria. EPA also proposes to promulgate the § 131.36(b) criteria where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all waters with relevant State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—CNMI efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. CNMI has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 108 priority toxic pollutants. These efforts represent evidence of the CNMI's recognition of the need for numeric criteria for these priority toxic pollutants.

—STORET data indicating the presence in CNMI waters of priority toxic pollutants which are not covered with approved CNMI criteria.

Guam has not been included in today's proposed rulemaking because Guam has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

Guam's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—July 2, 1987. Guam adopted revised water quality standards which include numeric criteria for priority toxic pollutants.

—August 1987. Guam submitted the adopted water quality standards with an Attorney General certification to EPA for approval/disapproval.
—September 30, 1987. EPA approved the revised Guam water quality standards, including full approval of the revised numeric criteria for priority toxic pollutants. EPA fully approved the criteria for priority toxic pollutants adopted by Guam on July 2, 1987. It has been determined since that time that the criteria are consistent with option 1 of the December 12, 1988 section 303(c)(2)(B) guidance document.

If additional information is submitted during the public comment period asserting that Guam has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Hawaii is included in today's proposal because, although the State has completed a review and adopted numeric criteria for some priority toxic pollutants in response to the statutory requirement, EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirements can be summarized as follows:

—January 8, 1990. The State adopted revised criteria.
—February 9, 1990. Hawaii submitted the adopted water quality standards with a State Attorney General certification to EPA for approval/disapproval.
—May 9, 1990. EPA approved Hawaii's water quality standards noting that omission of human health limits for five toxic metals precluded full satisfaction of the section 303(c)(2)(B) requirement.
—May 29, 1990. The State responded to the EPA approval indicating plans to adopt human health limits for the five toxic metals.
—July 13, 1990. EPA clarified portions of the May 1990 approval letter.

Because the State has adopted criteria for priority toxic pollutants using an option I approach as described in EPA's December 12, 1988 guidance document EPA is taking an approach of proposing criteria for all remaining priority toxic pollutants which have been the subject of section 304(a)(1) criteria recommendations. EPA believes that the discharge or presence of these priority toxic pollutants can reasonably be expected to interfere with designated uses in the State and that Federal criteria therefore are necessary to protect Hawaii designated uses. This conclusion is based on the following information in the record:

—priority toxic pollutants on the State section 304(l) lists for which State criteria have not been adopted and approved, including these metals,
—STORET data indicating the presence in surface waters of these priority toxic pollutants.

Nevada is included in today's proposal because, although the State has completed a review and adopted numeric criteria for some priority toxic pollutants in response to the statutory requirement, EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—May 24, 1988. The State held a public hearing on it's proposed water quality standards revisions.
—September 12, 1988. The State submitted draft water quality standards revisions to EPA and the public for review.
—September 20, 1988. EPA provided comments to Nevada regarding its proposed water quality standards for toxics.
—October 21, 1988. The State submitted revisions to the Nevada toxic material definition and bioassay procedures to EPA and the public for review.
—November 10, 1988. The State held a public hearing on its proposed water quality standards revisions.
—November 29, 1988. The State held a public hearing on its proposed water quality standards revisions. (Revisions to the definition of "toxic" were adopted following this hearing.)
—May 31, 1989. The State submitted draft water quality standards revisions to EPA and the public for review.
—June 22, 1989. EPA provided comments to Nevada regarding its proposed standards for toxics.
—August 9, 1989. The State submitted draft water quality standards revisions to EPA and the public for review.
—August 22, 1989. The State submitted draft water quality standards revisions and rationale to EPA.
—September 18, 1989. EPA provided comments on Nevada's proposed water quality standards for toxics.
—September 27, 1989. The State held a public hearing on its proposed water quality standards revisions. (Revisions to the bioassay requirements as part of the narrative toxics standard were adopted following this hearing.)
—February 28, 1990. The State submitted draft water quality standards revisions to EPA and the public for review.
—March 27, 1990. EPA provided comments on Nevada's proposed February 28, 1990 toxics standards.
—March 28, 1990. The State held a public hearing on its proposed water quality standards revisions.
—May 2, 1990. EPA provided comments regarding the latest proposed standards revisions.
—May 2, 1990. The State adopted water quality standards revision which included some numeric criteria for priority toxic pollutants.
—August 23, 1990. State transmitted approved water quality standards revisions without a State Attorney General Certification to EPA for approval/disapproval.
—September 28, 1990. The State Attorney General certified the May 2, 1990 adoption.
—January 16, 1991. EPA approved in part and disapproved in part standards adopted by the State and notified them of the actions they needed to take pursuant to the disapproval and that they had not fully satisfied section 303(c).
—March 14, 1991. The State responded to the January 1991 approval/disapproval of standards.

Today's proposed rulemaking would Federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not included in approved State criteria. EPA also

proposes to promulgate the § 131.36(b) criteria where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all waters with relevant State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for criteria. For most priority toxic pollutants, however, available data on the discharge and presence of such pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that section 303(c)(2)(B) criteria are necessary may be summarized as follows:

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific numeric criteria for 108 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—Presence in surface waters of the State of priority pollutants for which sufficient State numeric criteria have not been adopted, based on surface water monitoring data in STORET.

—Discharge to surface waters of priority pollutants for which suificient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

The Trust Territories of the Pacific Islands (Palau) has not been included in today's proposed rulemaking because Palau has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

Palau's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—November 7, 1990. Palau adopted revised water quality standards which include numeric criteria for priority toxic pollutants.

—December 12, 1990. Palau submitted the adopted water quality standards with an Attorney General certification to EPA for approval/disapproval.

—January 11, 1991. EPA approved the revised Palau water quality standards, including full approval of the revised numeric criteria for priority toxic pollutants.

EPA fully approved the criteria for priority toxic pollutants adopted by Palau on January 11, 1991 based on a determination that the criteria are consistent with option 1 of the December 12, 1988 section 303(c)(2)(B) guidance document.

If additional information is submitted during the public comment period asserting that Palau has not fully complied with section 303(c)(2)(B), it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

*Region 10*

Alaska is included in today's proposal because although the State had previously adopted all section 304(a) criteria by reference, the State Attorney General has decided that the adoption by reference is invalid. Based on information in the record (see below), EPA has reason to believe that at least some criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Alaska's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—December 20, 1989. The State submitted draft water quality standards revisions to EPA and the public for review.

—April 6, 1990. The State held public hearings and accepted written comments on its proposed water quality standards revisions through this date.

—On November 4, 1991, Region 10 sent a letter to the State partially approving the State's incorporation by reference of EPA's toxic pollutant criteria; and noting the deficiencies which will be included in EPA's proposed rulemaking (e.g. Alaska's failure to adopt a human health criteria).

This proposed rulemaking would federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above.

The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 103 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—STORET data indicating the presence in surface waters of priority toxic pollutants which are not currently covered with approved State criteria.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

Idaho is included in today's proposal because although the State adopted some numeric criteria for human health protection for some priority toxic pollutants before the 1987 amendments, the State has not completed a review of their numeric criteria for priority toxic pollutants in response to the statutory requirement. Furthermore, the State's criteria protecting human health are based only on drinking water maximum contaminant levels; fish consumption is not protected, and EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Idaho's action to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—July 23, 1990. The State submitted draft water quality standards revisions to EPA and the public for review.

This proposed rulemaking would federally promulgate the criteria necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the State Section 304(l) short list for which State criteria have not been adopted and approved, including metals and some organics.

—STORET data indicating the presence in surface waters of priority toxic pollutants which are not currently covered with approved State criteria.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

Oregon has not been included in today's proposed rulemaking because the State has adopted revised criteria for priority toxic pollutants in response to the section 303(c)(2)(B) requirement and received full EPA approval.

The State's response to the 1987 section 303(c)(2)(B) requirement can be summarized as follows.

—August 28, 1987. The State adopted revised water quality standards which included numeric criteria for priority toxic pollutants.

—January 26, 1988. The State submitted the adopted water quality standards with a State Attorney General certification to EPA for approval/disapproval.

—March 9, 1988. EPA approved the revised State water quality standards, including full approval of the revised numeric criteria for priority toxic pollutants.

EPA fully approved the criteria for priority toxic pollutants adopted by Oregon on February 12, 1989 as being consistent with option 2 of the December 12, 1988 section 303(c)(2)(B) guidance document.

If additional information is submitted during the public comment period asserting that the State has not fully complied with section 303(c)(2)(B) it will be necessary at that time to respond to those comments and reevaluate the Agency's determination of full compliance.

Washington is included in today's proposal because although the State adopted numeric criteria for some priority toxic pollutants before the 1987 amendments, the State has not adopted numeric criteria for any human health based criteria for priority pollutants, and EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B). Therefore, EPA has determined for purposes of today's proposed rulemaking that the State is not currently in compliance with section 303(c)(2)(B) because it has not adopted water quality standards consistent with section 303(c)(2)(B) which have been fully approved by the appropriate EPA Regional Administrator.

Washington adopted 20 freshwater and marine criteria which EPA fully approved on March 4, 1988 (see below). The State has not completed a review of their criteria for priority toxic pollutants in response to the statutory requirement and EPA has reason to believe that at least some additional criteria are necessary to comply with section 303(c)(2)(B).

The State's actions to respond to the 1987 section 303(c)(2)(B) requirement can be summarized as follows:

—February 9, 1988. The State submitted the adopted water quality standards with a State Attorney General certification to EPA for approval/disapproval.

—March 4, 1988. EPA approved the revised State water quality standards.

—July 20, 1990. Washington released its proposed water quality standards with public comments accepted through this date.

This proposed rulemaking would Federally promulgate the criteria

necessary to bring the State into full compliance with section 303(c)(2)(B). To fully protect State designated uses, and to ensure that the required criteria are adopted, EPA proposes to apply broadly the criteria in proposed § 131.36(b). At a minimum, EPA proposes to apply, to all appropriate State waters, the criteria in proposed § 131.36(b) for all priority toxic pollutants which are not the subject of approved State criteria. EPA also proposes to promulgate Federal criteria for priority toxic pollutants where any previously-approved State criteria are insufficiently stringent to fully protect all designated uses, or where such previously-approved State criteria are not applicable to all appropriate State designated uses. EPA invites public comment regarding any specific priority pollutants or water bodies for which Federal criteria may not be necessary to protect State designated uses.

For reasons which are fully discussed in the preamble, EPA has not attempted to determine the specific priority pollutants and water bodies that require criteria. However, EPA has determined that at least some Federal criteria are necessary to protect designated uses. This determination is supported by information in the record which demonstrates that priority toxic pollutants are discharged or present in surface waters at levels that can reasonably be expected to interfere with State designated uses. For some priority toxic pollutants, available data clearly demonstrate use impairment and the need for toxics criteria. For most priority toxic pollutants, however, available data on the discharge and presence of priority toxic pollutants are spatially and temporally limited. Nevertheless, EPA believes that the data for many of these pollutants are sufficient to satisfy the "reasonable expectation" test established in section 303(c)(2)(B). The information in the record which demonstrates that priority toxic pollutants are discharged or present and that Federal criteria are necessary may be summarized as follows:

—Priority toxic pollutants on the State Section 304(l) short list for which State criteria have not been adopted and approved, including metals and some organics.

—State efforts since 1987 to adopt additional numeric criteria for priority toxic pollutants, as described above. The State has initiated (but not completed) efforts to adopt new or revised chemical-specific, numeric criteria for 91 priority toxic pollutants. These efforts represent evidence of the State's recognition of the need for numeric criteria for these priority toxic pollutants.

—STORET data indicating the presence in surface waters of priority toxic pollutants which are not currently covered with approved State criteria.

—Discharge to surface waters of priority pollutants for which sufficient State numeric criteria have not been adopted, based on data in the Toxics Release Inventory database and/or the Permit Compliance System database.

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# The Myth of $10^{-6}$ As a Definition of Acceptable Risk

(Or, "In Hot Pursuit of Superfund's Holy Grail")

Kathryn E. Kelly, Dr.P.H.

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Plaza 600 Building
Sixth and Stewart, Suite 700
Seattle, WA 98101 USA
Telephone (206) 441-6142
Facsimile (206) 443-1812

## INTRODUCTION

It is difficult to imagine a criterion in wider use in U.S. environmental legislation than $10^{-6}$. It guides the use of pesticides and food additives; it defines our allowable exposure to groundwater contamination and incinerators. It is the most influential determinant we have in deciding what emissions should be allowed from stacks, how a hazardous waste site should be cleaned up, and how much Alar to leave on apples.

$10^{-6}$ is a shorthand description for an increased lifetime chance of 0.000001 in one (or one chance in 1,000,000) of developing cancer due to lifetime exposure to a substance. It is an upper-bound limit which is not likely to underestimate risk. $10^{-5}$ represents 1 chance in 100,000, and so on. $10^{-6}$ numerically represents an increase of approximately 0.0003% over our current chance of one in three (or $3.33 \times 10^{-1}$) from developing cancer from all causes in the U.S.

Background level of exposure to environmental contaminants is estimated at $10^{-3}$ to $10^{-2}$.[1] The vast majority of our exposure to carcinogens is thought to be due to those that occur naturally in our foods.[2] $10^{-6}$ is therefore 1,000 to 100,000 times less than our current risk of background exposure to environmental contaminants or developing cancer from all causes. As $10^{-6}$ is an upper-bound estimate of risk, not an absolute or average value, the difference may actually be much greater.

The past, present, and future costs of achieving compliance with such a stringent criterion are virtually incalculable; certainly many billions of dollars have been spent in attempting to achieve this goal for cleanups at hazardous waste sites in the U.S. As a result, determining the origins of $10^{-6}$ is of considerable social, scientific, and economic interest.

Recent research has revealed that there is no sound scientific, social, economic or other basis for the selection of $10^{-6}$ as a cleanup goal for hazardous waste sites. Remarkably, this criterion, which has cost society billions of dollars, has never received widespread debate or even thorough regulatory or scientific review. It is an arbitrary level proposed 30 years ago for completely different regulations (animal drug residues), the circumstances of which do not apply to hazardous waste site regulation. As a result, implementing i consistently has frequently been socially, politically, technically, and economically infeasible. Although the benefits of $10^{-6}$ generally have not been shown to outweigh the significant costs of attaining this goal, many state cleanup guidelines still advocate or require the use of $10^{-6}$.

Under these circumstances, communicating the meaning of $10^{-6}$ and the definition of "acceptable risk" poses considerable challenges to those responsible for explaining risk. The origin of $10^{-6}$ relative to its use as a criterion of "acceptable risk" is explored below.

## THE SURPRISING ORIGINS OF $10^{-6}$

Recently, we conducted an extensive review to determine the origin of $10^{-6}$ as a criterion of "acceptable risk."[3] We began with an informal telephone survey of affected agencies and an extensive literature search. The conclusions of this survey include the following:[3]

1. *None of the officials contacted at any federal or state agency currently using $10^{-6}$ as a criterion knew the basis of this criterion, nor is there any readily available documentation that specifically describes the origin of $10^{-6}$.*

The extensive literature search included numerous toxicological, medical, regulatory, pollution, environmental, and governmental databases, that were queried back to the origin of each database (usually the mid-1970's). Not finding any written documentation, the authors began calling a "Who's Who" of the environmental industry. The contacts included:

- The White House
- The U.S. Environmental Protection Agency
- The EPA's Science Advisory Board
- The EPA's Risk Assessment Forum
- The Food and Drug Administration
- The U.S. Department of Agriculture
- The U.S. Conference of Mayors
- Oak Ridge National Laboratories
- The Congressional Office of Technology Assessment
- The Natural Resources Defense Council
- Citizen's Clearinghouse for Hazardous Waste
- Greenpeace
- Two former EPA Administrators
- A former state environmental commissioner
- Rockefeller University
- Environmental divisions of major law firms
- Staff members of several Congressmen
- And many other contacts in government and industry

Despite widespread use of this criterion, none of the agencies could cite the source of $10^{-6}$, although there was almost universal surprise that the origin of $10^{-6}$ was not readily available. We were offered many good theories, but no written documentation. A sample of the responses:

- "My mind is a complete blank."
- "My, what an interesting question!"
- "I think it came from pesticides legislation or the Delaney Clause."
- "It came from the FDA in the 1950's."
- "It was derived from the Virtually Safe Dose used in the Safe Drinking Water Act."
- "It's an economic criterion."
- "It's based on the chance of being hit by lightening which is one-in-a-million."
- "I just assumed it was because one-in-a-million sounded like such a nice phrase."
- "It was selected because it was 'doable'. Or at least that's what we thought at the time."
- "It was a purely political decision made by several of the major agencies behind closed doors in the 1970's. I doubt very much you'll get anyone to talk to you about it."
- And our favorite, "You really shouldn't be asking these questions" (this from one of the federal agencies).

2. *The concept of $10^{-6}$ was originally an arbitrary number, finalized by the U.S. Food and Drug Administration fourteen years ago as a screening level of "essentially zero" or* de minimis *risk. This concept was traced back to a 1961 proposal by two scientists from the National Cancer Institute regarding determining "safety" levels in carcinogenicity testing.*[3]

The proposal for *de minimis* risk was contained in a 1973 notice in the Federal Register entitled "Compounds Used in Food-Processing Animals: Procedures for Determining Acceptability of Assay Methods Used for Assuring the Absence of Residues in Edible Products of Such Animals," commonly called the "Sensitivity of Method" regulations.[4] The term *de minimis* is an abbreviation of the legal concept, "*de minimis non curat lex*: the law does not concern itself with trifles." In other words, $10^{-6}$ was developed as a level of risk below which was considered a "trifle" and not of regulatory concern.

The purpose of these proposed rules was to set forth guidelines with regard to appropriate assay methods for carcinogenic animal drugs "which may be administered to food-producing animals, but for which no residue is permitted in human food" under the Delaney Clause of 1958. The rules were specifically prompted by the use of diethylstilbestrol (DES) as a growth promoter in cattle.

In adopting a threshold of safety, the FDA referred to a 1961 article by Nathan Mantel and Kay Bryan, originators of the well-known Mantel-Bryan equation, on the subject of safety testing in animal studies. Mantel, a biostatistician at the National Cancer Institute, had been asked by the Director of the Institute to develop guidelines for the number of laboratory animals required to establish the safety of a substance. This in turn was in response to a request by the Secretary of the Department of Health, Education and Welfare to the NCI to help establish which cancer-causing substances were "safe" and at what levels following the Thanksgiving cranberry scare of 1959. (Trace residues of a cancer-causing herbicide were found in supplies of cranberries shortly before the holiday, prompting the Secretary to recommend against buying cranberries that year. This in turn set off a mild panic which nearly devastated the cranberry industry.)

In their 1961 article, Mantel and Bryan reasonably pointed out that to define the parameters of safety testing, one must first come up with a definition of safety. For the purposes of discussion, they said, we'll assume "safe" is equal to one chance in 100,000,000 of developing cancer. Asked how he came up with the number of one in one hundred million, Mantel replied, "We just pulled it out of a hat." After all, defining "safe" was not the focus of their article. But this is the ultimate origin of $10^{-6}$.

FDA initially adopted this "one in 100,000,000" in their 1973 proposal, but changed this value to one in 1,000,000 by the time the final rule was issued in 1977. "One in one million" was thus established as the "maximum lifetime risk that is essentially zero", or the level below which no further regulatory consideration would be given regarding the safety of residues of a carcinogenic animal drug. Only two comments were received on these proposed rules, despite a specific request from the FDA Commissioner for public comment on the setting of one-in-a-million risk as a threshold of "essentially zero" risk.

3. *In the FDA legislation, the regulators specifically stated that this level of "essentially zero" was* not *to be interpreted as equal to an acceptable level of residues in meat products.*[4]

Nevertheless, many current regulations and guidance documents have done exactly that: interpreted this "essentially zero" level developed by the FDA, a level below which there would be no regulatory consideration given regarding safety, as a maximum "acceptable" level of risk.

An analogy to automobiles is that if we could not measure when a car were standing completely still, the FDA might consider one mile per hour a "virtually safe" rate of speed. Below this rate either speed is unmeasurable, or the costs of such measurements outweigh the benefits of the information gained.

In a sense, this criterion of one mile per hour has been misinterpreted to be a maximum "acceptable" rate of speed for driving a car on the highway without risk of dying in a car crash. The former is a *screening* level below which no regulatory consideration would be given to risks; the latter is a *safety* decision that takes into account cost-benefit considerations of highway safety, the road conditions, type and weight of automobile, etc.

Cleaning up all hazardous waste sites to a $10^{-6}$ level of "essentially zero" risk is therefore comparable to limiting highway traffic to 1 mph. The cost-benefits tradeoffs need to be evaluated more carefully in selecting a final cleanup number, using $10^{-6}$ as a starting point instead of a goal.

## HOW IS $10^{-6}$ USED?

A review of the evolution of $10^{-6}$ reveals that *perception* of risk is a major determinant of the circumstances under which this criterion is used.

1. *$10^{-6}$ is not consistently applied to all environmental legislation. Rather, it seems to be applied according to the general* perception *of the risk associated with the source being regulated. Specifically, $10^{-6}$ has been applied almost exclusively to hazardous waste sites, pesticides, and selected carcinogens, but not to air, drinking water, or other sources perceived to be of less risk.*

Cleanup levels for a given contaminant are not consistent and vary by orders of magnitude. From these past site cleanup decisions, we can see that what is determined to be "acceptable" is not a set value; the threshold of "acceptability" varies among countries, among states, and among different cities of the same state. Furthermore, the lack of consistent quality among risk assessments has resulted in similar sites with widely differing cleanup levels, all claiming to have been cleaned up to $10^{-6}$.

Less well known are the extreme differences even among various divisions of the same agency for the same substance. For example, there are six orders of magnitude (one million-fold) difference in target risk within different EPA regulations for arsenic.[5] We suggest the differences are in part due to the *perception* of risk associated with the particular regulatory decision: the greater the perceived risk, the narrower the gap between "essentially zero" and what the public

will allow as "acceptable risk." As a result, some sources that actually pose a higher risk to society, such as automobile emissions, are regulated less stringently simply because they are *perceived* to pose less risk than such sources as hazardous waste management facilities, whether or not the data support that assumption.

2. *Although it has been in widespread use for hazardous waste sites for many years, the concept of $10^{-6}$ as a criterion of acceptable risk has never been legislatively mandated in any EPA regulations. In fact, the target range of $10^{-6}$ to $10^{-4}$ as a range of "generally acceptable risk" was not actually codified into EPA Superfund legislation until 1990 with the passage of the revised National Contingency Plan.*

   How did this misconception arise? As the concept of risk assessment was broadened over two decades from carcinogenic animal drugs at the FDA to a host of other decisions and agencies (including food, water, air, hazardous waste, and others), the $10^{-6}$ concept was carried along as well. In the opinion of a former FDA counsel, the concept of $10^{-6}$ was repeated so often that it took on the stature of a firm regulatory policy, although the record clearly indicates otherwise. Unfortunately, in adopting $10^{-6}$ for other purposes, the original intent of $10^{-6}$ as a screening level was lost and still is not recognized today.

   We could find no reference to $10^{-6}$ as a criterion for "acceptable risk" in any published EPA regulation or guidelines. The guidance published in 1984 by the Office of Science and Technology Policy[6] made no mention of any target risk whatsoever with which to compare results of health risk assessments, nor did EPA's proposed or final Guidelines for Carcinogenic Risk Assessment.[7,8]

   The first use of "acceptable risk" in any environmental guidance appears to have been a part of the Superfund Public Health Evaluation Manual, issued in 1986 and now superseded by the 1990 National Contingency Plan.[9] The original Superfund guidelines stated: "... remedies considered should reduce ambient chemical concentrations to levels associated with a carcinogenic risk range of $10^{-4}$ to $10^{-7}$." This range was modified to $10^{-4}$ to $10^{-6}$ in the final NCP.

3. *In codifying $10^{-6}$ for the first time in hazardous waste site rules, the National Contingency Plan specifically designates $10^{-6}$ as a starting point for discussion of acceptable target risk at a site or "point of departure," not the ultimate goal.[9] This is consistent with the original intent of the use of $10^{-6}$ as a level below which regulatory consideration was not warranted, i.e., as a starting point for discussion.*

   The plan specifically states $10^{-6}$ should not be presumed to be the final target risk for hazardous waste sites, but a "point of departure" for deciding an appropriate target level. $10^{-6}$ to $10^{-4}$ is given as a range of "generally acceptable risk," with the option given for even $10^{-4}$ to be exceeded in some circumstances.

   Because no two sites are alike, the guidance then lists several site-specific or remedy-specific factors that can be used to assist in the selection of a final risk level. This approach is consistent with EPA's requirement to develop protective strategies for hazardous waste sites, not eliminate risk.

4. *The use of a single value of "acceptable risk" has never been used in EPA hazardous waste site regulation -- only a range of values.*

In an analysis of the final NCP by one of the EPA attorneys who drafted the rule, the attorney states:

> "The use of a *range* of acceptable risk is general practice for most government programs...[It] affords the Agency the flexibility to take into account different situations, different kinds of threats, and different kinds of technical remedies. If a single risk level had been adopted (e.g., at the more stringent end of the risk range), fewer alternatives would be expected to pass the protectiveness threshold and qualify for consideration in the balancing phase of the remedy selection process."[10]

The use of $10^{-6}$ as a definition of acceptable risk thus has no scientific or regulatory basis. Its use appears to be arbitrary and generally applied where risks are perceived to be high relative to other risks, regardless of the available data.

## SO WHAT IS AN ACCEPTABLE LEVEL OF RISK?

Much has been written about determining the acceptability of risk. The general consensus of the literature is that "acceptability" of a risk is a judgment decision properly made by those exposed to the hazard or their designated health officials. It is not a scientifically-derived value or a decision made by outsiders to the process. Acceptability is based on many factors, such as the number of people exposed, the consequences of the risk, the degree of control over exposure, and perhaps 40 or so other factors. The degree of risk acceptable at hazardous waste sites has never been formally quantified, but it does vary with each site, and it is clear that the public tolerates a very low threshold of acceptable risk at hazardous waste sites in part because hazardous waste ranks very high with many of these factors.

Travis *et al.* attempted to answer this question indirectly by quantifying the risk levels associated with 132 federal regulatory decisions, and thus determine a *de facto* level of acceptable risk.[11] If a consistent threshold of risk could be shown in other federal health and safety decisions, that could provide guidance for comparable protection of hazardous waste sites. From this effort they rather convincingly concluded that the *de facto* level of acceptable risk in federal regulatory decisions has been shown to be approximately $10^{-4}$.

This level, which is 100 times greater than $10^{-6}$, is likely due to several factors. We suggest that chief among those reasons is that *perception* of risk drives the regulatory decision on what constitutes the level of "acceptable" risk. This notion is supported by recent findings of the U.S. EPA Science Advisory Board,[12] which ranks hazardous waste near the bottom of its list of actual risks to the public, but near the top of the agency's priorities, which in turn are dictated by public perceptions and Congressional funding. In response to these findings, U.S. EPA Administrator Reilly has undertaken a major reorganization of the EPA to refocus its efforts on the major sources of actual risk and their reduction.[13]

A second reason we believe $10^{-6}$ has been so widely applied to hazardous waste sites is that unlike decisions about air contamination, pesticides, and other agency reviews made at the federal level, hazardous waste site cleanup decisions are made on a very local and site-specific basis. What seems "doable" at the local level, such as spending a million dollars for cleaning up a site in return for virtual elimination of risk, often does not seem "doable" on a larger scale, as when thousands of sites at perhaps several million dollars per site are the cost of reducing risk to levels well below those considered "acceptable" by other public health standards.

What does this mean for current and pending state environmental policy? We suspect that many agencies will begin to adopt policies such as that established by the New Jersey Department of Environmental Protection, Division of Environmental Quality (DEQ), in their guidance for risk assessments for municipal solid waste incineration facilities. This policy quite succinctly states:

> "Incremental risks from a new source which are less than one in a million are considered by the DEQ to be negligible. Incremental risks greater than one in ten thousand are deemed unacceptable. Risks between these two limits are judged on a case-by-case basis."[14]

## SUMMARY AND CONCLUSIONS

It has been nearly two decades since the FDA introduced the concept of risk assessment in its efforts to deal with DES as a growth promoter in cattle. As part of this effort, the threshold of one-in-a-million risk of developing cancer was established as a screening level to determine what carcinogenic animal drug residues merited further regulatory consideration.

Since then, the use of risk assessment and $10^{-6}$ (or variations thereof) have been greatly expanded to almost all areas of chemical regulation, to the point where today clearly one-in-a-million risk means different things to different agencies. What the FDA intended to be a *lower* regulatory level of "zero risk" below which no consideration would be given as to risk to human health, many federal and state agency decisions somehow came to consider a *maximum* or *target* level of "acceptable" risk.

As $10^{-6}$ seemed like a reasonably conservative level (or "doable," according to many of those we spoke with), it was adopted first for a few chemicals and exposure pathways, then more chemicals and exposure pathways, and so forth. Not until the rule came into widespread use or until everyone was limited to one mile per hour on the freeway, so to speak, and it was costing billions of dollars to eliminate risk -- did it become readily apparent that the "zero risk" screening criterion was not intended to be interpreted as "acceptable risk." Accordingly, the benefits of the $10^{-6}$ criterion applied to hazardous waste sites will rarely exceed the risks and costs, and the criterion is thus unsuitable for regular implementation or enforcement.

Furthermore, $10^{-6}$ as a criterion for "acceptable risk" has not been applied to other sources of exposure that pose considerably more risk to public health than hazardous waste, such as automobile emissions, radon, or sources of benzene. The primary reason for the inconsistent application of this criterion appears to be that public perception of risk has driven the regulatory management of these sites

to a greater degree than supported by the actual data. Reorganizing the EPA's priorities towards issues of actual rather than perceived risk is a major goal of EPA Administrator Reilly.

A lack of a sound basis for extrapolating the use of $10^{-6}$ from its very specific origins to a wide variety of other non-related applications partly explains the extreme difficulty agencies have had in implementing $10^{-6}$ as a goal. Such extrapolations face costs and benefits that are often not in balance (e.g., OMB's unwillingness to approve recent hazardous waste incineration rules because of EPA's inability to fully account for and justify the costs of implementing these rules -- i.e., $288 million dollars per case of cancer avoided).[15]

The discovery of a lack of a sound basis for the choice of $10^{-6}$ offers opportunities for introducing health-based considerations into the discussion of how to clean up hazardous waste sites, particularly when so many sites demand attention for cleanup and funds are limited. As the federal and state agencies review their position on the "Holy Grail" of $10^{-6}$ as a goal that is frequently sought but rarely found, it's interesting to know that in the absence of a well-established basis for $10^{-6}$, the door is wide open for discussion about the appropriateness of $10^{-6}$ or any other criterion. Of particular interest is the need for clarification of $10^{-6}$ as a screening level of "essentially zero" risk, as it was originally intended, vs. its frequent use at hazardous waste sites as a goal of maximum "acceptable risk."

This is an opportunity to create cleanup criteria with a more sound basis, instead of presenting an obstacle to further decisic n-making regarding important health and environmental matters. The solution to developing better criteria for environmental contaminants is not to adopt arbitrary thresholds of "acceptable risk" in an attempt to manage the public's perception of risk. Rather, the solution is to standardize the *process* by which risks are assessed, and to undertake efforts to narrow the gap between the public's understanding of actual vs. perceived risk. A more educated public with regard to the sources of real environmental risk will greatly facilitate the regulatory agencies' ability to prioritize their efforts and standards to reduce overall risks to public health.

REFERENCES


1. Travis, C.C. 1991. Environmental Science and Technology 25(5). In preparation.

2. Ames, B.N., M. Profet, and L.S. Gold. 1990. Dietary pesticides (99.99% all natural). Proc. Natl. Acad. Sci. U.S.A. 87: 7777-7781.

3. Kelly, K.E. and N.C. Cardon. 1991. The Surprising Origins of $10^{-6}$. In preparation.

4. U.S. Food and Drug Administration (USFDA). 1973. Compounds used in food-producing animals. Procedures for determining acceptability of assay methods used for assuring the absence of residues in edible products of such animals. Proposed rule. Federal Register, July 19: 19226-19230.

5. Travis, C.C., E.A.C. Crouch, R. Milson, and E.D. Klema. 1987. Cancer risk management: A review of 132 regulatory decisions. Environmental Science and Technology 21(5): 415-420.

6. Executive Office of the President. Office of Science and Technology Policy. 1984. Chemical carcinogens: Review of the science and its associated principles, May, 1984. Federal Register May 22: 21594-21661.

7. U.S. Environmental Protection Agency (USEPA). 1984. Proposed guidelines for carcinogen risk assessment. Federal Register November 23: 46294-46301.

8. U.S. Environmental Protection Agency (USEPA). 1986. Guidelines for carcinogen risk assessment. Federal Register September 24: 33992-34003.

9. U.S. Environmental Protection Agency (USEPA). 1990. National Oil and Hazardous Substances Pollution Contingency Plan. Final rule. Federal Register March 8: 8670-8852.

10. Starfield, L.E. 1990. The 1990 National Contingency Plan: More detail and more structure, but still a balancing act. Environmental Law Reporter June: 10222-10251.

11. Travis, C.C., E.A.C. Crouch, R. Wilson, and E.D. Klema. 1987. Cancer risk management: A review of 132 regulatory decisions. Environmental Science and Technology 21(5): 415-420.

12. U.S. Environmental Protection Agency (USEPA). Science Advisory Board. 1990. Reducing risk: Setting priorities and strategies for environmental protection. EPA SAB-EC-90-021.

13. Stevens, W.K. 1991. What really threatens the environment? Official seeks to start a debate over the nation's goals. (William K. Reilly of the Environmental Protection Agency). New York Times 140 (January 29): B7(N).

14. Held, J.L., and O. Boyko. 1991. New Jersey risk assessment guidelines for resource recovery facilities. Presented at the 84th annual meeting of the Air & Waste Management Association. Vancouver, B.C., Canada. June.

15. Environmental Policy Alert. June 13, 1990.

ALASKA PULP CORPORATION

4/29/92

Lloyd Jones
Alaska Legislature
PO Box (MS3100)
Juneau, AK 99811

Lloyd:

Here is a paper on the role of $10^{-6}$ as a determinant in risk assessment. Although the paper's main topic is hazardous waste clean-up, the topic does have relevance to water permits, state-federal environmental issues and discussions of risk.

Essentially, the paper states:

1) Very few people know where the term $10^{-6}$ originated – even those in regulatory agencies – or that the number was basically pulled out of a hat.
2) $10^{-6}$ is not consistently applied to environmental legislation.
3) $10^{-6}$ represents an increase of only 0.0003% over our current 1 in 3 chance of developing cancer.
4) In the evolution of risk assessment, agencies have interchanged the concepts of average risk, acceptable risk and zero risk.
5) Perception of risk drives the public or political process to stricter definitions of acceptable risk.
6) The cost to achieve $10^{-6}$ risk may be exceedingly high and not have any appreciable impact to public health or the environment.

I hope you will find this well-documented article both interesting and enlightening.

Respectfully,

Rollo Pool

TELECOPIER (907) 747 5588
TELEPHONE (907) 747 2211



ALASKA PULP CORPORATION
4600 SAWMILL CREEK ROAD • SITKA, ALASKA 99835-9639

April 9, 1992

Post-it™ brand fax transmittal memo 7671 | # of pages ▸ 2

| | |
|---|---|
| To Honorable Lloyd Jones | From Frank Poppel |
| Co. | Co. APC |
| Dept. | Phone # 747-2255 |
| Fax # 465-3922 | Fax # 747-2268 |

John Sandor
Commissioner
Alaska Department of
Environmental Conservation
P.O. Box O
Juneau, Alaska 99811-1800

RE: Proposed NPDES Permit for Alaska Pulp Corporation - Sitka

Dear Commissioner:

Based on a very cursory assessment of the preliminary draft (AK000053-1) of March 20, it appears it will cost Alaska Pulp Corporation (APC) in excess of $104 million in capital costs and $33 million annual costs for interest, depreciation, operations and maintenance to comply with the proposed permit. This translates to a cost of production increase of $190 per ton of pulp.

These proposed costs come at a time when our head to head British Columbia competitor has not yet installed even secondary treatment and has enjoyed a 12 million annual pollution control cost advantage over each of the two Alaska mills for more than the past ten years. The artificially reduced operating costs of Canadian mills and other international competitors preclude us from passing along these huge cost increases to the consumer. There is currently a soft market for our type of pulp and there is still the capacity to further increase production at some of the lowest cost producing plants.

The proposed permit is also competitively unfair to the Alaska mills compared to Lower 48 competitors because it imposes a significantly higher level of severity than noticed in recent Northwest mill permits.

In addition to the costs associated with a NPDES permit, APC is still faced with the costs of a new air permit, costly land fill closures, a million dollar mill drinking water change and storm (rain) water run-off control.

Under these conditions, no prudent banker would even consider the lending of money to fund such modifications, bringing into serious question the mill's ability to finance such huge costs.

The proposed permit will clearly require significant process changes and major equipment additions. We are presently detailing these and will get them to you soon. However, in 1983, EPA itself recognized the scope of equipment and process changes and the related costs needed for major reduction in effluent levels then required ($60 million in capital costs and $10.3 million in O&M costs for changes for less onerous than those required here).

As you know, our pulp is used in a very complex chemical process as compared to most pulps which are mechanically processed for paper making. The technology to support some of the apparently required changes has not yet been proven in the market place and would raise very serious doubts in the users as to the continued suitability of our product for their needs.

The proposed permit unfortunately ignores non-water quality impacts such as land fill and air emissions. These impacts are magnified because APC has no land fill area for sludge and bio-solids.

I urge the State to seek to have EPA agree to continue the existing NPDES permit for most parameters for another five year term or the remaining economic life of the mill. During that period, several parameters could be identified for effluent reduction. For example, I am confident that the more high profile issues important to this area such as color in the water could be significantly improved given time and flexibility.

APC has operated in Sitka for more than thirty years and intends to attempt to stay, but it must be recognized there is a limit to our ability to absorb these huge costs.

Yours very truly,

Franklin C. Roppel
Executive Vice President

FCR:cs

cc: Governor Hickel

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

MAR 26 1992

Reply To
Attn Of: WD-137

Richard Stokes, Regional Supervisor
Alaska Department of Environmental Conservation
Southeast Region
410 Willoughby Avenue
Suite 105
Juneau, Alaska 99801-1795

Re: Preliminary Draft NPDES Permits
- Ketchikan Pulp Company (AK-000092-2)
- Alaska Pulp Corporation (AK-000053-1)

Dear Mr. Stokes,

Enclosed for your review are copies of the preliminary draft National Pollutant Discharge Elimination System (NPDES) permits and supporting documentation for the referenced facilities. In accordance with established procedures between our agencies, this preliminary review should be completed within a two-week time frame. Upon completing the review, we plan to send the drafts to public notice.

EPA is sharing copies of these documents with the companies and other organizations or private parties who have requested a copy of the earliest draft possible. We will also share the documents with any other interested parties upon request. We wish to emphasize that we are not soliciting comment from outside parties, because we believe that any formal dialogue at this time could compromise the public participation process.

We call your attention to the mixing zone section of the fact sheet. EPA is proposing mixing zones for pollutants with aquatic life criteria; the dimensions of these zones are based on the guidelines set forth in the standards. EPA is not proposing a mixing zone for pollutants with risk-based, human health criteria. In addition, no mixing zone is proposed for any pollutants in the discharge to Sawmill Creek from Alaska Pulp Corporation. If your agency authorizes different mixing zones than those described in the fact sheet, EPA will revise the permit accordingly.

Please contact Carla Fisher (206) 553-1756 or Ben Cope (206) 553-1442 with comments on the drafts.

Sincerely,

Gregory L. Kellogg, Acting Chief
Water Permits and Compliance Branch

Enclosures

cc: Office of Management and Budget, Juneau
Robert Higgins, Ketchikan Pulp Company
Edward Oetken, Alaska Pulp Company
Margaret Twitchell, Sierra Club Legal Defense Fund
Rick Della, ENSR
Don Muller

PRELIMINARY DRAFT

PRELIMINARY DRAFT
March 23, 1992

Permit No.: AK-000092-2
Application No.: AK-000092-2

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

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, 33 U.S.C. § 1251 et seq., as amended by the Water Quality Act of 1987, P.L. 100-4 (the "Act"),

KETCHIKAN PULP COMPANY
(Ketchikan Pulp Mill)

is authorized to discharge from its pulping facility located in Ketchikan, Alaska

to receiving waters named Ward Cove,

in accordance with discharge point(s), effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective

This permit and the authorization to discharge shall expire at midnight,

Signed this day of

Director, Water Division, Region 10
U.S. Environmental Protection Agency

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ATTACHMENT 1 - STATION LOCATIONS FOR RECEIVING WATER MONITORING PROGRAM

## I. EFFLUENT LIMITATIONS

A. During the effective period of this permit, the Permittee is authorized to discharge from outfalls 001, 002, 003, and stormwater outfalls subject to the restrictions set forth herein. This permit does not authorize the discharge of any waste streams, including spills and other unintentional or non-routine discharges of pollutants, that are not part of the normal operation of the facility as disclosed in the permit application, or any pollutants that are not ordinarily present in such waste streams.

B. The Permittee shall not discharge beyond the existing log boom any floating solids, visible foam in other than trace amounts, or oily wastes that produce a sheen on the surface of the receiving water.

C. The Permittee shall not discharge sludge, including sludge removed from wastewater treatment facilities during cleaning or maintenance periods. All sludge recirculated to the aeration basin is considered a removed substance, subject to the restrictions set forth in the Removed Substances clause of this permit (Part IV.F.), and the Permittee shall not discharge it directly from the aeration basin to the receiving waters.

D. The Permittee shall submit annual certification to EPA that it has not used pentachlorophenol as a biocide and that it does not intend to use pentachlorophenol.

E. The Permittee shall limit discharges as specified in Table 1 below. All figures represent maximum effluent limits unless otherwise indicated. The Permittee shall comply with the following effluent limits at all times unless otherwise indicated (e.g., pH), regardless of the frequency of monitoring or reporting required by other provisions of this permit.

## Table 1 - Effluent Limitations

| Parameter (units) | Outfall(s)[1/] | Limits on Daily Discharge | | |
|---|---|---|---|---|
| | | Monthly Average | Operating Average | Maximum (Minimum) |
| Five Day Biochemical Oxygen Demand ($BOD_5$) (lb/day) Nov. - May | 001+002+003 | --- | 30,200 | 58,100 |
| Five Day Biochemical Oxygen Demand ($BOD_5$) (lb/day) June - Oct. | 001+002+003 +stormwater outfalls | 10,000 | --- | 18,000 |
| Dissolved Oxygen (mg/l) June - Oct. | 001+002+003 +stormwater outfalls | --- | --- | (5) |
| Total Suspended Solids (TSS) (lb/day) | 001+002+003 | --- | 51,000 | 94,600 |
| 6-44 7.5-35 P 70-7100 S | | | | |
| Chronic Toxicity ($TU_c$)[2/] | 001,002 | --- | --- | 16 |
| Chronic Toxicity ($TU_c$)[2/] | 003 >100 | --- | --- | 83 |
| 2,3,7,8-TCDD (ug/day)[3/] | 15 ppq 001 | --- 3ppq - stormwater | --- | 1.5 .02 ppq |
| 2,3,7,8-TCDD (ug/day)[3/] | 002 | --- | --- | 1.1 .02 ppq |
| Chloroform (ug/l) | 268 720 22 001,002,003 | 16 | --- | 31 |
| 2,4,6-Trichlorophenol (ug/l) | 13 9 001,002 | 3.6 | --- | 7.2 |
| Manganese (ug/l)[4/] | 1140 430 001,002 | 100 | --- | 200 |
| Mercury (ug/l)[4/] | 3.91 0.25 001,002 | .3 | --- | .6 |
| Copper (ug/l)[4/] | 10 8 001,002 | 20 | --- | 41 |
| Copper (ug/l)[4/] | 73 003 | 107 | --- | 215 |
| ickel (ug/l)[4/] | 22 19 001,002 | 81 | --- | 163 |

Table 1 - Effluent Limitations (Cont.)

| Parameter (units) | Outfall(s)[1/] | Limits on Daily Discharge | | |
|---|---|---|---|---|
| | | Monthly Average | Operating Average | Maximum (Minimum) |
| Color (color units) | 619 477 001,002 | 35 | --- | 70 |
| Total Hydrocarbons (ug/l)[5/] | 2100 2400 001,002 | 105 | --- | 210 |
| Sulfide (ug/l) | 1195 792 001,002 | 23 | --- | 46 |
| pH | 001,002 | Shall not be greater than 9.0 Standard Units for more than 7 hours 26 minutes in any calendar month, or for more than 60 minutes continuously at any time, and shall not ever be less than 5.0 or greater than 11 Standard Units. | | |
| pH | 003 | Shall not be less than 5.0 or greater than 9.0 Standard Units for more than 7 hours 26 minutes in any calendar month, or for more than 60 minutes continuously at any time, and shall not ever be less than 4.5 or greater than 11.8 Standard Units. | | |

NOTES:

1/ For $BOD_5$ and TSS only, limitations apply to the total combined discharges from the listed outfalls, as shown by the "+" symbol. For Dissolved Oxygen only, the limitations apply to the flow-weighted average concentration (see definitions) for the listed outfalls, also shown by the "+" symbol. For all other pollutants, limitations apply to discharges at the individual outfall(s) listed.

2/ Chronic toxic units, see Definitions.

3/ If the concentration of 2,3,7,8-TCDD in the final effluents is below the minimum level (ML) achievable with EPA method 1613 (10 picograms per liter, pg/l) compliance with this limit shall be determined by measurement of the combined bleach plant effluent or, if necessary, individual bleach plant wastestreams. If monitoring of individual bleach plant wastestreams is used, the loading (ug/day) for each wastestream with concentrations of 2,3,7,8-TCDD exceeding the ML will be added and reported on the DMR. If the concentrations of 2,3,7,8-TCDD in all of the bleach plant wastestreams are below the minimum level, the Permittee shall report the effluent loading as "non-detect" and shall be considered to be in compliance with the effluent limit.

4/ Metals limits are expressed as total recoverable metals.

5/ see Definitions.

F. The Permittee shall limit discharges from the sanitary waste treatment system as specified in Table 2 below. All figures represent maximum effluent limits. All limits shall be met at a point after treatment and prior to commingling with other waste streams. This point of compliance shall be designated outfall 001A. The Permittee shall comply with the following effluent limits at all times, regardless of the frequency of monitoring or reporting required by other provisions of this permit.

Table 2-Sanitary Wastes

| Parameter | Discharge Limitations | |
|---|---|---|
| | Monthly Average | Weekly Average |
| $BOD_5$ | 30 mg/l | 45 mg/l |
| TSS | 30 mg/l | 45 mg/l |
| Fecal Coliform Bacteria | 200/100 ml | 400/100 ml |
| Total Residual Chlorine | ---- | 1.0 mg/l |

## II. BEST MANAGEMENT PRACTICES PLAN.

A. Purpose. It is the purpose of the BMP program to prevent or minimize the discharge and potential discharge of pollutants from the facility to the waters of the United States through normal operations, plant site runoff, spillage, sludge or waste disposal, or drainage from material storage. Pollution that cannot be prevented or reduced shall be recycled or treated to the extent practicable and discharged into the environment in an environmentally safe manner. The BMP program will thereby serve to protect and maintain the chemical, physical, and biological integrity of the receiving waters.

B. BMP Plan. The Permittee shall submit a BMP plan to EPA within six months of the effective date of the permit. The Permittee shall operate and maintain the facility in accordance with the BMP plan and the standard management practices included within the plan.

1. Form and structure of the BMP Plan. The BMP Plan shall be documented in narrative form, including any necessary plot plans, drawings or maps, and shall be developed in accordance with good engineering practices. The BMP Plan shall be organized and composed in the following structure:

(a) Name and location of the facility.

(b) Statement of BMP policy.

(c) Structure, functions and procedures of the Best Management Practices Committee.

(d) Specific objectives for the prevention and reduction of pollutant discharges and potential pollutant discharges at the facility in accordance with the purpose of the BMP program, including at least the following:

(i) minimization of the number and quantity of pollutants discharged or potentially discharged at the facility,

(ii) minimization of the toxicity of wastestreams discharged or potentially discharged at the facility,

(iii) prevention of the entry of pollutants into the wastestreams,

(iv) minimization of contamination of stormwater runoff and snowmelt.

(e) Specific management practices and standard operating procedures to achieve the above objectives, including opportunities to meet the objectives through at least the following:

(i) modification of equipment, technology, processes, and procedures,

(ii) reformulation or redesign of products,

(iii) substitution of materials,

(iv) improvement in management, training, inventory control, materials handling and/or general operational phases of the facility.

(f) Risk identification and assessment.

(g) Incidents that result in unanticipated discharges.

(h) Materials compatibility.

(i) Good housekeeping.

(j) Preventive maintenance.

(k) Inspections and records.

(l) Security.

(m) Employee training.

(n) Review and approval by plant manager.

2. Documentation. The Permittee shall maintain a copy of the BMP plan at the facility and provide it for inspection upon request. The Permittee shall submit the BMP plan to EPA and the Alaska Department of Environmental Conservation (ADEC) on or before January 31st of each year of operation under this permit.

3. Review and amendment. The Permittee shall review and evaluate the adequacy of the BMP plan annually in light of applicable technological developments, modifications of the facility and its processes, and the condition of the receiving waters. The Permittee shall revise the BMP plan as necessary and appropriate.

C. Conditions for modification. If the BMP program proves to be ineffective in achieving its general purpose or specific

objectives, the BMP program and/or NPDES permit shall be subject to modification to incorporate revised BMP requirements.

## III. MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Monitoring Requirements. The Permittee shall monitor all effluent as specified in Tables 3 and 4 below, subject to the other monitoring and reporting requirements set forth in this permit.

Table 3 - Monitoring Requirements

| Parameter | Outfall(s) | Monitoring Requirements | | |
|---|---|---|---|---|
| | | Sample Frequency | Sample Type | Sampling Point |
| Five Day Biochemical Oxygen Demand ($BOD_5$)[1/] (lb/day) | 001,002,003 | Daily | 24-hour Composite | Final Effluent |
| | stormwater | See Part III.D. | See Part III.D. | See Part III.D. |
| Dissolved Oxygen (mg/l)[1/] | 001,002,003 | Daily | Grab | Final Effluent |
| | stormwater | See Part III.D. | See Part III.D. | See Part III.D. |
| Total Suspended Solids (TSS) (lb/day)[1/] | 001,002,003 | Daily | 24-hour Composite | Final Effluent |
| Acute Toxicity ($TU_A$) (See also Part III.C.) | 001,002,003 | Quarterly | Grab | Final Effluent |
| Chronic Toxicity ($TU_C$) (See also Part III.C.) | 001,002,003 | Monthly | Grab | Final Effluent |
| 2,3,7,8-TCDD (ug/day) (See also Part III.B.) | 001,002 | Quarterly | See Part III.B. | See Part III.B. |
| 2,3,7,8-TCDF (ug/day) (See also Part III.B.) | 001,002 | Quarterly | See Part III.B. | See Part III.B. |
| AOX (lbs/day) (See also Part III.B.) | 001,002 | Weekly | See Part III.B. | See Part III.B. |
| Chlorinated Organics (See also Part III.B.) | 001,002 | Quarterly | See Part III.B. | Final Effluent |

Table 3 - Monitoring Requirements (Cont)

| Parameter | Outfall(s) | Monitoring Requirements | | |
|---|---|---|---|---|
| | | Sample Frequency | Sample Type | Sampling Point |
| Chloroform (ug/l) | 001,002 | Weekly | Grab | Final Effluent |
| 2,4,6-Trichlorophenol (ug/l) | 001,002 | Weekly | Grab | Final Effluent |
| Pentachlorophenol (ug/l) | 001,002 | Quarterly | Grab | Final Effluent |
| Mercury (ug/l)[2/] | 001,002 | Weekly | 24-hour Composite | Final Effluent |
| Manganese (mg/l)[2/] | 001,002 | Weekly | 24-hour Composite | Final Effluent |
| Copper (ug/l)[2/] | 001,002,003 | Weekly | 24-hour Composite | Final Effluent, Sludge |
| Nickel (ug/l)[2/] | 001,002 | Weekly | 24-hour Composite | Final Effluent |
| Temperature | 001,002 | Continuous Record | NA | Final Effluent |
| Turbidity | 001,002 | Monthly | 24-Hour Composite | Final Effluent |
| pH[3/] | 001,002,003 | Continuous Record | NA | Final Effluent |
| | stormwater | See Part III.D. | See Part III.D. | See Part III.D. |
| Color | 001,002 | Weekly | 24-Hour Composite | Final Effluent |
| Total Hydrocarbons | 001,002 | Weekly | Composite[4/] | Final Effluent |

Table 3 - Monitoring Requirements (Cont)

| Parameter | Outfall(s) | Monitoring Requirements | | |
|---|---|---|---|---|
| | | Sample Frequency | Sample Type | Sampling Point |
| Effluent Flow (MGD) | 001,002,003 | Continuous Record | NA | NA |
| Production (Air Dried Tons per Day) | NA | Monthly | NA | NA |
| Biocides | NA | Annual[5/] | NA | NA |

NOTES FOR TABLE 3:

1/ For $BOD_5$ and TSS only, the Permittee shall report the total combined discharge from the listed outfalls. For Dissolved Oxygen only, the Permittee shall report the flow-weighted average concentration from the listed outfalls.

2/ The Permittee shall conduct analyses for total recoverable and dissolved metals. After the first year of monitoring, the Permittee may request to decrease the monitoring frequency. Such request shall set forth in detail the rationale for the decreased monitoring frequency and the effects, if any, such reduction will have on the efficacy of the Permittee's effluent monitoring.

3/ The Permittee shall submit the following pH information each month with the DMR for that month:

For each excursion outside the range of 5-9:

1) Outfall number
2) Date of the excursion
3) Maximum or minimum pH during the excursion
4) The duration of the excursion, in minutes
5) The total number of excursions exceeding 60 minutes
6) The total duration of each excursion

In addition, for each outfall the Permittee shall report:

1) The number of excursions outside the range of 5 to 11 for outfalls 001 and 002
2) The number of excursions outside the range of 4.5 to 11.9 for outfall 003

4/ Analyses for total hydrocarbons shall be conducted using Method 503B from Standard Methods for the Examination of Water and Wastewater, 16th edition. A composite sample shall be defined as the flow-weighted average concentration (see definitions) of 4 individually analyzed grab samples collected over a 24-hour period.

5/ The Permittee shall submit to EPA annually a report of the amounts and types of biocides used. This report shall be submitted with the December DMR.

The Permittee shall monitor effluent from the sanitary waste treatment system as specified in Table 4 below, subject to the other monitoring and reporting requirements set forth in this permit. All samples shall be collected after treatment and prior to commingling with other waste streams.

Table 4-Sanitary Wastes

| Parameter | ---Monitoring Requirements--- Frequency | Sample Type |
|---|---|---|
| $BOD_5$ | 2/week | 24-hour composite |
| TSS | 2/week | 24-hour composite |
| Fecal Coliform Bacteria | 2/week | Grab |
| Total Residual Chlorine | 2/week | Grab |

B. Chlorinated Organics Monitoring.

1. Beginning the first calendar quarter after the effective date of this permit, the Permittee shall conduct a 24-hour composite sampling program at each bleach line, the final effluent (001 and 002), and wastewater sludge from the permitted facility. The purpose of the monitoring program is to document current rates of formation of 2,3,7,8-TCDD, 2,3,7,8-TCDF, and AOX, and characterize the final effluent and sludge in terms of TSS, 2,3,7,8-TCDD, and 2,3,7,8-TCDF. This sampling program shall monitor waste streams that are representative of the facility's typical waste streams.

2. The Permittee shall collect twenty-four hour composite samples at the following locations and analyze them for 2,3,7,8-TCDD, 2,3,7,8-TCDF, and AOX:

Bleach Line

- Fully bleached pulp

- Combined bleach plant wastewater prior to mixing with other process wastewaters and non-contact cooling waters. Individual bleach plant filtrates may be

sampled and composited on a flow-weighted basis prior to analysis, or analyzed separately. Installation of flow monitoring equipment for bleach plant process wastewaters may be necessary.

Final Effluent

- Final effluent from 001 and 002 prior to discharge and prior to mixing with non-contact cooling waters.

3. To the extent that quarterly monitoring for AOX coincides with the weekly AOX monitoring required in Part III.A. of this permit, quarterly results may be used to satisfy that requirement.

4. The Permittee shall collect grab samples at the following location and analyze them for 2,3,7,8-TCDD, 2,3,7,8-TCDF, and Extractable Organic Halogens (EOX):

Wastewater Treatment Sludge

- Combined primary and secondary dewatered sludge or other sludge removed from the wastewater treatment system.

5. The Permittee shall determine mass flow rates of the sampled wastewaters and pulp, and shall record process information during the sampling event as required for the USEPA/Paper Industry Cooperative Dioxin Study (104 Mill Study).

6. Samples collected pursuant to paragraphs 2 and 4 above, shall be analyzed for 2,3,7,8-TCDD and 2,3,7,8-TCDF by USEPA Method 1613 or other methods explicitly approved by EPA.

The Permittee shall analyze samples for AOX by USEPA method 1650, SCAN-W 9:89 or ISO/DIS 9562 until the EPA Method 1650 for AOX is formally promulgated, after which time that method shall be used. Both the suspended and dissolved fractions of the wastewater shall be included in all analyses.

EOX analysis shall be conducted (using ethyl acetate as a solvent) in accordance with the method contained in the following document:

Martin, J.T. and Y. Takahashi, "Total Extractable and Leachable Organic Halides in Soils and Sediments", Chemical and Biological Characterization of Sludges, Sediments, Dredge Spoils, and Drilling Muds, ASTM STP 976. J.J. Lichtenberg, J.A. Winter, C.I. Weber and L. Fradkin, Eds, ASTM, Philadelphia, 1988.

7. The Permittee shall report the results of the monitoring program and the process information for each 24-hour sampling event not later than 60 days after the end of each calendar quarter.

8. Beginning the first calendar quarter after the effective date of this permit, the Permittee shall conduct quarterly monitoring of the final effluent for the following groups of compounds:

   a. Resin Acids
   b. Fatty Acids
   c. Chlorophenols
   d. Guaiacols
   e. Catechols
   f. Miscellaneous Organics
      6-chlorovanillin
      a-terpineol
      5,6-dichlorovanillin
      2-methyl-2-cyclopenten-1-one
      3,4,5-trichlorosyringol
      3-methyl-2-cylopentene-1-one
      Dimethyl-2-cylopenten-1-one

The Permittee shall collect and analyze 24-hour composite samples in accordance with standard protocols. The Permittee shall submit sample results with the DMR for the last month of the calendar quarter (i.e., DMRs for March, June, September, and December). After one year of monitoring, if all samples for all compounds in any one of the above groups are non-detect, monitoring for that group may be discontinued.

C. Toxicity Testing Requirements.

Chronic Tests

The Permittee shall conduct chronic toxicity testing for determining the toxicity of the effluent from outfalls 001, 002, and 003 in accordance with subsections 1 - 5 and 11 - 16, below.

1. The Permittee shall conduct chronic toxicity testing once per month with one of the following organisms:

   (a) Sand dollar (Dendraster excentricus)
   (b) Green, purple or red sea urchin (Strongylocentrotus droebbachiensis, Strongylocentrotus purpuratus, Strongylocentrotus franciscanus, respectively)
   (c) Pacific oyster (Crassostrea gigas)
   (d) Bay mussel (Mytilus edulis)

Species shall be selected based on availability of organisms in spawning condition. At least two tests per year shall be conducted using Pacific oyster.

2. All test organisms and procedures for the bivalve larvae tests shall be in accordance with:

   Standard Practice for Conducting Static Acute Toxicity Tests with the Larvae of Four Species of Bivalve Molluscs, designation: E 724-89. American Society for Testing and Materials (ASTM). 1989.

   All test organisms and procedures for the echinoderm tests shall be in accordance with:

   (a) Improved Methodology for a Sea Urchin Sperm Cell Bioassay for Marine Waters. Dinnel, P.A., J.M. Link, and Q.J. Stober. 1987. arch. Environ. Contam. Toxicol. 16:23-32; or

   (b) Methodology and Validation of a Sperm Cell Toxicity Test for Testing Toxic Substances in Marine Waters, Dinnel, et al., FRI-UW-8306, November 1983; and

   EPA Region 10 Guidance for Conducting Effluent Toxicity Tests Using West Coast Sea Urchins and Sand Dollars.

3. The toxicity testing on each organism shall include a series of six test solutions, ranging from zero percent effluent (control) to 100%. Based on available data, dilutions shall be selected that will bracket the expected no observable effects concentration (NOEC, see definitions) of the effluent. In addition, one dilution will be used that corresponds with the dilution necessary to show compliance with the applicable permit limit. Salinity adjustments shall be used, if appropriate. For compliance purposes, test results shall be reported in chronic toxic units (see definitions).

4. In addition to reporting $TU_c$, the Permittee shall report the NOEC and the $EC_{50}$ (see definitions) of the effluent in control water.

5. All reporting, quality assurance criteria and statistical analyses used for chronic tests shall be in accordance with Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms EPA/600/4-87/028 and individual test protocols. The report of results shall include all relevant information

outlined in Section 10, Report Preparation, of the EPA document.

Acute Tests

The Permittee shall conduct acute toxicity tests of the effluent from outfalls 001, 002, and 003 on a quarterly basis in accordance with sections 6 - 16, below.

6. The Permittee shall conduct 96-hour static renewal or flow-through tests for estimating toxicity of the effluent to the inland silverside (Menidia beryllina).

7. The Permittee shall conduct testing according to the guidelines set forth in Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (Fourth Edition), EPA/600/4-90/027.

8. The toxicity testing shall include a series of six test solutions, ranging from zero percent effluent (control) to 100%. Salinity adjustments shall be made as necessary. Based on available data, dilutions shall be selected that will bracket the expected $LC_{50}$ (see definitions). Test results shall be reported in acute toxic units (see definitions). In addition, the Permittee shall report the $LC_{50}$ of the effluent in control water, as well as the 95 percent confidence limits of the $LC_{50}$, calculated using an internally consistent scheme based on the moving average angle, graphical, or probit method, as appropriate.

9. In conducting acute tests, the Permittee shall also report responses that could reasonably be expected to result in ecological death (e.g., cessation of swimming behavior) and, if possible, the Permittee shall determine a 96-hour $EC_{50}$.

10. All reporting, quality assurance criteria and statistical analyses used for acute tests shall be in accordance with Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (Fourth Edition), EPA/600-4-90/027. The report of acute test results shall include all relevant information outlined in Section 12 of this document.

Both Types of Toxicity Tests

Paragraphs 11-16 below apply to all toxicity tests described in paragraphs 1-10.

11. Testing shall be conducted on grab samples of effluent. Each sample collected shall be large enough to provide

enough effluent to conduct the toxicity tests, as well as chemical tests required in paragraph 12., below.

12. The Permittee shall conduct acute and chronic testing on split samples of effluent to the extent possible. In addition, a split of each sample collected shall be analyzed for the chemical and physical parameters required for the respective outfalls in Part III.A., above. When the timing of sample collection coincides with that of the sampling required in Part III.A., analysis of the split sample will fulfill the requirements of Part III.A. as well.

13. Dilution water for marine tests shall be high quality natural seawater. Artificial sea salts or concentrated brine may be used if the lab can achieve reliable results when conducting the specified test with the chosen medium.

14. Any tests that fail the criteria for control response as specified in the respective protocols shall be repeated on a freshly collected sample.

15. The Permittee shall submit the results of the toxicity tests in TUs with the DMR for the month in which the test is conducted. The full report for each test shall be submitted by the end of the month in which the DMR is submitted. Along with the results, the Permittee shall include: (1) the dates of sample collection and initiation of each toxicity test; (2) the type of production; and (3) the flow rate at the time of sample collection.

16. If EPA determines that any of the toxicity tests are inadequate for evaluating the Permittee's effluent, EPA may substitute alternative tests that will provide the required toxicity information.

**D. Stormwater Monitoring Program.**

The Permittee shall conduct a Stormwater Monitoring Program. The requirements of the program are as follows:

1. The Permittee shall identify all stormwater discharge locations at the facility, as well as the activities that may contribute to pollutant loads in stormwater from the facility site. The Permittee shall develop a site map to scale that shows all pertinent facilities. This requirement may be used as part of the BMP plan required under Part II of this permit.

2. The Permittee shall conduct a monitoring study of each stormwater outfall for the following pollutants:

Biochemical Oxygen Demand ($BOD_5$)
Chemical Oxygen Demand (COD)
Total Suspended Solids (TSS)
Dissolved Oxygen (DO)
Polynuclear Aromatic Hydrocarbons (PAH) - EPA Method 625 or equivalent
Total Hydrocarbons - Standard Methods 16th edition, 503B or equivalent
Benzene - EPA Method 624 or equivalent
Ethylbenzene - EPA Method 624 or equivalent
Toluene - EPA Method 624 or equivalent
Xylene - EPA Method 624 or equivalent
pH
oil & grease

Sampling shall be conducted during at least three different storm/discharge conditions. One of the three conditions monitored shall be the first 20 minutes of a storm event after a dry period.

Based on data generated above, EPA may modify the permit to include additional monitoring and/or limitations on any discharges that show reasonable potential to contribute to violations of water quality standards.

3. During the summer months (June through October) of the permit term, the Permittee shall monitor the $BOD_5$ and DO of each stormwater outfall twice per month using grab samples. In addition, the Permittee shall monitor the flow at each outfall, using estimates if necessary. Samples shall be collected at least one week apart, and each sample shall be taken during the first 20 minutes of a storm event. For the purpose of this subpart, a storm event shall mean the onset of precipitation sufficient to collect a sample from the stormwater outfall.

The Permittee shall add the monthly average $BOD_5$ loading (lbs/day) from the stormwater discharges to the monthly average $BOD_5$ loading from outfalls 001, 002, and 003. The Permittee shall use stormwater DO concentrations and flow estimates in the calculation of the flow-weighted average concentration (along with the values for outfalls 001, 002, and 003) for each stormwater sampling day. These aggregate values shall be reported in accordance with Part III.G. of this permit, and shall be used as the basis for determining compliance with the effluent limits.

4. Information satisfying requirements 1 and 2 above shall be submitted to EPA within 6 months of the effective date of the permit. Results from ongoing $BOD_5$ and DO monitoring shall be submitted with the monthly DMRs.

E. Receiving Water Monitoring Program.

The Permittee shall conduct a Water Quality Monitoring program on the waters of Ward Cove according to the following:

Water Column Monitoring

1. The Permittee shall collect samples every two weeks at the stations indicated on Attachment 1. The date, time, weather conditions, and tide level and stage shall be noted and reported for each sample collected.

2. Such samples shall be analyzed for sulfite waste liquor (SWL), dissolved oxygen (DO), pH, salinity, temperature, Secchi disk depth, turbidity, and color.

3. The Permittee shall analyze for DO, temperature, pH, salinity, and turbidity every meter for the first five meters from the surface, then every five meters to the bottom. This profile shall be repeated from the bottom to the surface. All measurements shall be made using properly calibrated probes.

4. For SWL and color, the Permittee shall collect samples at depths of 1 and 5 meters from the surface with a suitable device for obtaining depth-specific water samples, such as a VanDorn bottle.

5. Station positioning, sample collection, analysis, and QA/QC shall be in accordance with Recommended Protocols and Guidelines for Measuring Selected Environmental Variables in Puget Sound (USEPA Region 10, 1986). Sulfite waste liquor determinations shall be made using the Pearl-Benson method as described by Barnes, et al., TAPPI 46 (6): 347-351.

6. All monitoring results shall be included in a report and submitted along with the DMR for the month in which samples are taken. The report shall include all relevant quality assurance/quality control (QA/QC) information, including but not limited to instrumentation, laboratory procedures, and sample collection methodology.

Sediment Monitoring

1. The Permittee shall conduct monitoring annually at stations 41 through 49, listed on Attachment 1. The Permittee shall establish two additional stations near the shoreline between stations 41 and 43. The Permittee shall collect a minimum of 3 replicates at each station for analysis.

2. The sediment samples shall be analyzed for the following parameters:

   a. all congeners of TCDD
   b. all congeners of TCDF
   c. total organic carbon (TOC)
   e. polynuclear aromatic hydrocarbons (PAH)
   f. cadmium, arsenic, and zinc
   g. phenol, 4-methylphenol, and benzoic acid
   h. acid volatile sulfides (AVS).
   i. sediment toxicity
   j. EOX

3. Station positioning, sample collection, analysis, and QA/QC shall be in accordance with Recommended Protocols and Guidelines for Measuring Selected Environmental Variables in Puget Sound (USEPA Region 10, 1986). EOX analysis shall be conducted (using ethyl acetate as a solvent) in accordance with the method contained in the following document:

   Martin, J.T. and Y. Takahashi, "Total Extractable and Leachable Organic Halides in Soils and Sediments", Chemical and Biological Characterization of Sludges, Sediments, Dredge Spoils, and Drilling Muds, ASTM STP 976. J.J. Lichtenberg, J.A. Winter, C.I. Weber and L. Fradkin, Eds, ASTM, Philadelphia, 1988.

4. The results shall be submitted by December 31st of each year in a report that includes thorough discussions of the sampling and analytical methodologies used and QA/QC procedures.

Bioaccumulation Monitoring

1. The Permittee shall implement a bioaccumulation monitoring program in the vicinity of the discharge. Monitoring shall be conducted annually for all congeners of TCDD and TCDF, and percent lipid.

2. The study shall be conducted using tissues from three organisms that are effective indicators of bioaccumulation.

3. Within 90 days of the effective date of this permit, the Permittee shall submit to EPA for approval a monitoring plan that justifies the selection of specific organisms, tissues, sampling locations, monitoring dates, and analytical procedures to be used in the monitoring program. Sampling and analytical procedures shall be consistent with those used by EPA's ORD Duluth Laboratory for the draft Bioaccumulation of Selected Pollutants in Fish - A National Study - Volumes 1 and 2 (EPA/506/6-90-001a and 001b) December 1990. Upon approval, the plan shall become an enforceable part of this permit.

4. The results shall be submitted by December 31st of each year in a report that includes thorough discussions of the sampling and analytical methodologies used and QA/QC procedures.

F. Representative Sampling (Routine and Non-Routine Discharges). The Permittee shall collect all effluent samples from the effluent stream prior to discharge into the receiving waters. Samples and measurements shall be representative of the volume and nature of the monitored discharge.

In order to ensure that the effluent limits set forth in this permit are not violated at times other than when routine samples are taken, the Permittee shall collect additional samples at the appropriate outfall(s) and analyze them for the parameters limited in Part I.E. of this permit, whenever any discharge occurs that may reasonably be expected to cause or contribute to a permit violation that is unlikely to be detected by a routine sample.

The Permittee shall collect such additional samples as soon as possible after the spill or discharge. The samples shall be analyzed in accordance with paragraph H., below. In the event of an anticipated bypass, as defined in Part VI.G. of this permit, the Permittee shall collect and analyze additional samples as soon as the bypassed effluent reaches the outfall. The Permittee shall report all additional monitoring in accordance with paragraph I., below.

G. **Reporting of Monitoring Results.** The Permittee shall summarize monitoring results each month on the Discharge Monitoring Report (DMR) form (EPA No. 3320-1). The Permittee shall submit reports monthly, postmarked by the 10th day of the following month. The Permittee shall sign and certify all DMRs, and all other reports, in accordance with the requirements of Part V.E. of this permit ("Signatory Requirements"). The Permittee shall submit the legible originals of these documents to the Director, Water Division, with copies to ADEC at the following addresses:

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, WD-135
Seattle, Washington 98101

Alaska Department of Environmental Conservation
Southcentral Region
3601 "C" Street, Suite 1334
Anchorage, Alaska 99503

H. Monitoring Procedures. Monitoring must be conducted according to test procedures approved under 40 CFR 136, unless other test procedures have been specified in this permit.

I. **Additional Monitoring by Permittee.** If the Permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the Permittee shall include the results of this monitoring in the calculation and reporting of the data submitted in the DMR. The Permittee shall indicate on the DMR whenever it has performed additional monitoring, and shall explain why it performed such monitoring.

Upon request by the Regional Administrator, the Permittee shall submit results of any other sampling, regardless of the test method used.

J. **Records Contents.** All effluent monitoring records shall bear the hand-written signature of the person who prepared them. In addition, all records of monitoring information shall include:

1. the date, exact place, and time of sampling or measurements;

2. the names of the individual(s) who performed the sampling or measurements;

3. the date(s) analyses were performed;

4. the names of the individual(s) who performed the analyses;

5. the analytical techniques or methods used; and

6. the results of such analyses.

K. Retention of Records. The Permittee shall retain records of all monitoring information, including but not limited to all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five years from the date of the sample, measurement, report or application, or for the term of this permit, whichever is longer. This period may be extended by request of the Regional Administrator or ADEC at any time.

L. Twenty-four Hour Notice of Noncompliance Reporting.

1. The Permittee shall report the following occurrences of noncompliance by telephone within 24 hours from the time the Permittee becomes aware of the circumstances:

   a. any noncompliance that may endanger health or the environment;

   b. any unanticipated bypass that results in or contributes to an exceedance of any effluent limitation in the permit (See Part IV.G., "Bypass of Treatment Facilities");

   c. any upset that results in or contributes to an exceedance of any effluent limitation in the permit (See Part IV.H., "Upset Conditions"); or

   d. any violation of a maximum daily discharge limitation for any of the pollutants listed in the permit.

2. The Permittee shall also provide a written submission within five days of the time that the Permittee becomes aware of any event required to be reported under subpart 1 above. The written submission shall contain:

   a. a description of the noncompliance and its cause;

   b. the period of noncompliance, including exact dates and times;

   c. the estimated time noncompliance is expected to continue if it has not been corrected; and

   d. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

3. The Regional Administrator may, at his sole discretion, waive the written report on a case-by-case basis if the oral report has been received within 24 hours by the Water Compliance Section in Seattle, Washington, by telephone, (206) 553-1213.

4. Reports shall be submitted to the addresses in Part III.G. ("Reporting of Monitoring Results").

M. **Other Noncompliance Reporting.** The Permittee shall report all instances of noncompliance, not required to be reported within 24 hours, at the time that monitoring reports for Part III.G. are submitted. The reports shall contain the information listed in Part III.L.2. of this permit.

N. **Changes in Discharge of Pollutants.** The Permittee shall notify the Regional Administrator and ADEC as soon as it knows, or has reason to believe:

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any pollutant that is not limited in the permit, if that discharge may reasonably be expected to exceed any of the following "notification levels":

   a. One hundred micrograms per liter (100 ug/l);

   b. Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;

   c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or

   d. The level established by the Regional Administrator in accordance with 40 CFR 122.44(f).

2. That any activity has occurred or will occur that would result in any discharge, on a non-routine or infrequent basis, of any pollutant that is not limited in the permit, if that discharge may reasonably be expected to exceed any of the following "notification levels":

   a. Five hundred micrograms per liter (500 ug/l);

   b. One milligram per liter (1 mg/l) for antimony;

c. Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or

d. The level established by the Regional Administrator in accordance with 40 CFR 122.44(f).

## IV. COMPLIANCE RESPONSIBILITIES

A. **Duty to Comply.** The Permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification, or for denial of a permit renewal application. The Permittee shall give reasonable advance notice to the Regional Administrator and ADEC of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions.

1. Civil and Administrative Penalties. Sections 309(d) and 309(g) of the Act provide that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act shall be subject to a civil or administrative penalty, not to exceed $25,000 per day for each violation.

2. Criminal Penalties:

a. Negligent Violations. Section 309(c)(1) of the Act provides that any person who negligently violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act shall be punished by a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or by both.

b. Knowing Violations. Section 309(c)(2) of the Act provides that any person who knowingly violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act shall be punished by a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment for not more than 3 years, or by both.

c. Knowing Endangerment. Section 309(c)(3) of the Act provides that any person who knowingly violates a permit condition implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury,

shall, upon conviction, be subject to a fine of not more than $250,000 or imprisonment of not more than 15 years, or both. A person that is an organization shall be subject to a fine of not more than $1,000,000.

d. False Statements. Section 309(c)(4) of the Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under this Act or who knowingly falsifies, tampers with, or renders inaccurate any monitoring device or method required to be maintained under this Act, shall be punished by a fine of not more that $10,000, or by imprisonment for not more than 2 years, or by both.

Except as provided in permit conditions in Part IV.G., ("Bypass of Treatment Facilities") and Part IV.H., ("Upset Conditions"), nothing in this permit shall be construed to relieve the Permittee of the civil or criminal penalties for noncompliance.

C. **Need to Halt or Reduce Activity not a Defense.** It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this permit.

D. **Duty to Mitigate.** The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

E. **Proper Operation and Maintenance.** The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems when the operation is necessary to achieve compliance with the conditions of the permit.

F. **Removed Substances.** Solids, sludges, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters. See also Part I.A.

G. Bypass of Treatment Facilities.

1. Bypass not exceeding limitations. The Permittee may allow any bypass to occur that does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs 2 and 3 of this Part.

2. Notice.

   a. Anticipated bypass. If the Permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least 10 days before the date of the bypass.

   b. Unanticipated bypass. The Permittee shall submit notice of an unanticipated bypass as required under Part III.L. ("Twenty-four Hour Notice of Noncompliance Reporting").

3. Prohibition of bypass.

   a. Bypass is prohibited, and the Regional Administrator or ADEC may take enforcement action against the Permittee for a bypass, unless:

      (1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

      (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment shall have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

      (3) The Permittee submitted notices as required under paragraph 2 of this Part.

   b. The Regional Administrator and ADEC may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator and ADEC determine that it will meet the three conditions listed above in paragraph 3.a. of this Part.

H. Upset Conditions.

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the Permittee meets the requirements of paragraph 2 of this Part. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

2. Conditions necessary for a demonstration of upset. To establish the affirmative defense of upset, the Permittee must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

   a. An upset occurred and that the Permittee can identify the cause(s) of the upset;

   b. The permitted facility was at the time being properly operated;

   c. The Permittee submitted notice of the upset as required under Part III.L., Twenty-four Hour Notice of Noncompliance Reporting; and

   d. The Permittee complied with any remedial measures required under Part IV.D., Duty to Mitigate.

3. Burden of proof. In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

I. Toxic Pollutants. The Permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

J. Planned Changes. The Permittee shall give notice to the Regional Administrator and ADEC as soon as possible of any planned physical alterations or additions to the permitted facility whenever:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source as determined in 40 CFR 122.29(b); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged.

This notification applies to pollutants that are subject neither to effluent limitations in the permit, nor to notification requirements under Part III.N.

K. **Anticipated Noncompliance.** The Permittee shall also give advance notice to the Regional Administrator and ADEC of any planned changes in the permitted facility or activity that may result in noncompliance with this permit.

## V. GENERAL PROVISIONS

A. **Permit Actions.** This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

B. **Duty to Reapply.** If the Permittee intends to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit.

C. **Duty to Provide Information.** The Permittee shall furnish to the Regional Administrator and ADEC, within the time specified in the request, any information that the Regional Administrator or ADEC may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Regional Administrator or ADEC, upon request, copies of records required to be kept by this permit.

D. **Other Information.** When the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or that it submitted incorrect information in a permit application or any report to the Regional Administrator or ADEC, it shall promptly submit the omitted facts or corrected information.

E. **Signatory Requirements.** All applications, reports or information submitted to the Regional Administrator and ADEC shall be signed and certified.

1. All permit applications shall be signed as follows:

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

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

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

2. All reports required by the permit and other information requested by the Regional Administrator or ADEC shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the Regional Administrator and ADEC, and

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company.

3. Changes to authorization. If an authorization under Part V.E.2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph V.E.2. must be submitted to the Regional Administrator and ADEC prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this Part shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

F. Availability of Reports. Except for data determined to be confidential under 40 CFR 2, all reports prepared in accordance

with this permit shall be available for public inspection at the offices of the Regional Administrator and ADEC. As required by the Act, permit applications, permits and effluent data shall not be considered confidential.

G. **Inspection and Entry.** The Permittee shall allow EPA, ADEC or one of their authorized representatives (including an authorized contractor acting as a representative of the Administrator), upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

H. **Oil and Hazardous Substance Liability.** Nothing in this permit shall be construed to preclude any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject under Section 311 of the Act.

I. **Property Rights.** The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

J. **Severability.** The provisions of this permit are severable. If any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

K. **Transfers.** This permit may be automatically transferred to a new Permittee if:

1. The current Permittee notifies the Regional Administrator at least 30 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new Permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and

3. The Regional Administrator does not notify the existing Permittee and the proposed new Permittee of his or her intent to modify, or revoke and reissue the permit.

If the notice described in paragraph 3 above is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.

L. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Act.

M. Reopener Clause.

1. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Act, as amended, if the effluent standard, limitation, or requirement so issued or approved:

   a. Contains different conditions or is otherwise more stringent than any condition in the permit; or

   b. Controls any pollutant or disposal method not addressed in the permit.

   The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

2. This permit may be reopened to adjust the effluent limitation, or associated monitoring requirements for 2,3,7,8-TCDD (dioxin) if:

   a. additional data or facts related to the criterion for dioxin become available; or

   b. major advances in analytical techniques occur; or

   c. as a result of EPA's review of the risks posed by dioxin, a standard is adopted for dioxin that differs from the value used to derive the limits for this permit; or

d. the State of Alaska adopts, and EPA approves, water quality standards that contain a numeric criterion for dioxin that differs from the value used to derive the effluent limitation in this permit.

3. This permit may be reopened to adjust any effluent limitations if future water quality studies, waste load allocation determinations, or changes in water quality standards show the need for different requirements.

4. This permit may be reopened to establish limits for AOX when sufficient data are available to establish a limit based on best available technology.

## VI. DEFINITIONS

1. Acute toxic unit ($TU_a$) is a measure of acute toxicity. The number of acute toxic units in the effluent is calculated as 100/LC50, where the LC50 is measured in percent effluent.

2. ADEC means the Alaska Department of Environmental Conservation.

3. Administrator means the Administrator of the USEPA, or an authorized representative.

4. AOX is defined as Adsorbable Organic Halogens. The Permittee shall analyze samples for AOX by USEPA method 1650, SCAN-W 9:89 or ISO/DIS 9562 until the EPA Method 165C for AOX is formally promulgated, after which time that method shall be used.

5. Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

6. Chronic toxic unit ($TU_c$) is a measure of chronic toxicity. The number of chronic toxic units in the effluent is calculated as 100/NOEC, where the NOEC is measured in percent effluent.

7. Daily discharge means the discharge of a pollutant during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in concentration, rates, or other units, the daily discharge is the average measurement of the pollutant over the day.

8. Daily maximum. See Maximum daily discharge.

9. DMR means discharge monitoring report.

10. $EC_{50}$ is a point estimate of the effluent concentration that would cause an observable adverse effect (such as death, immobilization, or serious incapacitation) in 50 percent of the test organisms exposed.

11. EPA means the United States Environmental Protection Agency.

12. Final effluent means effluent at, or upstream from, the point where a permitted outfall enters navigable waters, and through which all waste streams pass that are discharged from the outfall.

13. Flow-weighted average concentration is defined as the sum of the product of discharge flows and corresponding concentrations, divided by the sum of discharge flows.

14. Grab sample is a single sample or measurement taken at a specific time or over as short a period of time as is feasible. See Part III.F. (Representative Sampling).

15. $LC_{50}$ means the concentration of effluent that is acutely toxic to 50 percent of the test organisms exposed.

16. Maximum daily discharge limitation or daily maximum means the highest allowable daily discharge.

17. Minimum daily discharge limitation means the lowest allowable daily discharge.

18. Monthly average means the average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

19. NOEC means no observable effect concentration. The NOEC is the highest tested concentration of an effluent at which no adverse effects are observed on the test organisms at a specific time of observation.

20. Operating Average means the total units discharged during a monitoring month divided by the number of days in that period that the production or commercial facility operated. The Permittee shall calculate the number of days as the number of hours of operation during the month divided by twenty-four (24).

21. QA/QC means quality assurance/quality control.

22. Regional Administrator means the EPA Region 10 Regional Administrator, or an authorized representative.

23. Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to

become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

24. Sludge means settled solids.

25. Stormwater outfall means a conveyance for stormwater runoff or snowmelt.

26. Total Hydrocarbons means those compounds measured using the Gruenfields IR partition infrared methods specified in the 16th edition of Standard Methods for the Examination of Water and Wastewater (method 5038).

27. 24-hour composite sample shall mean a flow-proportioned mixture of not less than 8 discrete aliquots. Each aliquot shall be a grab sample of not less than 100 ml and shall be collected and stored in accordance with procedures prescribed in the most recent edition of Standard Methods for the Examination of Water and Wastewater.

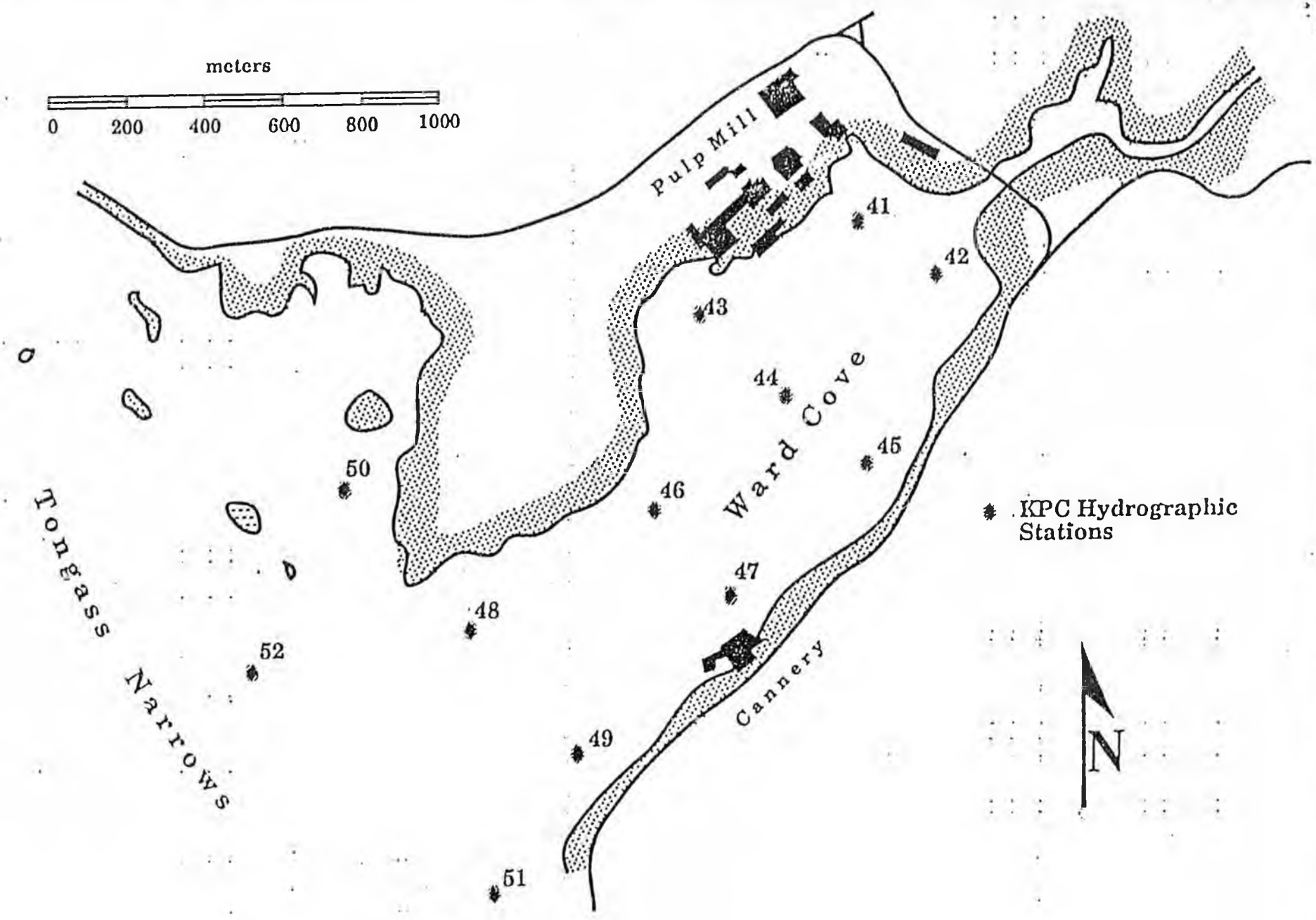
28. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

29. Waste stream means any non-de minimus stream of pollutants within the Permittee's facility that enters any permitted outfall or navigable waters. This includes spills and other unintentional, non-routine or unanticipated discharges.

30. Weekly average means the average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

31. 2,3,7,8-TCDD is defined as 2,3,7,8-tetrachlorodibenzo-p-dioxin. EPA method 1613 or an equivalent method acceptable to EPA shall be used to analyze for TCDD.

32. 2,3,7,8-TCDF is defined as 2,3,7,8-tetrachlorodibenzofuran. EPA Method 1613 or an equivalent method acceptable to EPA shall be used to analyze for TCDF.




ATTACHMENT 1
STATION LOCATIONS FOR RECEIVING WATER MONITORING PROGRAM

PRELIMINARY DRAFT
March 23, 1992

# FACT SHEET

United States Environmental Protection Agency
Region 10
Park Place Building, 13th Floor
1200 Sixth Avenue, WD-134
Seattle, Washington 98101
(206) 553-1214

Date:

Permit No.: AK-000092-2

PROPOSED REISSUANCE OF A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE POLLUTANTS PURSUANT TO THE PROVISIONS OF THE CLEAN WATER ACT (CWA)

Ketchikan Pulp Company
Mile 8-1/2 North Tongass Highway
Ketchikan, Alaska 99835

has applied for reissuance of an NPDES permit to discharge pollutants pursuant to the provisions of the CWA. This fact sheet includes (a) the tentative determination of the Environmental Protection Agency (EPA) to reissue the permit, (b) information on public comment, public hearing and appeal procedures, (c) the description of the current discharge, (d) a listing of tentative effluent limitations, schedules of compliance and other conditions, and (e) a sketch or detailed description of the discharge location. We call your special attention to the technical material presented in the latter part of this document.

Persons wishing to comment on the tentative determinations contained in the proposed permit reissuance may do so by the expiration date of the Public Notice. All written comments should be submitted to EPA as described in the Public Comments Section of the attached Public Notice.

After the expiration date of the Public Notice, the Director, Water Division, will make final determinations with respect to the permit reissuance. The tentative determinations contained in the draft permit will become final conditions if no substantive comments are received during the Public Notice period.

If no substantive comments are received, the permit will become effective immediately. If comments are received, the permit will become effective 30 days after the final determinations are made, unless a request for an evidentiary hearing is submitted within 30 days after receipt of the final determinations.

The proposed NPDES permit and other related documents are on file and may be inspected at the above address any time between 8:30 a.m. and 4:00 p.m., Monday through Friday. Copies and other information may be requested by writing to EPA at the above address to the attention of the Water Permits Section, or by calling

(206) 553-1214. This material is also available from the EPA Alaska Operations Office, Room 537, Federal Bldg., 222 W. 7th Avenue, #19, Anchorage, Alaska 99513, or EPA Alaska Operations Office, 3200 Hospital Drive, Suite 101, Juneau, Alaska 99801.

# Technical Information

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Technical Information

I. Applicant

Ketchikan Pulp Company (Ketchikan Pulp Mill)

| Mailing Address: | Facility Location: |
|---|---|
| P.O. Box 6600 | Mile 8.5 North Tongass Highway |
| Ketchikan, Alaska 99901 | Ketchikan, Alaska 99901 |

Contact: Robert W. Higgins, Environmental Director

NPDES Permit No.: AK-000092-2

II. Activity

Ketchikan Pulp Company (KPC) is engaged in the manufacturing of dissolving or paper grade wood pulp utilizing the magnesium base, acid bisulfate process. Activities include woodchip production from roundwood; pulping of woodchips; capturing of spent cooking liquor for evaporation; incineration with chemical and heat recovery; screening and cleaning of pulp to remove impurities; bleaching using chlorine and caustic; and drying and finishing for customer use.

An average of 31 million gallons per day (mgd) of wastewater generated in the manufacturing process are discharged from three outfalls into Ward Cove. Wastewaters discharged through outfalls 001 and 003 receive no treatment, while most wastewaters at outfall 002 receive secondary treatment from a primary clarifier, activated sludge basin, and secondary clarifier prior to discharge. Part of the 002 discharge receives primary treatment only.

Sludge generated in the primary clarifier (30 - 40 tons/day) is dewatered and mixed with hog fuel. The combination waste sludge and hog fuel is then dried and burned in woodwaste/oil burners. The fly ash is disposed of on mill property. Most of the sludge generated in the secondary clarifier is returned to the activated sludge basin. The company has indicated that excess sludge not returned to the activated sludge basin is discharged through outfall 002. This practice is prohibited in the proposed permit.

III. Background

The current permit for KPC was reissued on December 28, 1984, and expired on January 29, 1990. An application for permit reissuance was received on August 4, 1989. The company is operating under the terms of the expired permit during the reissuance process in accordance with the regulations (40 CFR 122.6).

IV. Receiving Water

Wastewaters from the mill are discharged into Ward Cove, located on the north side of Tongass Narrows, about 5 miles northwest of Ketchikan, Alaska. The cove is approximately 0.3 mile wide at the entrance, 0.5 mile wide at the widest point, and approximately 1 mile long.

Ward Cove has been classified by the Alaska Department of Environmental Conservation (ADEC) as marine water with water use classes 2A through 2D (water supply; water recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life).

A map of the facility location and Ward Cove is included in the draft problem assessment for dissolved oxygen, which accompanies this fact sheet.

Discussions of the impacts of the KPC discharge on water quality within Ward Cove are found in both this fact sheet and the problem assessment document.

V. Discharge Composition

The following pollutants were reported by the Permittee as being present in the discharge, according to KPC's NPDES application. The toxic and conventional pollutant categories are defined in the regulations (40 CFR 401.15 and 401.16). The category of nonconventional pollutants includes all pollutants not included in either of the other categories.

(1) Conventional pollutants - biochemical oxygen demand ($BOD_5$), total suspended solids (TSS), pH, oil and grease, and fecal coliform.

(2) Toxic pollutants - 2,3,7,8-TCDD, 2,4,6-trichlorophenol, bis (2-ethyl-hexyl) phthalate, cadmium, copper, chromium, zinc, mercury, nickel, chloroform, phenols.

(3) Nonconventional pollutants - temperature, fluoride, color, phosphorus, manganese, iron, adsorbable organic halogens, furans, magnesium, organic nitrogen, chlorine, sulfate, sulfite, sulfide, surfactants, and aluminum.

In developing the proposed permit conditions, EPA has evaluated the concentrations of these pollutants relative to the levels allowed under federal regulations and the state water quality standards.

VI. Compliance Status

At the time the current permit was issued, KPC was unable to comply with the effluent limitations for Biochemical Oxygen Demand ($BOD_5$) under promulgated guidelines (40 CFR 430) for the Pulp, Paper, and Paperboard Category. An earlier request by KPC for a fundamentally different

factors (FDF) variance from the guidelines was denied on September 21, 1984. In response to KPC's inability to comply with the terms of the permit in 1984, EPA issued a consent order following permit reissuance which established interim and final limitations and a schedule for design and construction of treatment systems to bring the facility into compliance. Full compliance with the permit was required no later than December 31, 1987.

As of December 31, 1987, KPC was not in compliance with effluent limitations for $BOD_5$. As a result of this and other violations, EPA and KPC entered into a consent decree establishing penalties for past and future permit violations on November 13, 1989. The consent decree expired six months later (May 1990).

## VII. Permit Conditions

### A. General Approach

Sections 101, 301(b), 304, 401, 402, and 405 of the Clean Water Act provide the basis for the effluent limitations and other conditions in the draft permit. EPA evaluates discharges with respect to these sections of the Act and the relevant NPDES regulations in determining which conditions to include in the permit.

In general, EPA first determines which technology-based limits are required, as well as best management practices or other requirements. EPA then evaluates the effluent quality expected to result from these controls, to see if the effluent could result in any exceedances of the water quality standards in the receiving water. If exceedances could occur, EPA must include water quality-based limits in the permit. The permit limits will thus reflect whichever limits (technology-based or water quality-based) are most stringent.

Under section 303 of the Act and 40 CFR 122.44(i), EPA must also include monitoring requirements in the permit to determine compliance with effluent limitations. Effluent and ambient monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality.

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

### B. Technology-Based Evaluation

#### 1. Statutory Basis for Technology-Based Limits

The Act requires particular categories of industrial dischargers to meet effluent limitations established by EPA. The Act initially focused on the control of "traditional" pollutants (conventional pollutants and some metals) through the use of BPT. Industries were required by section 301(b)(1)(A) of the Act to meet this level of control by July 1, 1977. Section 301(b)(3) of the Act allowed a deadline of March 31, 1989, under certain circumstances, but that deadline has also

passed. Thus, permits issued after March 31, 1989, must include any conditions necessary to ensure that the BPT level of control is achieved.

Section 301(b)(2) of the Act requires further technology-based controls on effluents. After March 31, 1989, all permits are required by sections 301(b)(2) and (3) of the Act to contain effluent limitations for all categories and classes of point sources which: (1) control toxic pollutants and nonconventional pollutants through the use of best available technology economically achievable (BAT), and (2) represent best conventional pollutant control technology (BCT) for conventional pollutants. In no case may BCT or BAT be less stringent than BPT.

In many cases, BPT, BCT, and BAT limitations are based on effluent guidelines developed by EPA for specific industries. Where EPA has not yet developed guidelines for a particular industry or a particular pollutant, permit conditions must be established using Best Professional Judgment (BPJ) procedures (40 CFR 122.43, 122.44, and 125.3).

As required by section 304(b)(2)(B) of the Act, when developing BPJ/BAT permit conditions, the Agency must consider the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, the cost of achieving such effluent reduction, non-water quality environmental impact (including energy requirements), and such other factors as EPA deems appropriate.

As required by section 304(b)(4)(B) of the Act, when developing BPJ/BCT permit conditions, the Agency must consider the reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived, the comparison of the cost and level of reduction of such pollutants from the discharge from publicly owned treatment works to the cost and level of reduction of such pollutants from a class or category of industrial sources, the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control techniques, process changes, and non-water quality environmental impact (including energy requirements).

2. Effluent Limitation Guidelines

Effluent Limitations Guidelines, 40 CFR Part 430 (Pulp, Paper, and Paperboard) have been promulgated for BPT (January 6, 1977), BCT (December 16, 1986) and BAT (November 18, 1982 & July 8, 1983). The subparts of these guidelines applicable to KPC are the following: Subpart K - Dissolving Sulfite Pulp Subcategory and Subpart U - Papergrade Sulfite (Drum Wash) Subcategory.

3. Production Bases

The effluent limitations guidelines specify that for the purpose of establishing limitations:

"Production shall be defined as the annual off-the-machine production divided by the number of operating days during the year." and "Production shall be determined for each mill based on past production practices, present trends, or committed growth."

In order to determine past production practices and assess production trends, monthly production by type (i.e. papergrade, nitration, viscose, and cellophane) and operating hours were tabulated for KPC. Characteristics of pulps produced at KPC were compared to those delineated in the BPT Development Document to determine which pulp type was appropriate. This comparison is provided in Attachment A. In addition, 12 month moving averages were calculated to determine annual average values. A review of these data show that production is variable with no apparent trends.

4. Permit Requirements

a. BPT

Biochemical Oxygen Demand and Total Suspended Solids

BPT effluent limitations were derived using annual average production and the appropriate BPT effluent limitations guidelines. Using the 12 month moving average for total production and the percentages for that same period of various grades, the effluent limitation for each grade was applied and the result totaled. The results of this tabulation were then scanned to determine the 12 month period for which the largest effluent limitation was obtained. This period was April 1988 through March 1989, when the total production was 672 tons/day, of which 1.3 percent was papergrade, 62.5 percent was nitration grade, 20.7 percent was viscose grade, 15.5 percent was cellophane grade. The effluent limitations shown below reflect an allowance for hydraulic debarking of 0.7 pounds $BOD_5$ per ton (Operating Average), 1.4 pounds $BOD_5$ per ton (Daily Maximum), 0.2 pounds TSS per ton (Operating Average), 0.3 pounds TSS per ton (Daily Maximum) which needs to be added for 336 tons of production (50%). The resulting limitations are as follows:

| | Operating Average | Daily Maximum |
|---|---|---|
| $BOD_5$, pounds/day | 30,200 | 58,100 |
| TSS, pounds/day | 51,000 | 94,600 |

In the proposed permit, EPA has replaced the term "Daily Average" with "Operating Average" to highlight the method for determining average discharge values. As discussed above, the limitations are based on formulas in the effluent guidelines for pulp mills, historic production volumes, and historic data for the number of days of production, which KPC calculated by summing the hours of production over a calendar month and dividing by 24 to obtain a number of "production days" for the month. EPA has clarified the definition of a "production day" in the

permit to provide consistency with the "production days" reported by the KPC for purposes of developing limitations.

The BPT effluent limitations represent a slight decrease over the effluent limitations of the expiring permit due to decreased production. In the proposed permit, the $BOD_5$ limitations above apply between November and May, while the limitations for the summer months (June through October) are more stringent than those shown above. This is because the water quality-based limitations for $BOD_5$ in the summer months are more stringent than these technology-based limitations. The water quality-based limitations are described in this fact sheet (under Water Quality-Based Evaluation); the technical support for the limitations is included in the "Draft Problem Assessment: Ward Cove" accompanying this fact sheet.

pH

The BPT guidelines require that effluent pH fall within the range of 5 to 9 standard units. Under the NPDES regulations, the total time during which the pH values are outside the required range shall not exceed 7 hours and 26 minutes (which constitutes 1% of the time) in any calendar month, and no individual excursion shall exceed 60 minutes duration (40 CFR 401.17). This provision does not apply to water quality-based limits. Therefore, the permit contains a technology-based pH range of 5 to 9 that may be exceeded under the above requirement and a water quality-based pH range that may not be exceeded. These latter limitations are further described in the "Water Quality-Based Evaluation" section of this fact sheet.

b. BCT

On December 16, 1986, EPA promulgated BCT effluent limitations guidelines for the pulp, paper, and paperboard industry. These BCT limitations set BCT equal to BPT for the subcategories under which KPC's effluent limitations are derived.

c. BAT

Pentachlorophenol and Trichlorophenol

The promulgated BAT guidelines establish limitations on pentachlorophenol and trichlorophenol, or, as an alternative, require that the Permittee certify that these chlorophenolic-containing biocides are not used at the facility. According to the 2c section of KPC's application, 2,4,6-trichlorophenol has been detected in the effluent at outfalls 001 and 002. Pentachlorophenol is reported as not detected. As discussed in EPA's Final Development Document for Effluent Limitations Guidelines and Standards for the Pulp, Paper and Paperboard Point Source Category (October 1982), these results are expected for this facility. Trichlorophenol is a contaminant that is generated during the bleaching process and would be expected in the effluent even though the Permittee has certified that trichlorophenol is not used as a

biocide. The only sources of pentachlorophenol are biocides or wastepaper that may be pulped. Because KPC does not pulp wastepaper and has certified that it does not use pentachlorophenol as a biocide, this compound would not be expected in the effluent.

Because 2,4,6-trichlorophenol is present in the effluent, a technology-based limit for it was calculated as follows:

Subpart U
Daily Max = .0036exp(.017 x 1.00) = .0037 lbs/1000 lbs product
= .0037 lbs/1000 lbs x 1,344,000 lbs production
= 4.97 lbs trichorophenol

Subpart K
Daily Max = .019 lbs/1000 lbs product x 1,344,000 lbs production
= 25.5 lbs trichorophenol

Weighted Average Calculation
(accounting for activity falling under each subpart)

Percentage of production under subpart U = 1.3%
Percentage of production under subpart K = 98.7%

Using the following equation the daily maximum limitation is:

Daily Max = (% U)(U limitation) + (% K)(K limitation)
= (.013)(4.97) + (.987)(25.5)
= 25.2 lbs/day

Because this limit is not sufficient to protect water quality, the limit in the draft permit is more stringent (see "Water Quality-Based Evaluation"). As discussed above, no limit is necessary for pentachlorophenol. As in the existing permit, the draft permit requires that the Permittee certify that pentachlorophenol in not used as a biocide. The draft permit requires that this certification be submitted annually, along with a report of the amounts and types of biocides that have been used. In addition, the permit requires monitoring for pentachlorophenol.

d. Other Technology-Based Requirements

BAT for Adsorbable Organic Halogens (AOX)

At this time, EPA does not have enough information to establish BAT for AOX for the dissolving sulfite subcategory of the pulp and paper point source category. The draft permit requires weekly monitoring for AOX, with a reopener clause that states that the permit may be reopened to establish technology-based limits for AOX when sufficient data are available.

BCT for Sanitary Wastes

Sanitary wastewater is treated by primary settling, biological (secondary) treatment, and disinfection prior to discharge through outfall 001.

The existing permit contains limitations on fecal coliform bacteria and total residual chlorine in treated sanitary wastewater. The proposed permit contains the same limitations for these pollutants; additionally, it contains $BOD_5$ and TSS limitations indicative of secondary treatment performance. The additional limitations are based on Best Professional Judgement (BPJ) and the Alaska wastewater disposal regulations (18 AAC 72). The state regulations require secondary treatment of domestic wastewater unless a reduced treatment level is established by the Department of Environmental Conservation in response to a request by the applicant. Secondary treatment is defined in both the state regulation and in federal regulations (40 CFR 133) as a monthly average limit of 30 mg/l and a weekly average limit of 45 mg/l for $BOD_5$ and TSS. These limits apply at the secondary treatment plant effluent before it commingles with the process effluent.

C. Water Quality-Based Evaluation

1. Statutory Basis for Water Quality-Based Limits

Section 301(b)(1) of the Act requires the establishment of limitations in permits necessary to meet water quality standards by July 1, 1977. Discharges to state waters must also comply with limitations imposed by the state as part of its certification of NPDES permits under section 401 of the Act.

The NPDES regulations at 40 CFR 122.44(d)(1) require that permits include limits on all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality" (54 Fed. Reg. 23868-23899; June 2, 1989).

The regulations require that this evaluation be made using procedures which 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 water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation.

The regulations also specifically address when the toxicity and chemical-specific limits are required. A toxicity limit is required whenever toxicity is at a level of concern (as discussed above) relative to either a numeric or narrative standard for toxicity. The only exception is where chemical-specific limits will fully achieve the narrative standard. A chemical-specific limit is required whenever an

individual pollutant is at a level of concern (as described above) relative to the numeric standard for that pollutant. The regulations also provide three options for developing a chemical-specific limit needed to control a pollutant which does not have a numeric standard, but is contributing to a problem with the narrative standard.

In proposing to reissue the permit, EPA has considered Alaska's antidegradation policy (18 AAC 70.010(c)). The reissuance of this permit will result in decreases in pollutant loading to the receiving water; therefore, this action complies complies with the state's antidegradation policy.

2. Wasteload Allocations and Mixing Zone Boundary

The wasteload allocation is the concentration (or loading) of a pollutant that may be discharged by the Permittee without violating water quality standards in the receiving water. For the KPC facility, three distinct approaches were taken to determine wasteload allocations for $BOD_5$, aquatic life parameters, and human health parameters. The $BOD_5$ allocation is based on an assessment of the $BOD_5$ loading capacity of the entire cove; pollutants toxic to aquatic life are addressed through a spatial dilution analysis, where toxicants cannot exceed the water quality criteria outside a mixing zone within the cove; and pollutants that present a risk to human health cannot exceed the water quality criteria at the end-of-pipe (no mixing zone allowed).

a. $BOD_5$ - Total Maximum Daily Load

There are times of the year, particularly during the months of July, August, and September, when the dissolved oxygen (DO) standard is violated in Ward Cove. These violations have been documented in several water quality surveys by state and federal agencies as well as by surveys conducted by KPC in compliance with the conditions of the expiring permit. These violations are primarily the result of the discharge of oxygen demanding wastewaters from the KPC facility.

In the most recent report, Jones and Stokes (August 2, 1989) reviewed the results of previous studies and conducted an intensive short-term field study. In the document entitled "Problem Assessment: Ward Cove" that accompanies this fact sheet, EPA has used information from the Jones and Stokes study and KPC's monitoring results to develop a model of the dissolved oxygen budget in Ward Cove. This model supports the establishment of a Total Maximum Daily Load (TMDL) for $BOD_5$ in Ward Cove, the allowable $BOD_5$ load to the Cove that is protective of water quality standards. The problem assessment and draft TMDL accompanies this fact sheet. Based on the draft TMDL, the wasteload allocation for KPC is 16,000 lbs/day $BOD_5$. Seasonal discharge limitations (for the months June through October) are derived using this allocation. During the remaining months (November through May), the facility must meet the technology-based limitations discussed earlier in this fact sheet.

b. Toxicity to Aquatic Life - Mixing Zone

Alaska's water quality standard for toxicity states that substances must not exceed 0.01 times the lowest measured 96-hour LC50 for the most sensitive test organism or EPA Gold Book criteria, whichever is more stringent.

Wasteload allocations for toxic parameters are calculated using available dilution in the mixing zone established in accordance with the Alaska water quality standards. The standards specify that a mixing zone may not exceed 10% of the width of the cove, nor exceed 10% of the total area of the cove, unless the Permittee demonstrates that a larger mixing zone is appropriate. Ward Cove is approximately 2500 feet wide at the discharge point, and its total area is approximately 0.35 square miles. The allowable mixing zone radius using the areal constraint (a semi-circle equal to 0.035 $mi^2$) is approximately 557 feet. The linear constraint under the standard is more stringent, allowing a mixing zone radius of about 250 feet from the discharge point.

Using a three-dimensional dilution model, EPA estimates that the dilution at a distance of 250 feet from each outfall is as follows:

| Outfall | Dilution |
|---|---|
| 001 | 14:1 |
| 002 | 14:1 |
| 003 | 74:1 |

As part of the state's certification under section 401 of the Act, these mixing zones will either be approved or modified. If the mixing zones approved by the state are different from the ones used to calculate the limits for the draft permit, the limits in the final permit will reflect these changes.

c. Human Health Concerns (Carcinogenic Pollutants)

The Alaska water quality standard for mixing zones (18 AAC 70.032) states, in part, the following:

> "In applying the water quality criteria set out in this chapter, the department will, upon application and in its discretion, prescribe in its permits or certifications a volume of dilution for an effluent or substance within a receiving water unless pollutants discharged could bioaccumulate; concentrate or persist in the environment; cause carcinogenic, mutagenic, or teratogenic effects; or otherwise present a risk to human health;"

Based on this standard, EPA has not proposed a mixing zone for four pollutants (chloroform, 2,4,6-trichlorophenol, manganese and dioxin) which present a risk to human health due to their bioaccumulative and carcinogenic properties. Wasteload allocations are therefore set equal to the water quality criteria. If the state determines that there are

no human health effects due to the discharge of these pollutants, the may designate a mixing zone. If a mixing zone is designated, the permit limits for those compounds will be adjusted accordingly.

The state of Alaska has not yet adopted specific numeric criteria for pollutants which pose a potential risk to human health. The state's standard for raw mollusk harvesting, however, references EPA's Quality Criteria for Water (Gold Book, 1986) as standards for toxic substances. The Gold Book contains concentrations of carcinogens that correspond to specific risks. The risk level chosen in this case is $10^{-6}$ or one excess cancer case per one million people due to ingestion of contaminated fish and shellfish. EPA has recently proposed the use of the $10^{-6}$ risk factor in its proposed promulgation of numeric standards for toxic pollutants in the state of Alaska (FR 58420; November 19, 1991). This risk factor is also consistent with EPA's recent decision regarding listing of facilities (including pulp mills) under section 304(l) of the Act.

3. Permit Limit Derivation

Wasteload allocations are compared to reported effluent values to determine if limits are needed for individual parameters. Under 40 CFR 122.4(d)(1), limits must be included if the discharge shows "reasonable potential" to exceed water quality standards. EPA's Technical Support Document for Water Quality-based Toxics Control (TSD, 1991) defines "reasonable potential" as being within a percentage of the wasteload allocation. Based on the comparison of effluent values from the KPC facility and the calculated wasteload allocations, the following parameters are water quality-limited:

$BOD_5$
Dissolved Oxygen (minimum)
pH
Color
Mercury
Copper
Chloroform
Manganese
Sulfide
Total Hydrocarbons (oil and grease)
2,4,6-trichlorophenol
2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)
Chronic Whole Effluent Toxicity

In deriving the water quality-based permit limits, Region 10 applied the statistical permit limit derivation approach described in the TSD. This approach takes into account effluent variability in setting limits which are low enough to ensure that the water quality standards are met. The approach also takes into account the difference in time frames and frequency of sampling between the water quality standards and monthly average and daily maximum limits. In addition to the wasteload

allocation values below, EPA used the following values in deriving limits using the formulas in the guidance documents:

| | |
|---|---|
| Coefficient of variation | 0.6 |
| Probability value for long-term average calculation | 99% |
| Probability value for monthly average limits | 95% |
| Probability value for daily maximum limits | 99% |
| ******* Frequency of monitoring | |
| 2,3,7,8-TCDD | Quarterly |
| Whole effluent toxicity | Monthly |
| mercury, chloroform, manganese, copper, nickel, color 2,4,6-trichlorophenol, sulfide, oil and grease | Weekly |
| $BOD_5$, Dissolved Oxygen | Daily |

These assumptions are used to derive monthly average and daily maximum limits.

The resulting limits which EPA is proposing for each parameter are also discussed below. In some cases, the maximum daily limit may appear to exceed the wasteload allocation value. However, this is due to the difference in time frames between the two values. The proposed limit will ensure that both the acute and chronic WLA and standards are met.

a) Aquatic Criteria

The following sections describe the evaluation of the KPC discharge with regard to water quality criteria for aquatic life.

$BOD_5$ and Dissolved Oxygen

The following is a comparison of (1) the current effluent limits for $BOD_5$, (2) BPT limits calculated for the reissued permit, and (3) the water quality-based limits derived from the draft TMDL. The most stringent limits are included in the proposed permit:

| | $BOD_5$ Loading (lbs/day) | | |
|---|---|---|---|
| | Operating Ave | Monthly Ave | Daily Max |
| Current Limits | 32,400 | - | 62,400 |
| New BCT Limits (November through May) | 30,200 | - | 58,100 |
| Water Quality-Based Limits (June through October) | - | 10,000 | 18,000 |

Based on the technical analysis presented in the TMDL, a minimum dissolved oxygen (DO) limitation (5 mg/l in the combined discharge) is included in the permit. Effluent dissolved oxygen at this concentration affords the maximum $BOD_5$ loading allocation while maintaining compliance with state standards. A lower minimum DO value is acceptable only if $BOD_5$ limits are adjusted downward in accordance with the relationships

described in the TMDL. Effluent data submitted by KPC in July 1991 indicated that the minimum aggregate DO for outfalls 001, 002, and 003 was 5.3 mg/l and the average over a 10 day sampling period was 6 mg/l.

Metals

In evaluating whether metals in KPC's discharge have reasonable potential to violate standards for aquatic life, the effluent concentrations were compared to the wasteload allocations (calculated by multiplying the Gold Book criteria by the dilution in the mixing zone); a percentage of the wasteload allocation was used in this comparison to allow for effluent variability, as discussed in the TSD.

Based on the applicant's 2c data and data from a recent study of Ward Cove (Jones and Stokes, 1989), mercury, copper, and nickel appear to show reasonable potential to violate state standards. The analysis of metals is complicated by the fact that the 2c application requires reporting of total metals. The metals criteria are written in terms of total recoverable metals. The fraction of the total metal which exists as total recoverable is highly variable and site specific. It is difficult, therefore, to extrapolate from total metal values to determine compliance with the criteria. In determining if limits on a given metal are necessary, EPA has taken the conservative approach of assuming that all of the metal in effluent samples (analyzed for total) was in the total recoverable form.

In order to provide information about the partitioning and bioavailability of the metals in the discharge, both total recoverable and dissolved metals monitoring is required under the proposed permit. Should monitoring indicate that metals values are below levels of concern, the permit contains a provision for reducing the monitoring frequency after one year of monitoring.

The following is a comparison of reported discharge values, wasteload allocations (WLA), and water quality-based limits (all values in ug/l):

| Parameter (outfall) | Discharge Level Reported | Wasteload Allocation | Effluent Limitations Daily Max | Month. Ave |
|---|---|---|---|---|
| Mercury (001) | 3.91 | 0.35 | 0.6 | 0.3 |
| Mercury (002) | 0.25 | 0.35 | 0.6 | 0.3 |
| Nickel (001) | 22 | 99.4 | 163 | 81 |
| Nickel (002) | 19 | 99.4 | 163 | 81 |
| Copper (001) | 10 | 41 | 41 | 20 |
| Copper (002) | 8 | 41 | 41 | 20 |
| Copper (003) | 73 | 215 | 215 | 107 |

Monitoring for these parameters will be weekly for the first year, with provisions to decrease the frequency, if appropriate.

Whole Effluent Toxicity

Toxicity was not limited under the expiring permit. Under 40 CFR 122.4(d)(1), whole effluent toxicity limits must be included if the discharge shows "reasonable potential" to exceed water quality standards.

Acute toxicity tests using salmonids have been conducted by KPC in accordance with the expiring permit. The results for the last four years are summarized below:

| Outfall | LC50 Range (%) | Number of Tests |
|---|---|---|
| Main (001) | 6 - 44 | 6 |
| Primary Effluent (002) | 7.5 - 35 | 6 |
| Secondary Effluent (002) | 70 - >100 | 6 |
| Filter Plant (003) | > 100 | 1 |

Results of chronic toxicity tests using Pacific oysters and purple sea urchins were reported in the Jones and Stokes study; chronic tests using Pacific oysters and sand dollars were conducted under the EPA Contract Laboratory Program in 1991. The results are summarized below (note that 4.8% and 6.25% were the lowest effluent concentration tested):

| Outfall | Jones & Stokes NOEC (%) | EPA Contract NOEC (%) | Sensitive Species |
|---|---|---|---|
| Main (001) | < 4.8 | < 6.25 | Oyster/Urchin |
| Secondary Effluent (002) | < 4.8 | < 6.25 | Oyster/Urchin |
| Filter Plant (003) | NA | < 6.25 | Oyster |

Alaska's water quality standard for toxicity states that substances must not exceed 0.01 times the lowest measured 96-hour LC50 for the most sensitive test organism. This standard protects against chronic effects to aquatic life by applying a translation factor (.01) to an acute toxicity measure (LC50). The state of Alaska has provided guidance to EPA for determining compliance with this standard. The guidance states that the TSD's approach to chronic toxicity, which relies on the use of a No Observable Effects Concentration (NOEC), should be used as a direct measure of compliance with the standard.

To calculate the wasteload allocations, the following relationship is developed using the No Observable Effects Concentration (NOEC) of the effluent:

Effluent concentration after mixing < NOEC

100%/(dilution) < NOEC

rearranging yields,

NOEC > 100/14 (for outfall 001, 002)
NOEC > 100/74 (for outfall 003)

therefore,

NOEC > 7.1 % effluent (001, 002)
NOEC > 1.3 % effluent (003)

The proposed permit contains numeric effluent limits (expressed in Chronic Toxic Units or $TU_c$) to insure compliance with the standard outside the mixing zone. The conversion from a minimum allowable NOEC value to a wasteload allocation expressed in chronic toxic units is performed as follows:

Limit in $TU_c$ = 100/(NOEC) (NOEC expressed in percent effluent)

In this case, the denominators are 7.1 (outfall 001, 002) and 1.3 (outfall 003), and the resulting wasteload allocations are 14 $TU_c$ and 77 $TU_c$ respectively. Limitations are developed using the statistical methods outlined in the TSD.

In order to determine compliance with the chronic toxicity limits, the permit requires monthly chronic tests of the effluent. The Permittee shall conduct tests on one of four marine species (sand dollar, sea urchin, oyster, or mussel) based on seasonal availability.

Exceedance of a chronic toxicity limit is considered a violation of the permit. If a limit is exceeded, the Permittee could then be required, through an order, to conduct a toxicity identification/reduction evaluation (TIE/TRE).

Because of concerns about acute toxicity, the permit also requires continued acute toxicity testing on a quarterly basis. The Permittee shall conduct the tests on the inland silverside, which is available throughout the year.

pH

EPA has evaluated the 001, 002 and 003 discharges to determine what pH levels will meet the state standard. The standard stipulates that the ambient pH must fall within the range 6.5 to 8.5 standard units. In addition, any change in ambient pH from natural conditions must be less than 0.1 standard unit. In this case, the latter requirement is more restrictive on the discharge.

Using the method outlined in EPA's "Water Quality Assessment: A Screening Procedure" (EPA/600/6-85/002b), EPA has performed an analysis of pH within the mixing zone that accounts for dilution as well as the buffering capacity of the effluent and receiving water. The range of

measured pH range at 001, 002 and 003 along with the new water quality-based limits are as follows:

| Parameter | Current Discharge | Water Quality-Based Limits |
|---|---|---|
| pH at 001 | 2.8 - 9.0 | 5.0 - 11.0 |
| pH at 002 | 3.4 - 9.0 | 5.0 - 11.0 |
| pH at 003 | 3.4 - 9.0 | 4.5 - 11.8 |

As described earlier, excursions above or below the existing pH limitation range (5.0 - 9.0 standard units) are allowable for up to 446 minutes per month (40 CFR 401.17). Excursions above or below the water quality-based ranges are not allowed at any time.

The proposed permit requires a change in monitoring methods from the existing permit due to the water quality analysis described above. While samples from the three outfalls are currently composited prior to analysis, the draft permit requires separate analysis of pH at each outfall.

Turbidity

Alaska's standard for turbidity states that turbidity shall not exceed 25 NTU, reduce more than a 10 percent the depth of the compensation point for photosynthetic activity, nor reduce the secchi disk depth by more than 10 percent.

There are not sufficient data to determine current compliance with the compensation point and secchi disk parts of this standard. In addition, an effluent limit cannot be calculated on the basis of these parameters.

Effluent data submitted by the company in July 1991 indicates that turbidity levels are below the 25 NTU standard. The final permit therefore includes a monthly monitoring requirement and no limitation for turbidity.

Color

Alaska's standard for color states that receiving waters shall neither exceed 5 color units nor reduce by more than 10 percent the depth of the compensation point for photosynthetic activity.

There are not sufficient data to determine current compliance with the compensation point part of this standard. In addition, an effluent limit cannot be calculated on the basis of this parameter.

The relationship between effluent color and receiving water color is not certain. Color is not a conservative pollutant (i.e. it may be created or reduced in the receiving water by chemical/physical interactions), so it is difficult to back-calculate an effluent limit for color based on a

receiving water standard. However, in 1984, the ninth circuit court ruled that EPA must calculate an effluent limit instead of applying a standard in the receiving water (Trustees for Alaska v. EPA, 749 F 2nd 549). Therefore, the draft permit contains an effluent limit for color at 001 and 002 based on the assumption that it is conservative and that background color is zero.

Wasteload allocations have been established for color by multiplying the dilution in the mixing zones by the color standard (5 color units or 5 mg/l platinum). Limitations in the draft permit are based on this allocation. The following is a comparison of reported color levels in the discharge (from permit application) with the proposed limitations (all values in color units):

| Parameter (outfall) | Discharge Level Reported | Wasteload Allocation | Effluent Limitations Daily Max | Month. Ave |
|---|---|---|---|---|
| Color (001) | 619 | 70 | 70 | 35 |
| Color (002) | 477 | 70 | 70 | 35 |

Total Hydrocarbons (oil and grease)

The Alaska standard for total hydrocarbons states that concentrations are not to exceed 15 ug/l, using method 503B in Standard Methods for the Examination of Water and Wastewater (16th Edition). Method 503B (partition infrared) is a measure of oil and grease; it detects more compounds than method 503A (partition gravimetric), the corresponding method required for the NPDES application. In the absence of 503B data, EPA has evaluated the need for a total hydrocarbon limit using the oil and grease data in KPC's application. Below is a comparison of this data with the calculated wasteload allocation (all values in mg/l):

| Parameter (outfall) | Discharge Level Reported | Wasteload Allocation | Effluent Limitations Daily Max | Month. Ave |
|---|---|---|---|---|
| Total Hydrocarbons (001) | 2.1 | 0.21 | 0.210 | 0.105 |
| Total Hydrocarbons (002) | 2.4 | 0.21 | 0.210 | 0.105 |

Sulfide

EPA's Gold Book criterion for sulfide is 2 ug/l undissociated hydrogen sulfide. Data submitted by the Permittee indicates that the effluent contains sulfide concentrations of 12 mg/l (outfall 001) and 8 mg/l (outfall 002), although the form of the sulfide is not specified.

According to the Gold Book, the toxic form of sulfide is undissociated hydrogen sulfide ($H_2S$), not hydrosulfide ($HS^-$) or sulfide ($S^=$). The equilibrium between $H_2S$ and $HS^-$ is dependent on pH. At pH 9, approximately 99 percent of the sulfide is in the form of $HS^-$, at pH 7

the sulfide is about equally divided between $H_2S$ and $HS^-$, and at pH 5 about 99 percent of the sulfide is in the form of $H_2S$. Based on the sulfide concentration reported by the Permittee and the pH limitations in the draft permit, the maximum potential undissociated hydrogen sulfide concentrations in the discharges from 001 and 002 are estimated below, and compared with the wasteload allocations:

| Parameter (outfall) | Discharge Level Estimated | Wasteload Allocation | Effluent Limitations Daily Max | Month. Ave |
|---|---|---|---|---|
| Sulfide (001) | 1188 | 28 | 46 | 23 |
| Sulfide (001) | 792 | 28 | 46 | 23 |

b) Human Health Criteria

The following sections describe the evaluation of the KPC discharge with respect to criteria for the protection of human health. In evaluating whether specific substances in KPC's discharge have reasonable potential to violate standards for human health, the effluent concentrations were compared to the wasteload allocation (equal to the Gold Book criteria); a percentage of the wasteload allocation was used in this comparison to allow for effluent variability, as discussed in the TSD.

2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)

Bleached pulp, effluent, and sludge from KPC were analyzed for 2,3,7,8-TCDD as part of the EPA/Paper Industry Cooperative Dioxin Study in 1989. The compound was detected in an effluent sample at a level of 15 pg/l (picograms per liter or parts per quadrillion); it was also detected in the sludge sample at a level of 3500 pg/l.

EPA and ADEC collected and analyzed salmon, rockfish, and crab tissues collected in Ward Cove for dioxins and furans in 1991. While dioxins and furans were found in the tissues, the levels of contamination appear to be similar to background concentrations reported for urban areas in the United States and other countries.

The 2,3,7,8-TCDD effluent limitations for the KPC mill were calculated based on the EPA Gold Book criterion of .014 pg/l. Due to the inability of current analytical techniques to detect this compound near the criterion level, loading limitations (in micrograms per day or ug/day) were developed using the maximum flow from outfalls 001 (29.0 mgd) and 002 (21.7 mgd); this enables the Permittee and agencies to conduct compliance monitoring on individual waste streams in the bleach plant, where 2,3,7,8-TCDD originates. The effluent sampling will be used in conjunction with flow measurements to determine the loading of 2,3,7,8-TCDD in the facility's final effluent. The following formula is used to convert from an effluent concentration and flow to a loading:

Loading (ug/day) = (conc. in pg/l) x (flow in mgd) x (3.785)

Based on the above concentration and flows, daily maximum limits of 1.5 pg/day (outfall 001) and 1.1 pg/day (outfall 002) were established. Because monitoring is quarterly, it is not feasible to express the limitation in terms of a monthly average. Using current analytical techniques, the Permittee will not be able to measure the effluent concentration that corresponds with this loading. Therefore, the permit specifies that compliance can be determined by monitoring the bleach plant effluent or individual bleach plant filtrate streams, which is where 2,3,7,8-TCDD is generated. Furthermore, the permit states that if the concentration of 2,3,7,8-TCDD in all filtrate streams is below the "minimum level" set by EPA (10 pg/l), the Permittee will be considered to be in compliance with the effluent limit. The minimum level is the lowest point at which the calibration curve is calculated and is set by EPA based on a level that can reasonably be quantified.

The draft permit requires the Permittee to conduct quarterly monitoring for 2,3,7,8-TCDD, beginning the first calendar quarter after the effective date of the permit. The Permittee must collect twenty-four-hour composite samples of the final effluent, bleach plant waste streams, and sludge.

EPA's Office of Research and Development is currently conducting a reassessment of the risks of dioxin. The proposed permit includes a reopener clause to allow for a modification of the 2,3,7,8-TCDD limitations, if the reassessment results in a revision of the Gold Book criterion.

Chloroform, Trichlorophenol and Manganese

Based on KPC's application, chloroform, 2,4,6-trichlorophenol and manganese appear to show reasonable potential to violate state standards. The following is a comparison of reported discharge values, wasteload allocations, and effluent limitations (all values in ug/l):

| Parameter (outfall) | Discharge Level Reported | Wasteload Allocation | Effluent Limitations Daily Max | Month. Ave |
|---|---|---|---|---|
| Manganese (001) | 1140 | 100 | 200 | 100 |
| Manganese (002) | 430 | 100 | 200 | 100 |
| Chloroform (001) | 268 | 15.7 | 31 | 16 |
| Chloroform (002) | 720 | 15.7 | 31 | 16 |
| Chloroform (003) | 22 | 15.7 | 31 | 16 |
| Trichlorophenol(001) | 13 | 3.6 | 7.2 | 3.6 |
| Trichlorophenol(002) | 9 | 3.6 | 7.2 | 3.6 |

D. Monitoring Requirements

Under Section 308 of the Act and 40 CFR 122.44(i), EPA must require a discharger to conduct monitoring whenever necessary to determine

compliance with effluent limitations, assist in the development of effluent limitations, and assess the quality of receiving waters. The proposed permit contains both effluent monitoring and ambient monitoring requirements.

Facility Monitoring

In the proposed permit, each limited pollutant is monitored in the effluent at a specified frequency. Selected monitoring frequencies are based on the nature and effect of the pollutant as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. The monitoring frequency for those pollutants previously limited under the expired permit remain unchanged.

The permit also requires quarterly monitoring of the effluent, sludge, and bleached pulp for AOX (EOX, in sludge), 2,3,7,8-TCDD, and 2,3,7,8-TCDF. This chlorinated organics monitoring will be used to gather information on the levels of chlorinated organics in the effluent for possible future establishment of technology-based and/or water quality-based effluent limitations.

Ambient Monitoring

The draft permit requires the Permittee to conduct ambient monitoring in Ward Cove to assess dissolved oxygen levels in the water column, the extent of sediment contamination, and the extent to which TCDD and TCDF are bioaccumulating in resident organisms. Except for the addition of turbidity (secchi disk) and color monitoring, the conditions of the water column monitoring program are unchanged from the previous permit. The sediment and bioaccumulation monitoring programs are new requirements; each will be conducted on an annual basis.

Stormwater Monitoring

A stormwater monitoring program is included in the proposed permit in order to identify and characterize any significant sources of pollutant loadings to Ward Cove. Monitoring data is also needed for determining compliance with the limitations on $BOD_5$ and Dissolved Oxygen in the aggregate discharge from the facility.

If a significant source(s) is identified, EPA may reopen the permit to include specific effluent limitations, additional monitoring requirements, and/or specific additions to the BMP plan to reduce the pollutant discharge(s).

E. Best Management Practices Plan

The draft permit requires that the Permittee develop a best management practices (BMP) plan to prevent the accidental discharge of toxic chemicals to waters of the United States. The plan shall address plant site runoff, spillage, leaks, sludge and waste disposal, and drainage from materials storage areas. Specific BMPs identified within the plan

become enforceable conditions of the permit. In addition, the plan must be amended whenever there is a significant change in facility operations. The plan will incorporate elements of pollution prevention as set forth in the Pollution Prevention Act of 1990 (42 U.S.C. 13101).

F. Unauthorized Discharges

Based on concerns about the potential discharge of pollutants and/or wastestreams not listed in the permit application, the permit does not authorize discharges of waste streams that are not part of the normal operation of the facility as disclosed in the permit application.

G. Changes to Standard Conditions

EPA has made several changes to the standard conditions of the permit. Some of the changes are intended to clarify or reorganize the conditions; others are substantive changes. These substantive changes are described below:

Representative Sampling

This language has been expanded and specifically requires sampling whenever a bypass, spill, or non-routine discharge of pollutants occurs, if the discharge may reasonably be expected to cause or contribute to a violation of an effluent limit under the permit. This change is in response to concerns that permit violations and/or water quality standards violations could result from bypasses, spills, or non-routine discharges during times when the effluent is not routinely monitored. This requirement directs the Permittee to conduct additional, targeted monitoring to quantify the effects of these occurrences on the final effluent discharge.

Changes in Discharge of Pollutants

Under the expired permit, the Permittee must notify EPA that an activity will occur or has occurred that may result in elevated discharges of toxic pollutants not limited in the permit. EPA has broadened this requirement in two ways. First, the requirement now applies to all pollutants; previously, this requirement only applied to the toxic pollutants listed under Section 307(a) of the Clean Water Act. Secondly, notification is now required when any of four notification levels is exceeded; previously, notification was required only if the highest of four notification levels was exceeded.

This broadening of the requirement will help insure that EPA is apprised of elevated discharges that may cause or contribute to violations of state water quality standards. Depending on the pollutants involved, elevated discharges of this kind may prompt EPA to reopen the permit to include appropriate limitations.

## VI. Other Legal Requirements

### A. Endangered Species Act

EPA has concluded that the discharges authorized by this permit will have no effect on any endangered or threatened species or its critical habitat. EPA is requesting concurrence from the U.S. Fish and Wildlife Service on the draft permit, and will consider their comments in the final permit decision. EPA will initiate consultation should new information reveal impacts not previously considered, should the activities be modified in a manner beyond the scope of the original opinion, or should the activities affect a newly listed species.

### B. State Water Quality Standards and State Certification

Since state waters are involved in this permitting action, the provisions of Section 401 of the Act apply. In accordance with 40 CFR 124.10(c)(1), public notice of the draft permit has been provided to the state of Alaska agencies having jurisdiction over fish, shellfish, and wildlife resources.

### C. Coastal Zone Management Act (CZMA)

The state of Alaska will be reviewing this permit to determine consistency with the Coastal Zone Management Act.

### D. Permit Term

This permit shall expire five years from the effective date.

# REFERENCES

USEPA, Development Document for Effluent Limitations Guidelines (BPCTCA) for the Bleached Kraft, Groundwood, Sulfite, Soda, Deink and Non-integrated Paper Mills Segment of the Pulp, Paper, and Paperboard Point Source Category, EPA 440/1-76/047-b, December, 1976.

USEPA, Final Development Document for Effluent Limitations Guidelines and Standards for the Pulp, Paper, and Paperboard Point Source Category, EPA 440/1-82/025, October 1982.

USEPA, Permit Writer's Guide to Water Quality-Based Permitting for Toxic Pollutants, EPA 440/4-87-005, July, 1987.

USEPA, Technical Support Document for Water Quality-Based Toxics Control, EPA 505/2-90-001, March, 1991.

USEPA, Quality Criteria for Water, EPA 440/5-86-001, May 1986.

USEPA, Water Quality Assessment: A Screening Procedure, EPA/600/6-85/002b, 1985.

Jones and Stokes Associates, Inc., Ward Cove: Water Quality Assessment, August, 1989.

ATTACHMENT A

## KPC PULP GRADE DATA SUMMARY

| Grade Name | Pulp End Use | Shrinkage-Hot Caustic Extraction, % | Total Yield% | Caustic Consumed, lbs/ton | S-10/ S-18% | Alpha Cellulose Content, % |
|---|---|---|---|---|---|---|
| K-118-N | Cellophane/Viscose | 8.0 | 37.3 | 160 | 10.2/6.4 | 91.0 |
| K-120-N | Cellophane/Viscose | 8.0 | 38.3 | 160 | 10.2/6.4 | 91.0 |
| K-316-N | Cellophane/Viscose | 8.5 | 35.5 | 190 | 9.0/4.5 | 92.5 |
| K-317-N | Cellophane/Viscose | 8.5 | 35.5 | 190 | 9.0/4.5 | 92.5 |
| K-320-N | Viscose | 9.0 | 35.6 | 190 | 8.3/4.5 | 93.0 |
| K-324-N | Viscose | 9.0 | 35.8 | 190 | 7.9/4.5 | 93.0 |
| K-340-M | Cellulose Spec. | 9.0 | 35.0 | 190 | 7.0/3.3 | 94.0 |
| KKW | Cellulose Spec. | 9.0 | 35.8 | 190 | 7.9/4.5 | 93.0 |
| K-NH | Nitration | 9.0 | 36.1 | 190 | 7.0/3.3 | 94.0 |
| Paper | Paper | 5.0 | 41.0 | 60 | 14.0/10.9 | 87.0 |

## CHARACTERISTICS OF DISSOLVING SULFITE PULI

| Grade | Shrinkage Hot Caustic Extraction, % | Total Yield, % | Caustic Consumed, lbs/ton | S-18, % |
|---|---|---|---|---|
| Nitration | 8-12 | 37 | 288 | 5.3-6.5 |
| Viscose | 13-17 | 36 | 250 | 4.5-5.3 |
| Cellophane | 17-20 | 34 | 300 | 2.9-4.5 |
| Acetate | 24 and above | 31 | 350 | <2.9 |

## KPC PULP CLASSIFICATION

| KPC Grade Name | Shrinkage-Hot Caustic Extraction | Total Yield, % | Caustic Consumed lbs/ton | S-18, % | Guideline Grade |
|---|---|---|---|---|---|
| K-118-N | Nitration | Nitration | Paper | Nitration | Nitration |
| K-120-N | Nitration | Paper | Paper | Nitration | Nitration |
| K-316-N | Nitration | Viscose | Paper | Vis/Cell | Viscose |
| K-317-N | Nitration | Viscose | Paper | Vis/Cell | Viscose |
| K-320-N | Nitration | Viscose | Paper | Vis/Cell | Viscose |
| K-324-N | Nitration | Viscose | Paper | Vis/Cell | Viscose |
| K-340-M | Nitration | Viscose | Paper | Cellophane | Cellophane |
| KKW | Nitration | Viscose | Paper | Vis/Call | Viscose |
| K-NH | Nitration | Viscose | Paper | Cellophane | Cellophane |
| Paper | Paper | Paper | Paper | Paper | Paper |

# WARD COVE

**PROBLEM AT A GLANCE:**

| | |
|---|---|
| *Water Quality-limited?* | *Yes* |
| *Segment Identifier:* | *10102-601* |
| *Parameter of Concern:* | *Dissolved Oxygen (DO)* |
| *Uses Affected:* | *Aquatic Life* |
| *Known Sources:* | *Point Sources: Pulp Mill* |
| | *Fish Processor* |




## Background Information

Ward Cove, located near Ketchikan in southeastern Alaska, is the site of a pulp mill operated by the Ketchikan Pulp Company (KPC) as well as a fish processing plant operated by Ward Cove Packing Company. The cove is located on the north side of Tongass Narrows about 5 miles northwest of the City of Ketchikan (Figure 1). It is 0.3 mile wide at the entrance, 0.5 mile wide at the widest point, and approximately 1 mile long. Centerline depths range from 9 meters at the head to over 50 meters at the mouth of the cove.

The physical setting and oceanography of Ward Cove characterize it as an estuary. There is no sill between Ward Cove and Tongass Narrows; therefore, water column stratification is expected to be similar to that in Tongass Narrows, apart from the effects of surface runoff and industrial discharges. Tongass Narrows is connected to the Gulf of Alaska through a series of larger channels leading to the waters of Dixon Entrance.

Ward Creek drops steeply from the mountains to the head of the cove. Three small lakes provide brief stretches of calm in its otherwise rapid descent. Stream discharge is subject to wide variation, as the stream collects water from steep mountain slopes in the area. The cove is located in an area of heavy rainfall, receiving an average of 150 inches annually.

Ward Cove is protected under the Alaska Water Quality Standards for the following beneficial uses:

Water supply for aquaculture, seafood processing, and industrial uses.
Contact and secondary recreation.
Growth and propagation of fish, shellfish, other aquatic life, and wildlife.
Harvesting for consumption of raw mollusks or other raw aquatic life.

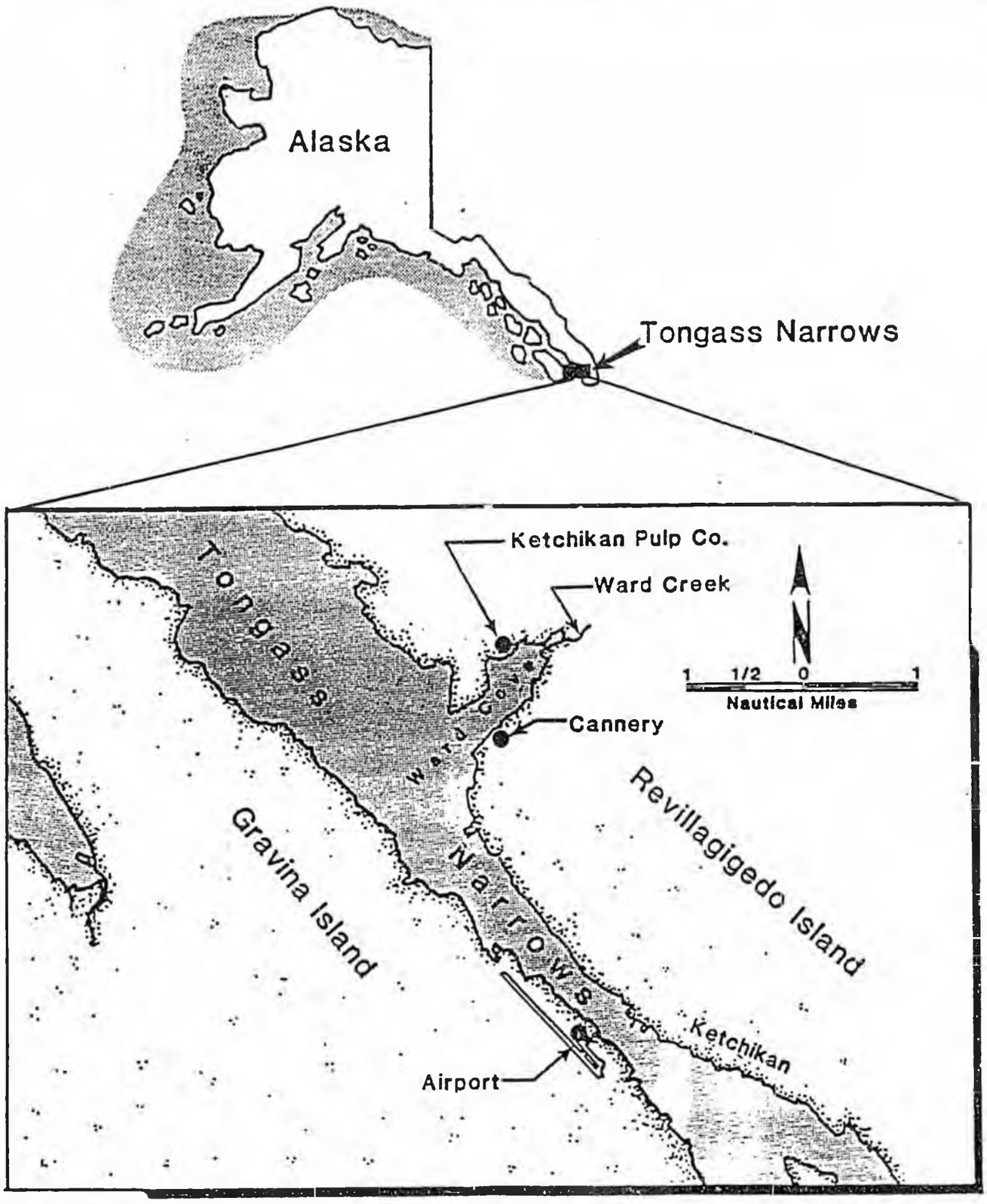



**Figure 1: Tongass Narrows and Ward Cove**

A great deal of data has been collected in Ward Cove by state and federal resource agencies and by the major industrial facility in the area, KPC, as part of the requirements of its National Pollutant Discharge Elimination System (NPDES) permit. The principal analyses of water quality conditions in Ward Cove are contained in the following reports:

Alaska Water Pollution Control Board (1953,1957)
Federal Water Pollution Control Administration (1965)
Federal Water Quality Administration (1970)
Environmental Protection Agency (1975)
KPC Discharge Monitoring Reports (1980-Present)
Jones and Stokes Associates (1989)

A brief synopsis of each report is included in Appendix A of this document.

## Problem Description

According to the Alaska Department of Environmental Conservation (ADEC), Ward Cove is water quality-limited due to the depletion of dissolved oxygen (DO). Adequate DO in the water column is a fundamental measure of the ability of the waterbody to support aquatic life.

### Applicable Water Quality Standards

Appendix B describes applicable portions of Alaska's water quality standards related to DO. The following sections further summarize this information.

### Beneficial Uses Affected

Ward Cove's most impaired beneficial use is the ability to support growth and propagation of fish, shellfish, other aquatic life, and wildlife. Recent and historic studies provide a picture of a biologically declining marine environment in the cove. There is historical evidence that Ward Cove had a diverse and healthy benthic community and had relatively good water quality prior to the beginning of operations of KPC in 1953. Ward Cove was studied in 1953, 1957, 1965, 1970, 1975, and 1989. KPC's discharge monitoring reports (DMRs), which are required as a part of their NPDES permit, provide additional evidence of conditions within the cove between 1980 and 1989. The studies document a gradual decline in biological activity and in water quality, in particular with respect to DO. State of Alaska officials have observed a number of fish kills in the summer months, further indicating that the decline in water quality threatens the cove's ability to support fish, shellfish, and other aquatic life.

### Water Quality Criteria

The State of Alaska water quality standards establish the following criteria for minimum concentrations of DO in marine waters:

> "Surface dissolved oxygen (D.O.) concentrations in coastal water shall not be less than 6.0 mg/l for a depth of one meter except when natural conditions cause this value to be depressed. D.O. shall not be reduced

> below 4 mg/l at any point beneath the surface. D.O. concentrations in estuaries and tilal tributaries shall not be less than 5.0 mg/l except when natural conditions cause this value to be depressed."

Because Ward Cove is considered both coastal and estuarine, the more stringent coastal criterion (6 mg/l) is applied at the surface, while the estuarine criterion (5 mg/l) is applied at depth. The focus of this assessment is the level of DO in the surface waters of Ward Cove.

### Available Monitoring Data

Field data collected by KPC as a requirement for their NPDES permit shows persistent, severe water quality impacts upon DO in the surface waters (depth < 1 meter) of Ward Cove (Figures 2 and 3). ADEC found that, for the months of July through September, the percentage of times measurements were less than the water quality standard ranged from 55% to 100% (Appendix B). Earlier studies (FWQA, 1970) in Ward Cove showed similar results, although the magnitude and extent of the water quality impacts were greater; this was also a period when organic loadings from KPC were higher. More recent data, including the results of water quality studies by KPC from 1987 through 1989, showed continued violations of the State of Alaska's DO standards.

### Pollutant Sources

Since the early 1950s, Ketchikan Pulp Company (KPC) has been engaged in the manufacturing of dissolving or paper grade wood pulp utilizing the magnesium base, acid bisulfate process. An average of 31 million gallons per day of wastewater generated in the manufacturing process are discharged from three outfalls into Ward Cove. A description of the current discharge conditions at KPC is included in Appendix D. The current National Pollutant Discharge Elimination System (NPDES) permit for the facility limits the discharge of biochemical oxygen demand ($BOD_5$) to an average of 32,400 pounds per day. As described in Appendix E, the available information indicates that KPC's discharge is the primary cause of depressed DO in the surface waters of Ward Cove.

Stormwater on the mill site is collected and discharged at several locations in Ward Cove. The volume and pollutant concentrations, including $BOD_5$, of these discharges are unknown. Potential sources of oxygen demanding materials in stormwater include runoff from the dredge disposal site, material storage areas, and vehicle maintenance yards. The draft NPDES permit for KPC includes a stormwater monitoring program to provide quantitative data about these discharges.

As described in the water quality studies listed earlier, the bottom of Ward Cove in the vicinity of the mill is covered by both large and small wood debris as well as fiber mats. Sediments are generally characterized as high in organic content and high in hydrogen sulfide, indicating anoxic conditions. The settled matter and sediments exert demand on the DO of the bottom waters of the cove. Dredging operations in the cove may result in localized impacts on DO due to sediment resuspension. While sediments affect DO in the deep waters of the cove, the data indicate that the impact of the sediments on surface waters is not significant (see Appendix E).

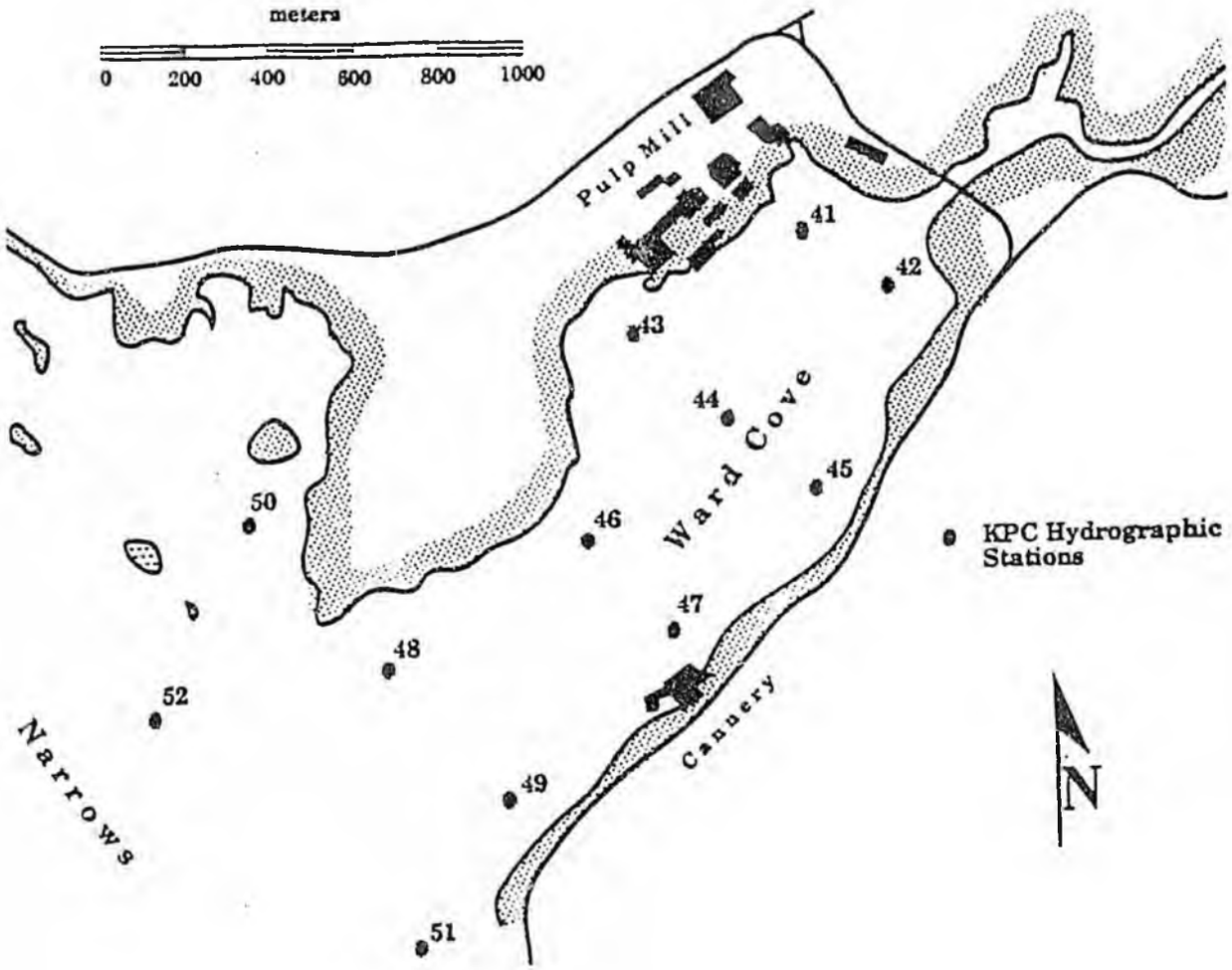



**Figure 2: Map of Ward Cove showing KPC monitoring stations**

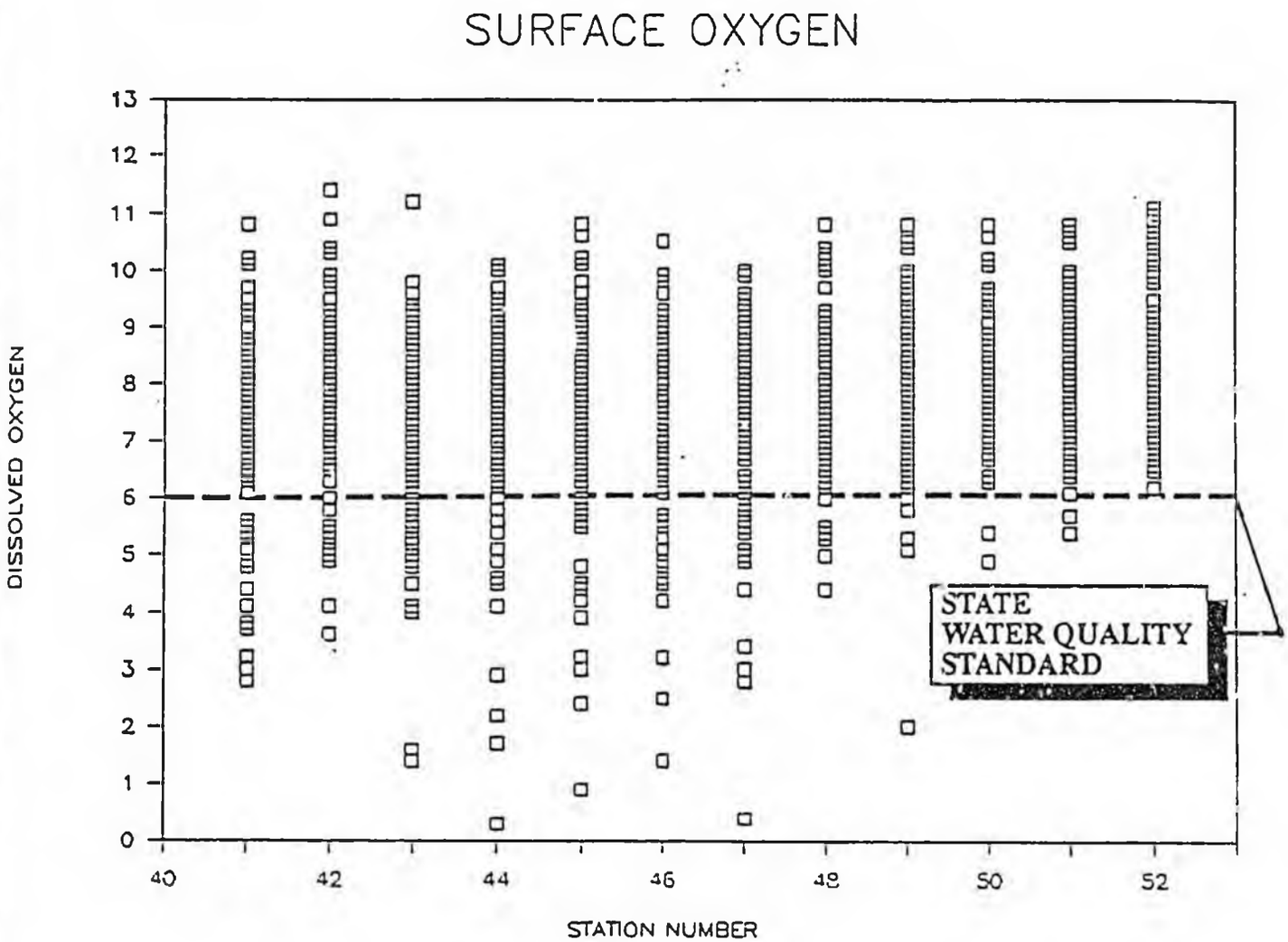



**Figure 3: Dissolved Oxygen Values from KPC Monitoring (1980-1987)**

Ward Cove Packing Company operates a seafood processing facility near the mouth of Ward Cove. Seafood wastes are ground to 0.5 inch and discharged to Ward Cove at a depth of approximately 58 feet at Mean Lower Low Water (MLLW). The magnitude of their discharge with respect to organic loading is significant. In 1988, for example, Ward Cove Packing Company reported that 3,847,117 pounds of waste were processed during a 35-day processing period. According to EPA (1975) guidelines, on the average, 45.5 pounds of $BOD_5$ are generated by every 1000 pounds of salmon processed. For the 1988 season, this corresponds to a daily average $BOD_5$ discharge from Ward Cove Packing Co. of approximately 5000 pounds. The discharge generally occurs during the critical months of July, August, and September. Due to the depth of this discharge (58 feet at Mean Lower Low Water), its significance in relation to surface water DO is believed to be minor (see Appendix E).

Non-point source pollution typically results from agricultural, silvicultural, and land use development activities. Land use adjacent to Ward Cove is dominated by the pulp mill complex, and most runoff from these areas is collected and discharged as point source stormwater (see above). Upstream activities may lead to non-point contributions to Ward Creek. These impacts are not documented; limited data from the 1989 study indicate DO concentrations between 7.7 and 8.7 mg/l at the mouth of Ward Creek.

## Actions to Date

KPC's allowable discharge of $BOD_5$ and TSS has been reduced over the years due to changes in production. For example, in 1980, KPC's permitted $BOD_5$ limit was set at an average of 120,000 lbs $BOD_5$/day. For the period 1981-1984, the average $BOD_5$ level was reduced to 52,500 lbs/day. In 1986 the limit was reduced to an average of 46,100 lbs/day. The 1987 allowable effluent limit was further reduced to an average of 40,600 lbs/day. Effective January 1988, effluent limits of an average 32,400 lbs $BOD_5$/day (62,400 lbs $BOD_5$/day maximum) and an average 52,900 lbs TSS/day (98,000 lbs TSS/day maximum) were placed on the mill to bring it into compliance with federal Clean Water Act mandates. KPC installed a primary wastewater treatment facility in 1972 and a secondary biological wastewater treatment facility for selected waste streams in 1979. Since 1984, KPC has implemented modifications to the mill to reduce the quantity and mass loading of the discharge.

## Pollution Control Strategy

### Assessment Model

As described earlier, EPA has determined that the discharge of $BOD_5$ from the KPC mill is the primarily cause of DO depletion in the surface waters of Ward Cove. In order to establish adequate discharge controls, a three-dimensional, steady-state model of DO and $BOD_5$ in Ward Cove has been developed (see Appendix E); the model satisfies criteria for the difference between observed and simulated values of DO. Based on data from August and September of 1986, the model predicts that the state standard for DO will be violated for a discharge of 20,000 pounds/day when effluent DO is at least 5.0 mg/l.

### Total Maximum Daily Load (TMDL)

A Total Maximum Daily Load (TMDL) is an implementation plan which identifies levels of pollution control to achieve water quality standards. The components used to address water quality problems through the TMDL process include:

- Effluent Limits
- Monitoring Requirements
- Compliance Schedules
- Special Conditions

A TMDL includes a determination of the amount of a pollutant (from point, nonpoint, and background sources), that may be discharged to a water-quality limited waterbody. Any loading above this capacity, which includes a margin of safety, risks violating state water quality standards.

Based on the available data and the model of the DO bugdet in Ward Cove, a TMDL is recommended for Ward Cove that establishes a maximum load of 20,000 pounds per day of $BOD_5$, to be allocated among the pollutant sources affecting the surface layer. Consistent with this problem assessment, this TMDL should focus on the DO problems in the surface waters of Ward Cove. As information about other potential water quality problems in the cove is collected and studied, additional TMDL's may be needed for other pollutants of concern.

## REFERENCES

Alaska Water Pollution Control Board. 1953. Report No. 7, Ward Cove survey. 23 pp.

Alaska Water Pollution Control Board. 1957. Ward Cove survey, unpublished report. 100 pp.

American Public Health Service. 1985. Standard methods for the examination of water and wastewater. 16th edition. 1268 pp.

Bodien, D.G. 1989. Quality assurance plan, NPDES inspections, Alaska Pulp Corp. and Ketchikan Pulp Co., Alaska. EPA Region 10. 4 pp.

Bowie, G.L., W.B. Mills, D.B. Porcella, C.L. Campbell, J.R. Pagenkopf, G.L. Rupp, K.M. Johnson, P.W.H. Chan and S.A. Gherini. 1985. Rates, constants, and kinetics formulations in surface water quality modeling (second edition). EPA/600/3-85/040. EPA Environmental Research Laboratory, Athens, Georgia. 455 pp.

Federal Water Quality Administration. 1970. Effects of pulp mill wastes on receiving waters at Ward Cove, Alaska. U.S. Department of Interior, Northwest Region, Alaska Operations Office. 49 pp.

Jones & Stokes Associates, Inc. 1989. Ward Cove water quality assessment. Work Assignment No. 16, EPA Contract No. 68-02- 4381. Bellevue, Washington.

Journel, A.G. 1989. Geostatistics for the environment sciences. Project No. CR 811893. EPA Environmental Monitoring Systems Lab., Las Vegas, Nevada. 135 pp.

Kruse, A. and A. Viteri. Ward Cove water quality analysis, February 1988. Alaska Dept. of Environmental Conservation, Juneau, Alaska. 23 pp.

Nelder, J.A. and R. Mead. 1965. A simplex method for function minimization. Computing Journal, 7:308-313. Press, W.H., B.P. Flannery, S.A. Teukolsky, and W.T. Vetterling. 1988. Numerical recipes. Cambridge University Press. 818 pp.

U.S. Environmental Protection Agency. 1975. Development document for effluent limitations guidelines for the fishmeal, salmon, bottom fish, clams, oysters, sardines, scallops, herring and abalone segments of the canned and preserved fish and seafood processing industry-point source categories. EPA/440/1-75/041a. Washington, D.C.

# APPENDICES

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# APPENDIX A

## HISTORICAL CHANGES IN THE ECOLOGY OF WARD COVE

The physical setting and oceanography of Ward Cove characterize it as an estuary. An estuary is defined as a

> "semi-enclosed body of water which has a free connection with the open sea and within which sea water is measurably diluted with fresh water derived from land drainage." (Pritchard, 1967)

Estuary settings range from coastal plain to steep-sided fjords, but all have the common feature of being a mixing region for fresh and salt water. Density differences between fresh and salt water can drive circulation and, hence, influence mixing and flushing in estuaries. The net circulation in an estuary depends on the amount and timing of fresh and salt water input as well as other influences such as winds, tides, topography, relation to continental shelf regions, and latitude. These influences can combine in various ways so that distinctly different circulations develop in otherwise similar estuaries.

A great deal of data has been collected in Ward Cove by state and federal resource agencies and by the major industrial facility in the area, KPC, as part of the requirements of their National Pollutant Discharge Elimination System (NPDES) permit. The principal analyses of water quality conditions in Ward Cove are contained in the following reports:

Alaska Water Pollution Control Board (1953,1957)
Federal Water Pollution Control Administration (1965)
Federal Water Quality Administration (1970)
Environmental Protection Agency (1975)
KPC Discharge Monitoring Reports (1980-Present)
Jones and Stokes Associates (1989)

A brief synopsis of each report is presented below.

### 1953

Ward Cove was surveyed by the Alaska Water Pollution Control Board (1953) to obtain information on the chemical, physical, hydrological, and biological conditions of the cove before wastes from the pulp mill were discharged. The survey was conducted from October 1951 through September 1952, with over 940 chemical, 100 bacteriological, 60 bottom, and 70 plankton samples taken from eight stations in the cove. The following information is summarized from the Board's report.

Dissolved oxygen (DO) concentrations were generally >80 percent of saturation during the winter and spring months. Although the water temperature increased during the summer months, the upper water layer became supersaturated with oxygen as a result of photosynthesis. The increase in DO was observed in water to the depths of over

100 ft. There was a decline in DO in lower depths in the fall, coinciding with the end of the heavy plankton bloom. Biochemical oxygen demand ($BOD_5$) varied from a low of almost 0 ppm to a high of almost 1.0 ppm in late summer, coinciding with the end of the plankton bloom and a high input of dead plankton and plant material.

Winter plankton samples were dominated by filamentous algae, fragments of Ulva sp. and Fucus sp., ctenophores, and many species of diatoms. With the increasing temperatures of summer, many pelagic eggs and larvae were represented in the samples. Larval clams, starfish, barnacles, and snails as well as diatoms and other plankton reached such high abundances that the surface of the water looked smokey.

Bottom samples were taken from depths of 20-185 ft. Collections contained limpets, calcareous tube worms, clams (including Macoma), nermerteans, polychaetes, brittle stars, and algae. The substrate varied from a rocky bottom through sand and gravel to a "slimy" mud at the cove entrance. It was noted that some benthic samples contained well-preserved sawdust (still brown and solid to touch) originating from a sawmill which operated in the 1920s.

The results of the 1952 study strongly indicate that Ward Cove supported a typical marine ecosystem, but the persistence of sawdust suggested a limited ability to decompose woody organic material.

## 1957

A follow-up study by the Alaska Water Pollution Control Board, suggested in the 1953 report, was implemented in 1955 after the pulp mill had been in partial operation for 15 months and at full capacity (525 tons pulp processed per day) for 4 months. A total of 258 samples were collected from 10 stations in August and December 1955 and March 1957 (Alaska Water Pollution Control Board 1957).

Oxygen depletion was noted at night time in cove waters near the pulp mill, although phytoplankton activity replenished the oxygen in the day. During the winter, when planktonic activity was low, dying fish were occasionally observed during the study, and fish kills were reported to the scientists by fishermen and U.S. Fish and Wildlife personnel. Bottom samples, collected near the outfall, included clams, of which approximately 50 percent were dead.

## 1965

Water samples were collected at 13 stations on 28 August 1965 by the Federal Water Pollution Control Administration (1965). The cove water was stably stratified (density increasing with depth), which inhibited downward mixing of surface discharged wastes. At this time, the main effluent discharge averaged 34.4 mgd. The effluent had a $BOD_5$ of 610 mg/l, a sulfite waste liquor (SWL) content of 7,285 mg/l, suspended solids content of 2,800 mg/l, and a volatile solids content of 160 mg/l.

The maximum DO concentrations were found between 5 and 10 m depth, with values of 7.33 mg/l (85 percent saturation) in Tongass Narrows and 5.59 mg/l (64 percent saturation) in Ward Cove. DO in Ward Cove decreased to 1.76 mg/l (21 percent

saturation) towards the surface and 1.96 mg/l at 40 m depth. Near-surface depressions in DO were attributed to the presence of pulp mill wastes, while near-bottom decreases in DO were attributed to the high oxygen demand of settleable solids in the pulp mill discharge (Federal Water Pollution Control Administration 1965).

1970

A total of 413 DO measurements were taken during the study by the Federal Water Quality Administration (1970). Of the total, 37 percent were below 6 mg/l. High SWL concentrations were found in Ward Cove and Tongass Narrows. Of 276 water samples taken in the top 20-m layer from May 1968 through May 1969, 50 percent had SWL concentrations greater than 44 ppm, 35 percent had SWL concentrations greater than 100 ppm, and 11 percent were greater than 500 ppm.

1975

A total of 266 water samples were taken by EPA from nine stations in Ward Cove and nine stations in Tongass Narrows at depths of 1, 7, 10, and 12 m for one week in September 1974 (EPA 1975). Mill discharges at this time were 42 mgd.

Data from the studies revealed that 24 percent of all samples had less than 6.0 mg/l of dissolved oxygen, and that 69 percent of near-surface samples (1 m) had DO values below 6.0 mg/l. On one of four observations at the head of Ward Cove near the water surface, DO was 1.0 mg/l. EPA concluded that there had been no major improvements in the DO concentrations in Ward Cove since the 1968-1969 study by its predecessor (Federal Water Pollution Control Administration).

The report also notes that SWL at concentrations of 50 mg/l are toxic to phytoplankton and fishfood organisms; at concentrations of 10 mg/l they cause damage to immature fish and shellfish (Department of the Interior 1967). SWL was distributed in the upper 7 m of water with the highest concentrations at the surface. All the water samples taken at 1-m depth had SWL concentrations of 50 mg/l or more at least once, and 10 mg/l concentrations were observed 97 percent of the time at all 1-m samples except those from two areas with apparently strong flushing or dilution. The maximum SWL concentration recorded was 872 mg/l, and 41 of 64 surface samples had concentrations over 100 mg/l.

Chemical analyses of bottom sediment showed high concentrations of organic nitrogen (0.36-0.75 percent) and total sulfides (0.15-0.43 percent). The chemical oxygen demand ranged from 147-655 percent (dry weight) and volatile solids from 11.1-46.9 percent (dry weight). The highest values were downstream of the main outfall. As a reference, the report noted that uncontaminated marine deposits have values of less than 0.1 percent organic nitrogen and sulfides, and less than 5 percent of both volatile solids and chemical oxygen demand.

Visual observations of the benthos revealed a paucity of organisms; with the majority being pollution-tolerant polychaetes. No macroscopic animals were observed at the head of the cove.

## 1980-1989

Since 1980, KPC has monitored dissolved oxygen, salinity, and temperature in Ward Cove in accordance with its NPDES permit. Some of this data is used for validation of the computer model outlined in the technical analysis section of this document. Figure 3 depicts the results of KPC's recent data collection.

## 1989

The Jones and Stokes (1989) report included a review of the previous studies as well as field work to assess water quality impacts. Water quality sampling again indicated that Ward Cove dissolved oxygen fell below the state standard.

While other water quality concerns were discussed in the report, a major concern identified was the level of DO in the surface waters of Ward Cove.

# APPENDIX B

## APPLICABLE WATER QUALITY STANDARDS

Ward Cove has been designated as water quality-limited. The pollutant of concern is dissolved oxygen (DO). In the state of Alaska, water quality standards are published in the Section 18 AAC 70 of the Alaska Code. Through the adoption of water quality standards, Alaska has defined the beneficial uses to be protected in its waters and the criteria necessary to protect these uses.

### Beneficial Uses Affected

Ward Cove is protected under the Alaska Water Quality Standards for the following beneficial uses:

> Water supply for aquaculture, seafood processing, and industrial uses.
> Contact and secondary recreation.
> Growth and propagation of fish, shellfish, other aquatic life, and wildlife.
> Harvesting for consumption of raw mollusks or other raw aquatic life.

Ward Cove's most impaired beneficial use is the ability to support growth and propagation of fish, shellfish, other aquatic life, and wildlife. Recent and historic studies provide a picture of a biologically declining marine environment in the cove, particularly with respect to DO levels. State of Alaska officials have observed a number of fish kills in the summer months, further indicating that the decline in water quality threatens the cove's ability to support fish, shellfish, and other aquatic life.

### Water Quality Criteria

The State of Alaska water quality standards establish the following criteria for minimum concentrations of DO in marine waters:

> "Surface dissolved oxygen (D.O.) concentrations in coastal water shall not be less than 6.0 mg/l for a depth of one meter except when natural conditions cause this value to be depressed. D.O. shall not be reduced below 4 mg/l at any point beneath the surface. D.O. concentrations in estuaries and tilal tributaries shall not be less than 5.0 mg/l except when natural conditions cause this value to be depressed."

Because Ward Cove is considered both coastal and estuarine, the more stringent coastal criterion (6 mg/l) is applied at the surface, while the estuarine criterion (5 mg/l) is applied at depth. The focus of this assessment is the level of DO in the surface waters of Ward Cove.

# APPENDIX C

## AVAILABLE MONITORING DATA

The State of Alaska's Department of Environmental Conservation (ADEC) tabulated the number of times the DO measured by KPC in the surface water was less than the State of Alaska water quality standard (DO = 6.0 mg/l) during the years 1985-87.

Summary of DO Values in Ward Cove
(one meter depth)

| Date | # of samples above 6 mg/l | # of samples below 6 mg/l | Percent above 6 mg/l standard |
|---|---|---|---|
| May 1985 | 12 | 0 | 0 |
| May 1986 | 12 | 0 | 0 |
| May 1987 | 11 | 1 | 8 |
| June 1985 | 6 | 6 | 50 |
| June 1986 | 12 | 0 | 0 |
| June 1987 | 9 | 3 | 25 |
| July 1985 | 6 | 6 | 50 |
| July 1986 | 0 | 6 | 100 |
| July 1987 | 2 | 4 | 67 |
| August 1985 | 0 | 6 | 100 |
| August 1986 | 1 | 11 | 92 |
| August 1987 | 5 | 7 | 58 |
| September 1985 | 0 | 11 | 100 |
| September 1986 | 0 | 12 | 100 |
| October 1985 | 9 | 3 | 25 |
| October 1986 | 6 | 0 | 0 |

Values were taken from the results of sampling surveys taken at stations 41-46 (See Figure 2 for map of station locations) during the period May through October for the years 1985-1986 and May through September of 1987.

Source: Kruse and Viteri, Alaska Department of Environmental Conservation

# APPENDIX D

## CURRENT DISCHARGE CONDITIONS AT KPC

Effluent Quality. The quality of KPC's effluent is governed by their National Pollutant Discharge Elimination System (NPDES) permit. This permit limits the amount of 5-day biochemical oxygen demand ($BOD_5$), total suspended solids (TSS), temperature, and pH of the discharge. The $BOD_5$ and TSS in the discharge have traditionally been the Environmental Protection Agency's (EPA) main concern with regard to the mill's effluent composition. The permit also mandates a water quality monitoring program.

Effluent Quantity and Temperature. KPC discharges between 25-50 million gallons/day (mgd) of wastewater through three different outfalls into Ward Cove. These discharges are referenced in their NPDES permit as outfalls 001, 002, and 003.

Outfall 001 is the main outfall line. The effluent discharged through Outfall 001 normally accounts for at least 50 percent of the total discharge volume and receives no wastewater treatment. The temperature of the discharge runs from a low of 20°C to an average temperature of 32-35°C, although it can have a maximum daily average temperature approaching 40°C.

Outfall 002 is a combination of primary and secondary treated wastewater. The average discharge temperature, 25-30°C, is generally cooler than that of the main outfall.

Outfall 003 is the discharge from the mill's water supply treatment (filtration) plant. The mill's water supply is from Lake Connell, an impoundment basin which drains to Ward Creek. The water treatment plant's wastewater has an average flow of 5.4 mgd, with a high volume of 8 mgd. Its discharge temperature is essentially the same as that of Ward Creek.

Combined, these three discharges flow at a rate that is normally around 30-35 mgd on an average basis for each month and between 40-45 mgd as a monthly maximum. During summer months, when rainfall is small, the mill discharges can exceed the flow in Ward Creek.

Discharges 001 and 002 take place behind a log boom which confines the foam that is produced by the discharge to the area between the boom and the immediate vicinity of the mill. Log rafts and log booms along the west shore of the cove effectively leave a narrow, open water channel along the shore out to Tongass Narrows.

# APPENDIX E

## TECHNICAL ANALYSIS AND CONCLUSIONS

### Identification of Significant Sources

In Ward Cove there are a number of possible sources for low DO in the surface water. These sources include 1) respiration of phytoplankton; 2) upwelling of oxygen-depleted water from oceanic sources or Ward Cove bottom water; and 3) discharge of organic, oxygen-demanding material by KPC and/or by the Ward Cove Packing Co.'s seafood processing plant.

Oxygen demand associated with phytoplankton respiration is a function of the rate of primary productivity. Jones & Stokes (1989) measured rates of primary productivity in Ward Cove during August 1988. Their results showed that primary productivity was low; they concluded that oxygen production was minimal in Ward Cove. When oxygen production by phytoplankton is low, respiration is also low. Therefore, based upon the results of the Jones & Stokes studies (1989), phytoplankton respiration was assumed to be of little significance for the DO budget in Ward Cove.

Upwelling can cause low DO in the surface water of estuaries when the oceanic source water is low in DO or when the bottom water from the estuary itself has been depleted of oxygen by sediment demand. Low DO associated with oceanic source water in Tongass Narrows may occur, but has not been documented in the studies surveyed for this report. Low DO in the bottom water has been observed in several studies (e.g., EPA, 1975; Jones & Stokes, 1989). When low DO in the surface is a result of upwelled water, DO just below the surface should be equal to or less than surface DO. Of the several data sets surveyed, only the Jones & Stokes (1989) DO data from August and September 1988 has characteristics which could be interpreted as being caused by upwelled water. However, the preponderance of the water quality data from Ward Cove, including measurements made by KPC, show DO increasing with depth. Under conditions for which DO increases with depth the mechanism of upwelling does not explain low DO in the surface water. While Jones & Stokes (1989) concluded that their data support the hypothesis that upwelling can lead to low DO in the surface, the results of the other field studies support the hypothesis that the source of oxygen demand originates in the surface, or near-surface waters of the estuary.

Additional support for the hypothesis that the source of oxygen demand originates in the surface, or near-surface waters, and, furthermore, that it is associated with discharge from the KPC pulp mill is provided by the measurements of Pearl Benson Index (PBI) reported in KPC's receiving water monitoring program. Measurements of PBI provide an index of the amount of sulfite waste liquor present. Since the only source of sulfite waste liquor in Ward Cove is the KPC mill, one way of testing this hypothesis is to determine if there is a positive correlation between PBI measurements and DO deficit in Ward Cove. Such an analysis was performed, using KPC receiving water quality data for the calendar year 1986. KPC measures temperature, salinity, DO, pH and PBI at depths of 1 and 5 meters at the 12 locations shown in Figure 2. Data collected on the dates shown in Table E1 were included in the analysis. These data were used to make

estimates of the total amount of PBI and DO deficit in a one- meter thick surface layer of Ward Cove.

Table E1
Estimates of total PBI and DO deficit
in the surface waters of Ward Cove during 1986

Estimates obtained from water quality measurements made by KPC as part of their NPDES permit.

| Date | Total PBI (kilograms) | DO Deficit (kilograms) |
|---|---|---|
| January 9 | 2273 | 3072 |
| January 29 | 5497 | 2555 |
| February 12 | 2716 | 3221 |
| February 28 | 4965 | 4091 |
| March 21 | 8841 | 3411 |
| March 31 | 6358 | 2980 |
| April 21 | 3936 | 1872 |
| May 20 | 6157 | 2408 |
| May 30 | 4770 | 3230 |
| June 24 | 2625 | 2855 |
| July 30 | 8887 | 5616 |
| August 19 | 24300 | 4833 |
| August 29 | 29680 | 7008 |
| September 9 | 9971 | 4286 |
| September 29 | 19070 | 6024 |
| October 24 | 4205 | 2923 |
| November 14 | 1173 | 2030 |
| November 30 | 4402 | 2230 |
| December 19 | 2879 | 2466 |
| December 30 | 3272 | 3039 |

The DO deficit was defined as the difference between the 100% DO saturation level at the observed temperature and salinity and the observed DO. The total PBI and DO deficit in the surface layer for each of the survey dates were estimated in the following. First, Ward Cove was divided into several discrete, equal elements as shown in Figure E1. Ordinary kriging (Journel, 1989) was then used to estimate the values of temperature, salinity, DO and PBI at the center of each of the discrete elements. The 100% saturation level of DO was determined for each element based upon the following relationship (Mills et al, 1985):

$$DO_{sat} = 14.6244 - 0.367134T + 0.0044972T^2 - 0.0966S + 0.0002739S^2$$

where,

$DO_{sat}$ = the saturation concentration of dissolved oxygen, mg/l
T = the water temperature, °C
S = the salinity, parts per thousand (o/oo)

The DO deficit, DDO, for each element was estimated as

$$DDO = DO_{sat} - DO$$

Total estimated PBI and DO deficit in Ward Cove for each of the survey dates in Table E1 are plotted as a time series in Figure E2. A regression analysis was also performed on these data. Results are shown in Figure E3. In spite of the fact that the processes leading to the decay of PBI and DO deficit are different, linear regression accounts for 74% of the variance in the analysis.

The other major source of organic loading to Ward Cove is the Ward Cove Packing Company. The magnitude of their discharge with respect to organic loading is significant. In 1988, for example, Ward Cove Packing Co. reported that 3,847,117 pounds of fish were processed during a 35-day processing period. According to EPA (1975) guidelines, on the average, 45.5 pounds of $BOD_5$ are generated by every 1000 pounds of salmon processed. For the 1988 season, this corresponds to a daily average $BOD_5$ discharge from Ward Cove Packing Co. of approximately 5000 pounds. The discharge generally occurs during the critical months of July, August, and September. However, the discharge is made through a submerged outfall located at a depth of 58.0 feet below Mean Lower Low Water (MLLW). This discharge may have a significant impact upon the DO levels in the intermediate and deep waters of Ward Cove. However, based upon the analysis of DO data, as described above, the contribution of Ward Cove Packing Co.'s discharge to water quality impacts in the surface water was assumed to be of minor importance compared to the KPC discharge. In consideration of the factors described above, the analysis of DO in the surface waters of Ward Cove focus upon the organic loading from the KPC pulp mill and the physical, chemical and biological processes which describe the fate of oxygen-demanding material. The development of the model for characterizing the DO budget is described in the following section.

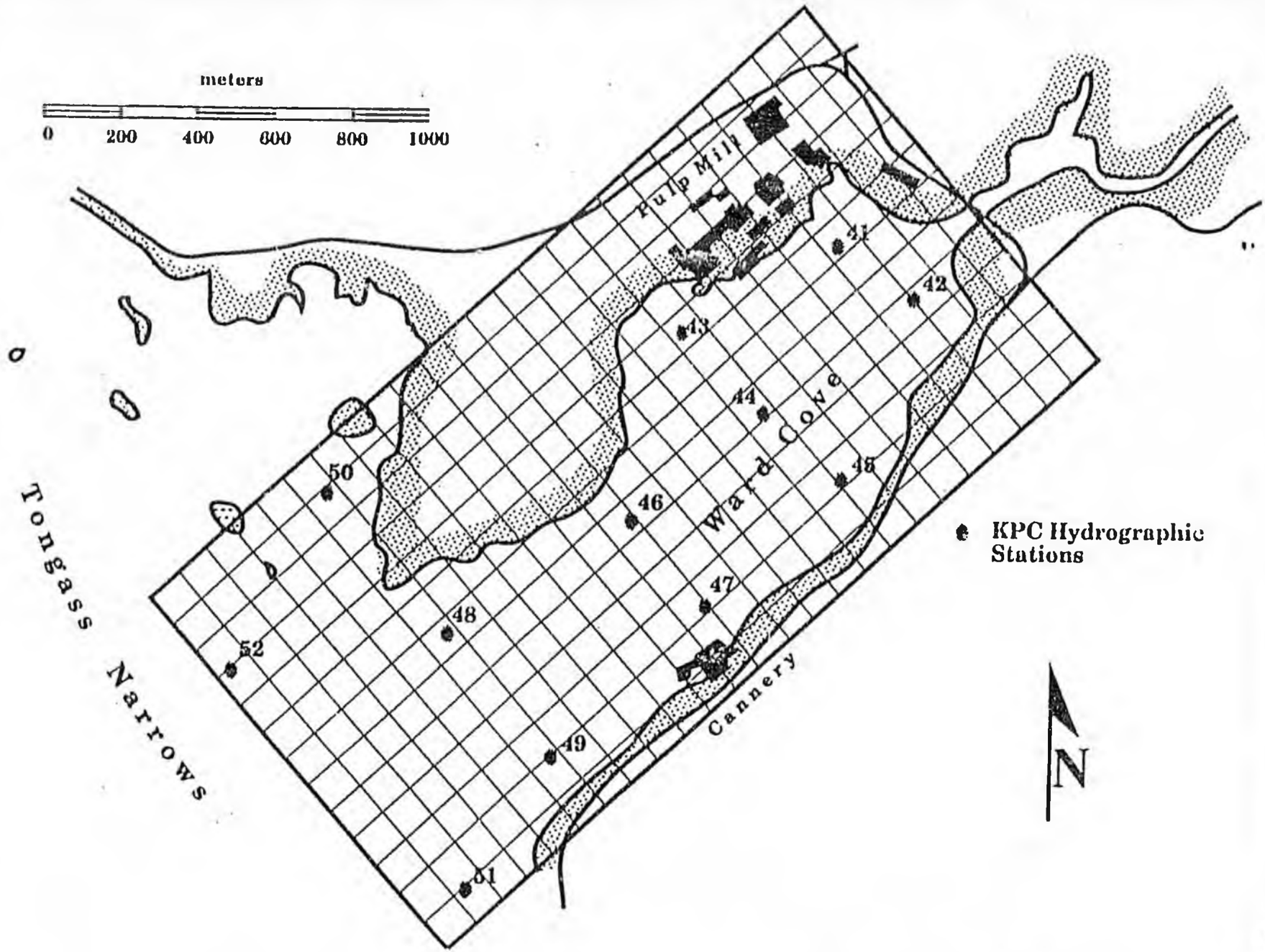



**Figure E1: Finite difference grid for steady-state model of BOD and DO in Ward Cove near Ketchikan, Alaska.**

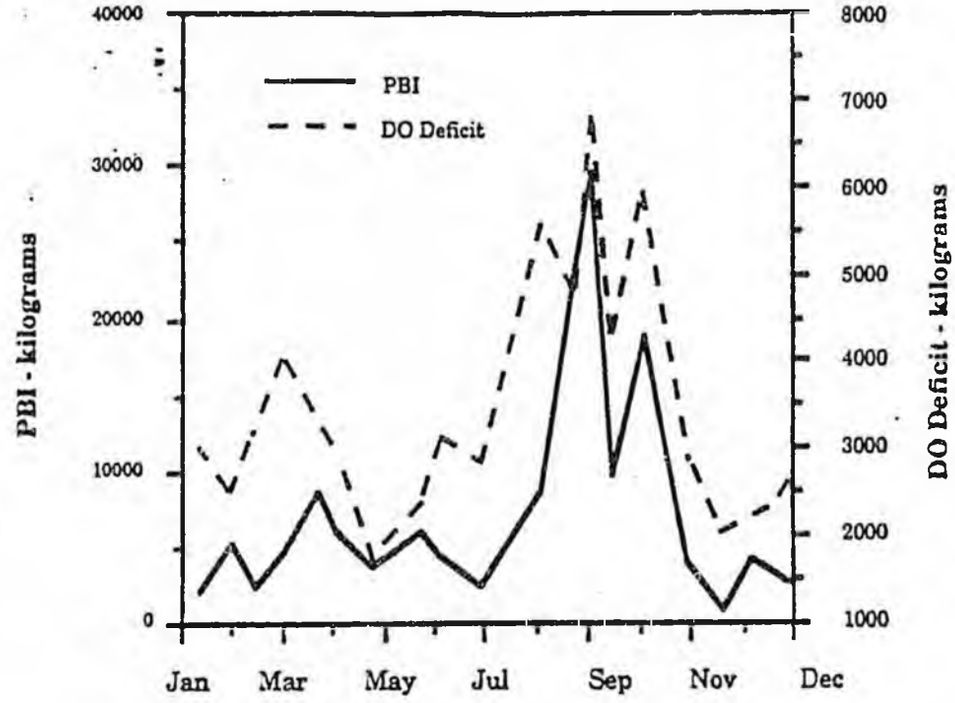



Figure E2: Time series of total PBI and DO deficit in the surface layer (thickness=1 meter) in Ward Cove during 1986

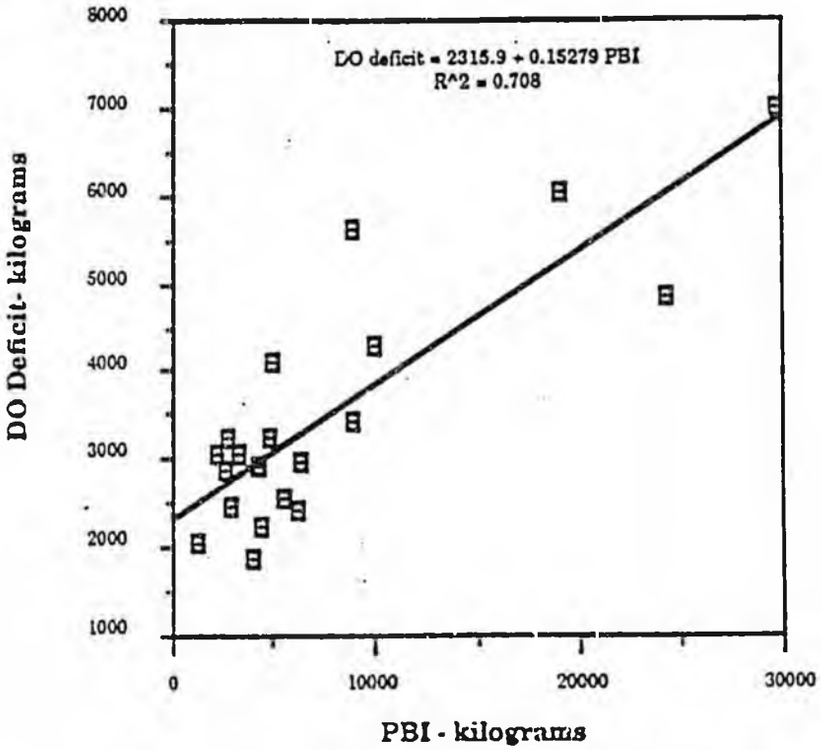



Figure E3: Regression of PBI on DO deficit in the surface water of Ward Cove for water quality data collected during 1896. Also shown are the least squares fit of linear relationship and $R^2$

## Model of the Dissolved Oxygen Budget

### Model Structure

The model chosen for characterizing the DO budget of the surface waters of Ward Cove was a three-dimensional, steady-state finite-difference model which included the following processes: 1) horizontal and vertical turbulent diffusion; 2) horizontal advection; 3) first-order stabilization of biological oxygen demand (BOD); 4) first-order transfer of DO across the air-water interface. The justification for choosing a steady-state model was developed from an evaluation of local meteorologic and hydrologic data. Specific emphasis was given to the months of July, August and September, for which water quality impacts have historically been the greatest.

Continuous hydrologic data from Ward Creek, the primary source of fresh water, was collected during the period 1949-1958, only. The record subsequent to October 1953 reflects the effects of diversion to KPC's water treatment plant upon streamflow in Ward Creek. For the months of July, August and September the records from 1953 to 1958 show that flow in Ward Creek remains relatively stable over periods of five to forty-five days. Flow in Ward Creek responds primarily to precipitation in the watershed, but it is also controlled by the regulation of releases from Connell Lake Dam. Rainfall events in the watershed typically have a five to ten day recurrence during the critical months. The frequency response of the Ward Creek watershed is smoothed further by the operation of the dam, particularly during the summer low flow months. Wind speed also appears to be an important factor in determining the level of DO in Ward Cove. Wind mixing provides a source of oxygen reaeration and is source of kinetic energy for turbulent mixing processes. Analysis of wind speed characteristics in the vicinity of Ward Cove have been done by Alaska Water Pollution Control Board (1957) and Jones & Stokes (1989). Although both of these reports consider only a limited data set, the results are consistent with the assumption that wind speeds are lowest during the critical months and that there are often periods of five to six days between meteorological events with wind speeds greater than 7 knots (Jones & Stokes, 1989).

Given these data and discretizing the water body of interest into volume elements as shown by the grid in Figure E1, a material balance on each element (Figure E4) for DO and BOD leads to the following equations:

Biological Oxygen Demand (BOD)

$$\frac{\kappa_x \Delta y \Delta z (L_{i-1,j,k} - L_{i,j,k})}{\Delta x} + \frac{\kappa_x \Delta y \Delta z (L_{i+1,j,k} - L_{i,j,k})}{\Delta x}$$

$$+ \frac{\kappa_y \Delta x \Delta z (L_{i,j-1,k} - L_{i,j,k})}{\Delta y} + \frac{\kappa_y \Delta x \Delta z (L_{i,j+1,k} - L_{i,j,k})}{\Delta y}$$

$$+ \frac{\kappa_z \Delta x \Delta y (L_{i,j,k-1} - L_{i,j,k})}{\Delta z} + \frac{\kappa_z \Delta x \Delta y (L_{i,j,k+1} - L_{i,j,k})}{\Delta z}$$

$$+ \sum_x Q_{in,x} L_{in,x} + \sum_y Q_{in,y} L_{in,y} - \sum_{x,y} Q_{out,x,y} L_{i,j,k}$$

$$- K_1 L_{i,j,k} \Delta x \Delta y \Delta z + \Lambda(i,j,k) = 0.0 \qquad (1)$$

Dissolved Oxygen (DO)

$$\frac{\kappa_x \Delta y \Delta z (O_{i-1,j,k} - O_{i,j,k})}{\Delta x} + \frac{\kappa_x \Delta y \Delta z (O_{i+1,j,k} - O_{i,j,k})}{\Delta x}$$

$$+ \frac{\kappa_y \Delta x \Delta z (O_{i,j-1,k} - O_{i,j,k})}{\Delta y} + \frac{\kappa_y \Delta x \Delta z (O_{i,j+1,k} - O_{i,j,k})}{\Delta y}$$

$$+ \frac{\kappa_z \Delta x \Delta y (O_{i,j,k-1} - O_{i,j,k})}{\Delta z} + \frac{\kappa_z \Delta x \Delta y (O_{i,j,k+1} - O_{i,j,k})}{\Delta z}$$

$$+ \sum_x Q_{in,x} O_{in,x} + \sum_y Q_{in,y} O_{in,y} - \sum_{x,y} Q_{out,x,y} O_{i,j,k}$$

$$+ (K_2(O_{sat} - O_{i,j,k}) - K_1 L_{i,j,k}) \Delta x \Delta y \Delta z + \Theta(i,j,k) = 0.0 \qquad (2)$$

where,

$L_{i,j,k}$ = the BOD concentration of the i,j,$k^{th}$ volume element, mg/l;

$O_{i,j,k}$ = the DO concentration of the i,j,$k^{th}$ volume element, mg/l;

$O_{sat}$ = the saturation level of DO in the i,j,$k^{th}$ volume element, mg/l;

$Q_{in,x}$ = the inflow rate to the i,j,$k^{th}$ element in the x-direction, meters$^3$/second;

$Q_{out,x}$ = the outflow rate of the i,j,$k^{th}$ element in the x-direction, meters$^3$/second;

$Q_{in,y}$ = the inflow rate to the i,j,$k^{th}$ element in the y-direction, meters$^3$/second;

$Q_{out,y}$ = the outflow rate of the i,j,$k^{th}$ element in the y-direction, meters$^3$/second;

$\kappa_x$ = the coefficient of turbulent diffusion in the x-direction, meters$^3$/second;

$\kappa_y$ = the coefficient of turbulent diffusion in the y-direction, meters$^3$/second;

$\kappa_z$ = the coefficient of turbulent diffusion in the z-direction, meters$^3$/second;

$K_1$ = the deoxygenation rate, seconds$^{-1}$;

$K_2$ = the reaeration rate, seconds$^{-1}$;

$\Lambda(i,j,k)$ = the source term for BOD, meters$^3$-mg/l/second;

$\Theta(i,j,k)$ = the source term for DO, meters$^3$-mg/l/second.

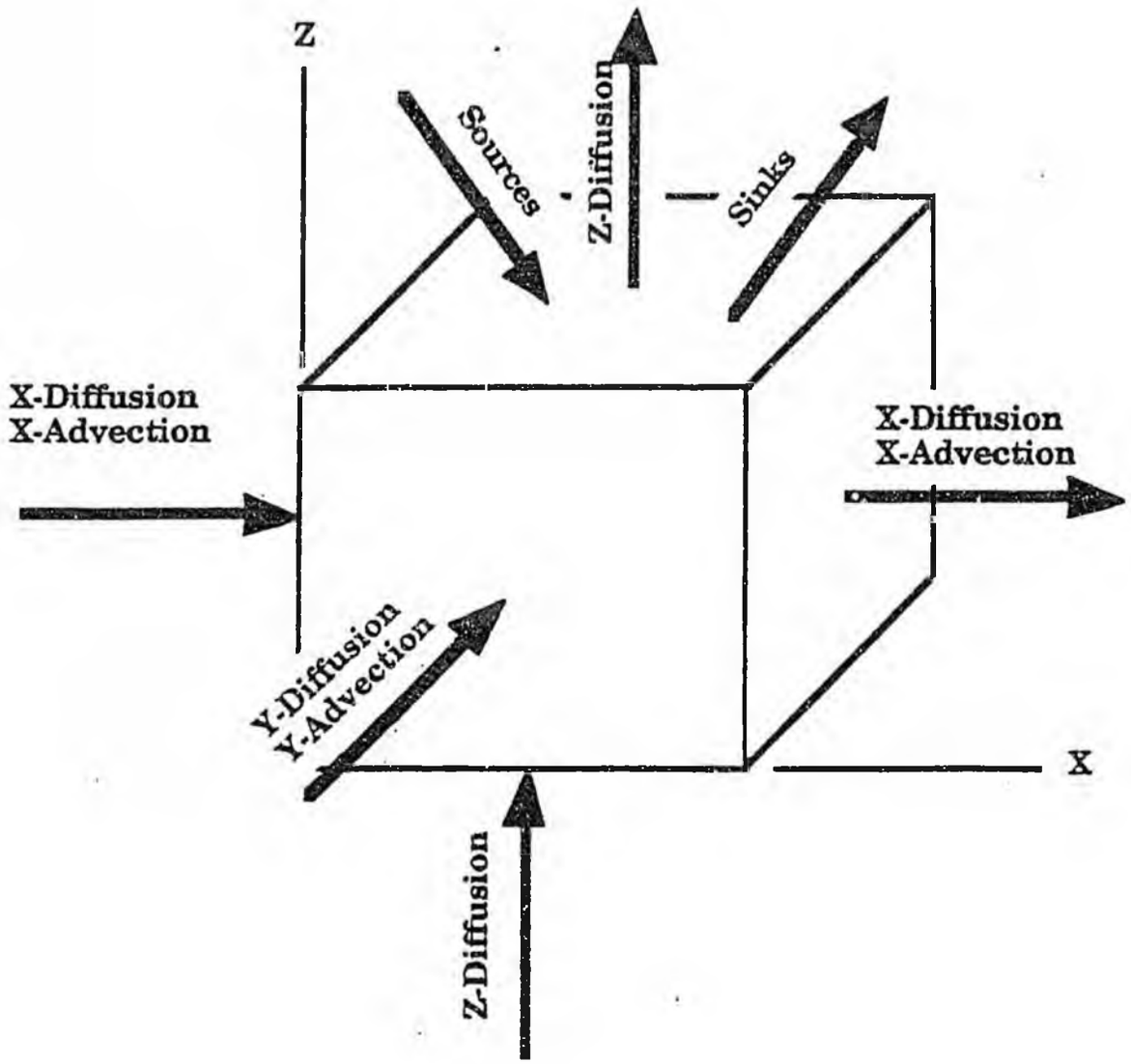



Figure E4: Typical element in numerical scheme showing material balance for modes of constituents subject to advection, diffusion, sources and sinks.

## Parameter Estimation

Once the model structure has been defined (Equations (1) and (2)), it is necessary to estimate the model parameters. In this case the parameters are $K_1$, $K_2$, $k_x$, $k_y$, $k_z$, $Q_{in,x}$, $Q_{out,x}$, $Q_{in,y}$, $Q_{out,y}$, $\theta(i,j,k)$, and $A(i,j,k)$. In principle, each of these parameters must be estimated for every one of the discrete elements given in Figure 4. This cannot be done with the available data. Estimates can be obtained, however, by placing certain restrictions upon the parameter set. The restrictions used in this analysis were 1) $K_1$, $K_2$, $k_x$, $k_y$, and $k_z$ are constant throughout the estuary 2) $A(i,j,k)$, and $\theta(i,j,k)$ are non-zero only for the elements which receive the discharge from KPC and Ward Creek 3) The magnitudes of $Q_{in,x}$, $Q_{out,x}$, $Q_{in,y}$ and $Q_{out,y}$ are a functions of the discharges from KPC and Ward Creek and location, only 4) Volume changes due to tidal fluctuations are negligible in the continuity equation when averaging over several tidal periods. Given these restrictions, available data were used in both a qualitative and quantitative manner to obtain parameter estimates. Following is a description of the way in which each of the parameters was estimated.

### Horizontal Velocity Structure

Current structure was estimated using field data as a guide, where it was available. Drogue tracks comprise most of the field data relating to the velocity. AWPCB (1953) used a Gurley-type meter to make current measurements in Ward Cove and reported only that most of the movement was in the surface water at depths less than three feet. Drogues released in Ward Cove (AWPCB, 1957; Jones & Stokes, 1989) have a more or less random pattern when released in the central portion of Ward Cove. Drogues released near the KPC discharge (AWPCB, 1957), however, tended to stay in the vicinity of the shore until they exited the estuary. The two major sources of freshwater discharge in Ward Cove are the KPC discharge and Ward Creek. Based upon the qualitative information available from visual observations and measurements of drogue tracks, it was assumed in this study that the KPC discharge is initially distributed uniformly over the top two meters of the surface. Furthermore, it was assumed that the maximum horizontal velocity occurs near the discharge point and decreases in the direction of the opposite shore. In the seaward direction, it was assumed that the shape of this plume flattens out, or disperses with increasing distance from the discharge point.

A similar approach was used to characterize the horizontal current distribution associated with the Ward Creek Flow. It was assumed that the discharge from Ward Creek is to the surface layer of one meter thickness and is distributed approximately uniformly across the estuary.

### Deoxygenation Rate ($K_1$)

Water samples were collected at Stations 43, 44 and 45 (Figure 2) in Ward Cove on October 25, 1989, preserved and handled according to the quality assurance plan (Bodien, 1989) and shipped to the EPA Regional Laboratory at Manchester, Washington. Standard methods (American Public Health Service, 1985) were used to determine the 5-,

10-, 15- , 20- and 60-day BOD of each sample. The simplex method (Nelder and Mead, 1965) for minimizing a nonlinear function, using the FORTRAN software implementation given by Press et al. (1986), was used to estimate both the rate constant, $K_1$, and the ultimate BOD of each sample. Estimates of these parameters are given in Table E2 below.

Table E2

Estimates of the ultimate BOD and the deoxygenation rate, $K_1$, for samples collected at three stations in Ward Cove, October 1989.

Station numbers correspond to locations on Figure B1.

| Station | Ultimate BOD(mg/l) | Deoxygenation Rate, $K_1$ ($days^{-1}$) |
|---|---|---|
| 43 | 8.52 | 0.127 |
| 44 | 2.34 | 0.097 |
| 45 | 2.19 | 0.165 |

Reaeration Rate ($K_2$)

According to Bowie et al (1985), there is very little research available for estimating the magnitude of the reaeration rates in lakes and estuaries. Their summary includes reaeration coefficients which are appropriate primarily for well-mixed estuaries. Bowie et al (1985) also summarize a number of reaeration formulae from lakes. These formulae for lakes are all given in terms of surface transfer rates and are either constant, first- or second-order functions of the wind speed. In view of the lack of available, reliable information regarding the reaeration rate, it was treated in this report as a variable to be estimated from the observations of dissolved oxygen.

BOD and DO Source Terms, A(i,j,k), $\theta$(i,j,k)

The source terms for BOD and DO, A(i,j,k), and $\theta$(i,j,k), are a function of discharge and concentration. For the KPC discharge, daily measurements of $BOD_5$ and flow rate are available as a requirement of the NPDES discharge permit. Five-day moving averages of these measurements were used to estimate the loadings. $BOD_5$ was converted to ultimate BOD using the rate constant obtained from the field measurement in the standard formulation:

$$BOD_{ultimate} = BOD_5/(1. - e^{-5. * K1}) \qquad (3)$$

It was assumed that the DO in the KPC discharge was 5.0 mg/l.

For the Ward Creek source terms, it was assumed that the ultimate BOD was zero

and the DO was 90% of saturation. These values are consistent with measurements of water quality from Ward Cove prior to the operation of the KPC facility (AWPCB, 1953). The five-day average flow in Ward Creek was treated as a variable to be estimated from the water quality data.

Coefficients of Turbulent Diffusion, $k_x$, $k_y$, and $k_z$.

Coefficients of horizontal and vertical turbulent diffusion were treated as variables to be estimated from the water quality data.

Estimation Method

Given limitations and assumptions described above, a total of five parameters remained to be estimated from the water quality data. These five parameters were:

$k_x$, $k_y$, and $k_z$; coefficients of turbulent diffusion
$K_2$; reaeration rate
$Q_{Ward\ Creek}$; the five-day average flow in Ward Creek.

KPC's water quality monitoring program includes observations of temperature, salinity, and DO at 12 locations in Ward Cove and Tongass Narrows (Figure 2). Water quality samples collected on three different dates, August 19, 1986; August 29, 1986; and September 19, 1986, were chosen for the analysis. Data from these surveys were used to solve the inverse problem of finding values of the five unknown parameters which provide the best solution to eqs. (1) and (2), given the 12 observations. For the purposes of this analysis, the best solution was defined as that which minimizes the sum of the squared differences between the observed and simulated state variables. Given a parameter set, q, with a cost function, J(q), defined as

$$J(q) = (z - x)T(z - x) \qquad (4)$$

where,
z = the vector of observations, and
x = the vector of state variables generated by the model,

the parameter estimate is the set of parameters, q*, for which

$$J(q^*) = \min (J(q)) \qquad (5)$$

The problem, as formulated, is a non-linear estimation problem, and, therefore, cannot be solved by standard least-squares methods (Larsen and Marx, 1981). In this case, a two-stage approach was used to find an optimal estimate of the parameters; one which satisfied eq. (3). The first step was an attempt to obtain an approximation to the optimal estimate. This was done by characterizing the five parameters as random variables with distributions estimated from available information. The reaeration rate, expressed in terms of a surface transfer rate, and the coefficients of eddy diffusivity were

assumed to have log-normal distributions with mean and coefficient of variation as shown in Table B2. Empirical cumulative distribution functions (CDF) were computed for the five-day average flow in Ward Creek using the streamflow data collected at USGS gage 15062000 during the period 1953-1958. CDF's for the five-day average flow during the months of August and September, for this period, are shown in Figures E5 and E6.

Table BE3

Means and coefficients of variation used for initial estimate of parameters

| Parameter | Mean | Coefficient of Variation |
|---|---|---|
| $k_x$ | 10 meters$^2$/second | 1.0 |
| $k_y$ | 1 meters$^2$/second | 1.0 |
| $k_z$ | $5 \times 10^{-5}$ meters$^2$/second | 1.0 |
| $K_2$ | 0.5 days$^{-1}$ | 2.0 |
| $Q_{Ward\ Creek}$ | 1.0 meters$^3$/second | 0.5 |

Values for the five parameters were then chosen at random, based upon the assumed distributions. Solutions to eqs. (1) and (2) were obtained with the full parameter set and the squared difference between observed and simulated state variables (eq. (4)) was calculated. 200 such simulations were performed with data from each of the three field studies. The parameters giving the minimum estimate of the cost function, J(q), were then used in the second step as the initial values for finding the best local minimum with the downhill simplex method (Nelder and Mead, 1965).

While this process of parameter estimation generally leads to a local minimum, it does not guarantee that such a minimum is unique. Nor does it guarantee that the resulting model is acceptable. Additional criteria must be developed to define model acceptability. For this study, two criteria were developed to define acceptability, one based upon the difference between simulated and observed at all sampling locations, the other based upon the mean of the differences. It was assumed that the errors were normally distributed and a confidence interval of 0.999 was chosen. For a confidence interval of 0.999, the specific criteria were:

1) the difference between observed and simulated was less than 3.3 standard deviations of the calibration error of the measurements

2) the mean of the differences was less than 3.3 times the standard error of the mean of the calibration error based upon 18 samples (the number used in the parameter estimation process).

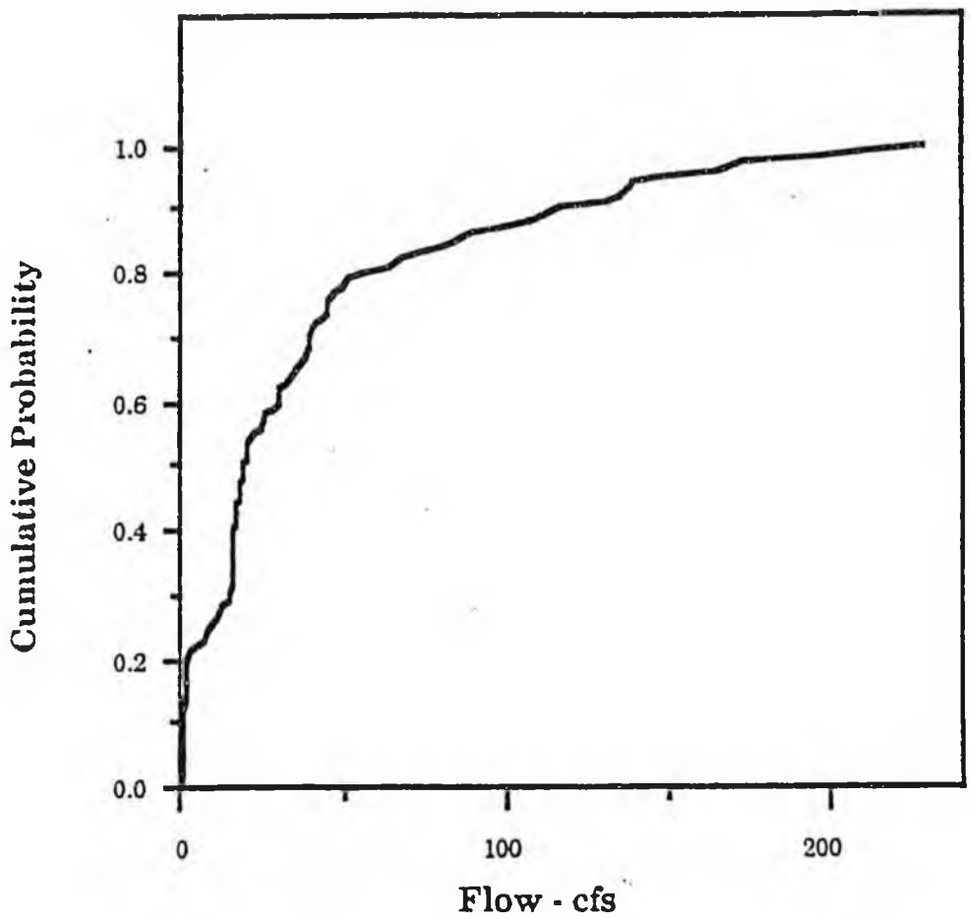



Figure E5: Empirical cumulative distribution function for 5-day averaged streamflow in Ward Creek, Alaska, during the month of August. Based upon data from USGS gage 1506200 for the period 1953-1958.

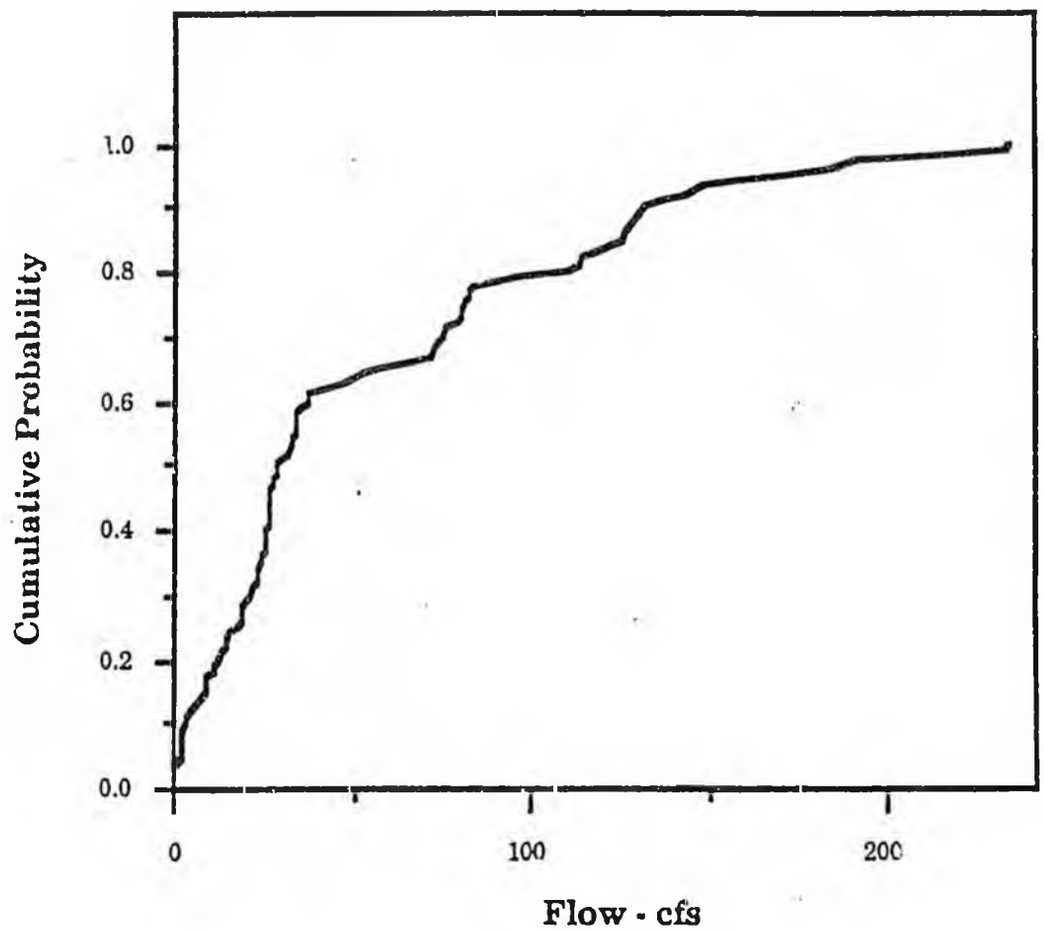



Figure E6: Empirical cumulative distribution function for 5-day averaged streamflow in Ward Creek, Alaska, during the month of September. Based upon data from USGS gage 1506200 for the period 1953-1958.

Sampling error was estimated from intercalibration results performed in the August 1988 studies of Ward Cove (Jones & Stokes, 1989). Differences between KPC DO measurements and measurements made by two other sampling parties (Kinnetic Labs, Inc. and Alaska Department of Environmental Conservation) had standard deviation of 1.23 mg/l and 0.79 mg/l, respectively. A standard deviation of 1.0 mg/l was chosen, implying that the standard error of the mean difference was $1.0/(18)^{1/2}$ = .236. The resulting criterion for acceptability was a difference between observed and simulated DO levels at each sample location of no more than 3.3 mg/l and mean difference no greater than 0.78.

The parameter estimates for each of the three studies, as a result of the second minimization step are given in Table E4.

Table E4

Optimal parameter estimates for water quality measurements made by KPC on three different days during late summer of 1986.

Parameter units are the same as given in Table B2.

| Parameter | August 19 | August 29 | September 9 |
|---|---|---|---|
| $k_x$ | 6.83 | 4.45 | 4.36 |
| $k_y$ | 3.73 | 1.10 | 3.63 |
| $k_z$ | $0.99 \times 10^{-5}$ | $1.99 \times 10^{-5}$ | $3.97 \times 10^{-5}$ |
| $K_2$ | 0.203 | 0.058 | 0.433 |
| $Q_{\text{Ward Creek}}$ | 0.581 | 0.453 | 0.960 |

Predicted and observed DO levels for each station, as well as their differences, mean differences and standard error of the mean difference are shown in Tables E5, E6, and E7. Parameter estimates for field studies on August 19, 1986 and September 9, 1986 lead to models which meet the criterion for model acceptability. The steady-state model, as formulated above, does not, however, meet this criterion for the August 29, 1986, due to an extremely low observation of DO at the surface of Station 49. The steady-state model given by eqs. (1) and (2) was, therefore, rejected for this set of data.

Table E5

Comparison of simulation using the optimal parameter set and observed DO at nine locations in Ward Cove for the KPC water quality survey of August 19, 1986.

| Station | Depth (meters) | Predicted DO (mg/l) | Observed DO (mg/l) | Difference (mg/l) |
|---|---|---|---|---|
| 41 | 1 | 4.5 | 3.0 | 1.5 |
| 41 | 5 | 7.3 | 7.3 | 0.0 |
| 42 | 1 | 5.1 | 3.6 | 1.5 |
| 42 | 5 | 7.4 | 8.0 | -0.6 |
| 43 | 1 | 3.9 | 6.3 | -2.4 |
| 43 | 5 | 7.2 | 8.1 | -0.9 |
| 44 | 1 | 4.3 | 2.2 | 2.1 |
| 44 | 5 | 7.3 | 8.8 | -1.5 |
| 45 | 1 | 4.5 | 3.0 | 1.5 |
| 45 | 5 | 7.3 | 7.6 | -0.3 |
| 46 | 1 | 5.1 | 4.6 | 0.5 |
| 46 | 5 | 7.5 | 8.4 | -0.9 |
| 47 | 1 | 5.2 | 7.9 | -2.7 |
| 47 | 5 | 7.5 | 6.8 | 0.7 |
| 48 | 1 | 7.2 | 6.9 | 0.3 |
| 48 | 5 | 7.9 | 7.3 | 0.6 |
| 49 | 1 | 6.9 | 5.3 | 1.6 |
| 49 | 5 | 7.8 | 7.0 | 0.8 |

Table E6

Comparison of simulation using the optimal parameter set and observed DO at nine locations in Ward Cove for the KPC water quality survey of August 29, 1986.

| Station | Depth (meters) | Predicted DO (mg/l) | Observed DO (mg/l) | Difference (mg/l) |
|---|---|---|---|---|
| 41 | 1 | 2.9 | 2.8 | 0.1 |
| 41 | 5 | 4.9 | 6.1 | -1.2 |
| 42 | 1 | 4.2 | 2.8 | 1.4 |
| 42 | 5 | 5.5 | 5.1 | 0.4 |
| 43 | 1 | 2.3 | 1.4 | 0.9 |
| 43 | 5 | 4.5 | 5.5 | -1.0 |
| 44 | 1 | 3.2 | 1.7 | 1.5 |
| 44 | 5 | 5.1 | 6.3 | -1.2 |
| 45 | 1 | 3.7 | 0.9 | 2.8 |
| 45 | 5 | 5.2 | 5.7 | -0.5 |
| 46 | 1 | 4.0 | 1.4 | 2.6 |
| 46 | 5 | 5.7 | 6.4 | -0.7 |
| 47 | 1 | 4.5 | 2.8 | 1.7 |
| 47 | 5 | 5.8 | 6.6 | -0.8 |
| 48 | 1 | 6.8 | 7.3 | -0.5 |
| 48 | 5 | 7.5 | 8.0 | -0.5 |
| 49 | 1 | 6.5 | 2.0 | 4.5 |
| 49 | 5 | 7.1 | 7.2 | -0.1 |

Table E7

Comparison of simulation using the optimal parameter set and observed DO at nine locations in Ward Cove for the KPC water quality survey of September 9, 1986.

| Station | Depth (meters) | Predicted DO (mg/l) | Observed DO (mg/l) | Difference (mg/l) |
|---|---|---|---|---|
| 41 | 1 | 6.0 | 5.5 | 0.5 |
| 41 | 5 | 6.1 | 6.4 | -0.3 |
| 42 | 1 | 6.4 | 5.5 | 0.9 |
| 42 | 5 | 6.4 | 6.6 | -0.2 |
| 43 | 1 | 5.3 | 4.9 | 0.4 |
| 43 | 5 | 5.8 | 6.6 | -0.8 |
| 44 | 1 | 5.6 | 4.5 | 1.1 |
| 44 | 5 | 6.0 | 6.1 | -0.1 |
| 45 | 1 | 5.8 | 4.4 | 1.4 |
| 45 | 5 | 6.0 | 6.2 | -0.2 |
| 46 | 1 | 6.3 | 5.5 | 0.8 |
| 46 | 5 | 6.6 | 7.0 | -0.4 |
| 47 | 1 | 6.4 | 7.6 | -1.2 |
| 47 | 5 | 6.6 | 7.7 | -1.1 |
| 48 | 1 | 8.0 | 8.3 | -0.3 |
| 48 | 5 | 8.1 | 8.2 | -0.1 |
| 49 | 1 | 7.8 | 7.7 | 0.1 |
| 49 | 5 | 7.9 | 7.9 | 0.0 |

The parameter estimates for the acceptable models (Tables E5 and E7) can be used to develop an interpretation of the environmental factors which result in low water quality in Ward Cove. This can be done by examining the characteristic time scales of the various processes which comprise the model. For the parameter values, typical of those which resulted in the two acceptable models:

Turbulent diffusion coefficient, $k = 5.0$ meters$^2$/second
Freshwater inflow, $Q_{\text{Ward Creek}} = 1.0$ meters$^3$/second
Deoxygenation rate, $K_1 = 0.130$ days$^{-1}$
Reaeration rate, $K_2 = 0.200$ days$^{-1}$
Volume of top five meters, $V = 5.0 \times 10^6$ meters$^3$
Length, $L = 2 \times 10^3$ meters

the characteristic time scales are:

Diffusion:
$t_{diff} = L2/k = 4 \times 10^6/5 = 8 \times 10^5$ seconds = 9.3 days
Advection:
$t_{adv} = V/Q_{Ward\ Creek} = 5 \times 10^6/1. = 5 \times 10^6$ seconds = 57.9 days
Reaeration:
$t_{reaer} = 1/K_2 = 1/.2 = 5.0$ days
Deoxygenation:
$t_{deoxy} = 1/K_1 = 1/.130 = 7.7$ days.

The role of turbulent diffusion is greater than that of freshwater discharge in terms of characterizing the exchange times of Ward Cove, while deoxygenation and reaeration have similar time scales approximately equal to the residence time implied by horizontal diffusion. The picture that emerges from this is one of poor exchange characteristics resulting from low runoff and low levels of energy from tides and winds. Low levels of energy available for turbulent mixing also give rise to longer time scales for reaeration, the transfer of oxygen from the atmosphere to oxygen-depleted surface waters. Lastly, the relatively high water temperatures during the summer months lead to maximum deoxygenation rates by providing optimal conditions for the microorganisms which stabilize the BOD of organic material. Based on the available data, the parameter estimates support the hypothesis that these factors, in conjunction with high levels of organic loading, result in degradation of the water quality of Ward Cove.

## Application of Model

The parameters estimated in the development of the model are diagnostic rather than predictive. That is, they are really only correct estimates for the data set used to make the estimate. Using these model results to estimate the effects that changes in loading from point sources will have upon water quality is predictive only if it is assumed that the hydrographic and meteorologic conditions for which the parameter estimates were made could occur again. This is a reasonable assumption, given that water quality problems in Ward Cove have historically been greatest during the late summer.

The steady-state BOD/DO model system was used to estimate the effect upon water quality for various BOD loading rates from the KPC mill. Such estimates were obtained for the optimal parameter sets from both the August 19, 1986 and the September 9, 1986 data sets.

Although it was assumed in the model development that the DO content of the KPC discharge was 5.0 mg/l, there was no direct measurement at that time to support the assumption. In the analysis, therefore, the DO level of the KPC was varied along with the BOD loading. An estimate of the minimum DC in Ward Cove was obtained as a function of BOD loading for several levels of discharge DO and for each of the two parameters sets. The minimum DO, as function of $BOD_5$ loading from KPC, for the various levels of discharge DO are shown in Figures E7 and E8. Information recently submitted by KPC indicates that aggregate DO levels in the discharges for the three outfalls into Ward Cove average approximately 6 mg/l.

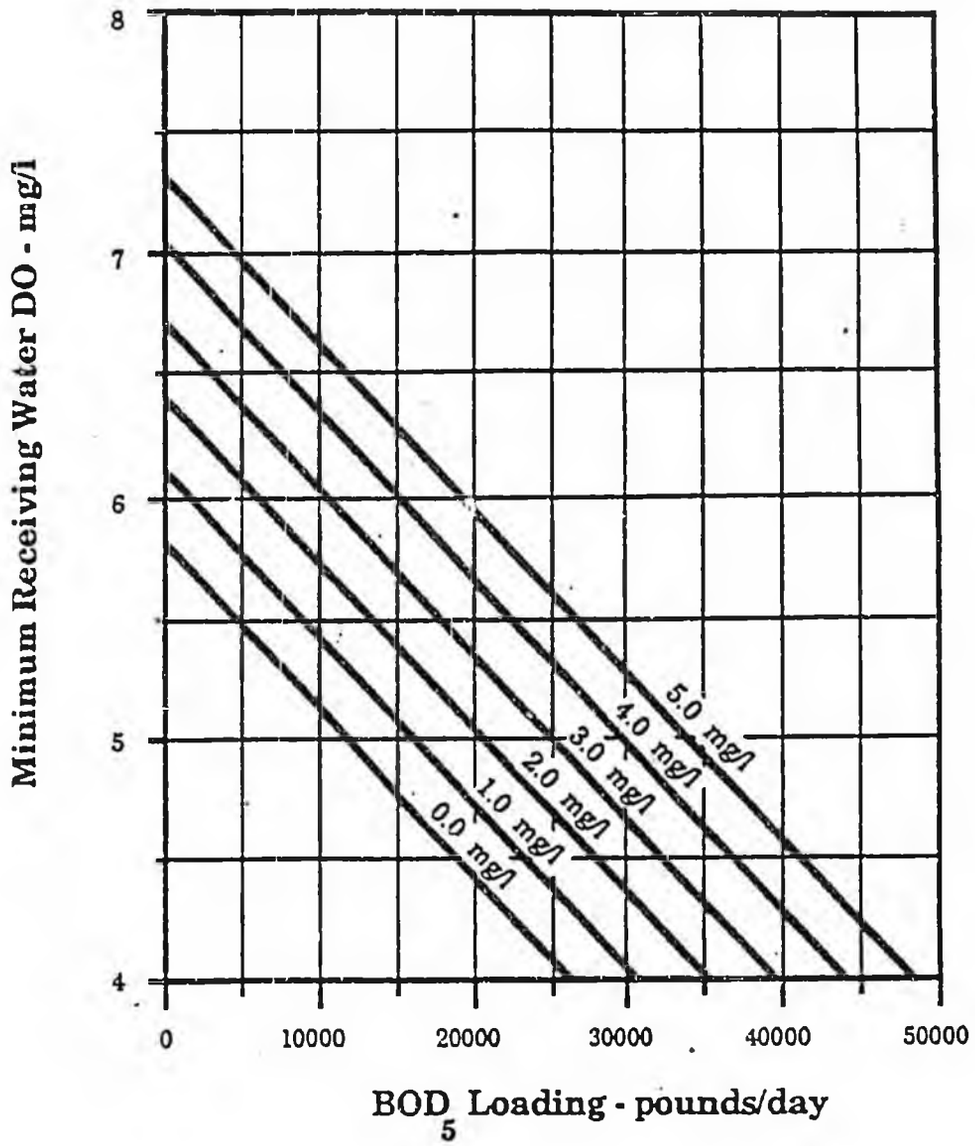



Figure E7: Minimum receiving water DO in Ward Cove as a function of BOD loading from KPC for various levels of DO in the discharge. Based upon model parameter estimates using August 19, 1986 sampling data.

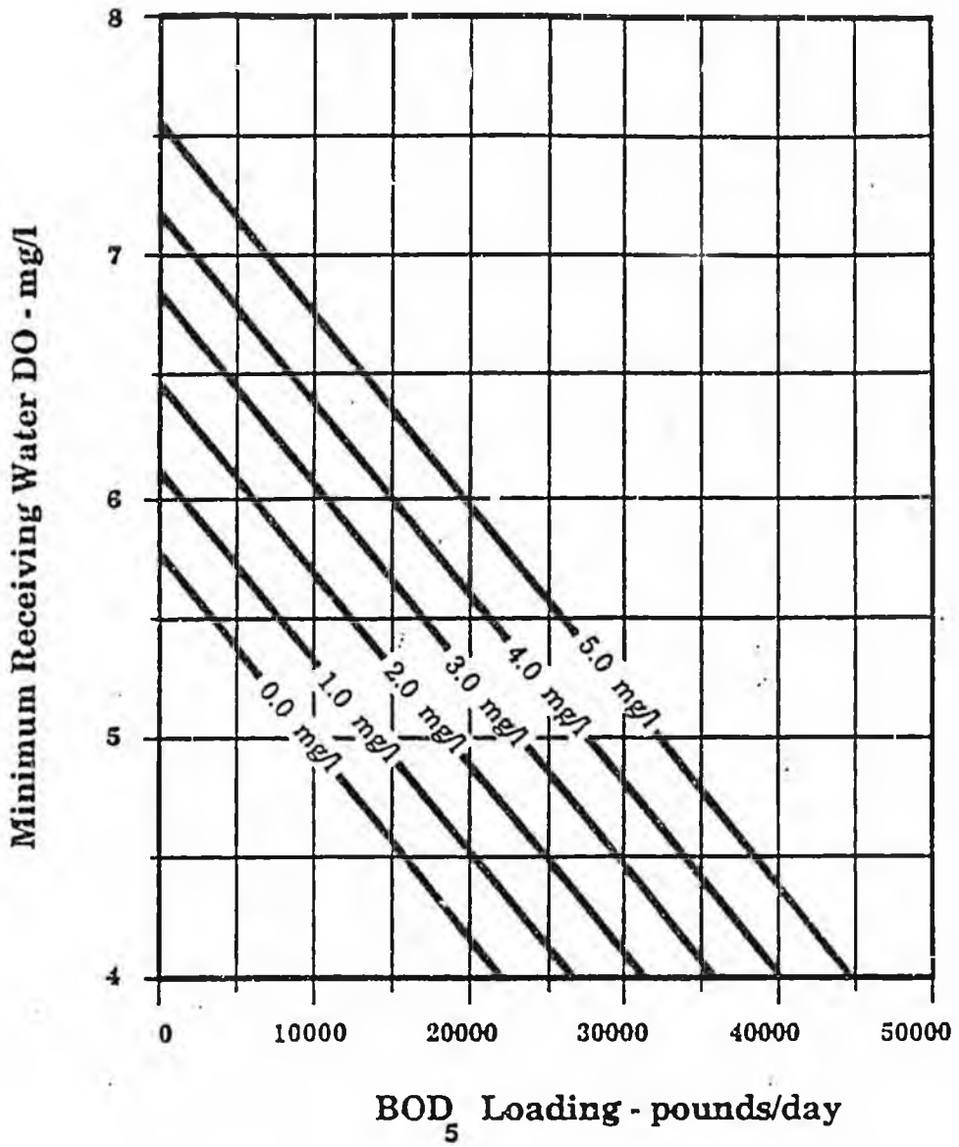



Figure E8: Minimum receiving water DO in Ward Cove as a function of BOD loading from KPC for various levels of DO in the discharge. Based upon model parameter estimates using September 9, 1986 sampling data.

The results of the analysis for the two acceptable parameter sets are similar. When the DO of the discharge is less than 1.0 mg/l, the model predicts that the minimum DO in Ward Cove will be less than 6.0 mg/l, even when the $BOD_5$ in the discharge is very close to zero. For DO levels in the discharge of 5.0 mg/l, the model estimates that DO will remain above the water quality standard for $BOD_5$ loadings as high as 20,000 pounds/day.

## Conclusions

The following conclusions are based on the results of this analysis of the quality in the surface waters of Ward Cove:

Numerous water quality surveys, beginning soon after the construction of the KPC mill, have noted severe water quality problems in Ward Cove, particularly with respect to DO. These problems have continued over time, according to data collected by KPC in the late summers of 1987, 1988 and 1989.

Low DO in the surface waters of Ward Cove are associated with high levels of PBI, a constituent unique (in Ward Cove) to the discharge of the KPC pulp mill.

For two out of three water quality data sets, using data collected in August and September of 1986, a three-dimensional, steady-state model of DO and BOD was identified which satisfied specific criteria for the difference between observed and simulated values of DO.

Parameter estimates for the three-dimensional, steady-state model support the hypothesis that water quality problems, typified by conditions in August and September 1986, are due to conditions of reduced freshwater flow, low levels of mixing and exchange, relatively high water temperatures and high organic loadings from the KPC mill.

For environmental conditions in Ward Cove similar to those of August and September 1986, the State of Alaska's water quality standard for DO will be violated for any KPC discharge of average volumetric rate when the effluent DO is less than 1.0 mg/l or for a loading rate of approximately 20,000 pounds/day when the effluent DO is at least 5.0 mg/l.

# TOTAL MAXIMUM DAILY LOAD FOR BIOCHEMICAL OXYGEN DEMAND IN WARD COVE, ALASKA

**PROBLEM AT A GLANCE:**

| | |
|---|---|
| *Water Quality-limited?* | *Yes* |
| *Segment Identifier:* | *10102-601* |
| *Parameter of Concern:* | *Dissolved Oxygen (DO)* |
| *Uses Affected:* | *Aquatic Life* |
| *Known Sources:* | *Point Sources: Pulp Mill* |
| | *Fish Processor* |




## Background

Section 303(d)(1)(C) of the Clean Water Act and EPA's implementing regulations (40 CFR Part 130) require the establishment of Total Maximum Daily Loads (TMDL) for the achievement of state water quality standards. A TMDL is an implementation plan which identifies the degree of pollution control needed to maintain compliance with standards using an appropriate margin of safety. The focus of the implementation plan is the reduction of pollutant inputs to a level (or "daily load") that fully supports the beneficial uses of a given waterbody; however, other considerations are needed to complete the TMDL process. The components used to address water quality problems through the TMDL process include effluent limits and monitoring requirements.

The state of Alaska has identified Ward Cove as being water quality-limited for dissolved oxygen. Based on an assessment of the problem of low dissolved oxygen (DO) in Ward Cove (which accompanies this document), a TMDL is proposed for this waterbody. The TMDL is established for Biochemical Oxygen Demand (BOD), a parameter directly related to the impact of a discharge on DO resources in the receiving water.

## Loading Capacity and Wasteload Allocation

### Loading Capacity

As indicated in the problem assessment, the cove's capacity to assimilate BOD loading is dependent not only on BOD loading but also on dissolved oxygen. Therefore, the loading capacity is defined in terms of both BOD and DO. Based on the modelling results from the problem assessment, a loading capacity of 20,000 lbs/day BOD is proposed for the surface layer of Ward Cove. Based on the same analysis, a minimum dissolved oxygen concentration of 5 mg/l is proposed for discharges from the Ketchikan Pulp Company (KPC) facility.

### Wasteload Allocation

The BOD loading capacity of Ward Cove must be allocated to the sources identified as contributing pollutant loads to the surface waters. In this case, a single significant source, wastewater discharges from KPC, has been identified.

In accordance with the regulations, a margin of safety is established to account for uncertainty in the data analyses. A margin of safety may be provided (1) by using conservative assumptions in the calculation of the loading capacity of the waterbody and (2) by establishing allocations that in total are lower than the defined loading capacity. In the case of the Ward Cove analysis, the latter approach is used to establish a safety margin. The following uncertainties have been considered in establishing the margin of safety:

- Potential contributions of BOD to the surface layer from the seafood processing facility discharge and bottom sediments
- Potential contributions of BOD to the surface layer from non-point source pollution in the watershed.
- Uncertainty about assumptions used in modelling the dissolved oxygen budget

Based on the information available at this time, EPA proposes the following allocations among these sources:

| Source | BOD Allocation (% of Total) | Minimum DO |
|---|---|---|
| Ketchikan Pulp Co. | 16,000 lbs/day (80%) | 5 mg/l |
| Non-Point Source | 2,000 lbs/day (10%) | - |
| Margin of Safety | 2,000 lbs/day (10%) | - |

The allocation for the KPC facility forms the basis of the BOD limitations in the draft permit (reissuance). The allocation and limitations are established for the summer months (June through October), when dissolved oxygen violations in Ward Cove have been documented.

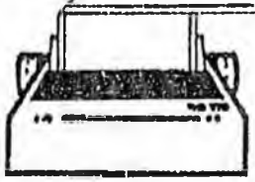
Monitoring Requirements

The ambient DO monitoring program conducted by KPC as required by its NPDES permit will continue under the reissued permit, as will monitoring of process wastewater discharges for BOD. The draft permit also requires the development of a stormwater monitoring program; this program will focus monitoring efforts on significant stormwater discharges, including those that may contribute significant BOD loadings to Ward Cove. For compliance purposes, stormwater BOD loadings will be added to process waste discharges to determine compliance with total BOD limitations.

Public Involvement

In conjunction with the Public Notice for the draft NPDES permit for Ketchikan Pulp Company, EPA is requesting comment on the Problem Assessment and proposed TMDL from all interested parties. All comments must be submitted to EPA before the expiration date of the Public Notice. After the expiration date of the Public Notice, EPA will make final determinations with respect to the TMDL issuance.

ALASKA PULP CORPORATION
4600 Sawmill Cr. Rd., Sitka, AK 99835 (907) 747-2211 FAX (907) 747-2268



DATE:

PAGES: 2 Incl. cover sheet

TO: Sen Jones.

FROM: Rollo Pool 747-2283, FAX 747-2268

SUBJECT:

The EPA spokesman was way off in his comparison of parts per quadrillion.

PPQ = 1 oz. in 1000 cu. miles of liquid

CC:

Sitka Daily Sentinel
November 7, 1991

# What's in Quadrillion?

By WILL SWAGEL
Sentinel Staff Writer

Ever miss a heartbeat over fear of toxic substances?

Well, if you live for 27 million years and miss only one heartbeat, you'd get an idea of the ever smaller amounts of toxic substances scientists are detecting in the laboratory.

Parts per million are now old hat.

Department of Environmental Conservation Sitka engineer Jim Clark said dioxin measurements are now being stated in parts per *quadrillion*.

In case you're wondering, a U.S. quadrillion is the number one followed by 15 zeroes: 1,000,000,000,000,000 (when in England, add nine more zeroes).

Recent Environmental Protection Agency reports on dioxin levels in Sitka gave readings in parts per trillion. Even the best labs haven't yet mastered techniques for making measurements in parts per quadrillion, authorities said.

One part per quadrillion is the relationship of just over one square inch to the area of the United States (including Alaska).

Or one grain of salt to 62 million tons of pretzels.

Or one heartbeat in 27 million years.

The equivalents are courtesy of Mark Buggins, who manages Sitka water and wastewater treatment programs.

He said the Alaska Water Management Association convention held in Petersburg last month, DEC safety trainer Tim Bigelow handed around a chart with some tongue-in-cheek comparisons that put things into perspective.

Reproduced below is the definitive chart of incredible shrinking equivalents:

## Comparison Tables:

| UNIT | 1 PART/MILLION | 1 PART BILLION | 1 PART/TRILLION | 1 PART/QUADRILLION |
|---|---|---|---|---|
| LENGTH | 1 Foot/192 Miles | 1 Foot/192,000 Miles | 1 Foot/192,000,000 Miles (1 Foot/A roundtrip to the sun) | 1 Foot/2,000 A.U. (1 Foot/1,000 roundtrips to the sun) |
| TIME | 1 Minute/2 Years | 1 Second/33.3 Years | 1 Second/33.33 Millenlums | 1 Second/33333 Millenlums |
| WEIGHT | 1 lb. Salt/500 Tons Pretzels | 1 oz. Salt/31,250 Tons Pretzels | 1 Grain Salt/62,500 Tons Pretzels | 1 Grain Salt/62 Million Tons Pretzels |
| VOLUME | 1 oz. Vermouth/7,800 Gallons Gin | 1 oz. Vermouth/186,000 Barrels of Gin | 1 oz. Vermouth/1 Cubic Mile of Gin | 1 oz. Vermouth/1,000 Cubic Miles of Gin |
| AREA | 1 Sq. Ft./23 Acres | 130 Sq. Ft./City & Borough of Sitka | 1 Sq. Ft/State of Alaska | 0.1 Sq. Ft./USA |
| ACTION | 1 Bogey/56,000 Rounds of Golf | 1 Lob/1,200,000 Tennis Matches | 1 Missed Heartbeat/ 27,000 Years | 1 Missed Heartbeat 27,000,000 Years |
| QUALITY | 1 Bad Apple/2,000 Barrels | 1 Typo Error/100,000 Novels | 1 Misfire/833 Hours Driving a V-8 | 1 Misfire/2,300 Years Driving a V-8 |

1 pt Billion is one person in China.