Alaska's Nonpoint Source Pollution Strategy

Volume 1: Strategy Document

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Alaska Department of Environmental Conservation
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PREFACE

The Department of Environmental Conservation (DEC) has updated Alaska's Nonpoint Source Pollution Control Strategy to control and manage nonpoint sources of pollution in Alaska. The Strategy update is designed to identify sources of pollution that can occur in Alaska and then suggest actions to manage those sources in order to prevent pollution of our waters. An updated strategy is required by the Environmental Protection Agency (EPA) in order for Alaska to continue to receive Clean Water Act Section 319 grant funding for projects that control nonpoint source pollution. In updating Alaska's Strategy several key elements were identified by EPA that have been incorporated into this document, in order to enhance the state's Nonpoint Source Pollution Control Program. This document also integrates elements of Section 6217 of the Coastal Zone Management Act Reauthorizations of 1990 designed to control nonpoint source pollution in coastal areas.

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NONPOINT SOURCE POLLUTION STRATEGY UPDATE
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I. INTRODUCTION

Alaskans depend on clean water. Clean water is critical to our way of life and our health, whether it is used for subsistence, recreational, commercial, or domestic activities. Alaska's generally pristine waters are a distinguishing characteristic that helps make Alaska unique among the states. As Alaskans move into the next century, clean water will be key to maintaining and improving public health, providing affordable energy, protecting fish and wildlife, and priming Alaska's economy. Maintaining good water quality can only be achieved when all sources of pollution in a watershed are taken into consideration, resources are used on the highest priorities and people work together to prevent pollution and achieve clean water goals.

Alaska has a tremendous amount and diversity of water resources. Alaska's water resources include an estimated three million lakes greater than five acres, 365,000 miles of rivers and streams, at least 170 million acres of wetlands, and approximately 45,000 miles of marine water shoreline.

The vast majority of Alaska's watersheds are in relatively pristine condition due to Alaska's size, sparse population, and general remoteness. However, in a 1998 assessment, 58 waters in Alaska were identified as having localized water pollution. Surface water quality has been found to be impaired or threatened from urban and stormwater runoff in cities, towns, and villages; mining operations in Interior and Northwest Alaska; seafood processing facilities in Aleutian Islands; oil and gas operations on the North Slope and Cook Inlet; contaminated military sites; and timber processing and transfer facilities in Southeast Alaska.

Ground water impairment has been documented in various areas of the state, and has been linked predominantly to aboveground and underground petroleum storage facilities, as well as operational and abandoned military installations. Other sources, such as failed septic systems and landfills, also contribute to ground water contamination.

Who are the Main Users of Alaska's Waters?

Alaska's waters can be characterized as the "wellspring of prosperity" for Alaska's fish and wildlife as well as many Alaskans. Alaskan waters are home to many marine and land-dwelling animals. Alaskans drink the water, fish in it, recreate in boats and kayaks, and enjoy the scenic beauty our streams, lakes, and coastal waters offer. However, our waters not only offer these positive aspects, but also serve as discharge points for our bath water, dirty dishwater, flushing toilets, and honey buckets. On any end of the spectrum, our waters are vital for a high standard of living.

Commercial fishing of salmon, herring, shellfish, and groundfish provides jobs and livelihoods for thousands of Alaskans, and pumps millions of dollars into the economy.

Major industrial activities in Alaska that use water as a pollutant transport and dilution mechanism include oil and gas facilities, log transfer facilities, mining operations, and seafood processing operations.

Other major industries, such as tourism and recreation, rely on our clean waters for their livelihood as well. People from around the world come to Alaska to enjoy the scenic and pristine nature of our waters, fish in our streams and coves, and kayak along our coasts. Even our pure

Alaska drinking water, taken for granted by most of us, is becoming a viable industrial commodity that has the potential for international markets.

A Vision for How Alaska Can Control Nonpoint Source Pollution

Alaska's water resources should be available for the benefit of all Alaskans as well as fish and wildlife, and managed by Alaskans through agency, citizen, and industrial cooperation, with leadership provided by the Department of Environmental Conservation. Alaskans must consider socio-economic, technical and scientific information on water bodies and make management decisions that support the beneficial uses of Alaskan water resources.

The challenge facing Alaska is that we take the necessary actions to safeguard our water quality as our population grows and natural resource based economy expands. *Alaska's Nonpoint Source Pollution Control Strategy* is a roadmap for how Alaska will meet that challenge for "nonpoint" sources of pollution over the next five years.

What is Nonpoint Source Pollution?

Nonpoint source pollution, or polluted runoff, generally results from land runoff, precipitation, atmospheric deposition, drainage, or seepage. Nonpoint pollution sources refer to broad, diffuse sources of activity that generate wastes and pollutants which are applied, spilled, leaked, leached, eroded, or dumped onto or into land or water. Nonpoint sources commonly originate from urban development, roads, highways and bridges, timber harvesting, agriculture, hydromodification, and harbors and marinas.

The term "nonpoint source" differs from "point source", which pertains mainly to industrial facilities and sewage treatment plants that discharge treated wastewater through a pipe or other discrete conveyance. Although nonpoint sources are described in a number of ways, they are technically defined as sources of water pollution that do not meet the legal definition of "point source" in Section 502 of the Clean Water Act as follows:

The term "point source" means any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture

II. ASSESSMENT OF ALASKA'S WATER QUALITY

What is the biggest source of pollution in Alaska? In a recent public survey, 80 percent of the respondents thought it was pipes spewing wastes. That may have been true 20 years ago. Today, it's polluted runoff. Over half of the waters known to be polluted in Alaska are polluted solely from surface water runoff and stormwater discharges.

Pollution Sources

Sources of Pollution from Community and Urban development

Community and urban development results in widespread disturbance of land surface through clearing, road building, new subdivisions, commercial shops and malls, winter sanding of roads, excavation, filling, construction and landscaping. Exposed soil is easily eroded by rainfall, snowmelt, and surface water flow. Increasing impervious surfaces such as asphalt and concrete increase the amount of stormwater runoff to adjacent surface waters.

Discharges from stormwater drains and ditches in developed communities are being recognized as one of the most prevalent and critical pollution sources leading to the impairment of our streams, lakes and marine waters. Until recently, neither the State of Alaska nor the federal Environmental Protection Agency regulated these discharges.

Polluted runoff from human and animal wastes carries fecal coliform to nearby streams. The most common source of sewage entering surface waters is improperly maintained or failing on-lot septic systems. Animal wastes ending up in storm drains are also an important source of fecal contamination.

A variety of hazardous or toxic substances are generated by household, commercial, and industrial activities. Examples include paints and thinners, preservatives, pesticides, petroleum products (solvents, fuels, oils, greases), detergents, acids, automotive products, heavy metals, PCBs, and asbestos. Materials that are disposed of, leaked or spilled, often end up being carried from surface runoff or storm drains into surface or groundwater.

In recent years, contamination of groundwater drinking water sources by petroleum products has been a growing problem. There are an estimated 1200 leaking underground fuel storage tanks in the state, of which approximately 20 percent have impacted groundwater supplies, which may be used for drinking water.

Most Alaskans dispose of their solid waste in community landfills or dumps. Permafrost, high water tables and heavy rainfall often found in Alaska can make it difficult to prevent landfill runoff from reaching surface waters and groundwater. The presence of organic garbage, sewage sludge, oil wastes, chemicals and metals in landfills means that leachates from landfills usually contain a variety of pollutants that have the potential to contaminate surface or groundwater's.

Urban development frequently encroaches on wetlands. Wetlands are important for maintaining healthy aquatic systems as well as acting as a pollution control system. Wetlands can absorb stormwater flows and reduce erosion and sedimentation, cleanse water by absorbing pollutants,

and recharge groundwater aquifers. The identification and retention of key wetlands must be a high priority for Alaskan communities to assure protection of water quality and habitat.

Community development may also decrease or cause pulses in stream flows. Maintaining minimum streamflows are important, both for aquatic habitat and acting as dilution for incoming pollutants. Low or inadequate stream flows do not allow adequate flushing of pollutants from waters, which can result in accumulation of sediments and toxics as well as reduced oxygen levels. An increase in impervious surfaces can cause dramatic increases in flow during storm events, which can also be problematic. These problems can be compounded by inadequate or improperly installed drainage structures at road crossings.

Harbors and marinas are often pollution hot spots where petroleum products, battery acid, anti-fouling paint, metals, bilge water, fish waste, and sewage can enter water directly or in runoff. Some of these materials adsorb onto sediments or are ingested by organisms. These pollutants can result in decreased dissolved oxygen, can stimulate algal blooms and the growth of nuisance plants.

Pollution sources in rural villages can be exacerbated by the lack of public drinking water supplies and adequate sanitary systems. Waterborne diseases can be transmitted from dumps through flies, birds, dogs, and children playing in and around the area. Designing and maintaining adequate waste facilities in rural areas is also a challenge.

Even recreational fishing, enjoyed by many Alaskans, is not immune as a pollution source. Recreational fishermen walking along salmon streams, such as the Kenai River, can trample and kill vegetation, causing bank erosion where soils are no longer held in place by living root masses.

Sources of Pollution from Industrial & Municipal Activities

Major activities that can generate water pollution in Alaska include oil and gas development and transportation, logging, mining, municipal treatment plants, seafood processing, tourism, and agriculture. Many industrial activities discharge wastewater through a pipe or single area, which are referred to as point source discharges. Point sources are subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements of the Clean Water Act. In contrast, nonpoint sources are not typically subject to federal permits and are usually addressed through approaches other than permitting.

Oil and gas production activities can affect water quality from shore-based refineries, ballast water facilities and offshore platforms. Polluted runoff can occur from roads, spills, culvert washouts and drainage alterations, pad runoff, reserve pit leachates, offshore causeways, and gravel mining. Placement of fill material into wetlands for roads, gravel pads, and reserve pits can also result in pollution from leachate and runoff.

Logging activities have the potential to cause increased sediment runoff from land disturbing activities associated with logging roads and harvesting operations. Excessive sediment in surface waters can affect salmon habitat, stream health, and drinking water. Changes to stream water quality and fish habitat can occur through alteration of natural processes including soil mass movement, blow down of trees, and accumulation of large woody debris. Log transfer

facilities cause woody debris and bark residues to build up on the sea floor, leading to degradation of ocean habitat.

Hardrock and placer mining have the potential to cause both point and nonpoint pollution. The discharge of mine drainage and processing wastewater may introduce dissolved metals and minerals into the receiving waters that leach out as lands are disturbed. Nonpoint sources usually result in pollution from sediment and turbidity, and can occur from the erosion of active and abandoned mine sites from stream flow and upland disturbed surfaces. Modification and diversion of stream channels can also cause problems. Erosion and runoff also occur from associated activities such as roads and camps.

Historic problems can result from old mining sites, as well as old military sites, especially in rural Alaska.

Municipal treatment plants provide primary and secondary treatment of sewage and wastewater from cities and towns throughout the state, and are regulated by the NPDES Program. Pollutants from these plants can include all of the pollutants associated with urban development, including fecal coliform, metals, sediment, and toxic pollutants.

Seafood processing facilities discharge wastes on the bottom of waters adjacent to processing. Seafood wastes can become a pollution problem when discharges occur into shallow waters with poor flushing, resulting in smothering of bottom-dwelling aquatic life and dissolved oxygen depletion of ocean water as the waste pile decomposes. Seafood processors are regulated as a point source discharge.

As tourism activities increase in many areas of Alaska, it is becoming more apparent that pollution problems can occur if the activities are not well managed. Potential problems that have been identified include cruise ship discharges of sewage and gray water, overuse of local trails that increase erosion and sedimentation into adjacent streams, lakes, and coastal waters, and increased development of parking lots and impervious surfaces to accommodate seasonal increases in people using an area.

Road and railroad construction, use, and maintenance can cause direct sedimentation of waterbodies, can alter natural water flow regimes, and can eliminate fish habitat due to blockage of movement of fish through structures such as culverts.

Localized pollution problems can also occur from erosion and sedimentation from agricultural lands, and wastewater and runoff from confined animal facilities. Pesticides and fertilizers may also cause pollution concerns. However, known problems from agricultural activities have been minimal and are not considered a significant source of pollution in Alaska.

Sources of Pollution from Long Range Transport and Concentration of Toxic Substances

Contamination of Alaska's coastal waters by toxics and airborne pollutants (such as mercury, dioxin, and PCBs) from sources out of our immediate control could potentially lead to contamination of rivers and land-based habitat and the food chain of migrating salmon. Recent evidence of contaminants, such as PCBs in birds and sea mammals in the Pribilof Islands, indicates a real potential for pollution outside of Alaska affecting our water quality and uses that depend on clean water, such as healthy salmon stocks and sensitive marine shorebirds.

Effects of Water Pollution

Development of communities and industries along salmon streams will ultimately lead to the loss of fish in the streams if pollution is not controlled. Streams like Duck Creek in Juneau, or Campbell Creek in Anchorage, have lost once healthy runs of salmon. Although restoration in these areas has resulted in increased salmon runs, it is an expensive and uncertain process when compared to the cost of prevention.

Drinking water sources have been lost to contamination from leaking underground fuel tanks. The potential loss of surface drinking water sources is a real concern in some watersheds as development and industrial sources continue to expand.

The potential restrictions on community development become more evident in watersheds where pollution controls have not been in place or required. Although in past years the excuse for not having pollution controls in place has been blamed on the costs, it is becoming apparent that the future costs to the watershed are much more expensive and restrictive than having the controls in the first place.

Pollution of our valuable waters can lead to losses to industries that rely on selling the scenic aspects of clean water, such as tourism or recreation. The economic loss of commercial or sport fisheries as a result of water pollution and habitat degradation can be significant, as witnessed in Washington and Oregon where decimated runs of salmon have caused economic disaster for local fishers, sport fish charters, and native subsistence users.

Current status of Alaska's Waters

Alaska has a tremendous amount and diversity of water resources. For the purpose of developing statewide water quality assessment reports, the term "waters of the state" has included streams, rivers, ponds, lakes, estuaries, ground waters, wetlands, and coastal marine waters within three miles from shore. The state's fresh waters are organized into 136 distinct U. S. Geological Survey (USGS) hydrologic cataloging units, each of which includes numerous watersheds.

Alaska has no fixed-station ambient water quality monitoring and relies heavily on other sources of water quality monitoring information. The water quality assessment process for the state's 1996 Section 305(b) Water Quality Assessment Report required by the Clean Water Act relies on water quality information from numerous sources, including: government agencies at the local, state, and federal level; industries; conservation organizations; and the public.

The 1998 water quality assessment process represents a summary of existing data and best professional judgement for compliance with the Alaska Water Quality Standards (Title 18 AAC Chapter 70). The assessment process relies on information obtained generally within the last five years. For purposes of the 1998 report, the term "assessment" means the process of collecting and evaluating available water quality data and other information (including bilogical data when available and best professional judgement) to determine if an individual waterbody meets the criteria for inclusion in the 1998 Section 303(d) list required by the Clean Water Act or other status categories. The individual status categories and the process used for waterbody listings are further defined in Section IV of the 1998 report.

Given the geographic size of Alaska and the limited amount of water quality data that has been consolidated and evaluated by DEC, the assessment of waters summarized in this report is somewhat limited in scope. As with many states, limited data preclude characterizing detailed levels of pollutants in most waterbodies, and prevent determining the extent and segment(s) -- in acreage or miles -- of impairment in most waters. The lack of data underscores the need for improved and expanded ambient water quality monitoring in priority watersheds in order to more completely evaluate and further consolidate existing water quality data from agencies, organizations, educational institutions, industry, and the public.

Alaska's water quality data collection efforts emphasize activities on waters with known impairment. Based on 1998 data, of the approximately 365,000 miles of rivers and streams in Alaska, only 513 miles were surveyed (418 miles monitored, and 95 miles evaluated). Five hundred and ten (510) miles of the 513 miles surveyed were identified as impaired for one or more designated uses. Of the 237 square miles of estuarine waters surveyed, Alaska identified approximately 234 miles as not supporting or partially supporting uses.

Status of Alaska's Surface Waters: 1998 Impaired Waterbody [Section 303(d)] List

Recent information in Alaska's 1998 Section 303(d) list of water quality-limited waters and the 1998 Section 305(b) (electronic transmittal) update, show that of the 58 total waters on Alaska's Section 303(d) list approximately 38 waterbodies, or 66%, are affected solely from nonpoint sources of pollution. Alaska does not have many waters that are affected solely by point sources of pollution. Of the waters that are impacted by nonpoint sources of pollution, the predominant stressor is from urban sources, such as road run-off, land development, landfills, domestic septic tanks or systems, and urban run-off (particularly fecal coliform bacteria). Another less dominant stressor, but significant, is abandoned mines. For more specific additional information on waters listed on Alaska's Section 303(d) list, please refer to the enclosed appendix of Alaska's 1998 Section 303(d) list.

Water quality-limited waterbodies are surface waters with documentation of actual or imminent persistent exceedances of water quality criteria, and/or adverse impacts to designated uses, as defined in the state's water quality standards. Designation of a waterbody as "water quality-limited" does not necessarily indicate that the entire waterbody is affected. In most cases, only a segment of the waterbody is affected.

The term "persistent" is key in the process to help determine if a surface waterbody is water quality-limited. Determining "persistent" exceedances of water quality standards is a waterbody-specific decision that requires the application of best professional judgement, and includes discussion and analysis of a variety of factors including: pollutant characteristics, pollutant sources, size of the waterbody, and the degree of remediation response required.

The following guidelines are used by DEC to determine if a waterbody is water quality-limited:

1. Water quality monitoring data that documents persistent exceedances of a criterion or criteria established in the water quality standards;

2. Issuance of a notice of violation or other enforcement action definitively linked to a persistent water quality violation that does not result in adequate corrective measures;

3. Photographs or videos with appropriate documentation definitively linked to persistent exceedances of water quality standards;

4. Documented persistent presence of residues (floating solids, debris, sludge, deposits, foam, scum) on or in the water, on the bottom, or on adjoining shorelines;

5. Documentation such as a government or academic report or study within the last five (5) years that concludes designated uses are adversely affected by pollutant conditions;

6. Documentation from a resource agency professional or other credible source where the use of "best professional judgement" is applied to determine if a subject waterbody has persistent exceedances of water quality standards, may be subject to imminent criteria exceedances, or designated uses are adversely affected by pollutant sources.

According to Section 303(d) of the federal Clean Water Act and EPA's implementing regulations, Section 303(d) designated waters include water quality-limited surface waters that do not or are not anticipated to meet applicable water quality standards solely through the implementation of existing technology-based or similar controls by the next Section 303(d) listing cycle (every two years). In Alaska, these waterbodies are priority ranked based on the severity and magnitude of the pollution, the feasibility of implementing a waterbody recovery plan, and other factors. A copy of the 10 year schedule for recovering waters on Alaska's 1998 Section 303(d) List can be found in **Volume 2: Strategy Appendices, Appendix I.**

Status of Alaska's Ground Waters

Ground water is one of Alaska's least understood natural resources. It is the major source of fresh water for public and private drinking water supply systems, industry, aquaculture (including fish hatcheries), and agriculture. Although ground water is presumed to be of excellent quality in most areas of the state, specific areas of generally good ground water quality have been degraded by human activities. With a few localized exceptions, Alaska's ground water resources do not appear to have been threatened by water withdrawals.

As of October 1997, there were 649 Class A ground water public drinking water systems (those serving at least 25 persons a day for at least six months of the year), 937 Class B systems (those serving at least 25 persons a day for at least 60 days), and 1,868 Class C systems (those not qualifying as an A or B system) in Alaska. Water quality at the tap is monitored routinely for Class A and Class B systems, providing a measure of relative water quality. The DEC Drinking Water Program maintains a database of analytical results for each of the public water supply systems it regulates. The database also includes basic information such as well location and owner.

Most Alaska residents who are not served by a public water system use ground water as their source of drinking water. Although the number of private water wells in Alaska is not known, it is estimated to be in the thousands.

The ADEC Drinking Water Protection Program is in the process of conducting source water assessments for Alaska's public drinking water sources. These assessments will analyze the susceptibility and vulnerability of ground and surface water systems from both natural and manmade sources of contamination. The assessments will provide valuable information on

where drinking water sources may be at risk from nonpoint sources of pollution. The assessment methods used to assess drinking water sources are described in guidance manuals for Class A and B systems, found through ADEC's Alaska Drinking Water Protection Program.

While there is information on specific contaminated sites that affect ground water quality, there is currently insufficient information to determine the extent and degree of ground water aquifer contamination through aquifer specific monitoring. Although Alaska does not currently maintain a comprehensive list of contaminated ground waters, the state does maintain a database to track sites where soil and waters have been impacted from petroleum and hazardous substance releases. Of the approximately 3,000 sites listed as being contaminated in DEC's Contaminated Sites and Underground Storage tank databases, there are more than 400 sites where there is documentation that links the contamination to impacted ground waters. The specific extent of the contamination is typically unknown, and at most of these sites it is presumed to be localized; whereas in some areas ground water impacts may be more extensive. Areas with significant known ground water contamination include: Adak, Anchorage, Bettles, Big Lake, Chugiak, Eielson Air Force Base, Fairbanks, Gakona, Gambell, Healy, Kenai, Marshall, Minto, North Pole, Shemya, Solomon, Sterling, Tok, Valdez Creek, and Wasilla.

Petroleum products constitute the primary contaminant of ground water. Approximately 90% of contaminated site areas are polluted with petroleum products. Many of those sites are also affected by other contaminants, but petroleum is the most prevalent contaminant. Other contaminants include chlorinated solvents, heavy metals, pesticides, cyanide, arsenic, nitrates, and fecal coliform. Although nitrates are suspected of occurring naturally in ground water in association with nitrogen-fixing organisms, on-site septic systems have been implicated as significant sources of ground water contamination. Free arsenic rarely occurs naturally unless the ores that contain it are disturbed for recovery of precious metals.

When a regulated drinking water supply well is closed down due to contamination, the contaminated sites program is notified and assumes responsibility for tracking the investigation and remediation of the contamination. Specific information on locations of leaking underground storage tanks (LUST) and other contaminated sites that are likely sources of ground water contamination may be obtained by contacting DEC staff with the ground water protection contaminated sites and/or LUST programs.

III. ALASKA'S NONPOINT SOURCE POLLUTION STRATEGY ELEMENTS

Except for the extensive development occurring in our three major urban hubs, Alaska is a relatively undeveloped state, with the vast majority of our watersheds still believed to be in pristine condition. Therefore, the emphasis of our nonpoint source pollution strategy is prevention**.** In populated areas, however, many waterbodies, including important salmon streams, have been degraded and are in need of restoration. Waterbody Restoration Plans will be developed and implemented in high priority watersheds where water quality is either impaired or threatened. Restoration strategies for polluted waterbodies will consider the entire watershed and include measures to control the sources of pollution to prevent future degradation. Restoration activities will be designed to achieve a water quality classification appropriate to the specific site.

Nine Key Elements Required for Enhanced Nonpoint Source Pollution Programs

Alaska's Nonpoint Source Pollution Strategy incorporates nine key elements that EPA has identified for all states that are needed for an effective nonpoint source pollution program. These are:

1. Explicit short-and long-term goals, objectives, and strategies to protect surface and ground water.

2. Strong working partnerships and linkages with appropriate state, tribal, regional and local entities (including conservation districts), private sector groups, citizens groups, and federal agencies.

3. A balanced approach that emphasizes both statewide and on-the-ground management of individual watersheds where waters are impaired or threatened.

4. The program both abates known water quality impairments from nonpoint source pollution and prevents significant threats to water quality from present and future activities.

5. Identifies waters and their watersheds impaired by nonpoint source pollution and identifies important unimpaired waters that are threatened or otherwise at risk. Included is a process to progressively address these identified waters by conducting more detailed watershed assessments and developing watershed implementation plans, and then by implementing the plans.

6. The program reviews, upgrades, and implements all program components and establishes flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water. This includes: (a) a mix of water quality-based and/or technology-based programs; and (b) a mix of regulatory, non-regulatory, financial and technical assistance as needed to achieve and maintain beneficial uses of water.

7. The program identifies federal lands and activities that are not managed consistently with nonpoint source program objectives.

8. The program is managed efficiently and effectively, including necessary financial management.

9. The program is periodically reviewed and evaluated using environmental and functional measures of success, and sources of nonpoint source pollution are assessed and its management program revised at least every five years.

Alaska Clean Water Action Plan

The state resource agencies have taken the lead in developing the Alaska Clean Water Action (ACWA) Plan, a statewide water quality planning document that will unite public and private efforts to protect and restore the quality of Alaska's water resources. The ACWA Plan is in the final stages of development by the Departments of Environmental Conservation, Fish and Game, and Natural Resources, and Division of Governmental Coordination in the Governor's Office. When finalized, the ACWA Plan will identify Alaskan waters that are polluted or vulnerable to pollution; prioritize and schedule clean-up actions; manage and share information on water quality; and describes how Alaska will implement best available technology and management practices to prevent pollution. A public review draft is anticipated in January 2001.

Key Components of the ACWA Plan

The ACWA Plan addresses water quality and aquatic habitat protection issues, and water quantity issues that affect water quality or aquatic habitat. It establishes a cooperative and effective approach to taking action on Alaska's waters. The ACWA Plan outlines a method that will be used to identify the highest priority water quality and quantity needs to prevent degradation of healthy waters and restore those waters that are polluted. The plan identifies where efforts should be focused, how best to take action, who is responsible for action, and why water resource protection is important to all Alaskans. The ACWA Plan will focus on three major categories for managing water resources in the state: 1) stewardship, 2) protection and restoration of waters at risk, and 3) recovery of polluted waters.

The "Stewardship" category describes programs needed to assess the condition of all Alaska waters and to provide baseline protection that maintains uses and activities on all waters. The stewardship category focuses on pollution prevention as a key priority for Alaska

Stewardship programs and tools include: science-based water quality standards to protect all Alaskan waters; permits that protect water quality and supporting uses; best management practices (BMPs); and local land use laws. The stewardship category assesses the health of Alaskan waters by documenting baseline conditions and assembling baseline data in a form that is readily available for use. This information will be used to determine the uses and likely risks of Alaskan waters. Other key elements of the stewardship category include:

- Conducting a needs assessment to identify waterbodies or watershed that need further action, or that have insufficient data with which to make decisions;
- Inform Alaskans about the condition of our waters so that Alaskans are knowledgeable about water resources, water use, and threats to water quality and quantity in order to engage the public in developing solutions to water resource problems;
- Collecting and evaluating data to identify where water quality, water quantity, or habitat is being degraded, and where corrective action is needed; and
- Evaluating the effectiveness of stewardship programs in protecting and maintaining water quality and uses of the state's waters through the assessment process.

The "Protection and Restoration Of Waters At Risk" category identifies actions needed to protect waters that are not polluted (not on the list of impaired waters under Section 303(d) of the Clean Water Act), but which show evidence of degradation to water quality, water quantity, aquatic habitat, or water uses.

The "Recovery of Polluted Waters" category describes actions needed to clean up polluted waters on the state's Section 303(d) list. In order to be included on the state's Section 303(d) list, a water must show exceedances of water quality standards, the problem must be persistent, and the problem must be documented.

How Will Waters be Prioritized in the ACWA Plan?

A Decision Tree is being developed to determine waters that need attention in the state, and will become a part of the ACWA Plan. Resource agencies will use the Decision Tree as an initial screening method to:

- Determine the highest priority needs for water- or habitat-related data collection;
- Identify prevention, protection, or restoration activities;
- Craft plans for recovery of Section 303(d)-listed waters.

The Decision Tree will point to one of two primary needs: either "Data Collection" (where information or data is inadequate to determine extent of existence of a problem) or "Corrective Action." If the latter, the Decision Tree will indicate the need for one of two types of corrective action: "Recovery" (if the waterbody is on the 303(d) List) or "Protection and Restoration" (for non-listed waters showing evidence of degradation to water quality, water quantity, aquatic habitat, or water uses).

In order to prioritize and rank waters through the Decision Tree, criterion have been developed that will be applied at various stages in the process. Criteria being established include the severity of the risk or impact, magnitude of the risk or impact, public concern, and feasibility.

When Will the ACWA Plan be Finalized?

As of September 2000, the ACWA Plan document is being developed by state resource agencies, and a draft for public review is scheduled for January 2001. The ACWA Plan will be comprised of the narrative document, the decision tree for identifying waters that need attention, and criteria to rank and prioritize those waters. Once the ACWA Plan is finalized in 2001, resource agencies and others will use the ACWA plan as guidance for water resource protection.

Watershed Protection Approach

Beginning in 1996 Alaska worked to develop and implement a watershed protection approach to coordinate efforts to restore and protect watersheds, including those affected by polluted runoff. The watershed protection approach is an effective tool to identify priorities and coordinate citizen, organization, and agency efforts to restore and protect watersheds, and will be incorporated into the ACWA Plan concept described above. As part of the watershed protection approach, watershed protection or restoration action strategies may include the following elements:

- Measurable environmental goals of the watershed;
- Identification of sources of water pollution and their contribution;
- Implementation of pollution control and natural resource restoration measures (e.g., permit revisions, implementation of best management practices and buffer strips) to achieve clean water and other natural resource goals, especially those measures which will achieve multiple environmental and public health benefits;
- Schedules for implementation of needed restoration measures and identification of appropriate lead agencies to oversee implementation, maintenance, monitoring, and evaluation;
- Implementation of total maximum daily loads (TMDLs) for pollutants exceeding state water quality standards (where applicable);
- Monitoring and evaluation to assess progress towards achieving environmental goals;
- Funding plans to support the implementation and maintenance of needed restoration measures;
- A process for cross-agency (federal, state, interstate, tribal, and local) coordination to implement watershed restoration action strategies; and
- A process for public involvement.

Focus on prevention and public education.

Alaska's watershed approach emphasizes the need to focus on prevention, in addition to restoring degraded watersheds. It is far more cost effective to prevent problems from occurring in the first place than it is to try to repair the damage later. Consequently, educating the public, land managers, industry and other stakeholders about the causes of water pollution and what can be done to protect and restore watersheds is a critical component for both protection and restoration strategies.

Supporting community involvement.

Alaska emphasizes the importance of involving local communities in planning and implementing watershed management activities. Local values, interests and goals relating to the resources in those watersheds must guide watershed protection. Since most activities that cause nonpoint source water pollution in developed areas are under the control of local governments (cities and boroughs) or tribal entities, it is important that watershed protection and restoration strategies be developed and implemented primarily at the local level.

Alaska's watershed protection approach encourages watershed partnerships to make things happen at the watershed level. Local watershed partnerships are made up of citizens, interest groups, industry, governmental, and tribal organizations that develop watershed protection and restoration strategies for specific watersheds. Over one hundred local watershed teams have been established throughout the state.

Federal Consistency

Sections 319(b)(2)(F) and 319 (k) of the Clean Water Act Amendments enable states to review federal activities and development projects for consistency with standards in the state's approved

nonpoint source pollution control strategy. This provision is a powerful tool allowing states to be involved in controlling the effects of federal activities on water quality. DEC focuses efforts to review federal activities for consistency with the nonpoint source pollution strategy through Alaska Coastal Management Program (ACMP) direct federal action reviews, thus affecting mainly the coastal zone. Federal agencies in Alaska that may have activities that affect nonpoint source pollution include the Bureau of Land Management , U.S. Fish and Wildlife Service, U.S. Geological Survey, National Park Service, Department of Energy, Bureau of Indian Affairs, and the U.S. Forest Service.

The Coastal Zone Act Reauthorization Amendments of 1990 amended the Coastal Zone Management Act to clarify that federal consistency applies when any federal activity, regardless of location, affects any land or water use or natural resource of the coastal zone. This federal consistency requirement is important since it addresses the need for federal actions to adequately consider State Coastal Management Plans. It is a mandatory but flexible mechanism to resolve potential conflicts between states and federal agencies by fostering early consultation, cooperation, and coordination.

Alaska's Federal Consistency Review Process in the Coastal Zone

The Alaska Coastal Management Program (ACMP) consistency review process is used to review federal activities in Alaska's coastal zone. The ACMP implements a federal consistency review process under 15 CFR Part 930, federal consistency with approved coastal management programs. The ACMP review process has proven to be successful in providing a streamlined, coordinated approach for reviewing applications and issuing permits for proposed federal projects that would affect water quality in Alaska's coastal zone. Whenever a federal permit is required for a project in Alaska's coastal zone, the Division of Governmental Coordination (DGC) coordinates the consistency review. This review process is governed by state regulations in 6 AAC 50, "Project Consistency with the ACMP." Federal consistency determinations and procedures are addressed in Section 307(c)(1)(A) of the Coastal Zone Management Act, 16 U.S.C. 1456(c) (1) (A).

Federal consistency review through the ACMP process involves a number of steps. The process starts with receipt of a notice of intent, preliminary plans, or draft environmental impact statement or assessment and the required consistency determination by the federal agency. Federal guidelines are controlling in the review schedule. The DGC coordinates the state's conclusive response back to the federal agency, either agreeing with the federal determination or disagreeing. If the state disagrees, it must identify alternative measures, if they exist, which would make the federal activity consistent to the "maximum extent practicable" with the approved standards of the state's coastal program. If differences between the federal agency and the state are not resolved informally, they can be accomplished in other ways. If resolution has not been reached on the consistency of a direct federal action at the end of the 90-day period, the federal agency can consider postponing the final federal action until the problems have been resolved. For non-federal activities requiring a federal permit, the federal agency may not issue its approval if the state objects. Either the state or the federal agency may request formal mediation by the Secretary of Commerce. These formal procedures have not been used between the state and federal agencies in Alaska because the agencies have successfully resolved their disagreements through a less formal, internal process.

A state interagency coordinated review process does not exist for review of federal activities and permits for non-coastal activities.

Consistency Review Standards and Guidelines

For federal development projects, the elements of Alaska's Nonpoint Source Pollution Strategy constitute the nonpoint source review standards, in combination with all DEC statutes, regulations, and procedures that are adopted by reference as standards of the ACMP. In addition, DEC will review federal development projects and federal permits to determine and ensure their consistency with the standards of the ACMP along with the Forest Resources and Practices Act (FRPA) and regulations, and Section 319 of the Clean Water Act.

Forest practices in Alaska's coastal zone are the primary focus of DEC federal consistency reviews for federal lands, and apply to the timber sale projects within the Tongass and Chugach National Forests. These projects are reviewed simultaneously under two separate agreements between the Forest Service and the State of Alaska. These agreements are the existing 1992 DEC/Forest Service Memorandum of Agreement and the 2000 Memorandum of Understanding between DGC and the Forest Service.

For forestry operations, forest practices regulations adopted under FRA constitute the nonpoint source pollution requirements under state law and Section 319 of the Clean Water Act for FRPA activities. The FRPA regulations are incorporated into the ACMP and serve as nonpoint source standards used in consistency reviews of Forest Service activities.

Use of the ACMP existing procedures for federal forest activities also meets federal consistency requirements under Section 319 of the Clean Water Act. Determining if an activity complies with Section 319 of the Clean Water Act is part of the DEC review of Forest Service development projects. DEC uses the following references to guide a consistency analysis.

1. Section 319 of the Clean Water Act

2. The State Nonpoint Source Pollution Strategy

3. The Alaska Department of Environmental Conservation/Forest Service MOA

4. The Division of Governmental Coordination/Forest Service MOU

5. DEC statutes, regulations, and procedures

The 1992 Forest Service / DEC Memorandum of Agreement entitled "Forest Service Alaska Region Water Quality Management Plan" includes the provision that the Forest Service meet federal Consistency requirements of Sections 319 and 303 of the Clean Water Act and the components of Alaska's Nonpoint Source Pollution Strategy. Changes to the MOA will carry forward ongoing work, and will include new priorities identified since 1992 such as watershed restoration, improving reporting of water quality violations, and annual reporting of the results of Best Management Practice (BMP) implementation and effectiveness monitoring by the Forest Service and DEC.

Federal Consistency with the 2000 MOU between the USFS and DGC

In March 2000, the DGC along with other state agencies agreed to implement a Memorandum of Understanding (MOU) that clarifies the application of ACMP standards and phased federal decisions. Specific Forest Service activities and projects listed in the MOU are subject to review against nonpoint source control standards and the ACMP requirements. The activities, terms, and conditions of review are identified in the 2000 MOU. This list of activities and projects, and the terms and conditions of review are adopted by reference into this strategy in the Forest Practices chapter.

The DGC/ Forest Service MOU describes the review process both agencies have agreed to follow in making and reviewing consistency determinations for Forest Service initiated activities and federally permitted activities that affect Alaska's coastal zone. This MOU has the following purposes:

- Improve cooperation and coordination between DGC and the Forest Service.
- Describe the process both agencies follow in making and reviewing consistency determinations for Forest Service activities.
- Define the types of categories of Forest Service activities that affect the coastal zone and which require Forest Service permits.
- Facilitate, refine, and simplify state review of federal activities.
- Identify a process for resolution of disagreements over Forest Service consistency.
- Integrate the implementation of pertinent sections of the Clean Water Act Section 319 into the state review process.

Integration with the Alaska Coastal Clean Water Plan

At the national level, Congress has recognized the importance of addressing nonpoint source pollution in coastal areas. To respond to this need, Congress added Section 6217 to the Coastal Zone Act Reauthorization Amendments of 1990. Section 6217 requires states such as Alaska with established coastal zone management programs to develop nonpoint source pollution control programs specifically for areas designated as part of the state's coastal zone. The purpose of this program is to assure statewide implementation of key *Management Measures* that will control nonpoint source pollution. The program is intended to strengthen the links between coastal zone management and water quality management agencies to keep coastal waters clean. Congress did not expect states to develop new, stand-alone nonpoint pollution programs. Rather, the coastal nonpoint pollution programs strengthen and build upon existing state and local expertise and authority.

A detailed description of the management measures can be found in the EPA publication *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*, January 1993. These management measures are to be fully implemented statewide within 15 years. Progress in meeting that objective will be evaluated at least every five years.

Alaska endorsed this approach and developed the *Alaska Coastal Clean Water Plan Public Review Draft* (August 1995) and submitted it to the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA) for approval as meeting the standards required by Section 6217. In June 1998, EPA and NOAA conditionally

approved the *Alaska Coastal Clean Water Plan* subject to *eleven conditions*, which must be met within five years in order for Alaska's program to fully meet the standards of Section 6217. Alaska is currently providing supporting information to EPA and NOAA to demonstrate that existing programs meet the eleven conditions.

Implementation of these required management measures for the coastal zone will be accomplished through a partnership of state resource agencies and local coastal districts. These agencies include DGC, which manages the Alaska Coastal Management Program (ACMP); DEC, the lead water quality agency; DFG, responsible for habitat protection; DNR, responsible for oversight of forest practices and dams; and DOTPF, responsible for construction and maintenance of highways and harbors. Implementation of nonpoint source management measures in the coastal zone is funded jointly by Clean Water Act Section 319 funds and Coastal Zone Management Act Section 6217 funds, as well as other existing programs identified in the *Alaska Coastal Clean Water Plan*.

The 15 year implementation strategy for Section 6217 is to have all of the management measures identified in *the Alaska Coastal Clean Water Plan* incorporated into local coastal district plans. This will give long term assurance that all appropriate management measures are being applied everywhere in the coastal zone.

Alaska has also developed action plan objectives and tasks at the end of each source chapter that implement or enhance implementation of the management measures required under Section 6217. These objectives and tasks are listed in a table, with those relevant to Section 6217 highlighted. These objectives and tasks serve as the 5 year implementation plan for Section 6217.

It should be noted that the majority of Section 6217 management measures are already being implemented through state programs and authorities in existence, such as: the state certification that water quality standards will be met, Title 16 for fish habitat protection, water rights appropriations, the Alaska Coastal and Harbor Design Procedures Manual, Harbor Management Agreements, the Forest Practices and Regulations Act, erosion and sediment control plans for dam construction, the Alaska Coastal Management Program consistency determination, and coastal district enforceable policies. For a complete listing of authorities and programs to implement the Section 6217 management measures, please refer to the *Alaska Coastal Clean Water Plan.*

Approval of the 6217 Program

In June 1998 EPA and NOAA conditionally approved the *Alaska Coastal Clean Water Plan* subject to *eleven conditions*, which must be met within five years in order for Alaska's program to fully meet the standards of Section 6217. The findings were based on a review of the *Alaska Coastal Clean Water Plan*, August, 1995. NOAA and the EPA reviewed this information and evaluated the extent to which it conforms with the requirements of Section 6217. A copy of NOAA and EPA's Findings can be found in **Volume 2: Strategy Appendices, Appendix IV. Findings For The Alaska Coastal Nonpoint Program**

Alaska has assembled an interagency team, lead by DGC, to make the improvements to the water quality and coastal management programs needed to meet the outstanding eleven conditions for

full approval of the *Alaska Coastal Clean Water Plan* and to improve implementation of the management measures. This team includes the DEC, DFG, DNR, and DOTPF. The management measures needed for full approval of the *Alaska Coastal Clean Water Plan* have been, or are being, developed according to the schedule below.

The conditions relate to the Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (EPA, January 1993) Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance (NOAA and EPA, January 1993); and Flexibility for State Coastal Nonpoint Programs (NOAA and EPA, March 1995).

Condition	*Lead*	*Completion Date*
Forestry: streamside management measures	DNR	Final: June, 2000
Urban: measures for new development to control sedimentation and erosion	DEC	Draft: June 2000 Final: June 2001
Watershed Protection: measures to reduce pollution from existing development	DEC	Draft: June 2000 Final: June 2001
Site Development: measures to limit sedimentation and erosion during construction	DOTPF	Draft: June 2000 Final: June 2001
Onsite Disposal Systems: improve inspection of existing septic systems	DGC	Draft: June 2000 Final: June 2001
Roads: measures to control polluted runoff from roads, highways and bridges	DOTPF	Draft: June 2000 Final: June 2001
Boat Harbors: measures to manage stormwater runoff from marinas	DOTPF	Draft: June 2000 Final: June 2001
Hydromodification: improved dams to protect water quality and riparian habitat measures for operation of	DNR	Draft: June 2000 Final: June 2001
Critical Coastal Areas: improved process to identify critical coastal areas for additional protection	DEC	Final: June 2000
Additional Measures: a process for developing and revising management measures in critical areas	DEC	Final: June 2000
Monitoring: develop a plan to monitor implementation and effectiveness of management measures	DEC	Final: June 2000

Tools for Implementing Alaska's Nonpoint Source Pollution Strategy

Pollution Sources with Objectives & Action Plans

The Nonpoint Source Pollution Strategy has developed goals, objectives and detailed action plans for six source categories: urban, forestry, mining, hydromodification, harbors and marinas, and agriculture. Objectives and action plans for each source category are included in the following chapters:

Chapter IV. Urban and Community Development
Chapter V. Forest Practices
Chapter VI. Mining
Chapter VII. Hydromodification
Chapter VIII. Harbors And Marinas
Chapter IX. Agriculture

Managing Water Quality: Partnerships and Roles

Improving the coordination and collaboration of water quality initiatives between agencies and organizations is an important part of the Alaska Nonpoint Source Strategy. Reaching consensus on the priority waters that require prevention and restoration will assure that resource will be used most effectively. The Department of Environmental Conservation will lead coordination efforts to provide consistency in meeting the goals of the Strategy, but it is ultimately the responsibility of everyone to work together to meet water quality needs in Alaska. A detailed description of state organizations and a list of federal agencies who are important for partnerships to control nonpoint source pollution are found in Chapter X.

Sources of Funding and Program Assistance

More and more communities are adopting a watershed approach to solving their water quality and other natural resource problems. Communities and local organizations know the types of projects most needed in their area, but they are often unable to implement such projects because of a lack of financial and technical support. By combining forces and resources, communities, agencies, and interest groups are now better equipped to address their local watershed issues. Information and internet addresses for funding sources from state, federal, and other funding organizations are found in Chapter XI.

Information Management System

Another important element of the Nonpoint Source Pollution Strategy is data management, monitoring, and the ability to access information through GIS systems and the internet. Ecosystem or watershed level management requires integration and access to data from many different projects and initiatives. Information sharing has become an expectation rather than an anomaly. A goal of DEC is to use existing data more efficiently, to make funding more effective, and to stem the loss of historic knowledge from data gathering. The development and implementation of an information management system for water resources is further described in Chapter XII.

Nonpoint Source Pollution Program Action Plan (NPS)

The following table lists the nonpoint source pollution program action plan objectives and tasks for implementing Alaska's Nonpoint Source Pollution Strategy.

Nonpoint Source Pollution Program Action Plan (NPS)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
NPS-A. Statewide Water Quality Planning			
NPS-A1. The Alaska Clean Water Action (ACWA) Plan is being developed as a roadmap for uniting public and private efforts to protect and restore Alaska's water resources When finalized, the ACWA Plan will identify Alaskan waters that are vulnerable to pollution; prioritize water bodies that are polluted and schedule clean-up actions; manage and share information on water quality; and describes how Alaska will implement best available technology and management practices to prevent pollution. A public review draft is anticipated in January 2001.	DEC, DFG, DNR,DGC, Local Govts, Coastal Districts, Tribal orgs, NGOs, Fed Agencies, public	2001	ALL MANAGEMENT MEASURES Additional Measures Critical Coastal Areas Admin. Coordination Public Participation Technical Assistance
NPS-A2. Develop an Alaska Strategy for Water Pollution Education to cover statewide issues.	DEC,DFG, UAF/CES, NGOs	2003	ALL MANAGEMENT MEASURES
NPS-B. Assess water quality on a statewide basis and in targeted watersheds to support watershed planning and restoration projects to protect water quality and associated uses, including habitat.			
NPS-B1. Develop and maintain a statewide water quality assessment program with tracking and website access to determine polluted waters, sources of pollution, and restoration projects and priorities.	DEC/NPS	On-going	Chap. 8: MONITORING, Critical Coastal Areas
NPS-B2. Provide adequate field presence and follow up on complaint response, inspections, and enforcement where necessary to correct water quality violations that are reported.	DEC	On-going	Chap. 8: MONITORING
NPS-B3. Assess fish habitat and passage at culverts on road and systems, and prioritize sites for protection and restoration.	F&G Habitat	2005	Chap. 4: URBAN, VII A, VII B, VII E
NPS-B4. Identify biological indicators for selected categories of high priority water bodies.	DEC, F&G, UAA-ENRI, EPA	2005	Chap. 8: MONITORING, Critical Coastal Areas
NPS-B5. Adopt nutrient criteria for selected categories of high priority water bodies.	DEC/WQS	2005	Critical Coastal Areas
NPS-B6. Determine reference conditions that are indicators of healthy biotic communities in Alaska's freshwater systems.	DEC/F&G UAA, EPA	2005	Chap. 8: MONITORING

Nonpoint Source Pollution Program Action Plan (NPS)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
NPS-B7. Total Maximum Daily Loads (TMDLs) will be developed for identified waterbodies according to the 10 year schedule established between DEC and EPA.	DEC, EPA, Local Govts	2010	Critical Coastal Areas
NPS-C. Support Water Quality Information Management Systems and Monitoring Efforts			
NPS-C1. Establish a statewide database for waters at risk from pollution & include monitoring plan to track..	DEC/NPS	2002	Chap. 8. MONITORING
NPS-C2. Develop and implement a statewide water quality monitoring strategy to assure that waters reach or maintain their beneficial uses. Provide consistent, long term training for entities monitoring water quality, such as agencies, local governments, businesses, and volunteers.	DEC/NPS, UAF/CES, NGOs	2003	Chap. 8 MONITORING Admin. Coordination
NPS-C3. Review and incorporate monitoring data provided by the regulated industry into an accessible water quality database.	DEC	2004	Chap. 8. MONITORING
NPS-C4. Monitor global nonpoint source pollution reaching Alaska.	DEC	2010	Chap. 8. MONITORING
NPS-D. Strengthen partnerships with government and Nongovernmental agencies and organizations to improve coordination and efficiency and reduce duplication of effort.			
NPS-D1. Participate in the Alaska Coordinating Committee, designed to meet obligations under the President's Clan Water Action Plan.	State, fed, local, tribal, NGOs	2001	ALL MANAGEMENT MEASURES
NPS-D2. Enhance interagency coordination by including resource agencies, education and research institutions, non-government organizations, and public in setting priorities and allocating funding	DEC, DGC	2001	ALL MANAGEMENT MEASURES Admin. Coordination Public Participation
NPS-D3. Identify areas for improved collaboration among agencies and institutions that have expertise in water quality and habitat protection, restoration, education and research	DEC, DGC, DNR, DFG	2003	Admin.Coordination
NPS-D4. Develop a checklist to determine federal consistency with Alaska's Nonpoint Soruce Pollution Strategy. Provide to federal agencies.	DEC, federal agencies	2005	ALL MANAGEMENT MEASURES Admin. Coordination

Nonpoint Source Pollution Program Action Plan (NPS)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
NPS-D5. Strengthen the partnership between the water quality and coastal management programs to implement nonpoint source controls in coastal areas.	DEC, DGC	2010	ALL MANAGEMENT MEASURES Admin. Coordination

IV. URBAN and COMMUNITY DEVELOPMENT

Community Development in Alaska

Alaska is sparsely populated, with approximately 622,000 residents (Alaska Department of Labor, July 1999). Urban development is concentrated in a few main population centers, with the majority of people living in the Southcentral region surrounding Cook Inlet. Nearly one-half of the state's population lives in the Municipality of Anchorage. Other major population centers include Fairbanks in the Interior region, Mat-Su Valley, Kenai/Soldotna area, and Juneau in Southeast Alaska. In the remainder of the state, communities tend to be small, spread out and generally not connected by a road system.

Alaska is experiencing rapid growth, particularly in the Cook Inlet region. Existing population centers are expanding within their borders, smaller outlying communities are becoming suburbs, and traditional "bush" villages are growing into regional centers. With this growth comes the need for new housing, schools, and businesses that require an expanding infrastructure to provide transportation, power, fuel, etc. The rapid growth of the tourism industry is causing additional demands for services in relatively undeveloped areas. Where community development is not accompanied by responsible land use planning, water quality and aquatic habitat become degraded, threatening the very values that have brought people to Alaska. Some urban streams in Alaska no longer support viable runs of salmon. There is a strong need for land use planning measures to be improved upon, to assure sustainable development, and to protect urban streams in Alaska from degradation that will damage salmon runs. We must recognize the need for resource development and economic growth while maintaining and protecting water quality.

Rural and Village Alaska

Many rural and village communities face the same challenges from growth as experienced in the more developed areas, including pressure for community expansion along waterways that are critical to maintain a subsistence culture. In many cases, the need to provide for basic sanitation and drinking water needs is the most important environmental issue facing villages of Alaska. In communities where basic sanitation needs have not been met, Alaska's strategy is to focus on technical and financial assistance, including education and planning, to enable the community to provide good drinking water, and to manage sewage and solid waste.

Sources of Pollution

While the large majority of the state's waters are remote and presumed to be in pristine condition, many lakes, streams and rivers in and near population centers have been degraded. Approximately half of the waterbodies identified by the state in *Alaska's1998 Unified Watershed Assessment* and *Impaired Waterbody List* as having "persistent" water quality problems are located in urban areas (a copy of Alaska's 1998 Unified Watershed Assessmen Category I Watershed Areas can be found in **Volume 2: Strategy Appendices, Appendix II).** Ground water contamination from polluted runoff is a problem, especially in the interior where ground water is a major source of drinking water. DEC's C*ontaminated Sites Database* identifies hundreds of contaminated sites in Alaska that affect or could potentially affect ground water. Old military and mining sites in rural areas put local waters at risk.

As urbanization occurs, previously vegetated and forested spaces are cleared and developed with impervious surfaces such as rooftops, roads, parking lots and sidewalks. This in turn decreases the infiltration capacity of the ground and results in greatly increased volumes of runoff.
The major source of water pollution in Alaska's urban areas is from polluted runoff. These nonpoint sources range from failing septic systems (bacteria, excess nutrients), rainwater runoff from streets and parking lots (oil and trace metals), erosion from construction activities (sediments), and leachate from landfills.

Fecal coliform, sedimentation, and petroleum are among the most common forms of pollution in Alaska's urban areas.

- ***Fecal Coliform.*** Fecal coliform bacteria come from the intestines of all warm-blooded animals, including pets and humans. Their presence indicates a potential pathway for other pathogenic organisms that cause human disease. The most frequent sources of disease-causing microorganisms (pathogens) are sewage overflows, polluted storm water runoff, sewage treatment plant malfunctions, boating wastes and malfunctioning septic systems.
- ***Sedimentation.*** Sedimentation refers to the introduction of sand and eroded soil into lakes and streams. Certain land-use activities can accelerate erosion and sedimentation, introducing excessive quantities of sediment particles into waters, causing degradation. Sediments also carry pollutants and change the characteristics of the stream. The major sources of sediment include runoff from roads, construction projects, housing or commercial developments.
- ***Petroleum.*** Petroleum products get into the surface and groundwater through road and parking lot runoff, accidental spills, leaking fuel storage tanks, boats and floatplanes, and inadequately constructed or managed landfills.
- ***Alteration of Natural Hydrology.*** Alterations to natural streams and other waterbodies due to urbanization and the accompanying runoff diversion, channelization, and destruction of natural drainage systems can result in riparian and tidal wetland degradation or destruction. Comprehensive planning is necessary for development on a watershed scale and for small-scale site development as well, including planning and designing to protect sensitive ecological areas, minimize land disturbances and retain natural drainage and vegetation whenever possible.

Regional Characteristics

Northern/Interior Area

The Northern/Interior watersheds lie within the arctic and subarctic climatic region, which is characterized by cold, dry winters that extend through most of the year, permafrost soils and extensive wetlands. The Northern Region is sparsely populated, with about half of the people living in the interior city of Fairbanks in the Fairbanks North Star Borough. Fairbanks and nearby North Pole and Ester are connected by a road system that extends south to Anchorage and north to the Prudhoe Bay oilfields. Several native villages are located along the Yukon and Kuskokwim Rivers in interior Alaska. Outside of the interior, most of the population is scattered in numerous villages

along the shores of the Beaufort, Chukchi and Bering Seas. The North Slope Borough borders the Beaufort and Chukchi Seas and includes the main Native village of Barrow, ten smaller villages, and the Prudhoe Bay oil fields. The northwestern arctic includes the villages of and Kotzebue and other smaller villages.

The major sources of polluted runoff identified in urban areas of northern/interior watersheds are stormwater, road and industrial/residential construction, spills, snow dumps and septic systems.

Southcentral Area

Urban development in Alaska is concentrated around Cook Inlet, with nearly one-half of the state's population living in the Municipality of Anchorage (over 260,000). Other major population centers around Cook Inlet include nearby Matanuska-Susitna Borough (57,000) and Kenai Peninsula Borough (49,000). On Kodiak Island, the City of Kodiak is a major seafood processing center, as well as Unalaska/Dutch Harbor. Urban development in Southcentral Alaska is increasing at significant rates, with the highest growth rates in the state. In addition to growth in population, the area has seen a huge increase in recreational tourism due to increased transportation and housing infrastructure. Stormwater within the Municipality of Anchorage is now regulated as a "point source" under the National Pollutant Discharge Elimination System (NPDES), which provides a regulatory mechanism for controlling polluted runoff within the municipality.

The three most common pollutants in urban areas of Southcentral Alaska are fecal coliform bacteria, petroleum products and low oxygen levels. By far the most common pollutant in urban areas of Southcentral Alaska is fecal coliform bacteria. Fecal coliform bacteria get into the water from inadequate on-site sewage treatment (septic systems) and from stormwater runoff carrying dog, cat and farm animal wastes. Waterfowl are also a major contributor to high levels of coliform bacteria in some areas, and it is often difficult to differentiate between natural (waterfowl) versus human causes where high levels of bacteria are found. Petroleum products (fuel, oil, and other toxic materials) reach surface and ground water from leaking fuel storage tanks, spills, landfills and runoff from roads, parking lots and residential/commercial developments. Oxygen in some urban lakes has become dangerously low due to decomposition of nuisance species of aquatic plants that are triggered by high nutrients in runoff.

Southeast Area

Southeast Alaska lies in a temperate rain forest along the coast. Rainfall is heavy and occurs throughout most of the year. Snowfall tends to be light to moderate, with frequent periods during the winter when the snow melts. The population is relatively stable and is concentrated in a few small coastal communities, with Juneau, the state capitol, being the largest with around 30,000 people. Only five additional communities, have populations over 1,000. These include Ketchikan, Sitka, Petersburg Wrangell, and Haines The regional economy depends mostly on government (Juneau), tourism, timber, fishing and mining.

The most common pollutants in Southeast Alaska are sedimentation, turbidity, solid waste (trash), low oxygen and fecal coliform bacteria. The major sources of sediment are runoff from roads and land-disturbing activities such as construction projects, gravel mining and housing or commercial developments. Turbidity is generally associated with runoff from eroding soils and roads. Large quantities of solid waste "trash" end up in streams, often clogging culverts, limiting fish passage

and generally degrading habitat. Fecal coliform bacteria get into the water from inadequate on-site sewage treatment (septic systems), from runoff carrying dog, cat and farm animal wastes, and from natural wildlife populations.

Key Partnerships

State agencies:

- DEC Programs: Nonpoint Source Pollution, Air and Water Data Monitoring, Drinking and Waste Water, Solid Waste, Prevention and Emergency Response, Contaminated Sites and Remediation Program, Village Safe Water, Municipal Water, Sewerage, and Solid Waste Grant Program, Municipal Loan Program.
- DNR Programs: Water Rights, Alaska Hydrologic Survey, State Land Use Plans, Soil and Water Conservation Districts
- DFG Programs: Habitat and Restoration, Special Areas
- DGC Programs: Alaska Coastal Management, *Alaska Coastal Clean Water Plan*
- DOTPF Statewide Planning
- University of Alaska Fairbanks, Cooperative Extension Service
- University of Alaska, Fairbanks, Marine Advisory Program
- University of Alaska, Anchorage ENRI

Federal Agencies**:** Environmental Protection Agency, Army Corps of Engineers, NOAA/Office of Oceans & Coastal Resource Management, Natural Resource Conservation Service, Department of Agriculture.

Local Governments**:** Alaska Municipal Governments (organized boroughs, unified home rule municipalities, incorporated cities), coastal districts, coastal resource service areas, soil and water conservation districts.

Tribal/Native Organizations: Native organizations are community-based with close ties to local economies. They have the ability to deliver locally and culturally relevant programs.

Nongovernmental Organizations**:** nonprofit groups, watershed partnerships.

Management Measures and Indicators

- Percent of assessed rivers, streams, and reservoirs designated for drinking water use that fully support use as a drinking water supply. (based on 305(b) report and 303(d) list).
- Percent of assessed waterbodies that protect public health and the environment by supporting a) fish and shellfish consumption, b) safe recreation, and c) healthy aquatic life use designations (based on 305(b) report and 303(d) list).
- Percent of waterbodies in urban areas or communities that have waterbody recovery plans being implemented.
- List the state priority waters/watersheds that are impaired or in need of special

protection; and, for those waters indicate whether or not: (1) action strategies have been developed that include actions needed to attain water quality standards; and (2) measurable environmental improvements have occurred in the last two years (phase in 1 and 2 in FY2000).

- Status (e.g., drafted, completed, date of expected completion) of developing unified watershed assessments that identify aquatic resources in greatest need of restoration or prevention activities in urban areas.
- Percent of submitted stormwater permits that are being reviewed in urban areas.
- Percent of projects going through stormwater pre-design review in urban areas.
- Calculate paved and unpaved road miles and percentage of impervious cover caused by road construction.
- Estimate the annual tonnage of de-icing material added to State and Borough maintained roads to estimate cumulative effects in given areas.

Urban and Community Development Action Plan (UR)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
UR-A. Support local watershed protection efforts and encourage communities and the public to protect their local water resources.			
UR-A1. Provide educational, technical and financial assistance to communities to ensure good drinking water and basic sanitation and sewage needs are met	DEC, Local Govts, UAF/CES	On-going	Chap. 4. URBAN-V A, VB Public Participation Technical Assistance
UR-A2. For cities that have done stormwater mapping and identified problem areas, implement water quality enhancement projects and educational efforts to allow adequate and proper treatment of stormwater runoff and minimize adverse impacts to water resources.	DEC, Univ of AK Local Govts	On-going	Chap. 4. URBAN -II A, III A, IV A, II C Public Participation Technical Assistance
UR-A3. Assist communities and individuals to properly site, design, inspect & operate onsite septic systems.	DEC/EH	On-going	Chap. 4. URBAN-VA,VC
UR-A4. Provide consistent and long term training, equipment, sampling protocols & other assistance to monitoring of local streams and lakes.	DEC, DFG, Local Govt, UAF/CES, NGOs	On-going	Chap 8 MONITORING Technical Assistance
UR-A5. Encourage local protection of riparian habitat (buffers) along streams, lakes and rivers through the establishment of greenbelts, parks and conservation easements and effective setbacks.	DEC, DFG Local govt's	On-going	Chap 4. URBAN-II B, II C, III A, IV A
UR-A6. Ensure that winter road maintenance and snow removal operations are conducted so that pollutants do not enter lakes and streams.	DEC DOTPF Local Govt	On-going	Chap 4 URBAN-VII E, VII F
UR-A7. Establish pollution prevention programs to educate the public on ways to reduce pollution from improper use and disposal of household hazardous chemicals, fertilizers and pesticides.	DEC, UAF/CES Local Govt, NGOs	2003	Chap 4 URBAN-VI A
UR-A8. Develop model ordinances for stream setbacks, bank stabilization practices, and in-stream structures to protect water quality and fish habitat.	DEC, Local Govts, NGOs	2005	Chap 4 URBAN-IIB, II C, III A, III B, IV A
UR-A9. Assist local communiies to develop and implement local source water protection plans for public water systems using surface and ground water as drinking water source.	DEC, Local Govts	2005	Chap 4 URBAN-II B

Urban and Community Development Action Plan (UR)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
UR-A10. Upgrade failed community landfills to ensure leachate control and water quality concerns are met. Research the needs of rural village landfill problems.	DEC, Local Govts	2005	Chap 4 URBAN-VI A
UR-A11. For local communities, develop stormwater management programs for their local areas, scuh as mapping existing stormwater drain systems, identifying water quality coming out of storm drains, and identifying storm drains that are inadequate or non-functional.	DEC, Univ. of Alaska. Local Govts	2005	Chap.4 URBAN-II A, III A, IV A, II B, III B, II C
UR-A12. Assist local governments and coastal districts in including enforceable land use planning policies into local laws to protect water quality. (Note: this long term task is important to implement the 15 year strategy for the Section 6217 management measures)	DEC, DFG, local Govts, coastal districts	2014	Chap 4 URBAN-ll A
UR-B. Provide tools to incorporate effective water quality protection in land use planning and improved permitting decisions. Tasks include:			
UR-B1. Provide training materials and list of best management practices (BMPs) to cities, private sector developers and engineers doing construction activities.	DEC	2002	Chap 4 URBAN-II A, III A, III B, II C
UR-B2. Compile a list of all existing BMPs that are applicable to urban sources of pollution, such as lawn fertilizing practices, landscaping, disposal of household substances, or use of biodegradable detergents for car washing. Distribute for educational and other purposes.	DEC, DOTPF, Local govts	2002	Chap 4 URBAN-VI A
UR-B3. Develop guidebooks for wetlands functional assessments (Hydrogeomorphic methodology - HGM) for the lower Kenai Peninsula and coastal southeast and southcentral. These guidebooks and HGM classifications will be used as a tool for watershed assessments, education, wetlands management and permitting decisions.	DEC, DFG, EPA, USFWS, local govts	2002	Chap 4 URBAN-II A, II B, Chap 7 WETLANDS-II C
UR-B4. Develop a model Watershed Restoration Action Strategy that communities can use to develop adequate plans to protect their local watershed.	DEC/NPS EPA, NGOs	2003	ALL MANAGEMENT MEASURES
UR-B5. Develop pollution runoff models appropriate to Alaskan conditions to better predict the timing, location and magnitude of how pollutants are impacting Alaska waters, and make available for local use and education.	DEC/, NGOs DOTPF Local Govt.	2005	Chap 8 MONITORING - Technical Assistance

Urban and Community Development Action Plan (UR)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
UR-B6. List & map important salmon habitat rearing and spawning areas to distribute to permitting agencies to use in reviewing applications & other activities near waterbodies.	F&G Habitat	2005	Chap 4 URBAN-II B
UR-B7. Assist local governments to develop wetland mitigation programs (such as mitigation banking and other tools) to conserve critical wetlands functions.	DEC, EPA, COE, local govts	2005	Chap 4 URBAN-II A - Technical Assistance
UR-C. Promote educational opportunities to control and abate nonpoint source pollution. Tasks include:			
UR-C1. Support education programs on proper operation & maintenance for on-site septic system owners.	DEC, UAF/CES, local Govts	2003	Chap 4 URBAN-IIA, II B
UR-C2. Educate public officials and citizens about the effects of impervious surfaces on water quality through GIS techniques & other tools to show connection between land use and water quality	DEC, UAF, DNR, DFG, Local Govts	2005	ALL MANAGEMENT MEASURES Technical Assistance
UR-C3. Research annual amount of paved and unpaved road miles and percent of impervious cover being constructed by roads, as well as annual tonnages of de-icing material added to highways, to use as an educational tool through GIS to help the public understand cumulative effects in discrete watersheds.	DEC, UAF, DNR, DFG, Local Govts	2005	Chap 4. URBAN-VII E, VII F

V. FOREST PRACTICES

Sources of pollution from forestry operations

Forest practices activities subject to Section 319 of the Clean Water Act are commercial timber harvest operations, associated road construction, and forest management activities. For the purpose of this strategy, forest practices activities do not include log transfer or log storage facilities that are regulated under Section 401 and Section 404 of the Clean Water Act.

The major pollutant attributed to forest practices activities conducted in Alaska that may adversely affect water quality and beneficial uses is sediment. Excessive sediment in surface waters can adversely affect the growth and propagation of aquatic species (particularly salmonids) and drinking water. Introduction of excessive sediment from forest practices activities may result when applicable best management practices (BMPs) are not implemented or, if they are implemented, not being effective enough to meet state water quality standards. Other potential threats to water quality and beneficial uses include changes in stream morphology and habitat features that could adversely impact fish. Changes in temperature/dissolved oxygen and in the quantity and timing of stream flows are possible, but a direct link between forest practices and such changes, and resulting impacts to fish, have not been demonstrated in Alaska.

Alaska's forest practices program is organized into two components according to regulatory requirements that govern forestry activities on the land on which the activity takes place. The first component covers activities on private (including Mental Health Trust Lands), state, and other public lands. Other public lands is defined as land managed by state agencies other than the Alaska Department of Natural Resources, land owned by a municipality, and land owned by the University of Alaska. Forestry activities on these lands are regulated by 1990 *Alaska Forest Resources and Practices Act (FRPA),* which was revised in 1999, state regulations (Alaska Forest Resources & Practices Regulations (11 AAC 95)) and Water Quality Standard Regulations (18 AAC 70), and elements within Alaska's Nonpoint Source Pollution Control Strategy.

The second component is for activities on federal lands. The federal component of the State's program is based on a combination of federal and state legislation. This includes but is not limited to the 1990 *Tongass Timber Reform Act (TTRA),* the 1997 revision of the Tongass Land Management Plan (TLMP), the Clean Water Act (CWA), the 1999 *Alaska Forest Resources & Practices Act*, Alaska Forest Resources & Practices Regulations and Water Quality Standard Regulations, and elements within Alaska's Nonpoint Source Pollution Control Strategy.

Currently, almost all forest practices activities on federal lands in Alaska occur on the Tongass and Chugach National Forests administered by the U.S. Forest Service. The Bureau of Land Management manages vast forest resources in the Interior portion of Alaska but these lands are generally not developed for timber harvest due to poor access and other factors.

In general, Alaska's forest practices program is comprehensive in scope and has accomplished the applicable tasks and elements envisioned in the 1990 Strategy. Stakeholder involvement is key to the program and includes state resource agencies, forest landowners, the timber industry, affected landowners, operators, forest managers, and other affected interests. The 1990 Strategy

tasks and accomplishments are further described in **Volume 2: Strategy Appendices, Appendix III. Forest Practices Accomplishments.**

Water Quality Research Efforts

There is limited information from Alaska concerning the effects of specific silvicultural treatments and forest management practices on water quality. Research topics have historically been grouped into three main areas: stream temperature and dissolved oxygen; sedimentation and turbidity; and stream morphology and large woody debris (LWD). Research needs are generally not specific to any one land ownership or set of legal standards and therefore may be addressed under both state and federal forest practices programs.

Research needs vary by forest practices region. The Region I Science/Technical Committee identified research needs for Region I in their final recommendations. The USFS is currently conducting a number of research projects within Region 1. In 1998, DNR convened interagency workshops to identify priorities for forest practices research in Regions II and III (interior Alaska). DEC is currently providing 319 funding to DNR for Region III research projects on large woody debris & analysis of river dynamics in glacial systems and to DF&G for advanced identification of fish habitat. Other high priorities for Regions II and III include effects of ice bridges on fish habitat. This study is not receiving 319 funding at the current time.

Additional research and monitoring is necessary for the state and federal resource agencies to better understand the long-term effects associated with recently developed and implemented BMPs. The U.S. Forest Service (Forest Service), state agencies, and the timber industry should continue ongoing research and monitoring that is designed to provide additional information on the effectiveness of BMPs and the effect of land management activities on water quality and aquatic resources on forested lands in Alaska. For example, a better knowledge of large woody debris (LWD) and sediment budgets (sources, quantities, transport mechanisms, and rates of depletion) for stream systems would improve our ability to measure and interpret impacts of management activities. More specifically, some areas where additional knowledge is needed include landslides, roads, buffers, and stream processes such as sediment routing and retention, and formation and changes in fish habitat features. A better understanding of disturbance processes and how they affect each of these specific areas would assist researchers and managers in assessing the impacts of management on water quality and fish habitat.

Specific research recommendations by the State's resource agencies should be included as information provided in the annual resource reports to the Board of Forestry. The State will continue to work cooperatively with the U.S. Forest Service Pacific Northwest Research Station, the University of Alaska, the timber industry, and other research entities that conduct and coordinate applied forest practices research in Alaska.

Goals and Objectives for Private, State, and Other Public Lands

Previous annual reports prepared by state resource agencies, indicated that there were insufficient agency staff to adequately monitor forest practices activities to determine if BMPs are actually effective in meeting state water quality standards. Declines in resource agency budgets for forest practices staff since 1992 had resulted in substantial reductions in field staff. Responding to the concern of the agencies, the Board of Forestry issued a report to the legislature, "Forest Practices Act Implementation and Funding" in January 1998. This report discussed funding alternatives, and provided estimated budget increments needed by each of the

three resource agencies to improve monitoring the implementation and effectiveness of the FRPA. Funding for the resource agencies has been supplemented the last two years with Section 319 funds. Increasing staff resources to monitor forest practices activities to determine BMP implementation and effectiveness is included as a short-term strategy over the next five years.

1. **State agencies will meet annually to set priorities and estimate budgets for the upcoming fiscal year. Top priorities should include evaluating and inspecting Forest Practices activities with the most risk of causing adverse impacts to water quality. The top priority for the state agencies is continued funding for state agency personnel to conduct FRPA-related work.**

State agencies must work with the Board of Forestry, the forest products industry, and other interested parties to bring attention to agency concerns, and to find a mix of funds that will allow the state to maintain the presence in forest practices envisioned by the FRPA and regulations. Section 319 funds play a role in this effort.

State agencies are eligible to receive Section 319 funds, if the activities funded relate directly to water quality protection or restoration. Since the total amount of funding is likely to be less than the total required, the agencies will also have to prioritize uses for Section 319 funds. Community grants may also be used for forest practices.

In 1998, the Board of Forestry and the state agencies identified several priority uses for additional funds, including Section 319 funds. The state agencies have committed to meeting at least once a year to prioritize specific projects and uses for Section 319 funds that are made available to the state agencies. DNR and DFG will submit a forest practices implementation proposal to DEC each year during the Section 319 grant proposal process.

The following objectives discuss the broad priority areas identified by the agencies. These will be the priorities for state agency work on forest practices issues on private, state and other public lands for the next five years. It is possible that minor changes may be made, based on Board of Forestry, public, or agency input. The Board of Forestry and the state agencies recognize that funding for staff support is the highest priority and is necessary to implement each of the following priority areas of work. Section 319 funds may be allocated to specific projects based on interagency priorities and the availability of adequate funding.

2. **Conduct ongoing review and evaluation of selected planning documents prepared under the forest practices program including forest land use plans and detailed plans of operation to assure that adequate BMPs are in place to protect water quality**

DNR, Division of Forestry, develops forest land use plans governing the disposal of timber and the use of other resources on state forest lands, and develops contracts for the harvest of timber on state lands. DNR also receives Detailed Plans of Operation for harvest of timber on private, municipal, and trust lands. These planning documents are integral parts of the State Forest Practices program, and are circulated for review to other agencies. To ensure that the BMPs contained in the FRPA and regulations are prescribed, DEC and DFG will conduct ongoing review of selected planning documents to evaluate water quality and other concerns appropriate to their mandates and expertise, and will provide comments to DNR where appropriate. As discussed above, and as recommended by the Science/Technical Committee, DNR, DEC, and DFG will work to ensure that the BMPs relating to the identification, classification, and mapping of surface waters in DPOs are properly implemented.

This objective is ongoing, and has no specific time line.

3. **Conduct ongoing, periodic field inspections of timber harvest operations on state, private and municipal lands to assess compliance with the FRPA**

Adequate funding to carry out the basic fieldwork associated with timber harvest needs to be maintained for state agencies. DNR is lead agency for administration of the forest practices program and has primary responsibility for field implementation of and compliance with the BMPs. Therefore, priority should be given to funding DNR staff for FRPA oversight in the field. DFG conducts field inspections in conjunction with "Title 16" permits on anadromous fish streams and other matters. Under the FRPA, DEC and DFG are given "due deference" in their areas of expertise. DEC will participate in routine inspections, primarily at the request of DNR and DFG.

As part of their responsibilities under the FRPA and Title 16, DFG will conduct field investigations to identify anadromous fish habitat in advance of timber harvest and road construction activities, and at the request of timber owners and operators. Priority areas will be identified in the annual agency meeting described above. Changes to the priorities may occur, due to new projects being proposed.

DEC and DFG will work with DNR in the field to implement the changes to the FRPA and regulations that were enacted in 1999.

4. **Evaluate the effectiveness of state BMPs in meeting state water quality standards**

Additional resources need to be committed to forest practices BMP implementation and effectiveness monitoring to continue the BMP iterative process (modifying the BMPs as necessary to meet water quality standards). 11 AAC 95.825(e) provides a process to develop annual comprehensive monitoring plans that will provide increased BMP effectiveness information for the Board of Forestry.

The BMP monitoring program should include:

1. Comprehensive monitoring, including:

    a.) BMP implementation monitoring, to determine if required BMPs are being implemented;

    b.) BMP effectiveness monitoring at selected timber harvest operations to determine if BMPs are effective in meeting water quality standards and protecting beneficial uses; and

2. Routine water quality monitoring (primarily for turbidity) by operators, landowners, and State agencies during regular field inspections.

DNR, in consultation with DFG and DEC, will continue to develop appropriate procedures and implement the overall BMP monitoring program. Components of the program will include field inspection forms, BMP evaluation protocols, data evaluation procedures, a computerized record keeping and analysis system, an annual plan for conducting the program (including sample site selection), and an annual report prepared by each resource agency relative to their area of expertise.

BMP implementation monitoring was initiated in FRPA Region I in 1997. Implementation monitoring will expand to include FRPA Region II in 2000. In Region III, limited monitoring (e.g., for roads) will be done until additional standards are developed (see 6. below).

BMP effectiveness monitoring includes several projects. The Alaska Forest Association / Sealaska Corporation-led monitoring project will continue over the next five years. Stream crossing condition surveys will continue in Regions I and II. The results of the implementation monitoring protocol for mass wasting adopted in 1999 will be used to determine if additional study of the effectiveness of BMPs designed to minimize the occurrence of mass failures is warranted.

Other high priority monitoring projects identified through the 11 AAC 95.825(e) process may also be undertaken during this period and may be eligible for Section 319 funding.

5. **Provide training for state agency staff, forest land owners, and timber harvest and road construction operators through training workshops and field trips, and prepare and distribute public information materials**

Continuing workshops will be conducted, including in-field sessions, to provide training for state resource agency staff and stakeholders concerning requirements of the FRPA, logging systems, habitat regulations, water quality standards and monitoring, agency coordination, enforcement procedures, and other matters. Presenters may include state and federal agency staff, industry representatives, and the scientific community.

Continuing efforts will be made to inform the public about the State's forest practices program, including measures for water quality protection. Written materials will be prepared (summary brochures, information packets, regulations, policies, brochures, etc.), and distributed to industry, cities, coastal districts, citizen groups, and other requesters. Copies of the revised FRPA and regulations have been distributed widely and are available on-line through DNR's web page. A brochure on the S/TC agreements and changes to the FRPA and regulations was produced after the completion of the S/TC review process. This document discusses the intent of the FRPA and describes in detail how it should be implemented. In addition, more training sessions will be needed, in light of agency agreements resulting from the S/TC process, and as the result of changes to the FRPA and regulations that were enacted in 1999. Three training sessions were conducted in March 2000 and additional training in the implementation of these changes will be scheduled in 2000.

6. **Review and revise riparian management standards for FRPA Region II and III**

Based on input from the public, the Board of Forestry, and state agencies, a process has been initiated to review and revise the standards for timber harvest and road construction in riparian areas in Region II (southcentral) and Region III (interior). Stakeholder meetings were held to identify research priorities. The state agencies will take the lead in conducting research and monitoring required to establish riparian standards. Other cooperators will include the University of Alaska, native corporations, associations, and interested stakeholders. This process started in Region III in 1999 and is anticipated to continue over several years.

The first phase, to be completed in FY2000, is the design of a stream classification system for Region III. At the same time, studies of river dynamics and fish habitat are underway in the Tanana River system, within the Tanana Valley State Forest. These studies will yield information on stream processes, particularly as they affect stream bank stability, the recruitment

of Large Woody Debris (LWD) and the location and use of fish habitat. Additional work on the role of LWD in different parts of the Tanana and tributary stream systems is anticipated. Monitoring of the effects of ice bridges on fish habitat is proposed. The above projects are expected to be completed in FY 2001.

BMPs will be developed based on the above work, and will be implemented as changes to the FRPA Regulations. Changes to the Regulations specific to Region III riparian BMPs are anticipated by FY 2002. The Region II review is expected to begin in FY 2002, with proposed changes prepared by 2004.

Goals and Objectives for Federal Lands

1. **Revise and reauthorize the DEC/Forest Service Memorandum of Agreement (the revised document will be a *Memorandum of Understanding* (MOU))**

Since the existing Memorandum of Agreement (MOA) is based on the 1990 Nonpoint Source Pollution Control Strategy, it will need to be updated when the revised Strategy is approved. Discussions on this revision are already underway between DEC and the U.S. Forest Service Region 10. The revised MOU will carry forward ongoing work, and will include new priorities identified since the previous 1992 MOA, such as watershed restoration. Also included will be improved processes for reporting any water quality violations and for annual reporting of the results of BMP implementation and effectiveness monitoring from the USFS to DEC.

2. **Conduct routine forest practices activities including: 1) state review and evaluation of selected Forest Service planning documents to determine consistency with the state and federal regulations, Forest Service BMPs, and demonstrate consistency with the Alaska Nonpoint Source Pollution Control Strategy, 2) ongoing, periodic field inspections of timber harvest and road construction operations on National Forest lands in cooperation with the Forest Service, 3) annual BMP implementation monitoring on all national forest Districts with timber harvest and/or road construction activity, and 4) training in Forest Service BMPs, forest plan standards and guidelines, and other procedures as needed.**

The Forest Service protects water quality on the Tongass National Forest through implementation of the Standards and Guidelines and other direction contained in the Tongass Land Management Plan (TLMP). Two interagency groups exist to clarify the intent of TLMP, and to provide a means for interagency input. The Tongass Plan Implementation Team (TPIT) is concerned with general TLMP direction; the Interagency Monitoring and Evaluation Group (IMEG) is charged with monitoring the implementation and effectiveness of the TLMP. The Chugach Land Management Plan (CLMP) is being revised, and will have equivalent processes. On a regional basis, the Forest Service implements the BMP Handbook, and works with DEC on water quality issues via the DEC/USFS MOU. Other water quality-related processes include the Alaska Coastal Management Program, Clean Water Act Section 404(f) BMPs applicable to roads, and the DFG/USFS MOU covering Title 16 permitting of activities in anadromous fish streams.

The Forest Service administers all timber harvest operations on National Forest lands through the planning process, timber sale contracts, timber sale administration, and field inspections. DEC field staff will inspect selected operations in cooperation with the Forest Service, or make

independent inspections, on an ongoing, periodic basis. The purposes of these inspections, will be to discuss site-specific water quality issues with the Forest Service and operators, assess site-specific application of BMPs, lend technical assistance in interpretation of water quality standards, and enforce water quality standards where necessary. DFG also may be involved in these inspections.

The Forest Service produces planning documents pertaining to National Forest management activities, ranging from forest-wide analysis and guidance to site-specific harvest plans. These documents are circulated for review by state agencies, including review, where appropriate, for consistency with the Alaska Coastal Management Program. The Departments of Environmental Conservation, Fish and Game, and Natural Resources will conduct ongoing review of selected planning documents to evaluate water quality and other concerns, and provide agency-specific comments to the Forest Service.

Specified Forest Service activities are subject to review against nonpoint source control regulations/standards and applicable Coastal Zone Management Act requirements. These activities, and terms and conditions of review are identified in the 2000 Memorandum of Understanding between DGC and the Forest Service. See the Federal Consistency section of this strategy for the details of the Coastal Zone Management Act and the 319 review process.

In conducting reviews of Forest Service timber sale projects for consistency with Section 319 of the Clean Water Act, DEC will assess the adequacy of the project planning and implementation documents for the components contained in the DGC/USFS MOU. The MOU contains informational and procedural requirements and agreements, including requirements of the FRPA and FRPA regulations, Forest Service Region 10 Best Management Practices, the ACMP, and the Clean Water Act. Implementation of these standards and requirements, in combination with forest plan standards and guidelines, will meet the intent of the CZMA Section 6217 management measures for forestry.

Workshops will be conducted, including in-field sessions, to provide training for state resource agency staff and stakeholders concerning the requirements of Forest Plan standards and guidelines, implementation of BMPs contained in the Region 10 Soil and Water Conservation Handbook, water quality standards and monitoring, DEC enforcement procedures, and other matters. Presenters may include state and federal agency staff, industry representatives, and the scientific community.

DEC will work with the Forest Service on the production of public information programs and materials related to protecting water quality on National Forest lands.

The state and the Forest Service can improve watershed management and water quality maintenance and improvement by cooperating on the design and use of GIS and natural resources database systems. Several projects are under way and will continue.

Finally, this objective includes reporting to DEC any water quality standards violations caused by Forest Service timber harvesting and road construction operations not covered by a variance under 18 AAC 70.200. Details are included in the DEC/FS MOU.

3. **Evaluate the effectiveness of Forest Service BMPs in meeting State water quality standards and protecting beneficial uses of waters of the state. Document these evaluations and make needed recommendations to improve future management through the Forest Service's Soil and Water Conservation Practices Handbook (SWCP).**

The pending memorandum of understanding (MOU) between the Forest Service and DEC will describe in more detail the responsibilities of each agency for monitoring the effectiveness of Forest Practices Best Management Practices (BMPs) on National Forest System lands. The recently completed Tongass Land Management Plan commits the Forest Service to conducting Best Management Practices (BMP) implementation and effectiveness monitoring, as well as monitoring of other water quality related issues. Similar wording may be included in the Chugach National Forest Plan. The Memorandum of Understanding (MOU) will strive to ensure that effectiveness monitoring of Forest Practices Best Management Practices (BMPs) is routinely and adequately conducted across the Region. The summarized results of Best Management Practices (BMP) monitoring will be used as the basis for any changes needed to the Forest Service SCWP handbook and/or the Forest Plan Standards and Guidelines. Revisions to the SCWP handbook should occur on an as needed basis in coordination with the Alaska Department of Environmental Conservation (DEC).

Additional resources will need to be committed to forest practices monitoring and determining the effectiveness of BMPs prescribed under the FRPA regulations and Chapter 10 of the *USFS Soil and Water Conservation Handbook* (BMP handbook).

Although BMP implementation and effectiveness monitoring has been achieved on National Forest lands, BMP effectiveness monitoring is not routinely or adequately conducted in all timber sale areas. The April 22, 1994 effectiveness monitoring strategy for the Tongass National Forest has been only partially implemented. The IMEG is providing guidance and protocols for implementing the monitoring plan included in the revised Tongass national Forest Land Management Plan

Under the revised TLMP and the CLMP, which is being revised, monitoring programs will include both structured evaluation of BMPs and water quality monitoring by interdisciplinary teams at selected timber harvest operations, and ad hoc or routine evaluation and water quality monitoring by field officers during regular field inspections. The Forest Service, in cooperation with other agencies, will identify monitoring objectives and questions, develop appropriate procedures, and conduct the program. Components for monitoring on National Forest lands include standard inspection forms, BMP evaluation protocols, data evaluation procedures, computerized record keeping, analysis, and annual reports.

The Forest Service will prepare two annual reports for DEC review. The first report is known as the pre-season monitoring report. This report details, by Ranger District for each National Forest, the types of monitoring and other water quality information that will be conducted for the next field season. Ideally, this information will be discussed at an annual meeting to plan work for the upcoming field season. The second report is known as the post-season monitoring report. This report summarizes in writing, by Ranger District, the BMP implementation, and effectiveness monitoring information collected from each District and provides

recommendations for the pre-season report. The post-season report may be included as part of the overall Forest Plan annual monitoring report.

4. **Identify and prioritize watershed restoration, rehabilitation, and enhancement opportunities and implement projects**

The Forest Service Region 10 has a regional Watershed Restoration Strategy (9/94; V2.1 revised 10/95). This Strategy discusses watershed restoration planning, identifies priority watersheds, and discusses specific projects for each fiscal year. It will be updated in federal FY 2000.

The information in the Strategy, as well as other Forest Service watershed information, can be used as input to the Unified Watershed Assessment evaluation and reporting process (e.g., Watershed Restoration Action Strategies).

Water bodies that meet "water-quality-limited" criteria will be included, where appropriate, in the post-season report, and included in the statewide 303(d) waterbody assessment reports.

Key Partnerships

Partnerships between state agencies, federal agencies, and the private sector are essential to successful implementation of the Strategy. Key partnerships already in place include the following:

- FRPA implementation. The FRPA depends on joint work by the state resource agencies – DNR is the lead agency. The three agencies review notifications of operation and inspect operations. DEC is granted due deference for water quality issues, and DFG is granted due deference for fish habitat issues. DFG also is responsible for resolving questions regarding stream classification.
- Science/Technical Committees. A Science/Technical Committee with members from the state resource agencies, the US Forest Service, the National Marine Fisheries Service, and private consultants led the review of forest practices standards in Region I that resulted in the 1999 revisions to the FRPA and regulations. A similar group with members from the state resource agencies, the US Geological Survey, the University of Alaska, and private consultants began review of riparian management standards in Region III in 1999.
- Monitoring. The state resource agencies jointly developed the protocols for implementation monitoring. DNR is the lead agency for implementation monitoring; DEC and DFG are encouraged to participate in field trips for monitoring. The agencies have also cooperated with the timber industry, including Sealaska, Atikon, the Alaska Forest Association, and Tlingit-Haida Central Council on industry-led effectiveness monitoring projects and peer review of the results.
- Research. DNR is working closely with the Tanana Chiefs Conference on forest practices research in Region III, including analysis of glacial river dynamics, riparian buffers, and winter roads. DNR, DFG, USGS, and the Alaska Boreal Forest Council (ABFC) are cooperating in an ABFC-led study of upwellings in the Tanana River and their relation to spawning habitat. Research priorities for southcentral and Interior Alaska were identified through interdisciplinary workshops with representatives from state and federal agencies, the University, and the private sector. These and other

cooperative efforts will be essential to expanding information throughout Alaska.

- Board of Forestry. Oversight for implementation of the FRPA is provided by the Board of Forestry with broad representation of affected interests.
- Interagency Monitoring and Evaluation Group (IMEG). This inter-agency group recommends USFS monitoring protocols and projects for implementation on the Tongass National Forest.
- DEC / DNR / DFG cooperation on funding priority

Management Measures and Indicators

Responsible agencies will provide the appropriate items to DEC to document the implementation and effectiveness of the management measures contained in the FRPA, forest practices regulations, and the Standards and Guidelines contained within TLMP:

- Copies of all planning and NEPA documents, plans of operation, and forest land use plans
- Copies of inspection reports that document violations of the FRPA that result in degradation of water quality, including any directives or charging documents issued, corrective actions taken to achieve compliance and inspection reports documenting success of mitigating measures.
- Copies of all BMP implementation and effectiveness monitoring reports.
- Annual statistics on forest practices notifications, inspections, and variations.

Forest Practices (FP) Action Plan			
Action Plan Objectives & Tasks	**Responsible Agencies**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
FP-A. Action Plan Tasks for Forestry Activities on Private, State and other Public Lands.			
FP-A1. State agencies will meet annually to set priorities and estimate budgets for the upcoming fiscal year. The top priority for the state agencies is continued funding for state agency staff to conduct FRPA-related work	DNR, DFG, DEC	On-going	Administrative Coordination
FP-A2. Conduct ongoing review and evaluation of selected planning documents prepared under forest practices program including forest land use plans and detailed plans of operation to assure that adequate BMPs are in place to protect water quality	DNR, DFG, DEC	On-going	Chap 3 FORESTRY II.A, II.B., II.C., II.D Chap 8 MONITORING
FP-A3. Conduct ongoing, periodic field inspections of timber harvest operations on state, private and municipal lands to assess compliance with the FRPA	DNR, DFG, DEC	On-going	Chap 3 FORESTRY II.E, II.F, II. G, II.H –Monitoring
FP-A4. Provide training for state agency staff, forest landowners, and timber harvest and road construction operators through workshops and field trips, and prepare and distribute public information materials	DNR, DFG, DEC	On-going	Technical Assistance
FP-A5. Review and revise riparian management standards for FRPA Region II and III	DNR, DFG, DEC	2002-Reg III 2003-Reg II	N/A
FP-A6. Evaluate the effectiveness of state BMPs in meeting state water quality standards	DNR, DFG, DEC	2005	Chap 8 MONITORING Additional Measures
FP-B. Action Plan Tasks for Forestry Activities on Federal Lands			
FP-B1. Conduct routine forest practices activities including: 1) state review and evaluation of selected Forest Service planning documents to determine consistency with the state forest practices regulations and to demonstrate consistency with the Alaska Nonpoint Source Pollution Control Strategy, 2) ongoing, periodic field inspections of timber harvest and road construction operations on National Forest lands in cooperation with the Forest Service, 3) annual BMP implementation monitoring on all national forest Districts with timber harvest and/or road construction activity, and 4) training in BMPs, forest plan standards and guidelines, and other procedures as needed.	DNR, DFG, DEC USFS	On-going	Chap 3 FORESTRY II.A., II.B., II.C., II.D., II.E., II.F., II.G., II.H. – Chap 8 MONITORING
FP-B2. Identify and prioritize watershed restoration and enhancement opportunities and implement projects	DFG, DEC, USFS	2001	N/A

Forest Practices (FP) Action Plan			
Action Plan Objectives & Tasks	**Responsible Agencies**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
FP-B3. Revise and reauthorize the DEC/Forest Service Memorandum of Agreement (the revised document will be a *Memorandum of Understanding* (MOU))	DEC, USFS	2002	Administrative Coordination
FP-B4. Evaluate effectiveness of Forest Service BMPs in meeting State Water Quality Standards and protecting beneficial uses of waters, make appropriate revisions to Forest Service BMP handbook & Forest Plan Standards & Guidelines, & prepare annual monitoring reports (pre-season & post-season) for DEC review	DEC, F&G, USFS	2005	Chap 8 MONITORING Additional Measures
FP-C. Action Plan Tasks for Restoration of Waters Impaired from Bark Deposits			
FP-C1. Establish a working group under the Board of Forestry to address outstanding water quality issues related to the discharge of bark from log transfer and storage facilities.	DEC/NPS, DFG, DNR, NGOs	2001	Administrative Coordination
FP-C2. Develop guidance for restoration of waters where bark deposits from log transfer facilities have exceeded one acre and evidence indicates that aquatic habitat is being impacted.	DEC/NPS, DFG, DNR, NGOs	2002	Technical Assistance

VI. HARBORS AND MARINAS

Harbors and Marinas is a new source chapter category for the revised *Alaska Nonpoint Source Pollution Strategy.* Most of the information compiled in this section was developed as part of the *Alaska Coastal Clean Water Plan Public Review Draft (August, 1995).* The *Alaska Coastal Clean Water Plan* includes management measures for nonpoint sources of pollution in the coastal zone. According to the Department of Transportation and Public Facilities (DOTPF) Alaska Harbor Management System database of public marine facilities (excluding the Marine Highway System facilities), there are 97 publicly owned existing and eight proposed harbors and marinas in the coastal zone. Fifteen facilities in the database do not offer permanent moorage or do not support at least ten recreational vessels. Forty-five communities representing 49 facilities have recreational moorage. There are about two dozen privately owned marinas listed by the Department of Community and Economic Development under SIC code 4493, marinas, that are not included in the DOTPF database.

Although the 1990 Alaska Nonpoint Source Pollution Control Strategy did not include a harbors and marinas chapter, following is a summary of some of the accomplishments that have been made in this source category in the recent past:

- DOTPF has prepared the Coastal and Harbor Design Procedures Manual that contains an appendix on Best Design Practices to control nonpoint source pollution, including stormwater runoff.
- Best management practices for the operation and maintenance of harbors have been prepared and discussed with Alaskan harbormasters at the 1997 harbormasters annual conference.
- Harbor Management Agreements have been developed between communities and DOTPF to achieve state requirements, including water quality protection.
- A cooperative program has been initiated between DOTPF and the Alaska Department of Fish and Game to construct or expand pumpout stations in recreational harbors through Clean Vessel Act grants.
- Harbor pollution prevention brochures have been developed for Ketchikan, Wrangell, Juneau (Auke Bay) and Hoonah.

Sources of Pollution from Harbors

A variety of challenges face harbormasters, water quality agency staff, and users of the state's harbors and marinas to prevent water pollution in and adjacent to these developed facilities. These challenges include the following:

- Educating harbor and marina users that their actions can affect water quality and cause pollution.
- Designing future harbors and marinas to maximize opportunities for adequate flushing and to incorporate infrastructure to address sewage, used oil, other vessel-generated wastes, and stormwater issues that affect water quality.
- Developing an implementation and effectiveness program for BMPs recently developed for harbors and marinas.
- Continuing the process to support development of Harbor Management Agreements for communities that need them.

- Continuing to coordinate and obtain support from the Alaska Association of Harbormasters and Port Administrators to address harbor and marina water quality issues.

Impacts of Harbor Design and Siting on Water Quality

Inadequate circulation (mixing and flushing of waters) may lead to an increased biochemical oxygen demand in harbor waters from fish cleaning stations and fish processors. There may be an increase of pollutants or sediments in the harbor if not properly designed. Adequate circulation can improve water quality by providing sufficient oxygen and diluting the effects of any potential hazards introduced into the water column.

Water Quality Impacts from Harbor Dredging

Dredging of harbor basins can lead to increased turbidity and burial of aquatic plants and organisms, destruction of fish and shellfish spawning, rearing and migration areas; destruction of sea lion habitat, alteration of salinity regimes and resuspension of contaminated sediments. Disposal of dredge material can be just as destructive as the dredging itself.

Upland Hull Maintenance Areas

Alaska has relatively few upland hull maintenance areas. Fewer than ten marinas have dedicated paved upland maintenance areas or boat yards; 17 facilities have gravel areas. About 15 harbors in nine communities have boatlifts to take large vessels out for maintenance. There are no upland hull maintenance areas currently planned at new or significantly expanding harbors. Many boats are pulled out of the water after the summer season and are maintained in winter storage areas away from the harbor. Larger vessels (greater than 30' in length) often remain in water year-round and typically undergo maintenance on tidal grids.

Most upland hull maintenance areas are gravel lots that are set back from the water. The gravel provides natural filtration for runoff. Paved upland hull maintenance areas are typically less than 1/2 acre in size. Maintenance areas that rae not designed to contain materials or are not properly cleaned after vessel maintenance may impact water quality in adjacent waters.

Fueling Stations

There are approximately 40 fueling facilities listed in the 1994 DOTPF inventory of harbors and marinas. Seventy-five percent of these facilities indicated that they have containment and cleanup equipment (booms, pads or sorbents) at the fueling facilities. An additional ten harbors indicated that they have cleanup equipment although there is no fuel facility in the harbor. These numbers are likely to be low because the inventory is constantly being updated as information becomes available.

Typically, fuel docks are designed with a concrete deck and are located in an area with easy access, but away from the other floats due to the fire potential. Fuel docks, if located within a harbor, should be visible from the harbormaster’s office for safety and environmental reasons.

Construction and Maintenance of Sewage Facilities

Approximately 5,100 of the 34,000 recreational boats registered in Alaska in 1993 had a marine head or portable toilet on board (Department of Fish and Game, 1993). At present, there are only four pumpouts in state-owned harbor, and they have been difficult to maintain. One of these has failed and is scheduled to be repaired.

Solid Waste

Solid waste generated in Alaskan harbors is typical of most mixed recreational and commercial facilities including nets, cables, ropes, rubber tires, chains, cardboard, waxed cardboard, aluminum, plastics, paper, etc. The quantities of items associated with the fisheries industries are generally believed to be greater in Alaskan harbors than those found in the Lower 48 states.

Solid Waste from Tidal Grids

There are approximately 60 grids throughout the state that are used for boat maintenance activities. Grids are generally constructed of parallel timbers laid in the intertidal zone alongside a dock. At high tide, a boat ties up to the dock and floats over the submerged timbers. When the tide goes out, the boat rests on the timbers and the owner can perform hull or engine repair or maintenance that can be completed during low tide. Typical activities include power washing, changing zincs, and maintaining or repairing propellers, cooling coils, rudder pintals, etc. Very seldom is sanding of hulls done on grids. In general, vessels using grids are greater than 26 feet. Vessels less than 26 feet in length are usually trailered out of the water and repaired or maintained away from the harbor. There has been no measurement of the amount of waste generated at grids.

Solid waste pollutants associated with grids include bottom paint residue, solvents, organics, and repair debris such as wasted zincs and fasteners. Bottom cleaning chemicals, paint (especially paint containing lead, copper, mercury and tin) and solvents may be toxic or hazardous to marine organisms.

Fish Waste

Concentrations of fish waste in harbors and marinas can cause an increase in the biochemical oxygen demand, dissolved oxygen, and total suspended solids in a harbor. The stench from the waste can be annoying. Besides potential water quality issues, piles of fish waste are unsightly and can cause slippery docks and can serve as an attractant for wildlife such as seagulls, otters, sea lions, bears, and eagles.

Hazardous Material

Hazardous materials include used oil, oily rags, bilge waste, anti-freeze, bad fuel, batteries and solvents generated from vessel use and maintenance. According to the 1995 DOTPF Alaska Harbor Management System survey, most harbors have waste oil collection facilities but few have hazardous waste collection points. Many harbor waste oil collection tanks have been constructed too close to the waters edge and don’t have secondary containment. A key issue at harbors is the need for a community coordinated hazardous waste collection area for vessel-generated wastes.

Stormwater Runoff

Many harbors receive stormwater that drains a defined upland area. This stormwater typically carries hydrocarbons, sediment and other pollutants. These pollutants are from a variety of upland sources including parking lots, residential streets and development sites.

Petroleum Products

According to the U.S. Coast Guard, most harbors have reported oil sheens due to sloppy fuel transferring procedures at the dock and the pumping of bilge water with contaminants into the harbor. Older fuel docks do not have automatic fuel shut-off nozzles at dockside fueling stations.

Resources from the Alaska Department of Transportation

Alaska Coastal and Harbor Design Procedures Manual

Unlike other engineering disciplines, there are few codes or standards for coastal structures. Experimental and "trial and error" design methods are often used by individuals with little or no training in coastal or harbor engineering. The basic rule for coastal and harbor projects is that each design must be site-specific. This limits the practicality of developing standard designs and enforces the need for step-by-step procedures and best management practices.

A draft manual on harbor design has been prepared cooperatively by DOTPF and the U.S. Army Corps of Engineers. The final manual will address all aspects of siting and design of harbors including flushing, water quality assessment, habitat assessment, shoreline stabilization, stormwater runoff, fueling station design, sewage facilities, grids and solid waste management. Other state and federal agencies will review and comment on the manual. The completed manual will become the recommended best design practices for DOTPF harbors.

A companion manual will be developed for the operation and maintenance of harbors. The manual will include at minimum improved best management practices that *implement Alaska Coastal Clean Water Plan* management measures.

Harbor Management Agreements

DOTPF negotiates harbor management agreements with communities to maintain and operate state facilities. The management agreements are written in general terms to ensure the operator complies with all existing and future federal, state and local laws, regulations, and ordinances. Further, the agreements may be supplemented to specifically cite new rules or regulations. Hence, if nonpoint source pollution controls are adopted under a federal law, state statute or municipal ordinance, they will automatically be included in the agreements. If nonpoint source pollution controls are adopted in the form of guidelines, they may be recommended by the state for implementation. Funding for these changes would have to come from increased user fees or state grants.

DOTPF has the authority to ensure compliance with the harbor management agreements. Failure to comply with terms of the agreement is set out in each individual agreement. In general, the state may cancel the agreement on 60 days notice for failure to comply with its terms. The operator may also cancel the agreement, in which case the state would be responsible for operation and maintenance of the facility.

The primary role of DOTPF is to determine the need and priority of state-developed harbor projects. The department also provides technical and administrative assistance. Through state harbor management agreements, the department enables local communities to enforce municipal ordinances and assess fees. Communities that operate and maintain harbors under management agreements are responsible for compliance with state statutes and regulations. Failure to comply with the terms of the lease agreements can result in the state taking back management of a facility.

DOTPF has a statewide Harbors Section consisting of a chief engineer, two technical engineers and a planner. The department also has three regional offices that administer management agreements, provide project management for construction, and provide maintenance and operation for state-operated facilities. Finally, there is a harbor design group in the Southeast regional office that works

on marine facilities. DOTPF assigns department staff according to project development requirements.

DOTPF has administered the harbor design and construction program since statehood. Program levels vary based on need and available funding. It is anticipated that from one to ten million dollars may be appropriated annually for harbor construction in the future. General state authority for the management of harbors include AS 35.10.090 which gives DOTPF the authority to lease or sell marine facilities constructed with state, territorial, or federal funds.

The *Alaska Coastal Clean Water Plan* for Harbors and Marinas will be carried out through regular meetings between all cooperating agencies, harbormasters, and marina owners. Representatives from DOTPF and the Division of Governmental Coordination attend the annual Association of Port Administrators and Harbormasters conference to distribute information, provide technical and administrative assistance and address concerns of the membership.

During all phases of siting and design of new or significantly expanding harbors, cooperating agencies are invited to review DOTPF projects. Through the permitting process, agencies have an opportunity to provide input into the siting, design and construction of harbors and marinas.

Key Partnerships

Key partners for harbors and marinas include the Alaska Association of Harbormasters and Port Administrators; State of Alaska resource agencies (Alaska Departments of Environmental Conservation, Natural Resources and Fish & Game); the Army Corps of Engineers; the Alaska Department of Transportation & Public Facilities; University of Alaska Marine Advisory Program, coastal district coordinators, municipalities, and citizens concerned by harbor and marina activities.

Management Measures and Indicators

- Percent of assessed waterbodies that protect public health and the environment by supporting a) fish and shellfish consumption, b) safe recreation, and c) healthy aquatic life use designations (based on 305(b) report and 303(d) list).
- Percent of waterbodies on the Section 303(d) List of Impaired waterbodies that are listed because of nonpoint source pollution stemming from activities associated with harbors and marinas.

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Harbors and Marinas Action Plan (HM)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe For Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
HM-1. Provide Corps of Engineers guidelines to dredges to minimize impacts of dredging & disposal of dredged material	DOTPF, local govts, Corps of Engineers	On-going	Chap. 5 HARBORS-II A, II B, II C
HM-2. Maintain U.S. Coast Guard requirement that fuel spills over five gallons are reported. Maintain DOTPF Harbor Management Agreements that require fuel dock operators to have spill equipment on-scene, and appropriate spill prevention plans. Hold workshops on how to prepare oil spill response plans and how to comply with MARPOL and DEC regulations.	Coast Guard DOTPF Local Govts	On-going	Chap. 5 HARBORS-II F, III D Public Education
HM-3. Establish procedures to ensure water quality and aquatic habitat concerns are considered in design and siting of new and significantly expanding marinas. Ensure developers who site and construct a harbor or marina are familiar with Alaska Coastal and Harbor Design Procedures manual.	DOTPF Local Govts	2005	Chap. 5 HARBORS-II A, IIB, IIC, IID, IIE, IIF, IIG
HM-4. Evaluate potential of stormwater discharges from new upland hull maintenance for impact on ambient water. Require oil-water separators, settling ponds or other mitigation if needed	DEC, DOTPF Local Govts	2005	Chap. 5 HARBORS-II B, II C, II E
HM-5. Maintain cooperative program DOTPF and Fish and Game to construct or expand pump-out stations in recreational harbors through Clean Vessel Act grants. Develop and distribute materials that educate boaters that dumping of untreated sewage is a violation of Water Quality Standards. Alternatives to disposal of sewage in waters will be made part of the brochure.	DOTPF Local Govts DFG	2005	Chap. 5 HARBORS-III F, III G – Public Education
HM-6. Continue U.S. Coast Guard administration of Marine Oil Pollution Act requirements that harbors and marinas with over 100 vessels have Coast Guard certified waste disposal facilities. Encourage smaller communities to operate solid waste disposal receptacles available at harbors.	DOTPF Local Govts Coast Guard	2005	Chap. 5 HARBORS-III A
HM-7. Further develop a harbor BMP program emphasizing operation & maintenance BMPs and need to immediately contain and cleanup spills from fueling, bilge pumping, and develop options to dispose of used oil, bad fuel, batteries, solvents, antifreeze, paints, and other waste materials.	DOTPF Local Govts DEC	2005	Chap. 5 HARBORS-II F, III C, III D
HM-8. Increase number of communities involved in hazardous waste collection efforts at harbors & marinas. Work at improving coordination between community and harbors to collect and adequately dispose of hazardous materials generated from vessel use and maintenance.	DOTPF Local Govts DEC	2005	Chap. 5 HARBORS-III C

Harbors and Marinas Action Plan (HM)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe For Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
HM-9. For harbors and marinas where fish waste is an issue, require harbor operators to provide appropriate fish waste disposal as a term of the harbor management agreement.	DOTPF, DEC Local Govts	2010	Chap. 5 HARBORS-III B

VII. HYDROMODIFICATION

Hydromodification is a new source category developed for the *Alaska Coastal Clean Water Plan.* For purposes of this chapter, the term "hydromodification" refers to activities relating to dams, channelization, channel modifications, and human-caused shoreline and streambank erosion that can adversely affect water quality.

The following are the main challenges to addressing priority issues in hydromodification under the revised Nonpoint Source Pollution Strategy over the next five years.

Kenai River and lower Russian River tributary restoration needs. The Kenai River and lower Russian River tributary is Alaska's top priority watershed for restoration efforts as identified in Alaska's September 1998 *Clean Water Action Plan – Unified Watershed Assessment.* The Kenai River and lower Russian River are threatened from a variety of human-related impacts that have caused riparian habitat concerns. For example, over 6.3 miles of the Kenai River shoreline have been modified by more than 400 separate bank stabilization projects. DFG study identified bank vegetation removal and structural development along the river's banks as major contributing factors in causing fish habitat degradation. Protecting the Kenai River and lower Russian River from further development and continued degradation, that includes the range and effects of hydromodification activity, may be Alaska's biggest watershed challenge during the period of this Strategy revision.

Adequacy of state resource agency oversight. A major challenge in the implementation of any recommendations or action plans in the revised Nonpoint Source Pollution Strategy is maintaining adequate funding for the state's resource agency budgets to properly review and inspect priority hydromodification projects. The state's three resource agencies have faced declining budgets since at least 1990. The overall effect of declining budgets has resulted in the state not funding programs or positions that help protect water quality. For example, DEC's placer mining inspection staff has decreased by at least 50% from 1990 levels with a subsequent reduction in field inspections and follow-up actions.

Dams

Dams constructed in Alaska are usually constructed for purposes of generating hydropower and for water supply storage for drinking water purposes. Dams are also built to form reservoirs for the disposal of mine tailings and "treatment" water. Many dams in Alaska are less than 25 feet high or impound less than 50 acre-feet of water.

The design and operation of dams may result in a variety of positive and negative environmental impacts including modifications to fish habitat.

Dam construction, operations, and maintenance activities can adversely affect terrestrial and aquatic resources, including impacts to water quality and fish habitat. A few dams in Alaska that block fish passages have been designed to incorporate fish bypass systems. Positive secondary impacts of dams can include flood controls and creation of lacustrine habitat.

The key state agencies that regulate dams and their activities are the state resource agencies and DGC.

DNR is the lead agency for regulating any dam that impounds at least 5 acre-feet of water and is at least 10 feet in height, any dam at least 20 feet in height, or any dam that is a threat to life and property (except for dams regulated by the Federal Energy Regulatory Commission and federally owned or operated dams). For state regulated dams, a Certificate of Approval is required for construction, operation, repair, modification, or abandonment. An erosion and sediment control plan that can address the potential nonpoint source issues of any proposed hydromodification activity is typically required for a Certificate of Approval.

DEC issues Clean Water Act Section 401 Water Quality Certifications for priority projects that require a federal permit to discharge into a navigable waterbody. A 401 certification is the state documentation that gives reasonable assurance the discharge will meet Alaska Water Quality Standards. To meet the water quality standards, DEC may attach stipulations, including erosion and stormwater controls, to help ensure the project may not affect the state's waters.

DFG uses its Title 16 permitting authority to specify conditions designed to eliminate or minimize impacts to fish species, fish passage, and other aquatic resource issues.

DGC coordinates multi-agency project reviews for projects within coastal boundaries to ensure requirements of the Alaska Coastal Management Program (ACMP) are met. Projects must be consistent with ACMP standards (6 AAC 80.010(b)) and comply with any statutes and regulations of the permitting agency (such as DNR or DFG) that authorizes the project.

Channel Modifications and Channelization

The most common activities associated with "channel modifications" in Alaska are projects to save upland property from streambank erosion. Property owners seek to implement a variety of bank stabilization projects including revegetation, riprap of banks, and installation of vertical bulkheads. Other channel modification projects include diverting streams around development sites, modifying channels to minimize bridge size and promote more efficient culvert installation, and fishery enhancement projects to create or maintain fish passage past natural obstructions, improve spawning sites, and improve rearing habitat. All of these projects have the potential to adversely affect water quality if best management practices are not incorporated in all phases of the project.

Placer mining operations in Alaska have had the greatest channelization effects in Alaska. Numerous streams have lost their sinuosity causing increased stream flows within and downstream of channelized segments and accelerating erosion along streambanks. Channelization from placer mining activity can also cause adverse effects to aquatic life in the waterbody due to changes in water chemistry from increased sedimentation and abrupt habitat changes.

Shoreline and Streambank Erosion

The common cause of human-caused shoreline and streambank erosion impacts are foot traffic, all-terrain vehicles, roads, airports, placer mining, timber harvest and other vegetation removal, and residential/commercial development.

Fish habitat can be adversely affected by shoreline and streambank erosion. The removal of riparian vegetation removes food sources for fish and reduces cover that protects young fish from predators. Erosion events can cause sediments to cover spawning gravels preventing water-dissolved oxygen from reaching the salmon eggs.

The Kenai River and lower Russian River have certain areas where streambank and shoreline erosion is an issue. A DFG study identified streambank erosion caused by bank trampling as a major contributing factor to fish habitat degradation in the Kenai river. Boat wakes from motorized riverboats are another contributing factor in streambank erosion along the Kenai River.

Key Partnerships

Key partners for preventing damage from hydromodification activities include the State of Alaska's resource agencies (Alaska Departments of Environmental Conservation, Natural Resources and Fish & Game); the Army Corps of Engineers; the Natural Resources Conservation Service; federal land management agencies if the activity is within their land management jurisdiction (Bureau of Land Management, U.S. Forest Service, U.S. Fish & Wildlife Service and the National Park Service); and municipalities, organizations, private landowners and citizens that are concerned by a proposed hydromodification activity or streambank erosion impacts.

Management Measures and Indicators

- Percent of assessed waterbodies that protect public health and the environment by supporting a) fish and shellfish consumption, b) safe recreation, and c) healthy aquatic life use designations (based on 305(b) report and 303(d) list).
- Percent of waterbodies on the Section 303(d) List of Impaired waterbodies that are listed because of nonpoint source pollution stemming from hydromodification activities.

VIII. Hydromodification Action Plan (HY)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
HY-A. Dams:			
HY-A1. Conduct project reviews of hydrologic activities to ensure that a minimum amount of water is reserved in lakes, rivers and streams to support resident fish populations.	F&G, DEC, DNR	2005	Chap. 6 HYDRO-III C
HY-A2. Develop a best management practices (BMPs) program specific to dams to be incorporated in permits as permit stipulations. NOTE: Key elements of BMP program are *Erosion and Sediment control guidances* and specific requirements for proper storage & disposal of toxic materials from activities associated with dam construction.	DNR, DFG, DEC DGC	2010	Chap. 6 HYDRO-III A, III B
HY-B. Channel Modifications And Channelization:			
HY-B1. Ensure proposed channel modification and channelization projects are designed and monitored to minimize impacts to streams. Incorporate bioengineering techniques in design of stabilization projects to protect channelized streams. Apply lessons learned from demonstration projects to similar projects. NOTE: Demonstration channel restoration projects have been completed for placer mining streams north of Fairbanks and in Denali Nat'l Park & Preserve	DFG, DNR	2005	Chap. 6 HYDRO-II A, II B
HY-B2. For priority channel segments that need restoration on state or federal lands, the appropriate land manager should take the lead in developing a restoration action strategy.	DFG, DEC, USFS BLM, NPS	2010	Chap. 6 HYDRO-II A, II B
HY-B3. Identify, in a priority list, channel segments that have been significantly modified, or have significant erosion or habitat impacts, and schedule impacted streambanks for restoration activity.	DEC, DFG, DNR	2014	Chap. 6 HYDRO-II A, II B
HY-C. Shoreline and Streambank Erosion:			
HY-C1. Develop demonstration streambank stabilization projects in priority watersheds where high human use is causing impacts similar to those on Kenai River. Apply lessons learned from Kenai projects to other high-use watersheds on an as-needed basis.	DFG, DEC, Local Govt, NGOs	2002	Chap. 6 HYDRO-IV A

VIII. Hydromodification Action Plan (HY)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
HY-C2. Develop mechanisms to protect and restore habitats, using standardized data collection and management systems that allow for sharing data. NOTE: Using the 1994 DFG Kenai River habitat survey as a model, expand analysis of channel modifications to other watersheds, focusing initially on channels receiving the greatest perceived human impacts.	DFG	2005	Chap. 8 MONITORING
HY-C3. Monitor effectiveness of past habitat protection projects and report results in standardized manner. NOTE: Reports should be updated periodically as new information becomes available.	DFG	2005	Chap. 8 MONITORING Additional Measures
HY-C4. Increase public awareness of the characteristics of intact and damaged aquatic habitats, the need to protect and restore aquatic habitats, and techniques to protect and restore aquatic habitats	DFG	2005	Public Involvement – Technical Assistance
HY-C5. Create or enhance group(s), such as the Aquatic Restoration Working Group, that represent a broad range of interests and expertise, including landowners, user groups, local, state, and federal agencies. The group(s) would cooperatively develop and implement watershed-specific strategies that prevent additional damage to aquatic habitat and restore impacted habitat.	DEC, DFG Local Govts, NGOs	2010	Administrative Coordination

VIII. MINING

Before the large-scale development of oil resources in the 1970's, gold was historically Alaska's most valuable resource commodity. Significant changes have occurred in the Alaskan mining industry since 1990, including a major increase in the exploration for hard-rock gold and base metal deposits with the resultant expansion and development of existing and new lode gold mines. Lode gold production now exceeds placer gold production. The mining industry is one of the few sectors of the state economy that is expanding, due in part to the initiatives of the Alaska State Legislature and the Governor.

Placer Mining

The only widespread nonpoint source pollutant related to placer mining is sediment. The Environmental Protection Agency (EPA) requires each mine operator to obtain a National Pollutant Discharge Elimination System (NPDES) permit if there is any point source wastewater discharged to surface waters. This permit contains effluent limitations, best management practices (BMPs) and monitoring requirements. The effluent limitations address settleable solids, turbidity, and total arsenic. Seasonal and daily monitoring are required and penalties for a negligent violation are set at maximum of $25,000 per day for each violation. Most placer operations today use BMPs to achieve zero discharge. Six BMPs are prescribed under the NPDES permit, which identify and control nonpoint source sediment load to receiving streams. These BMPs require:

1. Bypassing surface water around the active mine area.

2. Constructing berms and other water retention structures so that they prevent the passage of water.

3. Storing pollutant materials (e.g., sediment) so that they are not released to streams.

4. Using 100 percent process water recycling.

5. Maintaining dikes and diversion structures to protect them from failure.

6. Stabilizing all mine areas to prevent degradation of the receiving waters.

Most placer operations today use these BMPs to achieve "zero discharge". The State of Alaska Reclamation Act of 1991 requires reclamation of mining activities on all state lands and private lands. All operations on federal lands, and operations on state and private lands that exceed five acres of unreclaimed area, are required to post reclamation bonds to ensure the disturbed area is reclaimed.

Nonpoint source pollution due to runoff and erosion from mined areas, roads and camps can be controlled by enforcement of Bureau of Land Management 3809 regulations, the State of Alaska Reclamation Act and the use of BMPs referenced in the Placer Mining Reference Manual from DFG.

Destabilized settling ponds in floodplains are the focus of concern for nonpoint source pollution from sediment. Metals such as arsenic, entrained in the sediment, may also be of nonpoint

source concern. Modification and diversion of stream channels for active placer operations result in an incidental temporary increase in sediment loading that returns to normal when the channel is stabilized. During the period of the use of temporary bypass channels, fish and macro-invertebrate habitat may be impacted.

The erosion and runoff from disturbed upland areas is greatest during the active mining process and is one of the primary nonpoint sources associated with mining. Ditches are utilized to divert surface water around disturbed areas to minimize sheet erosion. Drainage ditches collect surface flow from disturbed areas while storm water permit BMPs are implemented to control offsite deposition of sediment. Other issues related to sediment and turbidity are addressed through the implementation and monitoring of BMPs designed to reduce or control nonpoint source pollution in the form of sedimentation from gravel extraction activities.

Hard Rock Mining

Nonpoint source pollution from hard-rock and coal mining operations are regulated through EPA NPDES permits, BLM 3809 regulations, the Alaska Surface Mining Act, and the State of Alaska Reclamation Act. In interior Alaska, the Fort Knox Mine, Illinois Creek Mine, and the Nixon Fork Mine have waste management permits from the Alaska Department of Environmental Conservation (DEC), not NPDES permits, because there are no point-source discharges. Water quality concerns from nonpoint source pollution are considered during the large mine permitting process coordinated by DNR, Division of Mining and Water Management.

State regulations require mines like Fort Knox, Illinois Creek, and Red Dog to monitor surface and ground water quality down-gradient from their facilities. The Kensington Mine is currently being set up to operate with a consolidated permit. Large hard rock mines such as these were not considered when the regulations were originally written. DNR covers these issues through approval of Plans of Operation and Mining Reclamation Plans. Waste rock disposal, storage, and/or treatment falls outside of the existing DEC Solid Waste Regulations, but drainage from those areas is addressed through DEC's state Water Quality Standards and DNR regulations. The issue of drainage from and over waste rock may be considered under the Storm Water Regulations, as this could be considered a nonpoint source pollution problem.

With the decline in the number of placer mining operations, as the easily accessible placer deposits are exhausted, the upsurge in hard rock mines will become the priority focus. Current projects (some Section 319 funded) are addressing the nonpoint source issues of closed and abandoned placer operations, especially in interior Alaska. Some form of consolidated permitting is one solution to addressing those issues not covered by regulations and for which site specific BMPs must be developed and implemented. ADNR is the lead agency for coordination of a multi-agency "team" review of proposed large mine projects.

Land management is the key to nonpoint source pollution oversight. Mines on federal land have BMPs in place for road building, borrow pits, culverts, and other mine features. Only mill and industrial areas are not covered by BMPs where contact water is the issue.

General permits are another option for handing of storm water permitting. The specific types of issues covered by these permits include: sediment that can drain from roads, wheel washing, concentrate on- and off-loading, waste rock storage, quarries, borrow pits producing runoff fines, fuel and hydraulic fluid leak potential, and fill areas. There is the potential for elevated metals in

the runoff from these areas. Monitoring at specific sites for specific parameters of concern needs to be considered in the NPDES reporting.

Tailings piles, but not waste rock, are covered under DEC Solid Waste Permits. Both the application of BMPs and the issuance of EPA storm water permits can address waste rock discharges. BLM and DNR regulations require the assessment of acid rock drainage potential of ore and waste to minimize the potential for offsite drainage, and waters originating from waste dumps must meet DEC water quality criterion.

NPDES permits do not necessarily preclude nonpoint source impacts and storm water controls. Adequate closure plans should be implemented to reduce the post-development nonpoint source impacts; BLM Section 3809 regulations and the State of Alaska Reclamation Act regulate these.

An expansion of monitoring programs is required to assess nonpoint source impacts of mine expansions and impacts to creek drainages, especially during fish spawning activities. BMPs are very site specific and need to be tailored to the specific situation and terrain demands. As such, regulations would be difficult to draft or apply across the board.

Abandoned Mines

Historic abandoned mine sites exist in Alaska and can be potential sources of nonpoint soruce pollution. Reclamation of abandoned mines is handled primarily through DNR's Abandoned Mine Lands Program. The federal Surface Mining Control and Reclamation Act was signed into law in 1977 to regulate surface coal mining and reclamation nationwide. The law provided state's the opportunity to develop state coal programs and assume primacy over the coal program from the federal government. Alaska chose to administer the program and the Alaska Surface Coal Mining Control and Reclamation Act was approved in 1983. The Commissioner of the Department of Natural Resources was granted jurisdiction over surface coal mining and reclamation operations in the state. In addition to regulating the coal industry the State and federal laws created the Abandoned Mine Lands (AML) Program for the purpose of reclaiming abandoned historic mines.

Land and water eligible for reclamation are those that were mined or affected by mining and abandoned or left in an inadequate reclamation status before August 3,1977 and for which there is no continuing reclamation responsibility under State or federal law. AML funds can be spent on coal and non-coal abandoned historic mines. State, private, native and federal lands are eligible. Sunset for the collection of AML funds is the year 2004, set by federal law.

Coal and non-coal abandoned historic mines were inventoried as part of the AML program. Coal mining in Alaska has been well documented and every mine of significance has been identified. The coal inventory was completed in 1983 and 340 sites were identified. A literature search of known non-coal mines was compiled in 1991 and 432 sites were identified. The non-coal inventory is incomplete for state, private and native lands.

Every inventoried site was evaluated to determine if it qualified for AML funding. Federal policy requires that priority one and two coal projects be completed first. Priority three coal projects can be completed in conjunction with priority one and two projects or after all priority one and two projects have been completed. Only priority one non-coal projects can be reclaimed. Priority one non-coal sites can be worked on simultaneously with coal sites if they have been requested by

the Governor. Because of the subjective nature of the criteria priority two non-coal sites were identified for further evaluation. The three reclamation priorities are:

1. Protection of public health, safety, general welfare and property from extreme danger resulting from the adverse effects of past coal mining practices.

2. Protection of public health, safety and general welfare from adverse effects of past coal mining practices which do not constitute an extreme danger.

3. Restoration of eligible lands and waters and the environment previously degraded by adverse effects of past coal mining practices, including measures for the conservation and development for soil, water (excluding channelization), woodland, fish and wildlife, recreation resources, and agricultural productivity.

Utilizing these priorities, it was determined that there were 224 coal projects and 32 to 123 non-coal projects that needed to be reclaimed. AML is now in the rpocess of working through these priorities.

While the AML program focuses mainly on abandoned coal sites and health and safety issues, it is obvious that attention is needed on non-coal abandoned mine sites that are causing environmental degradation. Recent reclamation projects funded with Section 319 Clean Water Act pass-through grant funds are aimed at nonpoint source pollution from abandoned mines through stream re-channelization, reconstruction and stabilization. These projects include the 101 mile Steese Highway - Birch Creek Reclamation project of 1992, and the on-going Phase I and Phase II placer reclamation on four selected sites in the Circle and Fairbanks Mining Districts. These projects are aimed at reclamation and stream channel stability with the materials and equipment on hand. They have been designed with multi-agency and mining industry input and have served as demonstration projects for placer miners and agency personnel.

Key Partnerships

Key partners for preventing nonpoint source pollution from mining activities include the Departments of Environmental Conservation and Natural Resources; federal land management agencies if the activity is within their land management jurisdiction (Bureau of Land Management, U.S. Forest Service, U.S. Fish & Wildlife Service and the National Park Service); the U.S. Environmental Protection Agency; tribal entities; and nongovernmental organizations that deal with the mining industry.

Management Measures and Indicators

- Percent of assessed waterbodies that protect public health and the environment by supporting a) fish and shellfish consumption, b) safe recreation, and c) healthy aquatic life use designations (based on 305(b) report and 303(d) list).
- Percent of waterbodies on the Section 303(d) List of Impaired waterbodies that are listed because of nonpoint source pollution stemming from mining activities.

Mining Action Plan (MI)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
MI-1. Distribute guidelines to help miners, companies, and government land managers reclaim mine sites effectively and economically. These guidelines will be finalized in 2000 in the report for the 319 Placer Mine Reclamation project in the Circle and Fairbanks Mining Districts. In addition, make available four demonstration sites and reports to assist miners, landowners and agencies.	DNR, DEC, DFG Tribal orgss	2001	N/A* *Section 6217 program does not have a mining category.
MI-2. Develop strategy for monitoring priority suspected areas that are threatening anadromous fish habitat and domestic water supplies from nonpoint source sediment caused by placer and gravel mines. Use 2000 data summary assessment reports, bibliography and file of water quality & hydrologic monitoring studies to assess and prioritize efforts nonpoint pollution sources from abandoned placer mines. In addition to sediment, strategy should evaluate other likely pollution sources such as oil spills, hydraulic fluid dumps, chemicals, and solid waste disposal.	DNR, DEC, DFG Tribal orgss	2010	N/A
MI-3. Provide technical assistance to miners and landowners in applying and complying with reclamation standards. **Note:** DNR has developed regulations based on Reclamation Act. Monitor effectiveness of BMPs designed to reduce or control sedimentation from placer and gravel extraction activities.	DNR, DEC, DFG, Tribal orgss	2010	N/A
MI-4. Continue evaluation of effectiveness of BMPs, and develop improved BMPs where necessary.	DNR, DEC, DFG Tribal orgss	2010	N/A
MI-5. Work with Federal resource agencies to cleanup selected abandoned mines. Other mines under a reclamation and closure plan should have those plans closely monitored for effectiveness of reclamation and restoration approaches	DNR, DEC, DFG Tribal orgss	2015	N/A

IX. AGRICULTURE

Introduction and Background

Agriculture in Alaska is not the pervasive source of nonpoint source pollution found in most areas of the contiguous United States. Alaska was listed in the 1994 *Farm Business Economic Report* with total farm marketing of 42 million dollars, 20 million from crops and 27 million from livestock and products. This publication also ranks Alaska 50th of the 50 states in order of total farm marketing and ranks greenhouse/nursery, dairy products, hay, and potatoes as the four principal commodities in Alaska by order of marketing.

Alaska has only 34,000 acres of cropland reported to United States Department of Agriculture (USDA) as actively in production. There are 560 farms in Alaska with annual sales of $1,000 or more. These statistics are from *1999 Alaska Agricultural Statistics* issued cooperatively from USDA, DNR and University of Alaska Fairbanks, Cooperative Extension Service (UAF, CES). These figures do not take into account the much larger acreage of identified agricultural land that is currently rangeland, fallow, in federal reserve programs, or still forested. Alaska's agricultural production has been relatively stable for a number of years. Sustainable agriculture will potentially be an important part of the future economy of the State.

DEC's 1998 List of Impaired Water Bodies and the state Water Quality Assessment do not identify any water bodies for which the beneficial uses are impaired because of agricultural activities. This results from a combination of the relatively small size of the agricultural sector and nature of agricultural operations in the state. The DFG states, "Because of the relatively low level of agricultural activity in Alaska, this *(agricultural impacts)* has not been a major focus of the department's attention."

The 1995 *Alaska Coastal Clean Water Plan* found no significant impacts from any agricultural practices in coastal Alaska. The agriculture chapter of the *Alaska Coastal Clean Water Plan* was the product of a year and a half collaboration by state and federal agencies, interest groups and the general public. It covers all agricultural areas of the state except for the Tanana Valley near Fairbanks and Kenny Lake in the Copper River watershed, which are outside the coastal zone.

The plan concluded that the enforceable policies of the *Alaska Coastal Clean Water Plan* Plan are not needed for agricultural sources in Alaska and that the voluntary, best management practice (BMP) approach of the Nonpoint Source Pollution Program is a better way to manage agriculture in the state. The coastal nonpoint source program has received a categorical exclusion from the U.S. Environmental Protection Agency (EPA) and National Oceanic and Atmospheric Administration (NOAA) for the agricultural source category.

Given these opinions and the low level of agricultural development in the state when compared to the size of the state, it would be easy to conclude that there are no nonpoint source pollution problems relating to agriculture. However, agriculture in the state is relatively concentrated within a few regions and at the watershed level is important. Water quality monitoring in the state is not developed enough that we know the full extent to which agriculture may be a significant pollution source in certain watersheds. DEC's nonpoint source pollution control objectives with respect to agriculture are as follows:

- Continue to monitor the size and nature of the agriculture sector for any indications that the long-term trend of low levels of pollution might be changing.
- Maintain contact with stakeholders who are active in the agricultural sector and support identified efforts to prevent or control those sources of pollution that are identified as being of concern. Continue to support the main agricultural agencies in the state, DNR and Natural Resource and Conservation Service (NRCS), in their efforts to prevent or reduce surface and groundwater pollution from agricultural activities.
- Monitor trends in the growth of feedlots and dog mushing kennels to assure that these animal-feeding operations do not cause serious, localized pollution problems.
- Support monitoring of the atmospheric deposition of pesticides from outside Alaska in arctic Alaska and in the marine food chain.

Key Partnerships

The Natural Resources Conservation Service (NRCS), Alaska Department of Natural Resources Division of Agriculture, U.S. Department of Agriculture, Alaska Department of Fish And Game, University of Alaska Cooperative Extension, U.S. Environmental Protection Agency, Soil and Water Conservation Districts, and representatives of the general public interest in water pollution prevention and control.

Management Measures and Indicators

- Percent of assessed waterbodies that protect public health and the environment by supporting a) fish and shellfish consumption, b) safe recreation, and c) healthy aquatic life use designations (based on 305(b) report and 303(d) list).
- Percent of waterbodies on the Section 303(d) List of Impaired waterbodies that are listed because of nonpoint source pollution stemming from agricultural activities.

Agriculture Action Plan (AG)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
AG-1. Continue to participate in the NRCS statewide Technical Committee, which identifies Conservation Priority Areas for agricultural impact in Alaska. DEC participation in this committee is an important strategy to deal with any identified agricultural pollution problems. The Committee is also tracking the Unified National Strategy for Animal Feeding Operations as it relates to Alaska. **Note:** This committee funds Wildlife Habitat Incentive Program (WHIP) and Environmental Quality Incentive Program (EQIP) projects.	DNR, NRCS SWCDs, DEC	On-going	N/A* *Agriculture category exempted under program approval.
AG-2. Continue to provide funding for priority agricultural nonpoint source projects to the extent that they are identified as serious threats to water quality. Work with other partners to combine grant resources on any specific projects that may become priorities in the mid-term.	DEC, DNR, NRCS, SWCDs	On-going	N/A
AG-3. Track research that is being done nationally and internationally on atmospheric deposition of pesticides in arctic and marine environments	DEC	2003	N/A

X. MANAGING WATER QUALITY: PARTNERSHIPS AND ROLES

Improving the coordination and collaboration of water quality initiatives between agencies and organizations is an important part of the Alaska Nonpoint Source Strategy. Reaching consensus on the priority waters that require prevention and restoration will assure that resource will be used most effectively. The Department of Environmental Conservation will lead coordination efforts to provide consistency in meeting the goals of the Strategy, but it is ultimately the responsibility of everyone to work together to meet water quality needs in Alaska.

Governing agencies are involved in water quality protection and restoration activities at all levels, including tribal entities. Nongovernment organizations (NGOs), including local nonprofit groups, industrial associations, and private citizens, also play an important part in protecting water quality. Listed below are key state entities that have a role in clean water.

State Agency Programs

The state implements a wide range of programs designed to manage water resources. State resource agencies who have main roles in water resource management are the Departments of Environmental Conservation (DEC), Natural Resources (DNR), and Fish and Game (DFG), and the Division of Governmental Coordination (DGC) within the Governor's Office. The Department of Transportation and Public Facilities (DOTPF) also has a role in assuring that water quality if protected or degradation minimized for transportation projects, including road, highways, and harbors. Each agency has programs which have roles in protecting, maintaining, and restoring water quality and quantity and its' uses. These programs are described below.

Department of Environmental Conservation (DEC)

DEC is the lead environmental agency in the state, and has several divisions and programs that deal with managing, protecting, and restoring water quality. A full description of DEC programs can be found on the Internet website at http://www.state.ak.us/dec/. Specific programs relating to water quality are described below.

Nonpoint Source Pollution Control Program

Program Goals: To protect water resources and public health from non-point sources of pollution

Primary Services:

- Identify water quality priorities and needs in the state, including a list of impaired and potentially polluted waterbodies, so that local, state, and federal groups can focus their resources most effectively and efficiently.
- Establish a schedule for developing recovery plans (Total Maximum Daily Loads) on impaired water bodies.
- Provide technical assistance and pass through funding to municipalities, local groups, and other state agencies involved in water quality projects designed to protect, enhance, or restore polluted waters and protect local watersheds.
- Provide technical assistance to villages, cities, and municipalities in long term planning for impervious surfaces and hydrological impacts.
- Respond to public concerns and complaints on local water quality issues, affecting

either surface water or groundwater that may be a public or environmental health threat.

- Review timber harvest plans and perform related field inspections for forestry operations.
- Review highway projects and development projects greater than 5 acres in size and perform field-related inspections to prevent erosion and contamination during stormwater events.
- Develop methods for assessing wetland functions as a foundation for wetlands planning and permitting decisions.

Air and Water Data and Monitoring Program

Program Goals: Create better tools for better air and water quality decisions

Primary Services:

- Operate ambient air quality monitoring networks for carbon monoxide and breathable particulate pollution.
- Perform baseline assessment monitoring for new air pollutants (PM2.5 and Regional Haze).
- Conduct and provide for ambient water quality monitoring (accomplished by grants, contracts, and the regulated community).
- Provide technical assistance in developing monitoring plans for air and water monitoring projects.
- Provide quality assurance oversight for statewide air and water quality monitoring operations, as well as protocols for consistent quality assurance from citizen monitoring efforts.
- Develop and maintain air and water quality databases to provide rapid access to environmental data to improve assessment, mapping, and reporting of environmental conditions.

Water Quality Standards Program

Program Goal: Protect the waters of the state from toxic levels of pollutants.

Primary Services:

- Develop credible and scientifically defensible water quality standards that incorporate state-specific standards.
- Assist the public in using regulations by providing water quality standards guidance and technical assistance to user groups.
- Provide tools to explain and interpret the regulations, such as fact sheets, technical papers, workbooks, and training opportunities.
- Adopt site-specific water quality criteria when federal criteria are stricter than necessary or not strict enough to protect water uses.

State Water Discharge Permits and Certifications

Program Goal: To protect water resources and public health by regulating wastewater discharges.

Primary Services:

- Implement workgroup process to determine how to use existing resources and the future of the permit program.
- Work on unique issues that may significantly affect state interest or liability.
- Work on critical time sensitive EPA permits to issue a state certification

Drinking Water and Wastewater Program

Program Goal: To ensure public water systems provide safe water, and that domestic wastewater systems, public and private, safely and effectively treat and dispose of wastewater.

Program Services:

- Ensure that suppliers test drinking water as required for regulated contaminants.
- Review contaminant monitoring test results from public water suppliers and specify corrective measures where contamination is indicated.
- Approve new public water and wastewater systems and modifications to existing ones, and provide design assistance and training for certified installers of on-lot septic systems.
- Regulate minimum health standards and procedures for design, construction, and operation of Alaska's 1,700 class "A" and "B" public drinking water systems.
- Implement a rural drinking water compliance strategy to assist rural Alaska water systems in providing cost-effective safe drinking water.
- Provide information about contaminant monitoring and sampling procedures for public water systems and/or private wells.
- Respond to complaints of contaminated or damaged drinking water wells and impacted watersheds.
- Maintain a statewide database with monitoring, compliance, and enforcement information on public drinking water systems.
- Respond to confirmed waterborne disease outbreaks, incidents of illness and overflowing sewage systems.
- Provide workshops on wellhead protection and source water assessments for communities and public water systems.

Solid Waste Program

Program Goal: To work with municipalities, tribal entities, private businesses and industrial companies toward improved environmental management and protection at Alaska's landfills.

Primary Services:

- Prevent improper disposal of solid waste by issuing permits for the approximately

450 disposal facilities, including municipal landfills, landspreading of sewage sludge, disposal of contaminated soils, and land disposal of industrial wastes such as oilfield drilling muds.

- Annually inspect 150 landfills for compliance with permit conditions and regulations.
- Provide practical, hands-on advice to small towns and villages to help them improve community solid waste management.
- Work with owners of closed landfill sites to ensure that actions are taken to prevent contamination and protect public health and the environment.

Pesticide Services Program

Program Goal: To monitor and ensure the proper and safe use of pesticides to prevent adverse effects on human health, wildlife, and the environment.

Primary Services:

- Provide training and certify pesticide applicators
- Marketplace inspections
- Groundwater and endangered species - protection from pesticide contamination
- Agricultural Worker Protection Standard
- Restricted-Use Pesticide Recordkeeping
- Proper use, storage and disposal of pesticides
- Permits for aerial, aquatic, and public pesticide projects

Laboratory Services Program

Program Goal: To conduct chemical and microbiological sampling of food, water, and soils, and approve commercial and municipal laboratories to conduct analyses of drinking water and soil remediation.

Primary Services:

- Food Safety Laboratory - Palmer
- Certify in-state laboratories for microbiological analysis of drinking water.
- Conduct product and water sampling required by the National Shellfish Sanitation Program (NSSP) to ensure that bivalve shellfish can be marketed.
- Routinely test commercial bivalve shellfish for marine toxins responsible for paralytic shellfish poisoning and domoic acid poisoning.
- Evaluate and randomly sample finfish for chemical and bacterial contaminants and parasites.
- Perform animal testing required to maintain USDA brucellosis- and TB-free certification.
- Conduct meat inspection analyses required by USDA.
- Test for equine infectious anemia in horses intended for interstate shipment or entered

in state fairs or other special events.

- Evaluate raw and finished dairy products for bacterial contamination, antibiotics, butter fat content, and efficiency of pasteurization.
- Conduct on-site evaluations of, and certify drinking water laboratories and operators for bacteriological monitoring.

State Chemistry Laboratory - Juneau

- Certify in-state and out-of-state laboratories for chemical analysis of drinking water and accreditation for underground storage tank remediation.
- Provide general analytical testing for inorganic (metals, nitrate, nitrite, fluoride, etc.) and organic (volatiles, semi-volatiles) compounds in a variety of soils, sediments, sludges, waters and tissues.
- Perform tests needed for enforcement of water quality permits, of soils and waters around sites and industrial facilities, and sites of leaking underground storage tank remediation, and spill source matching.

Prevention and Emergency Response Program

Program Goal To approve the cleanup of oil and hazardous substances by the responsible party and be prepared to clean up the spill directly if the responsible party is not available to.

Primary Services:

- Lead the state's response to spills of oil and hazardous substances. Area response teams in Anchorage, Fairbanks, and Juneau also work as one team under the Incident Command System for large events.
- Oversee spill cleanup by the responsible party or take over cleanup when a responsible party is not found or is incapable.
- Evaluate spill impact, ensure containment and cleanup, and recover cleanup and restoration costs from the responsible party.
- Develop and enhance in-state hazardous materials response team capability.
- Participate in government and industry response drills and exercises.
- Maintain the Federal/State Unified Plan and the ten Subarea/Regional Contingency Plans for Alaska. Develop spill reporting and notification procedures.
- Manage term contracts with spill response organizations.
- Train local personnel in at-risk areas throughout the state.
- Keep timely and accurate spill information.

Industry Preparedness and Pipeline Program

Program Goal: To prevent spills from producers, transporters and distributors of petroleum products and pre-stage privately owned spill response equipment and trained personnel in Alaska's industrialized areas.

Primary Services:

- Assist the crude oil and refined oil industry in spill prevention, assuring that they have the personnel, equipment and financial resources to quickly respond to any spill and remediate its environmental damage.
- Review and approve about 140 oil discharge prevention and contingency plans for installations or operations across the state.
- Inspect facilities, pipelines, and marine vessels to provide assistance and ensure compliance with requirements.
- Participate in oil spill drills with the regulated industries to exercise and demonstrate response readiness.
- Administer the statewide Financial Responsibility Program to ensure that oil operators maintain the financial resources to respond to any spill and mitigate environmental damage.
- Provide technical assistance and information to contingency plan applicants and the public on spill prevention and response requirements.

Contaminated Sites and Remediation Program

Program Goal: To clean up sites contaminated by past improper disposal or discharges of hazardous substances.

Primary Services:

- Identify and assess sites contaminated with oil or hazardous substances to determine their potential threat to public health and the environment.
- Ensure that contaminated sites undergo investigation and cleanup in a priority order, based on threat.
- Use term contractors to clean up high priority sites that lack a responsible party.
- Recover the state's costs of oversight or cleanup from responsible parties.
- Develop hazardous substance cleanup standards and operating procedures for all phases of contaminated site work.
- Negotiate cooperative funding agreements with federal agencies to enable staff oversight of federal sites.
- Coordinate development of an annual budget proposal to clean up high priority contaminated sites where the state is the responsible party.

Storage Tank Program

Program Goal: To prevent and clean up spills from fuel storage tank systems, and provide technical and financial assistance to tank owners and operators for tank upgrades, closures, and site cleanups.

Primary Services:

- Coordinate with the Board of Storage Tank Assistance.

- Identify and inventory all Aboveground Storage Tanks (ASTs) in Alaska. Coordinate repair, upgrade, and consolidation of state owned ASTs.
- Respond to and provides technical assistance for underground tank spills.
- Provide UST financial assistance grants and loans to persons on the waiting list for upgrade, closure, and cleanup of their facilities.
- Coordinate funding for state agencies to upgrade state-owned tanks.
- Facilitate UST worker certification/training/testing with the Alaska Department of Commerce and Economic Development.
- Provide general and technical information concerning installation, closure and upgrading of tanks as well as up-to-date information on the latest cleanup technologies. Mechanisms include UST hotline, quarterly newsletter, lending library (4 locations), and a facilities database.

Village Safe Water

Program Goal: Provide grants and engineering assistance to smallest communities for water, sewer and solid waste projects.

Primary Services:

- Secure federal grant funds with state CIP matching funds.
- Provide grants to small communities for water, sewerage and solid waste studies and projects.
- Assign an engineer to each project to assist communities with planning, developing facility design options and selection, and addressing regulatory issues.
- Ensure appropriate and effective use of grant funds by disbursing funds to communities as progress payments after review of invoices.

Municipal Water, Sewerage, & Solid Waste Grant Program

Program Goal: Provide partial grants and engineering assistance to larger communities for water, sewer, and solid waste projects.

Primary Services:

- Secure federal grant funds with state matching funds.
- Provide grants with a 50 to 15 percent local match requirement to larger communities for water, sewerage, and solid waste projects.
- Assign an engineer to each project to assist communities with planning, developing facility design options and selection, and addressing regulatory issues.
- Ensure appropriate and effective use of grant funds by disbursing funds to communities as progress payments after review of invoices.

Municipal Loan Program

Program Goal: Provide loans and engineering assistance to communities for drinking water and wastewater projects.

Primary Services:

- Secure federal grant funds with state matching funds to further capitalize the Clean Water and Drinking Water Loan funds.
- Provide low-interest loans to communities for drinking water and wastewater projects.
- Assign an engineer to each project to assist communities with project planning, design, construction, and addressing regulatory issues.
- Ensure appropriate and effective use of loan funds by disbursing funds to communities as progress payments after review of invoices.

Department of Natural Resources (DNR)

DNR is the lead land management agency for the state whose mission is to develop, conserve, and enhance natural resources for present and future Alaskans. DNR's goal is to contribute to Alaska's economic health and quality of life by protecting and maintaining the state's resources, and encouraging wise development of these resources by making them available for public use. The Department of Natural Resources manages all state-owned land, water and natural resources, except for fish and game, on behalf of the people of Alaska. A full description of DNR programs can be found on the Internet website at http://www.dnr.state.ak.us/. Specific programs relating to water quality are found in the Division of Forestry, and the Division of Mining, Land and Water, and are more fully described below.

Alaska Forest Resources & Practices Act Implementation

Program goals**:**

- Protect riparian areas from the significant adverse effects of timber harvest activities on fish habitat and water quality.
- Adequately preserve fish habitat by maintaining riparian area characteristics that are important to fish.
- Prevent or minimize significant adverse effects of soil erosion and mass wasting on water quality and fish habitat.

Primary Services:

- Enforce the state law governing commercial timber operations, including harvesting; road construction, maintenance, and closure; and reforestation.
- Set standards for riparian zone protection through stream buffers, slope stability standards, and best management practices.
- Require a Detailed Plan of Operations from operators on private, municipal, and other public land for interagency review prior to harvesting.
- Conduct field inspections before or during operations, and before operation closeout.
- Enforce the standards through directives, stop work orders, notices of violations, and civil fines when violations occur.
- Assure that operations on federal land within the coastal zone meet or exceed FRPA

standards.

Water Rights Program

Program Goal: Encourage the maximum use of Alaska's water resources consistent with the public interest.

Primary Services:

- Determine and adjudicate water rights.
- Issue temporary water use authorizations.
- Facilitate the maximum use of the water resources consistent with public interest.
- Provide certainty and security of water property rights.
- Maintain over 16,000 water right records.
- Cooperate with, assist, advise, and coordinate plans with federal, state, local agencies, in matters relating to the appropriation, use, conservation, quality, disposal or control of water.

Alaska Hydrologic Survey

Primary Goals: To provide technical hydrologic information to ensure proper and accurate management of the State's water resources for the benefit of the people of the State of Alaska.

Primary Services:

- Collect, analyze, interpret, and report on all Alaska's ground and surface water resources, including wetlands, glaciers, and coastal waters.
- Provide scientific hydrologic data on the quantity and quality of Alaska's surface and subsurface waters and analysis and interpretation of data collected.
- Provide for review and analysis of data collected by other state, federal, and local agencies and industry.

State Land Use Plans

Primary Goals: Through resource planning, DNR works with the public to determine where the important resources are and how state land can be used for the maximum public benefit.

Primary Services:

- Collect information about natural resources, present and past land use, land ownership, and the local economy.
- Work with the public and resource agencies to classify state land according to the primary uses for the land. Key watershed areas are classified for Water Resources.
- Establish guidelines for management of state land to ensure that multiple uses occur in a compatible manner. Guidelines include setbacks in riparian areas, priorities for instream flow adjudications, and guidelines for activities in wetland areas.

Department of Fish and Game (DFG)

The Alaska Department of Fish and Game's mission is to manage, protect, maintain, and improve the fish, game and aquatic plant resources of Alaska. The primary goals are to ensure that Alaska's renewable fish and wildlife resources and their habitats are conserved and managed on the sustained yield principle, and the use and development of these resources are in the best interest of the economy and well-being of the people of the state. A full description of DFG programs can be found on the Internet website at http://www.state.ak.us/local/akpages/FISH.GAME/adfghome.htm. Specific programs relating to water quality are described below.

Habitat and Restoration Division

The goal of the Habitat and Restoration Division is to protect fish and wildlife habitat and to protect the public use of fish and wildlife resources that depend on this habitat. This is accomplished by reviewing applications and issuing permits for activities affecting fish-bearing waters, and state game refuges, critical habitat areas, and sanctuaries. The division participates in other land management agencies' permitting and planning activities to ensure that fish and wildlife needs are addressed as required by law. The division also develops, conducts, or administers various injury assessment and restoration projects funded with Exxon Valdez oil spill settlement funds.

The Division complements the efforts of other ADF&G divisions that primarily engage in fish and wildlife population management, research, and enhancement activities. It also works with the natural resource development community to make sure that fish and wildlife populations remain healthy as Alaska develops its mining, oil & gas, forest products, transportation and community-based resources. The division is relatively small— approximately 6% of the overall department budget.

Special Areas Designation and Management

The goal of the Special Areas Designation and Management Program is to protect legislatively designated fish and wildlife habitat, which includes refuges, critical habitat areas, and sanctuaries. Special Area regulations may be found at 5 AAC 95.400-900. The Division of Habitat and Restoration issues a special area permit for any habitat-altering work, including any construction activity.

Division of Governmental Coordination (DGC)

The Alaska Division of Governmental Coordination in the Office of the Governor, is the lead agency for the Alaska Coastal Management Program. A full description of DGC programs can be found on the Internet website at http://www.alaskacoast.state.ak.us/. Specific programs relating to water quality are described below.

Alaska Coastal Management Program

Program Goals: The state and communities develop coastal management programs that guide land use decisions and protect key resources so that development in coastal areas does not result in an unacceptable level of degradation of habitat and water quality.

Primary Services:

- Set regulatory standards to maintain or enhance coastal habitats and water quality.
- Incorporate as standards all of DEC's statutes, regulations, and procedures with respect to the protection of air, land and water quality.
- Coordinate reviews of major development projects in coastal areas.
- Assure that permit stipulations are added to make projects consistent with statewide coastal standards and coastal district enforceable policies.
- Work with local coastal districts to develop state – and federally – approved coastal management programs that include enforceable policies to protect habitat and water quality.
- Implement the *Alaska Coastal Clean Water Plan* to protect coastal waters.

Department of Transportation and Public Facilities (DOTPF)

The mission of the Department is to improve the quality of life for Alaskans by cost effectively providing, operating, and maintaining safe, environmentally sound and reliable transportation systems and public facilities. Special emphasis will be given to using meaningful public involvement and creating working partnerships with other entities. A full description of DOTPF programs can be found on the Internet website at http://www.dot.state.ak.us/. Specific programs relating to water quality are described below.

Statewide Design and Engineering Services

Program Goals: Responsible for the planning, design, construction and maintenance of state owned facilities.

Primary Services:

- Updating erosion and sediment control, and maintenance and operations BMPs to address short-term and long-term water quality associated with storm water runoff (i.e. airports, highways, airports, boat harbors and facilities).
- Developing pollution prevention plans to address water quality associated with storm water runoff from DOT facilities.

University of Alaska

The University of Alaska is comprised of three major campuses and associated regional extended campuses. The University of Alaska Fairbanks, as the nation's northernmost Land, Sea, and Space Grant University and international research center, advances and disseminates knowledge through creative teaching, research, and public service with an emphasis on Alaska, the North and their diverse peoples. The mission of the University of Alaska Anchorage is to participate in the development, dissemination, and application of knowledge through high quality instruction, research, and service to the public. The University of Alaska Southeast Juneau campus offers a variety of degree and certificate programs. Its marine setting lends itself to the study of marine biology and environmental science, while other degree programs in public administration and business administration take advantage of being located in the state capital.

Alaska Cooperative Extension Service

The Alaska Cooperative Extension Service (CES) provides an educational delivery system supported through a partnership between the U.S. Department of Agriculture and the State of Alaska through the University of Alaska Fairbanks, with local Alaska Cooperative Extension offices located throughout the state.

CES delivers university research benefits to all Alaskans through four primary program areas, including land resources, home economics, 4-H/Youth, and community development. Topics range from food and nutrition to Alaska gardening; water quality to arctic construction. CES water quality programs traditionally emphasize watershed stewardship – they are a consistent supporter of statewide public outreach events and provide an educational perspective for state and federal stakeholder groups.

Environment and Natural Resources Institute

The goal of the Environmental and Natural Resources Institute (ENRI) is to provide sound scientific data and analyses without advocacy for use in natural resource and environmental decision making. ENRI also fosters the use of consensus-building techniques to help build agreement on public policy issues related to Alaska's resources.

ENRI provides access to environmental and natural resources information, offers public and contractual information services through several resource information companies, and maintains cooperative links with natural resources libraries and researchers in Alaska, elsewhere in the United States, and in other circumpolar nations. Through networking and the use of database services and resource-sharing products, ENRI can quickly tap into virtually any information source relevant to Alaska.

Marine Advisory Program

The goal of the University of Alaska Marine Advisory Program is to assist in the wise development, utilization, and enjoyment of Alaska's marine resources without detrimental impact on the resources. The program provides a liaison between the University and maritime communities to transfer the problems and needs of the maritime public to researchers and academicians. It provides technical information to harvesters, developers, and users of marine resources, including information on the development of new technologies as well as new applications of existing technologies to marine problems. Other objectives include:

- Developing public awareness of marine resource management and conservation and providing assistance in solving multiple-use conflicts.
- Promoting understanding between marine resource users and marine resource managers.
- Providing information and assistance to coastal communities on problems of coastal stabilization, coastal zone management, and development of port facilities.
- Providing continuing marine safety education to the maritime public; and
- Aiding in the development of marine awareness programs specifically for communities and their schools.

Local Governments

Local governments play a vital role in protecting water quality, especially nonpoint source pollution, which is more readily controlled by local land use laws. Four types cover local

governing units in Alaska: Alaska municipal governments, coastal districts, soil and water conservation districts, and tribal governments:

Alaska Municipal Government

Alaska municipal governments are legal entities incorporated under Alaska law to perform both regulatory—i.e. police, zoning, etc., and proprietary—i.e. water, sewer, airport, etc. functions.

- 16 Organized Boroughs and Unified Home Rule Municipalities (perform areawide education, planning/platting/zoning, and tax assessment and collection powers)
- 145 Incorporated Cities (general government powers, public facilities and services, and regulatory powers)

Alaska Coastal Management Program Coastal Districts

Coastal Districts are designated areas for protection of the coastal zone through local plans and consistency of state and federal permits.

- 33 Coastal District Programs (local plans to address local needs and resources)
- 33 Areas Meriting Special Attention (special area plans for high value areas)

Alaska Soil & Water Conservation Program

Alaska Soil and Water Conservation Districts are a grassroots partnership of local owners, state and federal agencies that work to manage, conserve and develop resources. Districts include:

- 11 Local Soil and Water Conservation Districts (locally designated districts)
- Alaska Conservation District (covers all areas not in a local district)

Tribal/Native Organizations

Native organizations are community-based with close ties to local economies. They have the ability to deliver locally and culturally relevant programs. Significant organizations include:

- Metlakatla Indian Reservation
- Indian Reservation Act (IRA) Tribal Councils
- ANILCA Native Corporations

Non-government Organizations

Non-governmental organizations fill gaps in and complement government agency roles. These groups often represent stakeholders in a watershed process or water quality issue, and are therefore vital for assuring that all of the needs and concerns of a watershed community are addressed.

Public and private nonprofit groups with water quality as a mission take a variety of shapes. Statewide environmental groups, such as Trustees for Alaska or Alaska Conservation Alliance often take on larger, statewide water quality issues. Other groups, such as Cook Inlet Keepers, Southeast Alaska Conservation Council, Northern Alaska Environmental Center, or the Prince William Sound Regional Citizens Advisory Council, take a regional interest in water quality issues most affecting their area. Local groups, such as the Anchorage Waterways Council,

Mendenhall Watershed Partnership, or Noyes Slough Action Committee, often spring up as a result of a need or concern in a community that is not being met.

Industry Associations can be found for every major industry in Alaska. Similar to other nonprofit groups, these can be industry-wide in scope, such as the Resource Development Council and Producers Council, or specific to one type of industry, such as the Alaska Oil & Gas Association, Pacific Seafood Processors Association, Alaska Forest Association, Alaska Miner's Association, or Alaska Council on Tourism. While these groups typically advocate for their constituents, they have been known to play significant roles in addressing key water quality issues affecting their industry.

Watershed Partnerships

Watershed partnerships provide a framework that enable citizens and agencies to work together to formulate strategies for protecting watershed resources that address community concerns and that are tailored to the social and cultural context of their area. Agencies recognize that such an approach is necessary in order to achieve the grassroots support and community involvement that are key to successful resource management. Agencies can also better carry out their own regulatory mandates by using the watershed approach and working through watershed partnerships. Several agencies have both separate and overlapping responsibilities under the federal Clean Water Act. For example, coordinating DEC's water quality efforts with the DFG's fish and shellfish habitat protection programs can lead to shared information, integrated plans, and time and cost savings for both agencies.

Federal Agencies

Federal agencies play a variety of roles in protecting water quality, from implementation of the Clean Water Act, to federal oversight of fisheries, wildlife, wetlands, federal lands and forests, coastal zone management, and offshore leasing. Key agencies in Alaska include:

- **U.S. Environmental Protection Agency** (federal manager for air, land, and water quality)
- **U.S. Fish and Wildlife Service** (conserve, protect and enhance fish and wildlife, federal land managers on National Wildlife Refuges)
- **Army Corps of Engineers** (develops and protects water resources and wetlands)
- **NOAA/National Marine Fisheries Service** (fed manager of fisheries and marine habitats)
- **NOAA/Office of Oceans & Coastal Resource Management** (federal coastal zone management)
- **U.S. Forest Service** (federal land managers on national forests)
- **Bureau of Land Management** (federal land managers, oversight on Trans Alaska Pipeline)
- **Minerals Management Service** (federal manager of offshore oil and gas leasing)
- **Natural Resource Conservation Service** (federal land conservation managers)
- **U.S. Geologic Survey** (hydrologic information to manage the nation's waters)
- **National Park Service** (federal managers on preserve and park lands)
- **Federal Emergency Management Agency** (coordinates and funds cleanup and restoration of impacts from disasters)

XI. SOURCES OF FUNDING & PROGRAM ASSISTANCE

More and more communities are adopting a watershed approach to solving their water quality and other natural resource problems. By considering the inputs from all pollution sources and activities within a hydrologically defined drainage system, managers can understand their watershed on a more holistic level and determine needs for restoring and maintaining the watershed's chemical, physical, and biological integrity. By combining forces and resources, communities, agencies, and interest groups are now better equipped to address their local watershed issues.

Communities and local organizations know the types of projects most needed in their area, but they are often unable to implement such projects because of a lack of financial and technical support. With limited funds available and limited discretionary spending, federal, state, and local government programs are rarely able to provide a single primary source of funding. Combined together they can result in environmental progress.

Federal Funding Sources

The EPA Office of Water has developed the Catalog of Federal Funding Sources for Watershed Protection (Second Edition) to inform watershed partners of federal monies that might be available to fund a variety of watershed protection projects. This version of the Catalog updates EPA's Catalog of Federal Funding Sources for Watershed Protection printed in 1997 (EPA-841-B-97-008), and can be found at http://www.epa.gov/owow/watershed/wacademy/fund/intro.html.

The document contains a one-page fact sheet for each of 69 funding sources that indicates to the reader the type of projects funded and eligibility requirements. Contacts and Internet sites are provided so the reader can obtain further information. This Catalog lists federal sources that provide monetary assistance (grants, loans, cost sharing) and does not present sources that offer only technical assistance. The information presented reflects sources available as of December 1999. Funding sources by topic include:

- Agriculture
- Coastal Waters
- Disaster Prevention and Relief
- Economic Development
- Education and Research
- Environmental Justice
- Forestry
- Indian Tribes
- Mining
- Monitoring
- Pollution Prevention and Control
- Watershed and Drinking Water Source Protection
- Wetlands

- Wildlife

State Funding Sources for Water Quality and Watershed Activities

Performance Partnership Grant

The primary source of state funding for nonpoint source activities and projects is an annual *Performance Partnership Grant* administered by EPA that combines funding from a variety of sources authorized in the Clean Water Act. These include funding from Section 319 Nonpoint Source Control, Section 106 Water Pollution Control, Section 106 Groundwater Protection, and Section 104(b)(3) grants. The Performance Partnership Grant funds require approximately 40% match from non-federal sources, which comes from both state funding and from local sources. The scope of work performed using funds from the Performance Partnership Grant is negotiated annually with EPA and documented in a *Performance Partnership Agreement*. Funding from the Performance Partnership Grant used to implement the Nonpoint Source Pollution Control Program is allocated into three categories:

- Department of Environmental Conservation water quality programs
- Collaborative projects with the Department of Fish & Game, Department of Natural Resources, and the University of Alaska
- Grants to communities for local watershed protection and restoration projects.

Municipal Grants and Loans for Water and Sanitation Projects

Municipal Grants

DEC's Division of Facilities Construction & Operation administers state grants to municipalities for public water, wastewater, solid waste, and water quality enhancement projects. Local match requirements depend on a community's population and can include federal funds.

Alaska Clean Water Fund (Revolving Loan Fund)

The Alaska Clean Water Fund is a revolving loan fund that provides low-interest loans primarily for public wastewater collection, treatment, and disposal projects. Funding for nonpoint source pollution controls and estuary protection projects is also encouraged. Projects funded under the Alaska Clean Water Fund must have identifiable water quality benefits, and only those portions of the project that are water quality related may be funded. Alaska intends to use the Alaska Clean Water Fund for the following types of nonpoint source pollution control projects, further described in the source chapters in the Strategy:

- Upgrading solid waste facilities, including but not limited to leachate collection and treatment projects
- Closeout of municipal landfills
- Stormwater management facilities including sediment basins and constructed wetlands, etc.
- Erosion controls
- Rehabilitation of stream banks, riparian corridors and buffers
- Wetlands restoration and preservation
- Wetlands mitigation banking
- Purchase of conservation easements

- Septic system improvements and replacement
- Estuary management projects

Program Assistance from the Environmental Protection Agency

The Watershed Academy

Public and private organizations, academic institutions, and citizens and their governments in thousands of communities across the nation are forming partnerships and learning new ways to manage their watersheds together. These groups seek guidance and examples of successful watershed approaches, which they may use to model their own activities. The EPA's Office of Water established the Watershed Academy to help address such needs.

The Watershed Academy assists in the protection of water quality on a watershed basis by offering training courses and developing educational materials. Information about the Academy and its services is available on the Internet at http://www.epa.gov/owow/watershed/wacademy/. The Academy offers training courses on watershed processes, functions, and management techniques, and it publicizes watershed-related training programs developed by others. In addition, the Academy provides watershed management facilitation services to help states and tribes implement watershed approaches, offers the Academy 2000 Internet-based training modules, and prepares watershed-related educational documents through its Information Transfer Series.

Academy 2000

EPA has developed an internet-based distance learning program, Academy 2000, to help train people who cannot attend live training courses. Academy 2000 is a set of self-paced training modules that provide a basic but broad introduction to the many facets of watershed management, organized under the following themes:

Introduction/Overview •Watershed Ecology •Watershed Change Analysis and Planning Management Practices Community/Social Context

Academy 2000 now has more than 20 modules available and more under development. These modules cover the most important watershed management topics those subjects about which watershed managers, local officials, involved citizens, decision makers, and others should have at least an introductory level of knowledge. Completing a series of 15 of these modules earns the Academy 2000 watershed-training certificate. Ten of the required certificate modules and their self- tests are now available, and the rest will be completed during 2000.

Information Transfer Series

EPA’s Watershed Academy provides watershed references through the Watershed Academy Information Transfer Series. The documents in the series are available on the Watershed Academy's web site. The Information Transfer Series publications available to date include the following:

- Watershed Protection: a Project Focus (EPA841-R-95-003)
- Watershed Protection: a Statewide Approach (EPA841-R-95-004)
- Monitoring Consortiums: a Cost-effective Means to Enhancing Watershed Data Collection and Analysis (EPA841-R-97- 006)

- Land Cover Digital Data Directory for the United States (EPA841-B-97-005)
- Designing an Information Management System for Watersheds (EPA841-R-97-005)
- Information Management for the Watershed Approach in the Pacific Northwest (EPA841-R-97-004)
- Inventory of Watershed Training Courses (EPA841-D-98-001)
- Statewide Watershed Management Facilitation (EPA841-R-97-011)
- Watershed Approach Framework (EPA840-S-96-001)
- Top 10 watershed Lessons Learned (EPA840-F-97-001)
- Catalog of Federal Funding Sources for Watershed Protection (2nd Ed.) (EPA841-B-99-003)
- Watershed Training Opportunities (EPA841-B-98-001)
- Stream Corridor Restoration: Principles, Processes and Practices (EPA 841-R-98-900)

Other Sources of Program and Funding Assistance for Nonpoint Source Pollution

Federal Sources

- **American Heritage Rivers' Catalog of Services** (Source: U.S. Environmental Protection Agency's Office of Water). EPA's American Heritage River Internet site (http://www.epa.gov/rivers/services/) offers a comprehensive listing of services (sources of assistance, helpful documents and guides, etc.) available to those working to improve the health of rivers across the nation.
  - **Beyond SRF: A Workbook for Financing Comprehensive Conservation Management Plans Implementation** (Source: U.S. Environmental Protection Agency's Office of Water, Document No. EPA 842-B-96-002, August 1996). This workbook presents potential approaches for financing coastal protection (in addition to employing the state revolving fund), especially those defined under the National Estuary Program (NEP). This document is available from the National Service Center for Environmental Publications (NSCEP).
  - **Environmental Finance Program** (EFP). Has developed the EFP to assist communities in their search for creative approaches to funding environmental projects. Drawing on the financing expertise of staff, the Environmental Financial Advisory Board (EFAB), and university-based Environmental Finance Centers (EFC), the EFP seeks to lower costs, increase investment, and build capacity by creating partnerships with state and local governments and the private sector to fund environmental needs. The EFC Network can be found at http://www.epa.gov/efinpage/.
  - **EPA's State Revolving Fund (SRF) Program** (Office of Wastewater Management, Office of Ground Water and Drinking Water). SRFs are available to fund a wide variety of water quality projects, including all types of nonpoint source, source water protection, and estuary management projects, as well as more traditional municipal wastewater and drinking water treatment projects.
  - **Clean Water State Revolving Fund Publications** (CWSRF) documents are available on

the Internet at http://www.epa.gov/owm/.

1. Funding Water Conservation and Reuse with the Clean Water State Revolving Fund (EPA 832-F-99-050, June 1999)

2. The Clean Water State Revolving Fund Program (EPA 832-F-99-051, May 1999).

3. Funding Estuary Projects Using the Clean Water State Revolving Fund (EPA 832-F-98-005, October 1998)

4. Using the Clean Water State Revolving Fund to Reduce Animal Feeding Operation Pollution (EPA 832-F-98-009, October 1998)

5. Cleaning Up Polluted Runoff with the Clean Water State Revolving Fund (EPA 832-F-98-001, March 1998)

6. Protecting Wetlands with the Clean Water State Revolving Fund (EPA 832-F-97-017, September 1997)

7. The Clean Water State Revolving Fund: How to Fund Nonpoint Source and Estuary Enhancement Projects (EPA 909-K-97-001, July 1997)

- **Drinking Water State Revolving Fund Publications** (DWSRF). The following DWSRF publications are available on the Internet at http://www.epa.gov/ogwdw/dwsrf.html or http://www.epa.gov/safewater/Pubs/index.html:

1. Drinking Water State Revolving Fund Management Manual (November 1999)

2. Prioritizing Drinking Water Needs: A Compilation of State Priority Systems for the Drinking Water State Revolving Fund Program (February 1999)

3. Drinking Water Infrastructure Grants Tribal Set-Aside Program Final Guidelines (EPA 816-R-98-020, October 1998)

4. Guide to Using EPA's Automated Clearing House for the Drinking Water State Revolving Fund Program (EPA 832-B-98-003, September 1998)

5. New Federal Funding for Land Acquisition and Conservation Easements (EPA 816-F-97-010, October 1997)

6. Drinking Water State Revolving Fund Program Guidelines (EPA 816- R-97-005, February 1997)

- **A Guide to Grants, Fellowships, and Scholarships in International Forestry and Natural Resources** (Source: U.S. Department of Agriculture's U.S. Forest Service, International Forestry Division, Document No. FS-584, December 1995). This guide, available on the Internet at http://www.fs.fed.us/people/gf/gf00.htm, contains a detailed description of grants, fellowships, and scholarships available to university students, scholars, and professionals seeking funding to undertake studies or research in forestry or natural resources.

- **Multi-Objective Management (M.O.M.) Resource Directory** (Source: U.S.

Department of the Interior, National Park Service's Rivers, Trails, and Conservation Assistance). M.O.M. is a stand-alone, Windows-based database that contains more than 300 assistance programs offered by private, state, and federal sources. By typing in keywords, the user can locate information about relevant programs. This database is available free of charge from the National Park Service.

- **National Agricultural Library** (NAL). The NAL (http://www.nal.usda.gov/) is one of four national libraries in the United States. NAL is a major international source for agricultural and related information. Funding resource information is available through two of the NAL's Specialized Information Centers the Water Quality Information Center (WQIC) and the Rural Information Center (RIC). The WQIC offers links to water quality-related funding information.
- **Protecting Sources of Drinking Water: Selected Case Studies in Watershed Management** (Source: U.S. Environmental Protection Agency, Document No. EPA 816-R-98-019, September 1998). This document, available on the Internet at http://www.epa.gov/safewater/swp/cstudy.html, details the experiences of 17 drinking water suppliers funding and implementing source water protection activities.
- **Research and Management Systems** (RAMS). RAMS (http://www.sciencewise.com/) is a federal service for the education and research community, offering software systems for electronic grant management, education opportunities, and research and development information. Services include FEDIX, an online database of federal grant and research opportunities.
- **United States Geological Survey** (USGS). The USGS provides funding for research, water resources data collection, data management, and information transfer activities. USGS program information is available at http://www.usgs.gov/ and also at http://www.cfda.gov/
- **Water Quality: A Catalog of Related Federal Programs** (Source: U.S. General Accounting Office, Document No. GAO/RCED-96-173, June 1996). This catalog briefly describes water quality-related federal programs that offer financial assistance, as well as technical assistance, planning or advisory services, studies, and education. This document is available on the Internet at http://www.gao.gov/AIndexFY96/searchpg.htm

Private, Nonprofit Sources

- **Commission for Environmental Cooperation** (CEC). CEC is a tri-national body (Mexico, Canada, and the United States) created by the environmental side accord to the North American Free Trade Agreement. The CEC created the North American Fund for Environmental Cooperation (NAFEC) to provide funding for community-based environmental projects in North America. Nonprofit, nongovernmental organizations are eligible to apply for grants. For more information, see http://www.cec.org/home/index.cfm?varlan=english/.
- **Community of Science** (COS). The COS Funding Opportunities Internet site (*http://www.cos.com*), updated daily, includes information on more than 15,000 grants from around the world.
- **Conservation Technology Support Program** (CTSP). CTSP (http://www.ctsp.org) annually awards grants of equipment plus software to tax-exempt conservation organizations

to build their geographic information system (GIS) capacity.

- **Environmental Support Center** (ESC). The goal of ESC's (http://www.envsc.org/) is to improve the U.S. environment by enhancing the health and well-being of local, state, and regional organizations working on environmental issues. ESC offers a Training and Organizational Assistance Program, a Technology Resources Program, a Workplace Solicitation Program, and a new Environmental Loan Fund to help environmental groups become better managed, funded, and equipped.
- **National Center for Small Communities** (NCSC). NCSC (http://natat.org/ncsc/) is a national, nonprofit organization devoted to serving the leaders of America's smaller communities. NCSC provides small town decision-makers with the tools to govern effectively and the skills to expand local economies, protect natural resources, and preserve community character. NCSC offers a series of funding resource publications:

  1. Action Guide for Source Water Funding: small town and rural county strategies for protecting critical water supplies. The guide summarizes local source water protection responsibilities and strategies; explains the opportunities for local governments available through federal programs; and identifies key points at which input can help determine state-based source water priorities and set-aside funding levels to benefit local and county governments. (http://natat.org/ncsc/PRGRAMS_AND_SERVICES.HTM).

  2. Source Water 2000: funding and assistance programs to protect small town and rural drinking water (34 pages; order on-line for free) describes small town and rural county program opportunities and presents a strategy for making rural county and small town voices heard.

  3. Keys to Successful Funding identify major federal and foundation funding sources and strategies for developing competitive applications. In addition to grant and loan funding, the guide identifies free or affordable sources of planning, technical, and administrative expertise, as well as contacts, hotlinks, and Internet sites of particular value.

  4. Innovative Grassroots Financing: a small town guide to raising funds and cutting costs helps community leaders meet the challenges of paying for programs and services in the face of taxpayer resistance and limited public resources.

- **National Fish and Wildlife Foundation** (NFWF). NFWF (http://www.nfwf.org), a nonprofit organization established by Congress in 1984, awards challenge grants for natural resource conservation projects. NFWF uses its federally appropriated funds to match private sector funds. NFWF's six priority program areas include wetland conservation, conservation education, fisheries, neotropical migratory bird conservation, conservation policy, and wildlife and habitat.
- **Non-profit Resource Center** (NRC). The NRC (http://www.not-for-profit.org/) serves as a one-stop directory for Internet resources of interest and value to nonprofit organizations. NRC provides valuable information, including a comprehensive list of fund-raising publications, fund-raising software and consultants, fund-raising programs, and information on grants.
- **Resources for Global Sustainability** (RGS). RGS offers grant seekers a variety of services, including identification of potential funders, information about colleagues, and custom reports on request. RGS's annual directory, Environmental Grantmaking Foundations,

provides information on more than 800 foundations that fund environmental projects. For more information see the RGS web site (http://www.environmentalgrants.com).

- **River Network**. River Network (http://www.rivernetwork.org) works to protect and restore America's rivers by building the capacity of grassroots organizations and acquiring threatened riverlands. River Network offers publications, fund-raising tips, technical assistance, and the opportunity to network with other groups across the country.
- **Sustainable Community Network** (SCN). SCN (http://www.sustainable.org/) focuses on using innovative strategies to produce communities that are environmentally sound, economically prosperous, and socially equitable. The SCN Internet site offers a variety of information, including funding sources and a comprehensive.

XII. INFORMATION MANAGEMENT SYSTEM

Ecosystem or watershed level management requires integration and access to data from many different projects and initiatives. Information sharing has become an expectation rather than an anomaly. Attitudes, capabilities, and expectations regarding information are evolving. Even so, it is currently difficult to develop a comprehensive picture of existing data resources when working to understand the health and needs of a watershed. Past practices have often ended in data and results being pigeonholed and lost because of various situational restrictions such as funding, perceived propriety, or technological capabilities at the time of the investigation. A goal of DEC is to use existing data more efficiently, to make funding more effective, and to stem the loss of historic knowledge.

Strategy for Development & Implementation of Data Management System

DEC has committed to a long-term goal of integrating data received from the water programs in the Division of Air and Water Quality with the other departmental data management and integration efforts. To accomplish this goal there is an ongoing effort to:

1. ***Identify all divisional water program databases, data needs and relationships to departmental data integration efforts.*** Collect data structures from existing databases and proposed data collection/utilization needs. Review and contrast the water program data structures and data needs to the department's data integration model. A data dictionary and structures document supports and defines steps needed for data integration. The data dictionary highlights information that is critical for program function, common data, and structures that fit with the department's integration efforts.

5. ***Develop feasible method(s) to allow retrieval of information from division databases and form queries.*** Analysis and use of division information requires suitable methods to share data. The purpose is to identify data collection efficiencies, minimize data entry efforts, compare, and retrieve data rapidly. Methods include Internet accessible queries, geographic based queries, and queries based on permit numbers. Maintain a diagram of information flow within the division. The diagram does not necessarily show every data element. It reflects how information from different databases moves or could move through the division. The flowchart assists in making decisions on how data is accessed and displayed. Information from databases is regularly used for reporting purposes and regulatory *activity.*

6. ***Outline steps to implement data integration.*** Data integration may require modifications to existing database structures. Additionally, there may be software or hardware that would enable data sharing. The data integration proposal will detail the steps to data integration. At a minimum, it should provide a logical progression in making data structure modifications, hardware or software implementation, documentation, testing, user acceptance, and training.

7. ***Define tasks for completing the implementation of data management goals.*** Phase two implements the results of the needs analysis. A list of tasks and resource needs (time, cost, software, programming, hardware, and FTEs) defines the scope for its completion. The plan describes the goals, objectives, steps, and resources to achieve full implementation. This plan acts as the scope of work for the next phase in this project. The implementation plan provides detail in tasks, deliverables, and estimated implementation time.

Architecture for an Information Management & Monitoring System

The Cook Inlet Information Management & Monitoring System (CIIMMS) is a two-year project, funded by the Exxon Valdez Oil Spill Trustee Council, that was initiated in 1998 and is designed to deliver an integrated database containing digital and spatial data for the Cook Inlet Watershed. This database and its associated graphical user interface will support monitoring, management and restoration of resources and services injured by the Exxon Valdez Oil Spill, as well as provide data sets and tools valuable to addressing the ecological health of a watershed. This system is unique in that it provides access to a broad spectrum of timely data and analysis tools via the Internet. The CIIMMS will allow regulators, resource managers, planners, and others to approach decision-making from a watershed perspective.

The Cook Inlet Information Management/Monitoring System (CIIMMS) provides an interactive web site (http://www.dec.state.ak.us/ciimms/) that links to a geographically distributed system of information providers. Through the CIIMMS web site, users are able to identify and access (e.g., download and print) information ranging from primary data (geospatial and tabular) to reports, project descriptions, and other documents across a variety of themes, such as habitat, land use, resource management, pollution, and water-quality information. CIIMMS will also provide (on-line) tools to make it easy to contribute information to the CIIMMS network. In the long term, CIIMMS will use integrated information resources and tools to create a virtual community center for Cook Inlet learning, resource management, and related activities.

CIIMMS not only comprises the hardware, software, and information contact components of the information management and monitoring system; it also establishes a framework for managing information resources more efficiently. Two important components of CIIMMS development are (1) establish an advisory group made up of data providers and users to oversee implementation and (2) publish guidelines on how to implement various aspects of the framework (e.g., compile metadata).

CIIMMS will be expanded to other areas of the State, while providing the tools and the framework that enable a unified approach to information management throughout a watershed. A statewide information management and monitoring system (SWIMMS) will help agencies and organizations use existing resources, such as water quality information, more effectively.

Integrating Nonpoint Source Links with SWIMMS

In order to assure a high degree of public access to water quality information it is vital that the Air & Water Quality Division actively seeks to maintain and improve its web site and associated pages. Each of the three water programs provides content for incorporation onto the program's main web page. Design and functionality is a collaborative process between the program manager and Statewide Database staff responsible for packaging and launching web content through web pages. Statewide Database staff also provide program mangers access to SQL(structured query language) server support, a way of capturing and centrally storing information across long distances and sharing information across programs. Web-based forms are created for user input and collection of information over the Internet, automatic storage to the SQL server databases and developing appropriate query structures.

Critical to data integration is the development of database standards and a single facility identifier. The department has developed database standards and is in the process of updating

existing databases to these standards, which includes eliminating redundant data in multiple systems.

As a part of the data integration project, all relevant, non-administrative applications will be migrated to client/server technology. As a first step toward that goal, key databases will be converted using the central framework. This framework will then be expanded to include other databases and applications. The migration to client/server database system will ensure the integration of reporting and data management systems across all regulated sources and programs through adoption of common Internet-based technology and data standards.

The SQL Database Server will be used as the client/server database engine, except where ORACLE-based EPA provided applications are deemed more economical and practical. Data from different programs will be linked through a common facility/site identification numbering scheme. Core applications will be web-enabled. Web-enabling the core applications has been identified as a three-step process. The first step is to identify the business services that will be offered. The second step will consist of creating web page services to generate content from the business services. The third step will be to integrate those services with our web environment.

The biggest driver for the move to web-based systems is the universal interface afforded by browsers. The user might be dealing with many different kinds of repositories, but the browser can make those differences transparent.

By correctly web-enabling core applications, the public will be provided on-line access to permits and other information that might be of interest to them while avoiding the problems of variable client platforms at user sites, duplicate applications and databases. Moreover, the benefits of web enabling multiply over time. Whenever business rules change, a single, centralized component can be updated and all applications will reflect that change.

STORET Program Integration as a Data Management Cornerstone

STORET (short for STOrage and RETrieval) is a repository for water quality, biological, and physical data and was developed by EPA for use by states and the public. The STORET system was recently updated to function in an ORACLE, thin-client/server, web-based environment.

Water quality data is a cornerstone of the non- point source program. It is a critical component to Total Maximum Daily Load (TMDL) development and implementation, the targeting of priorities for restoration and protection, the assessment of water quality trends in Alaska and the application of appropriate best management practices for controlling nonpoint sources of pollution. The new STORET system can be used to support the water quality data capture needs of the nonpoint source program, including staff support applications, in addition to the needs identified through the nonpoint source grant program.

STORET, as envisioned, can serve as the primary data capture method for storing and reporting water quality data generated directly by:

- DEC program staff
- Nonpoint Source grant recipients
- Volunteer organizations

- Third party contractors
- Discharge permittees reporting water quality data

It may be necessary to modify STORET's front-end interface to make it more applicable to Alaskan needs. Once the user interface is defined, a set of user-operating protocols are developed to assure high quality data entry, including appropriate quality assurance/quality control review prior to any data stored permanently in the STORET database.

Vision of A State Water Quality Permitting System & Reporting to STORET

The Nonpoint Source program develops a set of required quality assurance/quality control protocols related to the program. Nonpoint source projects that require data collection would develop a quality assurance plan (QAP). The QAP defines protocols related to data collection and are entered by agency staff. The QAP serves as the vehicle to populate STORET with specific project related QA/QC collection and analysis information required of STORET for establishing a project.

Project data is either entered into STORET, by the project grantee as individual records or batch uploaded. An alternative means of loading project data would be for agency staff to batch load data at periodic intervals. Either way, data are QA/QC reviewed in a temporary file. Upon approval by the QA Officer, data are moved to permanent storage in the agency's STORET system. At periodic intervals, data is transferred to the national STORET system managed by EPA.

The State of Alaska is re-building a water quality-permitting program to address discharges to state waters. The development of a one-stop electronic permitting site as an operational vision would include a web-accessible entry point. Permit application information is entered over the Internet and previous choices would determine applicable selections via drop-down boxes for subsequent information responses. Submitted information would generate a draft permit for site-specific conditions. The appropriate permit writer is notified to review the draft permit and re-draft specific conditions related to the permit. The permit is issued after the public notice elements are expedited through an electronic notification process.

Permits would also be available to the public through a download capability. Permit monitoring and reporting is enhanced through submission of monitoring reports over the Internet for review by permit compliance inspections, whereupon data would be digitally transferred to the state's STORET system. Upon acceptable QA review, data is permanently stored in Alaska's STORET system and periodically batch transferred to the national STORET system, via the Internet.

Permit and spatial trend monitoring are accomplished using queries of the water quality permit system and STORET in concert with geographic information system (GIS) mapping capabilities and USGS digital quad maps. A GIS/IMS map server provides the means to effectively communicate this information over the Internet both to the public as well as agency staff. This is an integral component to the Department's information management strategy and the maintenance of the server is the responsibility of the Division of Administrative Services/Information Services.

Nonpoint Source Project Management Database

As the nonpoint source program matures, an essential tool in tracking the progress of multiple grant projects, both current and past, lies in the development of an effective SQL database. The database would allow for statewide agency entry of specific information related to project status and common reports for management purposes, along with specialized query capability. This would not only provide management with a means to identify current status and geographic areas of project focus, but would serve as a tool to help manage grant-related monitoring activity within Alaska and help assure grant related-data is entered into STORET.

Nonpoint Source Grant Management & Fiscal Tracking Database Applications

It is essential to consider both the grant management database needs of the nonpoint source program including both fiscal tracking, as well as project management. These considerations are currently included in the development of an overarching administrative function at the departmental level.

TMDL Scheduling & Tracking System Development

Although not currently in existence, it will be essential to develop a means to track and schedule TMDL activity over time to assure effective implementation. The integration of a nonpoint source TMDL management database to effectively assure development and implementation are meeting required target dates into the future will be valuable and will serve as a means to monitor historical activity associated with waterbody restoration. Additionally, it will help address the State's need to secure requisite funding with a clear map into the future and an effective means of reporting past activity to assure success.

Assessment Database (ADB) & Section 305(b)/303(d) Tracking/Reporting

The Assessment Database is a relational database application for tracking water quality assessment results and generating reports, particularly useful for Clean Water Act Section 305(b) and 303(d) reporting and listing functions. DEC has committed to building this database on individual waterbodies for which there is assessment information, and reports the status of water quality for these waters and the status of water quality in Alaska on a statewide basis. Assessments that show impairments (e.g., non-supporting uses or persistent exceedances of water quality standards, Section 303(d) listed waters), or assessments that report waters are maintaining and attaining water quality standards, are entered into the database. In addition, the causes (pollutants) and sources of pollution may also be entered into the database. Alaska can track and report on this information, and on many other types of assessment data, for hundreds or thousands of waterbodies within this database. It allows for custom queries enabling the review of data in a variety of ways. The ADB is designed to make this process accurate and straightforward, yet flexible and user-friendly. It also allows Alaska to meet its water quality reporting requirements to EPA under the Clean Water Act.

DEC has committed to developing, building and maintaining ADB to:

1. provide an electronic repository for water quality assessment information of Alaskan waters,

2. improve the quality and consistency of water quality reporting,

3. improve water quality management decision making and water quality data analysis, and

4. reduce the burden of federal Clean Water Act reporting requirements.

The ADB water quality assessment information:

- Provides input into Alaska's water quality priorities
- Assists in tracking short and long-term goals within the Nonpoint Source Pollution Control Strategy to protect surface and ground waters
- Identifies where waters are impaired or threatened by nonpoint source pollution
- Identifies nonpoint sources of pollution or pollutants
- Assists in periodically evaluating nonpoint source program success by using environmental and functional measures of success in terms of sources and water quality impairments

Clean Water Needs Survey Database (CWNS) As A Management Tool

The Clean Water Needs Survey (CWNS) is conducted to assess needed water pollution control facilities and includes non-point sources. Alaska enters updates and maintains data into the recently EPA developed CWNS 2000 database for Alaskan facilities. (For nonpoint source related needs, a control activity at a waterbody location more closely describes the facility concept.) The CWNS includes detailed estimates of capital costs eligible for funding under the State Revolving Fund program. Every four years, Alaska updates and enters new data to reflect documented costs for existing and new categories of needs using the most current planning documents. The value of this information to Alaska lies predominantly in the ability to estimate total maximum daily load and restoration costs, develop realistic implementation plans and develop geographically-focused projections of priority needs and costs in Alaska for planning purposes.

Citizen Monitoring of Water Quality

DEC seeks to incorporate the principles of the watershed protection approach. These principles encourage a cooperative stewardship with the citizens of Alaska that ensures protection of public health and the environment. Since DEC's water quality program does not maintain a statewide ambient water quality monitoring network, DEC must rely upon an extensive network of coordinated partnerships with other federal and state agencies, educational institutions, local governments, industry, non-profit organizations and citizens to succeed in its water quality mission.

In order to assure high quality data from citizen monitoring, DEC establishes guidelines and adopts standards for assessing the quality of information provided. Citizen water quality monitoring is not used to conduct compliance and enforcement actions against permitted facilities, nor will it be used as the basis for listing of an impaired water body without agency confirmation and adequate QA/QC. It may be used to alert appropriate agencies or local governments of a legitimate concern that may require additional investigation to find a viable solution. In many instances, public awareness and education serve as the most expeditious and effective means of achieving compliance.

There are three modes of citizen monitoring in Alaska:

- Citizen Complaints

- Volunteer Monitoring
- Industry Self-Monitoring

Citizen Complaints

DEC provides a public service through its response to water quality concerns of Alaskan citizens. A primary means of bringing these concerns to the immediate attention of agency staff is through letters, phone calls, Email referrals and walk-in consultations. This on-going form of citizen water quality monitoring is random and relies upon qualitative observations. Typically, DEC staff verifies the concerns through additional investigation before any specific action is taken in response to the initial alarm.

The quality of citizen water quality complaints can be enhanced by educational outreach through the schools, community workshops, and state fairs. Published literature, workshops, and local school programs help individual citizens become more knowledgeable about water quality issues. With a basic understanding of water quality fundamentals and an awareness of standard protocols, individual citizens become more focused on what to look for in identifying water quality problems, and their information can help focus the agencies' efforts to verify expressed concerns. Organized stream clean-ups through the Anchorage Waterways Council is one example of how a locally directed, citizen-based organization helps enhance the focus and public awareness of water quality issues affecting the community.

Citizen Complaints require agency verification to establish both the degree and extent of a genuine situation; verification may lead to an eventual enforcement action.

Volunteer Monitoring

A second mode of citizen water quality monitoring that has proven effective as a tool in watershed management is the use of organized volunteer citizen groups to assist DEC in addressing water quality issues. Volunteer monitoring includes a structured program for the acquisition and reporting of water quality information. This type of citizen volunteer monitoring requires a consistent, long term formal training program that includes qualified lead program staff, trained instructors, and structured training programs in standard protocols for volunteer monitors. It is designed in a manner that citizens can participate in the actual collection and measurement of water quality data that can help monitor long-term trends and isolate sources of pollution. This form of volunteer water quality monitoring tends to focus on data that can be readily measured in the field with relatively simple analytical tools. It includes attention to quality assurance and quality control (QA/QC) issues, the degree to which depends upon the intended use of the data. DEC is often directly involved in the QA/QC review of these citizen programs. Volunteer monitoring employs technical peer review in partnership with agencies, industry, local government, and the public. Volunteer monitoring provides a more sophisticated level of water quality information that can be used to alert the appropriate agency of a potential concern.

Volunteer monitoring data at the community level identifies local water quality issues, helps establish ambient conditions, and allows DEC to track long-term trends. This information is brought to the attention of DEC by the volunteer monitoring organization for follow-up action. DEC may respond in varying ways, depending upon the level of confidence and degree of

concern raised by the information. Continued monitoring by the volunteer organization may be appropriate. One such example of this enhanced form of volunteer monitoring is through the Alaska Watershed Stewardship Programadministered through the University of Alaska Cooperative Extension, in cooperation with DECAlaska Watershed Stewardship reports are more focused and require a rudimentary level of quality control/quality assurance oversight. The enhanced quality of information may expedite some resolution of local issues, when identified.

In many cases, through existing partnerships, it may be more appropriate to coordinate activities with other state and federal agencies in conjunction with local governments to verify volunteer water quality monitoring information gathered by citizens. Upon verification of conditions related to DEC field inspections or investigations, subsequent enforcement sampling using appropriate chain of custody may be appropriate, or a more in-depth, independent study may be contracted to further define the issues at hand.

Volunteer Monitoring is primarily a tool to identify ambient conditions and establish long-term trends. It is not an enforcement tool, but may alert the agency of the need to verify information and take follow-up action to address a water quality problem.

Industry Self-Monitoring

A third mode of citizen monitoring is provided by the corporate citizens of Alaska. Industry provides self-monitoring through project-specific requirements of the National Pollution Discharge & Elimination System (NPDES) permitting process. Additionally, there may be instances where a special study must be designed and conducted to supplement the resources available to DEC for appropriate follow-up to citizen complaints or volunteer monitoring information. DEC may rely upon the actions or resources of settlements and penalties provided by industry where water quality violations are identified. Settlement agreements may either:

- outline DEC approved water quality monitoring studies for implementation and include an implementation schedule,

or

- require financial penalties that would substantially fund approved water quality monitoring studies defined by DEC in the settlement agreement. These studies are conducted by DEC or its approved contractor.
    - Industry Self-Monitoring was established under the Clean Water Act as an enforceable policy used to monitor compliance with permit conditions and may serve to track long-term trends. Violations may lead to an enforcement action, as determined by the appropriate regulatory agency.

XIII. REFERENCES

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XIV. LIST OF STRATEGY APPENDICES

The Nonpoint Source Strategy Appendices can be found in Volume 2. The table of contents for Volume 2 is as follows:

I. 10 YEAR SCHEDULE FOR THE 1998 SECTION 303(D) LIST

II. ALASKA'S 1998 CATEGORY I WATERSHEDS

III. FOREST PRACTICES ACCOMPLISHMENTS

IV. FINDINGS FOR THE ALASKA 6217 PROGRAM