PRINCE WILLIAM SOUND REGIONAL CITIZENS' ADVISORY COUNCIL

1998 RECERTIFICATION APPLICATION

TO THE U.S. COAST GUARD

MAY 1998

Prince William Sound Regional Citizens' Advisory Council
750 W. Second Avenue, Suite 100
Anchorage AK 99501

907-277-7222

Prince William Sound Regional Citizens' Advisory Council

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and crude oil tankers.

RCAC
Regional Citizens' Advisory Council

"Citizens promoting environmentally safe operation of the Alyeska terminal and associated tankers."

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1998 Recertification Application to the U.S. Coast Guard

(a) Membership information

(1) Selection and appointment process

Membership in the Prince William Sound Regional Citizens' Advisory Council is governed by its bylaws. Member organizations are communities affected by the Exxon Valdez oil spill and interest groups with a stake in the region. Member organizations appoint individuals to represent them on the RCAC Board of Directors.

Directors serve at the pleasure of the organization they represent. The bylaws require each representative be a resident of the State of Alaska.

Directors serve staggered two-year terms. There is no limit to how many terms a director may serve. When a director's term expires, the member organization submits in writing the name of the person it wishes to be seated on the board. Directors are formally seated by a vote of the directors at the annual meeting in March. When a director leaves in mid-term, the member organization may appoint a replacement to fill the unexpired term, subject to approval by the Board of Directors.

If a member organization resigns from RCAC, applications from other organizations representing the same constituency are solicited through advertisements in newspapers in the region affected by the spill.

(2) Board of Directors

The current membership of the RCAC board of directors is as follows: Charles Christiansen of Larson Bay, representing the Kodiak Village Mayors Association; Wayne Coleman of Kodiak, representing the Kodiak Island Borough; Tom Copeland of Cordova, representing the Oil Spill Region Environmental Coalition; Bill Lindow of Cordova, representing the Prince William Sound Aquaculture Corporation; Larry Evanoff of Chenega, representing the Community of Chenega.

Jo Ann McDowell, Ph.D., of Valdez, representing the City of Valdez; Keith Gordaoff of Anchorage, representing the Chugach Alaska Corp.; Blake Johnson of Nikiski, representing the Kenai Peninsula Borough; Margy Johnson of Cordova, representing the City of Cordova; John Allen of Valdez, representing the Community of Tatitlek.

Dennis Lodge of Seward, representing the City of Seward; Michelle Hahn O'Leary of Cordova, representing the Cordova District Fishermen United; Dale

Heath of Kodiak, representing the City of Kodiak; Stan Stephens of Valdez, representing the Alaska Wilderness Recreation and Tourism Association.

Marilynn Heddell of Whittier, representing the City of Whittier; Tim Volstad of Seldovia, representing the City of Seldovia; William M. Walker of Anchorage, representing the City of Valdez; and Tom Jensen of Anchorage, representing the Alaska State Chamber of Commerce.

The seat for the City of Homer became vacant in March 1998 with the resignation of Tex Edwards. RCAC has requested the City of Homer to name a replacement, who is expected to be seated in September 1998.

Eleven organizations hold ex-officio seats on the board of directors: Alaska Division of Emergency Services; Alaska Department of Environmental Conservation; U.S. Forest Service; U.S. Coast Guard/Marine Safety Office Valdez; U.S. Environmental Protection Agency; U.S. Department of the Interior; Department of Environmental Conservation; Alaska Department of Fish and Game/Habitat Division; National Oceanic and Atmospheric Administration; Alaska Department of Natural Resources; Oil Spill Recovery Institute (Cordova).

(3) Technical committee members and residence

RCAC's work is assisted by four volunteer technical committees that operate with financial and staff support from RCAC. Committee volunteers are recruited annually or as needed by print and radio advertisements and by press releases in the RCAC region.

The current makeup of the committees is as follows:

Port Operations and Vessel Traffic Systems Committee: Vince Kelly of Valdez, Tom McAlister of Valdez, Linda Lee of Valdez, Neil Schultz of Cordova, Dennis Lodge of Seward, Capt. James Beckham of Seward, Bill Conley of Valdez, and Tex Edwards of Anchorage.

Oil Spill Prevention and Response Committee: Paul Andrews of Homer, Jerry Brookman of Kenai, Wayne Coleman of Kodiak, Jon Dahlman of Seward, Gail Evanoff of Chenega Bay, Gordon Scott of Girdwood, Lou Weaver of Valdez, Joe Jabas of Valdez, Natasha Edwards of Girdwood, Tom Copeland of Cordova, and Dale Heath of Kodiak.

Scientific Advisory Committee: Peter Armato of Seward, Bill D'Atri of Anchorage, Gig Currier of King Salmon, David Hite of Anchorage, Dr. A.J. Paul of Seward, James Steward of Anchorage, Richard Tremaine of Anchorage, Charles K. Weaverling of Cordova, Gary Lawley of Anchorage, John Williams of Cordova.

Terminal Operations and Environmental Monitoring Committee: Bob Benda of Valdez, Paul McCollum of Homer, George Skladal of Anchorage, Stan Stephens of Valdez, David DeGrandpre of Anchorage, David Kang of Kodiak, Joe Price of Valdez, and Sean Thurston of Valdez.

(b) Meetings publicized and accessible to communities

Quarterly board meetings of the RCAC are publicized through press releases and advertisements in local newspapers in the region. All meetings are open to the public, with the exception of executive sessions. Committee meetings and board

teleconferences are also open to the public. The public is always provided opportunity to comment.

Before board meetings, agenda packets with extensive background information are sent to directors, ex-officio members, industry representatives and other interested parties.

RCAC has established a community outreach program to ensure public awareness of council activities and promote participation in its meetings. Since our last recertification application was filed, our community liaison has attended nearly 20 events, many of them in outlying communities of the RCAC region. Some examples:

ComFish Alaska '98, Kodiak, March 1998. This annual event is the biggest commercial fishing trade show in Alaska. RCAC had a booth at the show, where the community liaison talked with over 100 people from Kodiak about the council's work and why it is important to the commercial fishing industry.

Community reception, Cordova, December 1997. The community liaison set up an informational display at this event and showed a videotape about RCAC's work on predicting iceberg releases into Prince William Sound sea lanes by Columbia Glacier. About 50 people attended.

Arctic Science Conference, Valdez, September 1997. The community liaison operated a reception and information booth at this event, which drew Alaska Native and other participants from all over Alaska.

Chenega cleanup, Chenega Bay, July 1997. The community liaison monitored cleanup of persistent Exxon Valdez oil on beaches near the Native village of Chenega Bay. During this visit, the liaison also talked with community members about RCAC's work and the community's needs, such as better airport lighting and improved firefighter training.

(c) Interest groups represented

Commercial fishing interests are represented on the RCAC by Cordova District Fishermen United. Aquaculture interests are represented by the Prince William Sound Aquaculture Corporation.

Alaska Natives are represented by Chugach Alaska Corporation. In addition, the predominantly Native communities of Chenega Bay and Tatitlek each has a seat on RCAC and six villages on Kodiak Island are represented by the Kodiak Village Mayors' Association. Native environmental interests are also represented through the Oil Spill Region Environmental Coalition.

Tourism in the region is represented by the Alaska Chamber of Commerce, and recreation interests are represented by Alaska Wilderness Recreation and Tourism Association.

The Oil Spill Region Environmental Coalition represents environmental interests. The coalition consists of the Alaska Center for the Environment, Alaska Marine Conservation Council, Kachemak Bay Conservation Society, Kodiak Audubon Society, Kodiak Conservation Network, and the Nungpet/Chugachmiut Environmental Protection Consortium. The last group is a coalition of the villages of Tatitlek, Chenega Bay, Port Graham and Nanwalek.

(d) Activities

(1) Review of operations and maintenance of terminal and tankers:

(i) Terminal operations and maintenance

Terminal Maintenance: RCAC monitored repairs completed in late 1997 to piping in the tank farm vapor recovery system at Alyeska's Valdez Marine Terminal. A consultant has been retained to review terminal maintenance activities and plans. RCAC continues to monitor uncontrolled venting of hydrocarbon vapors and leaks in the piping system, when they occur. In early 1998, RCAC participated in a root-cause analysis with Alyeska, Department of Environmental Conservation, and EPA to analyze solid waste disposal of materials from the terminal. We routinely review and comment on Best Management Practice Plans for terminal operations and maintenance.

Control of Tanker Loading Vapors: RCAC monitored progress on planning and construction of vapor controls at two of the terminal's loading berths. Construction and start-up activities on Berths 4 and 5 were completed in early 1998. RCAC retained engineering and air quality consultants to review installation of the tanker loading vapor control system and implementation of EPA's Valdez Terminal Marine Vessel Loading Rule, which became effective March 20, 1998. Our staff and air quality consultant are working closely with Department of Environmental Conservation and EPA as compliance guidelines are developed.

At its May 1998 meeting, the council voted to spend up to $50,000 on a review of fire and explosion hazards at the new vapor-control system. This was in response to anonymous allegations to regulators that the system could be unsafe because of construction flaws.

Ballast Water Treatment Facility: RCAC continued to work with Alyeska Pipeline Service Company and regulatory agencies on issues related to the Ballast Water Treatment Facility at the Valdez Marine Terminal. The treatment facility discharges an average of 16 million gallons of treated effluent into Port Valdez per day. A central RCAC role is to review the performance and results of Alyeska's ongoing environmental monitoring program, which includes effluent analysis, effluent toxicity testing, and the sampling and analysis of marine sediments.

Ballast Water Treatment Facility Working Group: RCAC participates in the BWTF Working Group. This group, chaired by the Department of Environmental Conservation with logistical support from RCAC, provides a forum to present and discuss information on new and re-occurring issues. The group works to build an understanding of issues and to arrive at recommendations for the EPA and the Department of Environmental Conservation. In addition to RCAC and the Alaska Department of Environmental Conservation, the working group includes representatives of EPA, Alyeska, the state of Alaska's Technical Advisory Group and representatives of North Slope crude shippers. During the past year, the BWTFWG reviewed water quality monitoring programs and reports prepared by Alyeska, provided comments on a Caged Mussel Pilot Study conducted by RCAC, monitored progress on pollution prevention requirements of the Valdez Marine Terminal

NPDES permit, and held an annual technical meeting in August, 1997 as defined in the permit.

National Pollutant Discharge Elimination Systems (NPDES) Permit: The new pollution discharge permit for the Valdez Marine Terminal became effective in May of 1997, the result of a two-year collaborative effort by EPA, Department of Environmental Conservation, RCAC, and Alyeska. The objectives – to improve the permit, meet requirements of all the stakeholders, and avoid litigation – were achieved through a lengthy and facilitated process.

Ballast water influent monitoring: Since 1995, RCAC has conducted a program to monitor ballast water discharged by tankers into the treatment facility at the Valdez Marine Terminal. The purpose of the program is to determine whether ballast water arriving at the terminal contains compounds not anticipated for treatment. Because samplings are not announced in advance, the program may also deter discharge of unauthorized substances. Laboratory analyses have not detected any unanticipated chemicals. The program continues on a random and less frequent basis.

(ii) Tanker operations and maintenance

Prince William Sound Tanker Risk Management Plan: As a member of the Steering Committee that conducted the Prince William Sound Risk Assessment, RCAC has actively participated in subcommittees and working groups formed to develop and implement measures to reduce the risk of oil discharge in Prince William Sound. The groups consist of representatives from RCAC, Alyeska SERVS, major oil shipping companies, Alaska Department of Environmental Conservation, and Coast Guard. These subcommittees are addressing tanker escorts, waterways management, and vessel management.

Tanker Escorts Subcommittee: During the past fiscal year, RCAC's project team and maritime expert consultant George Randall reviewed Alyeska's request for proposals for construction of two state-of-the art tractor tugs for service in Prince William Sound. The team also reviewed and commented on the Gulf Service, a rescue tug added to the system to enhance tanker save capability in the Gulf of Alaska. RCAC reviewed and participated in a series of public meetings regarding a pending industry proposal to modify the escort system with the addition of two Protector class tractor tugs and implementation of a sentinel system in central PWS. RCAC observed sea trials of the Gulf Service and reviewed several technical reports analyzing the requirements and capabilities of various tugs in or being considered for the fleet. During the 1998 review of the State of Alaska Oil Spill Prevention and Response Plans required for each tanker, RCAC will review the Best Available Technology regulations as they apply to escort vessels in general, and specifically to the Gulf Service.

Waterways Management Subcommittee: RCAC participates on this subcommittee which is tasked with implementing risk management measures relating to navigational safety, port operations, and vessel traffic schemes. The subcommittee works closely with the Coast Guard and NOAA to identify specific tasks for the Cook Inlet and Prince William Sound Navigation Safety and Efficiency Project. Through this collaborative process, an additional wind monitoring station

was strategically installed, and sea current data is being collected to provide timely information to mariners. RCAC provided graphics and distribution support for a leaflet developed by the subcommittee to remind all vessel operators using Prince William Sound.

The Waterways Management Subcommittee also addresses the risk of a tanker collision with icebergs that often drift into the tanker lanes. RCAC provided organizational, logistical, and financial support to a Coast Guard/NOAA Symposium on Practical Ice Observation held in Anchorage, Alaska, on January 6-7, 1998. RCAC's contractor, glaciologist Wendell Tangborn, presented a status report on the development of a predictive model and the scientific background of Columbia Glacier calving. As one outcome of that symposium, RCAC is planning to test several technologies that could enhance the ability to detect and avoid ice and provide mariners with real-time information.

Vessel Management Subcommittee: This subcommittee was formed to develop and implement strategies to reduce the risk of an oil spill caused by human error. The oil shipping companies have developed safety management plans, and RCAC monitors those plans and the shipping companies' compliance with state, federal, and international standards. RCAC submitted comments to the Coast Guard on the rules for Implementation of the 1995 Amendments to the International Convention on Standards of Training, Certification and Watchkeeping to Seafarers, 1978 (STCW) and is verifying the shippers' progress towards meeting the July 1, 1998 ISM Code. RCAC staff is developing a white paper on human and organizational factors affecting the safety of oil transportation in Prince William Sound. ARCO and BP have conducted bridge management simulation training programs. RCAC staff and committee and board members have participated in both training programs in San Diego, Calif. During the past year, RCAC board member Wayne Coleman, Executive Director John Devens and Project Manager Joel Kopp were guests of ARCO Marine on tanker voyages out of Valdez. Their experiences have helped RCAC understand the complexities and realities of marine transportation.

Tanker Integrity: RCAC continues to maintain and refine data files for each of the tankers calling at the Valdez Marine Terminal. The file includes vessel size (length/beam), cargo capacity in barrels, year built, owner/operator, double hull replacement date, and any reported incidents and/or damage. The data files are being enhanced to include information about non-reportable incidents to ensure that corrective action is taken and lessons learned are shared among the operators. This document is updated constantly as new information is obtained. For example, during recent months, the data files have been expanded to track each tanker's certification and operational factors relating to the vapor control system. RCAC works closely with Alyeska/SERVS, Alaska Department of Environmental Conservation, and the Coast Guard tracking systems, and coordinates with the Cook Inlet RCAC and the Western States/BC Task Force to obtain information about the TAPS tankers from other ports.

RCAC is monitoring the OPA-90 dates requiring phase-out of single-hull tankers. We have expressed strong support for ARCO's Millennium Class tankers

now under construction and advocated an amendment to OPA-90 closing a loophole allowing some tankers to obtain extensions based on cargo allocations.

Through the Valdez Marine Operations Committee (VMOC) and routine interactions with local representatives of the TAPS shippers, Alaska Department of Environmental Conservation, and the Coast Guard in Valdez, RCAC receives timely notification of all reportable and non-reportable incidents experienced by TAPS tankers in Alaska waters.

(2) Review of oil spill prevention and response plans

State tanker plans: Oil-spill prevention and response plans are submitted to the state of Alaska on a three-year cycle. The next submittal is due in July 1998; however, during 1997 RCAC continued to monitor and provide comments on the plan holders' continued progress toward compliance with the 1995 conditions of approval. The conditions of approval included use of "best available technology," sharing of information about response equipment delivery times, and interim enhancements to tanker escorts in Prince William Sound. RCAC also monitored the appeals of several Department of Environmental Conservation decisions on the 1995 approvals. In addition, RCAC is participating in an informal "pre-review" process for the 1998 plan submittals with agencies and industry.

Valdez Marine Terminal Plan: RCAC monitored the Valdez Marine Terminal Contingency Plan conditions of approval following the January 1997 plan approval by the Department of Environmental Conservation. RCAC continues to monitor the appeal of several Department of Environmental Conservation decisions on the 1997 approval, and additional public comment periods on the conditions of approval.

Pipeline Plan: RCAC discussed the potential RCAC review of the Pipeline Plan with Alyeska with regard to those areas of the line which could impact the marine waters in RCAC's region, including Port Valdez (via the Lowe River) and the Gulf of Alaska (via the Copper River).

Area Plans: RCAC developed a white paper on the concept of Geographic Response Plans based on work done in Washington, Oregon and California, and promoted the use of the concept for the Prince William Sound Subarea Contingency Plan, the Cook Inlet Subarea Contingency Plan and the Kodiak Subarea Contingency Plan. RCAC attended meetings of the Cook Inlet Area Committee and its working groups. RCAC continues to fund a project to facilitate local involvement in and assist in the development of the Kodiak Subarea Contingency Plan for the Kodiak region in a federal/state/local working group process. RCAC also attended meetings of the Kodiak Subarea Committee.

RCAC participates in the Alaska Regional Response Team Sensitive Areas Working Group. RCAC seeks to ensure that contingency plans incorporate local knowledge about sensitive areas. RCAC supported and provided funds for the development of the NOAA Environmentally Sensitive Index Map Series of the Kodiak Island/Shelikof Strait area, which will be used for initial broad-brush identification of sensitive areas if an incident occurs. This project was completed in the fall of 1997 and included information provided by local residents and interest

groups on the location and prioritization of sensitive areas (Kodiak Island Borough Sensitive Areas project). Final printing of this map series was completed in March 1998. It will be distributed to all stakeholder groups.

In an effort to clarify RCAC's relationship with the Unified Command, we have prepared recommendations for revisions to the Prince William Sound Subarea Contingency Plan.

SERVS: In 1996, incidents during several marine spill-response exercises led to questions about the readiness of some SERVS equipment and personnel. Alyeska and RCAC continued to discuss these issues in 1997. RCAC plans to verify that SERVS meets all the federal requirements for oil spill response organizations based on discussions with Coast Guard headquarters personnel.

Federal Tanker Plans: RCAC met with Coast Guard personnel to clarify RCAC participation and assistance in the review of federal tanker plans. RCAC provided comments on the Keystone Shipping tanker plan.

Federal Tanker Plan Rulemakings: In 1997 and 1998, RCAC provided comments on the Paperwork Reduction Act requirements, and on OPA-90 Tier III equipment caps.

(3) Monitoring drills and cleanup of actual discharges.

RCAC contracts with a professional independent Drill Monitor, who observes and reports on Alyeska/SERVS drills and exercises that occur as often as three times a month. Each exercise observed by the Drill Monitor is followed by a written report distributed to the Response Planning Group as well as various Alyeska/SERVS personnel and RCAC volunteers. In order to facilitate better relationships with industry and to make the regular Alyeska/SERVS drills more effective, RCAC provides a preliminary copy of its reports to SERVS prior to broader distribution. Often SERVS personnel comment on the preliminary reports, and their comments are addressed in the final RCAC reports. The Annual Drill Monitor Report contains an overview of the effectiveness of drills and exercises at SERVS and observations for improvement in the future.

For major spill drills, RCAC fields a response team, just as it would in an actual spill. Its job is to observe the drill or spill and response efforts, independently verify information disseminated by official sources, inform citizens in the affected region and advise the incident command. RCAC submits written comments, observations and critiques after each drill monitored. In addition to observing routine drills and exercises over the past year, RCAC monitored a Tesoro Transition Drill (October 97) and a BP Logistics Workshop (September 1997). Approximately 25 drills and exercises were monitored in the year ending March 31, 1998.

During the past year, RCAC monitored several incidents and atypical events, including small spills and leaks of oil, a minor collision between an escort vessel and a tanker, a response-barge grounding, tankers requiring repairs in transit or in Port Valdez, communication or propulsion malfunctions, and unplanned course alterations. RCAC participates with the Valdez Marine Operations Committee where these incidents are discussed so that lessons learned can be captured and shared among the shippers, escort vessel operators, and pilots.

RCAC's response team is guided by an internal Emergency Response Plan that defines roles, responsibilities and procedures for notifications and communication with the board of directors and member organizations. RCAC is continually working to improve and update this plan and is currently seeking changes to the Prince William Sound Subarea Plan to clarify RCAC's role with the Unified Command.

(4) Review or coordinate scientific studies with recognized experts

RCAC has established policies and practices to ensure its independent scientific work addresses environmental issues related to the Valdez marine terminal and associated tankers. Further, RCAC's work is coordinated with scientific work done by or for terminal and tanker operators in order to avoid unnecessary duplication.

RCAC's Scientific Advisory Committee – one of four standing technical committees – is a primary resource in this effort. Its members are selected on the basis of scientific expertise. They review proposed research projects and provide assistance and advice to other RCAC committees, the RCAC staff, and the board of directors on scientific methodology, data interpretation, and other subjects.

RCAC maintains a database of scientific experts used to solicit proposals for specific studies and to select professional peer reviewers for project reports. RCAC staff, committee and board members attend major conferences to maintain contact with experts in environmental science and oil-spill prevention and response, and to keep informed about current research.

The Cordova-based Oil Spill Recovery Institute joined RCAC as an ex-officio member in December 1997. The Institute is associated with the Prince William Sound Science Center, providing another avenue for coordination and expert oversight of RCAC's scientific work. RCAC regularly attends quarterly and annual meetings of the West Coast States/BC Task Force and reviews scientific studies conducted by the Task Force and the members, coordinating comments through the Alaska Department of Environmental Conservation.

RCAC routinely sends copies of board and committee agendas and background packets to Alyeska, oil shippers and regulators to keep them informed about proposed and ongoing scientific work. The packets include draft copies of status and final reports for review and comment.

RCAC board and committee meetings are open to the public, providing regular opportunities for interested parties to monitor and comment on research projects.

Some of the major projects that RCAC coordinated or reviewed in the past year:

Prince William Sound Risk Assessment Study: The methodology used in this study was peer-reviewed by the Marine Board of the National Research Council.

Members of the reviewing committee are: Elisabeth Pate-Cornell, Stanford University; John F. Ahearne, Duke University; Elizabeth S. Bouchard, SEALAW Group; Philip M. Diamond, aerospace and defense consultant; Michael J. Donohoe, marine safety consultant; Paul S. Fischbeck, Carnegie Mellon University; John B. Garrick, PLG, Inc.

Eugene M. Kelly, Amoco Marine Products; Thomas M Leschine, University of Washington; Charles Massey, Sandia National Laboratories; Robert A. Santos, Hvide Marine, Inc.; Bernard Stahl, Amoco Worldwide; and Steven R. Winterstein, Stanford University.

Long-Term environmental monitoring program (LTEMP): Monitoring activities for RCAC's LTEMP project are carried out by Kinnetic Laboratories, Inc. (KLI), and the laboratory work is done by Texas A&M's Geochemical and Environmental Research Group (GERG). This region-wide monitoring program has been under way since 1993. It involves the collection of mussel tissue and marine sediments for chemical analysis.

During the past year an independent contractor was selected to analyze and synthesize the LTEMP data. Experts consulted regarding the analysis of the data were: Dr. James R. Payne, J.R. Payne Environmental; William Driskell; Dennis Lees, Littoral Ecological & Environmental Services; Jeffrey W. Short, Research Chemist and Dr. Stanley Rice, NMFS/Alaska Fisheries Science Center, Auke Bay Laboratory; and Dr. Keith Kvenvolden, USGS/Coastal & Marine Geology Team.

Non-Indigenous Species (NIS)/ Ballast Water Investigation: In addition to RCAC, U.S. Fish and Wildlife Service and others on the NIS Working Group, the project team includes principal investigators Dr. Anson Hines and Dr. Gregory Ruiz with the Smithsonian Environmental Research Center; Dr. Howard Feder, Institute of Marine Science, University of Alaska Fairbanks; Nora Foster, University of Alaska Fairbanks; Dr. James Carlton, Williams College; Dr. John Chapman and Dr. Gayle Hansen, Oregon State University. (This project is described in detail below.)

Caged Mussel Pilot Study in Port Valdez: The concept for this study came out of scientific discussions among industry, agencies and RCAC through the Ballast Water Treatment Facility (BWTF) Working Group. The study was conducted by contractor Michael Salazar, Applied Biomonitoring. The findings and final report were reviewed by a team of Alyeska scientists, including Drs. Howard Feder and David Shaw from the University of Alaska Fairbanks. The panel that conducted the formal peer review of the final report included: Dr. Ronald S. Tjeerdema, Professor of Toxicology, University of California, Santa Cruz; Dr. Henry Nowicki, Professional Analytical and Consulting Services, Inc.; John Karinen, NOAA Auke Bay Laboratory; and Douglas R. Redburn, Redburn Environmental & Regulatory Services. Implementing recommendations from the pilot study will require continued coordination among RCAC SAC and TOEM committees, the BWTF Working Group, and Alyeska's scientific team.

Columbia Glacier Study and Ice Symposium: The RCAC Columbia Glacier Study as described in Section (d)(6) was presented at the Symposium on Practical Ice Observation in January 1998. The symposium was sponsored jointly by the Coast Guard and NOAA, but planned and organized by a multi-stakeholder steering committee that included RCAC. The symposium provided an opportunity for scientific and technical experts from around the world and marine operators to exchange information, with the common goal to improve navigational safety.

Dispersants Workshop: RCAC also served on the sponsoring committee for the Conference on Dispersants Application in Alaska: A Technical Update. The conference featured international experts making presentations and answering

questions about recent developments in dispersants use. Panels of industry representatives, public stakeholders and technical experts discussed the relevance of these developments to dispersants planning in Prince William Sound. RCAC sponsored Dr. Merv Fingas, Chief of the Emergencies Science Division, River Road Environmental Technology Center in Ottawa for a scientific presentation. RCAC also sponsored John Goodlad, a fisherman from the Shetland Islands, as well as Riki Ott and John Allen, Prince William Sound commercial fishers, to present local knowledge and expertise.

(5) Review developments in spill prevention and clean-up technology:

Spill prevention technology: Following the recommendations of the PWS Risk Assessment completed in 1996 and in conjunction with the resulting subcommittees, RCAC's prevention projects focus on changes to the escort system, ice in the tanker lanes, and human and organizational factors. Specific RCAC prevention projects are discussed in more detail in sections (d)(1)(ii) and (d)(6). RCAC's Fiscal Year 1998 work plan includes an investigation into several remote-sensing technologies for iceberg detection, including field tests of UHF radar and sonar equipment.

Oil spill response and clean-up technology: RCAC monitors new technology through literature review and first-hand observation of testing and use of new response tools. Specific activities over the past year included the following:

- Spill trajectory model: In partnership with Cook Inlet RCAC, PWS RCAC funded the expansion of an oil spill trajectory model for lower Cook Inlet so that it would also cover the Kodiak and Seward areas.
- Weather data: RCAC continued investigating ways to use archived weather data gathered in Prince William Sound and the Gulf of Alaska to determine how often certain conditions occur. This information may be useful for projecting spill trajectories and other weather-related phenomena affecting oil spill-response capabilities.
- Nearshore Response Concept: RCAC developed and proposed a model for community-based nearshore strike teams. Strike teams are in place in some communities within the RCAC region. RCAC facilitated the development of contracts for training and deployment of the Alaska Responder 650 spill response barge with Cook Inlet and PWS oil spill response organizations, as well as with the Alaska Department of Environmental Conservation and the Coast Guard.

Dispersants: As noted in (d)(4) above, RCAC in March 1998 co-sponsored a dispersants workshop with the Alaska Department of Fish and Game, Alyeska, the Coast Guard, and the Oil Spill Recovery Institute. The two-day conference was held to review recent research and experiences with oil spill dispersants use including the large-scale use and monitoring of dispersants during the *Sea Empress* spill in 1996. The sponsors worked closely for several months to develop this workshop. International experts made presentations and answered questions concerning recent developments in dispersants. Panels of industry and public stakeholders and technical experts discussed the relevance of these developments to dispersants planning in Prince William Sound.

RCAC has worked closely with the other sponsors to develop a proceedings document for distribution in May 1998. The RCAC project team developed a position statement and recommendations for modifications to the Alaska Regional Response Team's guidelines for dispersants use that were adopted by the RCAC Board of Directors in May 1998.

Other activities: RCAC keeps abreast of oil spill response and clean-up technology in other areas by sending representatives to meetings of the States/BC Oil Spill Task Force, the International Oil Spill Conference, the Arctic Marine Oil Pollution Conference, and other conferences and seminars in Alaska and the continental U.S.

Here are some examples of activities during the past year to educate staff and volunteers and assist with development of informed recommendations to industry and government regarding oil spill prevention and response technology:

- Two members of our Scientific Advisory Committee attended the Fifth International Conference on the Effects of Oil on Wildlife. Major Workshops included: Deterrence and Prevention (Hazing); From NRDA to Joint Injury Determination; and Oiled Wildlife Care Techniques.
- Staff, committee members, and directors attended the 48th Arctic Science Conference held in Valdez, Alaska in September 1997. RCAC hosted the opening reception and participated in a panel discussion titled "Lessons of the Exxon Valdez."
- Staff, committee members, and directors attended the International Oil Spill Conference in Ft. Lauderdale, Fla., in April 1997. Many of the papers focused on response technologies such as chemical dispersants and *in situ* burning. RCAC personnel also attended presentations and workshops that focused on the National PREP guidelines for exercises and response training and proposed HAZWOPER regulations changes for marine oil spill emergency responders.
- Members of our Scientific Advisory Committee and our Terminal Operations and Environmental Monitoring Committee attended the Fourth International In Situ and On-Site Bioremediation Symposium in New Orleans, La., April 28 - May 1, 1997. This symposium had hundreds of papers on bioremediation response technology, a number of which addressed the issue of bioremediation in the marine environment.

(6) Review of port operations, organizations, safety systems and incidents, and recommendations made to promote safer transportation of oil

(i) Review of port operations, organizations, safety systems and incidents

RCAC personnel in the Valdez office monitor maritime operations and, in conjunction with the RCAC Port Operations and Vessel Traffic Committee, analyze issues and make recommendations for improving the navigational safety of TAPS tankers and escort vessels. These activities are carried out by routine tracking of vessel traffic; recording delays and incidents; reviewing proposed rules, regulations, and Coast Guard guidelines; maintaining a working relationship with shippers, SERVS, the Southwest Alaska Pilots' Association, Alaska Department of Environmental Conservation, and the Coast Guard. As described in detail in

Section (d)(2), RCAC reviews and comments on state and federal oil spill prevention and response plans, often including recommendations regarding port operations and safety systems.

RCAC regularly interfaces with Marine Safety Office Valdez personnel regarding operation of the vessel traffic system. As a member of the Valdez Marine Operations Committee (VMOC) and the PWS Waterways Management Subcommittee, RCAC staff and volunteers have participated in several joint initiatives to improve communication between operators of tank, fishing and recreational vessels, to fund maintenance and expansion of the weather buoy system, to support collection of additional sea current data to assist mariners, and to sponsor major symposiums on the navigational hazards of icebergs in Prince William Sound and marine firefighting.

Specific RCAC projects related to these activities are as follows:

Fire Protection: RCAC continues to work to improve marine and terminal fire fighting planning and response capabilities. Following up on recommendations adopted in 1996, RCAC continues to participate in the PWS Fire Protection Task Force. The Coast Guard's Prince William Sound Fire Response Plan was completed following a comprehensive review and presentation at an RCAC-sponsored training symposium. The symposium, held the first week of June 1997, was designed to train and certify land-based firefighters to respond to shipboard fires. The curriculum was developed and presented by RCAC consultant Mike Hildebrand and Associates and included a full-scale exercise on board the tanker ARCO Juneau. In addition to making the tanker and its crew available for the exercise, ARCO Marine provided instructors and other support services. More than 100 firefighters earned the 1407 certification. Forty participants were sponsored by RCAC and 20 by the Alaska Division of Emergency Services with the remainder coming from the Alyeska terminal and TAPS shippers. Based on the success of the 1997 symposium, a similar event is planned for the summer of 1999. RCAC continues to advocate acquisition of a portable air compressor to allow expanded use of self-contained breathing apparatus.

Incidents: RCAC routinely monitors incidents and atypical situations in the port, such as vessel traffic congestion, power outages that affect the Vessel Traffic Center, and weather-related closures.

Columbia Glacier Study / Ice Detection and Avoidance: RCAC's Iceberg Monitoring Project has continued for the past two years, with completion of a predictive model scheduled for late 1998. Based on this study and results of the January 1998 symposium, RCAC is sponsoring investigations of ice detection technologies and avoidance strategies.

Human and Organizational Factors: Based on recommendations from the 1997 PWS Risk Assessment Study, a literature review, and numerous reports on navigational safety, RCAC continues to develop recommendations related to human and organizational factors affecting safety at sea. RCAC submitted comments and supported the Coast Guard rules for Implementation of the 1995 Amendments to the International Convention on Standards of Training, Certification and Watchkeeping to Seafarers, 1978 (STCW). RCAC monitors the

development of TAPS shippers' Vessel Management plans and compliance with the International Safety Management Code by the deadline of July 1, 1998.

RCAC is developing an annotated bibliography and a white paper summarizing industry and government programs, including the Coast Guard's Prevention Through People. The paper will provide a framework for RCAC recommendations to enhance the effectiveness of the programs.

(ii) Recommendations to promote safer oil transportation

Fire response: In April 1997, in order to facilitate the completion of the Coast Guard PWS Fire Response Plan, RCAC recommended to the Governor that the state of Alaska designate a single point of contact for notification of a marine fire. In a March 1998 letter to Alyeska and the TAPS shippers, RCAC recommended a joint funding agreement to acquire the portable air compressor mentioned above. It would be maintained and deployed by the Valdez Fire Department for use in Prince William Sound.

British Petroleum's NPREP Drill: Following a logistics support workshop and SERVS fishing vessel response exercise in September 1997, RCAC made the following recommendations for consideration during the planning for the 1998 major drill:

- Incorporate aerial support capabilities
- Identify available Tier III fishing vessels with trained crews for nearshore response
- Identify additional storage resources for recovered liquid.

On April 15, 1998, RCAC recommended that the objectives proposed by Alaska Department of Environmental Conservation be adopted for the BP Spill of National Significance drill scheduled for September 1998.

Alaska Coastal Management Program (ACMP): In an August 29, 1997, letter to the Alaska Division of Governmental Coordination, RCAC made recommendations for streamlining the ACMP permitting process. During the 1998 legislative session, RCAC recommended to members of the Alaska House of Representatives and Senate that the public review of oil spill prevention plans be preserved in the ACMP.

Escort Vessel Program: In a letter to Alaska Department of Environmental Conservation on January 23, 1998, RCAC supported a proposal to modify the PWS tanker escort program, with a recommendation that an Emergency Response Vessel be stationed at Port Etches to maintain adequate response capability in the southern portion of Prince William Sound.

Prince William Sound Sub-Area Plan: At the March 1998 RCAC Board of Directors' annual meeting, a recommendation was adopted for changes to the PWS Sub-Area Plan. The recommended changes would allow RCAC to substitute for the Multi-Agency Committee during response to a TAPS spill, thereby giving RCAC direct access to the Unified Command.

State of Alaska Tanker C-Plan Review Process: In a December 19, 1997 letter, RCAC recommended that the Alaska Department of Environmental Conservation require that some C-Plan changes submitted with routine annual updates – which are not subject to public review -- be included with the 1998 plan renewals so they can under go full public review. During March and April 1998, RCAC submitted the

following recommendations to the Alaska Department of Environmental Conservation:

- Develop protocols for pre-submittal meeting and review process
- Ensure adequate time for public review process
- Develop an electronic document logging and notification system available on the internet
- Consider delaying the 1998 submittal and review until the 1995 appeals mentioned above have been resolved
- Stagger 1998 submittal and review schedules for the twenty-two tanker plans
- Clearly define process for ACMP review

State of Alaska NPDES Permit Monitoring and Enforcement: In July 1997 RCAC repeated a recommendation that Alyeska install continuous hydrocarbon monitoring instrumentation to measure oil and grease in the effluent from the ballast water treatment facility at the Valdez Marine Terminal. In April 1998, RCAC urged Alaska Department of Environmental Conservation to arrange funding for water quality monitoring personnel assigned to the Valdez Marine Terminal. In addition, RCAC recommended to the Alaska Legislature that the Alaska Department of Environmental Conservation's budget be adequate and allow participation in working groups.

Environmental Monitoring: RCAC recommended that Alyeska acquire differential GPS equipment to allow greater consistency in locating sediment sampling stations near the BWTF diffuser.

Copper River Flats Oil Spill Response Plan: In comments to Alaska Department of Environmental Conservation on April 13, 1998, RCAC expressed support for the public process being used for the development of this plan. RCAC encouraged the continued collection of wind and sea current data to facilitate development of response and protection strategies.

Tanker Vapor Control System: At the May 1997 Board of Directors' meeting, RCAC adopted a resolution recommending that Alyeska begin construction of a vapor control system on a third berth at the Valdez Marine Terminal. The recommendation was based on projected increases in throughput which were not anticipated at the time EPA required control at only two of the four berths. In February and March, 1998, RCAC recommended that EPA and Alaska Department of Environmental Conservation strictly enforce the Marine Vessel Loading Rule provisions for uncontrolled loading and that the agencies encourage construction of controls at a third berth.

State Air Quality Legislation: On April 14, 1998, RCAC recommended that a pending bill in the Alaska Senate be modified to ensure that the act, which would have exempted certain facilities from air-quality regulations, did not apply to emissions from the Valdez Marine Terminal or from associated tankers. After the bill passed despite RCAC's concerns, we wrote Alaska Gov. Tony Knowles on April 24 urging him to veto the measure, which he did.

Federal Legislation: In October 1997 RCAC urged the Alaska delegation to the U.S. Congress to support an amendment to the Oil Pollution Act of 1990. The amendment closed a loophole which has allowed several single-hull TAPS tankers

to extend their retirement dates. RCAC also recommended to the Alaska congressional delegation that they ensure the Sea Grant funding bill did not restrict research to zebra mussels. In August 1997, RCAC recommended to Alaska Department of Environmental Conservation and the States/BC Task Force that they negotiate agreements with the Coast Guard to more clearly define states' responsibilities, rather than proposing an amendment to OPA-90.

Nautical Charts: In a letter to NOAA on January 27, 1998, RCAC recommended that input be solicited from the Coast Guard MSO Valdez and the Southwest Alaska Pilots Association to determine nautical charting needs in Prince William Sound.

Federal Contingency Plans: On October 27, 1997, RCAC recommended to the Coast Guard that RCAC be consulted during the Coast Guard review of vessel response plans. On March 24, 1998, RCAC submitted comments supporting the existing Coast Guard authority to require vessel and facility response plans, shipboard oil pollution emergency plans, and we supported additional requirements for PWS as defined by the Oil Pollution Act of 1990.

Human factors: On December 22, 1997, RCAC supported and commented on Coast Guard rules implementing the STWC amendments, including a recommendation to combine the U.S. license and the STCW endorsement into a single, internationally acceptable document.

Response plan cap increases: On Apr. 24, 1998, RCAC wrote the Coast Guard to support increases in response planning equipment caps.

(7) Implementation of environmental monitoring strategy

RCAC conducts its own environmental monitoring in Port Valdez, Prince William Sound and the Gulf of Alaska, by taking water and sediment samples and by measuring chemical levels in the tissues of native mussels. In addition, the RCAC reviews and comments on Alyeska Pipeline Service Company's environmental monitoring program, which is intended to measure and mitigate environmental impacts resulting from the operation of the Valdez Marine Terminal. RCAC also reviews environmental monitoring work conducted in the region by other organizations, such as the Prince William Sound Science Center, whose ecosystem studies are funded by the Exxon Valdez Trustee Council. These efforts make up RCAC's environmental monitoring strategy.

(8) Environmental projects undertaken

Long Term Environmental Monitoring Project: Baseline data are collected on hydrocarbon concentrations at specific sites in Prince William Sound and the Gulf of Alaska. Details are provided below, in Section (d)(9).

Caged mussels pilot project: This pilot project was designed to determine if caged mussels could be used as a water quality monitoring tool in Port Valdez. Cages of mussels were deployed at significant depths in an area near the Valdez Marine Terminal ballast water treatment discharge pipe. The cages were retrieved after 56 days. A final report is scheduled for completion in June 1998, concluding that the mussels survived, grew, and bioaccumulated hydrocarbons that could be associated with the BWT effluent. The results will be analyzed by RCAC SAC and

TOEM committees and the BWT working group to determine if a larger-scale water quality monitoring project is warranted and feasible.

(9) Environmental conditions and locations monitored

Long-term Environmental Monitoring Project (LTEMP): Under this program, nine sites in Prince William Sound and the Gulf of Alaska are monitored for hydrocarbons in the water, sediment and mussels. The basic sampling is consistent with NOAA's National Status and Trends Mussel Watch program. Each year samples of blue mussel tissue, and subtidal sediments from an adjacent area, are collected during late winter (March), and during the summer months (July or August), to determine the existing hydrocarbon concentrations and characteristics. The purpose of this project is to maintain a long-term environmental monitoring program that helps identify stress on the ecosystem of the Exxon Valdez oil spill (EVOS) region due to the transport of Alaskan North Slope crude oil.

The monitoring is conducted by Kinnetic Laboratories, Inc. (KLI). The laboratory work is conducted by Texas A&M's Geochemical and Environmental Research Group (GERG).

In June of 1997, KLI submitted a special report describing the results of samples collected in response to the Alyeska Marine Terminal's Ballast Water Treatment Facility (BWTF) spill that occurred in January 1997. Samples were taken at the existing Saw Island site next to Berth 5.

Since Long Term Environmental Monitoring data have been collected for almost five years, it was decided to commission a thorough analysis and synthesis of the LTEMP data. This analysis was used to review the scientific validity of the Long Term Environmental Monitoring Program. The analysis confirmed that LTEMP was indeed successful in meeting its goals; the analysis also provided information on ways RCAC can refine the project for future years to come.

Nonindigenous Species/Ballast Water Investigation: In 1997, the RCAC and the U.S. Fish and Wildlife Service jointly sponsored a pilot study of the risk of invasion of Prince William Sound by nonindigenous plants and animals from the millions of tons of ballast water discharged into the Sound annually by tankers arriving from various domestic and foreign ports. RCAC contracted with the Smithsonian Environmental Research Center, leaders in the investigation of biological invasions, to conduct the pilot study.

The Coast Guard also contributed funding to this project to study the impacts of the Ballast Water Treatment Facility on plankton in the ballast water, which fulfilled their mandate in the National Invasive Species Act to evaluate that shoreside facility in Valdez.

The pilot study, led by principal investigators Dr. Anson Hines and Dr. Gregory Ruiz, showed that plankton in the arriving ballast water are abundant and diverse, and that at least some are nonindigenous to Prince William Sound. They concluded the Sound is at risk of invasion due to tanker traffic.

In an effort to quantify and better understand the nature of the risk of invasion, RCAC and the U.S. Fish and Wildlife Service have been joined by

Alaska SeaGrant and Alyeska in funding expanded research into this issue in 1998 and 1999. This ongoing effort, led by RCAC, includes further investigation into the content and management of ballast water as well as collection and analysis of samples from the Sound to see what nonindigenous species have already become established.

As a further demonstration of the level of partnership on this project, some major oil shippers in Valdez are planning to contribute money through the American Petroleum Institute to this expanded project in order to include an evaluation of the effectiveness and operational challenges of ballast exchanges at sea as a preventive measure against the introduction of nonindigenous species.

(10) Environmental impacts assessed

Mussels and sediments: The presence of hydrocarbons in mussels and sediments, and the source of any hydrocarbons found, are monitored in the Long Term Environmental Monitoring Program, described above. Samples are taken from sites oiled by the Exxon Valdez oil spill, and from un-oiled sites.

Non-Indigenous Species: Eventually, RCAC hopes through this project (described above) to learn whether non-indigenous aquatic species transported in tanker ballast water are affecting native habitat and species.

Caged mussels: This pilot project (described above) will determine the usefulness of using caged mussels to assess the impacts of effluent from the Ballast Water Treatment Facility on the marine environment in the vicinity of the facility diffuser.

(11) Scientific experts, universities and scientific institutions consulted

Columbia Glacier Study: RCAC's consultants on this project, which is described in Section (e), are Wendell Tangborn, a glaciologist and the principal partner in Hymet Inc., of Seattle, Washington; and Austin Post, a research hydrologist retired from the U.S. Geological Survey. Other scientific experts associated with this project are William St. Lawrence, Ph.D., a civil engineer with Polar Alpine, Inc., of Berkeley, California; Dennis Trabant, a hydrologist with the U.S. Geological Survey in Fairbanks, Alaska; and Robert Krimmel, also of the U.S. Geological Survey.

Long-Term Environmental Monitoring Program: This program, which is described in Section (d)(4), is conducted for RCAC by Kinnetic Laboratories, Inc., of Anchorage, Alaska. The laboratory analyses of samples collected in this program are performed by the Geochemical and Environmental Research Group (GERG) at Texas A & M University. An analysis of the data collected to date, for the purpose of confirming the validity of the monitoring program, was commissioned by RCAC and conducted by a panel consisting of James R. Payne, Ph.D., of the firm J.R. Payne Environmental in Encinitas, California; William Driskel of Seattle, Washington; Dennis Lees of Littoral Ecological & Environmental Services; Jeffrey W. Short, a research chemist with NOAA Auke Bay Laboratory in Auke Bay, Alaska; Stanley Rice, Ph.D., also of the Auke Bay lab; and Keith Kvenvolden, Ph.D., of the U.S. Geological Survey in Menlo Park, California.

Environmental monitoring in Port Valdez; Ballast Water Treatment Facility; NPDES permit: The teams for these projects include: Peter M. Chapman, Ph.D., a benthic ecologist with EVS Environment Consultants in North Vancouver, B.C.; John Karinen, a marine biologist with the NOAA Auke Bay Laboratory in Auke Bay, Alaska; Yoram Cohen, Ph.D., a chemical engineer and associate professor at the University of California, Los Angeles; Sandra Salazar, a biologist with the firm Applied Biomonitoring of Kirkland, Washington; and Michael Salazar, a marine biologist formerly with NOAA and now the principal partner in Applied Biomonitoring.

Ballast Water Treatment Influent Monitoring: RCAC's consultant for this project, which is described in Section (d)(1), is Kim Magruder, an environmental scientist and chemist with EVS Environment Consultants in North Vancouver, B.C.

Non-indigenous species introductions via ballast water: The team of experts sponsored by RCAC to study the risk of non-indigenous species introductions includes Anson H. "Tuck" Hines, Ph.D., a marine ecologist at the Smithsonian Environmental Research Center in Maryland, and an assistant director of that facility; Gregory M. Ruiz, also of the Smithsonian facility; James T. Carlton, Ph.D., director of the Maritime Studies Program at Williams College in Connecticut; John Chapman, Ph.D., of the Hatfield Marine Science Center at Oregon State University; and Gayle Hansen, Ph.D., also of the Hatfield center.

Oil Spill Prevention and Response: RCAC retains spill prevention and response expert Tim Jones to monitor the industry's spill preparedness activities, including on-water spill drills. In addition, RCAC hired the environmental consulting firm Dames and Moore to do a literature survey and prepare a report on the use of bioremediation in oil spill response, and hired S. L. Ross Environmental Research, Inc., to do a literature survey and prepare a report on the use of in-situ burning of on-water oil spills.

Tug and tanker escort vessel capabilities: RCAC retained the marine safety specialist George Randall of Hingham, Massachusetts, to assist in reviewing tug and escort vessel plans for tankers transiting Prince William Sound.

(e) Abstracts of ongoing reports and studies related to minimizing impacts of operations of terminal facilities and crude oil tankers.

Drill Monitoring 1997 Annual Report: RCAC's contractor is Tim Jones. This year, he observed and reported on 25 exercises in 1997, compared with 30 in 1996, 40 in 1995 and 31 in each of the previous two years. Eight other exercises held by SERVS this year were not observed because of scheduling conflicts.

Of the 25 reports, nine involved nearshore exercises and seven involved some aspect of the escort system and proposed changes in it. Additional reports focused on risk assessment and proposals for the Sentinel escort system. The other reports included: five on open-water operations; two on owner-company exercises and two on real spills. One was from the Ballast Water Treatment Facility; the second was a refined-product spill in Whittier during an exercise.

The 1997 annual report includes a discussion of the major issues identified during drill monitoring, project goals for 1998, and a summary of lessons learned from drills and exercises since 1992.

Long Term Environmental Monitoring Program (LTEMP) 1996-1997 Monitoring Report – November 1997: RCAC's contractor is Kinnetic Laboratories Incorporated. LTEMP, implemented by RCAC in 1993, was designed to provide baseline measurements of hydrocarbon concentrations and sources at program sites within areas of Prince William Sound and the Gulf of Alaska. The program focuses on sampling of shallow subtidal sediments and intertidal mussels to help provide information on hydrocarbon levels that currently exist in the study area.

This monitoring report includes data collected during 1996 and the first half of 1997. Samples were collected at nine stations during March 1996, July 1996, and March 1997. Mussel samples were collected from indigenous (native) intertidal blue mussel populations for the analysis of hydrocarbons in tissues. Additional measurements of lipid content, tissue weights and volumes, and shell characteristics were made to indicate the reproductive state of the animals because spawning can directly affect the amount of hydrocarbons that are concentrated in their tissues. Sediment was collected for the analysis of hydrocarbon concentrations and physical parameters, such as particle grain size and total organic carbon. Chemical analyses were performed using state-of-the art techniques following specific protocols to ensure the validity and integrity of the data.

Hydrocarbons in the marine environment, particularly in the study area, can have a multitude of origins. These include the release of oil through man's activities such as the TV Exxon Valdez oil spill in 1989, operations at the Alyeska Marine Terminal, or other oil transportation activities; combustion sources such as stack exhaust or forest fires; boating and ship activities; natural oil seepage; biological processes from bacteria or other organisms; and atmospheric fallout. The results presented in this report are intended to present a picture of what might be occurring at the program stations in terms of hydrocarbon levels and sources.

Hydrocarbon levels in tissues were generally quite low, as described by earlier program reports. A clear petroleum hydrocarbon signal was shown in mussel tissues collected from the stations at Alyeska Marine Terminal, Disk Island, Gold Creek, Sleepy Bay, and Windy Bay. Levels in sediments were more variable than those in tissues with some stations exhibiting very low levels and others showing higher levels that indicate the effects of man's activities.

In addition to the regular sampling program, opportunistic mussel tissue and sediment samples were collected from a visibly oil beach area at Disk Island during July 1996. The results indicate that there are still pockets of Exxon Valdez oil buried on the beach that may be unearthed by winter storm activity.

LTEMP Special Report on Sampling Program After January 1997 BWT Plant Incident: RCAC's contractor was Kinnetic Laboratories Inc. This report, dated June 19, 1997, presents the results of samples collected in response to the Alyeska Marine Terminal's Ballast Water Treatment Facility (BWTF) spill that occurred in January 1997. Samples were collected on 19 January 1997, approximately 9 days after the initial reports of sheen coming from the vicinity of the Alyeska Marine Terminal, at the Saw Island site next to Berth 5. Sampling and analysis procedures were identical

to those used for the LTEMP program and are fully described in the program reports. Based on fingerprint results, it appears that the mussels at the Saw Island site collected during the BWTF spill were subject to hydrocarbon contamination from a number of sources, including ANS crude and combustion. Fingerprints of tissues and the spilled oil did not closely resemble one another. Statistical testing failed to show that samples collected during the BWTF spill were significantly different from many of the other sampling times. Hydrocarbon concentrations seen in mussel tissue during the BWTF sampling can not be directly attributed to the BWTF spill.

LTEMP Data Analysis – Non-Technical Summary Report – March 16, 1998: RCAC's contractor was J.R. Payne Environmental. This peer-reviewed report presents an analysis of the data collected by LTEMP from 1993 through 1996. The results are discussed in terms of overall concentrations and general sources of hydrocarbons, an analysis of geographical and time trends, the identification of hot spots and areas of high variability, and correlation of mussel hydrocarbon values with known events. After intensive examination of the rationale, methods, and results of the LTEMP program, the report offers several assessments and recommendations to RCAC to better tune the program.

Geographical Response Plans (GRP) Draft Report dated 2/24/98: RCAC's contractor is Tim L. Robertson. This report provides a review and analysis of the planning practices used in other West Coast states to develop site-specific response plans for protecting environmentally sensitive areas and other areas of public concern from oil or hazardous-material spills. The report includes a comparison of the planning processes used in Washington, Oregon, and California with a discussion of how these practices might be applied in Alaska. It also includes the following recommendations on this issue for Prince William Sound Regional Citizens' Advisory Council (PWS RCAC):

- RCAC should adopt a position supporting GRPs for Alaska
- RCAC should develop and promote a cooperative process, including industry and federal and state agencies, to create GRPs
- RCAC should provide technical and financial support for the process

Human Factors White Paper – Scheduled Completion 12/98: RCAC staff and the Port Operations and Vessel Traffic Committee are preparing a white paper on human and organizational factors that affect the safe transportation of crude oil through Prince William Sound. The objective is to synthesize the issues and the many industry and government programs being implemented to address the problems. The report will include recommendations on how current research and ongoing programs can most effectively be applied to reduce the risk of a major oil spill.

Vapor Control – Final Report Due 3/99: RCAC's contractor is Sierra Research. RCAC retained air pollution specialists and vapor control engineers to conduct an independent review of vapor control technology and vapor control system maintenance at the Valdez Marine Terminal (VMT). The consultants also were asked to review TAPS throughput projections to determine the likelihood that Alyeska Pipeline Service Company will be able to stay within federal limits on uncontrolled loading in the absence of vapor controls at a third berth at the terminal.

The consultants' final report is expected in early 1999, and they already have submitted to RCAC three progress reports. While their assessment of the vapor control systems at the VMT is generally positive, they have made recommendations including the following:

• The systems should be carefully monitored for chlorides and sulfur-derived acids. Stainless steel pipes in the systems are susceptible to damage from chlorides, while the carbon steel (non-stainless) pipe remaining in the tank farm Vapor Recovery System (VRS) is susceptible to damage from acids formed from SO2.

• Because some installed components differ from design drawings, Alyeska should perform an "as built" check of the entire Tanker Vapor Control System and either install any missing components or update the Piping and Instrumentation Diagrams to reflect the actual installations.

• Preventive maintenance procedures for the crude oil storage tank pressure sensors, waste gas heat content analyzer, oxygen analyzers, and crude oil storage tank pressure/vacuum valves should be included in the Operation and Maintenance Plan prepared pursuant to the federal Marine Vessel Loading Rule. The plan should emphasize identification and resolution of problems with the storage tank pressure/vacuum valves.

Caged Mussel Study – Final Report Due 6/98: Scientists working for the Prince William Sound RCAC conducted a caged mussel pilot study in Port Valdez, to determine the feasibility of using transplanted mussels to monitor effluent from the Alyeska Ballast Water Treatment Facility (BWTF). A total of 2100 bay mussels (Mytilus trossulus) were transplanted to seven stations in the vicinity of the BWTF effluent outfall for a period of 56 days.

The potential of this monitoring tool in Port Valdez was first recognized nearly two decades ago, but this pilot test was a step necessary to determine its true utility, since mussels would be deployed in the water column at a depth of 70 meters, where they normally are not found.

The two most important questions to be answered by this study were:

• Would the caged mussels meet survival criteria (50%) and growth criteria (less than 20% loss in tissue weight)?

• Would the mussels accumulate chemicals known to have been associated with effluent from the BWTF?

Mussel survival was 97 percent, and increases in shell lengths and weights were small but statistically significant at most sites. Estimated tissue weights appeared to decrease slightly at most sites, but the decrease was much less than 20 percent. Hydrocarbons known to have been associated with the BWTF effluent accumulated in caged mussel tissues at levels higher than concentrations at the beginning of the study, although some of these chemicals could have come from sources other than the BWTF.

The pilot study was successful because the study's central questions were answered. Test mussels exceeded pre-determined survival and growth criteria and accumulated target chemicals in their tissues. The results demonstrate the feasibility of using caged bivalves for monitoring the effluent discharged by the BWTF. RCAC will use the results of the pilot study to evaluate the possible

expanded use of caged bivalves as an environmental monitoring tool in Port Valdez.

This approach of using mussels as sentinels of potential exposure and effects is consistent with the RCAC objective of developing a monitoring strategy that will permit early detection of environmental impacts associated with BWTF operations.

Nonindigenous Species Pilot Study – Final Report 12/4/97: RCAC's contractor was the Smithsonian Environmental Research Center.

Although nonindigenous species are common in marine environments, and some cause significant environmental and economic impacts throughout the world, little information is available about the frequency or impact of invasions by nonindigenous species at high latitudes. This pilot study was therefore conducted over a one-year period as an initial step in defining the problem and potential risks in Port Valdez and Prince William Sound.

The study briefly summarized the current state of knowledge about nonindigenous species and risk of invasions that are relevant to Prince William Sound. The study also examined the transfer of organisms into Prince William Sound via oil-tanker ballast water.

This initial analysis indicates that the risk of invasion exists for Prince William Sound because large and diverse quantities of plankton arrive during spring in the ballast of tankers from West Coast ports. Tankers from foreign ports exchange ballast water at sea, but some residual plankton remains in this diluted ballast water and the number of tankers arriving from overseas remains low at present.

The available information is currently inadequate to assess the magnitude of risk for ballast-mediated invasions, because seasonal and annual variability of plankton in the ballast water has not been measured for tankers. Moreover, the potential for survival and establishment of these organisms has not been studied.

Over the next two years, we will collect the necessary information for a detailed analysis of the risks, mechanisms, and patterns of species introductions for Prince William Sound. The Pilot Project and on-going research represent a cooperative and successful partnership of industry, citizen, agency, and scientific groups.

Dispersants Final Report May 1997: RCAC's contractor is S. L. Ross Environmental Research Ltd. This is a detailed, technical report titled "A Review of Dispersants Use on Spills of North Slope Crude Oil in Prince William Sound and the Gulf of Alaska." It synthesizes and evaluates recent technical literature related to oil spill chemical dispersants, with a view toward determining whether there are environmental advantages to using dispersants against spills of North Slope Crude in the Sound and the Gulf.

The report attempts to answer the following questions: Will present-day dispersants products actually be chemically effective in dispersing North Slope crude oil spills, and if so, is it appropriate to promote chemical dispersion as a desirable cleanup option, considering the possible detrimental effects of intentionally driving oil into the water?

Within the subject area, there are two main topics, dispersants effectiveness and ecological effects, and these are treated separately in the report. The report

includes recommendations for field and laboratory experiments and monitoring to better understand both effectiveness and potential ecological effects.

In-situ Burning Final Report May 1997: RCAC's contractor is S. L. Ross Environmental Research Ltd. This report was commissioned by RCAC to assist it in developing a position on *in-situ* burning for spills of Alaska North Slope (ANS) crude oil in Prince William Sound or the Gulf of Alaska. The report comprises an in-depth literature review, synthesis and summary of the scientific and operational material on the subject. A separate annotated bibliography has been provided in digital form using Microsoft Access 2.00.

The likely effectiveness of *in-situ* burning operations is compared to conventional containment and recovery effectiveness in the context of the expected characteristics of ANS crude oil spills and the marine environmental factors in the area. The report also includes a review of the likely properties – including recoverability, toxicity -- and effects of the residue after an *in-situ* burn, and an assessment of the likely composition, toxicity and effects of the smoke plume. Policies on the use of *in-situ* burning in other, similar areas of the world are documented, and needs for further research are identified.

Bioremediation Final Report 9/12/97: RCAC's contractor is Dames & Moore. This is a literature review presented to RCAC to provide decision-making information for the use of bioremediation technology in Prince William Sound and the Gulf of Alaska. A summary and synthesis of existing literature and research findings was conducted to assess the effectiveness of shoreline bioremediation for Alaska North Slope crude oil under sub-arctic conditions found in the Sound and the Gulf.

The report defines bioremediation and describes its methods, principles, effectiveness, advantages and disadvantages in the Sound and Gulf. Non-mechanical shoreline remediation methods are also described. An inventory of current research is presented, as are plans and recommendations for future research, and the status of national policies in the U.S. and other countries in northern regions of the world.

Columbia Glacier Study – scheduled completion 12/31/98: The disintegration and drastic retreat of Columbia Glacier since 1980 have significantly increased the potential for an oil spill in Prince William Sound due to an oil tanker/iceberg collision. The Exxon Valdez was maneuvering to avoid icebergs when it went aground in 1989, and the unladen tanker Overseas Ohio suffered over $1 million in damage when it struck an iceberg in 1994.

The ability to predict the ocean current direction and speed in Prince William Sound is the main goal of IMP (Iceberg Monitoring Project), funded by RCAC. An iceberg drift prediction model that uses tide and weather observations is under development for this project. The capability to predict circulation in Prince William Sound is essential for both prevention of oil spills and for environmental recovery in the event of a spill.

To reduce the potential for an iceberg/oil tanker collision resulting in an oil spill, real-time forecasts of iceberg drift trajectories are required. In addition, an improved understanding of circulation patterns in the Sound would greatly assist in oil clean-up efforts.

Additional tasks planned in 1998-99 are intensive current, salinity and depth measurements above and below the moraine shoal that acts intermittently as an iceberg barrier; the installation of a wind direction and speed, ocean tide and temperature instrumentation; installation of a time-lapse camera and development of a runoff prediction model for PWS. Approximately 50,000 high quality 35 mm photos of iceberg calving and drift that were collected for the RCAC-IMP project will be used together with the newly acquired data. In addition, freshwater runoff , which also influences circulation dynamics of PWS, will be calculated. An all-weather iceberg detection program using radar, sonar and other electronic techniques is also under way.

Community Impacts Planning Social/Technical Report – In Progress: A study initiated in 1993 to identify and develop coping strategies for the social problems created by a large technological disaster continued in 1996 and 1997. It was found that the Exxon Valdez oil spill created numerous social problems in the study community of Cordova, Alaska. Mitigation strategies were developed and tested in Cordova. A draft guidebook was developed based upon the results of the study and applied research. The guidebook is intended to be modified for other communities in the RCAC region and to be used to help those communities plan for potential social upheaval created by technological disasters. It is expected that this guidebook will be made final in the next recertification year.

(f) Financial summary

(1) Budget and spending plan for coming year – See Attachment 1.

(2) Work Plans for budget-approved studies and projects – See Attachments 1 and 2.

(3) Short-term strategy covering budget year – See Attachments 1 and 2.

(4) Long-term plan with goals, objectives and operating environment over next 3 to 5 years – See Attachments 2 and 3.

(5) Previous year's annual report – See Attachment 4.

(g) RCAC funding

RCAC's primary funding source is a long-term contract with Alyeska Pipeline Service Co. It provides approximately $2 million per year. A copy is included as Attachment 5.

RCAC also receives money from other sources in the course of conducting joint scientific and technical research, and occasionally contributes its own funds to research projects conducted by others. Some examples of jointly funded projects in the current fiscal year or will be active in the coming fiscal year:

Port Valdez Ecological Risk Assessment with Alyeska; Fire Symposium with many participants; Community-Based Nearshore Strike Teams with Kenai Peninsula Borough, Department of Environmental Conservation and City of Seldovia; Sensitive Area mapping with NOAA; Non-Indigenous Species (funding from U.S. Fish and Wildlife Service, Coast Guard and shipping industry); Dispersants Workshop with Department of Environmental Conservation, Coast

Guard and Alyeska; Ice Symposium with NOAA and Coast Guard; Cook Inlet Oil Spill Trajectory model with CIRCAC; Kodiak Subarea Plan with Kodiak Island Borough, Department of Environmental Conservation and Coast Guard; Port Valdez Water Quality Monitoring with EPA and NOAA; Community Education Program with Oil Spill Recovery Institute; Sensitive Area Mapping with NOAA; Weather and Current Data Collection with Prince William Sound Science Center; Ice Detection and Avoidance Strategy with Department of Environmental Conservation.

(h) Accessibility of Application

RCAC will inform the public of its recertification application through legal notices (see Attachment 6) and a press release (see Attachment 7).

Copies of the application will be available free upon request to RCAC's Anchorage office.

(i) Communications with industry and government

RCAC's goal is to maintain open, non-confrontational communications with government and industry that will further all our efforts toward safer oil transportation in our region.

We favor the collaborative approach, with all interested parties brought to the table to scope an issue, agree on objectives and otherwise maximize cooperation.

Industry and government representatives are encouraged to attend and participate in board and committee meetings, and they are provided with agendas and background information in a timely manner. RCAC routinely solicits their comments and input.

As noted above, RCAC's board provides ex-officio seats for ten government agencies, including the Coast Guard, the EPA and the Department of Environmental Conservation.

To promote effective communication with our chief industry contact – Alyeska Pipeline Service Co. – RCAC has developed standard operating procedures founded on the "no surprises" principle. These principles are embodied in a formal protocol RCAC entered into with Alyeska in August 1997 (see Attachment 8).

Top executives of RCAC and Alyeska meet quarterly to discuss relations between the two organizations. Separately, staff of the two organizations meet regularly to review, discuss and improve communication.

RCAC participates in a host of industry- and/or government-sponsored group efforts, as described in some detail earlier in this application.

These include meetings of the Alaska Regional Response Team, the ARRT's Sensitive Areas Working Group, the Wildlife Protection Working Group, and the Kodiak Subarea Planning Subcommittee Working Groups. RCAC's participation in these groups is intended to facilitate the inclusion of local knowledge and participation in the contingency planning process.

In addition, RCAC is funding a project to facilitate local involvement in, and assist in the development of, a federal/state/local subarea contingency plan for the

Kodiak region. RCAC also coordinates with Cook Inlet RCAC regarding the Cook Inlet Area Committee process.

RCAC is also involved in working groups on other subjects, ranging from ballast-water treatment to tanker escorts, and from non-indigenous species to waterways management.

The non-indigenous species project is a good example of the kind of coordinated, cooperative, multi-organization scientific effort that characterizes the RCAC approach. Besides RCAC, the working group includes representatives from the National Park Service, EPA, the Prince William Sound Community College, Alyeska, British Petroleum, Exxon's SeaRiver Maritime, the University of Alaska, the Smithsonian Environmental Research Center, the U.S. Geological Survey, NOAA, the Alaska Department of Environmental Conservation, the Aquatic Nuisance Species Task Force, the Alaska Department of Fish and Game, the Cook Inlet Regional Citizens' Advisory Council, the U.S. Fish and Wildlife Service, and Alaska SeaGrant.

In the past year, RCAC participated in the design, development, control and evaluation of approximately 25 drills and exercises. Major events included a Tesoro Transition Drill in October 1997 and a BP Logistics Workshop in September 1997. RCAC is currently involved in planning a British Petroleum Spill of National Significance drill scheduled for September 1998. After observing drills, exercises, and incidents, RCAC offers constructive comments and recommendations. RCAC also participates in drill debriefings.

We are currently working with the Coast Guard, Department of Environmental Conservation, and potentially responsible parties to clarify RCAC's interaction with the Unified Command in oil-spill response plans. RCAC is obligated to keep the public informed with verifiable information about response activities and to ensure that local knowledge and citizens' concerns are clearly communicated to the decision makers.

RCAC has also partnered with industry and government on several other kinds of projects as listed in the funding section above.

The non-indigenous species study, described in detail above, is an example of a project sustained by cooperation of all three sectors. It involved RCAC, Alyeska, TAPS crude shippers, the U.S. Fish and Wildlife Service and the Coast Guard.

RCAC is involved with industry and government in the development and implementation of risk management plans resulting from the findings of the risk-assessment study, which was completed in late 1996. Improvements to the tanker escort system, bridge management and communication, and navigational safety have resulted from efforts of subcommittees and working groups seeking to reduce the risk of oil releases in Prince William Sound.

RCAC's involvement in fire safety is another example of a joint effort. In June 1997 (shortly after our last recertification application was filed) RCAC sponsored a Valdez symposium to train land-based firefighters from the RCAC region to respond to ship-board fires so they could be called into service in the event of a tanker fire.

RCAC's co-sponsor was the Prince William Sound Community College, and the Alaska Division of Emergency Services paid for the attendance of 20 firefighters from outside the RCAC region.

As a result of the five-day symposium, the Alaska state fire marshal and the Coast Guard began a cooperative effort to develop a response team on call for marine emergencies anywhere in the state.

In March 1998, RCAC co-sponsored a dispersants workshop with the Department of Fish and Game, Alyeska Pipeline Service Company, the Coast Guard, and the Oil Spill Recovery Institute. The two-day conference was held to review recent research on and experience with oil spill dispersants use and provides an excellent example of how a cooperative approach can be used when addressing even the most controversial issues.

RCAC is also part of a joint effort with Alyeska, the City of Valdez, and Prince William Sound Community College to improve air service to Valdez, which is frequently delayed or canceled because of weather. All parties to this effort hope to have the best available aircraft servicing Valdez and to make the airport more of an all-weather facility, as it will be a critical resource in the event of a major spill or other serious accident at or near Valdez.

Given the complex and multifaceted relationship between RCAC and the industry, occasional tensions are inevitable and probably healthy, but there is no question that each side has made progress in understanding and respecting the other's positions, even when we disagree.

At RCAC's March 1998 annual board meeting, Rex Brown – Alyeska's liaison to RCAC – spoke in recognition of this maturing relationship, citing Alyeska's "pursuit of excellence and the critical role that RCAC plays in helping us achieve that."

Brown listed the 1997 fire symposium and the non-indigenous species study as examples of RCAC's participation and expertise contributing to safety improvements in Prince William Sound.

"Today the advice from RCAC is respected," Brown told the RCAC board. "There have been significant improvements in terminal operations and protection of the Sound. . . . It's sometimes a rough and rocky road beset by setbacks but the possibility for improvements locally, nationally and globally are within our reach when we work together."

In summary, RCAC continues to pursue and, we believe, maintain the type of relationship with industry and government contemplated in OPA-90.