

Sakhalin's Oil: Doing It Right

*Applying Global Standards to Public Participation,
Environmental Monitoring,
Oil Spill Prevention & Response and
Liability Standards in the Sakhalin
Oblast of the Russian Federation*

by

Dan Lawn, Rick Steiner & Jonathan Wills

A publication of Sakhalin Environment Watch and
the Pacific Environment & Resources Center



© Lawn, Steiner & Wills, Valdez, Alaska, November 1999

Publishers' Foreword

The Sea of Okhotsk is one of the world's most biologically productive seas. The people of the Russian Far East harvest rich fisheries stocks of crab, shrimp, pollock and other seafood products in the Sea of Okhotsk. The coastlines of the Sea of Okhotsk still provide spawning grounds for healthy, wild Pacific salmon runs that are in decline in other parts of the North Pacific. The waters near northeastern Sakhalin provide habitat for endangered Okhotsk Gray Whales. Yet new offshore oil developments along the northeastern shore of Sakhalin Island have greatly increased risks to the Sea of Okhotsk and its shorelines through an increased risk of oil spills.

On September 28, 1999, the people of Sakhalin received a wake-up call. They learned that oil had spilled from the "Vityaz" Marine Terminal, part of the newly operational Sakhalin-II project. Many questions remain about this spill. A month later, it is still not clear how much oil spilled or whether response measures were effective. The messages, however, are clear: that oil spills are all too possible, and that Sakhalin must take all measures to prevent oil spills and be prepared to respond to them.

While government authorities, international companies, and public financial institutions have focused attention on speeding ahead with efforts to develop Sakhalin Island's oil and gas fields, little attention has been paid to increasing Sakhalin's capacity to prevent and respond to oil spills.

In order to prevent a catastrophe such as the "Exxon Valdez" on Sakhalin Island, two non-governmental organizations – Sakhalin Environment Watch and California-based Pacific Environment and Resources Center – invited a team of independent experts to Sakhalin Island in order to review the island's spill prevention and response measures. Dan Lawn of the Alaska State Department of Environmental Conservation conducted tanker inspections at the Valdez Terminal in Alaska and was the first State official on board the "Exxon Valdez" the night it ran aground on March 24, 1989. He came to Sakhalin in a private capacity, representing the citizen's organization Alaska Forum for Environmental Responsibility. Rick Steiner, a professor in the Marine Advisory Program at the University of Alaska, was a commercial fisherman who responded to the "Exxon Valdez" spill. Jonathan Wills, a writer and environmental consultant from the Shetland Islands, has followed oil development issues in the North Sea for the last twenty years and monitored clean-up of such spills as the "Esso Bernicia" in 1978 and the "Braer" in 1993. All three have considerable expertise in oil spill prevention and response that was used in developing the enclosed recommendations.

In 1979, after the "Esso Bernicia" accident at Sullom Voe, the Shetland Islands and the oil companies working there improved their standards for oil spill prevention and response. Had these standards been in place in Alaska ten years later, the "Exxon Valdez" catastrophe might not have occurred. After the "Exxon Valdez" disaster in 1989, the U.S., the State of Alaska, and the oil companies improved their standards for oil spill prevention and response. Ten years later, in 1999, we hope that Sakhalin will not have to suffer a similar catastrophe before it improves its oil spill prevention and response standards to the same levels required in the North Sea and Alaska.

We thank these experts for volunteering their time to come to Sakhalin and study these oil pollution issues. We also would like to thank the many agencies, companies, and individuals in Sakhalin who

provided our experts with information needed to develop the enclosed recommendations. We met with many dedicated people who are truly concerned about ensuring the safety of Sakhalin's oil projects and preventing a potentially catastrophic oil spill. In particular, we would like to thank: Sakhalin Regional Committee for Environmental Protection, Sakhalin Regional Department for Development of the Shelf, Sakhalin Basin Emergency Salvage Department (SakhBASU), Kholmsk Accident Response Sub-Center, Korsakov Port Authority, American Business Center, Sakhalin Energy Investment Company, Ecoshelf, State Mining Technical Inspectorate, the Emergency Committee, the Special Research Bureau of the Russian Academy of Sciences, the Association of the Fishing Industry of Sakhalin, the Public Committee for the Shelf, concerned deputies of the Nogliki District Council, concerned indigenous representatives from the village of Val, and members of the Sakhalin media and public.

We also would like to thank the Rockefeller Brothers Fund and the Trust for Mutual Understanding, two U.S.-based charitable foundations that supported the experts' travel to Sakhalin.

The enclosed recommendations are entirely independent of Sakhalin Environment Watch and Pacific Environment and Resources Center as well as of the foundations that supported this work. They are offered as part of an independent analysis to compare the standards used in Sakhalin's oil development to global standards and to help ensure the safety of Sakhalin's oil and gas development. Some of these recommendations will take significant public, political, and private sector commitments to implement. Other recommendations do not require financial resources for implementation; rather, they require political will.

Following this independent study, our organizations remain concerned that Sakhalin is not yet able to either adequately prevent or adequately respond to a major oil spill. We call on all those who are involved in or affected by oil and gas development offshore of Sakhalin Island to take action to implement the enclosed recommendations. Work on implementing these recommendations must begin now – before oil pollutes the shorelines of the Sea of Okhotsk.

We respectfully provide these recommendations to Russian federal and Sakhalin Regional government agencies, Russian and multinational oil companies involved in development of the Sakhalin shelf, other interested governments such as those of Japan and the United States, public international financial institutions that are backing oil development projects, Russian and Japanese fishermen and fishing companies, the press, and the public. Implementation of these recommendations is a key step in preventing oil pollution within the pristine waters of the Sea of Okhotsk. We look forward to your response.

Sincerely,

Dmitry V. Lisitsyn
Sakhalin Environment Watch

David Gordon
Pacific Environment and Resources Center

Sakhalin's Oil: Doing It Right

Applying Global Standards to Public Participation, Environmental Monitoring, Oil Spill Prevention & Response and Liability Standards in the Sakhalin Oblast of the Russian Federation

by Dan Lawn, Rick Steiner & Jonathan Wills

Independent Consultants to Sakhalin Environment Watch and the Pacific Environment & Resources Center

Contents

Page iv **Frontispiece**

1 Purpose of Project

1 Introduction

2 Acknowledgements

3 Summary of 78 Recommendations

9 Discussion of Detailed Recommendations

- I: Guiding Principles for reducing environmental risk from offshore oil Developments
- 10 II: Public Participation: *Recommendations 1 - 7*
- 12 III: Environmental Monitoring: *Recommendations 8 - 16*
- 14 IV: Pollution Prevention: *Recommendations 17 - 22*
- 15 V: Oil Spill Prevention: *Recommendations 23 - 52*
- 20 VI: Oil Spill Response: *Recommendations 53 - 70*
- 23 VII: Legal Liability: *Recommendations 71 - 77*
- 27 VIII: Other Environmental Issues: *Recommendation 78*

Appendices

- 29 I: The Investigation Team
- 31 II: Itinerary and list of interviewees
- 32 III: Lessons for Sakhalin from Recent History
- 40 IV: Table of comparative data for offshore oil developments, tanker movements, onshore oil terminals and oil spill response in Alaska, Norway, Scotland and Sakhalin
- 45 V: Maps
- 48 VI: Information about the Publishers

Frontispiece

"...Sakhalin Energy has established policies which **will** protect and preserve the island's ecology..."

"...a **detailed** Environmental Impact Assessment was prepared and made available for public review..."

"An extensive environmental monitoring program is being carried out to **verify** project impact **is minimal**."

"The Company **will** ensure that **any** discharges from the Molikpaq [platform] **will** cause **minimum** damage to the marine environment. In the **unlikely** event of an accidental spillage of oil, special materials and equipment **are** available both locally and internationally to enable **immediate** response."

"...equipment and material can be used **quickly** and **effectively**."

"...the Project **has** established the necessary framework to deliver **excellence** in safety performance..."

*Selected quotations from "The Sakhalin-2 Project"
by Sakhalin Energy Investment Company Ltd,
32 Communistichesky Pr., office 550,
Yuzhno-Sakhalinsk 693000,
Russia. 1999
- **Emphases added***

These quotations show that Sakhalin Energy wishes to convey its good intentions to the public. We are sure that other companies involved in developing Sakhalin's offshore oil and gas resources will give similar assurances. However, our study of the existing situation suggests that some of these promises may be difficult to keep unless improvements are made. We have found serious environmental concerns about how the development is proceeding.

Dan Lawn
Rick Steiner
Jonathan Wills

Valdez, Alaska
27th October 1999

Purpose of Project

To review the existing status of environmental monitoring, oil spill prevention and response preparedness in the offshore oil and gas fields of Sakhalin Oblast in the Russian Federation and to make any necessary recommendations for improvements.

Introduction

The consultants wish to make it clear that we are well aware of the potential economic and social benefits to local people from environmentally responsible development of Sakhalin's offshore oil and gas deposits. We wish to see these benefits maximized and the environmental risks minimized.

We recognize the environmental expertise and commitment of people from government, industry and other organizations in Sakhalin and do not presume to instruct them how to act. Our intention, as unpaid volunteer observers invited to Sakhalin by local people, is merely to make suggestions based on our own experience and our (necessarily limited) knowledge of Sakhalin Oblast.

We are independent of government, the oil industry or any organized environmental group dealing with Sakhalin oil development. Our sole concern is to ensure that Sakhalin Oblast's existing environmental problems are not aggravated by an offshore oil pollution disaster, which would make the resolution of these difficulties much harder.

Although the main focus of our study was on the developing offshore oil and gas fields of the Sakhalin Shelf, we wish to make the point very strongly that the aging onshore fields - and the coastal tanker and subsea pipeline activity associated with them - appear to carry a far greater immediate pollution risk than the new projects on the north-east coast. This problem requires the urgent attention of the Russian Government.

We believe the best way to prevent environmental damage is to implement in Sakhalin the highest standards of pollution prevention and oil spill response, which we have seen put into practice by the oil industry elsewhere.

We have followed the progress of the Sakhalin offshore oil and gas industry for several years, and in detail since 1997, when Steiner and Wills were first asked by Pacific Environment & Resources Center to comment on the draft Environmental Impact Statement of Sakhalin Energy Investment Corporation (SEIC). We are familiar with the main public documents of the project and have studied numerous published articles about Sakhalin in professional journals and the media in general. We have also seen documentation prepared by Sakhalin Environment Watch, Greenpeace and other concerned Non-Governmental Organizations (NGOs).

Our program of interviews in Sakhalin was designed to elicit detailed technical information and points of view from a wide cross-section of professionals and concerned members of the public. Field trips to Lesnoye, Korsakov, Kholmsk, Nogliki, Katangli, Nabil Bay and Val were essential parts of the study, to familiarize the team with the geography of the area and also to hear at first hand the views of local people. Public meetings in Yuzhno-Sakhalinsk and Nogliki provided additional information about public opinion.

In addition, much data was obtained from the Russian authorities and Sakhalin Energy Investment Company (SEIC). We wish to emphasize that although SEIC is mentioned frequently in this report, because it is the first and so far only oil company actually producing on the Sakhalin Shelf, our comments are intended for the industry as a whole rather than SEIC alone.

General details of the report were discussed with representatives of Sakhalin Environment Watch, Pacific Environment & Resources Center and Sakhalin Energy Investment Company (SEIC). Copyright and sole responsibility for the contents rest with the consultants. This document may be quoted free of charge as long as credit is given.

Acknowledgements

Our international air fares from Anchorage to Sakhalin were paid by the Pacific Environment & Resources Center (PERC) of Oakland, California, a non-profit organization which promotes research and public participation in environmental debates.

Our travelling and subsistence expenses in Sakhalin were met by Sakhalin Environment Watch (SEW), a non-governmental organization in part funded by PERC.

Steiner's participation in the project was supported in part by the University of Alaska. Lawn, who is an Alaska State official, traveled to Sakhalin as a private citizen, in his capacity as President of the Alaska Forum for Environmental Responsibility. He and Wills used vacation time to make the trip. None of us received any consulting fee from PERC or SEW for our services.

We wish to thank everyone who made us so welcome in Sakhalin, particularly the government officials who spent much time with us and provided research materials, and the SEIC representatives who arranged access to documents, to the Nogliki spill response base and Kaigan, and transport for one of us from Yuzhno-Sakhalinsk to the Vityaz offshore terminal.

We also thank the staff of the Hotel Eurasia and the Kuban Guest House, the staff and volunteers of Sakhalin Environment Watch and, above all, our indefatigable and grossly overworked interpreters, Valeriya Williamova Hussar and David Gordon.

Dan Lawn
Rick Steiner
Jonathan Wills

Summary of Recommendations

Public Participation

1. Establish a Sakhalin Coastal Citizens' Advisory Council (SCCAC);
2. The SCCAC board of management should be elected and broadly-based;
3. International organizations such as Friends of the Earth, Greenpeace and the various oil industry associations should have observer status on SCCAC;
4. The SCCAC board should have a small, salaried secretariat and produce an annual report to the public;
5. SCCAC board members should be paid nominal salaries;
6. The council should have the power to hire expert researchers and to see relevant oil company and government data, and the obligation to publish its own data and to hold all sessions in public. Accounts should be subject to annual public audit;
7. We suggest that environmental activism in Sakhalin should be encouraged, supported, and listened to by government, industry, the media and the public;

Environmental Monitoring

8. The proposed SCCAC should commission a revised Environmental Impact Assessment (EIA) for the entire coastline of Sakhalin;
9. In future, all individual oil company EIAs should be supervised by the SCCAC or, at the very least, submitted to it for review and comment, prior to being submitted to the Russian Government for approval;
10. We suggest all environmental data collected by oil companies, contractors and government agencies be made public;
11. All environmental work should be subject to public peer review;
12. Environmental monitoring should continue throughout the lifetime of the oil and gas fields;
13. Monthly beached-bird surveys should be commissioned during the ice-free season on sample beaches and lagoon shores;
14. Other environmental monitoring tasks which appear to be required include researching and publishing the extent of existing contamination of the coastal lagoons;

15. There is also a need for a formal, accurate assessment of the total value to the economy of Russia and Sakhalin Oblast of the natural resources of the Sea of Okhotsk and the nearshore and coastal zone of Sakhalin and the Kuril Islands;

16. The oil industry should do more to promote environmental education in Sakhalin;

Pollution Prevention

17. The program of offshore seismic prospecting should be modified to minimize noise pollution effects on marine mammals, birds and fish;

18. The oil companies should revise operating procedures to minimize disturbance to wildlife;

19. Offshore drilling programs should eliminate the biological effects of drilling mud and drill cuttings;

20. The industry should comply with Russian law and dispose of all drilling cuttings by either re-injecting to the well or shipment ashore for reprocessing and disposal;

21. The oil companies on the Sakhalin Shelf should also comply with Russian law by making zero discharges to the sea;

22. The start and end dates of the tanker loading season at offshore terminal should be decided by the Russian authorities;

Oil Spill Prevention

23. Weather and visibility limits for operating at the Vityaz Marine Terminal and other offshore loading facilities should be made compulsory;

24. The Russian Government should review operating procedures to minimize the risk of collisions at the Vityaz Marine Terminal;

25. The Vityaz Marine Terminal should monitor all vessel traffic passing within 10 miles;

26. All components of the Vityaz Marine Terminal should be inspected regularly by Russian governmental authorities;

27. The operators of the Vityaz Marine Terminal should follow operating procedures in their manual when clearing loading hoses of oil, to minimize the risk of pollution;

28. Shuttle tanker draft limits should be revised downwards;

29. The continuous presence of independent technical and environmental inspectors at the offshore oil and gas fields is essential to verify compliance with Russian law;

30. The Russian Government's marine surveyors should thoroughly inspect shuttle tankers on arrival;
31. The Russian authorities should also agree, with the sellers of oil, all the procedures for pre-mooring, pre-loading and pre-departure checks;
32. A comprehensive vessel traffic risk assessment of the entire Sakhalin coast is required;
33. The identity, position, course and speed of all oil tankers around the coast of Sakhalin and the Kuril Islands should be continuously monitored by the Russian authorities;
34. Where possible, Russian military radar and other surveillance assets should be employed to assist the civil authorities in monitoring tanker traffic;
35. The state marine rescue services should include a tanker traffic advisory notice in their regular weather broadcasts;
36. We suggest establishing a lighted cardinal buoy to mark the 8.2m shoal at 52 degrees 31 minutes North; 143 degrees 40 minutes West;
37. Highest Standards of Training, Certification and Watch-keeping (STCW) must be enforced;
38. One-person Bridge Operation at Night (OBON) should be banned in Russian waters;
39. All personnel involved in marine traffic should understand orders in the international maritime language, English;
40. Russian border guards should do random alcohol screening of shuttle tanker crews;
41. Shipping lanes and areas to be avoided should be marked on nautical charts, and enforced for tankers trading to Sakhalin;
42. The guiding principle when establishing how far offshore a tanker should stay until altering course for her approach to an FSO should be the number of hours it would take for an ocean salvage tug to reach a disabled tanker;
43. Double-hulled tankers should be exempted from some of the escort provisions and also allowed a discount on fees charged for vessel traffic services and pollution prevention;
44. The Russian Federation should draw up a schedule for phasing in double hulls at all its tanker ports and offshore terminals by the year 2015, significantly in advance of the IMO schedule;
45. Meanwhile, all single-hulled tankers should be required to load in a hydrostatically balanced manner, to minimize spillage in the event of hull rupture;

46. Escort tugs should accompany all large tankers navigating the La Perouse Strait or other constricted waterways;
47. To assist disabled tankers, a second Neftegas-class tug is required on station in the offshore oil and gas fields, also to act as an escort;
48. There must be an agreed procedure for notifying shore authorities when a problem arises on a tanker;
49. Tugs and tankers must regularly test hooking up a towline in various weather conditions;
50. We recommend full, independent, engineering and safety audits to ensure that Molikpaq and subsequent platforms do indeed meet or exceed the safe construction and operation standards established by the Cullen Report in the North Sea;
51. A full technical audit of the aging oil pipelines across the Tatar Straits and the tanker terminals at Moskalvo and Pogranichnoye, should be a priority as these installations also carry the risk of serious oil spill;
52. Oily waste disposal facilities at all Sakhalin ports should be reviewed and, if necessary, upgraded;

Oil Spill Response

53. The Sakhalin Regional Spill Plan must be updated and integrated into a wider, north-west Pacific regional plan as soon as possible;
54. There is a need to inform and involve local councilors and officials;
55. Each tanker calling at Sakhalin must be required to file its own spill response plan;
56. More oil spill response centers are required;
57. Stocks of oil spill response equipment and materials, including workboats, should be increased;
58. We suggest immediate improvement of access roads to the lagoons;
59. We recommend the early establishment of a marine service base and emergency equipment/oilspill response depot at Nabil Bay;
60. It should be publicly admitted that there is little chance of stopping a tier two or three spill polluting the beach;
61. The suppliers of heavy lift helicopters should be pre-contracted to deal with a tier three spill, which would require at least eight such aircraft;

62. Nogliki airport needs to be upgraded to take larger cargo planes;
63. All control centers and forward bases should be equipped with electricity generators and telecommunications powered independently on site;
64. Spill response authorities need to provide phones or radios for all locally-based people involved in spill response;
65. More local residents with specialized knowledge of the areas at risk need to be consulted;
66. The SakhBASU offshore oilspill response base at Korsakov urgently needs massive augmentation and proper storage;
67. There should be field trials in the use of dispersants with Sakhalin oil and a clear policy on when and where they can be used;
68. It is essential to hold regular surprise exercises to test the ability to respond to a large spill. These should include practical liaison with Japanese authorities;
69. Between surprise drills there should be regular desktop drills and field trials;
70. The two terminals onshore Sakhalin, at Moskalvo and Pogranichnoye, and the Tatar Straits sub-sea pipeline owner, should contract with Ecoshef or a similar organization for spill response cover, if they have not already done so;

Legal Liability

71. Many improvements can be made without new Russian or international laws, simply by inserting clauses in commercial contracts between the sellers and buyers of the oil;
72. We recommend that Russian parliamentarians should, as a matter of urgency, consider comprehensive legislation - perhaps entitled the Russia Oil Pollution Act of 2000, or "ROPA 2000" - requiring standards comparable to the US Oil Pollution Act of 1990 (OPA 90), particularly in the double-hull and liability provisions;
73. It is imperative that the liability provisions for oil spills off Sakhalin be reviewed by an independent team of environmental attorneys, with recommendations to raise the liability limits to the maximum potential cost of a worst case accident.
74. We strongly recommend that the Russian Federation should take a lead in this matter and insist that all tankers and offshore installations carry adequate insurance to cover all the potential liabilities arising from a spill;
75. Russia should also be able to assess and collect punitive damages from polluters found to be grossly negligent;

- 76. A Prevention, Response & Oversight (PRO) Fund should be established;
- 77. A pipeline-to-shore oil transport system appears preferable to offshore loading, on both economic and environmental grounds;

Other Environmental Issues

- 78. Our final recommendation is for an immediate, full and public environmental and safety audit of the onshore oil and gas developments in Sakhalin, which we believe to be at least as serious a threat to the island's water, land and air as the proposed offshore projects.

Discussion of Detailed Recommendations

Our recommendations are under the headings of

- I: Guiding Principles
- II: Public Participation
- III: Environmental Monitoring
- IV: Pollution Prevention
- V: Oil Spill Prevention
- VI: Oil Spill Response
- VII: Legal Liability
- VIII: Other Environmental Issues

Äîâðÿé ñ ïðîâðÿé...
Trust, but verify...

I: Guiding Principles for reducing environmental risk from offshore oil developments

A: To implement in Sakhalin global standards of best practice in a) minimizing the risks of oil spills and other environmental contamination due to offshore oil exploration, production and transport, and b) responding to spills that occur.

B: To use Best Available Technology (BAT) and procedures to achieve this goal and to fund research into further improvements.

C: To follow administrative, fiscal and legal best practice in ensuring compliance with standards agreed between the civil authorities and industry (as exemplified in the use of commercial contracts to enforce the "Shetland Standard" package of safety precautions for tankers trading to the Sullom Voe oil terminal in Scotland).

D: To cooperate with fishermen, environmental groups and other non-governmental organizations (NGOs) in reviewing current practice and discussing improvements, rather than fostering antagonism by attempting to undermine or discredit such groups of concerned citizens.

II: Public Participation

1

Establish a Sakhalin Coastal Citizens' Advisory Council (SCCAC), funded jointly by the oil industry and the state - but politically independent of either - to conduct and oversee research into environmental science, oil spill prevention and response, to canvass public opinion and advise government and industry.

2

The SCCAC board of management should be elected and broadly-based, comprising representatives of local councils, indigenous peoples' representatives, non-governmental organizations such as fishermen's unions, tourism enterprises, local environmental groups (e.g. Sakhalin Environment Watch), associations and clubs for hunters, anglers, birdwatchers and other nature lovers, and local youth organizations. Government agencies should be ex-officio members without voting rights.

3

International organizations such as Friends of the Earth, Greenpeace and the various oil industry associations should have observer status on SCCAC, if requested, at their own expense and at the board's discretion.

4

The SCCAC board should have a small, salaried secretariat, based in Yuzhno-Sakhalinsk, with a field office in Nogliki or Okha , and produce an annual report to the public;

5

SCCAC board members should be paid nominal salaries plus legitimate travel and subsistence expenses for approved work.

6

The council should have the power to hire expert researchers and to see relevant oil company and government data, and the obligation to publish its own data and to hold all sessions in public. Accounts should be subject to annual public audit.

A Sakhalin Coastal Citizens Advisory Council would not only provide critical citizens' participation in the safety of the offshore oil projects, but also establish an important collaborative and mutually beneficial relationship between the local citizenry, the government, and the oil industry. Collective problem solving is often more productive than the traditional adversarial approach.

The essence of participatory, democratic forms of governance is that citizens have not just the right to vote, but also an obligation to become informed on issues affecting them and to express their concerns broadly and openly. Even if public opinion seems critical, government and industry should pay attention to it because experience has shown that critical public opinion can have a very positive effect on proposed development projects. For example, it is widely acknowledged that the

environmental activists in the United States who were vigorously demeaned by the government and the oil industry in the early 1970s, for criticizing the proposed construction of the Trans-Alaska Pipeline System (TAPS), actually contributed to the construction of a better, safer system. The activists became in practice unpaid and often very knowledgeable consultants, helping the industry to solve problems.

7

We suggest that environmental activism in Sakhalin should be encouraged, supported, and listened to by government, industry, the media and the public. It is in everyone's interest to do so. A catastrophic spill on the Sakhalin Shelf would cause extreme environmental, economic and social damage and adversely affect further oil and gas developments in the area. The political and financial repercussions on Sakhalin – and probably on Japan - would be enormous.

III: Environmental Monitoring

8

The proposed SCCAC should commission a revised Environmental Impact Assessment (EIA) for the entire coastline of Sakhalin, supervised by reputable, independent scientists and including a detailed biological database, intensive monitoring, annual surveys and consistent methodology to ensure comparability of data. This document should seek to include and co-ordinate the various studies done to date by public and private agencies.

At least two oil companies and several government departments appear to have been working more or less independently on ecological studies without, in our view, enough sharing of methodology or raw data. This expensive and disorganized approach can only lead to wasted effort, duplication, incompatible data sets and confusion. It is likely to worsen as more oil companies in the area reach the stage of submitting individual EIAs.

We are concerned by the variable standard of the environmental work in SEIC's Oil Spill Contingency Plan, which in our view contains several over-optimistic statements about the sensitivity of bird and mammal species to oiling, makes some unsubstantiated value judgments about biodiversity, relies upon inadequate and out-dated data for some species, and is unrealistic about the extent to which oil spill clean up is possible in some locations.

9

In future, all individual oil company EIAs should be supervised by the SCCAC or, at the very least, submitted to it for review and comment, prior to being submitted to the Russian Government for approval;

10

We suggest all environmental data collected by oil companies, contractors and government agencies be made public, not just summaries but discussion papers and draft recommendations before they are approved by the Russian Government.

11

All environmental work should be subject to public peer review. Honest, public and scientifically impeccable EIAs are essential to help oil companies and government make sensible decisions and to measure and value existing wildlife resources, providing a reliable base for calculating compensation in the event of serious damage.

12

Environmental monitoring should continue throughout the lifetime of the oil and gas fields and include water quality and pelagic organisms downstream from the platforms, as well as the benthic studies already proposed, along with monitoring of control sites.

13

Monthly beached-bird surveys should be commissioned during the ice-free season on sample beaches and lagoon shores, to provide baseline data in the event of a major spill. The work should include appropriate control sites where oiling is unlikely. This technique is inexpensive and has

proved very effective in other oil provinces, proving a good indicator of increased chronic spillage rates as well as acute incidents of oiling.

14

Other environmental monitoring tasks which appear to be required include researching and publishing the extent of existing contamination of the coastal lagoons from military bases, onshore oilfield operations (which appear to be seriously polluting some areas) runoff from settlements and industrial undertakings. In the event of an offshore spill polluting a lagoon, it is essential (not least for calculating compensation payments) to know the extent of pre-existing contamination, if any, from other sources. Without this baseline information there is potential for extensive legal arguments and court appeals, delaying restitution of state and personal losses for many years.

15

There is also a need for a formal, accurate assessment of the total value to the economy of Russia and Sakhalin Oblast of the natural resources of the Sea of Okhotsk and the nearshore and coastal zone of Sakhalin and the Kuril Islands. Without this information there is no prospect of establishing a realistic baseline for restitution of economic damages in the event of a spill.

16

The oil industry should do more to promote environmental education and public awareness of Sakhalin Oblast's coastal flora and fauna by publishing attractive, informative, full-color wall charts and field guides showing the flowers, trees, birds, animals, insects and marine life. There is very little such material available for Sakhalin or the Kuril Islands. The highly-acclaimed Shell Guides to the British Countryside may serve as a model. By filling this gap the oil companies could perform a much-needed public service, foster appreciation of responsible environmental stewardship and, quite legitimately, advertise their own performance as environmentally-aware corporate citizens. School visits, scholarships for students, displays in public libraries and site visits also have a role in such programs, which have been very successful in other oil provinces such as Alaska, Newfoundland, Norway and Scotland.

IV: Pollution Prevention

17

The program of offshore seismic prospecting should be modified, on the precautionary principle, to take into account what is known about the effects of seismic explosions and other submarine industrial noise pollution on migration, feeding and social behavior of whales, dolphins, fish and, indirectly, on feeding seabirds. Wherever practicable, seismic shots within 10 km of cetaceans and large shoals of fish should be avoided.

18

The oil companies should revise operating procedures to minimize disturbance to wildlife from increased human activity and industrial noise pollution above the surface in the area of the development, including increased access to formerly remote and unfrequented shorelines.

19

Offshore drilling programs should eliminate the biological effects of drilling mud and drill cuttings discharges - such as smothering and contamination of benthic and pelagic fauna and flora. This requirement is particularly urgent in the shallow waters of the Sakhalin Shelf, where the effects of discharges may be more severe and extensive than in the deeper waters of the UK Continental Shelf.

20

The industry should comply with Russian law and dispose of all drilling cuttings by either re-injecting to the well or shipment ashore for reprocessing and disposal, as is currently done for oil-based drilling muds offshore Norway and for all drilling muds on the North Slope of Alaska. This should apply to all drilling muds, including so-called "water-based muds" (which in fact may often contain water-soluble hydrocarbons and a range of other toxic substances).

21

The oil companies on the Sakhalin Shelf should also comply with Russian law by making zero discharges to the sea from exploration and production installations - including drilling chemicals, biocides, surfactants and oil and heavy metals in produced water.

22

The start and end dates of the tanker loading season at offshore terminal should be decided by the Russian authorities, not solely by the operators.

V: Oil Spill Prevention

23

Weather and visibility limits for operating at the Vityaz Marine Terminal and other offshore loading facilities should be made compulsory rather than discretionary as stipulated at present in the Terminal Operating Plan. The limits - 3.5 meters significant wave height, 35 knot wind, 3 knot current - must become mandatory. The VMT Operating Plan should be changed as follows: from "Export tankers may be required to disconnect...." to "Export tankers SHALL be required to disconnect..." The marine surveyor of the Russian government on board the FSO during each shuttle loading (see below) should have ultimate authority to order a suspension of loading and a disconnect when any of the weather limits (including poor visibility) is exceeded. In situations where the current reverses to the north (that is, where the FSO would swing around toward the Molikpaq) more strict weather operating conditions should be enforced. In view of the proximity to shore and the prevailing onshore wind during the loading season, there is no margin for error if the FSO or a shuttle tanker breaks away in severe weather.

24

The Russian Government should review operating procedures to minimize the risk of collisions between the Floating Storage and Offloading vessel (FSO), Single Anchor Leg Mooring (SALM), Marine Service Vessel (MSV) and shuttle tankers.

25

The Vityaz Marine Terminal should monitor all vessel traffic passing within 10 miles and have a contingency plan for alerting vessels which do not respond to warning signals.

26

All components of the Vityaz Marine Terminal should be inspected regularly by Russian governmental authorities, including mooring lines, oil transfer hoses, subsea pipelines, FSO, Molikpaq, etc. As the September 1999 incident showed, mooring hawsers and fittings require first-class quality control of components before, during and after installation.

27

The operators of the Vityaz Marine Terminal should follow operating procedures in their manual when clearing loading hoses of oil, to minimize the risk of pollution. We understand that this is not currently being done.

28

We suggest revising shuttle tanker draft limits downwards. The Environmental Impact Assessment for the Sakhalin II Project refers to shuttle tankers in the 80,000 to 90,000 dwt size, whereas the Vityaz Marine Terminal Operating Plan envisages tankers up to 250,000 dwt. We believe the water at the FSO is too shallow for loaded vessels drawing more than the FSO to navigate and load safely.

29

The continuous presence of independent technical and environmental inspectors at the offshore oil and gas fields is essential to verify compliance with Russian law. The inspectors,

reporting directly to the Russian Government, should include marine surveyors with professional qualifications approved by Lloyds, Det Norske Veritas, American Bureau of Shipping or equivalent Russian authorities.

30

The Russian Government's marine surveyors should thoroughly inspect shuttle tankers on arrival at the pilot station, verifying all assertions made in the company vetting process and vessel particulars. They should check that all essential systems are working and in particular that the vessel's rudder responds to commands and the engine can be put into reverse, as required by the VMT manual. SEIC's vetting program is extensive and thorough. It should be regarded as the minimum standard for other operators when they start up on the Sakhalin Shelf.

31

The Russian authorities should also agree, with the sellers of oil, all the procedures for pre-mooring, pre-loading and pre-departure checks, along the lines of the Shetland Standard used at Sullom Voe and the companies should enforce these conditions by commercial contract.

32

A comprehensive vessel traffic risk assessment of the entire Sakhalin coast is required, with identification of high risk areas, shipping lanes for tankers and other large vessels, areas to be avoided, traffic advisory services and details of additional aids to navigation. The assessment should be reviewed by a federal expertiza with regional participation.

33

The identity, position, course and speed of all oil tankers and other large vessels around the coast of Sakhalin and the Kuril Islands should be continuously monitored by the Russian authorities, to ensure that vessels standing into danger may be contacted by radio, warned and, if necessary, intercepted. The vessel tracking and identification system could use a combination of radar surveillance, GPS, GMDSS, satellite transponders and VHF radio and should be compatible with the standards being mandated by the International Maritime Organization in 2003.

34

Where possible, Russian military radar and other surveillance assets should be employed to assist the civil authorities in monitoring tanker traffic.

35

The state marine rescue services should include a tanker traffic advisory notice in their regular weather broadcasts, informing all ships of the intended movements of tankers in the Sea of Okhotsk.

36

We suggest establishing a lighted cardinal buoy to mark the 8.2m shoal at 52 degrees 31 minutes North; 143 degrees 40 minutes West. Although it is within the 12 mile territorial sea of the Russian Federation and most tankers will probably transit outside of this area, mistakes can occur and a navigation marker on the hazard would help to avert groundings.

37

Highest Standards of Training, Certification and Watch-keeping (STCW) must be enforced.

As most marine collisions, groundings and accidental oil spills are caused by human error, it is essential to ensure that all staff at the offshore terminals and aboard the shuttle tankers and support vessels comply with the latest International Maritime Organization standards for staff training, certification and watch-keeping.

38

One-person Bridge Operation at Night (OBON) should be banned in Russian waters. This is a very dangerous practice which has been responsible for numerous accidents around the world.

39

All personnel involved in marine traffic should understand orders in the international maritime language, English. Simple failures of verbal communication have led to frequent difficulties and occasional accidents in other countries.

40

Russian border guards should do random alcohol screening of shuttle tanker crews, with authority to refuse mooring and/or loading if the influence of substances is suspected. The zero-tolerance policy for drink and drugs must be rigorously applied. The VMT Operating Plan gives the mooring master the right to refuse vessels "found to be seriously deficient or substandard in any safety requirements," but gives, in our opinion, too much discretion to the operating company. The "right to reject" is not the same as the "obligation to reject."

41

Shipping lanes and areas to be avoided should be marked on nautical charts, and enforced for tankers trading to Sakhalin, with segregated channels for vessels on reciprocal courses in restricted channels. This should also apply to tankers trading to existing oil- and product-handling facilities at Sakhalin ports, and to all large vessels carrying hazardous and/or polluting cargoes or more than 500 tonnes of fuel oil in Russian waters.

42

The guiding principle when establishing how far offshore a tanker should stay until altering course for her approach to an FSO should be the number of hours it would take for an ocean salvage tug to reach a disabled tanker. For example, a loaded 100,000 dwt tanker may drift towards land at around 3 knots in a 50-knot wind blowing onshore. If we assume that tugs are 10 hours' steaming time away and, on arrival at the scene, will need 20 miles leeway to secure a towline and haul the casualty out to safety, the safe distance offshore for the tanker lane would be $(20 + (10 \times 3)) = 50$ nautical miles. This will vary according to circumstances. Escorted tankers might safely navigate closer to land.

43

Double-hulled tankers should be exempted from some of the escort provisions and also allowed a discount on fees charged for vessel traffic services and pollution prevention.

44

The Russian Federation should draw up a schedule for phasing in double hulls at all its tanker ports and offshore terminals by the year 2015, significantly in advance of the IMO schedule.

45

Meanwhile, all single-hulled tankers should be required to load in a hydrostatically balanced manner, to minimize spillage in the event of hull rupture.

46

Escort tugs should accompany all large tankers navigating the La Perouse Strait or other constricted waterways. Tanker masters should issue a traffic advisory message when departing Vityaz and other terminals, giving an estimated time of arrival at waypoints one hour's sailing time from such straits (including the various straits between the Kuril Islands).

47

To assist disabled tankers, a second Neftegas-class tug is required on station in the offshore oil and gas fields, also to act as an escort vessel during the crucial operations of shuttle tankers' topping off, disconnection from the FSO and, in strong onshore winds, departure out to 50 miles from the coastline. When not tending a tanker, it should be available as an oil spill response vessel.

48

There must be an agreed procedure for notifying shore authorities when a problem arises on a tanker. Delay in notification of coastal authorities to call out rescue tugs has been a contributing factor in several tanker disasters.

49

Tugs and tankers must regularly test hooking up a towline in various weather conditions.

50

We recommend full, independent, engineering and safety audits to ensure that Molikpaq and subsequent platforms do indeed meet or exceed the safe construction and operation standards established by the Cullen Report into the fire and explosion on Occidental Oil's Piper Alpha platform in the North Sea in July 1988, rather than the vague "modern North Sea" standards referred to in SEIC public relations literature.

51

A full technical audit of the aging oil pipelines across the Tatar Straits and the tanker terminals at Moskalvo and Pogranichnoye, should be a priority as these installations also carry the risk of serious oil spill. One oil pipeline, reportedly built in the 1940s, has been

described by Russian experts as being in "lamentable" condition. The terminals are believed to be poorly maintained and may not meet modern operating standards.

52

Oily waste disposal facilities at all Sakhalin ports should be reviewed and, if necessary, upgraded, to ensure that chronic spillers of small quantities of waste lubricating oil, dirty fuel and contaminated bilges have a convenient and affordable alternative to causing pollution. Relatively low cost and simple measures such as this can greatly reduce routine but cumulative pollution from fishing vessels, freighters, workboats, passenger vessels and pleasure craft

VI: Oil Spill Response

53

The Sakhalin Regional Spill Plan must be updated and integrated into a wider, north-west Pacific regional plan as soon as possible, to help the people, government and industry of Sakhalin prevent and respond to hazardous discharges into the sea around Sakhalin. We found evidence that some participants may not yet be fully aware of the plan's details, particularly as regards the division of responsibility and authority, but would emphasize that this is a common problem in other parts of the world. The revised plan should have an easily understood chain of command to show who is responsible for telling the authorities that there is a spill and what size it is, when and how they should inform those who have to deal with it, who should do what, how their work is organized and what equipment and materials they should have available. Most of the people we spoke with agreed that the plan is outdated and needs significant improvement.

54

There is a need to inform and involve local councilors and officials, some of whom undoubtedly feel, rightly or wrongly, that they have little influence on matters of vital concern to local people, such as oil spill response.

55

Each tanker calling at Sakhalin must be required to file its own spill response plan with the Russian authorities. This should detail exactly what response gear and staff the vessel has available and what it would do in the event of a spill, including disabled tanker assistance and salvage.

56

More oil spill response centers are required.

Although the spill responders at the Nogliki base are among the most qualified, committed and experienced in the world and their equipment inventory is comprehensive, first class and well-maintained, we believe that at present they could only mount a convincing response to oil threatening a single lagoon entrance on the north-east coast of Sakhalin. A large spill is likely to threaten several lagoon entrances simultaneously - and many tens of miles of beach.

57

Stocks of oil spill response equipment and materials, including workboats, should be increased to a level sufficient to attempt booming and skimming at the mouths of all endangered bays simultaneously, and pre-staged at these locations. While we understand security to be an issue, the companies should hire local guards, who will have a vested interest in ensuring the safety and proper storage of equipment designed to protect the resources on which they depend for subsistence. Stocks of offshore equipment held in Sakhalin should be increased at least 100-fold, given the delays certain to be encountered in bringing in extra equipment to Sakhalin from elsewhere in Russia, let alone from foreign countries (with attendant delays in Russian Customs).

58

We suggest immediate improvement of access roads to the lagoons, to ensure that additional workboats, booms and other essential equipment can be fully deployed at each lagoon entrance within six hours of a spill alert. In contrast to certain sections of SEIC's Oil Spill Contingency

Plan, the Technical Report of the Sakhalin Energy Coastal Bay Study Project (10 September 1999) is a chillingly realistic description of the very serious practical difficulties of mounting an effective oil spill response on the north-eastern shores of Sakhalin.

We can confirm that existing roads to the lagoons are poor, frequently impassable and completely unsuitable for rapid deployment of spill response equipment, particularly for the workboats at the Nogliki base, which are stored on trailers which would probably break up on the road to the nearest launch site at Kaigan. It would simply take too long to get the equipment in the water. However, better access could easily lead to problems of wildlife disturbance and even more poaching than at present and it might be necessary to restrict public use of improved access roads or to have some form of policing to prevent excessive adverse effects. Alternatively, very large air-cushion vehicles (such as hovercraft or Russian-designed "Ekranoplans") might be employed to move equipment when required. If enough of these were available, better access roads to the shore might not be necessary and fewer helicopters would be required.

59

We recommend the early establishment of a marine service base and emergency equipment/oilspill response depot at Nabil Bay (and possibly also at Chaivo and Piltun Bays). Breakwaters on the northern banks of the bay entrances could help deflect oil blowing alongshore with the prevailing NNE wind.

60

It should be publicly admitted that there is little chance of stopping a tier two or three spill polluting the beach. We recognize and applaud Sakhalin Energy's apparent acceptance of this fact and support their policy of concentrating efforts on preventing oil entering any of the lagoons, which are much more environmentally sensitive areas and of world-class importance for wildfowl and marine life, including spawning herring and other commercial fish species.

61

The suppliers of heavy lift helicopters should be pre-contracted to deal with a tier three spill, which would require at least eight such aircraft. We believe that a large spill will almost certainly involve considerable assistance from the Russian air force. (See also note on air cushion vehicles above)

62

Nogliki airport needs to be upgraded to take larger cargo planes, to fly in additional spill response equipment for a tier three spill. The same may be true of Okha.

63

All control centers and forward bases should be equipped with electricity generators and telecommunications powered independently on site. Spill response strategies should assume that there will be electrical power and telephone failures during an emergency, when already unreliable public utilities are likely to come under extra pressure and fail more often as a result.

64

Spill response authorities need to provide phones or radios for all locally-based people involved in spill response, so they can be contacted immediately they are required.

65

More local residents with specialized knowledge of the areas at risk need to be consulted on which areas are most vulnerable to contamination, how, when and where to deploy the available equipment to best advantage, and how to improvise equipment such as timber barrages and booms from locally-available materials on site. More locals should be paid to guard, maintain and train to use the equipment. This has been proved to be useful in Alaska and Scotland.

66

The SakhBASU offshore oilspill response base at Korsakov urgently needs massive augmentation and proper storage, preferably next to the pontoon where the response vessels are to load. The spill response equipment we inspected was in a derelict and leaky warehouse at the rundown Korsakov docks area. Piles of scrap metal lying around the muddy yards would obstruct rapid and efficient deployment of the equipment, which is in any case wholly inadequate. The manager in Korsakov appeared enthusiastic, knowledgeable and well-motivated. We suggest he deserves better facilities and equipment.

67

There should be field trials in the use of dispersants with Sakhalin oil and a clear policy on when and where they can be used. While controversial in some parts of the world, dispersants can sometimes offer the best immediate response tool for large, offshore spills - but it is essential to know how particular dispersants will react with individual oils. We have not seen any field data for dispersants and Sakhalin crude oil. However, dispersants should only be used if scientifically tested and verified to be effective on the oil spilled. Until this is done, dispersants should not be used in Sakhalin coastal waters on spills of Sakhalin Shelf oil.

68

It is essential to hold regular surprise exercises to test the ability to respond to a large spill. These should include practical liaison with Japanese authorities and "desktop" tests of the proposals for "cascading" equipment into Sakhalin from the Russian Mainland, Japan, Singapore, the USA and the UK.

69

Between surprise drills there should be regular desktop drills and field trials - both pre-announced and surprise - of response equipment, staff, strategies and tactics.

70

The two terminals onshore Sakhalin, at Moskalvo and Pogranichnoye, and the Tatar Straits sub-sea pipeline owner, should contract with Ecoshelf or a similar organization for spill response cover, if they have not already done so.

VII: Legal Liability

71

Many improvements can be made without new Russia or international laws, simply by inserting clauses in commercial contracts between the sellers and buyers of the oil, as has been done in Scotland for 20 years by BP, Shell, Marathon, Exxon and other participants in the Sullom Voe Terminal, but some new legislation appears necessary to ensure that Russia has maximum protection from the risk of a serious oil spill.

There is a need for improved Russian legislation on liability for pollution costs, to support and sustain voluntary agreements. In this regard, the following quotations may be of interest:

*"Although the Company has taken all reasonable care to ensure that the sea berths, loading hoses, facilities, gear and equipment provided by the Company are safe and suitable for vessels permitted to use them, **no guarantee of such safety or suitability is given.**"*

*"Indemnities ... [The] Company will endeavor to ensure that the Terminal is safe and suitable. However, **no guarantee of such safety or suitability is given.**"*

*Selected quotations from "Vityaz Marine Terminal Conditions of Use, Terminal Information and Regulations, Issue # 1",
Sakhalin Energy Investment Company Ltd,
32 Communistichesky Pr., office 550,
Yuzhno-Sakhalinsk 693000, Russia.
19 July 1999 –
our emphases added*

72

We recommend that Russian parliamentarians should, as a matter of urgency, consider comprehensive legislation - perhaps entitled the Russia Oil Pollution Act of 2000, or "ROPA 2000" - requiring standards comparable to the US Oil Pollution Act of 1990 (OPA 90), particularly in the double-hull and liability provisions.

73

It is imperative that the liability provisions for oil spills off Sakhalin be reviewed by an independent team of environmental attorneys, with recommendations to raise the liability limits to the maximum potential cost of a worst-case oil spill.

74

We strongly recommend that the Russian Federation should take a lead in this matter and insist that all tankers and offshore installations carry adequate insurance to cover all the potential liabilities arising from a spill. Russia deserves nothing less from the companies who stand to profit handsomely from exploiting Russian resources.

75

Russia should also be able to assess and collect punitive damages from polluters found to be grossly negligent, to punish the offender and to deter others. The US federal jury's punitive damages award of US\$5 billion against the Exxon Corporation for gross negligence in the "Exxon Valdez" spill undoubtedly sent a strong message to all oil companies operating in the US that they would be held financially accountable for their actions.

Discussion:

Financial liability is the primary motivation for responsible conduct by industrial interests throughout the world. The liability standards for the Sakhalin Shelf fields, as we understand them, are inadequate. It is our experience that oil companies know precisely how to design and operate the safest system possible, but our experience is that, unless they are enticed by sufficient legal liability, they will seek every opportunity to save money on prevention and response preparedness - as a gamble that it won't be needed and, if there is a major spill, their insurers will pay for it. In fact, very few tankers in the world are currently insured for the full potential liabilities they could incur if they have an accident.

In the case of the Sakhalin II project, appendix 8 of the contingency plan entitled "Liability Funding" states that damages from a spill will be paid by insurers and by the application of international treaties, which we assume means the International Oil Pollution Compensation Fund (IOPCF) of the UN International Maritime Organization. The IOPC Fund has been found time and time again to be inadequate in compensating damages from major oil spills (see below). It is emphatically not an assurance to local people that all will be well.

The USA realized the error in its liability structure after the 1989 "Exxon Valdez" spill and corrected it with the Oil Pollution Act of 1990 (OPA 90). Although Exxon had adequate financial resources to pay for the spill, many other companies would not have had. OPA 90 provides unlimited liability in instances of gross negligence or willful misconduct and does not pre-empt more stringent liability standards in individual American states, some of which have unlimited strict liability.

OPA 90 requires that ship owners qualify for "Certificates of Financial Responsibility" (COFRs) before they can haul oil in U.S. waters. We wonder if there is similar provision in Russian law.

Further, Natural Resource Damage Assessment (NRDA) regulations must account for all non-economic as well as economic natural resource damages. That is, they should include what are known as "non-use" values as calculated by methodologies such as contingent valuation by which economists can ascertain how much value the public places on "non-market commodities" such as seabirds, marine mammals, pristine beaches, etc. This would be a useful tool in Russia also.

According to Appendix 8 of the "Sakhalin Energy Oil Spill Contingency Plan" of March 1999, the owner of the FSO is required to have insurance cover of US\$700 million. While this "Protection & Indemnity" (P&I) limit for the FSO may seem adequate, it is entirely possible that it would not be. For instance, the "Exxon Valdez" spill, officially estimated to be about 250,000 bbls, has cost Exxon over \$2 billion in response, \$1 billion to settle natural resource damage claims by the

government, about \$300 million in compensatory damages to private plaintiffs, and they have had to post a \$6 billion letter of credit with the Federal court to cover a \$5 billion punitive verdict plus interest that they have appealed to the 9th Circuit court of Appeals - a total of about \$9 billion.

The FSO "Okha" has a cargo capacity of about one million barrels, three to four times the amount officially estimated to have spilled from the "Exxon Valdez", and while unlikely (as an Exxon-Valdez size spill was once considered), it is certainly possible that a one million barrel spill could be caused by an explosion or fire on a fully loaded FSO, or a breakaway from the SALM and grounding of a loaded FSO in storm conditions, or other scenarios. Although it is probable that a spill off Sakhalin would behave differently from the "Exxon Valdez" spill in Alaska, the environmental, economic, and social damage caused could still be very large.

In contrast, it appears that the owners of shuttle tankers, although they are required by Sakhalin Energy to have insurance cover of up to US\$700 million, will in fact be liable for only some US\$81 million in the event of a spill, to "cover costs for pollution clean up and damage". Shuttle tankers are far more likely to suffer catastrophic spillages than FSOs. Evidence from Alaska, France and Shetland suggests that the cost of a spill involving most of the cargo of a typical Sakhalin shuttle tanker will almost certainly be far in excess of US\$81 million.

This matter needs to be clarified immediately and authoritatively: if the tanker owner is not liable for the full cost of a spill, who is? The Russian Federation? The Sakhalin Oblast? Nogliki County Council? We may have misinterpreted or misunderstood the published information but it appears to us that there is a very large potential gap which could leave public funds to pick up the bill. In this regard we would point to the situation in Shetland, where numerous claims are still unpaid, almost seven years after the "Braer" oil spill, because the cost of the accident exceeded the limit of US\$240 million (UK£150 million) set by the International Oil Pollution Compensation Fund. The subsequent doubling of this limit could not be applied retrospectively. Russia should also be aware that the International Oil Spill Compensation Fund has gained an extremely bad reputation among victims of pollution in Europe, particularly those whose businesses suffer "secondary" damage. For example, after the "Braer" spill all but one of the Shetland tourist industry's claims were refused, although the spill clearly deterred many tourists from visiting the islands for up to three years. Similarly, it proved very difficult to get payment for fish processors who suffered a drop in price for Shetland seafood, which had previously commanded a premium in the market because of the pristine nature of the waters around the islands.

76

A Prevention, Response & Oversight (PRO) Fund should be established.

We heard often from government representatives that the main problem was lack of money to tackling many of these prevention and response issues. Thus we feel it is essential that Russia establishes a Prevention, Response and Oversight (PRO) fund from a small tax (perhaps five cents a barrel) on oil production, to pay for this work. This fund should be available to institute and operate the shoreside vessel traffic monitoring system, the tanker inspection program and the proposed Sakhalin Coastal Citizens' Advisory Council, and the improvement and maintenance of oil spill response capabilities.

77

A pipeline-to-shore oil transport system appears preferable to offshore loading, on both economic and environmental grounds. We recommend the Russia Government commissions a detailed study to evaluate the benefits and disadvantages of pipeline and tanker-based oil transport systems.

In view of the foregoing reservations concerning offshore tanker loading as a production system for the Sakhalin Shelf, we recommend moving to a pipeline-to-shore system as soon as possible. The technology exists to design and construct a pipeline to cope with the risks from near-shore ice conditions and earthquakes in this region. It has been done in Alaska. Although Russia's experience of pipelines has not been encouraging (e.g. Komi, etc.) in the North Sea thousands of miles of subsea pipelines have functioned for 30 years with minimal trouble and only miniscule spillages. Elsewhere in Western Europe there are many more thousands of miles of buried pipelines on land which have a similar record. Good design, robust construction and regular inspection and maintenance can make pipelines the safest way to move oil and gas, onshore or offshore.

The economic advantage of the pipeline option is that continuous flow is possible, all year round, rather than seasonal batch production with shuttle tankers. This option requires co-ordination of the development plans of many different companies, and may only be possible if the Russian Federation appoints a special commission to facilitate this with the minimum of bureaucracy.

VIII: Other environmental issues

All environmental problems should be considered in context with other problems, and thus a cumulative assessment is instructive.

We heard several times the view that people were too busy surviving the current economic crisis to worry too much about oil pollution. The anticipated spin-off in jobs and revenues from the Sakhalin Shelf was seen, by some, as making the risks worthwhile. We also heard it said that Sakhalin had far bigger environmental concerns. We understand and appreciate the underlying sentiment to this reasoning.

We would argue, however, that it is not a choice between spending money on reducing the risk of oilspills or on environmental issues judged to be more or equally important. The justification for spending on oilspill prevention and response is simply that an oilspill would gravely compound Sakhalin's existing economic difficulties and divert resources from dealing with serious environmental issues, such as:

A: Destruction of wildlife resources by widespread poaching of game and freshwater fish, and incalculable damage to marine fisheries by illegal fishing on a vast scale.

B: Widespread wildfire damage to terrestrial ecosystems, including extensive destruction of forests, destruction of cover for birds and mammals, loss of pasture for reindeer, increased erosion and silting of salmon streams and loss of visual amenity;

C: A poorly maintained and seriously defective sewage system which is causing extensive, chronic contamination of streams, ground water and soils, and gross, acute pollution whenever power cuts (outages) immobilize pump stations;

D: Poorly sited, unlined, landfill garbage tips (usually burning uncontrolled) which are polluting stream systems, groundwater, soil and air and are likely to be a serious source of dioxin contamination;

E: Extensive pollution by plastic trash and scrap metal in almost all inhabited areas - particularly acute where trash blows out of uncontrolled landfills;

F: Pollution of rivers and lakes by the universal practice of washing motor vehicles on the banks of streams and the clandestine disposal of used engine oil in sewers and ditches;

G: Poorly managed onshore oil developments which for many years have caused extensive pollution of soils, ground water, streams and lakes - and continue to do so, in addition to the contamination and loss of amenity caused by abandoned wells and pipelines.

78

Our final recommendation is for an immediate, full and public environmental and safety audit of the onshore oil and gas developments in Sakhalin, which we believe to be at least as serious a threat to the island's water, land and air as the proposed offshore projects.

Each of the problems mentioned above has negative economic effects, almost all adverse to the public interest. The disruption caused by a major spill and the subsequent response effort could pitch the Sakhalin economy into even greater disarray and stifle efforts at renewal. The advantage of our recommendations is that their implementation would provide a modest stimulus to demand for local goods and services, creating jobs, tax revenue and increased economic activity in general.

The central challenge for Sakhalin, and the rest of the world, is to build a society that is truly sustainable - economically, socially, and environmentally.

Appendices:

I: The Investigation Team

Dan Lawn (52) has a degree in Environmental Resources Engineering from Humboldt State University. In 1973 he was involved in the design and construction of the Valdez Marine Terminal (VMT) in Alaska. He was the first engineer on site and in 1977, near completion of the terminal, joined the Alaska State Department of Environmental Conservation. He developed the state's tanker inspection program and much of the oil spill response contingency plan oversight program in Valdez. As an inspector charged with ensuring that the terminal complied with state and federal environmental law, he was one of the first to raise concerns about declining safety standards and inadequate response capability at the terminal in the 1980s. On the night of the "Exxon Valdez" disaster he was the first state official to board the stricken tanker. He was closely involved in the spill response and later campaigned to expose the true cause of the disaster and the failed attempts to prevent it spreading and clean it up. He is currently responsible for the State of Alaska's on-site oversight of the Valdez Marine Terminal. With Professor Steiner, he traveled to Shetland to learn from the local authorities on their response to the "Braer" tanker disaster in 1993. Because of their knowledge, both were asked to advise the Shetland council during the "Braer" crisis. As with the "Braer", Lawn made the trip to Sakhalin as a private citizen, in his capacity as a founder and current president of the Alaska Forum for Environmental Responsibility, whose mission is to hold government and industry accountable for protecting the environment.

Rick Steiner (46) is Professor and Associate Chairman of the University of Alaska's Marine Advisory Program, with degrees in Ecology (University of Tennessee) and Oceanography (Oregon State University). He also has 20 years' experience as a commercial fisherman in Alaska, where he has lived since 1978. He has served on US oceanographic research vessels for NOAA and as a US Government fisheries observer with the Japanese fleet in the Bering Sea. He has published numerous scientific papers and directed research projects on marine conservation, fisheries development and oil pollution. He assisted with the emergency response to the "Exxon Valdez" oil spill, helped to draft detailed provisions of the US Oil Pollution Act of 1990 and, with his colleague Dr Wills, devised the idea of a Regional Citizens' Advisory Council for Prince William Sound, implemented by the US Congress in 1990. His research, technical reviews and lecturing on environmental issues have taken him to Norway, Scotland, Indonesia, Hawaii and Japan, as well as Sakhalin and Alaska. On previous visits to Sakhalin and the Kuril Islands he conducted practical classes for local fishermen in long-lining, gill-netting and seining techniques.

Jonathan Wills (52) is a writer and freelance environmental consultant who has specialized in the oil industry for over 25 years. He is the author of "A Place In The Sun" - a study of the development of the oil terminal at Sullom Voe in the Shetland Islands of Scotland - and "Innocent Passage" - a detailed account of the loss of the tanker "Braer" in 1973. A frequent speaker at conferences on oil and the environment, he has also written and broadcast extensively about oil in Alaska. In his 1990 British TV documentary, "Slick Operators", he revealed that the "Exxon Valdez" disaster could not have happened if the oil companies had implemented in Alaska the tanker surveillance scheme they had helped to set up in Shetland 10 years earlier. Dr Wills also operates a wildlife tourism business at Shetland's seabird and seal colonies during the summer months and is an honorary warden of the Noss Island National Nature Reserve. He holds MA

Honors and PhD degrees in Geography from the University of Edinburgh. He is a member of the Shetland Marine Safety Sub-committee for the UK Department of Transport and has a UK Boatmaster's License. He is chairman of the Shetland Labour Party.

II: Itinerary and list of interviewees

October 1999	Activities and Interviewees
8/9	by Aeroflot from Anchorage to Khabarovsk and by Sakhalin Air Transport from Khabarovsk to Yuzhno-Sakhalinsk.
10	Field trip to river mouth, lake and beaches at Lesnoye on coast east of Yuzhno-Sakhalinsk. Public meeting at Yuzhno-Sakhalinsk City Hall.
11	Meetings in Yuzhno-Sakhalinsk with: Dennis Royle, Sakhalin Energy Investment Corporation's Health, Safety and Environment Manager; Mark Sienkiewicz, Ecoshelf's Environmental Manager; and Michael Allen, the General Director of the American Business Center in Yuzhno-Sakhalinsk. Visit to port control offices in Korsakov, view port facilities and offshore service vessels, tour of oilspill response base stores with Anatoly Yanchuk, General Director, Ecoshelf.
12	Kholmsk – meeting with port controllers and emergency service personnel. Yuzhno-Sakhalinsk – meeting with Nikolai Gavrillov of State Mining Technical Inspectorate. Meeting with Vasily Khramushin and other staff at the Russian Academy of Sciences Special Research Bureau.
13	Yuzhno-Sakhalinsk – meetings with Natalia Onischenko chairwoman of the Committee on Environmental Protection for Sakhalin; Dr Galina Pavlova, Director of the Department for the Development of Mineral Resources Offshore Sakhalin; George Misoyianis, Crude Oil Export Manager, SEIC; and representative of Emergency Services Committee. Overnight train to Nogliki.
14	Lawn visited Molikpaq platform, Okha FSO and Smit Sabu MSV while Steiner and Wills met Allen Salvador, Field Manager, Oilspill Response, for Ecoshelf and inspected SEIC/Exxon oilspill response base, Nogliki, followed by visits to Kitangli, Kaigan dock and boomlaying sites on coastline at mouth of Zaliv Nabil.
15	Round-table meeting with members of Nogliki county council and local representatives of Emergency Services Committee and Committee on Environmental Protection. Public meeting with Nogliki citizens in the School of Art.
16	Visit to Val to meet indigenous people's representatives. Overnight train to Yuzhno-Sakhalinsk.
17	Half-day off and informal talks, Yuzhno-Sakhalinsk.
18	Report writing and follow-up interviews, Yuzhno-Sakhalinsk.
19	Interviews with Association of Fishermen of Sakhalin, Regional Duma representatives, and citizen's council. Report writing and follow-up interviews, Yuzhno-Sakhalinsk.
20	Press conference and Public meeting, Yuzhno-Sakhalinsk.
21	by air from Yuzhno-Sakhalinsk to Vladivostok. Visited wildlife management area in foothills of Sikhote Alin mountains
22	by air from Vladivostok to Anchorage.
23-27	Report-writing, Valdez.

III: Lessons for Sakhalin from Recent History

“Exxon Valdez”:

A poignant example of what can go wrong with shipment of oil via tankers is the disastrous 1989 “Exxon Valdez” spill in Alaska. A short summary may help those unfamiliar with such disasters to more fully appreciate the potential extent and severity of negligence.

Back in 1968 when oil was first discovered on Alaska's North Slope, the immediate question became how to get this enormous amount of oil from the remote arctic to market. Of the various options discussed, the two given serious discussion were to build a pipeline east to Canada, or build a pipeline south across Alaska and ship the oil in tankers through Prince William Sound (PWS). At the time, the commercial fishermen and environmental community favored the Canadian route because of concern for a major oil spill from tankers in Prince William Sound. The oil industry and certain government officials however, strongly favored the Alaska route because it would be cheaper and quicker to build, and they could one day ship oil to Asia. To win public approval of the Trans-Alaska route, the government and oil industry made several promises - 1) the tankers would all be double-hulled, 2) there would be a state-of-the-art vessel traffic system monitoring all loaded tankers through the Sound, and 3) and the pipeline owners would have an oil spill response capability to immediately respond to and clean up any amount of oil that happened to spill. Even though these and others were made, the vote in the US Congress was 51 to 50 in favor of building the pipeline - clearly not an overwhelming decision. As it turned out, none of these promises was kept. Some naïve politicians boldly stated that "not one drop of oil will ever enter Prince William Sound."

On the evening of March 23, 1989, the “Exxon Valdez” - one of the newest and best tankers in the trade at the time - loaded 1.3 million barrels of crude at the Valdez terminal and headed out. The master was given permission by the US Coast Guard to divert from the established tanker lanes to avoid ice floes, increased to full sea speed of 14 knots, put the vessel on autopilot, left orders with the third mate to turn back into the shipping lanes well before Bligh reef, and retired to his cabin below. At this point, there was a fully loaded, single-hulled supertanker travelling at full speed, outside the designated shipping lanes, on autopilot, headed directly toward Bligh Reef, unmonitored by the Coast Guard Vessel Traffic System, piloted by an exhausted mate without a pilotage certificate for this seaway - clearly a recipe for disaster. Although the third mate later said he had ordered the vessel taken off autopilot and ordered a 10 degree right rudder to turn back into the lanes, the vessel data recorder showed that the vessel didn't actually turn until five minutes - or one nautical mile - later. It is strongly suspected that the vessel was not taken off autopilot until it was too late, and just after the bridge crew realized the error, they slammed full ahead into Bligh Reef at 12:04 am on March 24, rupturing 8 of the 11 cargo tanks. Most of the 40,000 - 80,000 tons of oil flowed out as the tide fell. The oil remaining on board was successfully lightered onto other tankers over the next few days, and the “Exxon Valdez” was towed to California and rebuilt. The response and cleanup was a notorious failure, as very little equipment and dispersants were on hand. Much of it didn't work, and a strong northerly storm scattered the oil beyond control on day three. While a little oil was recovered from the beaches - perhaps about 5% of what spilled - the amount recovered was of little consequence to the coastal ecosystem.

The damage was extraordinary. Although not the largest in terms of volume spilled, the "Exxon Valdez" became the most environmentally, economically, and socially damaging spill in history. The oil spilled into a very productive, pristine, cold-water nearshore environment at a critical time of biological activity. Seabirds, whales, and herring were returning to the Sound and juvenile salmon were emerging from streams. The oil eventually spread over 16,000 km² of Alaska's coastal ocean, as far as 1,000 km from the site of the grounding. Over 2,000 km of some of the world's most extraordinary shorelines were oiled, including national parks, wildlife refuges, national forests, native people's lands, etc. Despite a US\$2 billion cleanup attempt, less than one million gallons was recovered.

The initial biological effects were devastating - everything associated with the upper layers of the sea was impacted. More marine mammals and seabirds were killed in the initial months than in any other man-made disaster. The marine mammal death toll included 3,500 - 5,500 sea otters, hundreds of harbor seals, and dozens of whales. Initial direct mortality to seabirds was estimated at 300,000 - 645,000, with an additional loss of chick production at perhaps 300,000, totaling about 1 million birds. The 1989 spawning class of herring was essentially lost. Terrestrial mammals were also affected, including river otters, brown bears, mink, and deer. Much of the intertidal zone was essentially sterilized by the toxic shock of oil, and invertebrate communities were severely altered. The extent of the tragedy was put eloquently by a regional native elder who said the following: "What we see now is death. Death, not of each other but of the source of life - the water...It is too shocking to understand. Never in the millennium of our tradition have we thought it possible for the water to die. But it is true."

Beyond the immediate acute damage, there has been profound long-term impact. There were brain lesions in harbor seals, reproductive failure in birds, blood chemistry problems, morphological deformities like curved spines, reduced growth rates, altered feeding habits, liver damage, eye tumors, viral disease epidemics, etc. Some of the ecological damage wasn't evident for several years. In 1993, the herring population collapsed for the first time ever recorded in the area. Of the 120,000 tons of herring expected to return to the Sound in the spring. Only 20,000 tons returned, more than 30% of which were infected with a viral disease brought on, most likely, from immune system suppression by oil. In the succeeding seven years, only small harvests have been possible in only two years. And although pink salmon runs were strong for the first two years, they too collapsed in the 1992/1993 seasons. Millions of outmigrant salmon were exposed as juveniles to oil in 1989, and many of the eggs of these fish were laid in oiled streams in 1990. The progeny of these year classes failed in 1992/1993. The ecosystem impacts of these fish stock collapses has also been profound. Herring, for instance, is an important prey item for 40 different species of seabirds, marine mammals, and fish in the area.

This year, 10 years after the grounding, there is still little evidence of recovery. The government scientists have listed only two of the injured populations - bald eagles and river otters - as fully recovered. Another 25 or so injured species are still listed as not recovering, recovery unknown, or in the process of recovery. These not recovered resources include such creatures as cormorants, pink salmon, herring, murrelets, harbor seals, killer whales, trout, pigeon guillemots, sea otters, mussels, clams, oystercatchers, etc. And there still exists a considerable amount of oil embedded in beach sediments. The surface of this oil has solidified into an asphalt layer, thus protecting the oil

beneath from weathering. This residual oil has been found to exhibit toxic effects down to concentrations as low as one part per billion.

Economic impacts of the spill were disastrous. The spill forced the closure of many of the region's commercial fisheries in 1989, and caused a depression in salmon prices statewide, out of fears of contaminated product reaching market. Litigation over damages continues at present - over 10 years later. A 1994 federal jury ordered Exxon to pay the 30,000 or so injured citizens about \$280 million in compensatory damages for lost income, and another \$5 billion in punitive damages. But Exxon continues to resist paying this judgment and the case is presently on appeal. More than 500 of the plaintiffs involved in the case have since died. Social impacts were also devastating. The spill had a profound destabilizing affect on communities in the region that depend largely on harvests of marine resources. There were well documented dramatic increases in stress disorders, domestic violence, depression, substance abuse, divorce and even suicide. Today there is still a deep and profound sadness among many in the region.

Many changes were made in the oil transportation system in Alaska and the rest of the world as a result of the "Exxon Valdez". In Alaska, we now have tugs to escort of every loaded tanker and make certain the tanker stays in the shipping lanes, to render towing assistance in the event of a loss of power or steering, and to provide immediate response to any spills; the vessel traffic system has been upgraded significantly, allowing all tankers to be monitored continuously until 100 km or so outside the sound, more stringent weather restrictions, alcohol testing, a federal Oil Pollution Act of 1990 (OPA 90) setting higher liability standards and requiring the phase-in of double-hulled tankers by the year 2015; much more response equipment; and, perhaps most importantly, a citizen's advisory council to oversee the oil industry and government.

The overarching lessons from the "Exxon Valdez" disaster can be summarized as follows:

- catastrophic spills can occur from relatively simple mistakes
- large spills cannot be contained effectively
- oil cannot be recovered effectively from the water or shorelines
- ecological damage can be extreme and long-lasting
- ecological damage cannot be repaired by human intervention
- local citizens offer the best chance for vigilance in preventing oil spill disasters.

Shetland:

The Sullom Voe oil and gas terminal in Shetland came on stream in October 1978, about a year after the Valdez Marine Terminal in Alaska. The tanker harbor and loading jetties are owned and operated by the local county council, which also owns the land on which the shore terminal is built. This unusual situation gives the council considerable influence over the industry. Councilors also have a special Act of the UK Parliament (Duma) allowing them to control developments in coastal waters, to receive royalties direct from the oil industry and to invest these revenues in a trust for the benefit of the local public. The neighboring Orkney Islands have a similar arrangement for their much smaller Flotta terminal.

In June 1976 a first attempt at an Environmental Impact Assessment had to be withdrawn and re-written after the county council severely criticized its deficiencies. The Sullom Voe Environmental Advisory Group was also disbanded at that time, because of allegations of bias towards the oil industry, and was reconstituted as the Shetland Oil Terminal Environmental Advisory Group, with an independent chairman and secretariat and a board comprising representatives of the oil industry, the council, fishermen, environmental NGOs, local wildlife clubs and independent university scientists.

After successful "dummy run" trials of bringing an empty tanker into the harbor, in November 1978 the terminal (which is operated by BP on behalf of some 30 oil companies, including most of those currently involved in Sakhalin) celebrated "First Oil Ashore" from the twin Brent and Ninian pipeline which link it with the oilfields some 150km offshore.

The 12th tanker to load caused the first spill. At 2332hrs on 30 December 1978 the Exxon tanker "Esso Bernicia" collided with a jetty after a tug suffered an engine room fire and had to drop the towline. The standby tug was not there as the crew had been given the night off to start celebrating New Year! Some 1100 tonnes of bunker fuel oil spilled into the sea. BP deployed two booms to contain the slick. During the night the booms failed after one air pump motor ran out of fuel and the other developed a clutch fault. Neither boom was being monitored during the hours of darkness. The oil mostly escaped and polluted sounds and bays up to 50 km from the oil terminal. Around 4,000 dead birds were recovered. The population of one species, the Great Northern Diver or Common Loon (*Columba immer*) has still not recovered in Sullom Voe, 20 years later. Many sheep were oiled as they grazed seaweed on the shore. Large areas of shoreline had to be fenced off, at great expense, and fodder shipped in to the island to feed livestock who could no longer reach the shore. To Exxon's credit, compensation claims were paid immediately, although the company was not to blame for the spill.

An additional problem was that the terminal had opened for business without facilities to receive and treat dirty ballast water from tankers. Some of them were now dumping oily ballast illegally, offshore, hoping it would be blamed on the "Esso Bernicia". The pollution caused public outrage and led to a cathartic political situation, in which there was a complete breakdown in trust between the oil companies, the county council and the people. The triumphant slogan "First Oil Ashore" was used to cause massive media embarrassment to the oil industry.

Something had to be done: by the summer of 1979 the protocols for operations at Sullom Voe had been completely revised and a number of spill prevention and response measures implemented which went beyond national and international legal requirements at the time and became known as "The Shetland Standard". The improved conditions, agreed with the council, the central government and the oil companies, were incorporated in contracts for tankers collecting oil from Sullom Voe and enforced by the oil industry using existing commercial law. Ships which broke the rules were denied their cargoes. A legal test case in 1981, after the tanker "Mihalis" was detected dumping dirty ballast offshore, confirmed that this sanction was lawful and enforceable.

The new regime included the following:

1. Tankers obliged to report in by radio when 200 miles from the pilot station;
2. Aerial surveillance of all tankers approaching and leaving the terminal, to check that they were not dumping dirty ballast or leaking oil, or cutting corners by sailing through areas around the coast which tankers were asked to avoid;
3. Improved radar coverage of the port and approaches, with automatic alarms if a tanker strayed from the channel;
4. Four tugs on call for every tanker;
5. Tug escorts to be within 15 minutes steaming time from tankers passing the outermost hazard in the approaches to the terminal;
6. Masters of tankers required to sign very detailed pre-arrival safety checklists;
7. Strictly observed weather limits on tanker movements and loading;
8. Stricter vetting of tankers nominated for Sullom Voe cargoes;
9. Additional equipment and materials for spill response on site, and better arrangements for shipping in additional equipment from bases on the UK mainland.

(The full list of requirements is incorporated in the Shetland Islands Council Sullom Voe Port Handbook, copies of which have been left with Galina Pavlova and other government officials in Sakhalin)

These measures led to a dramatic improvement in standards. Over the next 20 years the port of Sullom Voe became Europe's cleanest tanker harbor as well as the continent's largest oil and gas export terminal. In 1998, for example, the port handled some 38 million tonnes of oil and spilled less than half a barrel. Environmental monitoring showed that the main effect on wildlife was from tributyl-tin compounds used in anti-fouling paint on tanker hulls, which affected breeding of a species of whelk.

The improved tug provision led on several occasions to prompt intervention which prevented "Exxon Valdez"- type disasters.

The companies involved in the Valdez Marine Terminal were all involved in the Sullom Voe Terminal. They and the US Coast Guard knew in 1979 about the new Shetland Standard which would have prevented the "Exxon Valdez" disaster, had some of its most basic provisions been implemented in Alaska. Instead, they allowed standards of port management and ship surveillance and escort procedures to decline to a level where the "Exxon Valdez"

could run onto a notorious and well-lighted shoal, at full speed and in full view of a downgraded harbor radar system which was effectively unmonitored.

The new Shetland system was progressively improved over the years and lessons from the “Exxon Valdez” in 1989 were promptly implemented by the Sullom Voe port authority, Shetland Islands Council, with the full support of the oil industry. The problem was that the “Shetland Standard” only applied to tankers trading to and from Sullom Voe. Other ships on "innocent passage" past the Shetland coast went unmonitored, just as they did and still do through the straits in the Aleutian Islands chain in Alaska. The central government did not carry out its responsibilities over the area of sea for which it was responsible (most of the 1500 km long coastline of Shetland) as conscientiously as the Shetland local government did for its relatively small area of responsibility around the port.

This failure of government monitoring, surveillance and control led on 5th January 1993 to the wreck of the tanker “Braer” and the spillage of 80,000 tonnes of Gulfaks crude oil and 5,000 tonnes of fuel oil. The American-owned, Liberian-registered tanker ran into bad weather immediately after leaving the Norwegian port of Mongstad on a voyage to a Burmah Oil refinery in Quebec. Heavy seas damaged racks holding steel pipes stored on deck. The pipes broke loose and decapitated air breather tubes for the fuel tanks. Seawater entered the fuel tanks and the ship's engines started to falter. Instead of seeking shelter on the lee side of Shetland in a recognized tanker anchorage, the master sailed on into a rising south-westerly storm. He informed his owners in New York but did not tell the UK Coastguards about his problem.

At 0436 hours, some 12 hours after the problems began, the “Braer” broke down in the 22-mile-wide Fair Isle Channel, south of Shetland. The master delayed informing Coastguards for two more hours. When they received the message the Coastguards delayed ordering a tug to the scene (by chance a suitable vessel was in the area that morning), apparently because they were unsure of their powers and liability. The crew were rescued by helicopter around 0900, shortly before the tug arrived on scene. Coastguards did not put a salvage crew back aboard the tanker by helicopter until shortly before it grounded at 1115 and although they got a line aboard from the tug, by then it was too late. In any event the tug could not have towed the tanker into a Force 9 gale and seas up to 35 feet high.

Environmental damage was extensive, including the closure of some fishing grounds for two years and the destruction of millions of farmed salmon, but was far less than that caused by the reported 40,000 tonnes of oil spilled by “Exxon Valdez”. The reasons were that the oil was very light and of a chemical nature that allowed it to be dispersed by Nature relatively quickly, and that for 11 days hurricane-force winds blew almost without cease, churning up the oil in the water column and diluting it very widely with each tide.

Much of the oil was dispersed in sea spray blowing over the islands to a height of 100 meters, some was deposited on land (causing damage to pastures and winter fodder crops), and almost none was recovered - because the weather was too severe to launch or use spill response equipment. In short, Mother Nature cleaned up the mess. But there is still oil in patches of sand offshore and in sediments under the bays on the south west corner of the archipelago.

Compensation from the International Oil Pollution Compensation Fund was late, reluctant and inadequate for many claimants.

Since the “Braer” there have been several official inquiries and a campaign by the islanders for greater safeguards. Measures achieved to date include:

- Voluntary reporting in to Coastguards by some tankers transiting the Fair Isle Channel;
- New nautical charts showing advisory "areas to be avoided" and "precautionary areas";
- Clarification of the UK Coastguards' right to order salvage tugs against the master's wishes;
- Brief and inadequate experiments with coastal radar surveillance;
- Very slow progress towards agreement at the International Maritime Organization on a technical protocol for a global system of electronic transponders which will enable tanker identification and tracking;
- Stationing of a salvage tug in the area for the winter months only - paid for by the Government (this took six years of campaigning) .

The citizens' campaign, backed by their MPs in the Scottish and UK Parliaments, continues to demand that the half-hearted, voluntary and unenforceable measures are made mandatory and to ensure identification and tracking of all large vessels carrying hazardous/polluting cargoes or large quantities of fuel oil within 50 miles of the Shetland coastline.

Other Lessons:

The "Braer" and the "Exxon Valdez" were not the first examples of tanker traffic problems, some of which are still unresolved, many years later. For example, as long ago as 1966 the tanker "Torrey Canyon" was unwatched by UK Coastguards when her master made a simple navigational error and rammed the ship at full speed into the Seven Stones reef off the south-west coast of England, causing widespread and severe pollution and damage to wildlife, fisheries and the tourist industry. Nothing was done to improve coastal radar surveillance or require escort vessels.

On the other side of the English Channel, in 1978 the tanker "Amoco Cadiz" suffered a steering breakdown off the western coast of France and drifted ashore while her owner and a tug company argued about salvage terms. The incident illustrated the dramatic absence of any agreed system to assist a disabled tanker in time to prevent a grounding. The resulting spill of over 240,000 tonnes of crude oil (perhaps six times as big as "Exxon Valdez") caused devastation to wildlife, fisheries and tourism in the region of Brittany and also affected some areas of south-west England hit by the "Torrey Canyon" spill 12 years earlier. The French Government, to its credit, instituted a system of salvage tugs stationed around its coastline. The British and American governments did not.

Also in 1978, the "Argo Merchant" ran aground off New England, USA, and broke up, causing a huge spill. The cause again was navigational error, crew exhaustion and absence of any surveillance or traffic advisory system from shore.

The lesson from these disasters is that Governments are slow learners about maritime safety, particularly when it comes to spending money. We mention these examples (there are dozens more) in the hope that the Russian authorities will wish to take action before disaster strikes rather than waiting until after the event.

IV: Table of comparative data for offshore oil developments, tanker movements, onshore oil terminals and oil spill response in Alaska, Norway, Scotland and Sakhalin

The following table compares the environment: tidal range, current, operating requirements / restrictions and oil spill response requirements and capabilities for Valdez, Alaska, Shetland in Scotland, Norway and Sakhalin, Russia. The information presented is the best available to this group at this time:

Subject	Valdez	Shetland	Norway	Sakhalin
ENVIRONMENT				
Tidal Range (meters)	-1.5 to + 8	- 0.5 to + 1.5	- 0.5 to + 1	- 0.5 to + 1
Current (m/s)/ (knts)	1 to 6 knots	1 to 4 knots	0.4 knots	0- 1.75 knots
Average current				
PREVENTION				
Wave or sea state limits:				
Exploration / Production Pipeline	None	None	None	
Tanker movements	2.5 meter			
Tanker Loading onshore VLCC Tanker	1 meter	Yes	Yes	
Tanker loadings offshore		Yes	Yes	> 3.5 meters
Current Limits:				
Tanker loadings offshore	No tankers load offshore	At discretion of loading master	data not available	> 3 knots
Wind Limits:				
Exploration / Production Pipeline	None	None	None	
Tanker movements shore terminals	40 / 45 knots	20/30 knots	27 knots	
T/Vs > 150,000 dwt	30 knots Port Closed	20 knots No movements	data not available	
Tanker loading shore terminals VLCC Tanker	40 knots Same	20/30 knots 20 knots	27 knots Same	
Tanker loadings offshore	No tankers load offshore	At discretion of loading master	data not available	> 35 knots
Distance from Shore:				
Exploration/Production	2+ Km	80-200 Km	10-200 Km	12 Km
Offshore Tanker loading	none	120-200 Km	100-200 Km	12 Km
Size of Tankers (T/V)	none	60-90K + dwt	data not available	20 – 250K dwt
No. T/V per year loading offshore	none	200 +	Most production	data not available
% oil production from offshore T/V loading	none	< 25 %	> 80 %	currently <5%

Subject	Valdez	Shetland	Norway	Sakhalin
Onshore Terminal T/V loadings				
Size of Tankers	30-270K dwt	60-350K dwt	30-300k dwt	
No. of Crude T/V per year	700	450 = 14% of UK tanker loading	data not available	data not available
Offshore:				
Tugs or MSVs required	Yes	Yes	Yes	Yes
Exploration/ Production per platform		1 or more	1 or more	1
Number of platforms	15 in Cook Inlet	20+ in East Shetland basin		
Tanker loadings	None	Yes	1 or more	1
Tanker movements	None	Yes	1 or more	1
Onshore:				
Major Shore Crude Oil Terminals:	1 Valdez	1 in Shetland 5 in UK	5	none
Tugs or MSVs Required	Yes	Yes	Yes	data not available
T/V Docking	2-3	4	2	data not available
T/V Movement	1 Tug 1 OSRV	4 Tugs	2 Tugs / OSRV	data not available
T/V Escorts Required	2 always	4 always in narrows	2 always	data not available
Additional Escorts Required based on size And speed of wind	31-40 knots			
<150,000 dwt	3 total			
>150,000 dwt	4 total			
Port Closed: > 150,000 dwt	30 knots	20 knots	data not available	data not available
Onshore minor crude terminals	5 in Cook Inlet	2 small product terminals in Lerwick	data not available	2
Oil Spill Response Requirements				
Offshore: OSRVs required	Yes	Yes	Yes	Yes
Exploration / Production		Some equip on platforms	1 or more / Platform	Some equip on platform

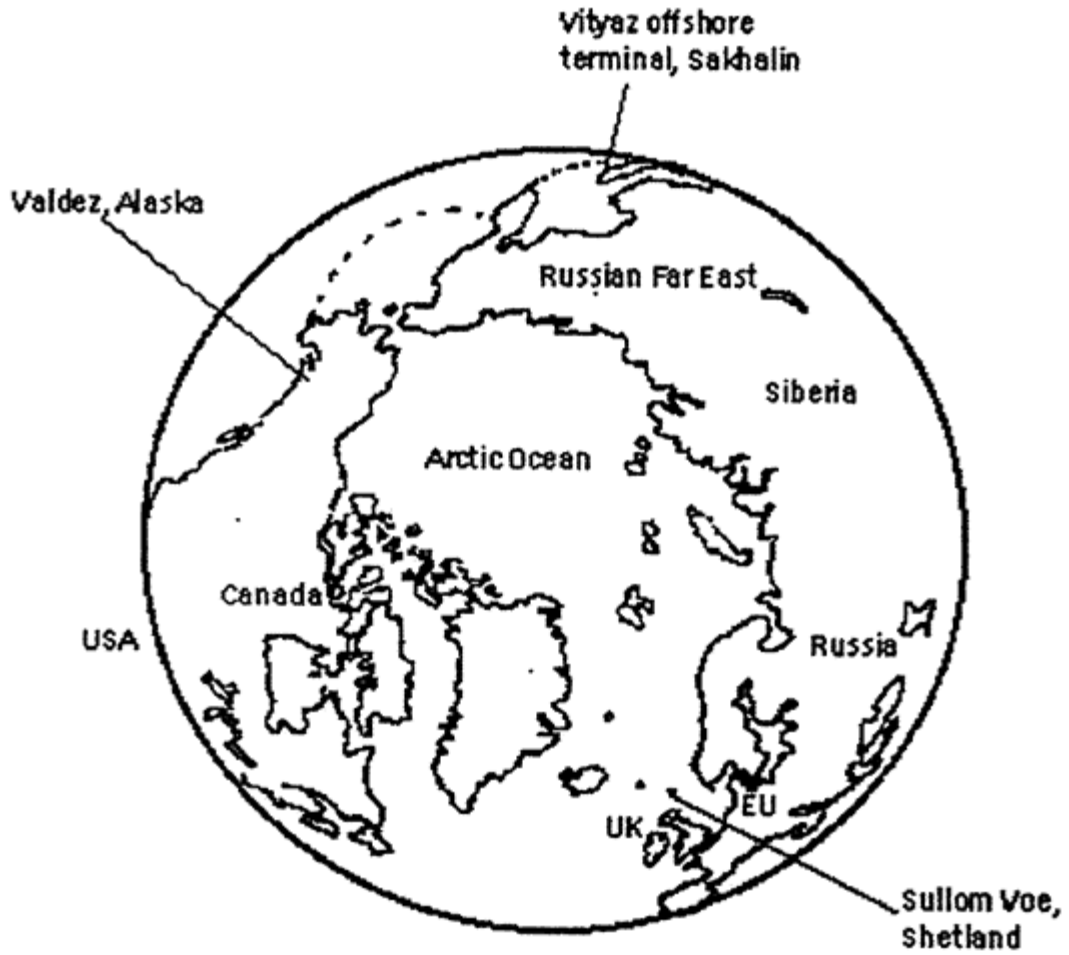
Subject	Valdez	Shetland	Norway	Sakhalin
Spill size planning standard For Wave size (m) , current (knots)		UK Government: 14,000 tons at sea in 48 hrs with dispersant	60,000 bbls 3 meter, 1.5 knots Offshore over 40km Each of 13 operating companies min spill capacity / platform Must respond in 15-20 min & to contain and begin cleanup within 2 hours with a minimum capacity of: 600 bph; additional capacity in 24 hrs of 1850 + bph; additional capacity in 48 hrs of 26,500+ bph	data not available
Industry oil spill response bases , equipment and capacity to respond to and prevent offshore oil from reaching the shoreline		Skimmers and boom at each terminal and	5 locations with a total of 9,000 meters boom, 14 + Skimmers, 26,000 + bph capacity 14 MSVs to transport and operate equipment	data not available
Government oil spill response bases , equipment and capacity to protect shoreline		Rest of UK 2640 tonnes per hour with Skimmers	15 locations with 15,000 bph capacity	data not available
Other Government response	State ferry system, USCG and US Navy	HM Coastguard SAR helicopter; Royal Air Force; SIC helicopter; Dispersant spraying aircraft; Royal Navy and Scottish Fishery Protection vessels; Standby/salvage tug on station in winter months.	Navy	data not available

Subject	Valdez	Shetland	Norway	Sakhalin
Additional requirements close to shore minimum spill size			If closer than 40 km 56,000 bpd 25 % of equipment (+/- 1200 bph capacity) must be in area and respond in few minutes. 75 % equip in 48 hrs If spill drift time is less than 20 hour to shore 50 % of equipment is required in area	data not available
Onshore terminal Oil Spill Response Vessel (OSRV) Requirements:				
Tankers must be boomed	Yes	No	Yes	data not available
Minimum capacity required	Valdez 300,000 bbls in 1.8 meter seas and 17 knots winds Cook Inlet 50,000 bbls minimum	5 major oil terminals in UK, with equipment. BP-contracted response base, Oil Spill Response Ltd, at Southampton has equip. to respond to 2 simultaneous 30,000 tonnes or 210,000 bbls oil spills anywhere in the world in 48 hours	36,000 bbls	data not available
Maximum planning standard	Valdez 65 % largest Crude T/V -- 960,000 bbls	data not available	56,000 bpd 25 % of equipment (+/- 1200 bph capacity)	data not available
Tankers less than 500,000 bbls	Cook Inlet 50,000 bbls		must be in area and respond in few minutes	
Tankers greater than 500, 000 bbls	300,000 bbls		75 % equip in 48 hrs	
Min cleanup volume 24 hrs		data not available	36,500 bbls	data not available
Min cleanup volume per hour		data not available	600 bph	data not available
Min cleanup volume 72 hrs	Valdez 300,000 bbls	data not available	data not available	data not available
Tankers less than 500,000 bbls	Cook Inlet 50,000 bbls			
Tankers greater than 500, 000 bbls	300,000 bbls			
Number of skimmers	Valdez 60	data not available	data not available	data not available

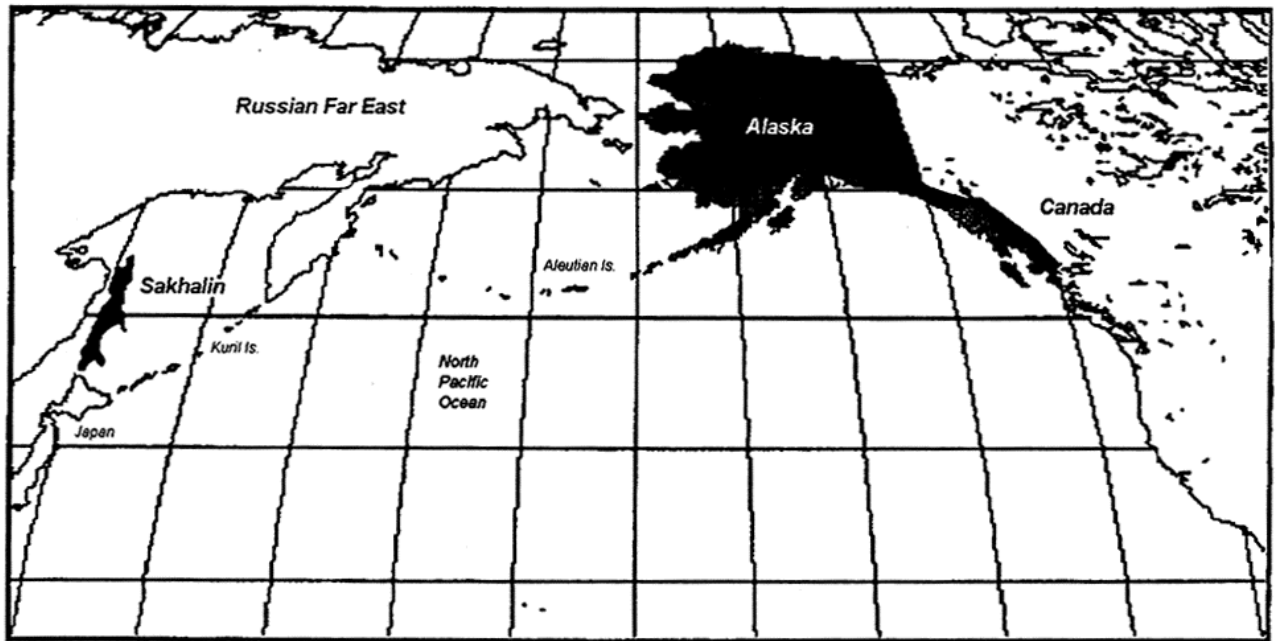
Subject	Valdez	Shetland	Norway	Sakhalin
Capacity per hour	+/- 60,000 bph in Valdez with similar capacity available for Cook Inlet	data not available	data not available	data not available
Containment boom	35 miles in Valdez 12 miles in Cook Inlet	data not available	data not available	data not available
Trained industry people	400	data not available	data not available	data not available
Tugs docking	2-3 Valdez	normally 4	2 minimum per terminal	data not available
Tugs escort	Valdez 5 available 1 - 3 required	Shetland – 4 available with one in reserve.	2 minimum at two of the large terminals	data not available
OSRV Escort	5 available 1 required	Tugs have OSR equipment	Tugs have OSR equipment	data not available
Additional OSRV under contract	350 fishing vessels	Offshore oilfield support vessels and local fishing vessels are available at short notice	50 or more	data not available
Additional trained people	500	Some fishermen and fish farmers are trained by BP in use of oilspill response equipment.	data not available	data not available

V: Maps

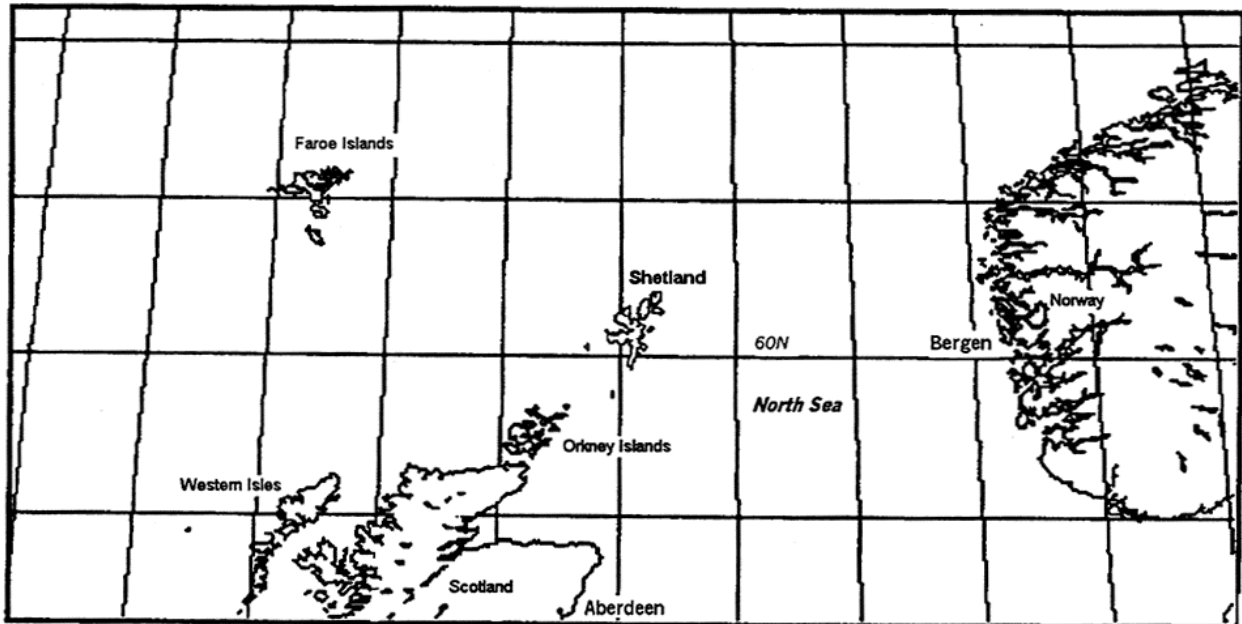
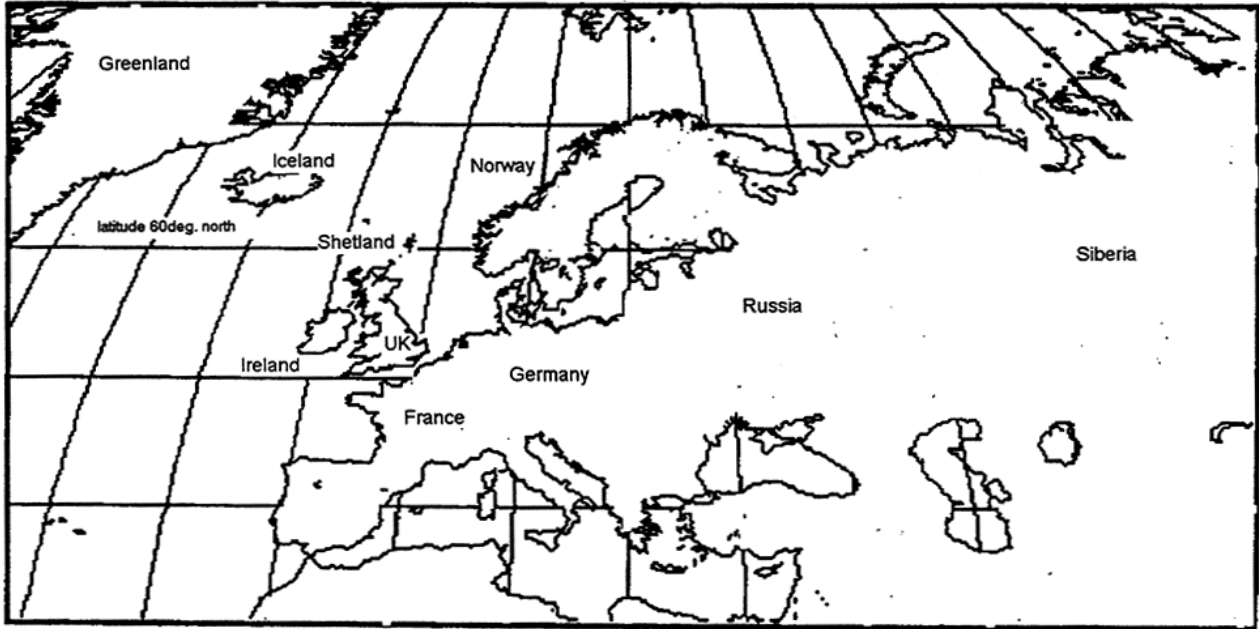
Polar View



Sakhalin/North Pacific



North Sea/Shetland Islands



VI: Information about the Publishers

Sakhalin Environment Watch (SEW) is an independent non-political non-governmental organization dedicated to protecting the natural ecosystems and wildlife of Sakhalin Island and the Kuril Islands in the Russian Far East.

SEW's main goals are:

- to preserve the forests of Sakhalin Region;
- to increase the ecological security of Sakhalin's offshore oil and gas projects.

SEW's main activities include:

- developing and implementing environmental projects and direct action initiatives;
- raising public awareness about wildlife protection issues;
- public monitoring of compliance with environmental legislation;
- facilitating public environmental expert reviews;
- organising scientific research in the field of environmental protection;
- developing and promoting ecological and scientific tourism.

SEW's environmental projects are aimed at protecting the remaining wilderness areas and facilitating regeneration of destroyed ecosystems. SEW studies a specific issue in depth, attracts scientists and other specialists, collects additional information and analyses the existing regulatory framework. SEW then determines possible resolutions and presents recommendations to decision-makers. SEW also disseminates information about nature protection to the public through the mass-media, pamphlets and booklets, and also through public meetings, round tables, lectures, conferences, seminars and workshops.

Pacific Environment and Resources Center (PERC) protects endangered ecosystems around the Pacific Rim through grassroots advocacy, environmental education, and law and policy analysis. Citizens who are educated about environmental issues, motivated to act, and empowered with training in grassroots activism will shape the protection of the Pacific Rim and the global environment into the 21st Century. In the Pacific Rim and around the world, citizens can protect the environment and promote ecologically sustainable development that protects local economies and empowers citizens to confront ecological threats and protect natural resources. Since 1991, PERC has worked with environmental organizations, scientists, government officials, and indigenous peoples in the Russian Far East to exchange information, review and publicize the environmental effects of proposed development projects, and implement cooperative environmental protection strategies. Since 1997, PERC has worked with local and international organizations to monitor offshore oil and gas development in the Sea of Okhotsk.

Cover photo depicts the "Okha," a 140,000-ton oil tanker working at the Sakhalin-2 oil field on the Sakhalin shelf. Photo by Dan Lawn.

Back cover photo depicts the Vityaz production terminal at Sakhalin-2 with the Molikpak platform and "Okha" tanker. Photo by Mikhail Bugaev.

A publication of:

Sakhalin Environment Watch

address: 693000 Russia, Sakhalin Region, Yuzhno-Sakhalinsk city, Admirala Makarova st, 27,
tel/fax: (42422) 3-21-53, e-mail: watch@sakhalin.ru

Pacific Environment and Resources Center

address: 1440 Broadway, Suite 306

Oakland, California 94612, USA

Tel: 510-251-8800, Fax: 510-251-8838, E-mail: percsiberia@igc.org, Web Page: www.pacenv.org

Produced in Russian as “ÑÀÕÄËËÍÑÊÀß ÍÀÔÛ: èàê íáãñâ÷èòü ááçîãñîñòü”