

**EXECUTIVE SUMMARY OF THE PHASE 2  
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT  
PROCESS**

**SAKHALIN II PHASE 2 PROJECT**

**November 2005**

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## **Section 1**

### **Introduction**

This document provides the reader with a summary of the environmental and social impact assessment work that has guided the definition and delivery of the Sakhalin II Phase 2 Project. It provides a summary of the likely impact of the project and what it is expected to bring to the people of Russia. It describes the Company's approach to the management of Health, Safety and Environment ("HSE") and socio-economic matters, as well as its requirements from its contractors. A description of the environmental and social impact assessment work that has been done to date follows, starting with a discussion on project alternatives, the impact assessment process, and a concise overview of each of the pertinent environmental and social issues.

The document concludes with a description of the Health, Safety, Environment and Social Action Plan ("HSESAP"), which comprises an important synthesis of all pertinent HSE and social commitments that the Company has made in order to ensure the project is delivered safely and with due regard for the environment and the people of Sakhalin Island and neighbouring Japan.

The key documents that are referred to in this document are the Environmental, Health, and Social Impact Assessments ("ESHIA"), the Environmental Impact Assessment Addenda ("EIA-A"), social-related documentation and the HSESAP. Together these comprise the main body of environmental and social impact assessment, mitigation and monitoring documentation, and their linkages are presented diagrammatically in Figure 1. The ESHIA, which was published in 2003, consists of seven volumes, each of which describes the impacts and mitigation measures per major project asset, including the infrastructure upgrade project. The ESHIA was prepared during the early design phase of the Project, and for that reason subsequent, more detailed information pertinent to the impact assessment process has been published in the EIA-A and the social-related documentation. Together this material demonstrates the Project's compliance to Senior Lender policies and procedures.

The EIA-A comprises 15 chapters, focused on subjects which include oil spill response planning, rare and migratory birds, marine mammals, waste management, dredging activities, and air emissions. It is supplemented with two standalone documents, namely the Comparative Environmental Appraisal of the Piltun Pipeline Route ("CEA") and the River Crossings Strategy Report ("RCR"). The social-related documentation comprises of five documents, namely the Social Impact Assessment Addendum (SIA-A), the Resettlement Action Plan ("RAP"), the Sakhalin Indigenous Minorities' Development Plan ("SIMDP"), Treatment Plan for Objects of Cultural Heritage, and the Public Consultation and Disclosure Plan ("PCDP") which also incorporates the Public Grievance Leaflet. All of these documents are described in Section 10.

In compliance with requirements of the EBRD and the World Bank Group policies on environmental action plans, the HSESAP provides a consolidation of all material environmental, health and social-related commitments derived from the ESHIA and addenda documents. The HSESAP is publicly available on the Company's websites in Russian and English. Certain parts of the HSESAP, which are deemed relevant to Japan, will be made available in Japanese on the Company's website in Q4 2005.

The HSESAP is set out into two parts and three annexes. Part 1 provides an overview of the Company's operating philosophy, and the structure and systems in place to manage HSE and social issues, including the management of contractors.

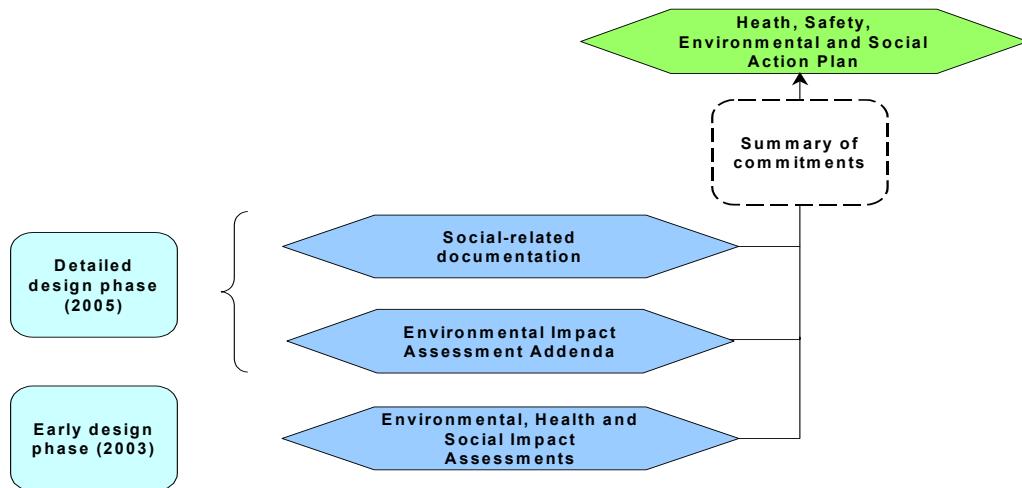
It also references the Company's obligations for public consultation and information disclosure, and sets out the reporting and auditing framework to the Senior Lenders.

Part 2 sets out in a themed tabular format the detailed commitments relating to specific HSE and social issues; the mitigation measures to achieve those commitments; timing for the implementation of commitments; and responsible parties. Themes include oil spill response, biodiversity, waste management, erosion control, river crossings and communities.

Annex A provides a comparison of how the project meets relevant international standards, in particular pertinent World Bank Group safeguard policies and European Commission directives.

Annex B is comprised of four parts. Parts 1-3 provide a narrative against a number of environmental and social related state-level conventions and treaties that the Russian Federation has yet to ratify. Subject to its overriding obligation to comply with Russian law, the Company sees benefit in complying with the spirit and intent of these conventions as far as they are capable of application to private entities. Part 4 of this Annex provides a list of international conventions and treaties that have been ratified by the Russian Federation and are deemed applicable to the Project. By virtue of its commitment to comply with material HSE and social law, the Company is obliged to comply with those provisions of the HSE and social international conventions listed which apply to private entities under Russian law and which are material to the Project.

Annex C provides information on the pre-construction and construction environmental monitoring programmes that are being implemented by the Project. Parameters include air quality, water and effluent discharges, marine mammal observations, and noise monitoring. The commissioning and operational monitoring plans will not be developed until Q4 2006, at which point they will be agreed with the Senior Lenders before finalisation. Whilst the detailed plans are still in preparation, Annex C does set out the general types of parameters that will be included in these commissioning and operational plans. An overview of social monitoring activities is also set out in Annex C. The social monitoring programme will be further developed in Q4 2005 in the form of a Social Compliance Monitoring Handbook.



**Figure 1. Environmental, Social and Health documentation linkages**

A diagram setting out how these documents link to one another is set out in Figure 1. All of these documents are available in Russian and English, and some in Japanese, and are publicly available on the Company's website [www.sakhalinenergy.ru](http://www.sakhalinenergy.ru) / [www.sakhalinenergy.com](http://www.sakhalinenergy.com).

## Section 2 Sakhalin Island

Located in the Russian Far East, just 42 kilometres from the northern tip of Japan, Sakhalin Island stretches almost 1000 kilometres from north to south and covers an area of 90,000 square kilometres. The Sakhalin region is divided into 17 administrative districts, comprising 19 towns and 33 urban-type settlements. Yuzhno-Sakhalinsk is the administrative centre and regional capital. Approximately 600,000 people inhabit Sakhalin Island and although the population is relatively small, the island is home to 170 ethnic groups. These include four that are native to Sakhalin: the Nivkh, Uilta, Evenkh and Nanai.

Most of Sakhalin is covered with low and medium altitude mountains. Two major mountain chains spread from the southern part to the central part of the island, namely the West Sakhalin range, which reaches heights of 1,300 metres, and the East Sakhalin range, whose highest peak reaches 1,909 metres. Between them lies the Tym-Poronaisk valley, which is largely agricultural.

Sakhalin's environment is highly diverse. The seas around the island are productive, enabling Sakhalin Island to be the third largest producer of fish products in the Russian Far East. There are more than 6,000 rivers and streams on the island, and more than 1,600 lakes with a total surface area of over 1,000 square kilometres. In Sakhalin's forests, wetlands and grasslands, there are more than 700 types of insect and over 350 species of bird. The island is also home to 1,400 different flowering plants.

Sakhalin's climate is variable. Winter on Sakhalin lasts between five and seven months and summer between two to three months, making it somewhat climatically severe and abnormal for its latitude. The climate varies considerably between the

South and North. For instance, the average monthly temperature in January is around -20°C in the north and -12°C in the south, but temperatures can be more extreme, reaching temperatures as low as -45°C in the north. Summers are often cool and humid, with fog along the shorelines and there are occasional typhoons in autumn, bringing heavy rainfall.

## **Section 3**

### **Sakhalin II Phase 2 Project Description**

Sakhalin Energy Investment Company ("Sakhalin Energy" or the "Company") is implementing the Sakhalin II Phase 2 Project (the "Project"), an integrated oil and gas project with international export of crude oil and condensate and Liquefied Natural Gas ("LNG") from Sakhalin Island, in the Russian Federation. The Project is being developed under the terms of the "Agreement on the Development of Piltun-Astokhskoye and Lunskoye Oil and Gas Fields on the Basis of Production Sharing" executed with the Russian Federation represented by the Government of the Russian Federation and the Administration of Sakhalin Oblast (together, the "Russian Party") in June 1994 (the "PSA"). The PSA governs the exploration, development and exploitation of hydrocarbon reserves in the Piltun-Astokhskoye ("PA") and Lunskoye ("Lun") fields.

Sakhalin Energy has currently three shareholders with the following interests in the Company, namely Shell (55%), Mitsui (25%) and Mitsubishi (20%).

The PA and Lun fields are two offshore fields located off the northeast Sakhalin coast, both of which were discovered around 1984. The PA field is predominantly an oil field (light oil of low sulphur content), but contains both associated and non-associated gas. The Lun field is a gas condensate field, though this field also has a potentially exploitable oil rim.

Sakhalin Energy is currently producing crude oil from the Astokh feature of the PA field, located about 20 kilometres east of Piltun Bay in an average water depth of 30 meters. Crude oil is produced on the existing PA-A platform and transferred to a Floating Storage and Offloading unit ("FSO"), located two kilometres from the production complex, for storage and loading onto shuttle tankers for sale to customers. Crude oil production occurs from late May to early December and is shutdown during the remaining period when shuttle tankers are unable to reach the FSO due to winter sea ice.

As part of Phase 2 of the Project, Sakhalin Energy is undertaking further developments of the PA and Lun fields that will lead to increased production of crude oil and to the production of condensate and natural gas, on a year-round basis. The Project involves the installation of an offshore platform (PA-B) on the Piltun feature of the PA field and the installation of an offshore platform (Lun-A) on the Lun gas field. Both of these platforms will be linked to the shore by pipelines. Gas from the Lun-A platform will be treated at the Onshore Processing Facility ("OPF"). The treated oil and gas will then be transported via two 800 kilometre long onshore pipelines to a new LNG plant and oil and LNG export terminal located at Prigorodnoye, in the south of Sakhalin Island.

The facilities constructed as part of the Phase 2 Project include:

- Oil export pumps and gas/oil treatment facilities on the existing PA-A platform (the Molikpaq) to enable gas export and year-round oil export from the Astokh block of the PA field (the "Molikpaq Tie-in Project"). The FSO and associated export facilities will be decommissioned;

- An oil and gas production and drilling platform (“PA-B”) on the Piltun area of the PA field, approximately 24 kilometre north of the PA-A platform;
- A gas and condensate/oil production and drilling platform (“Lun-A”) on the Lunskoye field;
- An OPF near to the town of Nysh in the northeast of Sakhalin Island, to process gas and crude oil (oil and condensate) from the Lunskoye field;
- Gas/condensate multiphase pipelines between the Lun-A platform and the OPF;
- An onshore and offshore oil pipeline system, including Booster Station 1 (“BS1”) at the OPF and Booster Station 2 (“BS2”) halfway between the OPF and the LNG plant, that will gather processed oil from the PA-A and PA-B platforms and condensate/oil produced from the Lun-A platforms and processed at the OPF, for transportation to the oil export terminal at Prigorodnoye in the south of Sakhalin Island. The onshore pipelines travel along the axis of the island, following principally the main transport and communication links;
- An onshore and offshore gas pipeline system, including pressure booster stations at BS1 and BS2 that will compress gas from PA-A, PA-B and the OPF for transportation to the LNG plant at Prigorodnoye. This pipeline system will also include a number of provisions to facilitate delivery of gas to the domestic market;
- A two-train LNG plant and 850-metre jetty at Prigorodnoye. Each LNG train, processing unit, will have a capacity of 4.8 mtpa;
- An oil export terminal (“OET”) including storage tanks situated 500 metres to the east of the LNG plant on the same site at Prigorodnoye and a tanker loading unit situated approximately 4.5km offshore in Aniva Bay;
- Necessary infrastructure work to support project execution, which include airport, road, bridge and culvert upgrades; and
- Shore-based supply camps and Company headquarters.

The locations of most of these facilities are shown in Figure 2 below.

Peak crude oil/condensate production capacity from the three offshore platforms is expected to be about 180,000 barrels per day (about 8.2 mtpa). LNG production capacity is expected to be about 9.6 mtpa for more than 25 years. Oil and LNG will be shipped to markets in the Asia-Pacific region and beyond. First year-round oil (first cargo from OET) is expected in Q3 2007 (and from PA-B in Q3 2008). First delivery of LNG is expected in Q3 2008.

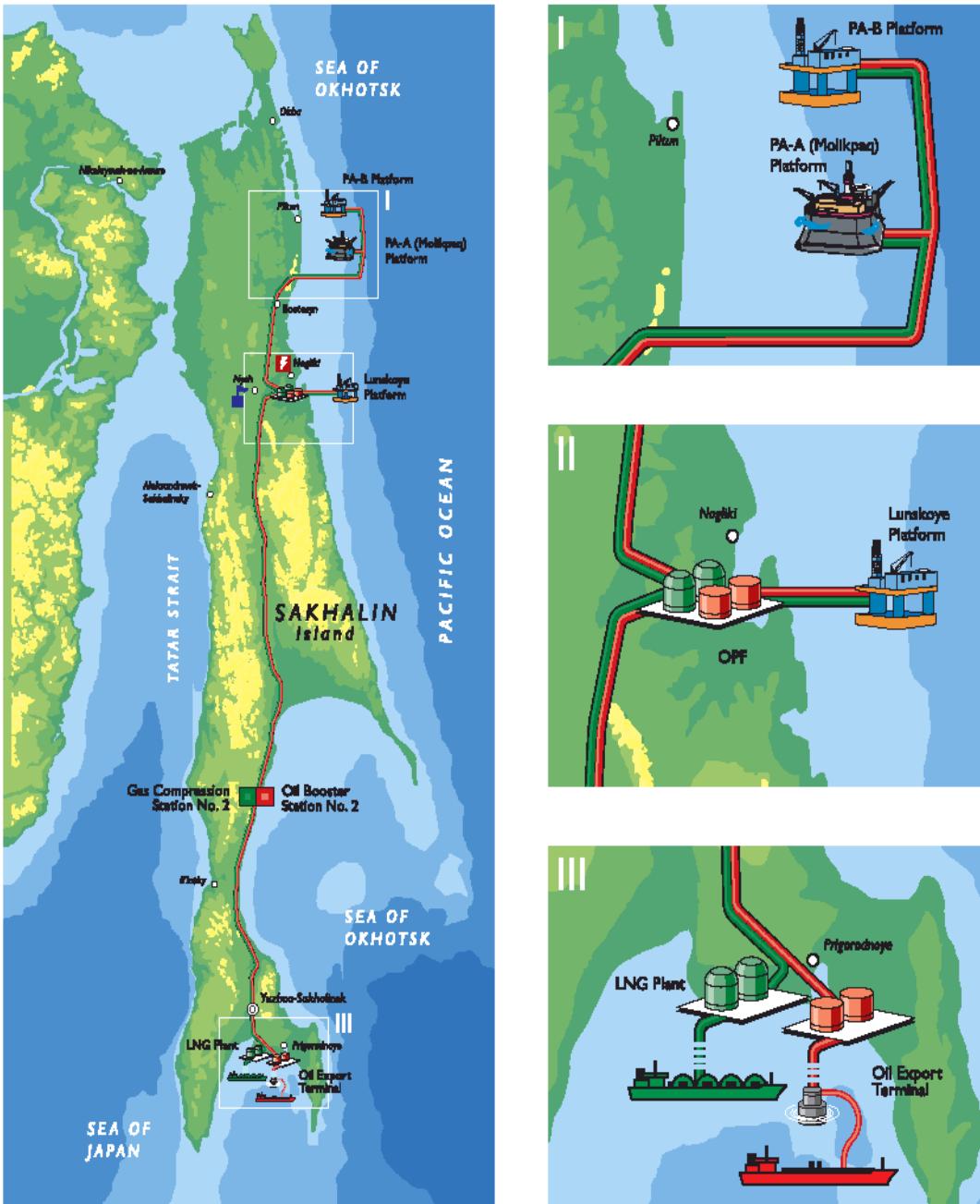


Figure 2. An overview of the Sakhalin II Project

## **Section 4      Benefits to Russia**

The Sakhalin II development is the largest single foreign direct investment in the Russian Federation and will generate billions of dollars in value for Russia in the form of hydrocarbon allocation, profit taxes, royalties, and other taxes. Between 1997 and 2001, Sakhalin Energy contributed USD100 million to the Sakhalin Development Fund, much of which has been used to develop public services on Sakhalin Island, including the construction of a children's clinic, a hospital and three schools. This is in addition to the USD300 million that the Company has already spent on improving roads, bridges, railways and other infrastructure to ensure that local public infrastructure is able to support the Project.

As part of the Company's efforts to achieve 70% Russian content over the life of the Project, there are significant opportunities for much needed employment for the Russian national and local populations. A large number of temporary and short-term construction jobs have and will continue to be created between 2002 and 2008, ranging in duration from several months to two or three years and peaking at approximately 17,000 jobs between 2004 and 2006. About 1,500 new long-term jobs with Sakhalin Energy, including an estimated 900 contract positions for local people, are expected to result from the Phase 2 development. Secondary employment will be generated as a result of increased demand for local goods and services. To assist both national and local Russians to compete successfully for these jobs, Sakhalin Energy has placed much effort in providing training and apprenticeship schemes.

Sakhalin Energy's community development programmes are an important mechanism to extend the range of benefits that the Sakhalin II Project will deliver to Sakhalin Island and to Russia to include as many people as possible. Since 1994, USD1.5 million has been provided to support educational, cultural, environmental and social initiatives within the local community and the budget for social investment initiatives rose to approximately USD0.5 million in 2005. Further increases to the social investment budget are expected from 2006. During the construction of the Phase 2 Project, an additional USD24.5 million have been set aside to contribute towards sustainable community initiatives that go beyond the Company's initial investment and continue to provide benefits to Sakhalin Island communities and their environment into the future.

There is likely to be a significant "multiplier" effect from the investments made by Sakhalin Energy, as each dollar spent should generate more wealth. The emergence of Sakhalin Island as a major exporter of LNG will promote its development as a strategic hub of Russian industry, as well as integrating it into the economic life of the dynamic Asia-Pacific region. Mobilising the region's offshore oil and gas resources should contribute to the region's stability and prosperity.

## **Section 5      HSE Management**

Management of HSE issues is a fundamental part of the responsibilities of all project managers and staff in Sakhalin Energy. The Corporate HSE Department is staffed to provide expert HSE support to the project teams and is responsible for co-ordinating HSE management between all parts of the Company, setting policy and standards, overseeing Project implementation and reporting externally on HSE performance.

The effective management of HSE and social issues requires allocating appropriate resources (human, physical and financial) to the responsibilities assigned at each level. HSE training is provided to ensure that staff and contractors are competent to fulfil their responsibilities and during construction the Company is devoting between USD500,000 and USD1million per year to HSE training and capacity building amongst its contractors. Company HSE Standards are used to communicate the level of performance expected from contractors and the HSESAP is also be used to define the methods by which Project construction contractors will be required to carry out particular mitigation and monitoring measures.

Sakhalin Energy has developed an integrated HSE Management System ("HSE-MS") to manage risks that the Company faces in relation to human health and safety and the environment, which is critical to the success of the business. The HSE-MS is a structured framework designed to ensure that the Company's operations and activities are performed in accordance with the policies and procedures of the Company. Continuous improvement in HSE performance is encouraged, and is assessed through monitoring activities and audits. The HSE-MS applies to all material assets and is implemented through a series of standards, policies, plans and procedures.

Sakhalin Energy's HSE Policy is the highest-level document in the Company's HSE-MS and reflects the Company's aims and objectives in relation to managing HSE issues. This Policy reiterates the Company's objective of compliance with Russian Federation law and other commitments, such as its obligations under the HSESAP. Its content is consistent with the International Standards Organisation ("ISO") Standard for Environmental Management Systems ("ISO 14001").

Phase 1 of the Project reached a major milestone in 2003 by achieving accreditation to ISO 14001. The Company is committed to all assets obtaining and maintaining a system consistent with ISO 14001 and to submit an application for the standard within 18 months of commencement of operations at the applicable facility.

## Section 6

### Social Management

The assessment and management of social issues as part of major oil and gas developments is a relatively new area for the industry in comparison to HSE. Nevertheless, the Company has put considerable effort and resources into the integration and management of social impacts within the Project.

The Company is in the process of establishing a social impact management system (SI-MS) to manage project activities that may impact on communities in a systematic manner. The SI-MS will include the provision of a social performance policy and a rolling five-year social performance plan that will define key performance improvement activities and targets for key performance indicators. To meet the Company's social commitment, the SI-MS will utilise various systems and processes including: the resettlement action plan, SIMDIP implementation plan, stakeholder consultation, grievance procedure, procurement, training and recruitment and contractor management. In addition, the Company is in the process of strengthening its monitoring, auditing and management review of social issues.

The day-to-day management of social issues is carried out by the Social Performance Team ("SPT"), which is a component of the External Affairs ("EA") Department. The SPT is responsible for social impact assessment, social investment, the development and planning of mitigation measures and social

performance monitoring, with the objective of identifying and resolving issues on a timely basis.

The SPT liaises closely with the Community Liaison Officer (“CLO”) organisation to provide an interface between the local population, contractors and the Company. The CLOs, who are either based in project camps or within community centres around Sakhalin Island, play a key role in resolving grievances raised by local citizens and in providing timely feedback on community issues to the Project. As of January 2005, the CLO network comprised 12 Sakhalin Energy-contracted CLOs and 8 CLOs employed directly by contractors. These CLOs work within key community centres around Sakhalin Island, particularly in project affected areas, including Nogliki and Val in the north, and Korsakov in the south.

Project managers have overall responsibility for social matters associated with each major project asset (or facility), and each asset team with a significant social footprint (i.e. onshore pipelines, the OPF and the LNG plant) has a designated Social Focal Point (“SFP”) who reports directly to the relevant project manager. The SFP is responsible for providing an interface between the asset team, the SPT and the contractors and is supported by the CLOs. Each major contractor whose activities involve social impacts is required to prepare and implement a Socio-Economic Management Plan and must have at least one CLO and/or designated SFP who provides an interface with the asset teams (the number depending upon the size of their operation and their interaction with local communities).

The summary of the Company's key social-related policies, procedures and commitments are set out below:

- Sustainable Development Policy and Commitment;
- Social Performance Policy and Plan;
- Public Consultation and Disclosure Plan;
- Commitment to Russian jobs and business opportunities;
- Resettlement Action Plan, covering:
  - Compensation according to Russian legislation;
  - Supplemental Assistance Policy and Programme<sup>1</sup>.
- Policies related to Contractor management issues, including:
  - Code of Conduct Policy for the construction workforce;
  - Camp Management Policy;
  - Socio-Economic Plan to be completed by contractors;
  - Requirement for Contractor community liaison staff.
- Policy on No Fishing, Gathering and Hunting;
- Sakhalin Indigenous Minorities Development Plan;
- Support for Uilta reindeer herders;
- Policy on Discovery and Disposal of Unexploded Ordnance from Sakhalin Energy Land Allocations;
- Policy on Discovery of War Dead during Construction;

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<sup>1</sup> Enabling World Bank OD4.30 compliance

- Treatment Plan for Objects of Cultural Heritage (modern and archaeological);
- Grievance Procedure;
- Commitment to the ongoing monitoring of potential social and economic impacts detailed in the Social Compliance Monitoring Handbook.

## Section 7 Contractor Management

Contractors will perform the majority of the physical work managed by Sakhalin Energy and, for the most part, this work falls under a few large contracts set in place for the development of each of the Project assets.

The Company requires contractors to adopt the same high standard of HSE and social performance as Sakhalin Energy. Accordingly, the Company's approach is to engage with its contractors to ensure that their HSE and social management principles align and that all activities on or around Sakhalin Island undertaken by the Company (or on behalf of the Company by contractors) relating to the construction or operation of the Project are subject to the applicable requirements of the Company's HSE and Social policies and standards, including the HSESAP. The management procedures adopted by the Company in this regard have been tested in numerous other projects worldwide, and comprise four key steps: screening; setting of HSE and social criteria; risk assessment and management and supervision and auditing.

The Company has a formal process for the annual alignment of contractor HSE plans with Company plans. The Company is responsible for setting clear commitments and deliverables to its contractors, including those that are required for inclusion in the contractors' Contract HSE Plans. The Corporate HSE team is responsible for discussing with each contractor the relevant aspects of the Company's Annual 5 Year HSE Plan and the equivalent plan for the relevant asset or project to assist the contractor to build its plan.

It is a critical part of the Company's contractor management system to communicate to each contractor those HSESAP requirements that are relevant to that contractor, and to monitor the enforcement of these requirements. Therefore, a comparable process to that set out above will be held following the finalisation of the HSESAP, to roll out to contractors any HSESAP commitments additional to the requirements in place under the Company's own plans and procedures. This will be co-ordinated with the SPT such that social commitments are also equally addressed.

Contractor monitoring and auditing is performed throughout the contract by way of performance and compliance reporting, site visits, audits, incident investigations and regular meetings. Contractor performance is managed at asset/project level through monthly meetings between the asset team and each contractor. The Company also undertakes regular monitoring to verify contractor compliance with their obligations under Russian law, compliance with the Company's policies, procedures and standards, as well as any additional applicable HSESAP requirements.

Where monitoring identifies non-compliances, the Company will ensure that the applicable activity is brought back into compliance, if necessary through the adoption of a remedial action plan. The significance of any non-compliance is determined using the Company's Risk Assessment Matrix. This determination,

together with any material remedial actions required, will be fed into an action tracking system.

More specific information relating to the management of contractors, in particular in the construction of the onshore pipeline, is provided in Section 10.

## Section 8

### Public Consultation and Disclosure

A component of Sakhalin Energy's Business Principles is its commitment to open communication and transparency with its stakeholders. This is borne from recognition of the importance of the impact of the Project on the local community and economy. Sakhalin Energy has developed substantial information programmes and is willing to provide information about its activities to interested parties on request, subject to any overriding considerations of business confidentiality, relevance and cost.

Sakhalin Energy has taken into account the legal requirements of the Russian Federation for public consultation as well as international guidelines on public consultation and disclosure, for which World Bank Group guidelines provide a benchmark. A key document setting out Sakhalin Energy's approach in this matter is the Public Consultation and Disclosure Plan ("PCDP"). The PCDP sets out the Company's approach to consultation and disclosure on Sakhalin Island, the Russian mainland, in Japan and with the wider international arena of interested stakeholders, detailing not only the methods by which consultation and disclosure will take place, but also providing summary information from consultation activities carried out since 2001.

Sakhalin Energy has been engaging with the public since its activities started on Sakhalin Island in the mid 1990s. Public consultation concerning the Sakhalin II Project first took place during the Sakhalin II Project Feasibility stage in 1993, and has taken place at regular intervals ever since.

The engagement process has principally taken several forms:

- Statutory public hearings to fulfil Russian legal requirements;
- Informal dialogue with local stakeholders, supported by the network of CLOs;
- Stakeholder meetings in Japan;
- Frequent *ad hoc* meetings with local, national and international NGOs and other interested bodies on pertinent issues;
- Establishment of a grievance mechanism to address any complaints and grievances; and
- Public disclosure of pertinent documents.

In the development of the ESHIA and particularly between September and December 2001 a large degree of public consultation was undertaken, including:

- Approximately 2,000 local residents were consulted in 52 communities across Sakhalin Island, with a particular focus on the 22 mostly rural communities where temporary construction work and permanent project facilities are to be located;
- Over 500 interviews took place with local experts;
- 25% of all indigenous households were consulted;

- Specific interest groups and members of the local authorities were consulted and the process amassed a significant level of baseline information generated through interviews and questionnaires.

Since the publication of the ESHIA documents in early 2003, Sakhalin Energy has developed a long-term engagement programme involving 62 communities throughout Sakhalin Island, with a specific focus on the four urban centres of Yuzhno-Sakhalinsk, Nogliki, Korsakov and Kholmsk. Elements of the long-term programme involve at least six monthly island-wide public meetings, ranging from town-hall meetings to smaller focussed informal discussions in affected communities. The Company provides regular updates on project activities and endeavours to inform communities of operational phase employment opportunities. Public open days to project sites are also organised on a regular basis, and the Company often organises tours for specific interest groups, such as the media.

A summary of the consultation and data gathering exercises is provided within the PCDP, which is updated on a periodic basis. The summary covers issues raised at meetings, which include employment opportunities; supply of gas to more remote parts of the Island; environmental impacts; compensation issues; and road traffic concerns.

The Company has been responsive to these concerns. For example, in June 2005 it committed USD 750,000 over three years in support of a Sakhalin Road Safety Partnership. This Partnership, along with other project-level commitments, includes an island wide seatbelt campaign, defensive driving training for truck drivers; large advertising hoardings displaying road safety messages throughout communities; awareness raising amongst school children via means such as safety videos, and a project-focused monthly campaign focused on different elements of road safety-related issues.

## **8.1**

### **CONSULTATION IN JAPAN**

Sakhalin Energy embraces the benefits of seeking to act in the spirit of UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991) and in this regard it has established links with a wide number of Japanese stakeholders and interested parties.

The focus of engagement is mainly in Hokkaido, which lies in relative proximity to Sakhalin Island, although some limited consultation also takes place in Tokyo. Regular dialogue is ongoing with interested stakeholders, including the Hokkaido authorities, fisheries cooperatives, NGOs, the Coast Guard and oil spill response organisations.

There has been a programme of regular biannual stakeholder meetings in Sapporo and Tokyo, which are set to continue for the duration of the construction period at least, at which issues of transboundary concern are discussed. These focus predominantly on the potential threat of oil spills, migratory birds including the Steller's sea eagle, migratory sea mammals, and the potential impact to commercial fisheries interests.

## **8.2**

### **PUBLIC DISCLOSURE OF DOCUMENTS**

In embracing the spirit of the Aarhus Convention, the objective of which is to guarantee the rights of public access to information and to promote public participation in decision-making, the Company has disclosed a large number of

project documents that are of interest to stakeholders. Generally these have been made publicly available in English and Russian (and some in Japanese) predominantly through the Company's website. Key documents, such as the ESHIA and addenda, and regular community updates, have also been made available in hard copy in public libraries in towns and villages throughout Sakhalin Island and on Hokkaido.

## Section 9      Phase 2 Project Alternatives

In the early design stages of the project, Sakhalin Energy considered various project alternatives and assessed these against a variety of technical, safety, environmental, and economic criteria. These design alternatives were analysed as a complete, integrated system, assessing different locations, design approaches, hazards and processing options and considering operational, environmental, social and sustainability impacts.

### 9.1

#### THE PLATFORMS

Prime considerations for optimal and safe exploitation of the Piltun and Lunskoye fields include:

- Location of subsurface hydrocarbon reservoirs in combination with maximum well reach;
- Avoiding drilling safety hazards such as shallow gas;
- Climatic considerations as the platforms need to operate in an arctic environment;
- Seabed characteristics – the seabed needs to be able to support the structure.

In selecting the optimal configuration for the development of the Piltun and Lunskoye fields, three alternatives were considered:

1. Sub-sea developments without a permanent surface platform;
2. Extended-reach drilling from shore or existing platforms;
3. Permanent surface platforms.

The first alternative was not selected due to limited technologies to cope with seasonal ice that limits access to ensure the continuous and safe functioning of the facilities located on the seabed. The second alternative, extended reach drilling from shore or from the existing PA-A platform is not technically feasible due to the drilling distances that are required to be covered. Extended reach for this type of exploitation was only possible for up to some 6km from base at the time of the feasibility study, and yet the Piltun field lies up to 18km offshore, and some 24km from the PA-A platform, even with today's drilling technology these distances are too large for extended-reach drilling. The Lunskoye reservoir is also located too far from shore for extended-reach drilling from shore.

The project design therefore focused on offshore permanent platforms. Originally Sakhalin Energy had planned for three platforms for the Piltun feature and two for the Lunskoye field. Ongoing technical developments in extended-reach drilling enabled the required number to be reduced to only one additional platform in Piltun and one in Lunskoye, and consequently the amount of materials used in platform construction, the environmental impact of construction, the physical imprint on the

environment and the potential for environmental impact to the sea floor and surrounding air and water have been considerably reduced.

The PA-B platform location is based on a combination of technical, economic and environmental factors. The platform can only be located within a limited area, as the platform needs to be placed sufficiently close to the targeted subsurface hydrocarbon reservoirs to enable wells to reach these reservoirs. Shallow gas hazards east and northeast from the planned platform location are a serious safety hazard and increase the risk of blowouts during drilling operations and need to be avoided. Clay channels composed of soft sediments south and southeast create an unstable foundation and the platform cannot be installed on such sediments. The western grey whale feeding ground is located 7km to the west of the proposed platform location. Any move to the east of the present location would have had to be at least 3.5 to 4.0km, to avoid the shallow gas hazards, and would have left a significant part of the planned well locations outside the reach of the platform drilling rig. The position of the platform has therefore been optimized, taking into consideration these factors.

## 9.2

### ONSHORE PROCESSING FACILITY

The OPF processes gas, oil, and condensate from the Lunkoye field prior to their export via the onshore pipelines to the LNG plant and export facilities at Aniva Bay in the south.

Offshore processing was not a practical alternative for the Lunkoye platform due to the large volumes of high-pressure gas that will be produced and the need to separate the drilling, processing facilities and the personnel living quarters for safety reasons.

In pursuing the onshore processing route, Sakhalin Energy evaluated six possible OPF sites, taking into consideration:

- Environmental concerns – including proximity to the Lunkoye nature reserve and the effect on the habitat of Steller's Sea-eagles and Aleutian sea swallows;
- Pipeline hydraulics – for technical reasons the OPF location must be within 15km of the shoreline and a maximum of 30km from the platform;
- Logistics for construction and operation;
- Physical site topography; and
- Geo-technical considerations regarding foundations and seismic design.

The six sites were located between 0.5km and 15km from the beach. The two sites closest to shore (at 0.5km and 2.8km from shore) were favourable from a technical and economic standpoint, but they had a number of environmental disadvantages, namely that they were situated within Steller's sea-eagle nesting areas and would have had impacts on other ornithological interests. The sites that were located between 9.4km and 14.8km from the shore generally had unsuitable terrain, which would have required considerable work to reduce flood risks or land levelling. The selected site is located 7km from shore, immediately adjacent to the established pipeline right-of-way ("ROW"), and outside of the sensitive coastal belt. A 1.0 kilometre safety or sanitary protection zone, which is large by international standards, surrounds the site without infringing on nature reserve or wildlife habitats.

### 9.3

## OFFSHORE AND ONSHORE PIPELINES

Sakhalin Energy's integrated offshore and onshore pipeline system will link the existing PA-A platform and the newly installed PA-B and Lun-A platforms with the OPF and onwards to a LNG plant and associated storage and export facilities 600km south of the OPF. The gas and oil pipeline network is designed to transport the production of the Lun and PA fields. The capacity of the pipelines can be increased with additional onshore boosters stations so that other oil and gas developments may use the existing pipelines and minimise the cumulative environmental footprint of multiple oil and gas developments.

Four feasible design alternatives were initially evaluated:

1. A pipeline running across the island to the Russian mainland;
2. An onshore pipeline system for the Piltun field and a predominantly offshore pipeline system for the Lun field;
3. A totally offshore pipeline system;
4. A predominantly onshore pipeline system.

The Russian Government did not favour the first option as it might have jeopardised the development of the island. Furthermore, this would only have been possible for oil (see rationale in the LNG project alternatives section below as to why an LNG terminal would not have been possible at the De Kastri port on the Russian mainland) and transporting oil to the mainland and gas to the south of Sakhalin Island would have increased the Project's footprint and eroded project synergies.

The second option would have involved splitting the gas and oil pipelines and would have increased the environmental footprint. It would also have reduced the overall Russian Content objective of the Project, as Russian contractors do not yet have the specialised experience required for building offshore pipelines.

After extensive evaluation, Sakhalin Energy discounted the third option of a wholly offshore route for safety, environmental, economic and sustainability considerations, including that it would limit the involvement of Russian companies (as above) and would increase the risks associated with seasonal ice.

The onshore route chosen connects all facilities by the shortest technically and environmentally acceptable routes between all locations. The design considerations for this option include:

- The shortest possible route to shore and pipelines designed fully against anchor dragging, fishing vessel activity, corrosion and ice-scouring, and avoidance of known western gray whale ("WGW") feeding grounds and onshore sensitivities where possible;
- Buried onshore routes traversing the island spine and following the existing north to south communications route. The rationale for the burial of the pipeline is due to this being the preferred option by the Russian Government; it also reduces the risk of third party interference and hence the risk of a spill occurring. The full rationale can be viewed in the position paper on the comparison between the Sakhalin II onshore pipeline and the Trans-Alaska pipeline on the Sakhalin Energy website. ([http://www.sakhalinenergy.com/documents/doc\\_38\\_taps.pdf](http://www.sakhalinenergy.com/documents/doc_38_taps.pdf)).
- The onshore pipelines run for the most part in parallel to the existing highway and railroad, minimising the need to develop access to the

pipeline right of way and permitting access for potential gas supplies in the future. Wherever possible, it follows existing footprints and avoids populated areas, active faults, mineral deposits, nature reserves, archaeological sites and other protected heritage areas. Impacts to rivers are minimised through the application of a river crossings strategy that has undergone independent peer review, as have the design measures taken to avoid or minimise seismic risks.

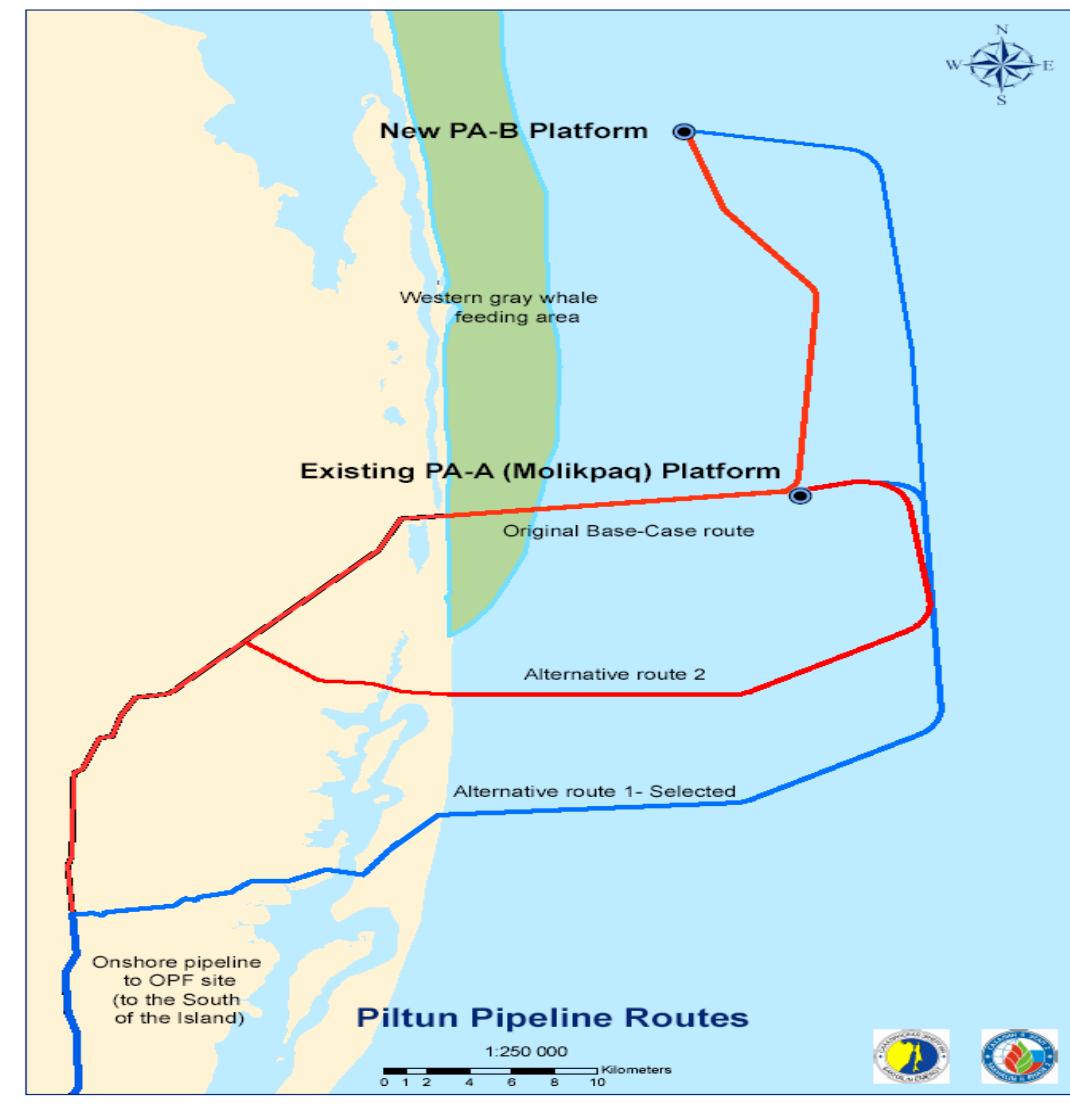
A number of re-routes have been selected after further environmental considerations, the most significant being the reroute associated with the avoidance of the WGW feeding ground at Piltun. The original route chosen for the Piltun offshore pipeline passed through the southern tip of a WGW feeding area at Piltun, and this route formed the basis upon which Russian Government approvals were obtained.

In 2003, additional seabed surveys indicated that a section of the offshore pipeline should be buried deeper than originally designed to add an additional margin of safety against ice scouring and seabed mobility. To undertake this additional work would have generated more noise than assumed for the original pipeline route selection and consequently could have had a greater impact on the whales feeding in that area. In early 2004, Sakhalin Energy postponed the pipeline construction work in the vicinity of the PA field to re-evaluate noise and other impacts and also to evaluate other possible routes.

Two alternative pipeline routes were investigated. Both followed a southerly route from the PA-B platform before turning westwards and arriving at a more southerly landing than the original route.

As part of the route selection process, Sakhalin Energy requested IUCN-World Conservation Union ("IUCN") to convene an Independent Scientific Review Panel ("ISRP"). The ISRP was tasked with appraising the Company's environmental analyses and impact assessments and the effectiveness of proposed mitigation measures to minimise the impact of its operations on the WGW. Of the three pipeline routes under consideration, the ISRP concluded that the most southerly (known as Alternative 1) would pose the least threat to the whale, and therefore this route option was selected. The Alternative 1 routing also changed the onshore impact profile, so additional mitigation measures were selected in order to minimise those, including:

- A number of minor-reroutes to avoid sensitive migratory bird habitats;
- Horizontal directional drilling (i.e. tunnelling underneath) of the Chaivo Lagoon to avoid impacts to this sensitive wetland, important in terms of both biodiversity and small-scale fishing;
- Winter construction of the horizontal directional drilling work, as well as other construction work in the Chaivo area, to avoid the sensitive bird and fisheries seasons.



**Figure 3. Piltun Offshore Pipeline Route Options**

#### 9.4

#### LIQUEFIED NATURAL GAS AND OIL EXPORT TERMINAL

The LNG plant and associated export facilities at Prigorodnoye lie 13km east of the port of Korsakov and approximately 50km south of the Sakhalin administrative centre, Yuzhno-Sakhalinsk.

There are two principal methods of transporting natural gas in large volumes. These are by pipeline in its natural state as a gas, or by ship as LNG. To liquefy natural gas it must be cooled to very low temperatures, which when converted to a liquid reduces in volume 600 times, and is thus suitable to be transported by ship so long as it remains cold, whereas natural gas has to be transported by pipeline, and therefore incurs a greater environmental footprint in order to get the gas to market.

LNG is the gas liquids technology of choice in Asia, Sakhalin Energy's natural market, and is the best and most flexible option as a fleet of tankers can deliver it to several buyers in different countries at the same time.

DiMethylEther ("DME") is another technology developed to convert gas to liquids, as an alternative to LNG. Sakhalin Energy commissioned a comparison of LNG technology with DME and this report is available on the Sakhalin Energy website ([www.sakhalinenergy.com](http://www.sakhalinenergy.com)). In summary, the report concluded that there are clear advantages to LNG. DME technology has not been commercially developed, whereas LNG technology has been proven to operate successfully over several decades. LNG is a more energy efficient fuel than DME and requires less capital expenditure to produce the same amount of energy. The LNG production process also produces less CO<sub>2</sub> than the DME manufacturing process.

The 1992 project feasibility study evaluated nine port locations around Sakhalin Island as potential sites for the LNG plant and OET, namely Tomari, Ulegorsk, Poronaisk, Ilyinsky, Kholmsk, Nevelsk, Korsakov, De Kastri (on the Russian mainland) and Prigorodnoye.

The suitability of each of these sites was assessed against technical, operational, environmental and economic criteria, including water depth, ice, wind and wave conditions, seismic faults, safety, space and shipping requirements. Heavy sea ice at the ports of Poronaisk and Ulegorsk in winter made them unacceptable. Similarly, winds were considered an unacceptable safety problem at the unsheltered ports of Ilinsky, Kholmsk and Nevelsk, and they would have required the construction of breakwaters, which can bring additional environmental impacts to coastal sediment transportation and visual amenity. Evaluation of seismic data for Sakhalin Island also disclosed potential problems for some prospective port sites, particularly at Ulegorsk, Ilinsky, Tomari, Kholmsk, Nevelsk and Korsakov. Although Prigorodnoye is not far from a minor seismic fault, the risk can be safely handled by design.

In terms of available space, the only port options with acceptable space were Prigorodnoye and De Kastri. At other sites, developments would result in crowded facilities and would compromise seismic precautions and raise safety concerns.

Of the nine site options, only Prigorodnoye and De Kastri emerged as acceptable options. However, the ice conditions at De Kastri, a northerly port, are far more severe than at Prigorodnoye, which is relatively ice-free in the winter months. Therefore Prigorodnoye was viewed as the more attractive option than De Kastri.

The benefits of the Prigorodnoye site include:

- Relatively ice-free in winter;
- A sheltered bay in a natural valley to reduce plant visibility, and with sufficient land area;
- Close enough to the urban centre of Korsakov to maximise local employment and business opportunities, but yet sufficiently removed to avoid environmental impacts to that centre;
- Low productivity land and a minimum requirement for resettlement;
- Minimum disturbance to local infrastructure – public road north of shoreline rerouted to behind the site;
- Minimum environmental impact to listed species – oil and gas pipeline approach to the plant was rerouted to avoid Glen Spruce habitat west and northwest of the site;

- Minimum disturbance of archaeological sites – the oil and gas pipeline approach to the site was rerouted to avoid a small, disused army camp, and a concrete Japanese school pavilion has been removed, restored and put on public display at Sakhalin Regional Museum.

## **Section 10      Environmental and Social Impact Assessments**

Due to the size and complexity of the Project and the long period between project concept and design phases through to the development and implementation of the Project, the Company has adopted a phased approach to the assessment of environmental, social and health impacts associated with the Project.

### **10.1**

#### **PRELIMINARY EIA AND RUSSIAN APPROVALS REQUIREMENTS**

The assessment process began in 2001 with the publication of a Preliminary Environmental Impact Assessment ("EIA"). This document was made available in Russian and English to the general public on Sakhalin Island and to other stakeholders including shareholders, potential lenders, governmental authorities and local, national and international non-governmental organisations. It was updated in September 2002 with a "Technical and Economic Substantiation for Construction ("TEOC") EIA" a requirement of the Russian approvals process. The TEOC EIA updated the Preliminary EIA to take into account the results of more recent public consultation.

As part of this process, the Russian Government also established an Expertiza to undertake a specialist review of this document. The presentation of information for Expertiza required a much greater level of detail and a more scientific style of presentation to be prepared than was provided by the Preliminary EIA or TEOC EIA. This additional material was therefore provided in Environmental Protection Sections ("EPS") of the TEOC submission, covering each project asset and including baseline data, a project description, impact assessment information, mitigation measures and fisheries damage compensation calculations. This is a normal part of the Russian approvals process. As an indication of scale, the Preliminary EIA is in the order of 300 pages plus graphics whilst the EPS have a cumulative size of over 10,000 pages plus graphics.

### **10.2**

#### **INTERNATIONAL-STYLE ESHIA**

In 2002, Sakhalin Energy commissioned international-style environmental, social and health impact assessments ("ESHIA") to bring the impact assessment work done to date in line with international standards. These were published in Russian and English on the Company's website in early 2003 ([www.sakhalinenergy.com](http://www.sakhalinenergy.com)).

#### **10.2.1**

##### **International style EIA**

Sakhalin Energy contracted Environmental Resources Management Limited, an international environmental consultant, to carry out the international-style EIA. Details of the environmental impact assessment process are described in the EIA report, and essentially it followed a typical process of assessment:

- Options appraisal;
- Baseline characterisation;

- Identification of potential impacts based on project activities, receptors to the impact and the scale and magnitude of the impact;
- Identification of mitigation measures and a reassessment of the likely severity and scale of the impact following mitigation;
- Definition of the residual impacts against criteria established for the assessment.

Each project asset or geographic region affected by the Project was considered individually and reported in separate volumes of the EIA, which totalled six volumes. Four levels of significance (no impact; minor impact; moderate impact; and major impact) were used to categorise impacts for the following topic areas that were common to each of the volumes:

- Soils and marine sediments;
- Surface water and marine water resources;
- Groundwater resources;
- Climate/air quality;
- Biological resources;
- Noise generation;
- Landscape and visual amenity.

The full details of the significance criteria are provided in Volume 1 Chapter 3 of the EIA.

In addition to the ESHIA, two very focused EIAs were conducted in 2002, specifically to address potential project impacts on the WGW. These were carried out by Canadian consultants specialising in marine mammals (LGL Ltd). The first of these EIAs is the “Western Gray Whale Technical EIA”, which summarised the substantial information that the Project had generated through its long-term WGW monitoring programme as part of the assessment process. The second was the “Lunskoye Seismic Survey EIA”, which focused specifically on the seismic survey work undertaken in the Lunskoye region. An overview of the mitigation measures defined to protect the WGW is provided in the next section, Impacts, Mitigation and Monitoring.

## 10.2.2

### **International style Social Impact Assessment**

The Social Impact Assessment (“SIA”) was carried out by in-house specialists, supported by external advisers.

The Sakhalin Energy Phase 2 SIA (2003) was completed between September 2001 and November 2002 by local and international experts. In completing the SIA, Sakhalin Energy went considerably beyond the requirements for social assessment contained in Russian legislation, which are limited to a requirement for public consultation. The SIA focused on scoping, data collection and impact assessment. Impact mitigation measures were developed in the form of Company policies, procedures and commitments.

Methods used during the preparation of the SIA included interviews with the public and local experts (e.g. representatives of local authorities and special interest groups), questionnaire surveys, price recording, resource mapping, direct observation, and analysis of secondary data. Secondary data sources included project documentation; official statistical data; published research and the media.

More information on the continued SIA impact, mitigation and monitoring process is provided in Section 10.3.

### 10.2.3

### International Style Health Impact Assessment

The Health Impact Assessment ("HIA") was conducted by Sakhalin Energy with the support and participation of the Sakhalin Island health community. The HIA addressed the impact on the health of the island population during the construction and operation phases of the Sakhalin II Phase 2 Project.

Sakhalin Energy's objective is to ensure the good health of its workforce as well as promoting improvements in the health of the community. The HIA sought to predict the Project's potential impact on health so that any adverse effects could be reduced or avoided, and positive effects enhanced.

In the development of the HIA, Sakhalin Energy drew on a number of public health and environmental health baseline studies and arranged additional baseline studies over the period 1999-2000. These studies established that the health situation in the Russian Federation in general and on Sakhalin Island in particular is related to the changing socio-economic situation. The transition from a centrally planned health service to a regional system has led to more autonomy for the Sakhalin region's health services but has led to a reduction in financial support from the central government. Decreased funding has resulted in a deterioration of island health institutions, particularly in staffing levels, equipment, materials, medication supply and maintenance. As a result, health standards declined and morbidity and mortality rose.

#### *Impacts, Mitigation and Monitoring*

Specific concerns raised by those working in the health system relate to poor standards of medical equipment limiting diagnostic, treatment and ambulance capabilities. Community concerns include the lack of skilled medical care, dissatisfaction with the attitude of medical practitioners, high levels of smoking and alcohol use and the poor quality of drinking water. The Sakhalin community, Sakhalin Energy's employers and contractors and their families, may be affected by the Project in terms of health, in both positive and negative terms. The HIA also addressed health impacts on other specific groups, such as camp followers.

The principal health impacts identified by the HIA were:

- Improved access to healthcare for the local population who are members of the workforce;
- Improvement in general access to healthcare due to improvements in the transport system;
- Improved living conditions for those directly associated with the Project;
- Decrease in smoking amongst the workforce;
- Increase in drug use, hepatitis B and C, HIV and other sexually transmitted diseases;
- Risk of tuberculosis for incoming workforce;
- Risk of water-borne disease for workforce;
- An increase in road-traffic accidents;
- Risk of animal- and insect-borne diseases for the workforce, e.g., Lyme disease; and

- Increased demand on the healthcare system.

The impacts on health from the Project principally relate to the influx of people, including construction workers and others during the construction phase. The temporary increase in the population is likely to increase demand on an already stretched healthcare system. However, the direct impact on public health is likely to be minimal. Camp facilities will be self-sufficient and extensive measures are being undertaken to minimise the risk of contamination of water sources during construction.

Positive impacts on health relate to the anticipated improvement in socio-economic circumstances, resulting in a better standard of living. Depending on the approach taken to camp management, the spread of communicable diseases including hepatitis, sexually transmitted diseases, HIV and tuberculosis may increase between the workforce and camp followers. Changes in the socio-economic circumstances for some population sectors may have an adverse impact on the incidence of lifestyle-related diseases including drug and alcohol abuse. Measures to mitigate adverse effects will be developed and will focus on supporting local programmes. Sakhalin Energy's camp management policy was developed to minimise the effect of camp residents on the community whilst providing a reasonable standard of facility for those within the camp.

Some changes may have both positive and negative effects on the community. For example, while changes in the structure of the healthcare system and upgrading of transport systems may improve access to medical care, the resulting anticipated increase in Project-related traffic means that road traffic accidents are more likely during construction. The Company has been responsive to these concerns. For example, in June 2005 it committed USD 750,000 over three years in support of a Sakhalin Road Safety Partnership. This Partnership, along with other project-level commitments, includes an island wide seatbelt campaign, defensive driving training for truck drivers; large advertising hoardings displaying road safety messages throughout communities; awareness raising amongst school children via means such as safety videos, and a project-focused monthly campaign focused on different elements of road safety-related issues. This is in addition to the rigorous journey management planning, strict vehicle safety standards, and avoidance where possible of routes through communities.

Due to the geographical extent of the development there were no clear boundaries that identified specific communities that would be completely unaffected by the Project. The health impacts relate to the change in workforce demography. Importation of labour, mainly from mainland Russia was required to supplement the available skilled labour on Sakhalin. The HIA found that none of the identified effects on the health of the community would warrant a major modification to the Project.

The Company coordinates closely with local authorities in the minimisation of both direct and indirect impacts through a Joint Health Advisory Committee, which is set up to continuously assist and support awareness and health education on issues such as communicable and sexually transmitted diseases, and its management for all company and contractor staff. Improvements for the general public will include better socio-economic circumstances with associated increases in funding for infrastructure, including healthcare. Similarly, by supporting improvements to secondary healthcare facilities, Sakhalin Energy will assist in the sustainable development of the healthcare sector, benefiting the island's community.

Health issues are monitored by the Company's Corporate HSE Department, some jointly with the local authorities. The issues that are monitored are set out in

HSESAP Part 2 Table 2.6 on Community Health and Table 2.7 on Occupational Health and Safety.

### 10.3

### ENVIRONMENTAL AND SOCIAL ADDENDA

As the international-style ESHIA was based on the early design phase of the Project, and following a process of review by interested stakeholders and the conclusion of much of the detailed design of the Project, the Company has since updated these documents in the form of environmental and social addenda. The addenda, which are being made publicly available, provide more detail on particularly pertinent environmental and social issues, particularly on the baseline conditions, and on a greater definition on mitigation measures and monitoring activities. The addenda have also provided an update on progress with certain activities, and on those design changes that have occurred since the ESHIA was published in 2003, which have for the most part been for the benefit of the environment, such as the revised Company commitment not to discharge any drilling muds and cuttings into the marine environment, and the commitment to use only double-hulled tankers year-round, both of which set a high environmental standard.

An important focus in the development of the addenda has been to ensure that the project meets the policies and procedures required by the potential Senior Lenders to Phase 2, and in doing so it has also been mindful of the requirements of the Equator Principles, to which a number of commercial banks participating under the senior financing ascribe.

The EIA Addendum ("EIA-A") comprises 15 key chapters and two stand-alone documents, namely the River Crossings Strategy and the Comparative Environmental Analysis of the Piltun-Astokh Pipeline Route Options. A short summary of the contents of each addendum chapter is set out below.

Chapter 1      Introduction

Chapter 2      Oil Spill Response

- Transboundary oil spill issues;
- Onshore and offshore oil spill response planning, including the strategies for dealing with oil in ice;
- Oil spill risks and management strategies associated with the movement of tankers year round.

Chapter 3      Pipeline Construction in Wetlands

- The nature and location of the wetland areas to be crossed by the pipeline;
- Ecological impacts of pipeline construction work in wetlands;
- Justification for the pipeline route crossings wetland habitat;
- Design commitments and other mitigation measures related to pipeline laying in wetland areas;
- Monitoring during the construction and operational phases.

Chapter 4      Steller's sea-eagle

- Numbers of nesting sites near to project activities;
  - Information on the surveys undertaken;
  - The Steller's sea-eagle Research Programme;
  - Mitigation measures, such as buffer zones.
- Chapter 5 Non-Western Gray Whale Marine Mammals
- Details of marine mammal surveys;
  - Information on Steller's sea lions, particularly with reference to potential winter use of waters around Aniva Bay and potential impacts;
  - Assessment of potential acoustic impacts;
  - Vessel collision risks and mitigation, particularly with respect to the North Pacific Right Whale and bowhead whale.
- Chapter 6 Benthos
- Sampling and analytical methodologies used for benthic surveys, with particular focus on the reporting of any rare or endangered benthic species;
  - Benthic sampling methodology;
  - Long-term monitoring programme and details of benthic recovery following the installation of the PA-A platform.
- Chapter 7 Commercial Fisheries
- Fish and non-fin fish aquatic species of commercial value;
  - Impacts and mitigation associated with dredging and disposal in Aniva Bay;
  - Fisheries compensation arrangements and fish damage calculations.
- Chapter 8 Geohazards
- The geological and tectonic baseline environment of Sakhalin environment;
  - Risks associated with the placement of project infrastructure in geohazard areas;
  - Design commitments and other mitigation measures;
  - Future monitoring.
- Chapter 9 Air and Water Quality, Noise and Groundwater
- Comparison of the Russian and UK air quality modelling methods;
  - Comparison of the Russian and "International" air emission and water discharge standards;
  - Quantification of flaring during commissioning;

- Noise impacts and groundwater usage at Booster Station 2;
  - Sustainability of groundwater use at the OPF.
- Chapter 10 Solid Waste Management
  - Waste classifications;
  - Waste generation volumes;
  - Impact associated with the generation of solid wastes;
  - Sakhalin Energy waste management policy, strategy and plan;
  - Landfill upgrade programme and environmental offsets.
- Chapter 11 Protected Areas
  - Description on the historical background, purpose and function of the Makarovsky and Izubrovsky Reserves;
  - Pre-construction survey scope of works and results;
  - Mitigation measures relating to pre-construction surveys;
  - Pipeline construction through protected areas.
- Chapter 12 Dredging in Aniva Bay
  - Dredging and disposal requirements in Aniva Bay;
  - Disposal site selection process;
  - Commercially important fish and shellfish within Aniva Bay;
  - Dredging and disposal methods;
  - Predictive modelling at the disposal site;
  - Impacts, mitigation and monitoring.
- Chapter 13 Material Project Changes
  - A summary of all significant changes that have occurred either in design or mitigation since the EIA (2003) was written;
  - A summary of the Alternative 1 reroute selection process; the independent advisory processes to ensure protection of the WGW; onshore mitigation measures (offshore measures being addressed in the Marine Mammal Protection Plan).
- Chapter 14 OPF Beach Landing Facility Appraisal
  - The rationale behind the decision to modify the landing method from a 300m-pier construction to the use of transit barges ballasted to the seabed;
  - Associated impact assessment and mitigation.
- Chapter 15 Red Data and Migratory Birds
  - Description of the Sakhalin Red Data Book ("RDB") bird species recorded on the island;

- Migratory behaviour and the habitat types that support these species;
- Potential impacts of the Sakhalin II project activities upon these different habitats and the bird assemblages;
- Mitigation measures.

Stand alone	River Crossings Strategy
Stand alone	Comparative Environmental Analysis of the Piltun-Astokh Field Pipeline Route Options

The key social-related documents prepared since the SIA was published in 2003 are set out below:

A general update to the SIA, known as the Social Impact Assessment Addendum ("SIA-A")	As a result of ongoing community consultation in 2003-4 following the publication of the SIA, an update to the SIA has been produced – the SIA-A. This identifies and addresses the community concerns that have been raised through this period of consultation. Work began on this document in Feb 2004.
Resettlement Action Plan ("RAP")	The RAP sets out the policy framework and procedures being followed to address land acquisition and resettlement required for construction and operation of the Project, including compensation and mitigation measures for project-affected people. Work began on this document in Feb 2004
Sakhalin Indigenous Minorities' Development Plan ("SIMDP")	SIMDP is the means by which the Company will, with the support of the Sakhalin Oblast Administration, enter into a partnership with the Indigenous Peoples of Sakhalin Island to develop and implement a programme of sustainable development activities to benefit indigenous communities, aiming to ensure that all Indigenous People on Sakhalin are enabled to enjoy social and economic benefits from the Project. Work began on this document in May 2005.
Treatment Plan for Objects of Cultural Heritage ("Treatment Plan")	The Treatment Plan outlines the procedures to treat cultural heritage objects potentially affected by project construction activities. This Plan was updated in 2005.
Public Consultation and Disclosure Plan ("PCDP")	The PCDP describes the Company's commitments to engaging with project stakeholders, and provides information on how the Company can be contacted. This Plan is updated periodically to include a summary of the preceding consultation period, and any material changes in engagement activities.

## Section 11 Impacts, Mitigation and Monitoring

The process of impact assessment highlighted both potentially adverse and beneficial environmental and/or social impacts. These impacts varied from negligible to those of a moderate or major adverse impact, or of a moderate or major benefit.

The Company is committed to managing environmental and social issues to an acceptable level, but it has also taken onboard the policies and procedures of the potential Senior Lenders and their required standards. These standards are in general equivalent to applicable World Bank Group environmental safeguard policies and guidelines and in the case of the European Bank for Reconstruction and Development (EBRD), pertinent European Union environmental standards, insofar as these can be applied to a specific project. In all cases, these standards are applicable where they do not unduly compromise national legislation.

Guided by these standards, Project activities that have the potential to lead to adverse environmental and social impacts have been subject to stringent mitigation in order to bring the residual impacts to acceptable levels. This section provides a summary of those environmental and social issues that are considered to be the most pertinent by the Company and its stakeholders, and which have been the focus of considerable discussion with external parties, including potential Senior Lenders and NGOs, to ensure that the overall approach to their management is appropriate.

### 11.1

### ENVIRONMENTAL IMPACTS, MITIGATION AND MONITORING

The potential impacts that have attracted the most attention in terms of potential threats to the environment, flora and fauna are listed below:

- Threats to the endangered WGW population, principally through noise disturbance, collisions with vessels, the risk of oil spills to their habitat; and disturbance to their benthic food resource;
- Potential losses in riverine fisheries' productivity and biodiversity, particular salmon species, caused by river crossing activities and induced erosion as a result of the clearance of the pipeline right of way;
- Potential losses in coastal fisheries' productivity and marine benthic biodiversity as a result of dredging and disposal activities in Aniva Bay;
- The risk of onshore or offshore oil spills during oil production, which can pose threats to wildlife, livelihoods, recreational activities and human health unless properly managed. The ability to deal with an oil spill under ice has been a key concern raised by project stakeholders;
- Threats to rare and migratory bird species listed in the Russian Red Data Book due to general disturbance caused by project activities in their habitats. This is principally an issue associated with project activities in the OPF and Chaivo Bay area; and
- Concern that the waste generated during the construction and operation of the project does not pose a health or environmental hazard on the island.

A summary of each of these issues and the mitigation and monitoring measures adopted for each, is provided in the sub-sections below.

**11.1.1****Western Gray Whales**

The WGW is listed as a Category I species (endangered) in the Red Data Book of the Russian Federation (2000) and is considered “endangered” by the United States Government (USFWS, 1997). This population was reclassified in 2000 as “critically endangered” (facing an extremely high risk of extinction) by the IUCN. The term “critically endangered” is defined by the IUCN as a population that is isolated both geographically and genetically and includes less than 50 reproductive individuals.

The WGW population has recovered at a significantly lower rate than the eastern gray whale population, which was removed from the endangered species list in 1994. Gray whales are a long-range, seasonally migrating species whose habitat extends between sub-tropical winter calving and mating grounds to the high latitude summer feeding grounds in the Arctic and sub-Arctic. In contrast to the eastern gray whales, whose entire distribution range is fairly well known, the exact location of the calving and mating grounds of the WGW remains a mystery. Their wintering grounds are believed to be located in the South China Sea, possibly along the coast of Guangdong province and/or around Hainan Island, although specific calving sites have never been reported.

The only two currently known feeding grounds of the WGW are located off the north-eastern coast of Sakhalin. The most important feeding ground, known as the Piltun feeding area, encompasses an area of approximately 90km long by 6km wide along the near shore coast from Piltun Bay. It is thought to be the most important feeding area as its shallow waters provide a relatively sheltered environment for mothers and calves. In 2001, a second feeding area was discovered offshore Chaivo Bay in 35-65 m of water, which has a greater density of food resources. No mother/calf pairs have been observed in this area. The migration of the whales to and from their feeding grounds is closely related to the ice conditions in these areas, with whales beginning to arrive in late May when ice has left and a few remaining until late November when the ice returns.

Remarkably little is known about this population, and in 1972 it was even believed to be extinct. Since 1997, however, much more information on the biology and ecology of the population has been obtained through an extensive research and monitoring programme funded by Sakhalin Energy, approximating USD1million annually. This programme is co-funded with Exxon-Neftegas Ltd and is executed by independent American and Russian scientists. The outputs from the programme are used to develop a comprehensive set of measures aimed at the protection of the whales from potential impacts from offshore oil and gas construction and operation activities and to determine the effectiveness of these measures. The protection measures are summarised in the Marine Mammal Protection Plan (“MMPP”), which is updated annually and made available on the Sakhalin Energy website.

To date, the available research results indicate that Phase 1 activities have not had any observable impact on the population of whales, and indeed the investment placed by the Company in monitoring has yielded a lot of new information about the distribution and abundance of the whales, its behaviour, food preferences and the availability of food in and outside both feeding areas.

*Impact assessment*

In preparation for Phase 2, in addition to the impact assessment for the WGW within the TEOC EIA and international-style EIA, a specific EIA dedicated to the WGW was conducted by an independent marine mammals consultant. This

Technical Western Gray Whale EIA (“WGW EIA”) was finalised in 2003 and is available on the Company’s website.

The WGW EIA focussed specifically on the key factors that could potentially have a negative impact on the critically endangered WGW, mainly with regard to feeding and migration. These key factors included: collision risk due to increased vessel traffic, behavioural reactions of the whales (i.e. disturbance or avoidance) due to increased underwater noise levels generated by project activities, potential loss of food resources due to disruption of the seafloor or increased sedimentation during construction, and major oil spills. The assessment of potential impacts of the Project was carried out by quantifying criteria such as predicted duration and geographical extent, and predicting the magnitude of the impact using all available knowledge on WGW, eastern gray whales and, where relevant, other baleen whale species. This enabled an overall assessment of impact (no impact, negligible, moderate, or major) for each key factor. Considering the critically endangered status of the WGW, the precautionary principle was applied to the assessment of overall magnitude. This means that impacts that would have been classified as being of a minor significance for less sensitive species were evaluated as being of moderate significance for WGW. For that reason no ‘minor impact’ category existed, implying that any impacts not deemed negligible were considered relevant.

In summary, the WGW EIA considered the major sources of potential impact during the construction and operational phases of the project to be the physical presence of vessels (collision risk and avoidance of the feeding areas) and major oil spills. Other sources of impacts identified included noise from construction activities, mainly from activities associated with the original Piltun pipeline routing which passed through the southern part of the larger feeding area. For the operational phase, noise from support vessels, helicopters and platform-related activities were assessed as having the potential to impact the WGW. Mitigation measures have been identified for each source of impact.

#### *Mitigation measures*

The MMPP comprises the key mitigation measures focused on protecting not only the WGW, but other whale, seal and porpoise species too. Information obtained from the various environmental impact assessments, the long-term WGW research and monitoring programme and lessons learned from the implementation of the Company’s Phase 1 Project have been instrumental in guiding the development of the MMPP. The MMPP is subject to external peer review by marine mammal consultants.

All offshore contractors are required to comply with aspects of the MMPP that are relevant to their activities. An essential element of this Plan is the network of marine mammal observers (“MMOs”) who are based on vessels operating within the area during construction activities within the offshore areas of the Project’s footprint. Each key construction vessel will have at least two MMOs onboard, who are responsible for alerting vessel operators to the presence of whales in the area, and for ensuring that the mitigation measures contained within the MMPP are adhered to, including the maintenance of a safety distance of 1km between vessels and whales.

Other important elements of the MMPP include the establishment of specific construction and transit corridors with various vessel speed restrictions and limits to noise generation, especially in areas close to the whale feeding grounds. It is due to this latter point that the Company made an announcement in March 2004 to postpone the construction of the offshore Piltun pipeline when detailed design impact assessment work identified that the ice scour depth potential was greater

than originally thought and that larger noisier vessels would be required to trench the pipeline to a deeper level. In reassessing the environmental impacts of the Piltun pipeline, the Company evaluated a number of possible route alternatives and technologies that could be employed to ensure effective mitigation against potential impacts on the WGW. This options analysis is presented in the Company's Comparative Environmental Analysis of the Piltun Pipeline Route Options ("CEAR"), which is publicly available on the Sakhalin Energy website. Furthermore, contractors are requested to use equipment and procedures that minimise noise, and the Company has a commitment that all types of aircraft will maintain a minimum altitude of not less than 450m over the WGW feeding areas, subject to pilot safety requirements, and all aircraft will be prohibited from flying over or circling wildlife, including whales, for the purposes of casual viewing.

*Independent advice*

Due to the importance of the WGW, the Company sought an independent scientific opinion on the scientific aspects of issues pertinent to the conservation of the WGW population and invited the IUCN to facilitate this process. In the third quarter of 2004, the IUCN convened an Independent Scientific Panel, consisting a number of whale scientists from around the world. Their main task was to review the pertinent EIAs and supporting documents, including the CEAR, and to provide an opinion on the adequacy of the Company's approach towards the protection of the WGW.

The Panel's findings were posted on the IUCN website in February 2005. In looking at the Piltun pipeline route options analysis (the CEAR), the Panel concluded that the most southerly route (known as Alternative 1) would be the safest in terms of potential impacts from noise disturbance, potential collision risk and disturbance to the whales' food source. It also highlighted the remaining uncertainties regarding the potential impacts to the whale population and advised a precautionary approach until these uncertainties were better understood through further research and monitoring.

The Company took the conclusions of the Panel seriously and in taking the precautionary approach it announced its decision in March 2005 to pursue the Alternative 1 pipeline route, rather than original base case.

As to the other points raised in the Panel's report, Sakhalin Energy produced a table listing the proposed action for addressing each item. This response formed the basis for a meeting of stakeholders convened by the IUCN in Gland, Switzerland, in May 2005. The Gland meeting provided an opportunity for stakeholders to share viewpoints regarding the nature and level of risks still posed to the WGW population by the Project. The meetings minutes were made publicly available.

Given that there were still remaining uncertainties, an additional meeting with the former ISRP scientists was convened in September 2005 in Vancouver to review the actions and approach taken by Sakhalin Energy since May 2005. Significant progress was achieved at this meeting, and an important outcome was the agreement for the formation of a long-term Western Gray Whale Advisory Panel ("WGWP") to provide a mechanism for independent review and recommendation regarding management of threats to the WGW. The Company is committed to incorporating all reasonable recommendations from the WGWP in its annual work programme and budgets, provided that they comply with Russian law, and to seek support for these recommendations from shareholders, Russian Party and joint industry partners as appropriate.

Over the course of the year in which the above meetings occurred, considerable advancement has been made by all involved in identifying threats to the WGW and seeking solutions to reduce those threats. At the same time, however, it has become increasingly clear that many of those issues are pertinent to WGW conservation on a longer term and over their entire distribution range, and that research efforts in general should be extended to cover their range.

#### *Monitoring*

Since 1997, in co-operation with other operators, the Company has commissioned and provided financial and logistical support for numerous long-term WGW research and monitoring projects. These include aerial, vessel-based and shore-based distribution and abundance surveys, behaviour studies, photo-identification of individual whales, prey studies and acoustic studies. Russian scientists mainly conduct the research, although non-Russian scientists are involved in some of the studies. The results of the research have significantly increased the overall understanding of WGW ecology and have been used in the development of measures to protect the whale from potential project related impacts.

The Company recognises that noise generated during offshore construction and operations activities at Piltun could potentially give rise to negative impacts on WGW while on their feeding grounds. Prior to the execution of offshore activities in the Piltun area the noise footprint in the feeding area has been predicted using an advanced acoustic model. This model has been developed for Sakhalin Energy as a tool to manage potential noise related impacts to WGW. Based on the predicted noise footprint in the feeding area, potential impact was calculated using criteria, including the part of the feeding area ensonified by levels of greater than 120 dB (a noise threshold level), the number of whales potentially avoiding that area, and the duration of the activity. Potential numbers of whales present in the predicted area where noise levels are greater than 120 dB are calculated based on historical distribution data (2001-2004). Seasonal changes in distribution and abundance were taken into account.

The model predictions for the installation of the PA-B concrete gravity based structure ("PA-B CGBS") in 2005 were validated by conducting real time acoustic measurements during the installation of the Lun-A platform's CGBS, a similar structure to the PA-B CGBS, which was installed in an area not utilised by the whales one month earlier than PA-B CGBS using the same operational procedures and vessels. The concrete gravity based structures form the base structure of the PA-B and Lun platforms. The topsides of the structures are planned to be installed in 2006 (Lun-A) and 2007 (PA-B). The Lun-A real time acoustic measurements confirmed that the model performed to a reasonable level of accuracy (to within 3 dB) for sound frequencies above around 200Hz. Although the model was found to be less accurate at lower sound frequencies, this model has been identified as a valuable predictive tool. Lessons learned from the Lun-A CGBS installation were discussed with the contractors and additional noise mitigation measures were identified, including positioning of vessels not directly involved in the operations to the east side of the PA-B location (i.e. further from the feeding ground), using anchors for positioning where possible (i.e. not using engines for maintenance of position), and minimising vessel movements overall.

During the PA-B CGBS installation, real-time acoustic measurements were taken so that the Company could monitor and control the actual noise levels. Noise action criteria were established, which served as an early warning in case operational activities deviated from planned mitigation levels. In addition to real-time noise measurements, behavioural studies on whale distribution and

abundance were conducted on a real-time basis in order to reinforce the effectiveness of mitigation measures.

After the installation of the PA-B CGBS, the noise footprint in the Piltun feeding area was recalculated with the acoustic model, using the results of the actual noise levels measured at the edge of the feeding area. Based on the actual noise footprint, the percentage of the feeding area as well as the number of whales observed were assessed in order to verify whether the predicted values matched the actual values. During both CGBS installations, the number of whales observed avoiding the area in which noise levels were greater than 120 dB was never higher than 5, as had been predicted. Furthermore, the actual noise thresholds that defined action criteria were not reached during installation, demonstrating that the Company had followed a precautionary approach in the definition of the thresholds.

For construction activities in 2006, similar monitoring activities are planned that will focus specifically on construction related activities, specifically noise monitoring, and whale behaviour and distribution. All research components of the long-term WGW programme will be continued, including photo-identification, prey studies, behavioural studies, distribution and abundance surveys, and acoustic measurements.

### **11.1.2**

#### **River Crossings**

During its passage from the northerly landfall to Prigorodnoye in the south, the onshore oil and gas pipelines will traverse a total of 1084 watercourses, the vast majority of which are small brooks and streams. Data gained from historical records and surveys specifically undertaken for the Project demonstrate that a number of the watercourses are important for salmon fisheries and provide habitat for a wide range of species including several protected aquatic species.

The commercial salmon fishery on Sakhalin Island is socio-economically important and targets two key fish species: pink salmon and chum salmon, which migrate to the rivers of Sakhalin for spawning. Together these two species represent 95% of the commercial salmon catch on the Island. Non-commercial fish present in the rivers include two Red Book protected aquatic species, namely the Sakhalin Taimen (a member of the salmon family) and a subspecies of the Manchurian minnow.

##### *Impact assessment*

The construction of the onshore pipeline through these watercourses may have a short-term impact on the aquatic environment, in terms of physical disturbance to habitats and salmon spawning grounds and a temporary increase in suspended sediments. Sakhalin Energy recognises the economic and ecological importance of these rivers and has developed a River Crossings Strategy Report (“RCR”) aimed at minimising construction impacts through the application of various mitigation measures. This has recently been revised to reflect lessons learned through previous crossing activities and to improve contractor execution of river crossings to keep environmental impacts to a minimum.

The RCR documents the philosophy with respect to the crossing of watercourses along the length of the Sakhalin Island and describes the fluvial and ecological characteristics of the island environment. It also presents the potential effects of the installation of pipelines and fibre optic cable crossings together with the associated potential environmental impacts.

Together with the relevant Russian authorities, SEIC has assessed and categorised the environmental and commercial importance of each watercourse

and has adapted the proposed crossing methods to correlate with the respective importance of each of the rivers. In order to place the specific river assessment work in context and the crossings strategy as a whole, analysis has been undertaken to indicate the potential influence of the pipeline construction works on salmon spawning habitat at a system level.

*Mitigation measures and residual impact*

Sakhalin Energy has given considerable thought to the application of appropriate mitigation measures to avoid, or minimise where possible, adverse impacts to riverine systems. A key mitigation measure is the crossing of the majority of rivers of sensitivity for commercial fisheries and ecological interests during the winter months, when most watercourses are frozen or have very low flow rates. These rivers will be crossed using standard wet-cut trenching methods and executed in line with international best practice.

A range of mitigation measures will be utilised to ensure that sediment inputs into a river during and after construction are minimised. These mitigation measures are assessed using both river ecological sensitivity and river hydrogeomorphology parameters, as well as analyses of crossing of rivers that are tributaries of sensitive rivers. Details of these mitigation measures, and others than relate to erosion control along the right of way in general, are listed in HSESAP Part 2 Table 2.5 on Land Management.

Six of the largest rivers to be crossed, the most important in terms of commercial fisheries potential, will be crossed using the Horizontal Directional Drilling (HDD) methodology. HDD involves drilling through the bedrock underlying the watercourse in order that contact with the water itself is avoided completely. It is only technically feasible under certain geological conditions. Whilst HDD avoids impacts on the aquatic environment it may cause indirect terrestrial impacts.

Data from Sakhrybvod indicates that approximately 77% of all potential commercial fisheries spawning habitat occurs upstream of the river crossing construction sites. Using these data, a sensitivity analysis has been undertaken to determine the potential extent of spawning habitat that could be affected by the downstream transport of sediment during pipeline installation. Using generalised figures for sediment transport distances and an indicative simple proportional model for spawning habitat distribution, the area of spawning habitat within the potential zone of effect of the works ranges from 0.38 -1.34% of the total available spawning habitat within the sensitive rivers. It is considered highly likely that the total area affected would fall within the lower part of this range.

It should be recognised that the calculated figures only represent the potential loss of habitat for a subset of the total spawning habitat available on Sakhalin Island. Numerous smaller river networks in the south, west and north of the island would remain unaffected by the works and as these systems also support salmon spawning habitat, the likely loss in relation to the entire resource would be lower than that calculated.

From both ecological and commercial perspectives, any influence of the construction works on salmon populations would be temporary. The effects of wet cut crossings on riverine ecology and fish fauna (including salmon) is limited with recovery of food resources and habitat occurring typically within a 1-2 year period. Recovery of the overall habitat would also be assisted and potentially enhanced in the longer term, through the placement of approximately 26,000m<sup>2</sup> of gravel substrate at crossing points, which would compensate for the 15,300m<sup>2</sup> of habitat directly disturbed within the pipeline right of way during the works.

The mortality of eggs and young salmon within spawning gravels and the temporary loss of between 0.38-1.34% of potential spawning habitat for a period of 1-2 years would also be highly unlikely to relate directly to commercial productivity and catch. In some rivers, particularly those of the north and east, larger areas of spawning habitat are likely to be available in comparison to stock levels (i.e. in these rivers the population levels are unlikely to be habitat-limited). Much of the commercial catch is also focused on the use of hatcheries, where potential habitat loss in the rivers associated with the construction work is not an issue. Available data indicate that approximately 70% of the pink salmon catch (pink salmon constitutes approximately 90% of the total commercial salmon catch) is taken from the rivers and hatcheries in the southeast of the Island. Approximately 30% of the crossings of medium-high sensitivity rivers occur in this area and the percentage of spawning habitat that could be influenced is also lower in these rivers than those further to the north. This suggests that with respect to commercial interests the influence of the construction works is likely to be proportionally much less in the area of greatest production than in areas of lesser commercial production.

The RCR forms the basis for the ongoing development of a River Crossings' Execution Plan and Monitoring Plan that will specify, for each river crossing and based on site-specific data, the detailed construction techniques together with the planned mitigation, supervisory and monitoring approaches to be used. Sensitive river crossings will only proceed once detailed Execution and Monitoring Plans for a specific river are in place, in the right seasonal and freezing/low flow conditions and in accordance with the RCR.

#### *Monitoring*

Supervision and monitoring will be a key mechanism through which the Company will ensure that its contractors follow the required mitigation measures and to assure the Company that these measures are effective. Supervision and monitoring will take place at five levels for those crossings where there is potential for significant adverse environmental impact:

- Onsite contractor supervision in each of the five construction sections. The contractor will ensure that these supervisors have the appropriate level of experience and effectiveness;
- Onsite Company supervision in each of the five construction sections. The Company will ensure that these supervisors have the appropriate level of experience, empowerment and effectiveness and will continue to provide training and capacity building where required;
- Continued regular environmental monitoring by the subcontracted Russian environmental consultant to ensure a continuity in the monitoring that has already taken place since 2003 in order to build up a long-term baseline. For the sensitive river crossings, this environmental monitoring applies to pre-installation, actual installation and post-installation phases of the crossings;
- Compliance observations during the winter river crossings installation period by a team of external observers. Throughout the period December 2005 to April 2006, these observers (comprising appropriate technical specialists) will be on site to observe and confirm compliance against the detailed river crossing Execution Plans or to highlight any areas of non-compliance or where actions could be strengthened. The observers will be stationed at each of the five construction sections and will report to the Company's Corporate HSE Department. The Company will require

the contractor to implement all reasonable recommendations put forward by the observers in order to achieve the objectives of the river crossing strategy and crossing plans. To take advantage of the efforts invested in this monitoring strategy, the Company also intends to publish the independent observer reports on its website to provide transparency and accountability.

In addition to the measures described above, the Company will make provisions and commitments to enable interested stakeholders to monitor the Company's river crossing sites and activities. Subject to prior discussion and agreement, stakeholder representatives will be able to visit and inspect river-crossing sites during the construction phase.

It is the Company's firm belief that the proposed strategy, mitigation measures and associated monitoring and supervision will be sufficient to minimise the potential adverse impacts of construction to a level that is environmentally acceptable. Notwithstanding this belief, Sakhalin Energy will launch two independent initiatives aimed at promoting additional salmon spawning areas on the island, firstly through the development of a river restoration project focused on no net loss of key habitat, and secondly through the development of a taimen research project that will involve Russian, Japanese and other international specialists.

The RCR can be viewed at the Sakhalin Energy website ([www.sakhalinenergy.com](http://www.sakhalinenergy.com)).

### **11.1.3 Dredging and Disposal in Aniva Bay**

The development of the LNG plant and Oil Export Terminal at Prigorodnoye in Aniva Bay requires the construction of two jetties for these facilities; an LNG jetty and a Materials Offloading Facility ("MOF"). In order to enable safe vessel access for offloading heavy equipment, capital dredging was required to deepen the approach channels and obtain adequate water depths. In total, an estimated volume of 1.45 million m<sup>3</sup> of material needed to be dredged; this is a relatively small volume in comparison with projects of a similar scale elsewhere in the world.

The timing for undertaking the dredging is significantly controlled by the prevailing climatic conditions within Aniva Bay (sea-ice from mid-January to end of March) and ecological sensitivities (salmon migration into local rivers between May and September). These factors have restricted marine dredging works to between October and December, and this is further constrained by the need for suitable weather to enable safe working.

Given the small window available for dredging, whilst at the same time having an objective to minimise the duration of dredging activities, the dredging programme has had to be carefully planned. The project has employed the use of a number of small grab dredgers. In late September 2005, for a period of five weeks, these were supplemented with a large cutter suction dredger in order to complete the work within the shortest timeframe possible (within the safe working window). The use of the cutter suction dredger has reduced the total dredging time by six months, and in so doing conveys a considerable environmental benefit in terms of an overall reduction in the duration of higher suspended sediment concentrations at the dredge and disposal sites, the promotion of an earlier repopulation by marine organisms and an overall reduction in the duration of potential impacts (e.g. noise levels, air emissions) associated with vessel activities in these areas.

The dredging campaign will be completed in 2005. Due to the relatively sheltered nature of the bay, the prevailing coastal processes and the dredged depth of the water at the LNG facilities, it is unlikely that there will be need for maintenance dredging.

*Disposal site selection*

The dredging campaign has required a site for the safe disposal of dredged material. The process to ensure the selection of a suitable site involved a number of steps, with the main objective being the selection of a site at which the environmental impacts associated with disposal would either be avoided or minimised, but which would meet economic and technical criteria too. Two principal sites were considered; one located close to shore near to the port of Korsakov, and the other located 25km due south of the LNG site. A site outside of the Bay was briefly considered, but discounted early on in the site selection process due to the distances that would be required to be covered (in the order of 60km) and the unknown environmental conditions and marine benthic biodiversity at water depths of approximately 900m.

The site closest to shore was discounted on the basis of unacceptable environmental impact. The location would have been close to recreational fishing areas in shallow water, and would have had a greater potential impact on juvenile fish species that tend to inhabit shallower coastal waters.

The physical and environmental characteristics within the area of the second site, in the central part of Aniva Bay, indicated that it was suitable for the disposal of dredged material and this was given Russian authority approval as the preferred disposal site, 25km due south of the LNG site and in a water depth of 63m. Use of this site will not impact on any rare or endangered species or habitat. The distance of the disposal site from shore is typical of other dredge disposal sites worldwide.

*Impacts, mitigation and monitoring*

Predictive modelling work to determine the extent and levels of suspended sediment concentration ("SSC") and associated deposition resulting from the dredging and disposal process has been undertaken. The results have been used in assessing potential impacts and developing appropriate monitoring actions. The following effects and potential impacts have been identified:

- The dredging works would be unlikely to have an effect on the productivity of species such as salmon, herring and capelin in the coastal zone as the works would be undertaken outside of their spawning seasons;
- The noise associated with the dredging operation may temporarily cause avoidance of the working area by fish. However, given the large area of open water in which noise levels would remain below thresholds at which harm could be caused to fish it is considered that this effect would not have a significant impact upon fish populations in the coastal zone;
- During dredging and disposal relatively high levels of suspended sediment would be generated (in the range of 20-200mg/l, depending on location to the actual works) in the water column and at the seabed;
- Exposure of fish populations to levels of SSC that could cause harm is unlikely as predicted levels would be temporary and for the most part below sensitive thresholds. Additionally, the majority of fish would avoid areas of high sediment concentration and return to areas once levels had reduced. Direct potential impact to fish species of commercial interest is

therefore considered negligible. Importantly, salmon would not be affected by the dredging activity as it is being undertaken outside the period of both juvenile and adult migration. Compensation for potential loss of food productivity for fish and eggs of commercial fish stocks (all species) as a result of dredging and disposal activity in Aniva Bay has been calculated by the regulatory authorities and will be paid by Sakhalin Energy;

- Within the dredging area and at the disposal site the works would result in the complete mortality of existing seabed communities. In the areas that have been dredged, it is estimated that recolonisation would occur and the communities re-establish within 2-3 years. At the disposal site the change in sediment characteristics (from fine, soft sediment to more consolidated, coarser grained material) following dumping of all dredged material would be likely to lead to the establishment (over a period of 2-5 years) of a different community to that already present. The change in sediment type at the disposal site would constitute less than approximately 0.1% of similar seabed conditions (within the 50-100m depth contours) in Aniva Bay and it is therefore concluded that disposal would have a negligible effect with respect to the seabed ecology of Aniva Bay;
- Some smothering of seabed organisms by fine sediment outside of the disposal site would occur. Potentially, mortality of smaller organisms inhabiting surface sediments within an area subjected to greater than 10mm of sediment deposition (approximately 14 hectares) and relatively high levels of suspended sediment (>50mg/l) would occur. Based on data from other studies and survey information it is estimated that recovery of the affected area would be expected within a period of less than three years. Any fish eggs present on the seabed surface where >2-3mm of fine sediment would be likely to accumulate would be killed. This temporary and localised impact would affect an area of less than 0.3% of the whole bay area and is therefore not considered to represent a significant impact with respect to the maintenance of fish populations within Aniva Bay. This limited impact is in part due to the fact that the offshore location of the dredging site is not as important a fish spawning and nursery area as the inshore areas of Aniva Bay.

In conclusion, the overall impact of the dredging and disposal of dredged material on the marine ecology of Aniva Bay would be of a local and temporary (less than 2-3 years) nature. In addition to the avoidance of sensitive fish spawning seasons, and the avoidance of a prolonged dredging campaign, other mitigation measures have also been employed to reduce impacts further, in particular:

- The prohibition of discharge of any dredged material by barges outside the allocated disposal site. Adherence to this commitment is monitored through the use of accurate electronic locating equipment and daily activity records/logs;
- All vessels will fully comply with the Marine Pollution Convention MARPOL 73/78;
- Any garbage generated during these activities will be collected and sent to an approved waste management site.

A dedicated 5 year monitoring programme initiated in 2003 has to date indicated that the types of effect observed are in line with those predicted and, importantly,

that the scale of impact, particularly at the disposal site, is less than that which had been forecast.

#### 11.1.4

#### **Oil Spill Prevention and Response**

The risk of oil spills and consequential environmental damage is a major concern shared by the Company, shareholders and stakeholders of the Project. Therefore, the avoidance of spills in the first instance and the ability to respond quickly and efficiently to spills, are afforded the highest priority. The Company has already demonstrated its commitment in this regard throughout the operation of Phase 1 in which it is a proven safe operator.

The Company has every intention of continuing this good performance in the development of Phase 2 and has invested considerable effort and resources to ensure that the Project is built to the highest standards and is able to withstand the stresses placed upon it by climatic and geological conditions. The management of potential oil spills is an integral part of the detailed design of all facilities.

The biggest threats to the integrity of these facilities are earthquakes and therefore each facility has been designed to withstand, without rupturing, the severest (and rarest) of earthquakes, in accordance with good international practice:

- The onshore pipelines will be built to withstand, without rupturing, the most serious earthquake that can be expected in a 1,000 year return period;
- The offshore pipeline will be built to withstand, without rupturing, the most serious earthquake that can be expected in a 2,000 year return period;
- The platforms will be built to withstand, without rupturing, the most serious earthquake that can be expected in a 3,000 year return period;
- The LNG plant (tanks and safety-related equipment) will be built to withstand, without rupturing, the most serious earthquake that can be expected in a 10,000 year return period; and
- The OPF has been designed to withstand ground motions with return periods of 1 in 475 years, with only minor damage to the facility such that it can be put back into operation after normal commissioning checks and minor repairs.

The pipelines will be further protected by being placed below ground, in order to minimise physical damage and third party interference, and approximately 150 block-valves will be installed along the length of the pipelines to optimise control over the transport of hydrocarbons. The pipeline system will be equipped with a state-of-the-art highly sensitive leak detection system, which will detect losses of less than 1% of the inventory of the pipeline. So as not to rely solely on this leak detection system, the Company will implement additional detection and preventative measures, which include a rigorous monitoring programme to ensure that a leak of any size would be quickly identified. The elements of this programme include frequent walk-over surveys of the onshore sections of pipe, dedicated weekly flights of the whole pipeline, monthly internal cleaning of the pipeline (known as "pigging"), annual assessment using a subsurface remotely operated vehicle ("ROV"), ROV assessment after major storms or other events, and five-year "intelligent pigging" of the pipelines to inspect the integrity of the pipe and detect for any signs of corrosion.

In addition to the potential for spills from facilities, another potential source is the transport of oil by tankers from Aniva Bay. Roughly one oil tanker will visit the project facilities every four days (approximately 90 per annum), and a range of measures has been adopted to ensure these tanker movements are safe, including:

- A rigorous tanker vetting procedure to Royal Dutch Shell standards which are renowned as world class;
- A policy stipulating the use of double-hulled tankers throughout the year;
- Compliance with the key marine pollution prevention conventions, such as MARPOL;
- Designated recommended tanker routes through La Perouse Straits;
- Voyage risk assessments; and
- Ice classification requirements for tankers and escorts by ice-breaking tugs during the ice season.

With these and other design features in place, the risk of spills is low. Nevertheless, accidental spills are possible and therefore the Company is committed to a high performance in oil spill response ("OSR"). To this end, the Company is developing and implementing a comprehensive OSR strategy as part of the overall management of oil spill issues for the Sakhalin II Project. A key element of this strategy will be the development of oil spill response plans, which are due to be completed to international and Russian standards by Q3 2006, and well in advance of first oil (Q3 2007).

#### *The development of oil spill response plans*

Successful oil spill response initiatives typically require the following key inputs:

- A significant planning effort, based on the acquisition of relevant information;
- Development of effective and efficient response strategies;
- A firm commitment to the acquisition, storage, deployment and maintenance of suitable equipment;
- Maintenance of a team of trained personnel; and
- Development of an efficient response organisation, integrated into local, regional and international agencies.

The current plan for PA-A has been approved by Sakhalin Government agencies in 2003 and was the subject of an independent audit during 2003. Updated in 2005 to reflect changes in Russian Federation Government agency responsibilities, the Plan provides a firm foundation for the development of Project OSR plans.

There will be seven OSR plans for Project activities:

- Corporate OSR Plan, setting the overall framework for oil spill response planning;
- LNG terminal & OET Onshore Facilities OSR plan;
- Tanker Loading Utility and LNG Terminal Offshore (Aniva Bay) OSR plan;
- Piltun-Astokh (platforms & offshore pipelines) OSR plan;
- Lunskoye (platform & offshore pipelines) OSR plan;

- Onshore Pipeline OSR plan (including BS2); and
- OPF OSR plan.

Throughout the course of their development, the structure and content of the OSR plans will undergo an independent peer review. The review will include a benchmark of the plans against a number of recognised international standards, guidelines and conventions, including:

- IFC Offshore oil and gas development guidelines (2000);
- IMO (1995) IMO manual on oil pollution, Section II Contingency Planning;
- IPIECA (2000) A guide to contingency planning for oil spills on water; and
- The International Convention on Oil Pollution Preparedness Response and Cooperation (1990).

The development of these plans will be guided by preparatory work undertaken in a number of areas and will include as a minimum:

- A description of the operations, site conditions, and weather patterns;
- Risk assessment to identify potential spill scenarios, including worst-case potential accidents, taking into account local conditions such as seasonal climatic variations, hydrometeorology, catchments and river gradients;
- A definition of Tier 1, 2 and 3 levels in accordance with Russian Federation regulations and a clear demarcation of Company responsibilities and obligations with reference to each tier (contractual arrangements with third party oil spill response contractors will be described within the plans);
- Environmental sensitivity mapping of habitats and other areas of special value (the information will include detail on sensitive areas, facilities, equipment inventory and equipment locations);
- Organisational structures for oil spill response, including roles and responsibilities, notification and communications procedures, and contact details. The emergency response and crisis management systems are currently being upgraded;
- A list and description of onsite and offsite response equipment and instructions on usage;
- The contributions of Government personnel, as appropriate;
- Strategies for the deployment of equipment and personnel, according to the potential location of the spill and environmental sensitivity, to ensure protection of the environment. These strategies will take into account local and climatic conditions, including the presence of ice and key habitats such as coastal lagoons;
- Procedures for the protection of oil spill response personnel and potentially affected populations;
- Guidelines for wildlife hazing, rescue and management;
- Plans for the treatment and disposal of waste materials; and
- Programmes for the training of relevant Company staff and Contractors.

The processes that have already guided a few of these areas is described below, focusing on:

- Potential spill scenarios;
- Sensitivity mapping;
- Response strategies for oil in ice;
- Transboundary issues; and
- Training, exercises and capacity building.

#### *Potential spill scenarios*

Over a period of six years numerous oil spill risk studies and trajectory models covering all assets have been undertaken and the results have been relatively consistent. The risk of transboundary impacts from facility sources is very low due to predominant metocean conditions and oil persistence. Spills from tankers can be expected to pose some risk depending on wind conditions and variability of locations.

The modelling results will be used to determine the optimal approach to oil spill response, and to ensure well-targeted sensitivity mapping.

#### *Sensitivity mapping*

With knowledge of the possible trajectories of various spill scenarios, the next step has been to identify the potential sensitive receptors of oil spills, so that response strategies and equipment can be appropriately targeted.

Sensitivity maps have already been prepared for the shorelines adjacent to offshore developments and the onshore pipeline route. Aerial and ground surveys have now covered the entire southern and eastern coast and a large section of the west coast (around the port of Kholmsk) of Sakhalin Island. The maps are produced from data stored in the Company's geographical information system ("GIS"). This data has come from field ecological and morphological surveys, photographs, scientific papers, aerial surveys and other sources, including consultation with government bodies, particularly relating to areas of special value. As new data comes in through regular monitoring work, it is fed into the GIS so that the maps remain up to date. Sensitive areas that have been identified include river mouths and lagoons, which are important wildlife and fishing areas, and migratory bird nesting and feeding areas. These are among the groups that are afforded the highest protection. The Company encourages the public to contribute information on any areas that they consider are particularly sensitive, so that these views can be taken into consideration in the planning process.

Due to the relative proximity of the northern Japanese island of Hokkaido to Sakhalin Island, and the remote possibility that a spill could reach these shores, the Company is also engaging closely with a Japanese institute that is currently preparing detailed coastal sensitivity maps for Hokkaido to ensure that these maps are included within the response plans. These sensitivity maps will be available from mid-2006, but as an interim measure the Company has made itself aware of the key sensitivities along the northern shore of Hokkaido from existing maps.

#### *Response strategies for oil in ice*

The recovery of oil during ice conditions has been a key focus of attention for OSR planning given that after completion of the Project, operations will take place year-round, and that for 6 months of the year there is ice present in the waters around the northeast of Sakhalin Island.

A key factor influencing the response strategy will be the determination of the rate of spreading and extent of spilled oil on or under ice. This will vary due to the high variability in ice character and the ice-water interface, as follows:

- Oil under ice will be influenced by currents, lower ice roughness, and the possibility of ice capturing (accumulating) oil from water; and
- The behaviour of oil on the ice surface is comparable to an onshore spill with the spreading rate determined by oil density and viscosity.

Overall, oil will tend to spread relatively slowly either above or underneath ice cover compared to an ice-free water surface. Other factors affecting the response strategy include ice cover (percentage); size of ice leads, slick behaviour (e.g. break-up and dispersal); and the type and amount of response equipment that can be mobilised.

There are a number of response options available, including mechanical recovery, in-situ burning where volatiles are present and where it is safe to do so and possibly the use of chemical dispersants if there is a net environmental benefit in their use. In some instances the best environmental response might simply be to track and monitor the spill and take no action if the oil is likely to dissipate and not impact sensitive areas. Due to the natural variations of oil behaviour and ice conditions, the plans are being produced in a manner that allows the precise response strategy to be determined at the time of a spill.

In addition to the known response options, the Company will strive to further the oil and gas industry's knowledge of addressing oil in ice, and to this end it has commissioned research into response equipment and methods. These efforts are supported by the Company's Ice Management Team ("IMT"), OSR team personnel and facility operators and managers, who have a wide-range of experience in ice operating in conditions. The knowledge generated through this approach will feed into a wider Royal Dutch Shell-sponsored industry-wide initiative to improve response capabilities for addressing oil in ice.

#### *Transboundary oil spill issues*

The Company has an existing Memorandum of Understanding ("MOU") with the Japanese Maritime Disaster Prevention Centre for Phase 1 of the Project, which requires the Company to inform applicable Japanese agencies of any spill from the Company's facilities that may enter Japanese waters. Daily notifications would be provided on the quantity and estimated trajectory of a spill. This MOU is currently being updated to cover Project operations.

Due to the relative proximity of some of the Project assets to the island of Hokkaido in northern Japan, close collaborative arrangements are being developed with key Japanese oil spill response organisations. These include a programme of workshops and seminars with Japanese stakeholders on technologies and response strategies; the development of technical response manuals and their translation into Russian and Japanese; training courses in OSR techniques.

#### *Other studies*

An extensive OSR work programme is currently underway to develop well-organised and resourced OSR plans and response capability for the new Project facilities. The work programme encompasses over 50 background studies (e.g. on the use of dispersants, oil behaviour, and oil spill response strategies in ice), preparation of specific plans or guidelines (e.g. shoreline plans, health and safety guidelines), acquisition of equipment and the further development of cooperative arrangements with Government agencies and other companies.

*OSR exercises, drills and capacity building*

A crucial part of the OSR strategy is provision for a comprehensive training programme to ensure that all personnel who are, or may be, assigned tasks during a response are suitably trained and capable of performing their designated roles efficiently and effectively. This includes Company staff, contractors, and even volunteers from communities on the Island.

Running small-scale and large-scale OSR exercises enables the effectiveness of OSR plans and response teams to be tested. The scope of exercises include those that are:

- Facility-based;
- Project-wide;
- Undertaken in cooperation with relevant federal and Oblast authorities; and
- Extended to facilitate the participation of Japanese organisations in regional exercises.

Exercises can involve desktop exercises (including OSR plan orientation and notification procedures), field deployment exercises and combined exercises (desktop and field simulation). The next major exercise, planned by the federal Ministry of Transport and involving the Japanese Coast Guard will take place in May 2006 in Aniva Bay.

In October 2005, Sakhalin Energy signed an agreement with the Sakhalin Oblast and other partners in the oil and gas industry to integrate its efforts and resources to prevent and respond to emergencies associated with the production, offloading and transportation of hydrocarbons. Through the signing of this agreement all signatories committed to working cooperatively to prevent emergencies, and to respond to emergencies, using available resources, technologies, personnel, scientific and administrative capabilities.

As a major international company in the oil and gas industry on Sakhalin Island, the Company considers it important to invest in building the capacity of local and regional organisations, as well as its contractors, in spill response. The Company is in the process of preparing a number of operational handbooks on the following topics. These will be published in Russian and English, and some in Japanese:

- Shoreline Response
- OSR in Ice Conditions;
- Environmental Handbook;
- OSR Health and Safety;
- Dispersants;
- Aerial Surveillance and Assessment;
- Computer Modelling for OSR; and
- Development of an English-Russian OSR Technical Glossary.

A detailed account of the information given in this section can be found in the EIA Addendum Chapter 2 on Oil Spill Response (2005), on the Sakhalin Energy website ([www.sakhalinenergy.com](http://www.sakhalinenergy.com)).

**11.1.5****Rare and Migratory Birds**

A variety of terrestrial, wetland and coastal habitats are present on Sakhalin Island, all of which support distinct bird communities, including a number of rare species. The list of rare birds included in the Red Data Book (“RDB”) of Sakhalin Oblast and which are present, or have been recorded, on Sakhalin Island consists of 90 species. Given Sakhalin Island’s role as a migratory bridge to and from spring-summer breeding grounds for a large number of birds travelling between Japan, the Russian Far East mainland and Kamchatka (e.g. Bewick’s swan), a significant number of these are also listed in the Japan-Russia Migratory Bird Treaty (1973).

The major part (about 70%) of Sakhalin’s rare bird fauna is represented by wetland (lake-swamp and littoral-marine species) species reflecting the extensive presence of these habitats across the island and in particular the dynamic and productive coastal ecosystem of the northeast of the island. Terrestrial species, representative of the mountainous and forested interior of the island and human-influenced habitats (e.g. commercial forestry or agricultural land) make up the remaining part of the rare bird fauna. The majority of the RDB species are characterised by small populations and an uneven distribution, linked to either very specific habitat requirements, or other influencing factors such as human disturbance.

On the basis of data collected for the Project since 1998 and from other available ornithological literature it is apparent that there are several ecosystems, habitat types and areas of the island that are of particular significance for RDB bird species in relation to project activities. These are:

- The lagoon/wetland ecosystem of the north-east – the wetland complex of coastal lagoons and associated wet larch/Ledum forest and bogs of the coastal plain support a diverse bird assemblage, including a number of rare or protected species such as Steller’s sea-eagle, white-tailed sea-eagle, spotted greenshank, the Sakhalin subspecies of dunlin and Aleutian tern, all of which migrate to the area during the spring in order to breed. The area also supports large populations of waterbirds (ducks, swans and waders) on migration to and from breeding grounds further to the north;
- Northern mature larch/Ledum forests – this habitat is of particular importance for resident species such as Siberian spruce grouse, black-billed capercaille, Tengmalm’s owl, pygmy owl and northern hawk owl and possibly breeding long-billed murrelet. This habitat also supports the most diverse resident breeding bird assemblage found on the island;
- Mature willow/alder forests in the main river valleys – the complex of mixed woodland found along some of the river valleys provides important breeding habitat for tree-nesting birds such as mandarin duck, osprey, white-tailed sea-eagle, owls and Japanese sparrow hawk;
- Shallow intertidal waters and lagoons in Aniva Bay – the northern end of Aniva Bay is particularly well known as a staging ground, normally during the spring, for a wide range of migratory waterbirds including large numbers of Bewick’s and whooper swans and rarer species of waders.

*Impacts, mitigation and monitoring*

Impacts to bird species are largely confined to the construction phase of the project, particularly during site clearance activities for the siting of the OPF, LNG plant and the onshore pipeline right of way. Impacts include loss of habitat, and disruption caused by people, project traffic, and noise pose threats to their well-

being unless properly mitigated. During operations, impacts to birds and other wildlife will be much reduced, due to the relatively small numbers of people operating the facilities, and the regeneration of many disturbed areas.

In recognition of the importance of the bird fauna and associated habitats, mitigation measures to offset potential harm to species such as the Steller's sea eagle and RDB bird assemblages as a whole have been actively implemented. These have included pipeline route deviations to avoid critical Steller's sea-eagle nests; the development of mitigation guidelines and contractor awareness-raising activities; maintaining a buffer zone around key sensitive areas within which construction work is not permitted; and avoidance of site clearance activities during sensitive bird nesting seasons. Furthermore, helicopter flights shall avoid a 600m (radius) zone around and 300m elevation above Steller's sea-eagle nests between mid March and mid September, except in cases of emergency, and helicopter landing sites shall be located at a minimum distance of 1km from nesting sites except in cases of emergency response.

With regards to the Steller's sea-eagle, the development of these mitigation measures and conservation opportunities has been informed through a project-funded programme of research on the Steller's sea eagle population of northeast Sakhalin undertaken by Moscow State University.

In addition, a large number of measures are being implemented to ensure that project activities do not adversely affect ecosystem processes that support critical habitats for RDB and migratory birds. These measures have been designed to ensure that the habitats and RDB bird populations of areas such as the northeast coastal lagoons are maintained intact during project construction and operation. Key mitigation measures adopted for the Alternative 1 onshore pipeline route at Piltun have been:

- avoidance of the main bird nesting and migratory periods by undertaking pipeline construction through these areas during winter;
- crossing of the Chaivo Lagoon, an important waterbird habitat, by horizontal directional drilling during winter, thereby avoiding the main bird nesting and migratory periods, and also limiting disturbance to the lagoon;
- pipeline realignments have been undertaken to avoid duck and greenshank habitats; and
- the pipeline right of way has been shared with the Sakhalin I project operator wherever possible in order to minimise the footprint of the project.

For rarer tree-nesting species (e.g. some species of owls, mandarin duck) of larch/ledum forests in the north-east and willow/alder forest in river valleys, it has been recognised that further measures may be required to maintain breeding sites affected by tree clearance from the pipeline right of way. A pilot artificial nest box scheme is therefore being developed in order to replace breeding site habitat (i.e. tree hollows) for birds such as mandarin duck and owls. Schemes elsewhere around the world have proved that artificial nest boxes can be very successful at maintaining and even enhancing populations.

The Company is committed to a rigorous programme of monitoring to assess the effectiveness of the mitigation measures against baseline conditions. These and other measures will form a key component of the Biodiversity Action Plan ("BAP") currently being development by the Company, which will be implemented from Q1

2006. The BAP has been developed in close dialogue with the Smithsonian Institution and will be implemented in consultation with national and international biodiversity specialists, including those of Japan.

#### 11.1.6

#### Waste Management

Sakhalin Energy has developed a Solid Waste Management Strategy ("SWMS"), which establishes and defines the procedures for the management of waste materials generated by the assets during construction, installation and throughout the scheduled lifetime of the Sakhalin II development.

Due to the technical similarity of oil and gas projects worldwide, and the environmental conditions on Sakhalin Island compared to other parts of Russia, Sakhalin II waste streams and waste generation quantities have been relatively predictable. Table 1 summarises the predicted type and quantity of solid waste generated (the waste classification system is that relating to the Russian Federation).

**Table 1. Predicted type and quantity of solid waste**

Hazard		Waste Stream Project Examples	Waste Generation	
Class	Description		Construction (total tonnes)	Operation (tonnes/year)
1	Extremely hazardous	Mercury containing fluorescent lights, activated carbon contaminated with mercury sulphide.		
2	High hazard	Concentrated acids, alkalines, halogenated solvents, lead acid batteries, dry batteries, etc.	32	32
3	Moderate hazard	Used lubrication oil, oily sludge, oily rags, used oil filters, non-halogenated solvents, paint wastes, etc.	4,790	1,200
4	Low hazard	Domestic trash, non ferrous metal scrap, some chemicals, some construction waste, treated sewage sludge, treated medical wastes, water based drilling mud, etc.	37,507 (excluding brushwood etc from pipeline clearing wastes)	2,600

Hazard		Waste Stream Project Examples	Waste Generation	
Class	Description		Construction (total tonnes)	Operation (tonnes/year)
5	Practically non-hazardous	Inert wastes: plastic, ferrous metal scrap, inert construction wastes, food waste, brush wood, non-treated wood waste.		

From this table it can be seen that the bulk of the waste is low hazard/practically non-hazardous and the hazard class 1 – 3 wastes mainly comprise waste oil and lead acid batteries that can be recycled, with very small volumes requiring storage and/or export for treatment. The only hazardous waste stream identified as potentially justifying the development of local treatment capacity is hydrocarbon-contaminated soil. Sakhalin Energy's total waste quantities are also relatively small compared to the overall waste generated by the municipalities and other industries on Sakhalin Island.

The most significant identified impact associated with waste generated during the Project would be that which would occur as a result of inadequate environmental protection measures being taken, such that the degradation of wastes could cause contamination of groundwater or surface water pollution which could threaten potable water extraction or fish spawning rivers. Mitigation measures have therefore been developed to minimise the potential for such impacts occurring.

#### *Mitigation*

Sakhalin Energy has developed a number of mitigation measures as part of the SWMS in order to minimise the potential negative impact of waste generation on community health and the environment.

#### Comprehensive waste minimisation, re-use and recycling programme

Sakhalin Energy has used a “hierarchical approach” to select appropriate waste management solutions, and prioritises the minimisation of waste in the first instance, and thereafter the reuse and recycling of waste. Only if these options are not possible will waste be disposed of. This approach to waste management is consistent with Russian and international best practice.

The minimisation of waste focuses on avoiding waste generation wherever practicable and, where waste is generated, on avoiding/minimising high hazard class waste generation, for example by the substitution of hazardous materials with non-hazardous/low-hazard materials.

In order to maximise the diversion of wastes with potential for recycling, reuse and resource recovery, Sakhalin Energy will facilitate an integrated alternative waste management option for the disposal of such waste streams.

#### Temporary storage of Hazard Class 1 to 3 wastes

Consistent with Sakhalin Energy's commitment not to dispose of Hazardous Waste Classes 1 to 3 on Sakhalin Island, the SWMS provides for environmentally secure storage facilities at the point of generation. The storage option will be used until suitable treatment and disposal facilities are available locally or sufficient quantities are accumulated to allow economical export to suitable treatment and disposal

facilities in the Russian Federation or elsewhere. The quantity of waste following the recycling of waste oil and lead acid batteries is small, excluding this, the residual storage requirement is likely to be 100 tonnes over the whole construction period.

Bio-treatment of Hazard Class 3 oily wastes

Facilities will be constructed to store and biologically treat soil and similar material that has been contaminated by hydrocarbons arising from the accidental spillage of products during construction and operations. The anticipated quantities received on a routine basis are estimated to be small. These secure areas will also be utilised for the minor emergency storage of materials collected from a more significant oil spill event. These secure areas will be separate from the Company's planned OSR contingency arrangements.

Upgrading of three municipal landfills

In order to safely dispose of its Class 4 and 5 wastes, and also convey lasting benefits to the Island's communities, the Company is upgrading three main existing landfills located at Nogliki in the north, Korsakov in the south and Smirnykh in the central part of the island. These upgrades are for the use of both the Project and local municipal wastes. The three landfills are being upgraded to meet Russian regulatory standards and to bring their operation more in line with international best practice in environmental performance. This will be achieved through implementing the following control measures:

- Strict limitation of low hazard wastes in classes 4 and 5 going to landfills;
- The provision of waste management training to landfill operators in order to meet Sakhalin Energy's Landfill Operators' Code of Conduct and Landfill Operating Manuals;
- Installation of a landfill dual liner system and integrity testing of the liners to identify for any defects and repair prior to commissioning;
- The collection of leachate accumulating in the landfills;
- Passive landfill gas ventilation systems;
- The capping of landfills to reduce infiltration, reduce wind-blown rubbish, and reduce leachate management requirements;
- Implementation of a Construction Quality Assurance plan for the upgrade works; and
- Groundwater and surface water monitoring to detect for possible leakages in the landfill system, and application of risk assessments to determine the trigger levels that are correlated to these monitoring activities.

Due to some delays in upgrading of Nogliki, Korsakov and Smirnykh landfills, and with the aim of reducing distances to transport waste, the onshore pipeline contractor has had to temporarily use a number of local municipal landfills for the disposal of Hazard Class 4 to 5 construction and domestic wastes.

By the end of April 2006, the Company is planning to enact a central waste transportation and compaction contract, which will centralise the collection of disposable Hazardous Wastes in Classes 4 and 5 from Sakhalin Energy construction activities and ensure the disposal of this waste at the three upgraded landfills only. Once this centralised system has been established, the use of all non-upgraded landfills will cease. Sakhalin Energy has budgeted for a minimum of

USD350,000 funding for offset environmental improvements at each of the non-upgraded landfill sites, and has also budgeted USD350,000 for the provision of technical and engineering support for the new Yuzhno landfill. The local administrations, in conjunction with Sakhalin Energy, shall determine how the funding is utilised, but at least part of the investment shall be spent on improved waste management practices and waste disposal environmental impact mitigation. All funding shall be directed exclusively towards the practical implementation of environmental programmes.

*Waste tracking system and control of Sakhalin Energy generated wastes*

Sakhalin Energy implements a system to track and document the generation, care and custody, storage, transfer and disposal of wastes resulting from the construction and operation activities of both Sakhalin Energy and its contractors. This system is based on the “care and custody” principle embodied in most systems employed in OECD countries by regulatory authorities in tracking hazardous waste and is extended to include all Sakhalin Energy waste. It is based on three principal standard control documents:

- Waste Generation Ledger;
- Waste Manifest (Waste Transfer Form); and
- Waste Management Activity Report.

*Co-operation with Sakhalin Oblast Administration*

Sakhalin Energy has also chosen to implement its approach to waste management on a co-operative basis with the Sakhalin Oblast Administration and local municipalities. The objective of this is to support the progressive improvement of waste management capacity for the broader community and thus inherently contribute to sustainable development. This arrangement has been formalised in a “Framework Agreement on Waste Management Cooperation” between the Sakhalin Oblast Administration and the Company. The current and planned initiatives of co-operation between the parties include:

- Waste minimisation projects;
- Upgrading of three strategically located municipal landfill facilities for disposal of Hazardous Wastes in Class 4 and 5; and
- Planning of the long-term development of communal waste management infrastructure within the Oblast.

The strategy and framework SWMS approach effectively balances the parallel waste priorities by providing a high level of environmental performance in accordance with Russian and international best practice. In so doing it also provides environmental benefits to the broader community by:

- Developing waste co-operation, strategy and programmes in conjunction with the Sakhalin Oblast Administration;
- Stimulating local waste minimisation and recycling projects;
- Upgrading of three municipal landfill facilities for the disposal of Hazardous Wastes in Class 4 and 5 for local use;
- Reducing the environmental impact at each of the three landfill upgrade sites; and

- Improving waste management practice and rectifying environmental impacts at a number of local landfill sites including the landfill that serves Yuzhno-Sakhalinsk.

#### *Monitoring*

A Monitoring plan has been developed to demonstrate that the SWMS is fully implemented. This is undertaken by:

- Checking the Waste Management Activity Reports. This will demonstrate that all generated waste is disposed of at the correct disposal point and no Hazardous Waste Classes 1, 2 or 3 is disposed of at the landfills; and
- The risk assessments will provide 'trigger levels' for the samples taken from monitoring wells adjacent to the upgraded landfill sites. Laboratory analyses exceeding these values will result in corrective action preventing pollution damaging the groundwater environment.

## 11.2

### **SOCIAL IMPACTS, MITIGATION AND MONITORING**

Key concerns of community residents voiced during the SIA consultation process were access to job opportunities; impacts on fishing, hunting and gathering areas; and issues related to compensation.

During SIA-A-related consultation in 2003 and 2004, local residents noted that the Project had provided employment, training and business opportunities, and contributed to improved living and working conditions. Infrastructure upgrading has improved life in some settlements and local residents appreciated the clearance of unexploded ordnance from around the pipeline right-of-way. The importance of social investment by Sakhalin Energy and contractors in communities is clear, in particular in the education, health and social spheres, and the additional assistance of contractors, e.g. clearing snow from roads and lending machinery to the housing and utilities services.

However, local residents also voiced their concern about equality of employment and training opportunities and the transparency of the hiring process, delays in wage payment and other violations of Russian labour law, and the outflow of skilled workers from local enterprises. Residents expressed concern about the impacts of contractor and subcontractor activities in local communities, social disturbance caused by incomer workers and the increased burden on local infrastructure, especially damage to local roads. The SIA-A identified further local concerns about potential Project impacts on fish health and fish populations, and on commercial and subsistence fishing activities, as well as hunting and gathering activities. In addition to impacts on reindeer pastures and herds, indigenous residents highlighted their anxiety about potential impacts on the broader indigenous population, in particular those who engage in livelihood activities, such as fishing, hunting and gathering, close to Project sites. Furthermore the Company has focused on issues relating to resettlement, compensation and supplemental assistance to ensure that project-affected people are compensated for any loss of property and/or socio-economic displacement as a result of the Project in accordance with World Bank Operational Directive (OD) 4.30 without prejudice to the Russian Federation legislation.

The remainder of this section provides an overview of the following social matters as they relate to the Project: employment, training and business opportunities;

community impacts; resettlement, compensation and supplemental assistance; heritage resources; recreational and subsistence hunting, gathering and fishing; and indigenous peoples.

#### **11.2.1**

#### **Employment, Training and Business Opportunities**

Sakhalin Energy is committed to working according to labour standards set by the Russian Labour Code and other Russian Federation legislation. This is in line with International Labour Organisation (ILO) conventions covering occupational health and safety, harmful child labour, forced labour and discriminatory practices, which have been ratified by Russia. The requirement to work according to Russian Labour Code and other Russian Federation legislation is written into Sakhalin Energy and contractors' contracts.

According to the Sakhalin II PSA, Sakhalin Energy is committed to a best effort to achieve 70% Russian content (use of Russian labour, materials, equipment and contractors) over the life of the Project. In 1998, a Joint Committee was set up as a forum for Sakhalin Energy and the Russian Party to discuss opportunities for involvement of Russian businesses and industry in the Sakhalin II Project. Sakhalin Energy is also committed to providing local employment and business opportunities where possible.

Employment and business opportunities include construction, procurement and service contracts and direct hiring of staff in both office-based and construction-related employment. Sakhalin Energy gives preference to Sakhalin workers and businesses where practicable, offers training programmes and educational initiatives, and seeks to provide adequate information to local communities about employment and training opportunities. However, the limited Sakhalin workforce increases the risk of wage inflation and the loss of skilled workers to Project-related jobs. Positive and negative impacts are cumulative due to the fact that several large oil and gas projects are taking place at the same time, or within close succession.

CLO and SPT activities are aimed at ensuring transparency of the hiring process and building the capacity of local people to take advantage of employment opportunities. SPT experts work closely with employment centres to assist information flow between contractors, Sakhalin Energy and local communities regarding employment opportunities. CLOs have provided over 300 local residents with advice or assistance (e.g., writing job applications and CVs) to maximise employment and training opportunities.

Company and contractor compliance with Russian Labour Code and Legislation is to be monitored via the Social Compliance Monitoring Handbook. CLOs and SPT experts also monitor local concerns through regular public consultation, interviews with experts, media monitoring, grievances, and the incident tracking and issues management processes. Contractors report regularly to Sakhalin Energy on their performance and the Company engages regularly with its contractors to assist in compliance with Project commitments. The results of monitoring and reporting are fed back to project teams, contractors, subcontractors and Sakhalin Energy corporate managers on a regular basis.

#### **11.2.2**

#### **Community Impacts**

The Project has had positive impacts on local communities through improvement of infrastructure via the Infrastructure Upgrade Project, contractor services to local communities, such as road clearing, and sponsorship via the Social Investment and Contractor Set-Aside programmes. Negative impacts include the increased burden on community infrastructure, especially damage to local roads, social disturbance

caused by incomer workers in local communities, increased local concern about traffic safety and some concern about price increases.

Impacts on local communities were initially minimised through careful siting of camps and facilities. Whenever feasible, brown field sites were chosen, the clean-up of which would ultimately benefit communities, and camps were sited to minimise construction traffic through communities and other potential nuisances. Siting requirements following Russian regulations ensured that community water supplies and other sensitive areas were protected. Construction camps were designed to be ‘closed’ in order to minimise the burden on local communities, while recognising that this may limit opportunities for local communities to benefit from increased trade with camp workers. Workers are allowed into communities during leisure hours, where their behaviour is regulated by a Contractor Code of Conduct (see below).

Sakhalin Energy has established several procedures to manage potentially negative community impacts due to Contractor activities. These include socio-economic terms and conditions incorporated into the bidding process, the requirement for contractors to prepare a socio-economic plan; the Sakhalin Energy Code of Conduct for Contractors; the Camp Management Policy for construction camps and the requirement for contractors to have their own community liaison staff. Contractor compliance with Sakhalin Energy policies is monitored by Sakhalin Energy CLOs.

SPT experts and CLOs carry out regular cross-project monitoring of community issues and public concerns, through fieldwork and consultation. SPT experts maintain a community database of issues and concerns for monitoring and reporting purposes. Public grievances are addressed using the Company’s Grievance Procedure, which provides a channel for communication and resolution of community concerns. The Issues Management Process is used to address persistent issues and grievances. This process captures stakeholder concerns and develops an effective response from the Company, especially for recurring grievances and issues related to broad public discontent. The issues are brought to the attention of senior management, who are responsible for ensuring that an action plan is in place and that the issues are regularly reviewed.

Since 1994, USD1.5 million has been provided to support educational, cultural, environmental and social initiatives within the local community, and the budget for social investment initiatives rose to approximately USD0.5 million in 2005. During the construction of the Phase 2 Project, an additional USD24.5 million has been set aside to contribute towards sustainable community initiatives that go beyond the Company’s initial investment and continue to provide benefits to Sakhalin Island communities and their environment into the future.

### **11.2.3 Resettlement, Compensation and Supplemental Assistance**

The Sakhalin II Project Resettlement Action Plan (the “RAP”) describes the policy framework and procedures that are being followed to address land acquisition and resettlement required for construction and operation of the Project. The RAP contains compensation and mitigation measures for the Project affected people (“PAP”) and enterprises.

The Company expects to acquire rights to 4,850 hectares of land for a 3-year period to enable it to construct the natural gas and crude oil production infrastructure. Some additional land area (about 275 hectares) will be required for periods of 6 months to five years for temporary construction facilities and construction phase Safety and Sanitary Protection Zones. Depending on the final

design of the pipeline, the Project will require 254 hectares of land for permanent facilities.

In addition to those required to relocate, SEIC has identified particular groups of PAP that may be socio-economically impacted by Project activities. As summarised below, these potentially include dacha communities located outside the LNG Sanitary Protection Zone, commercial fishing enterprises, ancillary industries and native fishing enterprises. Groups that are identified as being particularly vulnerable will require particular attention to ensure that they are fully able to benefit from the compensation entitlements and other mitigation measures to be supported by the Project.

**Table 2. Summary of Project Impacted Groups**

Group of PAP	Summary of PAP impacted by land acquisition, resettlement and socio-economic displacement	Commentary
Project Impacted Households	<p>In total 125 households (432 individuals) will be affected by both permanent and temporary land loss.</p> <p>117 households (409 individuals) will be affected by temporary loss of land during the three-year pipeline construction period.</p> <p>10 households (27 individuals) will permanently lose land and structures to make way for permanent aboveground facilities or associated Sanitary Protection Zones and Safety Exclusion Zones.</p> <p>100 dacha owners may potentially be socio-economically impacted.</p>	All households have been relocated from existing dwellings to replacement land and housing apart from one household that was affected by the pipeline Sanitary Protection Zone. This household shall be relocated once operations commence.
Farms	<p>The land of fifteen farms (50 individuals, mostly family members) will be affected by construction of Project facilities.</p>	<p>The total of 15 farms includes 2 farms (5 individuals) which have been forced to relocate as a result of the LNG/Oil Export Terminal or Sanitary Protection Zone.</p> <p>In most cases, the Project affects no more than 5% to 10% of each farmer's land. In the three most severely impacted cases, where over 25% of the farms' land was affected, compensation was paid for lost income for the whole of the plot of land.</p>

Group of PAP	Summary of PAP impacted by land acquisition, resettlement and socio-economic displacement	Commentary
<b>Dacha communities</b>	Four dacha summer users (11 individuals) have been forced to relocate as a result of the LNG/Oil Export Terminal and due to temporary pipeline construction needs.  100 dachas (approximately 300 individuals) from 2 dacha communities have been identified as potentially impacted with socio-economic displacement.	The 4 dacha summer users forced to relocate have agreed to waive their land rights.  The 100 dacha owners that fall outside the 1km SPZ have however been identified as potentially impacted with socio-economic displacement. Discussions with dacha communities are scheduled to take place in November.
Reindeer Herders	The Project construction land needs will affect five reindeer herder families (57 individuals) belonging to the Ulta and Evenk communities (primarily Ulta).	Reindeer herders are considered to be a vulnerable group of PAP and as such may require particular attention to ensure they are fully able to benefit from compensation entitlements and other mitigation measures to be supported by the Project.
Subsistence Hunting Fishing and Gathering	The Project will only impact a very small proportion of the forests and fisheries areas that are utilised by local people for recreational and subsistence activities.	Many of the permanent facilities are in remote areas that are not readily accessible to communities for subsistence uses. Losses in forest and berry fields resulting from the pipeline will be very localized.
Recreation – Prigorodnoye Beach users	Construction of the LNG Plant/ Oil Export Terminal requires the withdrawal of part of the Prigorodnoye Beach.	Prigorodnoye is a summer recreation area popular with local residents. Full closure has been avoided. SEIC has agreed to pay compensation of USD800,000 to the Korsakov Administration to support park reconstruction in lieu of the impact on the Prigorodnoye beach.

Group of PAP	Summary of PAP impacted by land acquisition, resettlement and socio-economic displacement	Commentary
<b>Project Impacted Enterprises</b>	<p>66 enterprises will be affected by the Project as a result of direct Project land needs.</p> <p>The Company estimates that approximately 61 enterprises (between 1963 to 8635 individuals depending on season) may be potentially socio-economically impacted.</p>	<p>Of the 66 enterprises affected as a result of direct Project land needs, 13 enterprises will permanently lose land and structures to make way for permanent aboveground facilities or associated Sanitary Protection Zones and Safety Exclusion Zones.</p> <p>The 61 enterprises that may be socio-economically impacted include commercial fisheries, ancillary industries and native enterprises.</p>
Agricultural	Pipeline construction will impact 16 agricultural enterprises.	These enterprises will experience short-term loss of use of parts of their agricultural land. Where land falls within the Sanitary Protection Zones and Safety Exclusion Zones, enterprises will be able to continue their pre-Project agricultural activities.
Forestry	The Project land needs affect a very small proportion of lands managed by nine state forestry enterprises.	70% of the pipeline right of way is located in State Forestry Fund land.
Commercial Fishing Enterprises	<p>Three commercial fishing enterprises (employing 90 permanent and 370 temporary workers) have already been identified as being impacted by the Project (the construction and operation of the LNG/OET in Prigorodnoye).</p> <p>It is estimated that up to 40 commercial enterprises (between 1200 to 6120 individuals depending on season) in Aniva Bay (including small enterprises and ancillary industries such as fish processing and transport) and 14 (between 420 to 2142 individuals depending on season) in the Nogliki region (with one estimated ancillary industry) could suffer socio-economic impacts as a result of the Project.</p>	<p>One commercial enterprise lost land previously used for a fisherman's camp and was compensated. The two other companies potentially face some impacts due to an overlap of 3% and 28% respectively of the Project impacted area with the agreed fishing water area.</p> <p>The Company acknowledges that small fishing enterprises including ancillary industries and native fishing enterprises may also suffer socio-economic impacts as a result of Project activities. Further surveys on the numbers of these enterprises are planned in December 2005 to January 2006.</p>

Group of PAP	Summary of PAP impacted by land acquisition, resettlement and socio-economic displacement	Commentary
Native Fishing Enterprises	It is estimated that 6 Noglik enterprises of 42-72 people are involved in native (IP) fishing enterprises.	<p>Further information on native fishing enterprises will be available following completion of the 2005 IP survey.</p> <p>Potential socio-economic impacts on native fishing enterprises will be better known following the completion of the IP survey. Due to the low level of impact on fish resources as a result of Project activities, as discussed in the RAP, the key source of likely socio-economic impacts will be ecological impacts such as oil spills.</p>
Municipal	The Project construction and operation area affects land of 27 municipal formations and of the Administration of the Sakhalin Region. Affected formations include 10 districts, 14 rural districts, 3 settlements and the Sakhalin Region Administration.	Municipal land affected by the Project is generally remote from settlements and unutilised. The total area of municipal formation land affected by the Project is 2005 hectares.
Other Enterprises	Project land requirements will affect small areas of land controlled by state ministries, departments or government agencies. This category includes 11, predominantly state, entities.	Lands of state organisations affected by the Project are presently unutilised so there is no significant impact on assets or livelihoods. Land of transport and railway enterprises is generally only affected at crossings where the pipeline is required to pass under existing road or rail infrastructure.
<b>Vulnerable Groups</b>	About 89% of the Project affected households are assessed as potentially vulnerable. Of the 125 households who have been identified as a Project affected families, 72-75 families have been identified as vulnerable.	<p>Vulnerable PAP fall into four categories: elderly households, low-income households, non-registered land users and reindeer herders.</p> <p>Vulnerable groups may require particular attention to ensure they are fully able to benefit from compensation entitlements and other mitigation measures to be supported by the Project.</p>

A total of approximately USD28 million has been budgeted for private land acquisition and resettlement compensation. Of the total USD28 million, USD775,000 will be set aside for claims under the Supplemental Assistance Programme. This will include approximately USD350,000 budgeted for compensation that is paid as a result of socio-economic impacts. This amount may be adjusted to reflect the actual extent and nature of potential socio-economic impacts. In addition to this, USD360,000 has been allocated to cover the costs of meeting monitoring and reporting commitments. A complete breakdown of the SEIC Land Acquisition and Resettlement budget is provided in the RAP.

In addition to those required to relocate, SEIC has identified particular groups of PAP that may be impacted by Project activities. As summarised above, these include dacha communities located outside the LNG Sanitary Protection Zone, Reindeer herders, subsistence hunters and gatherers and agricultural, forestry and commercial fishing enterprises. Groups that are identified as being particularly vulnerable will require particular attention to ensure that they are fully able to benefit from the compensation entitlements and other mitigation measures to be supported by the Project.

#### *Objectives of the RAP*

Based on the assessment of the impacts of the Project, the RAP aims to ensure that people and enterprises affected by the Project are compensated for any loss of property and/or socio-economic displacement as a result of the Project in accordance with World Bank Operational Directive (OD) 4.30 without prejudice to the Russian Federation legislation. The Company will ensure that appropriate mitigation measures for local communities are in place and will provide PAP with the opportunity to restore or improve their living standards and income earning capacity to at least pre-project levels.

These goals will be realised through the following objectives:

- Minimise land acquisition (temporary and permanent) in order to minimise livelihood impacts and physical relocation of people;
- Where acquisition cannot be avoided, carry out land acquisition and resettlement in accordance with the laws and regulations of the Russian Federation, the Sakhalin II Project Production Sharing Agreement (PSA), and World Bank/International Finance Corporation (IFC) OD 4.30 on Resettlement;
- Undertake land acquisition through following the principles of OD 4.30, with powers of eminent domain to be used only as a last resort;
- Compensate PAP in accordance with the compensation norms set out in the legislation and regulations of the Russian Federation, except in specific cases where requirements under OD 4.30 are more extensive, in which case the Project shall establish entitlements in accordance with its principles;
- In cases of permanent land acquisition, and where feasible, offer landowner and users the option of replacement land;
- Pay special attention to vulnerable and disadvantaged groups including those without formal title to land;
- Conduct full and thorough consultation with affected people throughout the land acquisition and resettlement process;
- Monitor the full and effective implementation of the RAP; and

- Wherever possible, explore avenues for affected people to participate and benefit from the Project's construction and operations.

In some circumstances, obligations to compensate or assist PAP as defined by World Bank OD 4.30 are more extensive than required under Russian Federation legislation. The Company has established a Supplemental Assistance Programme specifically to provide compensation to people and households who may not be eligible under Russian Law, but who need to be compensated to assist in experiencing unforeseen difficulties as a result of project activities, and to augment livelihood restoration activities where necessary.

The World Bank policies on resettlement place particular emphasis on the need to involve PAP in resettlement planning. Consultations carried out by the Company have been thorough and extensive. Project affected households have been consulted about their preferences for compensation and have been offered alternatives regarding the form of assistance that they receive, the process of receiving it and, where applicable, the locations they would like to be relocated to.

#### *Monitoring and compliance*

Periodic monitoring of the effectiveness of actions described in the RAP and compliance with World Bank OD 4.30 will be completed in a timely and efficient manner. CLOs will perform field based monitoring using the SEIC Social Compliance Monitoring Handbook and surveys will be carried out internally by the Social Performance Team and externally by an independent resettlement specialist on a semi-annual basis for a period of 36 months following the completion of construction.

Should an individual or group of PAP have a claim relating to resettlement and compensation issues, SEIC have established the Resettlement and Claims Compensation Process. This process will be publicised amongst PAP by CLOs to ensure that they fully understand their rights to claim. Monitoring will also ensure that grievances lodged through the Company's Grievance Procedure are followed through and that, where necessary, appropriate corrective action is implemented.

The implementation of the RAP is the responsibility of the Social Performance Team. The External Affairs Manager, who is a member of the SEIC Leadership Team, will oversee the management of the RAP. A Social Performance Manager who will assume day-to-day responsibility for RAP issues is in the process of being appointed.

#### **11.2.4**

#### **Heritage Resources**

According to the SIA, about forty cultural, prehistoric and historic heritage resources were identified on or close to the pipeline route. These include sites dating from the Early Palaeolithic period to historic World War II sites. Sakhalin Energy has introduced policies addressing the discovery of unexploded ordnance and war dead during construction, as well as a Treatment Plan for Objects of Cultural Heritage ("Treatment Plan").

The search for war dead was carried out in 2002-2003 by the non-governmental organisation ("NGO") Pioneer, under the project management of the Sakhalin Oblast Military Commissariat. The aim was to locate and bury Russian war dead with full military honours and cremate Japanese war dead in a Shinto ceremony. As of 2005, the total number of war dead found, buried or cremated was 61, of which 36 were Russian and 25 Japanese. These operations have had a positive influence on public opinion, especially among residents aged 40 years and above in rural communities.

A by-product of Pioneer's operations has been the discovery of unexploded ordnance ("UXO"), which in accordance with Sakhalin Energy procedures have been reported to the Military Sappers for demolition. Sakhalin Energy's conduct of a high quality and well-controlled UXO programme has helped to promote awareness and understanding (at the local community level up to the highest levels of the Russian administration) of significant UXO and landmine contamination. There is also a high degree of interest within the global landmine/UXO industry – this is the first such programme designed to be fully compliant with "International Mine Action Standards" and the International Standards Organisation (ISO). In addition, the UXO programme has contributed approximately USD1 million into local communities and provided medium/long-term employment to approximately 570 Russian citizens (97% from Sakhalin). Considerable investment in capacity building has enabled Russian contractors to become substantially more competitive on the international market.

The Treatment Plan sets forth procedures to treat cultural heritage objects potentially affected by project construction activities. These include archaeological and palaeontological objects, religious objects and locations and places with unique environmental features. The original Treatment Plan was updated in 2005 and is being implemented, following its recent approval by the Sakhalin Oblast Administration. An expanded programme of archaeological excavation and monitoring is proposed during onshore pipeline construction, in line with the World Bank Operational Policy No. 11.03 on Management of Cultural Property in Bank-Financed Projects. In 2004, the Company's archaeologist completed a handbook for non-specialists on identifying archaeological sites and the proper procedures to be followed. Sakhalin Energy has a responsibility for the training of corporate and contractor staff, where appropriate. The Company shall publicise good management practices in archaeological and cultural heritage conservation in order to raise awareness of the importance of these resources and the methods by which they can be protected. The media used for publication are likely to include the university in Yuzhno and exhibitions in conjunction with museum, as well as the Company's website.

#### **11.2.5**

#### **Recreational and Subsistence Fishing, Hunting and Gathering**

The Company's No Fishing, Hunting and Gathering Policy was developed in response to the concerns of local indigenous and non-indigenous residents about potential impacts of incomer workers on the local resource base and markets. Thus for northern project sites, incomer workers were forbidden from fishing, hunting and gathering. However, during the development of the SIA-A, Sakhalin Energy reviewed the No Fishing, Hunting and Gathering Policy and a revised version will be completed by December 2005. This revision sets out that during the construction period in northern and central Sakhalin (north of Dolinsk and Tomari districts) non-local project workers shall not be permitted to fish, gather or hunt. In southern Sakhalin (Dolinsk and Tomari districts and to the south), project workers may fish with a licence, but not gather or hunt. Provided that they have the necessary permits, the Sakhalin local construction workforce may undertake hunting, gathering and fishing activities outside of work time. Sakhalin Energy shall annually review this policy with the relevant Russian authorities to identify any potentially adverse effects. The Sakhalin Energy CLO Organisation shall independently monitor community responses to this policy.

Contractors are required to ensure that construction personnel are fully briefed about issues related to fauna, and particularly the measures taken to ensure that unauthorised hunting does not take place. The keeping of pets on construction sites is also prohibited.

Other mitigation measures include provision of transportation to alternative sites for fishing, hunting and gathering, if the usual sites are temporarily inaccessible due to Project-related construction activities. Further concerns relating to impacts on recreational and subsistence resource use can be addressed via the Grievance Procedure. Sustainable resource use is also a major focus of the SIMD<sup>P</sup>, which looks at the adequacy of existing mitigation measures for indigenous communities and seeks to provide opportunities for indigenous peoples to develop sustainable resource use enterprises, based on their traditional livelihood activities.

#### **11.2.6**

#### **Indigenous peoples**

There are approximately 3,500 people from amongst four main groups of Indigenous Peoples (the Nivkhi, Uilta, Evenk and Nanai) living within relative proximity to the Project footprint. Of those, Uilta and Evenk reindeer herders, who number about 5 families and 18 herders, are currently assessed to be the most directly affected by project activities as the project pipeline traverses through a very small percentage of their reindeer pastures. The other indigenous communities are those that might be affected by the project, principally in terms of possible interference with subsistence and commercial fishing activities, which are currently the subject of further investigation and consultation. Issues of access to Project-related benefits such as employment and business opportunities are also of particular concern to indigenous workers, who feel they have fewer specific appropriate skills than non-indigenous workers, and may suffer due to discrimination in the hiring market and workplace.

Sakhalin Energy is committed to meeting World Bank Operational Directive (OD) 4.20 standards for projects affecting Indigenous Peoples and to phasing in compliance with the World Bank's new OP 4.10, which came into effect in July 2005.

In this regard and in connection with the Project, the Company is committed to:

- Identifying and mitigating all potential and actual adverse Project impacts on Indigenous People;
- Ensuring that all Indigenous People on Sakhalin are enabled to enjoy social and economic benefits from the Project.

The means by which the Company will address these core objectives are principally laid out in the Sakhalin Indigenous Minorities' Development Plan ("SIMD<sup>P</sup>").

##### *Status and intent of the SIMD<sup>P</sup>*

The first phase of the SIMD<sup>P</sup> will take the form of a Five Year Plan (2006–2010), which will be one in a series to be designed and implemented over the life of the Project. This first SIMD<sup>P</sup> is currently under development and an interim draft has met Senior Lender approval. It is due to be finalised by the end of 2005, at which point it will become a public document. The first Five Year Plan is due to be officially launched in March 2006.

Through the SIMD<sup>P</sup>, the Company aims, with the support of the Sakhalin Oblast Administration, to enter into a partnership with the Indigenous Peoples of Sakhalin Island to develop and implement a programme of sustainable development activities to benefit indigenous communities.

The key goals of the SIMD<sup>P</sup> are:

- Avoiding or mitigating any likely or potential negative effects caused by the construction and planned operation of the Project's oil and natural gas pipelines and associated Project facilities;

- Improving the lives and livelihoods of the Indigenous Peoples of Sakhalin Island through support for the delivery of benefits (social development and sustainable natural resource use programmes) in a culturally appropriate and sustainable manner;
- Enhancing the capacity of indigenous communities and individuals to actively participate in the management of the programmes that will be developed as part of the SIMDPI and, by extension, similar socio-cultural and economic intervention strategies; and
- Facilitating the capacity of Indigenous People's Organisations and relevant government organisations to co-operate effectively to improve the quality of life of IPs.

*Scope of the SIMDPI*

The SIMDPI works in conjunction with other Project documents, particularly the Social Impact Assessment and the Resettlement Action Plan. It includes an assessment of potential adverse project effects on Sakhalin's Indigenous Peoples and, once the consultation process is complete, an implementation plan will be developed that will set out amongst other issues:

- Additional mitigation actions to be taken by the Company to avoid/minimise negative impacts of the Project, if current measures are seen to be insufficient;
- Actions required to realise the full development potential of the Project for Indigenous Peoples;
- Mechanisms to ensure participation of Indigenous Peoples in SIMDPI development and implementation throughout the life of the Loans;
- Measures to ensure long-term sustainability of SIMDPI activities;
- Procedures for periodic review of the SIMDPI;
- Mechanisms to ensure that Indigenous Peoples have access to and make effective use of the Project Grievance Procedure;
- Monitoring, evaluating and reporting procedures; and
- A budget for the SIMDPI as well as a discussion of financing for future phases of the SIMDPI.

It should be noted that implementation of mitigation measures highlighted in the SIMDPI will be restricted to the SIMDPI Project Area (defined in the SIMDPI as areas in or north of Poronaisk District which are: (a) within 1km either side of the pipeline; (b) in or near land used by Indigenous Peoples in which Project activities take place; (c) downstream of pipeline river/lagoon crossings; and/or (d) in oil spill sensitive areas). Unlike the mitigation measures, benefit sharing will be available to all Project Affected Indigenous People (defined in the SIMDPI as all 3,513 members of the Nivkh, Uilta, Evenk and Nanai communities).

*Involvement of Indigenous Peoples*

The engagement with Indigenous Peoples, as required by World Bank OD 4.20, in relation to the development of the first Five Year Plan is in addition to consultation that has taken place with Indigenous Peoples since 2001. This was related to the Project in general and, in particular, to the Sakhalin II Project Phase 2 Social Impact Assessment (SIA, 2003).

Consultation with Indigenous Peoples specifically in relation to the SIMDp began in May 2005. This first round of consultation focused on ascertaining priorities for benefit-sharing components, but was also used to gather input on the perceived impact of the Project and the potential impact mitigation strategies. By the end of June 2005, nearly 200 people (constituting over 5% of the indigenous population of Sakhalin Island) had been involved in SIMDp consultation activities. A second round of consultation took place in Q3 2005 and a third round is due to take place in Q4 2005. In addition, a period of public comment is planned following disclosure of the first Five Year Plan.

A working group has also been established to provide input into the SIMDp and to provide guidance to the Company in its preparation of the first Five Year Plan. The Working Group is composed of representatives of the Sakhalin Indigenous Peoples Council, the Sakhalin Regional Parliament (Duma), and the Company.

#### *The Future of the SIMDp*

Recent press articles indicate that the SIMDp initiative has been welcomed by the indigenous communities on Sakhalin Island. The first Five Year Plan, which is due to commence in March 2006, is just one of a series of plans that will be developed and implemented throughout the life of the Loans, in compliance with OD 4.20, in collaboration with the Working Group and the Sakhalin Oblast Administration and in conjunction with an ongoing consultation process with Sakhalin's Indigenous minority peoples.

### **11.3**

### **ADDRESSING GRIEVANCES**

Anyone, including Japanese stakeholders, can raise a grievance with Sakhalin Energy if they believe the Company's business practices or development of the Project are having a detrimental impact on the community, the environment or on their quality of life. Examples of this may include:

- Negative impacts on communities;
- Dangers to Health & Safety or the environment;
- Failure to comply with standards or legal obligations;
- Harassment of any nature;
- Criminal activity;
- Improper conduct or unethical behaviour;
- Financial malpractice or impropriety or fraud; and
- Attempts to conceal any of these.

SEIC has an established grievance procedure and Public Grievance Leaflet that is available on the Company website or from CLOs.

Grievances can be reported in a number of ways: by sending a completed Grievance Form to Sakhalin Energy (or leaving a completed form in designated collection boxes); by contacting a local CLO; by contacting Sakhalin Energy directly by email or phone; or reporting concerns on a confidential website.

All grievances received by Sakhalin Energy are screened by the Sakhalin Energy Compliance Department, led by a Compliance Manager and managed on a daily basis by a Whistle Blowing Focal Point. Once a complaint is received by the Compliance Department or it is notified of a grievance, the grievance is logged within an action tracking system. The Compliance Department assigns an action

party to be responsible for coordinating the resolution of that specific grievance. The action party will vary depending upon the type of grievance, but in the case of public grievances, this will be the Issues Manager, who resides within the External Affairs Department.

The action party is required to issue an acknowledgement to the complainant within 10 working days of having received the grievance. This acknowledgment specifies a contact person, a reference indicator and an explanation of Sakhalin Energy's proposed action.

The complainant will be contacted by the action party as part of the grievance investigation process and in order to agree proposed actions for resolving the grievance. If a grievance remains unresolved after 20 working days (the timeframe within which Sakhalin Energy endeavours to bring grievances to a satisfactory conclusion), it is reassessed and further dialogue takes place between the complainant and Sakhalin Energy to discuss any further steps required. At this stage, the Compliance Department is responsible for ensuring that a plan is developed and implemented to bring the grievance to a swift and satisfactory resolution, and if necessary this plan will be endorsed by senior management to ensure it receives the required attention.

The Compliance Manager is responsible for monitoring the resolution of grievances and providing regular reports to senior management on the status of grievances. The Company will publish in its Annual Report the aggregate number of grievances received in the preceding year, and the number that were resolved satisfactorily within a 20-day period.

## **11.4**

### **SOCIAL MONITORING ACTIVITIES**

Social monitoring and auditing is a key component of the social performance process to ensure compliance of social social-related policies, procedures and commitments. A social monitoring programme will form part of the annual Social Performance Plan (SPP) that will be developed by the end of 2005 and will include:

- Targets for key social performance activities, with targets for each indicator to be updated on an annual basis with the aim of continual performance improvement;
- Measures of success and key performance indicators to track social performance. Monitoring of social parameters and the effectiveness of mitigation measures are required to fulfil the Company's social performance objectives;
- Key mechanisms, including methodology, tools, actions, roles and responsibilities, for monitoring including SP reviews and assurance audits, a social compliance monitoring handbook and public opinion surveys. If necessary, the actions described in the monitoring programme will be supplemented or adjusted to ensure maximum effectiveness of impact management measures, fulfilment of Project commitments, and correspondence with SEIC guiding principles.

The SPT is responsible for leading monitoring planning and process in general and all major parties engaged in the Project are responsible for social monitoring and management in their areas. The CLOs play a key role in monitoring within communities. The social monitoring programme will establish monitoring obligations for SEIC and contractors in line with the Company's guiding principles.

There are three elements of monitoring process:

- CLO ongoing community liaison and oversight activities which will be documented in the CLO reports and other meeting minutes;
- Social compliance monitoring and reporting. The key tools are a social compliance monitoring handbook (aggregate check lists to be felt by those primarily responsible for implementation of different areas of social commitments to track their compliance) and project data sheets (contractor regular reporting data on employment, procurement and housing etc., and statistics to demonstrate the successes or failures in the social process);
- SPT Social Impact Monitoring (with a focus on assessing the Project impacts, and its compliance with the HSESAP social commitments, having regard also to broader project principles and overall objectives).

Senior Lenders will be given the opportunity to comment on the SPP prior to its completion at the end of 2005.

The social indicators that will be monitored by the SPT include those relating to public consultation and disclosure; grievances; Russian content, employment and business opportunities; recruitment and employment, procurement of goods and services, impacts on communities, impacts on natural resources, worker housing and camp management, the Company's Code of Conduct, indigenous peoples, unexploded ordnances; war dead; cultural heritage; land acquisition, resettlement and compensation; and social investment. More information on these indicators can be found in HSESAP Part 2 Tables 2.10a-g.

## Section 12      **HSESAP**

In compliance with requirements of the EBRD and the World Bank Group policies on environmental action plans, a consolidation of all material environmental, health and social-related commitments derived from the ESHIA and addenda documents is presented in the Health, Safety, Environmental and Social Action Plan ("HSESAP"). Set out in the manner that it is, the HSESAP provides an effective means for ensuring that all project teams and contractors are aware of their environmental, health and social obligations, and it is used by internal and external auditors for checking compliance. The commitments set out in the HSESAP will be covenanted under the Common Terms Agreement for the Phase 2 financing, and the Project's compliance in meeting these commitments will be monitored by Senior Lenders on a regular basis (quarterly during construction and annually during the operation of the Project) for the duration of the financing. These monitoring reports will be made publicly available on Sakhalin Energy's website ([www.sakhalinenergy.com](http://www.sakhalinenergy.com)) following their finalisation.

The HSESAP is publicly available on the Company's websites in Russian and English. Certain parts of the HSESAP, which are deemed relevant to Japan, have been translated in Japanese.

The HSESAP is set out into two parts and three annexes:

Part 1:              Part 1 provides an overview of the Company's operating philosophy, and the structure and systems in place to manage HSE and social issues, including contractor management. It also references the Company's obligations for public consultation and information disclosure, and sets out the reporting and auditing

framework to the Senior Lenders.

Part 2: Part 2 sets out in a tabular format the detailed commitments relating to specific HSE and social issues; the mitigation measures to achieve those commitments; timing for the implementation of commitments; and responsible parties. The tables are set out according to themes, as follows:

- Table 2.1: Oil spill prevention, preparedness and response
- Table 2.2: Waste management
- Table 2.3: Onshore biodiversity
- Table 2.4: Offshore biodiversity
- Table 2.5: Land management
- Table 2.6: Community health
- Table 2.7: Occupational health and safety
- Table 2.8: Air emissions
- Table 2.9: Chemicals
- Table 2.10: Social commitments, set out in tables focused on commitments to address matters relating to resettlement, grievances, indigenous peoples, communities, public consultation and disclosure, objects of modern and archaeological cultural heritage, unexploded ordnances, war dead, and social investment.
- Table 2.11: Road safety

Annex A

Annex A provides a comparison of how the project meets relevant international standards, in particular pertinent World Bank Group safeguard policies and European Commission directives. Annex A comprises the following themes:

- Annex A1: Indigenous Peoples
- Annex A2: Cultural Heritage
- Annex A3: Resettlement
- Annex A4: Occupational health and safety, and community health
- Annex A5: Hazardous materials
- Annex A6: Waste management
- Annex A7: Air emissions

- Annex A8: Discharges to water
- Annex A9: US Federal Energy Regulatory Commission environmental guidelines on construction through wetlands and uplands.

Annex B

Annex B is comprised of four parts. Parts 1-3 provide a narrative against a number of environmental and social related state-level conventions and treaties that the Russian Federation has yet to ratify. Subject to its overriding obligation to comply with Russian law, the Company sees benefit in complying with the spirit and intent of these conventions as far as they are capable of application to private entities. These non-ratified conventions include two habitat-related conventions, five shipping-related conventions; and two social-related conventions. It also provides reference to two other conventions concerning the sharing of environmental information, namely the Aarhus and Espoo conventions.

Part 4 of this Annex provides a list of international conventions and treaties that have been ratified by the Russian Federation and are deemed applicable to the Project. By virtue of its commitment to comply with material HSE and social law, the Company is obliged to comply with those provisions of the HSE and social international conventions listed which apply to private entities under Russian law and which are material to the Project.

Annex C

Annex C provides information on the pre-construction and construction environmental monitoring programmes that have been developed and are being implemented for the Project facilities. For each facility the following information is provided:

- Introduction to monitoring programme;
- Scope;
- Purpose and objectives;
- Summary tables showing:
  - Environmental parameter;
  - Observation point/monitoring point;
  - Monitoring parameters;
  - Monitoring frequency and duration (where applicable).

Parameters include air quality, water and effluent discharges, marine mammal observations, and noise monitoring.

The commissioning and operational monitoring plans will not be developed until Q4 2006, at which point they will be agreed with the Senior Lenders before finalisation. These monitoring measures will therefore continue to be executed until January 2007, unless their need becomes redundant due to a cessation in a particular project activity. Whilst the detailed plans are still in preparation, Annex C does set out the general types of parameters that will be included in these commissioning and

operational plans, which will include:

- Ambient air quality around relevant facilities;
- Stack emission monitoring of main emission sources;
- Greenhouse gas emission estimates;
- Flaring volumes;
- Liquid discharges;
- Water quality;
- Wetlands;
- Waste management facilities;
- Noise;
- River and riverbank quality;
- Land reinstatement status;
- Commercial fisheries;
- Flora and fauna; and
- Pipeline integrity.

An overview of social monitoring activities is also set out in Annex C. The social monitoring programme will be further developed in Q4 2005 in the form of a Social Compliance Monitoring Handbook.