

Chapter

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Mitigation

Chapter 13 Mitigation

The following mitigation measures address the construction and operational phases of the Project. Periodic evaluation of the effectiveness of these suggested measures will be required, and an assessment of any residual impacts should be made.

13.1 CHANGED DISEASE SPECTRUM

13.1.1 Sexually Transmitted Disease (STD)

The approach to mitigation focuses on supporting existing local measures aimed at reducing the incidence of STD. These measures include:

- Joint review and update of community guidelines for STD prevention on Sakhalin Island
- Assist and support the health community in improving STD programme management
- Assist and support the health community in STD surveillance and data management
- Assist and support health leadership in the community and individual behaviour change intervention programmes
- Include STD awareness as part of the company and contractor health education programmes
- SEIC camp management policy (details in SIA)

Key performance Indicators (KPI):

The effectiveness of the above measures can be determined by studying the monthly and annual STD incidence and prevalence statistics.

13.1.2 HIV/AIDS

Evidence from other oil and gas development projects suggests that camp followers, including prostitutes, will set up facilities adjacent to construction camps. Although it is not possible to completely isolate the camps, particularly when they are in close proximity to settlements, it is possible to restrict access to the camps for non-residents.

In addition to SEIC camp management philosophy, other mitigating methods could include the following:

- Participate in updating community guidelines for HIV prevention on Sakhalin Island
- Assist and support the health community in improving HIV programme management
- Assist and support the health community in HIV surveillance and data management
- Assist and support health leadership in community and individual behaviour change intervention programmes. Focus on comprehensive school-based HIV and sex education programme
- SEIC to implement HIV and blood-borne pathogens policy in line with the Shell Policy. Include HIV awareness as part of the company and contractor health education programmes.

Key Performance Indicators:

The effectiveness of the above measures can be determined by studying the monthly and annual HIV incidence and prevalence statistics for both the workforce and the Sakhalin population, although these may not be reliable.

13.1.3 Hepatitis B and C

Mitigation measures include:

- Hepatitis B vaccination for all health staff and other at-risk groups among Project personnel
- Company support of community measures to minimise spread of blood and other body fluid related disease through support of local agencies and NGOs
- Management of company generated, biologically contaminated waste included in the company waste management plan

Key Performance Indicators:

Percentage of health staff immunised against hepatitis B
Evaluation of disposal of biological waste

13.1.4 Tuberculosis

A reduction in TB incidence can be effected by helping the local health authorities to develop a better TB management programme. The approach needs to improve screening, diagnosis and treatment.

- Assist and support the local health community in expanding the TB prevention and care programme based on DOTS in line with internationally accepted standards and practices
- Promote the development of a national and sub-national partnership to combat TB with all stakeholders in society, including governmental and private healthcare sector partners and NGOs
- Company and contractor TB screening programme as part of medical fitness assessment. This will enable the early identification and treatment of TB.

Key Performance Indicators:

Monitoring and evaluation of the national TB programme on Sakhalin Island
Periodic health surveillance in accordance with RF guidelines.

13.1.5 Tularemia

- Contractors clearing the pipeline right of way should be provided with insect repellent treated clothing
- Waste management practices within camps should minimise the possibility of rodent access
- Camp medics will need to be trained to recognise several vector borne diseases
- Vaccination for at-risk groups

Key Performance Indicators:

Cases of tularaemia amongst the workforce.

13.1.6 Tick Borne Encephalitis and Lyme Disease

- Clothing and work procedures that minimise the risk of tick bites will reduce the number of cases among the SEIC workforce
- Medical and other staff will need training to recognise cases and to implement the appropriate management regimes
- Russian law prescribes immunisation against TBE for those at risk
- SEIC may need to commission an entomological review to determine if further management of this risk is required

Key Performance Indicators:

Cases of TBE and Lyme Disease amongst the workforce.

13.1.7 Leptospirosis

Procedures to minimise rodent activity in the camps will be required and pets will not be permitted in the camps.

Key Performance Indicators:

Control the number of rodents in the camps to minimal levels.

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13.2 IMPACTS ASSOCIATED WITH LIVING CONDITIONS

13.2.1 Food Contamination

- Develop and implement adequate, standardised food and drinking water hygiene practices for company and contractors
- Assess and monitor food hygiene procedures and practices in the hotels and catering agencies used by company staff and contractors and upgrade as required

Key Performance Indicators:

Audit records of catering companies used by SEIC and contractors.
Ensure compliance with permits.

13.2.2 Acute Intestinal Infections

- Treatment of all drinking water on SEIC sites
- Food hygiene programmes at all SEIC locations
- Risk based immunisation for hepatitis A (catering personnel)

Key performance Indicators:

Audit outcome for catering.
Water quality meets standards.
Immunisation rates for catering staff.

13.2.3 Acute Respiratory Infections

- Support risk-based immunisation programme for influenza
- Provision of good standard of accommodation.

13.2.4 Drug and Alcohol Use and Abuse

- Implement company alcohol and drugs policy for SEIC staff and contractors with focus on awareness and prevention
- Support community alcohol and drug programmes, including support to NGO, to minimise harm
- Assist and support the health community in improving alcohol and drugs leadership and programme management
- Assist and support the health leadership in the community and individual behaviour change intervention programmes
- Implement the company and contractor revised comprehensive alcohol and drugs policy with focus on awareness, prevention and control

Key Performance indicators:

Assess the monthly and annual alcohol and drug-related statistics compiled by existing Sakhalin Island programmes.
Conformance with SEIC Drug and Alcohol Programme.

13.2.5 Air Emissions

The planned mitigation measures detailed in the EIA will ensure that air emissions remain well below WHO standards.

13.2.6 Waste Management and Sewerage

SEIC have prepared a comprehensive solid waste management plan as part of the environmental management plan. Consideration of medical contaminated waste, hazardous substance handling, radioactive waste and rodent management will be included in the plan.

On remote company sites, there will be tertiary treatment of sewage prior to discharge. Sites located within towns, like the Poronaik IUP camp, will be connected to the town sewer system.

Hazardous waste will be stored in accordance with RF requirements or exported to an appropriate facility. Details of hazardous waste volumes are contained in the solid waste management plan.

Key Performance Indicators:

Achieving a target of zero on the percentage of water discharge samples which are above acceptable contamination limits at control point.

13.2.7 Hazardous Substances

SEIC minimum health standards require product stewardship of hazardous substances. This includes the cradle-to-grave management of these materials, starting with the selection of the substances based on the minimum effect on human and environmental health. All products must also be registered for use in Russia. Some carcinogenic materials, such as asbestos, have been excluded from use (apart from limited use in gaskets) in the Project Basis of Design.

13.2.8 Water Course Disturbance

Water course disturbance was identified as a major potential environmental impact. The pipeline route takes into account the effect on water courses and water sources, sanitary protection zones and salmon spawning rivers. See Volume 1, Chapter 5 and Volume 4 of the EIA for further details.

13.2.9 Water Contamination

The potential for the contamination of domestic water supplies by sewerage and grey water will be managed by the collection of these contamination sources at camps, followed by treatment in purpose-built treatment facilities. Further details are included in the EIA for each asset.

13.2.10 Noise

Noise standards have been included in the design requirements for each of the facilities. The design will minimise the noise exposure for employees within the fence line. Environmental noise at the fence line is being modelled and will be included for the relevant assets in the EIA report.

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**Management
plan for health
infrastructure**

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Management plan for health infrastructure

SEIC, in conjunction with Sakhalin Island healthcare practitioners, needs to further evaluate detailed requirements for employee healthcare, focusing on existing standards of clinical care as well as equipment and training of medical and paramedical staff. At present there is not enough detail to determine the best approach to take, although it is apparent that the company will need to support some development in emergency care within the Sakhalin healthcare system to meet company standards.

An independent evaluation of the facilities has been commissioned jointly by SEIC, Exxon Neftegas and the Regional Health Authority. Efforts are likely to focus on key activity hubs. The possibility of sharing the cost of these sustainable development programmes is being investigated with other industry-related projects.

14.1 MEDICAL AND INDUSTRIAL EMERGENCIES AND DISASTERS

Management and mitigation measures will focus on:

- Joint company - community approach to Emergency Response (ER) management and programme development
- Integrate Sakhalin RCRT into ER training, exercises and response planning
- Jointly develop comprehensive 'worst case scenarios' and mitigation strategies for eventualities such as earthquakes, explosions, aircraft crashes, community outbreaks of food poisoning etc.
- Road safety HSE case implementation in HSE MS
- Support local road safety campaigns in light of possible increase in road transport during Project construction

Key Performance Indicators:

Audit of company Medical Emergency Response.

14.1.1 Road Traffic Accidents

The planned mitigation measures are:

- Upgrade of transport systems
- Development of road traffic safety case
- Implementation of vehicle standards
- Implementation of drug and alcohol policy including random testing

14.2 HEALTH STANDARDS (MEDICAL FITNESS)

The health standards related to medical fitness are regulated within the RF by Order #90, Ministry of Health and Medical Industry 'On order of preliminary and periodic medical examinations of employees and medical regulations of admissions to employment.' Although the RF requirements are well developed and detailed, the participants of the HIA workshop recognised that current regulations do not address criteria of medical fitness for those working in remote areas. There is a risk that some workers will be unfit for their job.

SEIC has its own medical fitness standards, based on Oil and Gas Producers (OGP) documents for working in remote locations. Employers will be required by contract to ensure compliance with the Russian law, as well as with SEIC's own fitness standards. Evidence of compliance will include a SEIC audit of employers' conformance and examination of clinical records by SEIC medical staff.

14.2.1 Immunisation

Guidelines for 'medical fitness standards' will be implemented and include an assessment of the immunisation status. Vaccination for diphtheria, tetanus and polio will be mandatory for all employees and contractors. Contractors will be advised to immunise employees based on the potential risk of exposure to blood-borne, arthropod and zoonotic diseases as part of a disease prevention programme in

accordance with RF requirements. There will also be compliance with RF requirements with regard to immunisation for specific groups e.g. hepatitis A and typhoid for catering staff. The key performance indicator will be the percentage of SEIC employees and contractors' employees fully immunised based on recommended immunisation schedules.

14.2.2 Health Awareness Programmes

Health awareness programmes will be included in HSE training and occupational health programmes.

14.3 GENERAL MANAGEMENT PLAN

SEIC, jointly with Sakhalin health authorities, will establish a 'Health Advisory Committee' to address, review and advise on how best to manage health issues of common interest. The terms of reference for this committee will be agreed upon by its members. The exact form and composition of this committee is still to be determined but the aim is to work together to improve health on Sakhalin Island.

SEIC will also develop and implement a specific health issue engagement plan and consult the general community and other identified key health stakeholders. This plan complements and is fully integrated into SEIC's overall Public Consultation and Disclosure Plan (PCDP).

To facilitate monitoring of the Project's effects on community health, SEIC will establish a health data reporting structure in co-operation with the local health authority based on standardised definitions. This will be undertaken following the commencement of construction.

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Management plan for health infrastructure

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**Summary of
health issues on
Sakhalin Island**

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Summary of health issues on Sakhalin Island

The health situation in the RF in general and on Sakhalin Island in particular is directly and indirectly related to the changing socio-economic situation. The transformation of the political and economic systems which started more than a decade ago has affected every RF managed structure including the healthcare system, the drinking water distribution system and waste management system. The decrease in funding has resulted in a deterioration of Sakhalin Island health institutions in terms of staffing levels, equipment, materials, medication supply and maintenance. Furthermore, citizens dependent on state support are finding it difficult to maintain an adequate standard of living. This has an effect on their personal health. Statistics from Sakhalin Island sources, the RF, and the WHO demonstrate that the health of the population has been negatively affected, and morbidity and mortality rates have increased.

The current health issues on Sakhalin Island are:

- Underfunded health infrastructure affecting Emergency Response support and basic healthcare provisions
- Rapid increase in or stable high level of communicable diseases such as STD, TB and blood-borne pathogens (hepatitis B, C and HIV/AIDS)
- Increasing exposure to some water-borne infections related to public service systems (drinking water, waste management)
- Lifestyle-related threats to personal health including smoking, alcohol abuse and drug-use
- Increase in lifestyle-associated pathology and diseases like cerebrovascular disease, myocardial disease and diseases of the digestive tract
- Increase in accidents, particularly road traffic accidents, and increased morbidity and mortality rates related to violence and suicide

Although these are important health issues for Sakhalin, not all will be impacted by the Sakhalin II Project. The important Project-related impacts are highlighted in the following section.

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Conclusions and recommendations

Chapter 16

Conclusions and recommendations

The health impacts that have been identified for the Sakhalin II, Phase 2 Project relate predominantly to the influx of workers during the construction phase and have been summarised below.

16.1 HEALTH IMPACTS OF THE SAKHALIN II, PHASE 2 PROJECT

The positive health impacts of the Project include:

- Improved access to healthcare for the local population who are members of the workforce
- Improvement in physical accessibility of healthcare due to improved transport system
- Improvement in living and psychological conditions for those directly associated with the Project
- Decrease in smoking amongst workforce

The negative health impacts of the Project relate to increases in:

- Drug use
- Hepatitis B, C and HIV
- STDs
- Risk of TB for imported workforce
- Water-borne disease for workforce (if water not treated)
- Road traffic accidents
- Risk of zoonoses and insect-borne diseases for workforce e.g. Lyme Disease, TBE
- Demand on healthcare system
- Income inequality between Island residents

The temporary increase in the population is anticipated to increase demand on an already stretched healthcare system. However, the direct impact on public health of this effect is likely to be minimal.

Camp accommodation facilities will be generally self-sufficient and extensive measures are being undertaken to minimise the risk of contamination of water sources during construction (further details are included in the EIA).

Depending on the camp management approach, the spread of communicable disease may increase between the workforce and camp followers. TB incidence however is not likely to change especially as the rate is expected to be lower amongst the workforce than the general population.

Overall, the Project is expected to have a positive impact on the Sakhalin economy. However this may render food and housing less affordable for those on fixed incomes and the unemployed. Such changes in socio-economic circumstances for particular sectors of society (which are discussed further in the SIA) could lead to a reduction in the standard of health for these sectors, as inflation means that healthcare becomes less affordable.

16.2 MONITORING OF PERFORMANCE LEVELS

In order to limit any potential negative health impacts of the Project to 'as low as reasonably practicable', SEIC have identified a number of mitigation measures (see Chapter 13). The effectiveness of the mitigation measures will be determined by monitoring the issues, as outlined in the following sections. These measures are in addition to the environmental and sanitary monitoring plan. The challenge will be to collect accurate data and to determine the degree of change that can be attributed to Project activity.

16.2.1 Communicable Diseases

- Incidence and prevalence of STD in workforce and in community
- Prevalence of HIV/AIDS in workforce
- Number of cases of TB in workforce
- Cases of intestinal infection in workforce

16.2.2 Effectiveness of Preventive Measures

- Absence of cases of vector and arthropod-borne disease
- Absence of cases of vaccine preventable diseases e.g. diphtheria, typhoid

16.2.3 Public Health

- Drinking water quality
- Compliance with drinking water monitoring plan
- Quality of discharge water (see effluent monitoring plan)

16.2.4 Lifestyle and Non-communicable Diseases

- Number of positive alcohol tests
- Case breakdown of work-related and non-work related illness
- Monitoring of official statistical reports of disease in community which are potentially related to the Project

16.3 RECOMMENDATIONS

With appropriate management of the identified health impacts, there is unlikely to be a major adverse direct impact on health related to the development of Sakhalin II, although there may be residual effects if cases of diseases such as HIV escalate.

Close co-ordination with local authorities will be required to minimise some indirect impacts, especially those related to 'boomtown' effects during construction. The improvements for the general public will depend on better socio-economic circumstances with associated increases in funding for infrastructure, including healthcare. The key threats relate to the spread of communicable diseases and an increase in road traffic accidents.

By managing camps appropriately and providing good primary and emergency care on site, the general health of the workforce is likely to improve. Similarly, by supporting certain changes in some secondary care facilities, SEIC will be assisting in the sustainable development of the healthcare sector, which will benefit the Sakhalin Island community.

Facility design has taken into account health requirements to minimise the effect on both the workforce and community. Specific measures, such as oil spill response planning, have been developed to minimise the potential impact in the event of a catastrophic event.

The way forward requires co-operation between SEIC and the health stakeholders to optimise healthcare in a cost-effective manner.

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Conclusions and recommendations

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Health Hazard

The potential to cause harm to health. Health hazards are also known as 'agents hazardous to health'.

Health Risk

The likelihood that, under specified conditions of exposure, the health of a certain population will be harmed.

Health Hazard Rating

A rating of Low, Medium, High allocated to a health hazard dependent on the severity of its potential ill-health effect.

Health Control

The means controlling exposure to health hazards, listed in preferential order as

- Elimination
- Substitution (alternatives)
- Engineering (plant and equipment)
- Procedural (avoid or limit exposure, including awareness)
- Personal protective equipment
- Immunisation

Health Impact

The effect of a project on a health issue or hazard. Impacts may be positive or negative.

Primary, Secondary (Qualified) and Tertiary (Specialised) Healthcare

General Practice medical care, hospital care and referred specialist hospital care

Acronyms and Abbreviations

BCG	Bacillus Calmette-Guerin
DOTS	Directly Observed Therapy Shortcourse
EIA	Environmental Impact Assessment
EP	Exploration and Production
ER	Emergency Response
ESHIA	Environmental, Social and Health Impact Assessment
FSO	Floating Storage and Offloading unit
HCP	Healthcare Practitioner
HIA	Health Impact Assessment
HRA	Health Risk Assessment
HSE	Health, Safety and Environment
HSE MS	HSE Management System
ICD	International Coding of Disease
ISOS	International SOS
IUD	Intra Uterine Device
IUP	Infrastructure Upgrade Project
IV	Intravenous
KER	Key Environmental Requirement
KPI	Key Performance Indicator
LNG	Liquefied Natural Gas
MPE	Maximum Permissible Emissions
MTPA	Million Tonnes Per Annum
OGP	Oil and Gas Producers
OPF	Onshore Processing Facility
OTC	Over The Counter
PCDP	Public Consultation Plan + Disclosure Plan
PEIA	Preliminary EIA
PSA	Production Sharing Agreement
RAM	Risk Assessment Matrix
RCRT	Regional Catastrophic Response Team
RHCD	Regional Healthcare Department

Chapter

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Glossary and acronyms

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Glossary and acronyms

RF	Russian Federation
RMMIF	Regional Mandatory Medical Insurance Fund
RTA	Road Traffic Accidents
SEB	Base Office in Yuzhno-Sakhalinsk
SEIC	SEIC Investment Company
SIA	Social Impact Assessment
SMNG	Russian Oil Company
SOW	Scope of Work
STDs	Sexually Transmitted Diseases
TB	Tuberculosis
TBE	Tick Borne Encephalitis
TsGSEN	Centre for Sanitary and Epidemiology Supervision
WHO	World Health Organisation